Resource Mobilization Information Digest N° 90 February 2013

Sectoral Integration of Biodiversity in Poland

Contents

1. Introduction 2

2. Forest management 2

3. Agriculture 7

4. Fishery 11

5. Tourism 15

1. Introduction

Poland reported[1] on forest management, agriculture, fishery, and tourism.

2. Forest management

In the foreseeable future, Poland will not be among countries at risk of deforestation, threatening its sustainable development. The above is guaranteed by the forest policy adopted by the state, along with the practice of ecologization of the forest economy, carried out by the State Forests National Forest Holding (Państwowe Gospodarstwo Leśne Lasy Państwowe – PGL LP). This business entity manages 78% of forests in Poland. Forests in national parks and forests owned by local authorities and the State Treasury amount to 4% of the total forest area. The remaining 17% are private forests. The dominant role of the state in the forest ownership is peculiar to Poland and generally uncommon across the European Union. On the one hand, the dominant role of the state facilitates sustainable forest management, whereas on the other hand, PGL LP is at risk of becoming privatized and market-oriented in the modern market economy. Despite the threat, the leading role of the state in forest management is not only successfully maintained, but also deepened. Maintaining the present status of Polish forests (e.g. their general accessibility) is essential for sustainable forest management that guarantees harmonious relationship between the growing demand for materials and the need of preserving forests for their environmental significance.

The Forest Act of 1991 specifies the principles of preserving, protecting and expanding forest resources, along with principles of forest management, in connection with other components of the environment and national economy, regardless of forest ownership. These principles equalize environmental and social benefits with resource-related benefits. The legal basis for the protection of forest species is contained in the Act on Protection of Farmland and Forestland of 1995. Two years later, the government outlined the *National Forest Policy*, related to the provisions of the *National Environmental Policy* of 1991, updated by the Polish Parliament in 2001 as the *II National Ecological Policy*. As a result of introducing the *National Forest Policy*, the *Polish Policy of Sustainable Forest Management* was adopted by the Chief Executive of PGL LP. Pursuant to the *National Forest Policy*, the sustainability and multi-functionality of forests shall be maintained through: increasing forest resources of the country, improving the condition of forest resources and their continual protection, as well as changing the mode of forest management from raw material-oriented model to pro-ecological and economically sustainable, multifunctional forest management model.

In 2007 (as of 31st December), the forest area of the country was 9,05 million ha., constituting 28,9% of the total area of the country. The ownership structure is dominated by public forests – 82,1%, of which 78,1% is managed by PGL LP. The percentage of private forests varies geographically, with the highest

[1] Poland (2009). Fourth National Report, Ministry of the Environment, Warsaw, March 2009, 137 pp.

proportion found in southern, central and eastern provinces of Poland: Małopolskie (43,3% of the total forest area of the province), Mazowieckie (42,8%) and Lubelskie (39,5%). The lowest proportion of private forests is observed in western provinces of Poland: Lubuskie (1,2%), Zachodniopomorskie (1,5%) and Dolnośląskie (2,5%), mainly for historical reasons. Forests in Poland cover areas of the poorest soil, this fact being reflected by the arrangement of habitat types: the prevailing temperate coniferous forests make up 55,1% of forests managed by PGL LP. Coniferous species cover 76,7% of the area. In Poland, pine (69,3% of the area together with larch) has the most favourable climatic and biotopic conditions in its Euro-Asian occurrence area. Between 1945 and 2007, the species composition structure of forests in Poland changed significantly, this fact being reflected by the increasing percentage of deciduous forests under the management of PGL LP from 13% to 24%. The age structure of forests managed by PGL LP is dominated by age class III and IV (approximately 44% of the area altogether), with age class II and III for private forests (60% of the area). In PGL LP, trees older than 100 years cover 14% of the area, with 2% for private forests. Over 51% of trees in PGL LP are 41-80 years old (age class III and IV). In private forests, over 2/3 of trees are of age class II and III. The volume of trees older than 100 years in PGL LP amounts to 18% of total volume. The average age of forest stands in PGL LP (in 2007) was 60 years, with 40 years for private forests.

Forests are a renewable source of wood materials that enhance development, without harm to the environment. In the recent years, forest resources have been used at a rate that is below the self-recovery capability of the natural environment in order to ensure forest sustainability and increase wood resources. Wood resources of the country are growing. The growth is reflected by an increase of gross wood volume up to 1,91 billion m^3. For the past twenty years, forest resources in PGL LP have been used at a rate that is below the volume growth rate. In 2006, the harvested volume made up 56% of the growth. A more dynamic economic development since Poland joined the EU has resulted in a growing demand for wood. In the years 2005-2008, a more intense pressure from different industries for increased production of wood has been exerted and it may remain so in the years to come.

