DIALOGUE ON WATER, FOOD AND ENVIRONMENT IN CENTRAL AND EASTERN EUROPE (CEE)

NATIONAL REPORT LITHUANIA

Compiled by Rūta Vačiūnaitė

APLINKOSAUGA IR ŽEMĖS ŪKIS VIDURIO IR RYRŲ EUROPOS ŠALYSE

LIETUVOS NACIONALINĖ ATASKAITA

Sudarė Rūta Vaičiūnaitė

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EXECUTIVE SUMMARY

1. BASIC INFORMATION

Historically Lithuania is an agricultural country. Even nowadays the agricultural sector performs very important economic, social, environmental and ethno-cultural functions, and is considered to be a priority sector of the national economy.

Total area of the country is 6.53 million ha. Total population – 3.692 million. At the end of 2001 the number of people in the agriculture, fishery and forestry sectors constituted about 17.4% of total employment. GDP per capita in 2001 – 13752 Litas (3929 USD)

Of the 6.530 thousand hectares of total area, utilised agricultural area (UAA) at the beginning of 2001 equalled 3.488,7 thousand hectares, or 53.4 per cent of total country territory. Arable land accounted for 2.932,6 thousand hectares (84.1 per cent of UAA), meadows and natural pastures – 497.1 thousand hectares, or 14.2 per cent of UAA and permanent crops - 59 thousand hectares, or 1.7 per cent of UAA. Forests cover 1998.4 thousand hectares (or 30.6 per cent of total country area), water bodies – 262.1 thousand hectares (or 4.0 per cent of total country area), roads – 131 thousand hectares (or 2.0 per cent of total country area), build-up territories – 187.3 thousand hectares (2.9 per cent of total country area), other land – 462.5 thousand hectares (or 7.1 per cent of total country area). The reclaimed area equalled 3.05 million hectares, 85 per cent of which has been drained.

The composition of soil in Lithuania is far from uniform. 13 per cent of the agricultural land is sand, over 37 per cent is sandy loam, over 39 per cent of clay loam, 3 per cent of clay, about 8 per cent of peat. The greater part of the Lithuanian territory is lowlands separated by low hills.

1.1 Land reform

The process of land reform and restoration of ownership rights to land started in 1991. The ownership rights have been restored to up to 79 per cent of land area. By the beginning of 2002 the total number of private land owners reached 555.700. Restitution process has not been finished yet. By 2000, there were registered 67 thousand family farms on the Farm Register. The average statistical size of farm is 17.2 hectares. It is expected, that by 2006 the average size of farm will reach 18.2 hectares and by 2010 – 22.0 hectares. The number of corporate type enterprises reduced sharply. By 2001 963 agricultural companies remained active, while in 1995 there were 2611 ones.

Co-operation can be defined as one of the way that allows small producers to strengthen their position. By the end of 2000 there were involved 12 thousand rural people into the co-operative activities. The total number of agricultural co-operatives makes up to 371. Currently, 130 agro service co-operatives and 110 agriculture co-

operatives are registered. However, the vast majority of them have less than 10 shareholders.

With regard to economic issues, both agriculture and the processing industry are characterised by structural imbalances (fragmentation and small units), outdated technology, and lack of capital for investments causing low productivity and thereby lack of competitiveness.

1.2. EU accession

Since the restoration of independence the political and economical orientation of Lithuania has been linked with Europe. The main criterion for EU membership is approximation of the Lithuanian legal framework with EU laws. 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. Lithuania has set itself an ambitious goal to be ready for the EU membership by the 1st of January 2004. Since some harmonisation and implementation of the EU *acquis* concerning agriculture will take longer than until the 1st of January 2004, a few transitional periods and technical adjustments are requested by Lithuania.

In 2000 SAPARD program has started its support to rural development. The annual grant aid provision makes up 29 829 thousand EURO, with slight increase of 1.7 per cent every year.

2. RURAL POPULATION

In 2000 the rural population of Lithuania was 1176.8 thousand or 31.8 per cent of the total population whereas the average percentage of the rural population in the EU member states is 17.5 per cent. About half of rural inhabitants consisted of persons of working age, either employed or unemployed. Share of female employment in active population – 41.8 in %. During the last three years, the changes in the labour of force in rural areas has not been very great, but there are certain adverse tendencies which give reason for concern: the number of the employed decreases while unemployment is growing.

About 56 per cent of the population employed in agriculture are persons of retirement age. As many as two thirds of the farmers are 60 or over years old, and only 2 per cent of them are under 30. Low standards of living and other unfavourable factors (injuries, occupational diseases) determined rural population's life expectancy: in 1999 rural population's life expectancy was 5 per cent lower than the life expectancy of urban population. Lithuanian rural people are less educated compared to urban population.

According to survey of 2001, per capita average income was 409.5 Litas per month (urban population – 455.4 Litas/month, rural population – 310.9 Litas/month, agricultural population – 249.9 Litas/month).

Note: official exchange rate in 2001 was 1 Euro = 3.45 Litas

3. AGRICULTURAL PRODUCTION

3.1 Grain crops

Agricultural share in GDP in 1999 was 8.6 □%. Share of agr
value added – 6.3%.

The total crop area makes up to about 2.15 million hectares. Grain crops and fodder crops are the important ones. Grain and fodder crops take up the largest proportions of the total crop area (44.5% and 45.6% accordingly, in 2001).

3.2 Rapes

Rapes are the most suitable oil crop for cultivation in Lithuania. Compared to 2000, area covered by rapes crop reduced to 5 per cent and accounted to 50.7 thousand hectares. It is expected, that by 2010-2015 the rape crops will extend to 210-230 thousand hectares. It will enable Lithuanian rape producers to deliver 150-200 thousand tonnes to the external markets annually.

3.3 Potatoes

The total potato cultivation area remains stable and makes up to 4.7-4.8 per cent of the total crop area (about 102.2 thousand hectares in 2001). Development of the sector is closely related to the establishment of the specialized farms.

3.4 Flax

Over the last years area covered by flax increased significantly from 8.8 thousand hectares in 1999 to 10.2 thousand hectares in 2001. It is expected, that the total demand of the local textile industry in fibre flax raw material will increase up to 17-18 thousand tonnes in 2010 and 20 thousand tonnes in 2015.

3.5 Vegetables

Lithuania’s geographic position and climate are favourable for field vegetable cultivation. Increase in output, that is supposed to reach 500 thousand tonnes in 2004, 632 thousand tonnes in 2010 and 650 thousand tonnes in 2015, is closely related with the aid from EU structural funds.

3.6 Fruits and berries

Average fruit and berries production is 134.0 thousand tonnes per year. The main part (90 %) of fruit and berries is produced by farmers and town dwellers in their small holdings. Specialised agricultural companies have storage capacity able to contain 22 thousand tonnes of fruit and vegetables. Small fruit, berries and mushroom processing enterprises enter the market.

Development of the agricultural sector will be also aimed to solve social problems, as it enable establishment of working places in rural area, especially in the regions where natural conditions impose constrains on traditional agriculture. It is supposed, that by 2015 there will be created 10 thousand additional working places in rural area.

3.7 Meat production

Meat sector plays an important role in agricultural production. The total worth of the breeds in 2000 made up to 17.8 per cent of total Lithuania agricultural output. About 17.4 thousand people are involved in the livestock breeding sector, and 3.9 thousand in the meat processing industry. However, productivity is low in comparison with the EU countries.

Traditionally two species of breeds – cattle and pigs - dominate in the herds. At the beginning of 2002 the total number of cows amounted to 441.8 thousanand the total number of pigs was 1010.8 thousand.

Majority of livestock farms are small in size. At the beginning of 2002 there were 239.363 herd owners, 209.557 of them have 1-5 heads.

Decline in output of meat processing sector was predetermined by the decrease in raw material supplement. In 2000 meat production fell down by 15 per cent.

3.8 Milk production

Milk production is one of the main branches of agricultural production. In 2000 1.725 million tonnes of milk have been produced, that made up about 18 per cent of total agricultural output and 41.0 per cent of livestock production. By the beginning of 2002 the total herd of the cows amounted to 441.8 thousand ones.

Currently there are 38 milk-processing companies, 17 of which have the EU veterinary number, and are qualified as exporters of dairy products into the EU countries. The main trade partners are the EU countries, CIS and the USA.

Due to different factors (change in nutrition pattern, decreased purchasing power) the domestic per capita consumption of milk dropped during the last decade.

4. LABOUR EFFICIENCY IN AGRICULTURE

The rather large number of people engaged in agriculture is determined by the low efficiency of labour, partial employment and small farms. A better labour efficiency on larger farms of 50 and over hectares is determined by a better availability of agricultural machinery and equipment. The increase in income is also related to the size of the farm because larger farms can afford to buy agricultural machinery and increase labour efficiency.

5. FOREIGN TRADE

Foreign trade in agricultural and food products plays a relatively important role in the economy of Lithuania. Lithuania, traditionally, is an exporter of food products. During 1994-2000 the share of agricultural and food products in total foreign trade dropped from 16.6 per cent to 10.8 per cent. Its share in the total exports was 11.6 per cent, and its share the total imports made up 10.2 per cent in 2000.

6. ECONOMIC MEASURES OF MARKET REGULATION

The main economic state regulation measures in agriculture may be divided into two categories. The first comprises price and income support measures. The second covers structural measures as well as measures for the improvement of crop and livestock quality.

6.1 Prices

Price reform may be seen as a several stage process. The first stage resulted in the replacement of a differentiated purchase price system by a uniform agricultural product price system. The last stage in the year 2000 marked the beginning a pre-accession stage, i.e. the stage of adjustment to EU price policy. Intervention and target prices were stipulated..

6.2 Taxes

With the reestablishment of its independence Lithuania changed the whole taxation system, agricultural taxes included, fundamentally.

Pursuant to the Law on Tax Administration agricultural entities shall pay the following taxes: value added tax, excise duty, personal income tax, corporate income tax, land tax, tax on land lease, road tax, and make mandatory health insurance contributions. The amount of tax paid by agricultural entities has been gradually diminishing. The only reason for shrinking amounts of tax paid is a marked drop in production.

6.3 Foreign trade regulation

An agreement on economic, commercial and trade cooperation with the EU was signed in 1992, which was followed by a free trade agreement in 1994. Since 1995 free trade agreements have been in force with all EU member states. In June 1995 the Europe Agreement which granted the status of an associate country for Lithuania was signed.

Free trade agreements between Lithuania, Latvia and Estonia were enacted in 1994. Beside the above mentioned free trade partners of Lithuania FTAs have been signed with Poland, Slovakia, Slovenia, Czech Republic, Turkey, Hungary, Ukraine, and EFTA countries.

7. SOCIAL WELFARE

By the number of employees agriculture takes the first place among the economy of Lithuania. Agriculture remains a main activity among the rural population: the sector employs 54.0 per cent of total rural employment. A large part of food products is produced by rural population on farms themselves. Therefore, rural population’s in kind income makes up one third of the total household income per member, and in the case of a farmer – 45 per cent in 2000.

7.1 Rural unemployment

The most important social problem of the countryside is a high unemployment rate. The unemployment rate of rural population rose from 9 per cent in 1999 to 12.8 per cent in 2000. The highest unemployment rate is among young people, the age group under 25.

7.2. Poverty

The highest level of poverty was recorded in the countryside, while the lowest – in biggest cities. In 2001, more than one quarter of all rural inhabitants and every twelfth town dweller were living below relative poverty line. The countryside is still unattractive to local and foreign investors. Investment in rural areas per head was 2.6 times lower than in urban areas.

7.3. Rural infrastructure

Compared to urban areas, Lithuanian rural areas have a lower standard of living in terms of physical infrastructure. Although, at the end of 1997 there were no villages without electricity, wide disparities between rural and urban areas existed in water supply, central heating systems, sewage and telephone networks. Only 43.5% of rural residential units, or one third of rural settlements, have central piped water supply systems. Approximately 700,000 rural inhabitants use drinking water from 300,000 dug wells. The same is true for sewage systems. In total, 733 sewage systems

have been installed in rural areas. They serve around one third of rural inhabitants. Poor development of water supply and sewage systems raises major environmental issues.

To conclude, poor water supply and sewage systems represent a major threat to rural environment. Besides, existing disparities in infrastructure between rural and urban areas and poorer quality of life may lead to migration from rural to urban areas. These trends would have a negative impact on rural development and threaten the sustainability of rural communities.

8. WATER

Geographical location of Lithuania is favorable with respect to surface and groundwater resources. There are 29,000 rivers with total length of 64 000 km but only 18 rivers are longer than 100 km. The Nemunas River basin occupies 74 % of the territory of the country (with also 74 % of total population). Number of lakes larger than 0.5 ha comprises 2850 with total area of 908 km^2. Rainfall during the average year amounts to 748 mm. Renewable water resources of Lithuania reach 15.4 km^3, beside that 10.8 km^3 of water are transit flows from Byelorussia, Poland and Russia. Surface water availability is 7.043 m^3/cap/y. In 2000 total amount of 3 578 million m^3 of water was withdrawn for power production, industrial and domestic purposes. 93 percent or 3290 million m^3 was used for energy production (mainly for cooling of Ignalina Nuclear Power Plant). 242 million m^3 was used for industry, household, agriculture and fisheries. Industry consumed 21.5%, household use was 44.2%, agricultural sector – 0.7% and fisheries 33.1% of total water volume.

Lithuania is probably the only country in Europe using exclusively groundwater resources for potable water supply. The supply of drinking water is provided by the municipalities, which are in most cases the owners of the water supply companies. Municipalities are also responsible for the extraction, delivery, treatment and monitoring of drinking water, and for the provision of information on drinking water quality to the public. There are approximately 1.330 individual supplies of drinking water exceeding 10 m^3/day or serving more than 50 persons, and 80 larger drinking water supplies extracting over 1.000 m^3/day or serving more than 5.000 persons.

3 525 million m^3 of waste water was discharged into surface water bodies in 2000. Energy sector is responsible for the largest amount of discharged water (Ignalina NPP and Kruonis Hydro-accumulation PP). 168 million m^3 of waste water needed purification before discharging into surface water bodies. 80% of waste water was treated in biological treatment plants, 18% of waste water was only mechanically treated and 2% was discharged without purification. In 2000 about 86% of discharged waste water in Lithuania has failed to satisfy the EU environmental requirements.

9. ENVIRONMENT

Lithuanian agriculture occupies over 53% of the land area of the country and its impact on the environment is big. 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 for 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 problem results 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.

