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**Environmental, agricultural and forest policies integration
for sustainable agriculture**

Abstract

The present-day *environmental policy* is not able to prevent environmental stress and it must be viewed more comprehensively. Not only does it deal with the protection of the natural environment, but also with the utilisation of the environment and its natural resources in an ecologically sensitive, resource-preserving fashion. Due to this view, modern environmental policy should be a central policy area aimed at the realisation of sustainable development - a goal that attempts to reconcile economic, social and ecological aspects of human action.

International agreements concerning environmental protection, which, if they have been signed and ratified by Ukraine, have to be integrated into the international legislation. Moreover, the environmental protection directives of the European Union (EU) will be relevant to Ukraine in the future, since the ties to Western Europe are being intensified and, consequently, the pressure increases to conform to the standards of environmental protection held there (e.g., regarding export of agricultural products).

Those who currently hold leading positions in Ukrainian state agencies with environmentally oriented responsibilities (including agricultural sector) for the most part acquired their qualifications and work experience under the old soviet regime. They are not trained in modern approaches and instruments of the environmental policy in market conditions. What seems to be lacking are the modern economic instruments of the environmental policy based on the theory of environmental economics, the knowledge about the system of the environmental management of the enterprises, the tools of eco-audit, eco-certification, eco-labeling, green marketing.

New sustainable agriculture requires new coordinated governmental *agricultural policies*. The government must take the lead on the long-term multidisciplinary studies that create a greater understanding of the interlocking part of agricultural systems and that further creation of profitable, sustainable, environmentally sound farms. The government is also a key player in developing new technologies. Long term interdisciplinary research can not be done without government funding and encouragement. Additionally like research a new extension agenda must be adopted to support a transition to sustainable agriculture.

Under the existing marketing system, prices for agricultural products do not reflect their full costs. The government has a role to play in helping farmers control and eliminate the environmental damage agriculture can cause. Finally agricultural policy providing consumers with the knowledge an opportunity to make informed choices about the food they buy.

The improvement of environmental situation in rural areas and ecological stability of agricultural landscapes is impossible without effective usage of the *forest policy* instruments. The present socio-economic situation demands a new approach to the creation and realization of afforestation programs on low productivity agricultural lands

Introduction

Ukraine is moving towards integration into Europe by developing its national economy, creating a social system and coping with ecological crisis. Reforms are under way to aid Ukrainian's transformation from a planned economy system to a market economy. These reforms will generally have a direct impact on the growth of the different sectors of the economy as well as on the environment. Country is being confronted with a number of problems, including in particular an inefficient bureaucracy, unproductive and wasteful concerns, and tremendous environmental damages.

Agriculture and forestry are cultural and ecological phenomena which is essential to human survival. A number of nations are developing approaches to the production of farm and forest resources which rely less on industrial processes and more on ecological principles. In Ukraine both sectors are playing crucial role in achieving sustainability.

State of agriculture, forestry and environment

Ukraine has a large agricultural potential. Agriculture represents almost 18% of GDP and even a greater share of country's total employment . It has an important social function, since the rural population (which makes up approximately 30% of Ukraine's total population) almost entirely depends on it. In 1999 agricultural sector shrank to less than a half of it's 1990 size. Success of agricultural reforms is mainly determined by government ability to develop and implement a sound reform strategy (Bostyn, Boytsun, 2001). The main figures that shows the dynamics of agricultural sector have been placed in table 1.

In much of Central and Eastern Europe under former regimes there was a trend to increase fertilizer, pesticides and machinery use in arable cropping, and to concentrate livestock production in intensive units. Across much of the region, the landscape has been considerably saltered and simplified by collective farms. Soil erosion, salinization and contamination, groundwater pollution, mismanagement of water resources, pollution from vast, intensive livestock units and contamination through through pesticides and nuclear radiation have been widespread (Dixon, 1997). As our researches in Western Ukraine (1987-1991) show the influence of agricultural intensification (simplification of rural landscapes, so called "melioration" of bugs, usage of heavy machinery, intensive use of pesticides and fertilizers) had considerable influence on fauna of agricultural areas.