Forest ecosystems are the most precious and the most abundant component of environmental protection areas that cover over 32% of Poland's area. Forests make up almost a half (43,5%) of the protected area. The majority of the country's most valuable and the most attractive environmental protection areas are managed by PGL LP. Pursuant to the Forest Act and the *National Forest Policy*, for the past several years, PGL LP has been drawing up an inventory of all precious forms of biological diversity, updating it when creating environmental protection programmes for forest divisions. The inventory contains all the components protected by law, i.e. nature reserves, nature monuments, ecological sites, endangered and rare species. PGL LP takes its own initiatives to maintain the biological diversity and restore endangered species of flora and fauna. These initiatives include: *Forest Gene Preservation Programme, Programme for restitution of Fir in Western Sudeten Mountains, Yew Restitution Programme* and *Capercaillie Reintroduction Programme.* Over 243 000 ha of forest stands provide seeds for the propagation of indigenous ecotypes of tree species. A significant part of the approved protection areas in Poland within the European network of Natura 2000 are located on

woodlands. Those areas in PGL LP amount to 2,6 million ha. They include a significant part of large forest complexes, such as Bory Tucholskie, Puszcza Augustowska, Puszcza Piska and Puszcza Białowieska. Since 2006, PGL LP has been running a project aimed at increasing retention capabilities and preventing floods in forest ecosystems located in lowlands. The project has a chance of becoming the first European large-scale undertaking aimed at increasing retention capabilities of forests. The main objective of the project is to improve the water balance in small river basins, minimise the effects of droughts in forest ecosystems and prevent floods. The undertaking is also aimed at preserving the biological diversity of water terrains and swamps, as well as restoring swamps and marshes to their natural state.

Forest Promotional Complexes (FPC) are of primary focus when it comes to enhancing the management model that integrates the objectives of environmental protection, improving the biotope-forming function of forests, providing the sustained use of wood resources, ensuring the economic stability of forestry and collectivizing the management of forests as a public property. These complexes have been created as a result of implementing the *National Forest Resources Protection Policy*. FPCs facilitate intercommunication between the community and forest officers. PGL LP runs an educational programme aimed at promoting the idea of pro-ecological and multifunctional forest management, especially among children and young people. The programme is implemented by all PGL LP forest divisions, most of its regional head offices and its national units (Information Centre, Forest Culture Centre in Gołuchów, Forest Gene Bank in Kostrzyca or Centre for Development and Implementation of State Forests in Bedoń). With their education facilities, Forest Promotional Complexes play the key role in providing forest education for the local community. Equally important objectives include: forming ecological awareness and appropriate attitudes towards forests and forestry, along with developing multilateral and rational cooperation with environmental organizations and associations. PGL LP's policy of promoting ecological forest maintenance has led to creating 19 FPCs with the total area of 990 500 ha, with this being almost 13% of the total area under the management of PGL LP.

Since 1989, forests in Poland have been assessed for damage every year within the forest monitoring programme that is part of the State Environmental Monitoring System. Health condition of forests is affected chiefly by weather conditions, soil quality and air pollution. Weather conditions in 2007 were favourable for the formation of assimilation apparatus in trees. The average rainfall in the vegetation period for the country reached the highest level in the quinquennium (113% of the perennial average). The increase in rainfall in the vegetation period in 2007 was accompanied by a decrease in the number of damaged trees in most regions. The health condition of trees is endangered by the process of eutrophication of forest biotopes. Observed in most areas of the country high concentration of nitrogen compounds results in a higher susceptibility of trees to negative effects from biotic and abiotic factors. This phenomenon is confirmed by the increased content of nitrogen in the assimilation apparatus of all species studied in 1997-2005. The process enhances the growth of trees but it also makes trees more susceptible to pathogenic fungi, insects, as well as frost and collapse under wind or snow. Prevailing in most regions of the country high level of NO_2 aids the process of eutrophication of forest ecosystems. An opposite trend is being observed for SO_2 concentrations that remain at the same level or decrease.

The health condition of trees has remained unchanged in recent years. The past two years have shown a slight improvement in health condition of pine, fir, beech, alder and birch trees. Deterioration of health condition has been observed in spruce trees, especially in southern Poland, and oak trees that have shown signs of poorer health condition throughout the country for the past several years. The poor health condition of spruce trees has remained a problem. The spatial distribution of health condition of trees is highly uniform. In comparative data from 2007, listing European countries according to the proportion of trees falling under defoliation classes 2-4, Poland was identified as a country with an average proportion. In Poland, these proportions were as follows: 20,2% for all species studied, 20,9% for coniferous species and 18,9% for deciduous species.

There are serious concerns as to the protection, management and exploitation of private forests. They are dispersed, often mismanaged and neglected. It is essential to provide sufficient funds to ensure proper supervision over forest management in private forests. They cover an area of 1,6 million ha., i.e. 17,9% of the total forest area in Poland. It has been estimated that the actual area may be even larger by 300 000-400 000 ha, since many plots have not been converted from farmland to forest land. These forests are of lower environmental and economic value when compared to state forests (with few exceptions, e.g. in Carpathians). This poor condition is mainly due to dispersion. The average size of a forest property in a farm is approx. 1,43 ha. The *National Forest Policy* stipulates that in order to improve the condition of private forests, small forest owners should form associations. Collective administration could make the management of private forests more rational. Since its accession to the EU, Poland has missed some opportunities for obtaining European funds for private forests within the framework of *the Rural Development Programme*.