The pollution of soil because of recent agricultural practice does not exceed permissible marginal concentrations. Although individual rare cases of higher pollution with fertilisers, pesticides or other chemical materials might be encountered. Fertilisation of fields in the European Union is 1.5 times more intensive than in Lithuania. For comparison, in the EU the average figure for 1998 was 126 kg/ha of fertiliser active material while in Lithuania is was 99 kg/ha.

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 in 1997. In 1991, 196 kg of fertiliser was applied per ha. Before the agricultural reform, average 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. The total drainage area is estimated at 3 million hectares, of which 2.6 million have a functioning drainage system. 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

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.

Abandoned lands in Lithuania have become an ordinary phenomenon. Coastal and moraine plain areas becoming long-fallow lands can have a negative effect on bio-diversity there since this area is quickly grown by deciduous bushes and low-value wood. For the protection of bio-diversity extensive farming is preferable in such areas, and the least productive and suitable lands should not be used for agricultural purposes.

9.1 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 single farmsteads were removed. During the last 30 years, 70 % of the wetland have been lost. Vast areas of wetlands suffer from eutrophication, which has adverse effects on vegetation.

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.

9.2 Organic farming

Lithuania's integration into the EU implies a challenge to produce only competitive goods, i.e. competitive agricultural products. All necessary preconditions for the production of organic products exist in Lithuania: a favourable ecological situation, state support, expanding local and foreign market of organic products, national and international recognition of the certification enterprise 'Ekoagros' – all that results in possibilities to export organic products.

The number of organic farms is constantly increasing. In 1993, the first organic farmers were certified. In 2001, 230 organic farms and 19 processing and trade enterprises were certified. The area of certified organic farms is 0.18 per cent of the total area of agricultural land in Lithuania. An average size of the organic farm is 20 ha. The major part of certified lands is meadows - 50 per cent and cereals - 40 per cent, 10 per cent of the area is used for vegetables, leguminous, potatoes, berry plantations, orchards, etc. As a rule, organic and conventional farms are mixed, i.e. they produce different products: grain, potatoes, livestock products, fodder, etc. Only a few farms are specialised in producing of vegetables, fruit, berries, mushrooms, or herbs.

Grain makes up the major part of organic crop products (40 per cent), potatoes rank next (25 per cent), followed by vegetables (12 per cent). As for livestock production, the major organic product is milk (90 per cent). However, milk as well as beef and poultry are sold as ordinary products, without the mark of organic certification. There is no processing plant producing livestock organic products.

Organic products are in greater demand in Lithuania now, however, the network of distribution channels of organic products has not been developed yet. A survey results show that only 45 per cent of certified organic products were sold as organic ones with a 20-40 per cent surcharge.

The number of organic farms increases by 20-30 per cent annually. If the certification of land follows the same pattern, in 2006 this area will comprise 0.5 per cent of the total agricultural land, while the goal is to have 1 per cent of the total agricultural land area turned into organic farms before 2006.

10. ENVIRONMENTAL PROTECTION IN AGRICULTURE

Taking into account the diversity of natural resources of Lithuania, the following ecologically sensitive territories are identified:

- *Particularly sensitive, very sensitive and sensitive territories*. Their area amounts to about 1934 thousand ha.
- *Protection zones of water bodies* cover the area of 195 thousand hectares
- *Karst region of Northern Lithuania* is an area of 193.5 thousand hectares.
- *The Nemunas River water-meadow region* – 52.4 thousand ha.
- *Ecological protected territories*. There are 1062 protected territories in the country (773903 hectares or 11.9% of the national territory): 5 state strict reserves (24004 ha), including 4 natural and 1 cultural reserves, 5 national parks (152294 ha), 30 regional parks (436000 ha), 258 state nature reserves (150299 ha), 101 municipality nature reserves (11186 ha), and 662 protected items of a natural landscape.

In 2000, an operational concept of national ecological networks (NECONET) in Lithuania, was created, as well as its implementation strategy that conform to European standards. The implementation of ecological network is necessary for ecologically balanced development of the region and for implementation of the principles of sustainable development, maintenance of landscapes and biodiversity, as well as implementation of the EU Habitat and Bird Directives (Natura 2000 areas), Agri-Environmental programmes, as a process of the EU accession, and also Biodiversity and Bern Convention (EMERALD network). The general structure of ecological network - core areas, corridors, buffer zones and stepping stones - is accepted in the country. Development of the national ecological network provides Lithuania a tool for setting priorities in biodiversity protection and will start integration of general and cross-sectoral policies, applying concepts of European and Regional Ecological Networks.

11. NATURA 2000

Since the beginning of 1999, the first steps in the implementation of Natura 2000 in Lithuania has been the responsibility of an EU approximation project supported by the Danish governmental funding agency Dancee in co-operation with the Lithuanian Ministry of Environment. During the years 1999 through 2001, the project has been intensely working in order to provide a solid scientific and legal basis for the final selection of sites to be protected under the Natura 2000 network of Lithuania. For the first time, Lithuania now has an objective scientific basis for designating protected sites.

On the basis of thorough scientific work including field investigations as well as literature studies, a list of proposed Natura 2000 sites which are suitable for the protection of the species and habitats covered by the Habitats and Birds directives was produced. The guidelines and criteria for the selection of Natura 2000 protected areas were created as well.

Altogether, more than 317 separate sites are now included on the list of Natura 2000 sites proposed by scientists and technical experts. Preliminary, these territories occupy an area of 919 253 hectares that make 13.8% of the Lithuania's territory. Out of total number of proposed 317 sites, 84 are SPAs (286 430 ha), while 277 – SACs (632 816 ha).

Existing protected areas in Lithuania cover almost 12% of the country. Almost two thirds of potential NATURA 2000 sites are located in the existing network of protected areas. The remaining part should be designated after the list of Natura 2000 sited will be approved in 2002.

Due to the complexity of Natura 2000 and its interaction with agriculture and forestry, it is necessary to involve several ministries in finding the best solutions for the implementation of the Natura 2000 network. Such co-operation is being facilitated by organising round-table discussions and informal meetings involving staff from the Ministry of Environment as well as staff from the Ministry of Agriculture, including the Department of Forestry.

12. GENETICALLY MODIFIED ORGANISMS (GMOS)

GMOs and GMPs in Lithuania are considered as the new phenomenon - the product of the last decade of XX-th century – first years of XXI-st century. In order to co-ordinate the national efforts in the field of management of GMOs and GMPs, a GMO division in the Nature Protection Department of the Ministry of Environment was established and a Consultative Committee on GMO management.

There are several other governmental institutions, which are obliged to work closely with the Ministry of Environment on this issues, namely: Ministry of Health, Ministry of Agriculture, State Food and Veterinary Service, Customs Department and several others.

It is a need to establish the framework of an administrative system for competent and effective decision-making process on notifications and requests related to GMOs, including the establishment of the administrative systems and develop the overall integrated National Biological Safety Framework in Lithuania.

13. POSITIVE IMPACT OF NITRATE DIRECTIVE ON ENVIRONMENT

The Nitrates Directive has the objectives of reducing water pollution caused or induced by nitrates used in agriculture and preventing further such pollution.
In 1994-1995, regional centres of the Ministry of Health together with Geological Service have investigated water quality in 5775 dug wells throughout territory of Lithuania. In more than one third of the wells that are used by one million inhabitants of Lithuanian rural areas, concentration of nitrates is higher than the allowable standard 50 mg/l. The polluted wells are scattered evenly throughout the whole territory of the country. Most of them are located close to dwelling houses, barns, toilets, heavily fertilised orchards and gardens. Main reason of pollution of the well water with nitrates is inadequate distances from the barns, dunghills and toilets. The concentration of nitrates in the wells in the countryside is up to 100 times higher than in open agricultural fields.

The eutrophication of the Curonian Lagoon is very high and is constantly increasing. During 16 years of monitoring, clear increase of abundance of phytoplankton is observed. Due to these reasons, in the negotiation with the EU Lithuania has committed itself to prepare a Programme for protection of waters from pollution with nitrogen compounds from agricultural sources till 2003 and to start its implementation in the whole territory of the country from the date of accession.

Code of Good Agricultural Practice (CGAP) for Lithuania was prepared and submitted to the Commission in 2000. It summarises existing national legislation that regulates protection form nitrate pollution in agriculture and EU requirements that will need to be transposed into national legislation.

In 2002, a working group should be established at the Ministry of Agriculture that will be responsible for the preparation of the Programme for protection of waters from pollution with nitrogen compounds from agricultural sources.

16. INSTITUTIONS

The institutional sector system consists of the following:

- Ministry of Agriculture (MoA).
- Rural Development Department on a County scale,
- Agricultural Division on a District scale, and Units of Agricultural Advisory Service together with other non-governmental organizations are implementing the policy on the local level;
- Agencies for Regional Development are responsible for the common supervision of the Regional policy implementation. In its turn, it is the Ministry of Management Reforms and Municipality Affaires that in responsible for the coordination of the above institutions.

A public authority – the State Food and Veterinary Service carries out the functions of public administration related to animal health and wellbeing, veterinary control of the production and handling of animal products, veterinary control of the production and trade of veterinary preparations, veterinary control at the border, livestock identification and registration, and approximation of national veterinary legislation with the acquis.

The main water institutions are municipalities and regional department of the Ministry of Environment.

Water supply have to be used rationally, taking into account cirstumstances of environment protection and restoration. Problems of state governing institutions in water management depend on the Laws accepted by the Seimas and the Government power of attorney to governing institutions. Laws in the Seimas are accepted taking into account political and economical spectrum of the state, and it is stipulated by the water management.

Water users can unite to associations according the established order by other laws. Enterprises of water supply at institutions of local government are united into the Lithuanian Association of Water Suppliers.

The administration and management of land reclamation works were the duties of state land reclamation services. The two level land reclamation offices had been established for this purpose. The ownership and administration rights had been delegated to the county administrations. The organisation of maintenance, reparation, rehabilitation and construction of land reclamation structures are within the responsibility of district land reclamation offices, which are in some counties actually married to the agricultural offices. To formulate the policy, and together with other interested parties to co-ordinate its implementation is under responsibility of Ministry of Agriculture.

In the field of self-government and education of private farmers and other land users there are the non-governmental organisations that play a significant role.

Currently there are over 70 different NGOs and producer associations in Lithuania. The most significant of them are the Lithuanian Agricultural Chamber and the Lithuanian Agricultural Advisory Service (LAAS). The Agricultural Chamber joins the multiple associations in different professional fields as well as Associations of agricultural land users that have been established on the territorial basis. The LAAS has local advisory offices in all 44 districts. Its task is to give consultations/recommendations to the farmers as well to develop and to organise advisory and training programmes.

INTRODUCTION

Historically Lithuania is an agricultural country. Even nowadays the agricultural sector performs very important economic, social, environmental and ethno-cultural functions, therefore it is considered to be a priority sector of the national economy. Owing to certain geopolitical and historical circumstances the agricultural sector has retained a much greater economic and social significance in Lithuania than in its neighbouring countries or in the EU.

The strengths, weaknesses, opportunities and threats (SWOT) of Lithuanian agriculture are summarized in the table below:

Table 1. SWOT analysis of Lithuanian agriculture

Strength	**Quantitative index**
1) Sufficient supply and productivity of drained soil; 2) Comparatively low soil water and air pollution; 3) Experience and traditions in agriculture; 4) Dense network of agriculture science, consultancy and training institutions; 5) Developed rural community.	3.05 million hectare of drained soil; small, dissipated pollution; Effective system.
Weaknesses	**Quantitative index**
1) Unfinished land reform, limited land market functioning 2) Comparatively small, low competitive farms, highly fragmented production 3) Low competitiveness of agro processing industry; 4) Undeveloped rural infrastructure; 5) Insufficient employment and incomes of rural population.	Recreated 79.0 per cent property rights to land; Average farmer's farm 17.2 hectares; Only 3 enterprises, certificated by the EU
Opportunities	**Quantitative index**
1) External market possibilities will be improved due to emerging the EU market; 2) Development of modern technologies will be promoted according to the EU structural support; 3) Presumptions for balanced social and economical development of rural areas will be created 4) Food quality and safety assurance system will be created.	
Threats	**Quantitative index**
1) Trade liberalization will enlarge pressure upon Lithuania's food market; 2) Undefined trends of the CAP future development; 3) Low quotas for main agriculture products will reason decrease of rural employment and incomes; 4) Dependence of agricultural sector upon the activities of other sectors.	

1. BASIC INFORMATION

Total area of the country is 6.53 million ha. Total population – 3.692 million. Population density – 53.4 inhabitants in square kilometre.

At the end of 2001 the number of people in the agriculture, fishery and forestry sectors constituted about 17.4% of total employment. In spite of the fact, that in 1995 the share of the sector employment made up 22.9 % of total employment, it must be considered, that the share of employment is continuously decreasing. GDP per capita in 2001 – 13752 Litas (3929 USD)

Of the 6.530 thousand hectares of total area, utilised agricultural area (UAA) at the beginning of 2001 equalled 3.488,7 thousand hectares, or 53.4 per cent of total country territory. Arable land accounted for 2.932,6 thousand hectares (84.1 per cent of UAA), meadows and natural pastures – 497.1 thousand hectares, or 14.2 per cent of UAA and permanent crops - 59 thousand hectares, or 1.7 per cent of UAA. Forests cover 1998.4 thousand hectares (or 30.6 per cent of total country area), water bodies – 262.1 thousand hectares (or 4.0 per cent of total country area), roads – 131 thousand hectares (or 2.0 per cent of total country area), build-up territories – 187.3 thousand hectares (2.9 per cent of total country area), other land – 462.5 thousand hectares (or 7.1 per cent of total country area). The reclaimed area equalled 3.05 million hectares, 85 per cent of which has been drained. More than 1 million hectares of soil are sour, so it must be permanently chalked.

The fertility of utilised agricultural land is usually expressed by land quality points, which show the quality of farm land by crop productivity under average economic conditions for farming. The best lands are concentrated in Central Lithuania.

At present, the agricultural land quality points are used to assess the value of the parcels of land sold, leased or donated to private owners (1999 Resolution No. 205 of the Government of the Republic of Lithuania). On average, the quality of land is assessed at 39.1-41 points, the average price for agricultural land of this quality is 1500 Litas per hectare. The price is usually adjusted for various factors, taking into consideration restrictions on the use of land and economic activities, distance from town, the seat of the municipality or the district centre, the location of the land parcel from the point of view of urban development, and ecology.

