SZENT ISTVÁN UNIVERSITY

ENVIRONMENTAL CONSIDERATIONS IN FARM PLANNING AND FARM RECORDS

SUMMARY OF DOCTORAL THESIS

KATALIN BALÁZS

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Doctoral school

name: ***Doctoral School of Environmental Sciences***

tudományága: ***environmental sciences***

leader: ***Dr. Zoltán Menyhért, DSc.***

university professor, doctor of agricultural sciences
SZIE Faculty of Agriculture and Environmental Science
Institute of Environmental and Landscape Management

Subdivision of science field

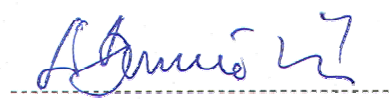
title: ***Environment management, environment protection***

leader: ***Dr. József Ángyán, CSc.***

university professor, candidate of agricultural sciences
SZIE Faculty of Agriculture and Environmental Science
Institute of Environmental and Landscape Management

Supervisor: ***Dr. László Podmaniczky, Ph.D.***

university docent
SZIE Faculty of Agriculture and Environmental Science
Institute of Environmental and Landscape Management



Approval of
programme leader

Approval of
supervisor

BACKGROUND

In the European Union after WWII the environment destructing effects of production increase, also affecting agriculture, were increasingly emerging from the 1960s despite of the fact that in the treaty establishing the European Union paragraph 2 of article 39 listing the original objectives of the Common Agricultural Policy could have also made possible the development of less environmentally harmful farming systems. Attention to environmental problems from agriculture was paid from the 1970s and this was the time when the principles and objectives of environment protection were composed.

The gradual introduction of environmental considerations into the Community legislation has started in the mid 1980s in parallel with acknowledging the phenomenon of overproduction and bringing measures for suppressing the quantity of agricultural production outputs.

Beyond the introduction of direct payment system the 1992 CAP reform made possible that Member States could tie the direct payments in the beef and sheep sector to meeting environmental requirements (minimum standards). This reform also introduced the system of accompanying measures in the frame of which farmers could become eligible for compensation payments for undertaking environment and landscape management measures.

The document Agenda 2000 identified the new multifunctional model of European agriculture in 1999 and gave a new basis for agricultural and rural development policy development. As a result the Rural Development Regulation (EC/1257/99) made compulsory for Member States to introduce agri-environment schemes. It was also set in the regulation that farmers are eligible for agri-environmental payments only for undertakings that go beyond the requirements of Good Farming Practice specified in the national rural development plans of the respective countries. The regulation emphasized the importance of agri-environment and landscape management and also made possible to give agri-environmental support to non-productive areas serving nature conservation.

The 2003 reform of the CAP based on the mid-term review of Agenda 2000 set out, among others, the decoupling and gradual decrease of support policies from production, the compulsory introduction of meeting standards and the further support for agri-environment policies. With these measures the EU wants to help the process of effective integration of environmental policies into the agricultural policy.

The process of development in Hungary, similarly to the EU, was lead by the strives to increase production. As a result agriculture has become a strategic sector in the economy by the 1970s. However, due to the differing objectives of the political system not enough attention was paid to the emerging environmental problems in an agricultural sector struggling with structural difficulties.

As a result of the agricultural crisis after the change in the political regime and also due to the changing property rights through the process of privatisation the quantity of industrial inputs used in agriculture has shown a sharp drop that was positive for the environment. On the other hand the dramatic decrease in the number of livestock (in particular in the number of sheep and beef that is important from an environment management point) was unfavourable and resulted in unmanaged areas.

During the preparation for EU accession important legislation concerning environmental aspects of agriculture were taken over. Apart from the domestic adoption of the Nitrate

Directive it was the National Agri-environmental Programme (NAKP) launched in 2002 with six schemes and accompanying measures that meant the main measure for supporting agri-environment management prior to the accession. The popular programme and its experiences showed significant need for further gradual enlargement of the agri-environment measures both in terms of application possibilities and budgetary resources.

The development of agri-environmental measures also bring up farm management research tasks. SZABÓ ET AL. (2003) call the attention to the fact that determining the actual support payments is currently based on expert estimation only as ***there is no reliable farm level cost and income data available on farming practices fulfilling agri-environmental prescriptions***. Furthermore, they consider the improved involvement of higher agricultural education institutions mainly into informing individual farmers and helping them with farm planning.