Currently, the basis for afforestation in Poland is the *National Programme for the Augmentation of Forest Cover* (NPAFC), created by the Forest Research Institute, approved by the government in 1995 and updated in 2003. As a result of the modification, the programme has provided for an increase of the formerly accepted afforestation area to 680 000 ha in the years 2001-2020, and has led to a verification of the existing afforestation preferences across the country. Pursuant to the *National Forest Policy*, the main objective of the NPAFC is to increase the country's afforestation to 30% in 2020 and to 33% in 2050 and to provide optimum spatial and temporal afforestation distribution, along with establishing ecological and economic preferences together with completion measures. For the past 13 years, over 200 000 lands of different ownership status have been afforested in the framework of the NPAFC. As for afforestation volumes, the programme objectives have been divided into stages. In the first stage (1995-2000), a total of 111 300 ha of land was afforested, meaning that 111% accomplishment was achieved. The second stage (2001-2005) provided for afforesting 120 000 ha of land. Actually, only 95 400 ha of land was afforested, giving 79,5% accomplishment.

In 2004, a farmland afforestation support system was introduced within the framework of the *Rural Development Plan* (RDP), giving an important incentive for afforestation. With the financial support from the European Union, tens of thousands of hectares of farmland were afforested in the years 2006-2008.

Afforestation courses for land owners have also for the years 2004-2006 been introduced at a large scale. All RDP activities are financed in 80% from EU grants and in 20% from own resources. The afforestation plan is based on a scheme prepared by a forestry inspector, i.e. the local PGL LP representative, who is a guarantee of its credibility. Subsidies received do not only provide resources for planting trees, but also for their maintenance for 5 years to follow, along with an afforestation premium to compensate for the loss of income as a result of converting a farmland into a forest land.

However, a large number of premises indicate that the subsequent stages of RDP will not be completed. It is anticipated that the limitations introduced to the *Rural Development Programme for the years 2007-2013* (exclusion of meadows and pastures, as well as Natura 2000 sites, from afforestation, limitation of afforestation volume per 1 beneficiary from 0,5 to 20 ha, considerable acreage reduction for farmlands obtained by PGL LP from Agricultural Property Agency for afforestation, along with an increase in farmland prices) will make the RDP objectives impossible to achieve in the subsequent stages.

In the years 2000-2004, Polish environmental policy was in line with the process of joining the European Union. Forestry law had been adapted to the European legislation before Poland joined the European Union, and in the years 2000-2004, activities were focused on carrying out the accepted programmes, international cooperation and enhancing the significance of forestry for regional development, pursuant to the guidelines of the *EU Forestry Strategy*. In the years 2004-2007, Poland presided over the *Ministerial Conference on the Protection of Forests in Europe* and hosted the 5th ministerial conference. MCPFE is an initiative of cooperation at a high political level in order to ensure the possibility of taking collective actions for forest protection and maintaining sustainable forest management in Europe. The conference involves 46 European countries and the European Community. Furthermore, the conference is watched by international government and non-government institutions and organizations and non-European countries. With the implementation of the EU law in 2004, a Bureau of Forest Seed Production was created and the *National Register of Forest Base Material* was introduced for the territory of Poland. Unique for Europe, a mycorrhized seedling production is widely being practiced. In the past 4 years, 200 million seedlings of trees and shrubs have been planted. Within the *Forest Gene Preservation Programme and the Cultivating of the Selective Forest Tree Species in Poland*, activities are taken aimed at protecting endangered and rare species, including yew and wild service tree. Within the *Progeny Testing Programme*, the first test cultures of beech were created. In the years 2005-2007, within the EU programme *Food Sector Restructuring and Modernisation of Food Sector and Rural Development*, actions were taken in order to restore forest production potential that had been damaged through a natural disaster or fire. Owners and administrators of forests damaged as a result of natural disasters or fire may claim support from the European Union for restoring the forests. In 2005, the first edition of *Plant Your Tree* competition was launched. It is aimed at promoting afforestation, mainly in rural areas and small towns.