The former kolkhozes and sovkhoses have changed since independence. The number of new entities are given in table 2. Reorganized agricultural entities occupy 99,8 of agricultural land area. This diversification of agricultural entities is a new challenge for nature protection activity in rural areas.

Table 1

Number aft agricultural entities, 2001

Non-reorganized agricultural entities		26
New agricultural entities, divided into;		16205
Private companies	3277	
Limited liability companies	6641	
Joint stick companies	770	
Agricultural cooperatives	2845	
Private (family) farms	1765	
Other entities	905	
Private farms NOT registered as legal entities		228001
Total		244232

Source: State Statistical Committee

Agriculture in Ukraine is the most nature-intensive branch of the economy. It includes 41.84 million ha of agricultural lands (69.3% of the territory of Ukraine), including 33.19 million ha of arable land (55%), and 7.63 million ha of natural fodder lands - hayfields and pastures (12.6%). While Ukraine occupies 5.7% of the territory of Europe, its agricultural lands occupies 18.9% and arable lands - 26.9%. Agriculture consumes annually over 10.9 billion cubic meters of water, being 36.4% of total water consumption. There are 0.82 ha of agricultural land per one inhabitant, including 0.65 ha of arable land, while in Europe these indicators are 0.44 and 0.25 ha. On average, some 72% of agricultural land is ploughed, and in some regions it exceeds 90%. Marginal productivity lands, including river shore meadows and pastures, and hilly lands, have been placed under cultivation. These features caused the conflicts between agriculture and the environment, determined the high level the territory usage, low level of agricultural production efficiency, soil layer intensive degradation, and radical reduction in biodiversity.

Last years same positive trends also observed. As one of the follow-up to the Concept (National Strategy) of Biodiversity Conservation in Ukraine (1997), Pan-European Biological and Landscape Diversity Strategy as well as Law of Ukraine "On the state Program of Development of National Ecological Network for the Years 2000-2015" has been approved by the Parliament of Ukraine (2000). The principal objective of this Program is to increase the area of lands in the country under natural landscapes to a level sufficient for the preservation

of their diversity close to their initial natural conditions and development of their territorially integrated system built to ensure possibility of using natural ways of the migration and propagation of plant and animal species which would ensure preservation of natural ecosystems, species and population of the flora and fauna. It was foreseen that National Eco-Net should meet the requirements to the operation thereof within the Pan-European Eco-Net and perform the leading functions in respect of the preservation of biodiversity (Movchan, 2002).

It is difficult to overestimate the role of forests in the national economy, social and cultural life. Ukraine still remains a country with low forest cover where the forest cover (Forested Areas) is 15.6 % of the total land area. About 13 million cubic meters of timber is harvested annually, including 45% from the final harvest that are not enough to meet domestic demand. About 60 percent of finished wood products has been used internally, 30 percent has gone to other parts of the FSU, and 10 percent to foreign export. Seventy percent of timber produced from final harvest comes as logs. Taking into account the high deficit of forest resources in Ukraine, the forest industry widely utilized timber waste and non-timber forest products that comprises about 30% of harvested timber value (Nilsson, Shvidenko, 1999).

At the same time, because of insufficient wooded areas and developed metallurgy industry, energetic, Ukraine belongs to those countries, which burns high amount of oxygen on the planet. The capacity of our forest is only 40% of what is needed for utilization CO₂ and air oxidation.

As Ukraine is agro-industrial country with low percentage of forest cover, protective afforestation is extremely important here. The whole estimated of land suitable for afforestation is 1.030.000ha. According the government decision No 189 from February 28, 2001 it is decided to create 29.500 ha of forest stands against erosion on marginal productivity agricultural lands in 2001-2005. In the current economic conditions exist growing difficulties in long-term state subsidies for afforestation.

In the post-war years, it was allowed to exceed the rated cutting area 1.5-2.0 times, which caused changes in the age structure of forests, and less productive timber. Nowadays harvest are regulated so as not to exceed growth. The main data about forest use and restoration presented in the table 3.