Soil is one of the most important assets of the country; it is the result of the activities of nature, the farmer and the State, which has financed its improvement. The composition of soil in Lithuania is far from uniform. 13 per cent of the agricultural land is sand, over 37 per cent is sandy loam, over 39 per cent of clay loam, 3 per cent of clay, about 8 per cent of peat. The greater part of the Lithuanian territory is lowlands separated by low hills. 48.1 per cent of agricultural land lie in lowlands, 31.6 per cent in undulating areas (slopes of 2^0 - 5^0), 16.9 per cent in hilly areas (slopes of 5^0 - 12^0) and 3.4 per cent in rather hilly areas (over 12^0).

1.1 Land reform

The process of land reform and restoration of ownership rights to land started in 1991. The situation considerably improved in 1997 as the result of the improvement of the implementation of the land reform procedures. By 1st of October 2000 the land management projects have been prepared and approved. The ownership rights have been restored to up to 79 per cent of land area indicated in applications. By the beginning of 2002 the total number of private land owners reached 555.700.

The total area of the land to which the ownership rights have been restored, makes up 2090 thousand hectares, or 52.8 per cent of UAA.

Restitution process has not been finished yet. However, it is obvious that the existing private land tenures are too small to run perspective and competitive activities. In spite of the process of Lithuania's integration into the EU, it is necessary to stimulate competitive farm development and promote formation of the expedient holdings. The preparation of the principles of the land management and administration are underway. These principles are aimed to improve the agricultural farm structure, to ensure implementation of the environmental protection, to stimulate infrastructure development. Land consolidation is defined as one of the measures. In order to promote further development of the land market and improve competitiveness it is necessary to perform legislative basis according which foreign citizens will be allowed to acquire agricultural land.

Currently, 3 different types of farms characterise Lithuania's farming structure:

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

By 2000, there were registered 67 thousand family farms on the Farm Register. In 2000 new regulations of family farm registration have been approved. By October 2001 29.2 thousand farms have been registered according to new regulations. They own 504 thousand hectares of land. The average statistical size of farm -17.2 hectares. It means that the average size of farm increased by 4.6 hectares. However, this fact hardly fits the real situation, as less than 50 per cent of farms have been registered under new regulations.

According to the Farm Register data, by October 2001 small in size holdings predominated. Holdings from 3.0 to 9.99 hectares made up 38.0 per cent, from 10.0 to 19.9 hectares – 32.0 per cent of, from 20.0 to 29.9 hectares – 18.0 per cent and from 30.0 to 49.9 hectares – 8.0 per cent of the total number of the farms. Holdings more than 50.0 hectares made up 5 per cent. It is expected, that by 2006 the average size of farm will reach 18.2 hectares and by 2010 – 22.0 hectares.

According to agricultural companies record data the number of corporate type enterprises reduced sharply. By 2001 963 agricultural companies remained active, while in 1995 there were 2611 ones. It was predetermined by the lack of competitiveness. The main reasons for low competitiveness can be defined as follows:

- Outdated machinery and equipment
- High operating costs
- Lack of investments.

By 2001 there were 274.6 thousand household plots instead of 300,4 thousand ones in 2000. They own 602.8 thousand hectares of land, compared to 357.9 thousand hectares in 2000. Due to low competitiveness of the farms and the ageing of the rural population the number of these types of agricultural holdings falls off approximately about 10 per cent annually.

Co-operation can be defined as one of the way that allows small producers to strengthen their position. Despite of the measures taken to promote the co-operation, establishment of producer groups is still not popular. By the end of 2000 there were involved 12 thousand rural people into the co-operative activities. The total number of agricultural co-operatives makes up to 371. Currently, 130 agro service co-operatives and 110 agriculture co-operatives are registered. However, the vast majority of them have less than 10 shareholders.

With regard to economic issues, both agriculture and the processing industry are characterised by structural imbalances (fragmentation and small units), outdated technology, and lack of capital for investments causing low productivity and thereby lack of competitiveness. Furthermore, the necessary framework conditions (land market, infrastructure and administrative structures) are at least not functioning in an optimal manner and at worst not in place.

Compared to the EU, the following disparities are significant:

- GDP per capita at PPP is one third in Lithuania compared to the EU average.
- Dependency on agricultural activities in Lithuania is considerably higher than in the EU.
- The agricultural sector in Lithuania lags behind in terms of quality, productivity, efficiency and competitiveness.

1.2. EU accession

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 the 8th 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 laws. 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 1st 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.

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 1st of January 2004, a few transitional periods and technical adjustments are requested by Lithuania.

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.

In 2000 SAPARD program has started its support to rural development. Implementation of SAPARD is performed in accordance with Agriculture and Rural Development Plan, which was approved by the European Committee resolution No. 3329 on November 27, 2000. The annual grant aid provision makes up 29 829 thousand EURO, with slight increase of 1.7 per cent every year. The Community financial contribution started in 2002 after the National Paying Agency was approved.

2. RURAL POPULATION

At the beginning of 2000 the rural population accounted for 31.8 per cent of the total population in Lithuania whereas the average percentage of the rural population in the EU member states is 17.5 per cent. According to the figures available at the Department of Statistics, about 20 per cent of the working population in Lithuania are engaged in agriculture whereas the average percentage in the EU member states is as low as 5 per cent.

Lithuanian rural areas are characterised by some unfavourable developments compared to urban areas:

- Rural population is decreasing (3.8% in 1998) due to falling birth rate and high death rate in rural areas. Urban population increased by 0.2% in the same period. The disparity is further illustrated by the ratio between children and retired people, which is 0.93 for rural areas and 1.28 for urban areas.
- Duration of life was respectively 5 and 2.4 years shorter for men and women in rural areas than in urban areas.

The quality of agricultural and rural labour is determined by the quantitative and qualitative potential of rural labour resources.

In 2000, the rural population of Lithuania was 1176.8 thousand, 50 per cent of which consisted of persons of working age, either employed or unemployed. Share of female employment in active population – 41.8 in %. In the last three years, the changes in the labour of force in rural areas has not been very great, but there are certain adverse tendencies which give reason for concern: the number of the employed decreases while unemployment is growing.

The demographic processes in rural areas have an influence on the quantitative aspects of the labour force engaged in agriculture (Table 2.1.).

Table 2.1. Vital statistics and migration of rural population in 1996-2000

Vital statistics and migration	1996	1997	1998	1999	2000
Births	14326	14080	13953	13619	…
Deaths	19430	18527	18344	17 693	…
Natural increase	-5084	-4447	-4391	-4344	…
Immigration	36554	34477	25918	23429	20034
Emigration	27461	27910	23548	20732	15770
Net migration	9093	6567	2370	2697	4264

Sources: Statistical Yearbook of Lithuania 2000. – Vilnius: Department of Statistics under the Government of the Republic of Lithuania, 2000; Demographic Yearbook 1996, 1997, 1998, 1999. – Vilnius: Department of Statistics under the Government of the Republic of Lithuania, 2000.

Natural increase of rural population is negative, deaths exceed births. Net migration remains positive for more persons move to rural areas than leave them. But the composition of the rural population deteriorates: more persons of working age leave, while more persons of retirement age move in.

In 1999, persons of working age accounted for 51.9 per cent of the total population in rural areas, persons of retirement age made up 24.9 per cent, children under 15 - 23.2 per cent. The number of children in rural areas has decreased by 6 thousand since 1996.

The ageing tendencies are observed in the entire country: the number of children decreases both in the rural and urban areas while the number of elderly people increases. This is reflected by the ageing index – the number of persons of 60 and over per 100 of children under 15 (Table 2.2).

Table 2.2. Ageing index of rural population in 1996-1999

	1996	1997	1998	1999
Ageing index	104	105	105.5	106.6

Source: Demographic Yearbook 1996, 1997, 1998, 1999. – Vilnius: Department of Statistics under the Government of the Republic of Lithuania.

Vital statistics are different in different administrative territorial units: they are worst in the Counties of Alytus and Utena, while best in the Counties of Klaipeda, Siauliai and Kaunas.

About 56 per cent of the population employed in agriculture are persons of retirement age. As many as two thirds of the farmers are 60 or over years old, and only 2 per cent of them are under 30.

Low standards of living and other unfavourable factors (injuries, occupational diseases) determined rural population's life expectancy: in 1999 rural population's life expectancy was 5 per cent lower than the life expectancy of urban population. Mortality rate (per 1000 population) of rural population was 74 per cent higher (74 per cent – for males, 75 per cent – for females) than among urban population. However, a better quality of life leads to higher life expectancy of rural population (Table 2.3).

Table 2.3. Quality indicators of urban and rural population in 1995-1999

Indicators		1995	1996	1997	1998	1999
Life expectancy, years						
Rural	males	60.84	61.80	62.64	63.16	65.45
	Females	74.26	74.71	75.32	75.36	75.47
Urban	males	64.92	66.63	67.61	68.34	69.15
	Females	75.64	76.69	77.65	77.75	78.58
Population mortality rate (per 1000 population)						
Rural	males	18.9	18.3	17.1	16.9	16.8
	Females	15.2	14.7	14.5	14.4	13.8
Urban	males	11.4	10.6	10.1	9.9	9.7
	Females	8.6	8.2	7.9	8.0	7.9

Source: Statistical Yearbook of Lithuania 1999. - Vilnius: Department of Statistics under the Government
of the Republic of Lithuania, 2000.

Education plays an important role. Despite of dense network of agricultural consultancy and training centres, Lithuanian rural people are less educated compared to urban population. About 30.0 per cent of them have primary education, 22.2 – basic and 30.1 - secondary education. Vocational school and university graduates make up to 12.8 and 4.9 per cent respectively.

3. RURAL ECONOMY

According to survey of 2001, per capita average income was 409.5 Litas per month (urban population – 455.4 Litas/month, rural population – 310.9 Litas/month, agricultural population – 249.9 Litas/month).

Note: official exchange rate in 2001 was 1 USD = 4 Litas

Lithuanian rural areas are characterised by some unfavourable developments compared to urban areas:

- Per capita income in rural areas is 30% lower than in urban ones.
- Rural areas have a lower employment rate, but despite of this, the rural employment rate is also lower than the urban one. Age structure of rural unemployment rate is unfavourable for young people - nearly 30 % of persons under 20 are unemployed. Employment in rural areas is highly dependent on agriculture.

Compared to the EU, the following disparities are significant:

- GDP per capita at PPP is one third in Lithuania compared to the EU average.
- Dependency on agricultural activities in Lithuania is considerably higher than in the EU.
- The agricultural sector in Lithuania lags behind in terms of quality, productivity, efficiency and competitiveness.

In terms of social development, rural disposable household income is lower than in urban areas. In that respect, over-dependence on agriculture is equally a serious problem in rural areas demanding for a diversification of rural activities and employment opportunities. This will be increasingly important when the agriculture and processing sectors become more efficient. Moreover, basic living conditions are comparatively poorer in rural areas than in the cities, and a tendency to ageing of rural population can be a threat to economic vitality.

4. AGRICULTURAL PRODUCTION

4.1. General information

Agricultural share in GDP in 1999 was 8.6 □%. Share of agr
value added – 6.3%.

In 1999 the added value created by the agricultural sector and related services reached 3021.2 million Litas. From 1995 to 1997 its volume increased even more than in the economy of the country as a whole, but in 1998 and 1999, due to the Russian crisis and other factors, the added value decreased. The share of value added in

agriculture in respect of the total value added in the country's economy shrank as well. In 1995 it made up 10.9 per cent, and in 1999 it dropped to 7.9 per cent.

The structure of the agricultural production has also changed significantly during the recent decade. In 1990 livestock production constituted the major part of the agricultural production (54.5 per cent) while in 2000, referring to preliminary data of the Department of Statistics, it was crop production that took the leading position (61.9 per cent) (Figure 4.1).

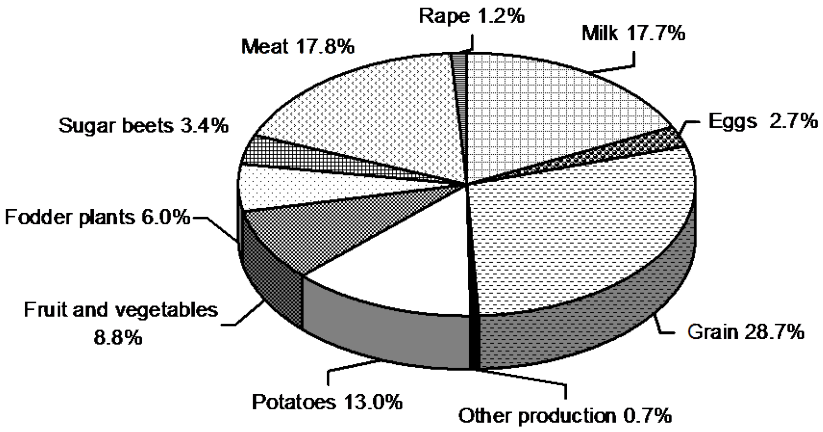


Figure 4.1. Structure of gross agricultural production in 2000

Source: Data provided by the Department of Statistics under the Government of the Republic of Lithuania.

4.2. Grain crops

The total crop area makes up to about 2.15 million hectares. Grain crops (winter and spring cereals, and leguminous grain) and fodder crops (fodder root-crops, perennial grasses, maize for silage and green fodder, and other silage crops) are the important ones. Grain and fodder crops take up the largest proportions of the total crop area (44.5% and 45.6% accordingly, in 2001).

50 per cent of grain crops are currently used for feedstuffs, about 20 per cent – for food production, and 12.6 per cent for seeds. Cereal supply exceeds actual demand for cereal in 5 per cent. Consequently, it is expected, that cereal consumption will slow down. The average annual consumption will not exceed 100 kilogram per capita in the nearest future. However, increase in livestock production reasoned by the growing demand for dairy and meat products will support overall demand for cereal. Despite of the drop-off of the grain crops area, especially in poor soil regions, the growth of the cereal production must be reasoned by the growth of the productivity. It is supposed, that crop yields must exceed to 3.7 tones per hectare in 2004 and 5.5 tonnes per hectare in 2015 in comparison with 2.7 tonnes per hectare in 2000. It must be determinated by using of the progressive technologies and farm specialisation. This process must be supported by EU funds.

The total yield of protein crops amounted to 73.0 tonnes in 2000, whereas total area made up 39.8 thousand hectares. In 2001 it reduced to 52.2 thousand tonnes in spite of bad weather conditions. Leguminous made up 1.7 % of the total crop area in 2001.