At present, Poland is committed to carrying out the provisions of the *National Environmental Policy for 2003-2006 including Perspectives forYyears 2007- 2010,* adopted by the Parliament. The forest

management policy carried out in Poland is also consistent with worldwide forestry trends, as described in *Forestry Rules* (UNCED 1992). All forest owners are obliged to promote sustainable forest management, as described in the Forest Act (1991). PGL LP's forest policy is based on the principles of general forest protection, long-term maintenance, continual and sustainable use of all forest functions and afforestation. The above statement is supported by the *Good Forest Management Certificate* that was awarded to most forests under PGL LP management. The certificate is awarded by certification organizations, acting according to the standards of Forest Stevardship Council and SmartWood (e.g. Societe Generale de Surveillance, Nepcon). The certificate bears on the fact that forests in PGL LP are managed in a way that makes it possible for them to continually fulfil their productive, environmental and social function. The certificate is also a guarantee for customers that wood they purchase is manufactured in an environmentally friendly way, according to up-to-date requirements of the sustainable development.

3. Agriculture

When compared to other European countries, Polish agriculture and rural area development are of great social and economic significance, although, the share of agriculture in GDP is substantially low (2,6%). Over 38% of Polish population lives in rural areas. There are regions where farming is the main industry, affecting the quality and standard of living. Polish agriculture has preserved its traditional model, with many regions still using multidirectional extensive farming methods. This is largely due to the natural environment as well as historical and cultural factors. Agriculture in Poland has a great potential despite the fact that climatic and soil conditions here are less favourable than in most European countries. In 2008, 16,3 million ha of land was used as farmland, i.e. 52,2% of the total area of the country. Polish agriculture is distinguishable by high dispersion, large labour force, medium and poor quality soil, relatively low use of industrial means of production. The rural population in Poland is not as well educated as in other EU countries. Nevertheless, Poland is a recognized producer of a number of farming, gardening and animal products.

It is a serious and pressing problem to adapt Polish farms to the EU standards for environmental protection, as well as hygiene and wellbeing of animals. According to sociological research, these areas lag behind as a result of poor economic conditions, along with the lack of proper education and vocational training. Only some 30% of farmers are aware of potential negative effects that farming may have on the environment. It is especially costly to modernize production facilities, provide new technical equipment, proper sanitary conditions in dairy production, meat production, vegetable and fruit processing, etc. The present mineral fertilization level (approx. 93 kg of NPK) and the use of chemical plant protection products in Poland are regarded as moderate. Such use of chemicals does not have any negative effects on the quality of arable lands and products. From this point of view, this model of production is environmentally friendly. New challenges related to environmental care are described in *Code of Good Farming Practice* that specifies environmentally-friendly methods of farming.

Poland owes its reach biodiversity to favourable natural conditions, as well as different anthropogenic influences (uneven industrialization and urbanization, traditionally extensive farming, large and durable forests preserved in many areas) when compared to other European countries. As a result of maintaining the traditional, extensive methods of farming, certain local varieties of plants and animals have been preserved.

Poland is capable of producing quality food, demand for which will grow both among the EU and Polish consumers. Environmental advantages of rural areas, together with large labour force, create excellent conditions for ecological farming. For a long time, ecological farms that pursue the idea of environmental protection have been marginally represented (0,03% of the total farmland area). The number of ecological farms began to soar in 1999, with the introduction of subsidies and legal measures (the first act on ecological farming passed by the Parliament in 2001), especially the new act on ecological farming as of 2004. The act regulates, among other things, the conditions for farming production and food processing with the use of ecological methods, and specifies the system of control and certification, along with requirements for ecological product circulation and marking. In 2005, a total of 7 128 farms were registered in the ecological farming control and certification system, with 11 887 farms (certified and still in the process of shifting production) registered in 2007.

The protection of biodiversity and its sustainable use is ensured by introducing agro-environmental schemes. They are based on the *Rural Development Programme*. They were introduced in the previous programming period (2004-2006) and are being implemented in this programming period (2007-2013). The main objective of agro-environmental schemes is to achieve sustainable development in rural areas and to preserve biodiversity in these areas through promoting farming production that is using methods based on environmental protection principles. Agro-environmental schemes are used to subsidize farms that are run ecologically and meet the *Rural Development Programme* standards. The subsidies are also intended to reimburse costs or compensate for financial losses incurred as a result of converting the production model. The activities that are supported have been expressed in the following nine so-called agro-environmental packages:

- Package 1. Sustainable agriculture;
- Package 2. Ecological agriculture;
- Package 3. Extensive permanent grasslands;
- Package 4. Protection of endangered bird species and habitats outside Natura 2000;
- Package 5. Protection of endangered bird species and habitats within Natura 2000;
- Package 5. Protection of local varieties of cultivated plants;
- Package 7. Protection of local breeds of household animals;
- Package 8. Protection of soil and water;;

- Package 9. Buffer zones.

Subsidies from agro-environmental packages are granted to actions aimed at preserving biological diversity both in protected areas and beyond such areas. Additionally, such actions are to reduce hazardous pollutants disposed into the environment and to limit their effects by creating buffer zones. Thus, the formally approved and practically implemented idea of agro-environmental schemes provides a substantially broad approach to issues related to environmental protection and biological diversity in agriculture and with the introduction of the minimum participation period of 5 years and the involvement of whole farms only, the programmes may bring long-term results. Farmers show great interest in agro-environmental schemes, with this fact being reflected by a number of 600 000 applications filed for participation in the programme in the previous programming period and a constantly growing number of ecological farms in Poland. In the years 2004-2007, their number increased approximately 5 times. The number of ecological processing plants doubled in the same period (207 in 2007).