The current ecological state of forests is conditioned by the level and intensity of anthropogenic influence as well as by the growing technogenic load which impair the natural stability and environment formative functions of forest ecosystems.

Institutional frameworks

Environmental policy was initiated in Ukraine when economic and politic reforms were launched in the country in 1991. The main objectives of the environmental policy in Ukraine are to provide people with a healthy environment, and to promote economic development without causing damage to nature. Ukraine's environmental action plan is laid out in a document entitled "Principal Directions of Ukraine's State Policy on Environmental Protection, Use of Natural Resources, and Ensuring Environmental Safety" adopted by the Verkhovna Rada of Ukraine on March 5, 1998. This document contents separate chapters "Agriculture", "Flora and Forest Resources".

The Ministry of Environment and Natural Resources of Ukraine (MENR) plays a leading role in environmental management in the country, both in national and local levels. The administrative reforms initiated in 1999 have granted greater authority to the MEHR in developing policy and undertaking regulatory changes necessary for policy implementation. The MEHR has a broad range of statutorily-defined responsibilities, which make it a primary agent in environmental legislation enforcement and regulation (Policy Studies, March 2000). Since Ukraine declared its independence it has slowly begun reforms to move towards a market oriented civil society based on democratic principles. At present, about 200 environmental organizations (national and local) are registered in Ukraine. The top of their activity was in the beginnings of 1990th. Now the environmental movement is more professional but not so massive as popular in society in comparison with West European countries.

There are some difficulties in creating fruitful cooperation among NGOs. Lack of clear governmental policy and support for NGOs does not create good circumstances for this process. It is difficult for environmental NGOs to become fully accepted by state organizations and companies as a factor in improving the serious environmental situation.

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NGOs and the authorities have hardly any experience in constructive cooperation with one another. In order to influence environmental policy, NGOs have to have a better understanding of the functioning of the authorities. NGOs can seriously support the authorities in the implementation of environmental measures and mobilization of citizen actions to improve the environment. But they should propose their own strategies and solutions for environmental problems.

There are four policy-making bodies for *agricultural policy*. The President and the Presidential Administration, the Cabinet of Ministers of Ukraine, the Ministry of Agrarian Policy and the agricultural committee Ministry of Agrarian Policy of Verkhovna Rada. Oblasts and rayons have little legislative power, but they do have power while implementing agricultural policy. Furthermore agriculture is also influenced by general policies, such as the tax policy. According to the external evaluation the agricultural policy in Ukraine is not very transparent, because on national level there are different policy-making institutions that do not cooperate very well with each other (Meijel, 2002).

The Ministry of Agrarian Policy is involved in state environmental monitoring procedures, particularly soil pollution monitoring, biological resources monitoring. The Ministry maintains 900 monitoring posts for detecting pesticides and fertilizer pollution. It also monitors animals and plants for the impacts of pesticides, fertilizers, and heavy metals.

The Ministry of Economy and Regional (Local) Governments supervises rural development. The Government has created and adopted the National Programme of Development of Agricultural and Industrial Production and Rural Development for the period of 1996 to 2005; and the Programme of Development of Land Use.

The State Committee of City Building and Architecture, the Ministry of Agrarian Policy, the State Committee of Land Resources, and the Ministry of Environment and Natural Resources supervise the planning and management of land resources. The Government has developed and started to implement the Programme (Conception) of Development of Land Use, the State and Regional Programmes of Land Protection from Water and Wind Erosion, and the State Programme of Natural Environment Protection and Rational Use of Natural Resources

The Ukrainian forests are managed by the state authority headed by the State Forestry Committee. The committee manages about 380 enterprises and organizations, among them 294 state forestry enterprises and specialized forest-huntings, 2 national protected parks and 6 nature reserves.

According to the formulation in "Official report of forestry in Ukraine, 2002" development and realization of *forest policy* in Ukraine is based on the data of wood supply and changes in economy. It balances protection of forest ecosystems with sustainable multifunctional management.