4.3. Rapes

Rapes are the most suitable oil crop for cultivation in Lithuania. Its oil-cake is albumen fodder. Compared to 2000, area covered by rapes crop reduced to 5 per cent and accounted to 50.7 thousand hectares. Low technological and technical level of rapes cultivation predetermines high input and not high enough crop capacity. There is a need for rapes sewing, crop supervision and harvesting machinery.

There are potential facilities to expand rape cultivation in order to provide food oil and bio fuel processing companies with raw materials as well as supply consumers with domestic oil. Moreover, rape can be defined as the export commodity. It is expected, that by 2010-2015 the rape crops will extend to 210-230 thousand hectares, while the rape yields will exceed to 2.6-3.0 tonnes per hectare. It will enable Lithuanian rape producers to deliver 150-200 thousand tonnes to the external markets annually.

4.4. Potatoes

The total potato cultivation area remains stable and makes up to 4.7-4.8 per cent of the total crop area (about 102.2 thousand hectares in 2001). Development of the sector is closely related to the establishment of the specialized farms. On the other hand, direct payments to the potato producers and subsidies to the processors through the EU funds will encourage potato cultivation and starch production.

4.5 Flax

Flax cultivation concentrates in certain areas known for their old flax or sugar beet growing traditions. Over the last years area covered by flax increased significantly from 8.8 thousand hectares in 1999 to 10.2 thousand hectares in 2001. It is expected, that the total demand of the local textile industry in fibre flax raw material will increase up to 17-18 thousand tonnes in 2010 and 20 thousand tonnes in 2015. Despite of that, Lithuanian farmer’s abilities to ensure these supplements must be treated doubtfully as the fibber flax cultivation is limited by fibber flax production quotas. The other obstacle for achieving good yields – low economical potential of the flax growers. To increase productivity and efficiency of output and improve the quality, investments for renewal of fibre flax production technologies, fibre flax and seed treatment as well as investments for fibber flax processing are essential.

4.6. Vegetables

Lithuania’s geographic position and climate are favourable for field vegetable cultivation. However, the main obstacles for smooth development of the sector are: lack in storage capacities, outdated vegetable growing technologies, low level of producer’s co-operation in sharing special equipment and performing common marketing activities. Increase in output, that is supposed to reach 500 thousand tonnes in 2004, 632 thousand tonnes in 2010 and 650 thousand tonnes in 2015, is closely related with the aid from EU structural funds. The support will be focused on investments concerning modernized cultivation of the vegetables, improvement of production storage, handling, grading and packing facilities, implementing of modern vegetable processing technologies.

4.7. Fruits and berries

Average fruit and berries production is 134.0 thousand tonnes per year. The main part (90 %) of fruit and berries is produced by farmers and town dwellers in their small holdings. Their orchards are old and the yield from such orchards goes mainly for processing into concentrated juice. Apples cover up to 80 per cent of fruit production.

Main suppliers of dessert fruit and berries are agricultural companies and specialised horticultural farmer farms. Specialised agricultural companies have storage capacity able to contain 22 thousand tonnes of fruit and vegetables. Storage equipment needs to be renovated. Some companies have already started this process of renovation. Small fruit, berries and mushroom processing enterprises enter the market.

Development of the sector will be also aimed to solve social problems, as it enable establishment of working places in rural area, especially in the regions where natural conditions impose constrains on traditional agriculture. It is supposed, that by 2015 there will be created 10 thousand additional working places in rural area.

4.8. Meat production

Favourable climate in Lithuania, skilled employees, sufficient fodder recourses and long traditions in cattle breeding and meat processing has created a base to foster a comparative advantage in livestock production.

Meat sector plays an important role in agricultural production. The total worth of the breeds in 2000 made up to 17.8 per cent of total Lithuania agricultural output. About 17.4 thousand people are involved in the livestock breeding sector, and 3.9 thousand in the meat processing industry. However, productivity is low in comparison with the EU countries.

During the last years meat production fell down. In 2000 there was 186.4 thousand tonnes of meat produced, instead of 202.3 thousand tonnes in 1998 and 192.9 thousand tonnes in 1999. During the last decade beef and veal production reduced 3.3 times, pork and poultry production – 2.9 and 2.7 times respectively.

By 2000 Lithuania meat processing industry still remained a net exporter. Three meat processing enterprises ("Skinija", "Mazeikiu mesine" and "Vilke") have been qualified for the EU veterinary number that encouraged them to export beef and beef foodstuffs to EU countries. However, the production produced in the enterprises mentioned above makes rather small proportion of the total output of the sector. Thus, enlargement of the number of meat processing enterprises, that meet EU sanitary and hygiene standards must be foreseen as a challenge.

Traditionally two species of breeds – cattle and pigs - dominate in the herds. According to statistical data by the beginning of 2002 the total number of cows amounted to 441.8 thousand ones (according RBDIC data -492.6 thousand). It makes up to 59 per cent of total herd structure, while, beef cattle and half-breeds makes up to 5 per cent. That illustrates revaluation of milk production in Lithuania livestock sector. By the beginning of 2002 the total number of pigs amounted 1010.8 thousand.

Majority of livestock farms are small in size. According RBDIC data by the beginning of 2002 there were 239.363 herd owners, 209.557 of them have 1-5 heads. The same figures illustrate the situation in milk sector. Though, in order to keep high quality and hygiene standards and improve competitiveness of the sector it is necessary to

encourage farm restructuring and investments into the modern equipment and technologies.

Decline in output of meat processing sector was predetermined by the decrease in raw material supplement. In 2000 meat production fell down by 15 per cent, production of sausages – by 25 per cent, production of meat semi manufactures – by 46 per cent and production of canned meat – by 53 per cent in comparison to 1998. According to statistical data in 1998 meat consumption amounted to 53.0 kilogram per capita (20.0 kilogram of beef, 25 kilogram of pork and 8.9 kilogram of poultry) while in EU countries this figure equalled 89.7 kilogram per capita (19.9 kilogram of beef, 44.6 kilogram of pork and 21.7 kilogram of poultry and 3.6 kilogram of mutton). In 2000 meat consumption reduced to 48.0 kilogram per capita (13.5 kilogram of beef, 25.1 kilogram of pork and 9.0 kilogram of poultry). It is expedient to promote meat consumption in order to reach the EU consumption level.

Due to the improvement of the quality of the raw material and promoting the competitiveness of meat products, development of cattle breeding is expectable. In order to keep natural landscape and to increase market supplement with dietary meat, development of sheep breeding assume a high importance. Further development of the sector is deeply connected with farm specialization, implementation of progressive technologies.

4.9. Milk production

Milk production is one of the main branches of agricultural production. In 2000 1.725 million tonnes of milk have been produced, that made up about 18 per cent of total agricultural output and 41.0 per cent of livestock production. By the beginning of 2002 the total herd of the cows amounted to 441.8 thousand ones.

During the last decade state aid encouraged establishment of specialized dairy farms. In spite of that the quality of the raw milk improved and productivity of the cows increased. According the Annual Report of Milk Recording data in 2001 the average productivity of the recorded cows made up to 4.447 tonnes of milk per year. However, prevaluating of the small farms appears as an obstacle for the further competitive development of dairy sector, especially in spite of Lithuania‘s integration into the EU.

Currently there are 38 milk-processing companies, 17 of which have the EU veterinary number, and are qualified as exporters of dairy products into the EU countries. In order to keep relatively high export level leading dairies focus on the implementation of the new technologies and extending their assortment. It makes Lithuania dairy enterprises to keep export of dairy products in a relatively high level (34 per cent of the total export volume). The main trade partners are the EU countries, CIS and the USA.

Due to different factors (change in nutrition pattern, decreased purchasing power) the domestic per capita consumption of milk dropped during the last decade. However, this trend is currently being reversed as income growth resumes and as new products such as cottage cheese and spreads and various forms of yoghurts and other value added dairy products become more widely available and replace imports. Despite of relatively low domestic market protection, the import of dairy products makes a very insignificant part of total assortment. Dairy production outmeasure domestic consumption at 50 per cent.

In order to solve the problems of dairy sector and to use transition period in the most efficient way, it is necessary to focus on the measures that would encouraged

changes in farm restructuring and modernisation, improving the quality and extending the external market.

5. LABOUR EFFICIENCY IN AGRICULTURE

The rather large number of people engaged in agriculture is determined by the low efficiency of labour, partial employment and small farms. The analysis of the use of the annual standard working hours (2033 hours) shows that some members of family farms do not use as many as half of these hours (Figure 5.1.). Such people account for about 27 per cent of the total number of agricultural labour force, therefore it is doubtful whether they should be included in the total number of persons engaged in agriculture.

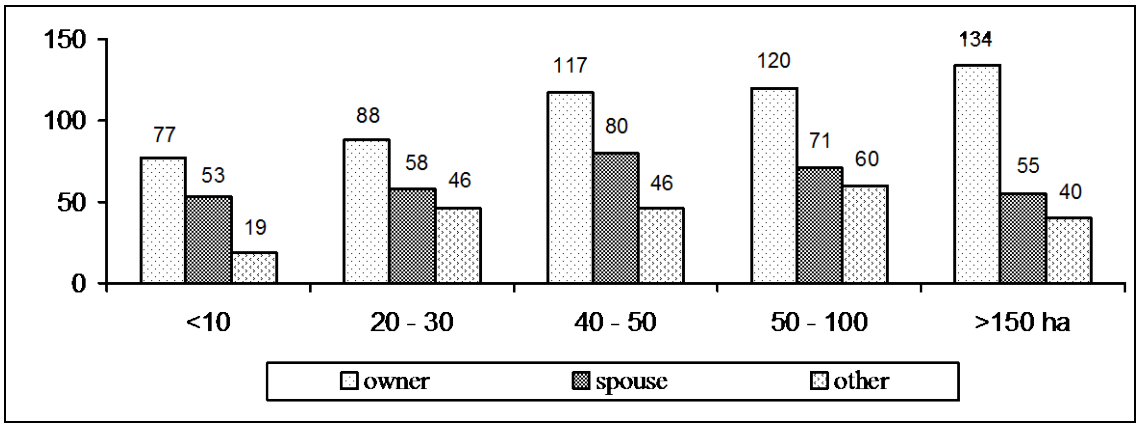


Figure 5.1. Exploitation level of working hours by farm members on farms of different size, %

On farms under 10 hectares, there are 23 annual working units per 100 hectares of utilised agricultural area. With the increase of the size of the farm, this indicator goes down: on farms of 20-30 hectares in size there are 8 annual working units per 100 hectares of utilised agricultural area, on farms of 40-50 hectares – 6 AWUs; on farms of 50-100 hectares – 4 AWUs. In respect of this indicator Lithuania is rather far behind the EU member states: the average number of employees on family farms per 100 hectares of utilised agricultural area was 16.6 whereas in the EU member states it is 9.

A better labour efficiency on larger farms of 50 and over hectares is determined by a better availability of agricultural machinery and equipment. The increase in income is also related to the size of the farm because larger farms can afford to buy agricultural machinery and increase labour efficiency (Table 5.1.).

Table 5.1. Labour efficiency by farm size in 1999

Farm groups by size, ha	Number of annual working units (AWU) in agricultural production		Agricultural production produced by one AWU, thousand Litas
	average on farm	on 100 ha of utilised agricultural area	
< 10	1.5	22.7	12.6
10.1 – 20.0	1.8	12.5	15.9

20.1 – 30.0	2.0	8.4	18.8
30.1 – 40.0	2.6	7.6	22.8
40.1 - 50,ž.0	2.5	6.0	24.8
50.1 – 100.0	2.7	4.0	32.7
100.1 – 150.0	3.0	2.5	51.5
> 150.0	4.6	2.0	64.0

6. FOREIGN TRADE

Foreign trade in agricultural and food products plays a relatively important role in the economy of Lithuania. Lithuania, traditionally, is an exporter of food products. During the recent decade the scope, amount, structure, and geography of Lithuanian export and import of agricultural and food products underwent considerable change.

Statistically the value of foreign trade in agricultural and food products experienced a growth period in 1994-1997 and a contraction period in 1998-1999. In 2000 its statistical value expanded again and amounted to 109.2 per cent of the 1999 value.

During 1994-2000 the share of agricultural and food products in total foreign trade dropped from 16.6 per cent to 10.8 per cent. Its share in the total exports was 11.6 per cent, and its share the total imports made up 10.2 per cent in 2000 (Table 6.1.).

Table 6.1. The share of agricultural and food products in Lithuanian foreign trade in 1994-2000, %

Indicators	1994	1995	1996	1997	1998	1999	2000
In total foreign trade	16.6	15.5	14.8	13.1	12.2	11.7	10.8
In export	24.1	18.3	17.1	16.0	14.0	12.6	11.6
In import	10.0	13.4	13.1	11.1	11.0	11.2	10.2

Sources: Foreign Trade in 1996, 1999. – Vilnius: Department of Statistics under the Government of the Republic of Lithuania;

Economic and Social Development in Lithuania 1/2000. – Vilnius: Department of Statistics under the Government of the Republic of Lithuania, 2000.

The role of agriculture in the overall structure of the country's foreign trade was predetermined not only by the changes in agricultural and food exports and imports, but by foreign trade tendencies in other sectors of economy as well.

Agricultural and food exports were 27 per cent higher and imports were as much as 2.7 times higher in 1997 than in 1994. 1998 witnessed rapid growth of imports. In 1999 both exports and imports declined, but there was a modest upturn of both in 2000, the upward change of exports, however, was more marked (Table 6.2.).

Different pace of export and import growth affected the balance of trade in agricultural production. Before 1996 the balance was favourable, while in subsequent years imports were in excess of exports, and the gap was widening. In 1999 imports

exceeded exports by LTL 658.8 million. In 2000 the gap narrowed to LTL 435 million. The balance, however, remained unfavourable.

Table 6.2. Changes in export and import of agricultural and food products in 1994-2000, %

Indicators	1994	1995	1996	1997	1998	1999	2000
Exports	100	102	118	127	107	77	92
Imports	100	208	256	267	271	231	238

Sources: Foreign Trade in 1996, 1999. – Vilnius: Department of Statistics under the Government of the Republic of Lithuania;

Economic and Social Development in Lithuania 1/2000. – Vilnius: Department of Statistics under the Government of the Republic of Lithuania, 2000.

7. ECONOMIC MEASURES OF MARKET REGULATION

Faced with the challenge of transition from administrative to economic measures of market regulation the Government has been gradually introducing changes since the very beginning of the state’s economic independence (1990-2000): subsidies for agricultural resources have been eliminated, purchasing prices of agricultural production have been partly liberalized, and food prices have been fully liberalized.