Another instrument used to improve biological diversity in rural areas is the so-called single payment. It is introduced gradually and intended to replace the so-called direct payments. Obtaining the single payment requires, among other things, meeting several ecological criteria. The first criterion was introduced in early 2009 and it requires the farmland to be maintained in the so-called *Good Farming Conditions*, according to environmental protection requirements. In particular, these requirements include:

- wild bird protection,
- groundwater protection from contamination with dangerous substances,
- conditions of using sludge in farming,
- water protection from nitrates of agricultural origin,
- wild fauna and flora protection.

Among initiatives that improve the ecology of Polish agriculture one deserves particular attention for its innovative character: IRENE project that is based on the postulations of the *Strategy of Multifunctional Development of Rural Areas*. Its key objective is to create conditions for development in rural areas as based on ecological farming through development and implementing a new model of cooperation between partners that are interested in such activity. Possible solutions are to be implemented in test areas, including Brodnicki Park Krajobrazowy (Brodnica Landscape Park) where the so-called Ecological and Multifunctional Agriculture Competence Centre is located. Furthermore, the project has led to organizing information and training events that promote the idea and methods of producing healthy food.

The most important of all documents that had formed the basis of agricultural policy during the four years before Poland joined the European Union was the *Coherent Structural Policy for Rural Areas and*

Agriculture Development (1999). It specifies the following objectives of the rural area sustainable development policy.

- creating conditions for the sustainable development in rural areas, protecting environmental resources together with the rural cultural heritage (including the promotion of ecological farming and other pro-ecological methods of agricultural production, along with bringing marginal lands into cultivation);
- shaping working and living conditions for rural communities according to contemporary living standards so that people living in such communities can achieve their goals;
- reorganizing the agriculture in order to create conditions for adapting it to the changing economic an social situation.

Today, such policy forms the basis for formulating further development strategies for Polish agriculture and rural areas, as well as for dealing with the present financial period in the European Union in the years 2007-2013. The above shows determination with which Poland has been making efforts since early 1990s to continue the process of modernizing its agriculture, without detriment to its cultural heritage and environmental advantages. These are the attributes that will make Polish agriculture and products stand out in the competitive market economy of the European Union.

Along with the development of the principles of reorganization and strategic documentation for rural areas in Poland, worked-out by the Ministry of Agriculture and Rural Development, the issues related to this sector of the economy and its impact on the environment have been addressed throughout the whole revision process of the environmental law in Poland. This process became a part of the general process of adjusting Polish law to the EU legislation. The objectives of the sustainable development for the country, applicable also to agriculture, were expressed in the *II National Environmental Policy* (2001) and *National Environmental Policy for Years 2003-2006 including Perspectives for Years 2007-2010* (2003). The use of good management practices and environment management systems has been deemed a priority in order to be able to merge ecological benefits with the economic ones. It was also accepted that protecting biological and landscape diversity in rural areas plays the key role in ensuring ecological security of the country.

Poland's accession to the European Union had a great impact on setting out strategic goals. The main programming document was the *National Development Plan 2004-2006* that defined the development strategy for the social and economic development of Poland in the first years after joining the European Union. This document formed the basis for the development of the *Sectoral Operational Programme – Restructuring and Modernisation of Food Sector and Rural Development*. The *Rural Development Plan* for the years 2004-2006 was also created and it formed the basis for farming subsidies from the Common Agricultural Policy fund.

In 2007, a new document was launched: *National Strategic Reference Framework (National Cohesione Strategy) for the Years 2007-2013*. It ascribed the key role to agriculture and rural areas. The *NDP (2007-*

2013) with its 16 regional programmes provides for support for rural areas from the European Regional Development Fund and the European Social Fund. The *Rural Development Programme for the Years 2007-2013* was among the first programmes and it was launched in September 2007. It was financed from the European Agricultural Fund for Rural Development and based on experience gained from the *Rural Development Plan for the Years 2004-2006* and *Sectoral Operational Programme – Restructuring and Modernization of Food Sector and Rural Development for the Years 2004-2006.* The activities to be undertaken include: support for farms in mountain areas and other less favoured areas, along with afforestation of farmlands and other types of land. The budget of the programme amounts to 17 billion euros.

The Rural Development Programme was preceded by the *Rural and Agriculture Development Strategy for the Years 2007-2013* (with a forecast up till 2020). The document assumes that in 2007-2013 Poland will follow the model of multifunctional rural development. The process of sustainable development in rural areas will be supported through diversifying activities in order to provide alternative sources of income, adjusting farming production to the environmental requirements and without detriment to the landscape. It will also be important to improve the social and technical infrastructure in rural areas. Selected food processing industry branches will be strengthened and support will be provided for plant modernization investments, in particular those that will be aimed at meeting environmental standards and requirements. Support will also be provided for activities aimed at marketing and promoting farming products. Also, supporting traditional and regional products will be another priority.