Combined influences of the globalization and transitional processes create specific challenges for forest policy in Eastern European countries: adaptation of forestry sector and wood industry to world markets and market economy, controlled change in forest ownership, restructuring of state forest services, conservation and protection of forests using economic instruments of environmental policy in new conditions.

In 1994 the Ukrainian Parliament has adopted the Forest Code of Ukraine which regulates forestry management in new conditions. In 2002 the Parliament has adopted a new Land Code of Ukraine. Nowadays changes cause the necessity to develop a new version of the Forest Code. Actually two alternative versions have been elaborated – prepared by the State Forestry Committee and by a group of scientists in Department of Forest Economics and Management in Ukrainian State University of Forestry (Synyakevich, Soloviy, Melnyk and others, 2002).

In April 2002 the government of Ukraine has adopted the programme Forests of Ukraine for 2002-2015. Realization of this programme extends forest covered territories and other wooded lands to 11,3 mln. ha and percentage of forests cover will increase from 15,6% to 16,1%. This program has positive features but its not lies in the framework of the National Forest Programs (NFP) Process. Within the recent and ongoing global policy processes such as International Panel of Forests (IPF) and International Forum of Forests (IFF) NFPs have been seen as a comprehensive approach and a vital tool with the aim to promote and implement sustainable forest management

As the Ministry of Agrarian Policy the State Forestry Committee is involved in state environmental monitoring procedures. The development of Ukrainian forest ecological monitoring system started in 1989 within the framework of International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests under the aegis of UN European Economic Commission Convention on Long-Range Transboundary Air

Pollution. Today forests of 14 oblasts are monitored. Committee operates 155 monitoring sites to evaluate primary forestry indicators, including deforestation, effects of pesticides, and blights such as disease and insect infection.

Since 1995 forests are monitored under American Programme of Forest Health Monitoring, which is realized cooperatively with USDA Forest Service and Environmental Protection Agency (EPA).

EU experiences of agri-environmental policy

Land use in most Western European countries is often characterized by apparently strong competition between agricultural needs and ecological requirements.

The ecological problems become a challenge for the Common Agricultural Policy (CAP) since establishing by the Roman Treaty in 1957 under went a great evolution to the present form of agricultural and rural policy described by the Agenda 2000. For the first time in 1975 the CAP proposed included environmental targets for undeveloped areas. The Green Book from 1985 proposed for agricultural policy to take into account environmental policy through pollution controlling and business activity promoting. The key role for integration of environmental policy with the CAP played The Reform of Mac Sharry (1992) – through agricultural environment regulation (2078/92). The environmental targets in CAP found a further strengths in the Maastricht Treaty on the EU.

Still there three main areas of interest for the EU Common Agricultural Policy as far as environment concerned :

- searching for rational input level and its effectiveness without environmental pollution,
- rationalizing of agricultural structure, farm size, production scale, etc. what can have positive impact on rural landscapes and natural environment,
- encouraging agriculture improvement in undeveloped areas with marginal lands too keep rural population in the country (Adamowicz, 2001).

Ukraine has the richest and most fertile land in Europe. Country has high potential for agriculture development, but in comparison with EU countries Ukrainian's economy is not so strong. Besides of it the experience of CAP couldn't be fully "imported" in Ukrainian agricultural policy, but many regulations of agri-environmental policy can be adopted.

Adoption of the new Land Codex by the Parliament, decisions of the president and government increased the intensity of the process of privatization. Discussing the question of afforestation possibilities we should first of all take into account this specificity of situation. The main question is a how to stimulate the afforestation activity of private landowner.

European Union experience in this field could be used. In European Union countries afforestation of arable land and grassland is furthered in the framework of the Common Agricultural Policy as a long term means to reduce surplus agricultural production. But the reduction of agricultural surplus production was not as high as expected, the first European programmes to further afforestation proved to be insufficient. Experience over recent years has shown that forest established on former agricultural land is often managed for landscape, hunting or biodiversity reasons, not primary for wood production.

According to the expectations of the European Timber Trends Study V area of Europe's «exploitable forests» is expected to grow by just less than 5 million hectares between 1990 and 2020, of which 3,5 million hectares would take place in EU (12)(an increase of 8 %).