In Hungary the pre-accession rural development programmes, the NAKP and the SAPARD[1], terminated by the EU accession date of 1 May, 2004. However, the frameworks for planning rural development in the respective member states encompass and bring further these pre-accession plans. The current support areas of farming systems set out in the Rural Development Regulation are detailed in the National Rural Development Plan (NVT) while the structural support schemes are detailed in the Agricultural and Rural Development Operative Programme (AVOP).

In the NVT one of the most important measures, also when considering budget, is area based support for agri-environment management. This ensures the enlarged continuation of NAKP.

For claiming simplified area based support schemes and rural development support measures also including agri-environment measures it is the ***156/2004. (X. 27.) MARD Regulation*** that sets out the environmental requirements in the form of the ***Good Agricultural and Environmental Condition*** and ***Good Farming Practice***, respectively. However, we can find many requirements, e.g. „applying crop structure according to the agro-ecological features of the region" or „grazing practices accommodating to the natural carrying capacity of the area should be pursued" that are difficult to interpret without giving information about the regional specifications or concrete practices to be applied. In-depth investigations into describing these regional specifications and practices is a research task that the results of which could significantly contribute to the spread of environmentally sound farming in practice if the recommendations could reach farmers in the form of planning guides, good practice publications and practical trainings.

[1] **SAPARD:** Special Accession Programme for Agriculture and Rural Development

OBJECTIVES

The production efficiency of sustainable agriculture, the quality of its products and through these its competitiveness on the market is dependent to a great extent on the environment, the status and quality of natural resources. A basic principle of environment-friendly farming is adaptation to the environment (both natural and economic). The most important tool for adaptation might be farm planning methods that are integrating these above aspects. With the increasing level of environmental requirements identified by the society and policies for farmers, the preparation of such integrated farm plans becomes of key importance for agricultural businesses.

A good farm plan, however, is not only a basis for reasonable farming but more increasingly required in agricultural support schemes, for obtaining bank loans, and can help receiving agri-environmental payments and other funds.

The objective of this work was to elaborate a farm planning system that, beyond helping farmers with understanding agri-environmental measures, also facilitates the preliminary analysis whether how the measures planned to be undertaken can be fit into the everyday farming practice of the farm. As a result, a farm planning practice – integrating environmental and agronomic aspects – can emerge that might result in an environmentally and economically more sustainable farming than generally accepted at present.

To ground the topic I thought important to overview the following issues:

- the emergence of the need for environmental protection in agriculture, the processes of integrating environmental considerations into agricultural policies in the European Union and in Hungary, the evolvement of environmental management in agriculture,
- the historical development of farm planning and farming record keeping methods in Hungary,
- the theoretical background of farm planning,
- the practice and experiences of agri-environmental farm planning in the European Union,
- aspects of and possibilities for evaluating the ecological and economic performance of farming.

In the central part of the work I examined

- how a planning methodology for harmonising environmental protection and nature conservation with farming, an agri-environmental farm planning system can be developed,
- what modules these farm plans should contain,
- what structure of the farm planning system to be developed for the agri-environmental schemes in the initial year of the National Agri-environmental Programme is needed,
- what experiences can be gained from the practical application of the developed farm planning system with special regard to the Environmentally Sensitive Areas Scheme, and finally
- how the farm planning system can be supported with spreadsheet software and on-line internet applications.

The work wish to contribute to the preparation of sustainable and environment friendly farming plans with a scientifically grounded practical tool for the concerned farmers, advisors and policy makers.

DISCUSSION OF RESULTS AND RECOMMENDATIONS

After I gave an international and national overview of important related issues and literature background I collected the reasons, influencing factors and results of the most important environmental problems from farming and evaluated these environmental problems by environmental elements (soil, water, air, biodiversity, landscape diversity). I also identified in which farm planning module and how should a given environmental problem be taken into account. As a result, I have concluded the environmental requirements that should be tackled within the various planning modules and summarised how the different planning modules can contribute to maintaining and conserving natural resources. I present the result of the synthesis in **Table 1**.