4. Fishery

Poland's geographical location and its environmental specificity are the main factors that explain why its fisheries concentrate around the Baltic region and inland waters. Additionally, very important are fish cultures.

The main species fished in the Baltic Sea include: cod, salmon, herring, sprat, flounder and bull trout. In 2006, Poland fished 104 900 tons, i.e. 19 400 tons less than in 2005 (124 300 tons) and 48 900 tons less than in 2004 (153 800 tons).

For Polish fishermen cod is the most precious species from the economic point of view. Its catch in 2006 amounted to 15 000 tones, i.e. 3 000 tons more than in 2005. Nevertheless, due to overfishing in most fishing grounds, no increase in fishing quotas nor improvement in the biomass of the species can be expected in the years to come. With the introduction of small catch limits, some fishermen have been forced to shift to fishing flounder. For the past several years, sprat catches have tended to decrease. In 2006, they amounted to 56 200 tons, with 74 300 tons in 2005 and 96 700 tons in 2004. This drop resulted from the withdrawal of a part of the pelagic fleet, along with low prices offered by fodder manufacturers. In comparison with the previous years, herring catch has also decreased. In 2006, the catch amounted to 20 600 tons, with 21 800 tons in 2005 and 28 400 tons in 2004. Another catch drop has been observed for bull trout (180 000 fish in 2004, 142 000 fish in 2005 and 128 000 fish in 2006).

The only species that has been providing unchanged catch volume since 2005 is salmon (approx. 20 000 fish a year).

With a substantial overexploitation of the fish resources, catch limits have been introduced for individual species. For the past several years, they have been used as follows:

- sprat: 2003 – 104,9%, 2004 – 81,7%, 2005 – 52,6%, 2006 – 48,6%;
- herring: 2003 – 105,0%, 2004 – 88,3%, 2005 – 64,5%, 2006 – 57,1%;
- cod: 2003 – 100,7%, 2004 – 103,6%, 2005 – 97,6%, 2006 – 99,9%;
- salmon: 2003 – 83,0%, 2004 – 88,1%, 2005 – 77,4%, 2006 – 70,5%.

With the introduction of catch limits, some fishermen have been forced to shift their business to tourist services and sea angling.

The area of inland waters (natural and artificial) in Poland amounts to approximately 600 000 ha: approx. 300 000 ha of lakes, 139 000 ha of rivers and streams, 55 000 ha of dam reservoirs (larger than 20 ha), 40 000 ha of marshes and old-river beds. For the past several years, the share of inland fisheries in overall food production has dropped, although this type of business has had a growing impact on the rationality of water resource management in order to protect the biological diversity, preserve fish resources for future generations. The scope of activities has also been diversified, mainly due to a growing interest in tourism and angling. In Polish legislation, entities entitled to be involved in fishing are obliged to ensure rational fishing management in surface waters. The management should allow for the maintenance of fish resources in biological balance and at a level that will enable future generations to use them effectively. In 2006, approximately 2 870 tons of fish were obtained commercially from surface waters, and 2006 was another year of reduced catch volume in by fishermen. The average commercial catch volume in fisheries is decreasing every year. In the case of inland fishing, recreational fishing is becoming increasingly popular. It has been estimated that in 2006, a total 15 000 tons of fish was obtained as a result of angling. In Poland, almost 1 500 000 people engage in sport fishing. The rules of recreational fishing are regulated by the Act of 18 April 1985 on Inland Fishing. Pursuant to this act, fishing territories are organized in fishing districts. Strategic for these districts are documents known as fishing management plans. They are drawn-up for a period of 10 years and apart from the principles of rational fishery management, they specify the rules of recreational fishing. They establish protection periods, areas and sizes for individual species, permitted methods of fishing and the allowed number of specimens of each species to be fished by an individual angler. Owing to these regulations, it is possible to maintain ecological balance in water ecosystems, maintaining a pre-defined population of the most precious species. Of great importance is also the fact that any individual interested in pursuing recreational fishing is obliged to obtain the so-called fishing licence. To receive one, it is necessary to become familiar with legal regulations and the basics of water ecology. This requirement helps to build better environmental awareness among anglers. There are several institutions that ensure the

observance of the regulations contained in the Act on Inland Fishery, regulations of fishing districts, and verify the possession of relevant permits. These institutions include: National Fishing Guard, Public Fishing Guard of the Polish Fishing Association, Police, Property Protection Guard of the Polish Fishing Association, National Hunting Guard and guard services from national parks and landscape parks. Apart from issuing fishing permits, fishing districts and the Polish Fishing Association are responsible for stocking. Stocking is aimed at maintaining and improving the ecological condition of water ecosystems. It is scheduled in fishing management plans. Waters are stocked mainly with native species that are adequate for a given habitat. To be able to introduce species that do not occur in Poland, it is necessary to obtain a permit from the ministry of agriculture, issued in consultation with the ministry of the environment upon the opinion from the State Council for Nature Conservation. Thus, the introduction of new species is strictly controlled. It should be emphasized that stocking is scheduled based on research results, under the supervision of ichthyology specialists. The process is constantly monitored and evaluated. This is possible through marking of the fry and collecting information from anglers on occurrence areas and condition of individual specimens. With the activity of fishing districts and the Polish Fishing Association, angling is becoming increasingly sustainable, focusing not only on using the existing resources, but also on maintaining them in good condition.