The main economic state regulation measures in agriculture may be divided into two categories. The first comprises price and income support measures. The second covers structural measures as well as measures for the improvement of crop and livestock quality. Budgetary allocations for research, subsidized credits and tax relieves are also ascribed to the second category of measures.

7.1. Prices

Price reform may be seen as a five-stage process. The first stage resulted in the replacement of a differentiated purchase price system by a uniform agricultural product price system. Essentially, price categories were eliminated, and a uniform price for a certain grade and quality of products was set irrespective of a land productivity.

The second stage - 1992 - was characterised by support prices of the main agricultural products. It collapsed because processing plants used to contract for low purchase prices and sought state support in order to secure trading margins. On the other hand, the state was not able to ensure sufficient income to agri-producers as the general price index of goods and services was higher than the purchase price indices of the main types of agricultural production.

In stage three (1993-1994) prices were liberalised. Because of large supply of agricultural products their prices and profitability dropped.

At the end of 1994 with the adoption of the Law on State Regulation of Economic Relations in Agriculture minimal marginal purchase prices were set for food grains, milk, livestock, flax, and rape. The prices stayed in force with only a few minor changes till 2000.

The year 2000 marked the beginning of a new price stage which might be called a pre-accession stage, i.e. the stage of adjustment to EU price policy. Intervention and target prices were stipulated. An intervention price is the price at which intervention stocks of agricultural production or food products are procured. A target (orientation)

price is the price stipulated by the government for agricultural production and food products to ensure minimal profitability to efficient farmers.

7.2 Taxes

With the reestablishment of its independence Lithuania changed the whole taxation system, agricultural taxes included, fundamentally. In 1992 land tax (1.5 per cent rate) and tax on land lease (3 per cent rate) were introduced. Farmers were exempt from land tax for the three initial years of their farming. Agricultural partnerships have been paying a corporate income tax since 1991. In 1994 when the value-added tax was imposed, agricultural producers were granted special tax allowances. Till 1 January 1997 VAT on agricultural products was 9 per cent against 18 per cent rate applicable to other products. In 1997 this tax allowance was eliminated.

Pursuant to the Law on Tax Administration agricultural entities shall pay the following taxes: value added tax, excise duty, personal income tax, corporate income tax, land tax, tax on land lease, road tax, and make mandatory health insurance contributions.

The data given in Table 7.1 suggest that the amount of tax paid by agricultural entities has been gradually diminishing. In 1998 the total tax paid in respect of value of agricultural production amounted to 8.5 percent, it was 7.8 per cent in 1999, while respective figures for agricultural production sold were 17.6 and 16 per cent, which is indicative of the fact that much of agricultural production is consumed on farms. The only reason for shrinking amounts of tax paid is a marked drop in production.

Table 7.1. Agricultural taxes and contributions in 1998-1999, in million Litas

Taxes and contributions	1998	1999
Value Added Tax, total	253.24	146.13
Land Tax, total	28.71	27.81
Tax on land rent (agricultural partnerships)	12.30	12.35
Road tax (agricultural partnerships)	2.12	2.06
Social insurance contributions	79.22	64.54
Corporate income tax (agricultural partnerships)	0.72	0.21
Personal income tax (agricultural partnerships)	30.00	17.00
Excise duties (on diesel fuel, petrol, lubricant)	78.00	83.0
Other taxes	40.80	43.60
Taxes, total	**525.11**	**396.70**

7.3 Foreign trade regulation

At the beginning of the period of transition from command to market economy different quantitative restriction were applied for the regulation of trade. At the beginning of 1993, however, after foreign trade was liberalized, the restrictions were removed. Conditions for foreign trade were further improved by launching the system of customs duties with rates set in 1993 and with signing of trade agreements with foreign states.

An agreement on economic, commercial and trade cooperation with the EU was signed in 1992, which was followed by a free trade agreement in 1994. Since 1995 free trade agreements have been in force with all EU member states. In June

1995 the Europe Agreement which granted the status of an associate country for Lithuania was signed.

Free trade agreements between Lithuania, Latvia and Estonia were enacted in 1994. Beside the above mentioned free trade partners of Lithuania FTAs have been signed with Poland, Slovakia, Slovenia, Czech Republic, Turkey, Hungary, Ukraine, and EFTA countries.

8. SOCIAL WELFARE

By the number of employees agriculture takes the first place among in the economy of Lithuania. Agriculture remains a main activity among the rural population: the sector employs 54.0 per cent of total rural employment. The second largest employer is public services - healthcare, education and social sectors. It constitutes 13.0 per cent of the total rural working population. The rest part of rural population is engaged in retail trade, services and public utilities.

Social development implies the improvement of living conditions of rural population - high life expectancy and a healthy lifestyle, education. The quality of life is expressed in certain indicators. In 2000 average disposable income per family member of rural population per month was 33 per cent. This indicator in the case of farmers was 48 per cent lower than that of townsmen (Table 8.1).

A large part of food products is produced by rural population on farms themselves. Therefore, rural population's in kind income makes up one third of the total household income per member, and in the case of a farmer – 45 per cent in 2000. Although a share of in kind income was decreasing during the last years, individual agricultural activities in households are still the main source of income for rural population. Low monetary income from business indicate to low profitability of commercial agricultural production and unfavourable circumstances for alternative income in rural areas.

Farmers' low incomes do not allow them and other people employed in agriculture to participate in the social insurance system. Only 2.5 thousand (14 per cent) out of 18.9 thousand of farmers who had to pay their social contributions effected the payments in 2000. Nevertheless, in comparison to 1999, the number of the insured increased by 1.5 times.

Table 8.1. Average household disposable income and expenditure in 1995-2000, in Litas

Indicators	1995	1996	1997	1998	1999	2000
Average disposable income per family member monthly:						
urban	290.7	352.7	403.1	463.5	475.2	464.9
Rural	212.8	268.9	298.4	336.3	327.1	311.0
of which farmers'	…	248.8	245.7	286.0	252.2	239.3
Share of expenditure on food, %						
urban	46.4	51.7	48.5	44.3	42.0	40.4
Rural	42.1	65.3	62.1	59.0	56.8	56.2
of which farmers'	…	66.8	67.5	63.6	62.6	60.6
Health care:						
Urban	…	2.7	3.1	3.5	3.7	4.5
Rural	…	2.4	3.2	3.3	3.4	5.8

of which farmers'	…	2.1	2.1	2.1	2.1	3.3
Education:						
Urban	…	1.0	1.0	0.4	0.8	0.8
Rural	…	0.6	0.7	0.1	0.2	0.3
of which farmers'	…	0.6	0.6	0.0	0.1	0.0

Sources: Household Income and Expenditure in 1995, 1996, 1997, 1998, 1999, 2000. – Vilnius: Department of Statistics under the Government of the Republic of Lithuania.

Farmers' low incomes determined the structure of their expenses. The majority goes for food, the smallest amount - for health care and education.

According to the data by the Department of Statistics, in 2000, the majority of rural employees were engaged in agricultural activity, hunting, forestry and fishery - 54 per cent; 10 per cent of rural employees were engaged in industry, 9 per cent - in education, 7 per cent – in services, 4 per cent in health care and social sphere, 3 per cent in construction.

8.1 Rural unemployment

The most important social problem of the countryside is a high unemployment rate. The unemployment rate of rural population rose from 9 per cent in 1999 to 12.8 per cent in 2000. The highest unemployment rate is among young people, the age group under 25. The high unemployment rate (33.8 per cent) among young people was conditioned by their training and professions that are not needed in the labour market, insufficient education, lack of skills. 26 per cent of the unemployed rural inhabitants registered with the Labour Exchange had secondary vocational education and 15 per cent - had the principal vocational education. This proves that the vocational training is not tuned to the needs of the labour market.

The main direction for the improvement of the social situation in the countryside is solving the problem of employment, which is related to the production of agricultural products in demand and the diversification of business activities. Employment and income levels reflect in living conditions and social differences between socio-economic groups, therefore, it is extremely important to create favourable conditions for a wider choice of employment for the rural population.

8.2. Poverty

The highest level of poverty was recorded in the countryside, while the lowest – in biggest cities. In 2001, more than one quarter of all rural inhabitants and every twelfth town dweller were living below relative poverty line.

A poorly developed social infrastructure of the countryside prevents rural population from developing and from improvement of their life quality. On the other hand, the scale of development of the social infrastructure is partly conditioned by needs and requirements of rural population, which reflects their mentality, income levels and the prices for their services. The rural population is mainly engaged in agricultural activities and housework, and it is natural that its leisure time, opportunities for retraining, self-education, and public activity depend on the factors mentioned above.

The countryside is still unattractive to local and foreign investors. Investment in rural areas per head was 2.6 times lower than in urban areas.

8.3. Rural infrastructure

Compared to urban areas, Lithuanian rural areas have a lower standard of living in terms of physical infrastructure. Although, at the end of 1997 there were no villages without electricity, wide disparities between rural and urban areas existed in water supply, central heating systems, sewage and telephone networks. Only 43.5% of rural residential units, or one third of rural settlements, have central piped water supply systems. Approximately 700,000 rural inhabitants use drinking water from 300,000 dug wells. The same is true for sewage systems. In total, 733 sewage systems have been installed in rural areas. They serve around one third of rural inhabitants. Poor development of water supply and sewage systems raises major environmental issues.

Recent investments in the telephone network increased the number of telephones per 100 rural inhabitants to 13.4 in 1997. However, the rural areas still lag behind the urban by almost a half.

Table 8.2. Rural infrastructure compared to urban areas, at the end of 1997.

	Percentage of residential units	
	Rural	**Urban**
Electricity	99.5	99.9
Central heating systems	13.5	81.9
Water supply	43.5	89.6
Hot water supply	10.5	78.0
Sewage systems	49.5	91.0
Telephone network	46.4	76.8

Source: Lithuanian Department of Statistics, 1998

Though Lithuania has a well-developed road network, which is well maintained, the condition of local roads is not so good. At the end of 1997 the total length of local roads was 42,157 km. And approximately 80% of them were surfaced.

To conclude, poor water supply and sewage systems represent a major threat to rural environment. Besides, existing disparities in infrastructure between rural and urban areas and poorer quality of life may lead to migration from rural to urban areas. These trends would have a negative impact on rural development and threaten the sustainability of rural communities.

9. WATER

Geographical location of Lithuania is favorable with respect to surface and groundwater resources. There are 29,000 rivers with total length of 64 000 km but only 18 rivers are longer than 100 km. The Nemunas River basin occupies 74 % of the territory of the country (with also 74 % of total population). Number of lakes larger than 0.5 ha comprises 2850 with total area of 908 km^2. Rainfall during the average year amounts to 748 mm. Renewable water resources of Lithuania reach 15.4 km^3, beside that 10.8 km^3 of water are transit flows from Byelorussia, Poland and Russia. Surface water availability is 7.043 m^3/cap/y. In 2000 total amount of 3 578 million m^3 of water was withdrawn for power production, industrial and domestic purposes. 93 percent or 3290 million m^3 was used for energy production (mainly for cooling of Ignalina Nuclear Power Plant). 242 million m^3 was used for industry, household,

agriculture and fisheries. Industry consumed 21.5%, household use was 44.2%, agricultural sector – 0.7% and fisheries 33.1% of total water volume.

Table 9.1. The longest rivers (in kilometres)

Name	Total length	Length in Lithuania
Nemunas	937	475
Neris	510	234
Venta	346	161
Sesupe	298	209
Musa (Lielupė)	284	146
Sventoji	246	246
Nevezis	209	209
Merkys	203	190
Minija	202	202

The biggest lakes[1]

Name	Area, ha	Depth, m
1	2	3
Druksiai	4479,0	33,3
Dysnai	2439,4	6,0
Dusia	2334,2	31,7
Sartai	1331,6	22,0
Luodis	1320,0	16,5
Metelys	1292,0	15,0
Plateliai	1209,6	46,6
Avilys	1209	13,5
Rekyva	1150,9	7,0
Alausas	1054,0	42,0

There are 2000 lakes with the area more than 0,5 ha in Lithuania. Their total area is 880 km^2.

[1]The Vistytis Lake would be the fourth in size, but only a small part of it is in the territory of the Republic of Lithuania.

Lithuania is probably the only country in Europe using exclusively groundwater resources for potable water supply. The supply of drinking water is provided by the municipalities, which are in most cases the owners of the water supply companies. Municipalities are also responsible for the extraction, delivery, treatment and monitoring of drinking water, and for the provision of information on drinking water quality to the public. There are approximately 1.330 individual supplies of drinking water exceeding 10 m^3/day or serving more than 50 persons, and 80 larger drinking water supplies extracting over 1.000 m^3/day or serving more than 5.000 persons.

3 525 million m^3 of waste water was discharged into surface water bodies in 2000. Energy sector is responsible for the largest amount of discharged water (Ignalina NPP

and Kruonis Hydro-accumulation PP). 168 million m^3 of waste water needed purification before discharging into surface water bodies. 80% of waste water was treated in biological treatment plants (of them 61% without elimination of nitrogen and phosphorus and 19% with elimination of N and P). 18% of waste water was only mechanically treated and 2% was discharged without purification. In 2000 about 86% of discharged waste water in Lithuania has failed to satisfy the EU environmental requirements.

10. ENVIRONMENT

Lithuanian agriculture occupies over 53% of the land area of the country and its impact on the environment is big.

Lithuania's integration into the European Union calls for the necessity to develop environmental measures applicable for Lithuania. The analysis of the experience of the countries that are implementing environmental programmes shows that before applying EU environmental legislative provisions, they should be adapted to the conditions of Lithuania.

10.1. 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 for 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 problem results 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.

The number of livestock raised in Lithuania is considerably smaller than in EU countries. In 1998-2000 on average the number of cattle was 28 per 100 ha of agricultural land and the number of pigs was 38 per 100 ha of arable lands, in EU countries the number was 75 cattle and 152 pigs accordingly. Less intensive cattle breeding causes lower dispersed water pollution and spot pollution.

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. Until 1990 the intensity of agricultural production was not balanced with environmental considerations. Because of consolidation of fields, destruction of farmsteads and green plantations about 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. Approx. 19 per cent of the area of the country are lands sensitive to deflation. This phenomenon is particularly typical of the coastal areas of the Baltic Sea. The elevated areas of western and eastern districts of Lithuania are mostly damaged by water and wind erosion.

The pollution of soil because of recent agricultural practice does not exceed permissible marginal concentrations. Although individual rare cases of higher pollution with fertilisers, pesticides or other chemical materials might be encountered. Fertilisation of fields in the European Union is 1.5 times more intensive than in Lithuania. For comparison, in the EU the average figure for 1998 was 126 kg/ha of fertiliser active material while in Lithuania is was 99 kg/ha (Figure 10.1.).