Most of the expansions is accounted for by three countries: Spain and France, where forests expansion policies will continue, and Poland, where the area under agriculture is expected to shrink due to the to the transition process. The Polish Programme of Afforestation (KPZL) is now being modified as result of the accession process to European Union, in which the country is involved (Witkowski , 2001). The programme involve: nature conservation (Natura2000), afforestation (KZLP) and agriculture (the agro-environmental programme).

According to Weber (1998) in recent years there has begun important shift in the discussion about afforestation from the agricultural point of view to environmental aspects. Large-scale afforestation is seen as an appropriate instrument to reduce the GHG Carbon Dioxide in the atmosphere. New approaches to improve the afforestation planning by integrating socio-economic and ecological aspects seem to be a promising way.

Steps toward agricultural sustainability

A number of different terms are used to describe sustainable agriculture –alternative, low-input organic, ecological, regenerative and so on. Various definitions have been provided for what constitutes sustainable agriculture, ranging from the narrow focus on economics or production to the incorporation of culture and ecology

For example, the International Alliance for Sustainable Agriculture have developed a definition that unifies many diverse elements into a widely adopted, comprehensive, working definition: *A sustainable agriculture is ecologically sound, economically viable, socially just and humane.* These four goals for sustainability can be applied to all aspects of any agricultural system, from production and marketing to processing and consumption. Rather than dictating what methods can and can not be used, they establish basic standards by which widely divergent agricultural practices and conditions can be evaluated and modified, if necessary to create sustainable systems. The result is an agriculture designed to last and be passed on to future generations.

Sustainable agriculture is not simply return to the past (as some view it), although some of the practices of the past may be resurrected. Such agriculture presents a positive response to the limits and problems of both traditional and modern agriculture. It is neither a return to the past nor an idolatry of the new. Rather, it seeks to take the best aspects of both traditional wisdom and the latest scientific advances. This results in integrated, nature-based agro ecosystems designed to be self-reliant, resource-conserving and productive in both the short and long terms.

Sustainable agricultural systems, over the short and long term:

- a) maintain or enhance environmental quality, wisely use nonrenewable resources and promote the maintenance of renewable resources, including plant and animal species;
- b) provide safe and nutritious food to meet human needs;
- c) enhance the quality of life in rural and urban communities in terms of social, aesthetic, economic and other conditions;
- d) promote economic viability.

Sustainability of agriculture has ecological, economic and social aspects. As producer of renewable resources, farming is a key to achieving sustainability as whole. Development in agriculture must be coordinated with the reform in society in other aspects.

The concrete economic instruments, legislative regulations of the policy towards more sustainable agriculture should be based on evaluation of the agriculture influences on environment and natural resources, which conceptually described on fig.1.

In Ukraine organic farming is supported by individual enthusiasts, who do not have any practical support from the state. Organic research is being done in the National Agrarian University, Institute of Agroecology and Biotechnology, Vinnitsa State Agrarian University and Illinets State Agrarian technical school. Organic farms exist in Western part of Ukraine, in Poltava, Kiev, Vinnitsa and Odessa regions. Their major focus is on crop production - growing corn, sugar beet, sunflower, wheat (Green Dossier,2003).

In many cases organic products are not sailed as such because they are not certified. One of the examples of eco-labeling process development is the national project "Ecologically clear product" founded by the West Ukrainian Society Food Producers, Lviv State Centre of Standardization and Metrology with support of State Inspection of Ecology and Society of Ecological Experts. The project has some positive influence but it has disadvantage because it is not based on network of organic food produced farmers.

According the data of the Center of Innovations and Development 11 of woman's NGOs declared the "ecologically clear agriculture" as priority of their activity. But generally the idea of sustainable agriculture still has not enough interest of society and is not supported by state.