Poland is engaged in nursery-based culture of fresh-water species. With regard to fish species and breeding methods, two types of activity can be distinguished: nursery-based culture of fresh-, warm-water fish and fresh-, cold-water fish. Out of 70 000 ha of estimated nursery area, only some 50 000 ha is in use (70%). It is estimated that there are approximately 600 fish farms that offer their products for sale. Among these, approx. 400 farms have fish nurseries of more than 50 ha in total area. Most of them specialize in carp production based on in-ground nurseries that use natural resources. Such production is of extensive type. In-ground carp nurseries are an important and precious element of the traditional rural landscape and national biodiversity protection systems. In Poland, in-ground fish nurseries have an additional function: they retain surface waters and provide habitats for legally protected plants and animals. In fact, in some parts of the country, Natura 2000 sites were pointed out by locating large areas of in-ground carp nurseries that provided habitation for numerous rare and precious plants and animals. The other type of fish breeding is focused on fresh-, cold-water species, primarily rainbow trout. A vast majority of trout farms are located in northern and southern regions of Poland, in areas abundant in clean and cool rivers and streams. Salmonoid fish cultures use intensive breeding methods, based on new-generation granulated fodder and equipment to improve the breeding conditions in concrete nurseries. Fish cultures of species other than carp and rainbow trout are estimated to provide the production of 2 000 tons annually. Sturgeon, African catfish and native crayfish cultures are becoming increasingly popular.

More and more farms undertake tourist services, taking advantage of attractive locations of their nurseries, availability of fish, rich flora and fauna in the vicinity of their nurseries and a growing demand for recreational fishing and leisure activities in areas of high natural values.

The basic documents that determine the direction of fishery development are as follows: The *Fisheries Development Strategy 2000-2006* with its continuation and extension described in the *Fisheries Development Strategy 2007-2013*. The above documents define the key objectives, including:

- obtaining and maintaining a durable balance between resources and fishing capacities, providing social and economic protection for employees in the fishing industry and undertaking actions aimed at improving the competitiveness of fisheries in close connection with the condition of available resources;
- providing conditions for the sustainable development in inland aquacultures and fisheries, an increase in fresh-water fish production, an improvement in the profitability of fish cultures, an improvement in the competitiveness of aquaculture products and stabilization of employment in the industry, along with the continuation of the development by improving standards and ensuring employment stability in the fish processing industry;
- providing support for activities aimed at building stationary and movable facilities intended for protection and development of water flora and fauna or restoring inland and sea waters, including sprawling areas and migration routes of migrating species (e.g. creating fish passages and artificial reefs);
- providing support for activities aimed at preserving biodiversity and restitution of precious and protected species.

The above objectives are coherent with the basic principles of the *Common Fishery Policy* of the European Union and national programming documents and relevant legal instruments. They are being carried out with the help of the European Fisheries Fund and state subsidies.

The basis for carrying out the *National Strategy for Fisheries Development for 2007-2013* and, consequently, the means of providing support for Polish fisheries sector in the years 2007-2013 as per the Operational Programme of *Sustainable Development of the Fisheries Sector and Coastal Fishing Areas 2007-2013*, is the *Framework of the Sustainable Development of Polish Fisheries Sector*. It provides for a support for the common fisheries policy in order to optimize the production potential of living sea resources so that they can be used by future generations, with simultaneous support for actions aimed at providing a durable balance between resources and catch capacity of the national fleet. The framework was created as a result of an obligation, undertaken by Poland and other member states of the Community at Johannesburg Sustainable Development Summit (September 2002), to maintain or recover resources so as to ensure the highest maintainable catch, with the simultaneous maintenance of the resource balance in seas. It is also essential to provide support for aquaculture in order to ensure economic, environmental and social continuity, support for the sustainable development of inland fisheries and support for activities aimed at protecting and improving the condition of the environment and natural resources in the fisheries sector.