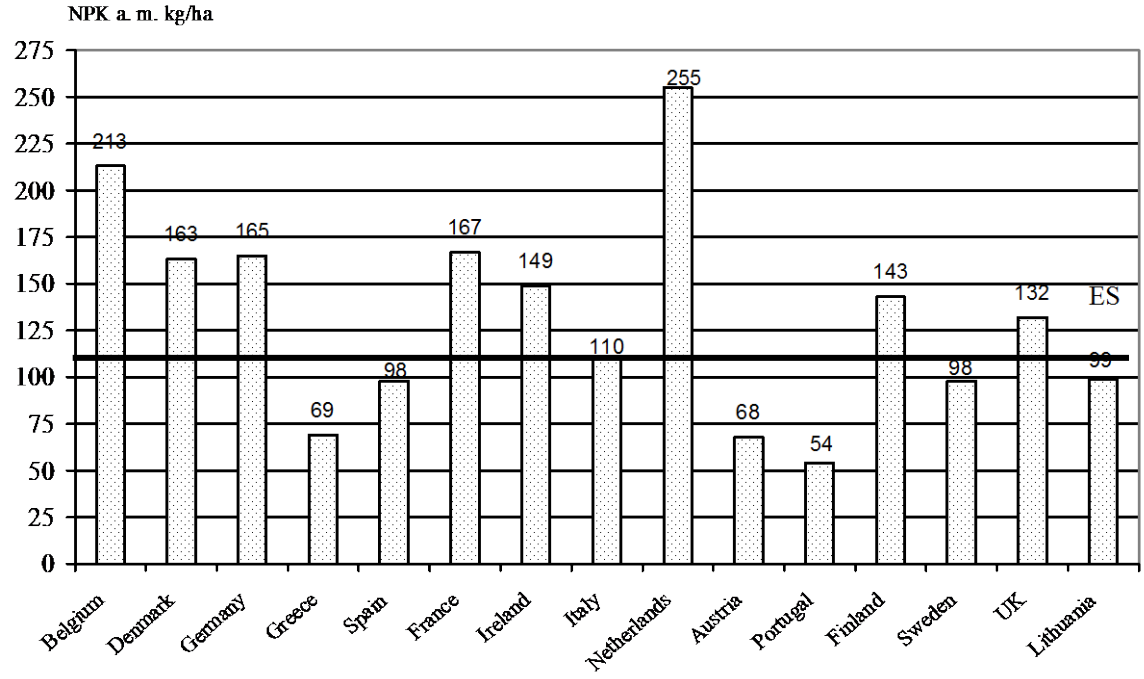


Figure 10.1. Average use of NPK (active material) fertilisers in EU states and in Lithuania

Sources: Agrarbericht der Bundesregierung 2000. Bundesministerium fiur Erniahrung, Landwirtschaft und Forsten; Agriculture in Lithuania 1999. – Vilnius: Department of Statistics under the Government of the Republic of Lithuania, 2000.

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 in 1997. In 1991, 196 kg of fertiliser was applied per ha. Before the agricultural reform, average 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. The total drainage area is estimated at 3 million hectares, of which 2.6 million have a functioning drainage system. 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

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 peatlands. 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 worsening 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 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 only a minor problem in Lithuania now, private farmers can use it in order to increase their arable area.

Currently, when markets do not need that much agricultural production, some land is not used. The research carried out by the Lithuanian Institute of Agrarian Economics shows that in view of the current intensity of production and availability of markets 65-74 per cent of agricultural land satisfy the needs.

Abandoned lands in Lithuania have become an ordinary phenomenon. Coastal and moraine plain areas becoming long-fallow lands can have a negative effect on bio-diversity there since this area is quickly grown by deciduous bushes and low-value wood. For the protection of bio-diversity extensive farming is preferable in such areas, and the least productive and suitable lands should not be used for agricultural purposes.

On the other hand, some owners farming in protected territories gradually increase the areas of agricultural land by cutting down coastal greenery, by ploughing creek meadows and destroying natural barriers that protect environment and landscape in the other ways. Some owners do not know or do not apply farming systems suitable for the protected territories. Birzai - Pasvalys karst region is an exception. Here organic and sustainable farming is implemented.

10.2. Impact of agriculture on biodiversity

Agrarian ecosystems occupy the largest land area in Lithuania (53.7 %), have the most impoverished biodiversity. Recent changes in land use, which includes land privatisation, less intensive agriculture and agri-chemical use, and an increase in fallow land has provided an opportunity for meadows and scrub systems to develop.

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 single farmsteads were removed. During the last 30 years, 70 % of the wetland have been lost. Vast areas of wetlands suffer from eutrophication, which has adverse effects on vegetation.

A wide variety of chemicals were used in vast monocultures of arable fields, including disbalanced 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 wastewater from cities and settlements 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 loss of land used traditionally farmed on the basis of 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, all farming activities have direct impact on the environment.

Before independence in 1990, Lithuania 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 minimum. 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.

Among Lithuanian environmental assets which might be affected negatively or positively by agriculture are ecosystems that include natural/ semi-natural (forests, wetlands, meadows, aquatic, lakes, rivers systems) and anthropogenic (agrarian) ecosystems.

During the last 30 years, natural meadows have decreased: in 1956, meadows covered 19.6 % of the country, whereas by 1980 they accounted for only 6.5 %. Natural continental meadows, which were intensely cultivated or planted with forests, have suffered most. The surviving natural flooded and continental meadows have deteriorated. Conservation of semi-natural meadows is related to their extensive use, yet no legal economic compensatory mechanism has been created. Economically strong farms use fertile meadows intensively as pastures, which degrades them. In other cases, in low-intensity use, non-fertile meadows and pastures are over-grown with shrub or forest. In some regions unused arable land is turning into meadow. There are natural/ semi-natural and cultivated meadows and grasslands in Lithuanian farms. Some of the grassland quality is poor. The sow into these grasslands the proper

grass varieties or the proper application of organic fertilisers could improve the quality and biodiversity of the grasslands.

10.3 Organic farming

Lithuania's integration into the EU implies a challenge to produce only competitive goods, i.e. competitive agricultural products. It is also necessity to apply cost effective farming methods, environmentally friendly and socially acceptable arrangements. This gives a task to solve economic, ecological as well as social problems in a complex way. In this regard one of the best management systems is bio-organic agriculture. It is based on natural biological processes and materials in order to ensure sustainable farming and production of high quality agricultural products.

All necessary preconditions for the production of organic products exist in Lithuania: a favourable ecological situation, state support, expanding local and foreign market of organic products, national and international recognition of the certification enterprise 'Ekoagros' – all that results in possibilities to export organic products.

The number of organic farms is constantly increasing (Table 10.1.). In 1993, the first organic farmers were certified. In 2001, 230 organic farms and 19 processing and trade enterprises were certified.

Table 10.1. Development of bio-organic farming in 1993-2000

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of farms	9	14	36	65	106	144	171	230	280
Area, ha	148	267	582	1118	1568	4006	3995	4709	6400

Source: Data provided by „Ekoagros" 1993-2001.

Information about organic farms and enterprises is presented in an annual publication by "Ekoagros" - Certified Organic Farms and Enterprises in Transitional Period.

The area of certified organic farms is 0.18 per cent of the total area of agricultural land in Lithuania. An average size of the organic farm is 20 ha. In terms of the area of certified land Klaipėda District ranks first, then come Varena, Birzai, and Moletai Districts. Other producers of organic products are located in different regions of Lithuania, and they are absent only in five districts of Lithuania (Vilkaviskis, Trakai, Šalcininkai, Rokiskis, and Pakruojis).

The major part of certified lands is meadows - 50 per cent and cereals - 40 per cent, 10 per cent of the area is used for vegetables, leguminous, potatoes, berry plantations, orchards, etc. (Figure 10.2.). The structure of crop area on organic and conventional farms is very similar, the difference lies in the fact more vegetables, leguminous and potatoes are produced on organic farms.

As a rule, organic and conventional farms are mixed, i.e. they produce different products: grain, potatoes, livestock products, fodder, etc. Only a few farms are specialised in producing of vegetables, fruit, berries, mushrooms, or herbs.

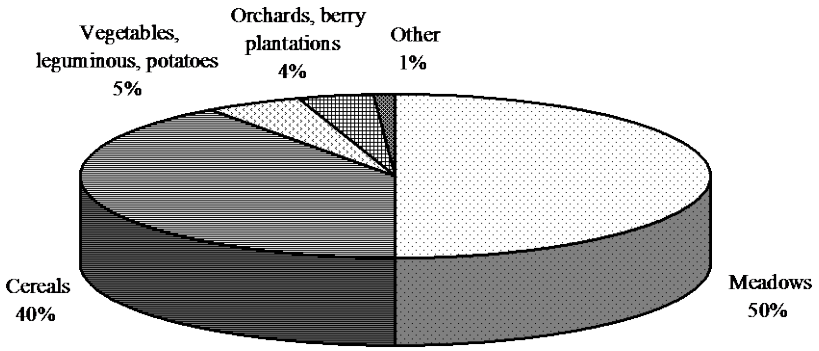


Figure 10. 2. The structure of bio-organic crop area in 2000

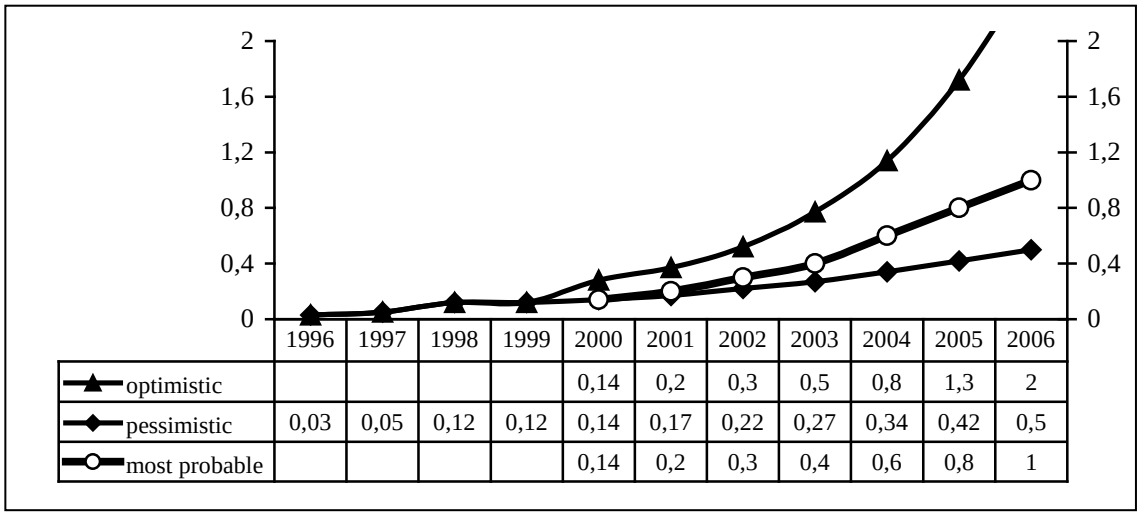
Source: Data provided by ,,Ekoagros" 2000.

Grain makes up the major part of organic crop products (40 per cent), potatoes rank next (25 per cent), followed by vegetables (12 per cent). As for livestock production, the major organic product is milk (90 per cent). However, milk as well as beef and poultry are sold as ordinary products, without the mark of organic certification. There is no processing plant producing livestock organic products.

The state supports the owners of organic farms. Direct payments per ha of certified crop land area are applied. Such farmers have been supported since 1997. This process has induced the growth of organic production. The area of certified lands increased by 2.5 times in 1998 in comparison with 1997. However, during recent years this process slowed down because of various reasons. Only 50-60 per cent of organic farm owners received direct payments. In general, the volume of state support was reduced from Litas 1.4 million in 1998 to Litas 0.45 million in 2000. As a result, pointing out to the reason of insufficient state support some farmers refused to continue their engagement in organic farming.

Organic products are in greater demand in Lithuania now, however, the network of distribution channels of organic products has not been developed yet. A survey results show that only 45 per cent of certified organic products were sold as organic ones with a 20-40 per cent surcharge. There are attempts to export organic products (berries, honey). On the domestic market 21 per cent of organic products are sold directly in the farms, 40 per cent – in fairs and market-places, 14 per cent - in shops, 25 per cent - in other points. The future will show what form of trade is the most popular. It is probable that selling organic products in supermarkets will stimulate the development of these products market.

The number of organic farms increases by 20-30 per cent annually. If the certification of land follows the same pattern, in 2006 this area will comprise 0.5 per cent of the total agricultural land (Figure 10.3.).



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
optimistic					0,14	0,2	0,3	0,5	0,8	1,3	2
pessimistic	0,03	0,05	0,12	0,12	0,14	0,17	0,22	0,27	0,34	0,42	0,5
most probable					0,14	0,2	0,3	0,4	0,6	0,8	1

Figure 10.3. The development of organic crop area in 1996-2000 and forecasts up to 2006, %

The development of organic farming described above will not be able to meet an increased demand. The goal is to have 1 per cent of the total agricultural land area turned into organic farms before 2006. Therefore, increasing the number of organic farms annually is of primary importance. Organic farming should play an important role in the National Strategy for Agricultural Development of Lithuania.

11. ENVIRONMENTAL PROTECTION IN AGRICULTURE

The diversity of natural resources of Lithuania, peculiarities of land use, and level of pollution predetermine the regional specificity of environmental problems.

Taking into account the diversity of natural resources of Lithuania, the following ecologically sensitive territories are identified:

- *Particularly sensitive, very sensitive and sensitive territories*. Their area amounts to about 1934 thousand ha. The largest area of these territories is in East Lithuania, especially in the territories of Lazdijai, Utena, Ignalina, and Trakai Districts. Sandy soil sensitive to erosion, characterised by the most intensive infiltration of precipitation prevail;
- *Protection zones of water bodies* cover the area of 195 thousand hectares. Within this area the economic activity is limited in order to reduce discharges of food substances into water bodies and their pollution, to slow down the processes of water eutrophication, and to preserve the stability of their banks;
- *Karst region of Northern Lithuania* is an area of 193.5 thousand hectares. It includes 61 per cent of Pasvalys District area, 46 per cent of Birzai District area, 16.9 per cent of Panevėzys District area and 6.1 per cent of Radviliskis District area. Direct pollution of underground water is especially dangerous in this territory;
- *The Nemunas River water-meadow region* – 52.4 thousand ha, including 47.6 thousand ha of Silute District area and 4.8 thousand ha - of Klaipeda District area. 75 per cent of the water meadows is agricultural land;
- *Ecological protected territories*. There are 1062 protected territories in the country (773903 hectares or 11.9% of the national territory): 5 state strict reserves (24004 ha),

including 4 natural and 1 cultural reserves, 5 national parks (152294 ha), 30 regional parks (436000 ha), 258 state nature reserves (150299 ha), 101 municipality nature reserves (11186 ha), and 662 protected items of a natural landscape.