Conclusions

New approach of the policy for sustainable agriculture has to include the following main aspects:

1. Development of the comprehensive government agri-environmental policy which aimed:
 - a) to secure the sustainable profitability of agricultural sector

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- b) development of alternative employment opportunities in rural areas
 - c) preserve and enhance biodiversity and rural landscapes that are rich in natural and cultural values
 - d) to offer the farmers reasonable economic returns for producing of foods that are pure ,i.e., free from contaminants
 - e) help farmers control and eliminate the environmental damage they can cause
 - f) maintain the productive capacity of soils
2. The integration of wide scale afforestation projects with changes in structure of agriculture, and realization of agrarian reform in Ukraine. The elaboration of our own strategy and state program of afforestation which takes into account the following aspects: the need for forest resource, the economic viability the necessity of solving problems in environmental optimization in agricultural landscapes, natural resources protection (both existing natural and semi-natural forests, which will affect water resources, CO₂ in air, etc), and increasing amount of recreational use of landscapes, stronger public involvement.
 3. Maintenance of sustainable land use, taking into account the social interest groups demands, which is necessary to make prognoses and prevent land use conflicts.
 4. The orientation towards international programs, which foresee the integration of socio-economic and environmental aspects drawing attention to the global ecological role of forests. It is necessary to make official political decision about development of the National Forest Program within the ongoing global policy processes such as International Panel of Forests (IPF) and International Forum of Forests (IFF) .

REFERENCES

1. **Adamowicz, M., 2001.** Integration of agricultural and environmental policies as a way for sustainable development of rural areas. Paper presented at the ACE Seminar on Environmental Effects of Transition and Needs for change Central and Eastern European Sustainable Agriculture. September 10-16, 2001 Nitra, Slovakia
2. **Bostyn, F. and Boytsun, A., 2001.** Ukrainian Agriculture needs comprehensive government policy// International Centre for Policy Studies newsletter # 101,19 March 2001
3. **Dixon, J. 1997.** European agriculture: threats and opportunities. In : Farming and birds in Europe : The Common Agricultural Policy for Bird Conservation. Academic Press., San Diego, London, Boston.
4. **Movchan Ya., 2002.** Conserving the biodiversity : challenges of transition (agroaspect). Proceedings of the High-level Pan-European Conference on Agriculture and Biodiversity (Paris, France, 5-6-7 June 2002)
5. **Nilsson, S., Shvidenko, A. 1999.** The Ukrainian Forest Sector in a Global Perspective. Interim Report, IIASA. Austria
6. **Official Report of Forestry in Ukraine, 2002.** Department of science and information of the State Forestry Committee of Ukraine, Kyiv
7. **Pesticide contamination .** Special issues of "EcoWeek" To the 5th Ministerial Conference "Environment for Europe" (Kiev-2003) http://www.dossier.kiev.ua/news_en/news_en.htm
8. **Principal Directions of State Policy of Ukraine in Environmental Protection, Use of Natural Resources, and Ensuring Environmental Safety , 1998.** A main element of Ukraine's National Environmental Action Plan, Kyiv
9. **Synyakovich I, Soloviy I, Melnyk S. and others, 2002.** Forest Act of Ukraine (alternative project)// Derevoobrobnyk, No 1. (in Ukrainian language
10. **Ukraine's Environmental Policy, 2000.** International Centre for Policy Studies newsletter. # 10, March 2000
11. **Van Mejei, S., 2002.** The future of agriculture in Ukraine.- Agricultural Economics and Rural Policy Group.Wagenigen University.
12. **Weber, N., 1998.** Afforestation in Europe: Experiences and Future Possibilities// Carbon Dioxide Mitigation in Forestry and Wood Industry. Berlin, Springer: 153-166
13. **Witkowski J.Y., 2001.** Ochrona przyrody a program zwiekszenia lesistosci Polski. Sylwan. 1 3: 15-25

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Table 1 - Main figures of agricultural sector dynamics