5. Tourism

Interactions between tourism and natural environment are characterized by feedback. On the one hand, tourism, being the recipient of natural environment, makes use of its resources. These resources are often the essence of the tourism product, at the same time delineating its attractiveness and value. On the other hand, however, tourism, apart from other fields of business activity, can lead to environmental degradation and destabilize the functions of its resources and, at the same time, disturb their use in the process of creating and offering the tourism product. It is estimated that in Poland tourism contributes to degradation of natural environment by 5-7%, while industry - by 60% and agriculture - by 15%. The threat posed by tourism is growing in the most popular tourist destinations, in regions where the number of people coming to have a rest is very high, in situations when the stipulated limits of permitted tourist traffic are not respected. The areas that are especially threatened by this type of degradation include Baltic Sea Coast, Masurian Lake District, the Tatra Mountains and the Karkonosze Mountains.

From the socio-economic point of view, positive sides of tourism development includes also advantages, arising mainly from stimulating the resourcefulness of city-dwellers for receptive areas, which benefit from a range of services provided for tourists.

In the past few years the interest of nature-oriented tourism has visibly been gaining ground in Poland. This happens due to the fact that natural richness of national and landscape parks is presented in an even more attractive form, mainly because these parks develop tourism infrastructure, as much as they can, by erecting museums and natural exhibits, didactical paths, nature-oriented routes and information spots. Among the different types of professional tourism there is one type growing particularly fast, namely leisure activities combined with ornithological observations in national parks, mainly in Biebrza National Park and the Ujście Warty National Park.

Apart from nature-oriented tourism, developing mainly on protected areas, there are other environment-friendly tourism alternatives, so-called ecotourism and agrotourism. In the past few years a dynamic expansion of the above mentioned tourism alternatives could be observed. The number of agrotouristic holdings increased from 590 in 1990, 4800 in 1997, to almost 8000 today. The biggest number of agrotouristic accommodation places can be found in the Małopolskie Voivodeship (1220) and in the Podkarpackie Voivodeship (1060). The foundation of numerous organizations and associations to promote ecological tourism is another tangible effect that this kind of tourism is developing in Poland. Most active ones include:

- The Polish Chamber of Agrotourism – founded in 2003; it is a voluntary association of businesses providing services in agrotourism, farmers and entrepreneurs conducting processing operations or pursuing a business activity, whose objective is to create new jobs in agrotourism;
- The European Centre for Ecological Agriculture and Tourism (ECEAT-Polska) – an association founded in 1994, mainly in order to promote development and recreation in ecological holdings;

- The Polish Federation of Rural Tourism "Hospitable Farms" – an organization founded in 1995, bringing together regional agrotourism associations to promote the development of nature-oriented tourism in rural areas.

In June 2005 the Council of Ministers adopted the draft *Strategy for Tourism Development 2007-2013* and on the 26 of September 2008 the document called *The Direction of Tourism Development till 2015*. The main assumption made in the documents was that tourism is a sector closely linked to many development processes and as such should be shaped in compliance with other socio-economic national growth objectives. In the above mentioned documents the focus is not only placed on coherence on pursued activities but also on the existing synergy effect between tourism and natural environment, culture and social development. In accordance with the adopted guidelines, by making Poland a country attractive to tourists living both inside and outside the country, tourism should become an important tool used to spur socio-economic development of Polish regions.

Sustainable tourism development strategies are documents that describe environmentally friendly tourism on the regional and local level. The strategies are developed for some voivodeships, poviats, gminas and selected cities. Directions of tourism development and activities taken in this respect, usually within 8 to 10 years, are determined on the basis of results presented in the local conditions' diagnosis.

On the macroeconomic scale the implementation of the documents above unambiguously merge with the implementation of the European Union strategic objectives enumerated in the reviewed *Lisbon Strategy*, as well as with the implementation of the priorities set in the *National Development Strategy 2007-2015*, the strategic objectives of the *National Cohesion Strategy 2007-2013* and the priorities set in the *National Reform Program for 2005-2008*.

The measures related to the development of nature-oriented tourism and agrotourism are subsidized within the framework of a number of programmes such as, for example, the *Rural Development Program 2007-2013*, *Operational Program 'Development of Eastern Poland'* or other regional operational programs. Out of several dozen projects implemented in the past few years by means of different type of funding the following projects should be mentioned:

- The Network of Sustainable Tourism Development in the Baltic Sea Region (AGORA) – a project whose major objective was to develop a marketing concept for sustainable tourism and a mechanism, and specific ways, of cooperating in partnership in order to create and promote products;
- "Sustainable tourism development – tourism and protection of the natural environment" - a project implemented in cooperation with the Kaliningrad Oblast (Russia) and aimed at supporting the achievement of sustainable tourism development with respect for the natural environment on Polish-Russian border areas;

- "Ecological tourism in ecological holdings" – a project implemented to support the development of ecological tourism in small agricultural holdings;
- Ecotourism without borders – a project promoting the natural and cultural riches of ecological tourism in the border region between Chełm – Kowel (Ukraine);
- Agrotourism a chance to revitalize and improve the economic situation of farming families in Lower Silesia – within the framework of this project a series of trainings and individual advisory consultations were conducted, which were to help farmers to set up and run an agrotourism holding.