Table 5.3. Main measures applied for environmental protection in problem territories

Protection measure / Territory	Change of production type	Regulation of fertilisation	Regulation of plant protection	Restriction on animal number	Regulation of agri-equipment	Regulation of haymaking
	A	B	C	D	E	F
Ecologically sensitive territories	A1	B1	C1	D1	E1	
Protection zones of water bodies	A2	B2	C2	D2	E2	F2
North Lithuania's karst region*						
I group land		B3.1	C3.1	D3.1	E3.1	
II group land	A3.2	B3.2	C3.2	D3.2	E3.2	
III group land	A3.3	B3.3	C3.3	D3.3	E3.3	
IV group land	A3.4	B3.4	C3.4	D3.4	E3.4	
Nemunas River water-meadow region		B4		D4	E4	F4
Protected territories	A5	B5	C5	D5	E5	F5

A, B, C, D, E, F - measures for environmental protection; 1, 2, 3, etc. - environmental protection zones' numerical indices.

* The development of underground water protection against pollution and environmentally friendly farming foreseen in the targeted programme (1993) according to special land and forest use conditions. The system of crop structure, fertilisation and plant protection specified for Northern Lithuanian karst region.

An Agri-environmental programme corresponding to EU Council Regulation No. 1257/1999 is being prepared and a pilot Agri-environmental measure within SAPARD has been aproved. These instruments seek to improve the environmental situation while still keeping profits at a level that secures a good living standard for farmers. The pilot Agri-environmental measure will be tested in 3 pilot areas since 2003:

1. Birzai and Pasvalys districts (north Lithuania);
2. Silute district (west Lithuania);
3. Lake Dovine basin territory (south Lithuania).

12. PROTECTED AREAS

The network of protected areas (natural parks, reserves, etc.) in Lithuania was developed in the last ten years. The system of legally protected areas of Lithuania is aimed at the conservation and where possible restoration of:

- Nature and cultural heritage features,
- Landscape ecological balance,
- Biodiversity,
- Gene pool for restoration of biota resources.

Also, it creates conditions for the development of interpretive, research and the promotion of nature and cultural heritage protection.

There are 4 categories of protected areas:

- Conservation areas- strict nature reserves or culture reserves, protected landscape features (nature or culture monuments), nature or culture reserves,
- Protection areas- protection zones for various purposes (buffer zones for strict reserves, national or regional parks, nature or culture monuments, water bodies, roads and railways, recreational areas, etc.),
- Restoration (recuperation) areas- sites where natural resources are protected or restored,
- Integration areas- national parks and biosphere monitoring areas.

In 2002, specially protected areas covered 773.9 thousand hectares, equalling 11.9 per cent of total country area. There were 1,062 protected sites listed in total, including 5 national parks and 30 regional parks. Most of the protected areas are concentrated in the Southeast Lithuanian regions.

Table 12.1. Protected areas, in 2002.

	Number	**Area (1000 ha)**	**Share of total area %**
Integrated areas:			
National parks (IUCN II)	5	152.3	2.3
Regional parks (IUCN V)	30	436.0	6.7
Conservation areas:			
Strict nature reserves	4	23.8	0.4
Strict culture reserves	2	0.3	0.0
Reserves (IUCN IV)	258	150.3	2.3
Municipality nature reserves	101	11.2	0,2
Landscape objects	662	.	.
Total of above listed data	1032	773.9	11.9

With the factual development of the system of particularly protected areas before land reform, good preconditions for the conservation of landscape and biodiversity in Lithuania have been created; however, part of the areas especially valuable from the biodiversity point of view are still unprotected.

In 1983, in the national Integrated Nature Protection Scheme, the idea of Lithuania's Nature Frame was raised and approved. Lithuania proposed the concept of Nature Frame, which became the concept and approach for the conservation and protection of Lithuania's natural landscape.

The Nature Frame, which offers a universal approach, was put forward and legally established under the relevant laws of the Republic of Lithuania on environmental protection and protected areas. The Nature Frame links all natural protected areas with other ecologically valuable or relatively natural areas which underpin the general stability of landscape, to form a landscape system of geoecological compensation zones. It is aimed not only at development of a complete system for natural buffering and connecting natural protected areas, but also at conservation of natural landscapes, biodiversity and natural recreational resources. It does so by providing guidelines and conditions for recovery of forests, optimising the

structure of agrarian landscape from the geoecological point of view, regulating development of agrarian activities and defining sustainable urbanisation. It is a concept based on catchment and biologically important areas.

The Nature Frame, however, is not a continuos network of green belts. Instead, it is an integrated process for all land use, management and protection. Currently, the Nature Frame covers about 60% of Lithuania varying from 35 to 80% depending upon natural conditions and land use.

The increasing environmental threats of a local, regional, national and international kind requires territorially unified nature conservation system in Europe, allowing combination of individual countries' efforts in preservation, reproduction and growth of national resources. The concept of ecological network represents the process of integration of conservation and environmental aspects into different sectors, such as agriculture, regional planning, transport, etc.

In 2000, an operational concept of national ecological networks (NECONET) in Lithuania, was created, as well as its implementation strategy that conform to European standards. The implementation of ecological network is necessary for ecologically balanced development of the region and for implementation of the principles of sustainable development, maintenance of landscapes and biodiversity, as well as implementation of the EU Habitat and Bird Directives (Natura 2000 areas), Agri-Environmental programmes, as a process of the EU accession, and also Biodiversity and Bern Convention (EMERALD network). The general structure of ecological network - core areas, corridors, buffer zones and stepping stones - is accepted in the country. Development of the national ecological network provides Lithuania a tool for setting priorities in biodiversity protection and will start integration of general and cross-sectoral policies, applying concepts of European and Regional Ecological Networks.

13. NATURA 2000

Like any other country in the world, Lithuania has a moral obligation to protect its share of biodiversity. This obligation forms the basis for the most important pieces of EU legislation on nature conservation, the Birds and Habitats Directives. According to these directives, Lithuania must protect species and habitats, which are rare or threatened at the European level. A number of species must be strictly protected all over Lithuania, and in addition we must designate a number of areas to be included into the EU network of protected areas - Natura 2000.

The EU Habitats Directive (92/43/EEC) requires Member States to designate and participate in the EU Natura 2000 Network of sites for the conservation of species and habitats which are of EU importance. This network will consist of Special Areas of Conservation (SACs) established under the Habitats Directive together with Special Protection Areas (SPAs) established under the EU Birds Directive (79/409/EEC). The SACs deal with non-bird habitats and species, and the SPAs with bird species and habitats (particularly wetlands).

Since the beginning of 1999, the first steps in the implementation of Natura 2000 in Lithuania has been the responsibility of an EU approximation project supported by the Danish governmental funding agency Dancee in co-operation with the Lithuanian Ministry of Environment. During the years 1999 through 2001, the project has been intensely working in order to provide a solid scientific and legal basis for the final selection of sites to be protected under the Natura 2000 network of

Lithuania. For the first time, Lithuania now has an objective scientific basis for designating protected sites.

A thorough legal analysis has been carried out in order to identify gaps in existing Lithuanian legislation on nature conservation compared to the requirements of the EU. On the basis of this analysis, a number of legal amendments have been proposed. Some of these proposals have already been adopted by the Lithuanian Parliament and enforced. Also, an assessment of the costs of implementing the two Directives in Lithuania was carried out.

An analysis of the major differences between the national classification system of habitats and the classification system used by the EU was carried out. On the basis of this analysis, important changes to the national system were proposed in order to create a unified system that will work within Lithuania and be compatible with the EU classification system.

A large number of scientific researchers and field workers have been involved in gathering data in order to determine the current status and distribution of Lithuanian species and habitats covered by the EU Habitats and Birds Directives. Data has been gathered through fieldwork as well as literature searches. Furthermore, the project made a special assessment of already protected territories and areas defined as Important Bird Areas (IBAs) by the Lithuanian Ornithological Society. So far, the project has revealed that 52 habitat types, 14 plant species and 137 animal species protected by the Habitats and Birds Directives occur in Lithuania. An additional list of Lithuanian habitat types, which are in need of special conservation measures, was also produced.

On the basis of thorough scientific work including field investigations as well as literature studies, a list of proposed Natura 2000 sites which are suitable for the protection of the species and habitats covered by the Habitats and Birds directives was produced. The guidelines and criteria for the selection of Natura 2000 protected areas were created as well.

Altogether, more than 317 separate sites are now included on the list of Natura 2000 sites proposed by scientists and technical experts. Preliminary, these territories occupy an area of 919 253 hectares that make 13.8% of the Lithuania's territory. Out of total number of proposed 317 sites, 84 are SPAs (286 430 ha), while 277 – SACs (632 816 ha).

Existing protected areas in Lithuania cover almost 12% of the country. Almost two thirds of potential NATURA 2000 sites are located in the existing network of protected areas. The remaining part should be designated after the list of Natura 2000 sited will be approved in 2002.

Recommendations for new guidelines for the management of Natura 2000 species were provided. A template for management plans covering Natura 2000 habitats was produced. The template plan covered the Daubenai area , which has been proposed by the project as a candidate Natura 2000 site. Agri-environmental measure set under the RDP should greatly contribute to the management of Natura 2000 sites in Lithuania.

The database systems for handing the large amount of data gathered on habitats and species was set up ensuring its compliance with the requirements of the reporting procedures to the European Commission.

Due to the complexity of Natura 2000 and its interaction with agriculture and forestry, it is necessary to involve several ministries in finding the best solutions for the implementation of the Natura 2000 network. Such co-operation is being facilitated by organising round-table discussions and informal meetings involving staff from the

Ministry of Environment as well as staff from the Ministry of Agriculture, including the Department of Forestry.

14. GENETICALLY MODIFIED ORGANISMS (GMOS)

Currently there is no statistically precise evaluation of the scope of activities related to GMOs and GMPs in Lithuania, because such activities are considered as the new phenomenon in Lithuanian society, being the product of the last decade of XX-th century – first years of XXI-st century. Up till now neither Ministry of Environment, nor any other institution has not kept the constant reliable accountings of GMOs and GMPs, no united databases are available.

For the present, Lithuania is participating in the Cartagena process and ratified the Biosafety Protocol. Meanwhile, it is considered a strong motivated need in Lithuania to implement the requirements of a protocol setting out appropriate procedures in the field of the safe transfer, handling and use of any living modified organism resulting from biotechnology, that may have adverse effects on the conservation and sustainable use of biological diversity.

The Cartagena Biosafety Protocol of the CBD sets out the requirements for the Contracting Parties to take appropriate legislative, administrative and policy measures in participatory processes and research programs, including regional efforts and initiatives, to explore and develop, in collaboration with all relevant stakeholders, guidelines and practices in order to ensure the development of national biosafety system in participating country. It encourages national governments to implement human and institutional capacity-building programmes and projects to promote successful development and implementation of legislative, administrative and policy measures to develop national regulatory biosafety frameworks.

Meanwhile, Lithuania has recently started to explore and develop its national legislative institutional system approximating the requirements set out in the EU environmental policy.

- Thus, on 12 June 2001 the Parliament of the Republic of Lithuania adopted the Law on Genetically Modified Organisms, which will come into force on 31 December 2002. The law is aimed at regulating the management of the activity related to the use of GMOs and GMPs, the assessment of the risk to the environment and human health, release into the environment, placing on the market, without posing any obstacles to the development of gene engineering and seeking to protect human health and the environment against the possible negative impact. Ministry of Environment (national authority) is authorised to regulate the state management of activities concerning the handling (export, import) of the genetically modified organisms (GMOs) and genetically modified products (GMPs). Therefore, seeking to approximate the national legislation to EU legal acts, it is necessary to prepare secondary legislation, regulating the activities related to GMOs and GMPs.

In order to co-ordinate the national efforts in the field of management of GMOs and GMPs, a GMO division in the Nature Protection Department of the Ministry of Environment was established and a Consultative Committee on GMO management (by MoE Order of 18 December 2001).

There were planned and drafted (one of them is already adopted at the ministerial level) several pieces of secondary legislation during the first half of 2002, namely:

- The procedure for granting consents (permits) for the use GMOs as or in GMPs in the Republic of Lithuania (approved by the MO No. 601, 18 December, 2001);
- The procedure for GMO and GMP labelling and classification;
- The procedure for assessing the risks posed to human health and environment by GMOs and GMPs, and the information required for risk assessment (the latter legal regulations are being prepared for the final approval).

The European Committee under the Government of the Republic of Lithuania has sub-contracted the national environmental consultancy in order to assess and evaluate the socio-economical consequences for the implementation of the Council Directive 2001/18/EC (17 of April 2001, amending Directive 90/220/EEC) "On the deliberate release into the environment of genetically modified organisms". The final report is scheduled for autumn, 2002.

There are several other governmental institutions, which are obliged to work closely with the Ministry of Environment on this issues, namely: Ministry of Health, Ministry of Agriculture, State Food and Veterinary Service, Customs Department and several others.

The Ministry of Health, among its primary functions, is responsible:

- To set up the mandatory safety requirements for food which contains GMOs or consists thereof or is manufactured therefrom;
- To initiate the mandatory labelling requirements for foodstuffs containing GMOs thereof or manufactured therefrom;
- To set up the procedure of safety examination of food which contains GMOs or consists thereof or is manufactured therefrom;
- To establish the procedure for conducting safety examination of products,
- To lay down the procedure of acceptance for use, registration and use of medicinal products, medicines containing or manufactured from GMOs, except for veterinary products and veterinary medicines.

The Ministry of Health or its duly authorised institution shall carry out control of medicines for human use. There is only one officer under whose responsibility is the implementation of the described tasks within the Ministry of Health.

The Ministry of Agriculture, among its primary functions, is responsible:

- To participate in the manner laid down by the Government or the institution authorised by it, in carrying out the assessment of risk posed to agriculture by GMOs and GMPs;

There is only one officer under whose responsibility is the implementation of the described tasks within the Ministry of Agriculture.