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total agricultural area, th. ha	40030,3	41973,4	41929,5	41890,4	41861,6	41852,9	41839,7	41854,3	41826,5	41829,5	41827,0
Crops areas, th. ha											
cereals	14583	14671	13903	14305	13526	14152	13248	15051	13718	13154	13646
technical crops	3751	3611	3563	3507	3505	3748	3652	3348	3770	4340	4187
potatoes and vegetables	2073	2184	2369	2165	2096	2165	2135	2185	2066	2166	2277
forage plants	11999	11555	11707	11287	11881	10898	11026	9720	9236	8653	7063
Total yield, th. t											
cereals	51009	38674	38537	45623	35497	33930	24571	35472	26471	24581	24459
beet sugar	44265	36168	28783	33717	28138	29650	23009	17663	15523	14064	13199
sunflower seeds	2571	2311	2127	2075	1569	2860	2123	2308	2266	2794	3457
potatoes	16732	14550	20277	21009	16102	14729	18410	16701	15405	12723	19838
vegetables	6666	5932	5310	6055	5142	5880	5070	5168	5492	5324	5821
Average yield, centner/ha											
cereals	35,1	26,5	27,9	32,1	26,8	24,3	19,6	24,5	20,8	19,7	19,4
beet sugar	276	234	194	222	192	205	183	176	174	156	177
sunflower seeds	15,8	14,6	13,0	12,7	9,1	14,2	10,5	11,5	9,3	10,0	12,2
potatoes	117	95	119	137	105	96	119	106	102	82	122
vegetables	149	128	110	130	115	120	112	114	123	111	112
Animal breeding, thousands											
cattles	25194,8	24623,4	23727,6	22456,8	21607,3	19624,3	17557,3	15313,2	12758,5	11721,6	10626,5
pigs	19946,7	19426,9	17838,7	16174,9	15298,0	13945,5	13144,4	11235,6	9478,7	10083,4	10072,9
seeps and coats	9003,1	8418,7	7829,1	7236,6	6862,6	5574,5	4098,6	3047,1	2361,8	2026,0	1884,7
Production of breeding											
Meat, th. tone	4357,8	4029,1	3400,9	2814,5	2677,4	2293,7	2112,7	1874,9	1706,4	1695,3	1662,8
Milk, mln. tone	24,5	22,4	19,1	18,4	18,1	17,3	15,8	13,8	13,8	13,4	12,7
Eggs, mln	16286,7	15187,8	13496,0	11793,8	10153,7	9403,5	8763,3	8242,4	8301,4	8739,7	8808,6
wool, th. t	29,8	26,6	23,1	21,1	19,3	13,9	9,3	6,7	4,6	3,8	3,4
Index of total agricultural production (to former year)											
	96,3	86,8	91,7	101,5	83,5	96,4	90,5	98,1	90,2	93,1	109,8

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Table 3 - Forest use, restoration, nature protected areas dynamics

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Timber haarvestin g, th. m ³	12642	10833	10183	9649	9959	9741	9176	10597	10549	10309	11262	12022
Including main felling	5755	5267	5047	4761	4891	4574	4375	4761	5139	4880	5236	5507
Forest reneval on forest lands fund, th. ha	37,5	33,7	31,9	29,7	33,1	38,4	38,5	38,5	36,7	38,6	37,8	42,6
Including tree plantation s	35,4	31,2	28,9	26,8	29,6	33,9	34,3	33,5	30,2	29,9	29,8	34,3
Hunting areas, th. ha	50538,7	51797,8	52153,8	51772,0	51214,1	50631,6	50583,5	48701,6	47721,8	47903,9	47989,3	47721,6
Total ammount, th. units: Hoofed animals	254,6	271,8	270,8	253,1	244,9	237,3	219,4	205,3	192,3	182,6	179,2	177,3
Fur animals	2134,2	2194,9	2332,7	2360,2	2431,5	2497,7	2528,9	2554,0	2464,2	2422,3	2421,2	2379,3
Game- birds	5098,0	5112,6	7767,7	10234,5	10581,4	11794,5	10888,8	9975,6	9828,0	8953,9	9427,6	9436,7
Reservate s, national parks: entities	21	19	19	19	19	20	22	24	27	31	31	32
Area, th.ha	407,0	361,4	361,4	384,6	414,9	417,6	711,9	761,8	768,5	877,1	887,5	970,8

Source : State Committee on Statistics

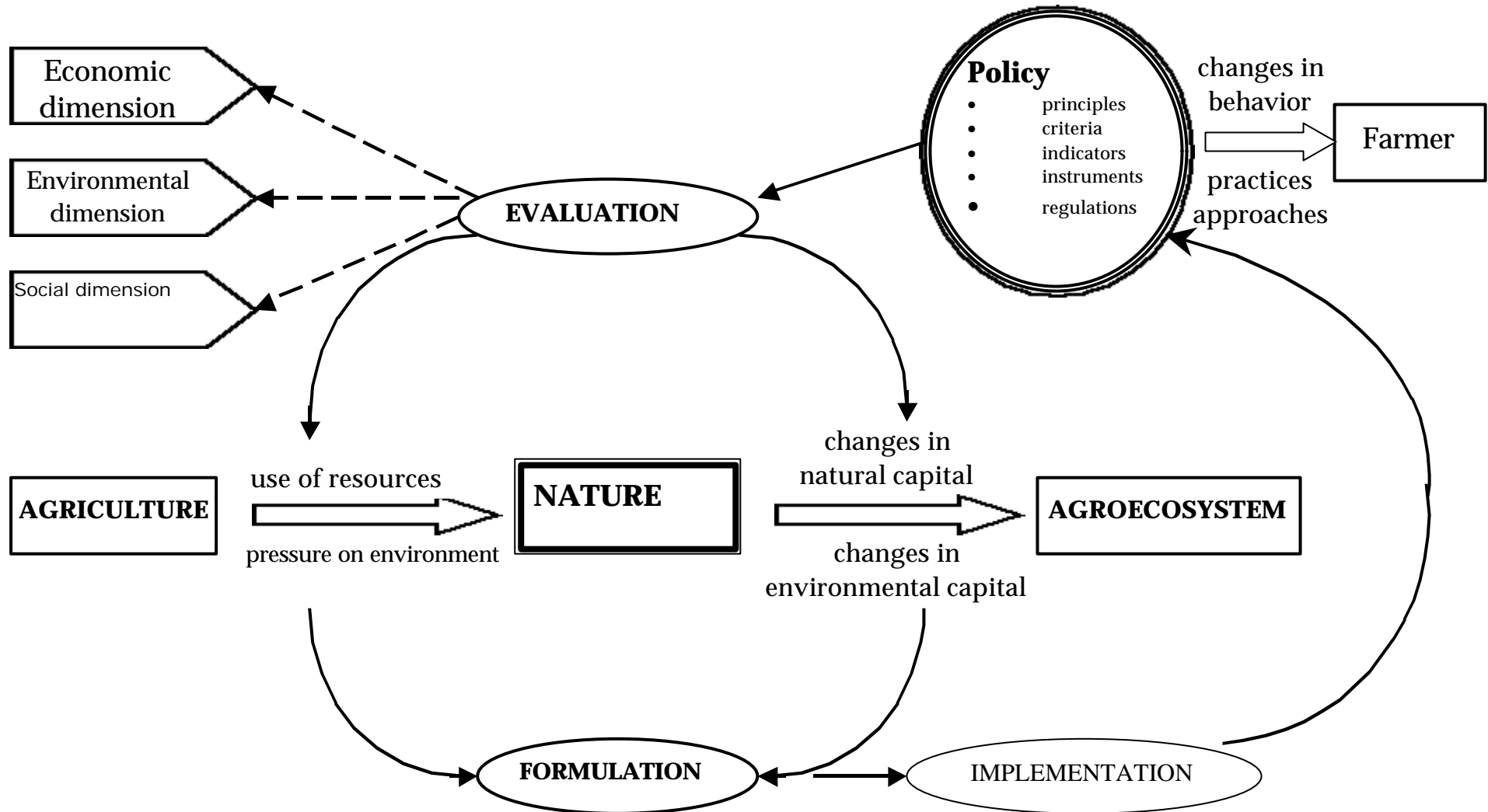


Fig. 1 Concept of policy for sustainable agricultural