The State Food and Veterinary Service, among its primary functions, is responsible:

- To establish the requirements for manufacturing and placing on the market foodstuffs and their constituent parts which contain GMOs or consist thereof or are manufactured therefrom;
- To establish the procedure of approval, registration and use of veterinary products, veterinary equipment, veterinary medicines, which contain GMOs or which are manufactured therefrom;
- To carry out safety examination of GMPs according to the established procedure.

The State Food and Veterinary Service shall carry out, according to their competence, safety control of placing on the market of GMOs and GMPs and market surveillance.

There is only one officer under whose responsibility is the implementation of the described tasks within the State Food and Veterinary Service.

- The state management of GMOs activities are co-ordinated by the Ministry of Environment along with other state institutions the Ministry of Health and the Ministry of Agriculture. Therefore, it is considered the need to establish the framework of an administrative system for competent and effective decision-making process on notifications and requests related to GMOs, including the establishment of the administrative systems. The latter need will be addressed during the future implementation of the Phare twinning project "Strengthening of Institutional capacity to implement EU requirements on chemicals and genetically modified organisms management", which is planned to start in autumn, 2002. The project is aimed at assisting Lithuania with the development of institutional administrative capacity of the Ministry of Environment for implementation of the acquis in the chemicals GMOs sectors, development of required laboratory practices on chemicals and GMO management and control mechanisms.

Despite several individual initiatives mentioned above, it is an evident need to draft and develop the overall integrated National Biological Safety Framework in Lithuania. It will be done by a special project that started in 2002.

15. POSITIVE IMPACT OF NITRATE DIRECTIVE ON ENVIRONMENT

The Nitrates Directive is one of the most important directives in the environmental chapter of the negotiations of Lithuania's accession to the EU. Its has the objectives of reducing water pollution caused or induced by nitrates used in agriculture and preventing further such pollution. Nitrates are a health hazard in water which are used as sources of drinking water. They are also nutrients that contribute to eutrophication of waters. The Directive requires:

– The establishment of a code of practice, to be implemented on a voluntary basis by farmers, to protect waters from pollution by nitrates;
– The identification of waters polluted by nitrates from agricultural sources;
– The identification of the land areas contributing to the pollution and the designation of these lands as Nitrate Vulnerable Zones (NVZs);
– The establishment of compulsory action programmes in relation to designated NVZs within one year of designation: a primary consideration is the management of manures and fertilisers;
– The implementation of these action programmes within four years of their establishment.

In Nitrates Directive, agricultural pollution is estimated according to the ground and surface water quality. Based on Nitrates Directive, the candidate countries have to determine nitrate vulnerable zones.

In 1994-1995, regional centres of the Ministry of Health together with Geological Service have investigated water quality in 5775 dug wells throughout territory of Lithuania. In more than one third of the wells that are used by one million inhabitants of Lithuanian rural areas, concentration of nitrates is higher than the allowable standard 50 mg/l. The polluted wells are scattered evenly throughout the whole territory of the country. Most of them are located close to dwelling houses, barns, toilets, heavily fertilised orchards and gardens. Main reason of pollution of the well water with nitrates is inadequate distances from the barns, dunghills and toilets. The concentration of nitrates in the wells in the countryside is up to 100 times higher than in open agricultural fields.

Research on Lithuanian surface water eutrophication done by the Marine Research Centre of the Lithuanian Ministry of Environment has revealed the eutrophication of the Curonian Lagoon is very high and is constantly increasing. During 16 years of monitoring, clear increase of abundance of phytoplankton is observed. The biggest algae bloom was recorded in 1986. Decrease of agricultural production and fertilising during the last decade has not changed abundance of phytoplankton. The numbers of some algae species typical for eutrophicated waters have increased highly. In addition, intensification of the algae bloom related to rapid growth of blue algae was recorded. During the last 5-6 decades, their numbers increased more than 10 times.

Due to these reasons, in the negotiation with the EU Lithuania has committed itself to prepare a Programme for protection of waters from pollution with nitrogen compounds from agricultural sources till 2003 and to start its implementation in the whole territory of the country from the date of accession. The Nitrate Directive requires that the Programme would include measure regulating:

- Code of Good Agricultural Practice, limiting use of fertilisers taking into consideration characteristics of vulnerable zones;
- Fertiliser norms, animal density, ratio between areas of perennial and annual crops, periods when it is prohibited to apply certain types of fertilisers;
- Storage capacities and application of animal manure.

15.1. Code of Good Agricultural Practice (CGAP)

CGAP for Lithuania was prepared and submitted to the Commission in 2000. It summarises existing national legislation that regulates protection form nitrate pollution in agriculture and EU requirements that will need to be transposed into national legislation.

Out of 74 rules set in the Code of Good Agricultural Practice, 34 are already established in various national legal documents, while 40 rules will still need to be transposed into legislation and applied throughout the whole territory of Lithuania.

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 land 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 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.

In 2002, a working group should be established at the Ministry of Agriculture that will be responsible for the preparation of the Programme for protection of waters from pollution with nitrogen compounds from agricultural sources.

16. INSTITUTIONS

The institutional sector system consists of the following:

– Ministry of Agriculture (MoA). The MoA formulates the policy, and together with other interested parties coordinates its implementation on the National scale;
– Rural Development Department on a County scale, Agricultural Division on a District scale, and Units of Agricultural Advisory Service together with other non-governmental organizations are implementing the policy on the local level;
– Agencies for Regional Development are responsible for the common supervision of the Regional policy implementation. In its turn, it is the Ministry of Management Reforms and Municipality Affaires that in responsible for the coordination of the above institutions.

Ministry of agriculture

The Minister of Agriculture manages the implementation of the Government Programme in the area of agriculture and rural development. The Minister is accountable to the Seimas and the President and is directly reporting to the Prime Minister. The Minister of Agriculture is the head of the Ministry of Agriculture.

The Ministry of Agriculture is a public authority financed from the state budget. The Regulations of the Ministry are approved by the Government. The Ministry has an administration managed by the Ministry Secretary. The Ministry of Agriculture is charged with the functions of public administration in the areas of agriculture, food, fisheries and rural development and with the responsibility to implement the state policy in these fields. The Ministry of Agriculture has departments, divisions and other types of units. During the period of Lithuania's independence the Ministry underwent changes reflecting the reality of each period, it was adjusted to specific tasks and Government policies. Currently the Ministry staff is 230 people.

Within the Ministry of Agriculture there is a panel – an advisory body to the Minister and the Scientific Council for Agriculture that submits proposals on science

and research, strategy for agriculture, scientific and technical progress, and other issues.

Departments, services and other bodies are set up under the Ministry of Agriculture to carry out functions of control and inspection. The National Paying Agency, Land Management and Legal Department, EU Integration Department, Fisheries Department, State Livestock Breeding Control Service, State Seed and Grain Service, and State Plant Protection Service. The Ministry of Agriculture alone or together with other institutions sets up state enterprises and public institutions for the implementation of different programmes and for various economic and other type of activities.

A public authority – the State Food and Veterinary Service carries out the functions of public administration related to animal health and wellbeing, veterinary control of the production and handling of animal products, veterinary control of the production and trade of veterinary preparations, veterinary control at the border, livestock identification and registration, and approximation of national veterinary legislation with the acquis.

When a new Law on Food will be in the process of implementation, it is foreseen an institutional structure to be established, which should ensure the State control of Food quality.

The Constitution of the Republic of Lithuania stipulates that the Government acts in administrative units. A county is an administrative unit, and central government exercises its public administration functions through county administrations. Beside other things, a county governor co-ordinates the implementation of programmes for agriculture and rural development, carries out Government tasks concerning other agricultural and land management matters. A county governor's administration contains a rural development department, which is responsible for the execution of a county governor's responsibilities in the area of agriculture.

The main water institutions are municipalities and regional department of the Ministry of Environment.

Water supply have to be used rationally, taking into account cirstumstances of environment protection and restoration. Problems of state governing institutions in water management depend on the Laws accepted by the Seimas and the Government power of attorney to governing institutions. Laws in the Seimas are accepted taking into account political and economical spectrum of the state, and it is stipulated by the water management.

The Seimas (parliament) of the Republic of Lithuania:

- determinates main trends of rational water usage and protection defence;
- ratifies strategies of environment protection;
- ratifies State budget assignations for financing of environment (water bodies) protection;
- ratifies and denunciates the main agreements on water protection and usage of water stocks.

The Government of the Republic of Lithuania:

- ratifies programmes and schemes of state water usage by presentation of Environment Ministry;
- formats a system of state institutions on usage and protection policy of water stocks according established order of laws;
- co-ordinates activities of state and territorial governing institutions on water protection and usage;

- forms and realizes interregional agreements on water usage and protection;
- ratifies list of state water stocks as exceptional private rights of the state.

The main institution of state governing, which is responsible for rational usage of water stocks and water protection, is the Ministry of Environment (former Ministry of Environment Protection).

The Ministry of Environment carries out the following functions

- organizes and co-ordinates activities and puts the strategy into practice;
- prepares programmes, their fulfilment order and controls their realization;
- organises and co-ordinates arrangement of schemes of state power (for river basins, levels of underground water) and arranges other means, also prepares these schemes and means, provides putting into practice mechanism;
- prepares laws, drafts resolutions for the government, organises preparing of common, special and detailed territorial planning documents in water protection;
- arranges and ratifies regulations, standards and rules;
- establishes and controls standards of environment pollution and standards of quality in superficial water bodies, ascribes these bodies to fishery (according categories) and recreation;
- prepares and ratifies methods of damage made for environment counting, brings in action payments for made damage to legal and natural person;
- organises and co-ordinates monitoring of quantity and quality in superficial and underground waters, creates and replenishes computerised system of information in defence of water bodies and uses it;
- establishes order of permission for water usage and also order of permission for navigation and hydrotechnical facilities, and issues these permissions;
- regulates and controls registration of usage of water bodies, creates and arranges state registries and cadastres, forms a register of betrayal, alienation, renewal and abolition for usage of water bodies;
- organises and co-ordinates scientifical researches in rational usage of water supplies and protection of water bodies, and in improvement of hydrographical network;
- forms the State Nature Fund according to the established order and disposes of its means, controls usage of nature protection funds in local governing, co-ordinates forming the means of Lithuanian Fund of Environment Protection, controls usage of the means;
- keeps in touch with foreign state institutions and international organisations, prepares projects of international agreements, signs these agreements and organises their putting into practice;
- informs society about conditions of water bodies, executes ecological education;
- controls usage of state water supplies, executes state control of hydrographic network and dangerous hydrotechnic buildings, etc.

There are 10 districts in Lithuania and local governings are created in these places. Their functions are described in the Law on District Governing of the Republic of Lithuania (1994, No1-702, lots of changes). Administration of the head of a district is an institution of governing and charges with its functions in the territory of a district. It charges with the following functions in water governing:

- establishes limits for water usage;
- organises supervision of zones of water bodies;
- executes operation of hydrotechnic facilities in reservoirs of the state significance;

- organises building and maintenance of hydrotechnic and land reclamation facilities,

operates these facilities and installations.

Functions of local governing are established in the Law on Local Governing (July 7, 1994, No1-533, lots of changes).

Local governings in organising the realisation of the laws on the environment protection, standard acts of the Government and other governing institutions carry out the following functions:

- rule over enterprises of water supplies, take care of a good quality water for inhabitants, clean waste water to the level, that corresponds to a defined standard;
- solve financial problems of sewerage and wastewater cleaning equipment;
- define rates of supplied and waste water;
- distribute limits of water usage according to the defined limits of water for governings;
- prepare, ratificate and put into practice programmes of water supply usage and protection, schemes and other means of water protection;
- form the Fund of Water Protection in local governing and dispose it, ratificate assignations for the environmental protection;
- investigate, ratificate and co-ordinates projects of the objects of economic activities according the competence of local governing;
- establish more severe standards than standards of the Government, co-ordinating them with the ratification institutions;
- execute environment monitoring in local governing;
- make decisions and control their putting into practice according the competence.

Functions and obligations of users of water supplies and water bodies:

- estimate the possible influence of agricultural activities on environment by own means;
- keep requirements in superintendence, repairs and reconstructions of ponds and hydrotechnical constructions, ensure stability of water bodies shores;
- arrange zone of sanitary protection of strict routine in watering – places according standards, and carry out its superintendence;
- do not change water level in lakes and ponds, do not perform deepening and regulation in rivers, do not clean water ground and change shores, do not build dikes and other hydrotechnical buildings without a permission from the authorised institution of Ministry of Environment;
- husband water, do not exceed limits of established water usage and standards of waste-water and pollution, that are spread out into natural environment;
- do not violate water supply users of their rights;
- ensure inhabitants right to bathe, to water domestic animals, or somehow differently use private water bodies by established order;
- use waste-water engineering installations and other constructions, that have influence on water economy in the proper way;
- do not destroy water fauna and flora;
- do not breed and introduce new variety of water fauna and flora in the Republic of Lithuania;
- regulate calculation of water usage and execute monitoring according the Law on Environmental Monitoring in the established order;
- do not execute activities in internal water bodies (water-ways), which can provoke danger for safety navigation or condition of water-ways;

- compensate damage made for environment by illegal activities.

Water users can unite to associations according the established order by other laws. Enterprises of water supply at institutions of local government are united into the Lithuanian Association of Water Suppliers.

The administration and management of land reclamation works were the duties of state land reclamation services. The two level land reclamation offices had been established for this purpose. The ownership and administration rights had been delegated to the county administrations. The organisation of maintenance, reparation, rehabilitation and construction of land reclamation structures are within the responsibility of district land reclamation offices, which are in some counties actually married to the agricultural offices. To formulate the policy, and together with other interested parties to co-ordinate its implementation is under responsibility of Ministry of Agriculture.

In the field of self-government and education of private farmers and other land users there are the non-governmental organisations that play a significant role. Currently there are over 70 different NGOs and producer associations in Lithuania. The most significant of them are the Lithuanian Agricultural Chamber and the Lithuanian Agricultural Advisory Service (LAAS). The Agricultural Chamber joins the multiple associations in different professional fields as well as Associations of agricultural land users that have been established on the territorial basis. The LAAS has local advisory offices in all 44 districts. Its task is to give consultations/recommendations to the farmers as well to develop and to organise advisory and training programmes.

Other citizens’ institutions include municipalities, rural districts (seniūnija), co-operatives. Only recently the process of establishing rural communities has started. Currently there are some 300 registered rural communities in Lithuania.

Social institutions include Ministry of social security and labour through municipalities and rural districts, and the church through “Caritas” organisation.