Table 1 Tackling environmental problems in the various planning modules

	Erosion /Sedimentation	Soil compaction	Nutrient loss, leaching or evaporation	Organic matter loss or leaching	Soil acidification	Pesticide contamination, evaporation	Heavy metal contamination	Irrigation	Removal/loss of habitats/landscape elements	Overgrazing	Undergrazing
Land use plan	X	X	X	X	X			X	X	X	X
Soil conservation plan	X	X	X	X	X	X	X	X			
Crop rotation plan	X		X	X				X	X		
Nutrient management plan			X	X	X		X			X	
Crop protection plan						X	X		X		
Irrigation plan	X	X	X			X		X			
Crop production technology plan	X	X	X	X		X		X			
Grazing plan	X									X	X
Nature conservation plan									X	X	X

Table 1 describes the environmental requirements set for the respective farm plan modules and for what environmental questions should these modules give answers. **Table 2** shows the contribution of each farm plan modules to conserving natural resources and what the short term and long term farming benefits from using these modules. On the basis of this analysis I described the objectives of the respective farm plan modules.

Following this analysis I identified the building blocks that the specific agri-environmental farm plans should contain according to the management requirements of the various schemes of the National Agri-environmental Programme. Then I prepared the farm plan worksheet system for the National Agri-environmental Programme and concluded the experiences gained with the practical application of the worksheet system for the Environmentally Sensitive Scheme. The planning system consist of general sheets containing the general identification data, the production structure of the farm, and the identification of plots enrolled into agri-environmental schemes plus scheme specific sheets that correspond to the different agri-environmental schemes.

Table 2 Objectives of farm plan modules to conserve natural resources

	soil	water	air	biodiversity	landscape	Short term agricultural objective	Long term agricultural objective
Land d use plan	rationalised soil use	rationalised land use			rationalised land use	rationalised soil use	rationalised land use
Soil conservation plan	less erosion, improved soil conservation	less sedimentation, less water contamination		maintenance of surrounding habitats	more landscape diversity	more stable ground and stabilised watercourse banks	maintenance of soil quality and quantity
Crop rotation plan	variegated crop structure, improved soil life	less contamination		more diverse habitats	more landscape diversity		maintenance of soil structure and fertility
Nutrient management plan	Rationalised nutrient use	less water contamination	less air contamination	less load to habitats		more efficient nutrient use	maintenance of soil structure and fertility
Crop protection plan	less contamination	less contamination	less air contamination	less load to habitats		more efficient chemicals use	
Irrigation plan	Less erosion, rationalised water use	less sedimentation, rationalised water use		less load to habitats		more efficient water use	
Crop production technology plan	rationalised soil use	less contamination	less contamination	less load to habitats	more landscape diversity	more efficient production	
Grazing plan	rationalised land use	less contamination	less contamination	more diverse habitats	more landscape diversity	rationalised land use	
Nature conservation plan	rationalised land use	less contamination		more diverse habitats	more landscape diversity	rationalised land use	

I developed the spreadsheet (MS Excel) version of the agri-environmental farm planning system and related information support on the Internet. The planning forms developed in the Excel spreadsheet system can be stored in separate workbooks by farms. With the Excel spreadsheet system I made the automation of calculations possible that enables a more quick but clear-cut, precise work. With the application operable through the Internet I prepared an on-line decision support and data managing system. The application makes it possible that with inputting material use and operations made on plots farmers could fulfil their obligations set by the agri-environmental schemes of keeping field records. With operating the database in the background the application also give information to the farmers about the economic and ecological aspects of their farming. The applications developed might greatly help users that they could pursue agriculture according to their resources in a manner that is in harmony with the national agri-environmental prescriptions and EU directives.

The implementation of the integration process of environmental policy into agricultural policy in practice should be realised at farm level and focus on integrating environmental aspects into the everyday farming practices. As a result of policy development a wide array of agricultural support schemes become conditional on a developing hierarchy of different levels of environmental requirements/standards. The necessity of planning for environmental management therefore is unquestionable. However, according to the farming content behind the environmental standard level that is aimed for there are several different types of environmental farm plans whose field of application might also greatly differ from each other.

A „plan of good practice" can best serve the general environment conservation aspects and conservation of abiotic resources in particular. In this case planning means a complex economic and environmental approach of the whole farm and the enterprises that mean a flexible decision supporting tool to develop an economic yet environmentally adaptive action plan, a good farming plan.

Such plan of good practice should

- list the basic geographic and farming features of the farm,
- explore farming objectives,
- plan farming in details based on environmental considerations including
    - stocking density,
    - soil conservation measures,
    - cropping structure
    - nutrient management plan and balance,
    - crop production practices,
    - basic livestock data and husbandry practices,
    - grassland management plan and
- related economic calculations, planning for financial issues.

However, the preparation of agri-environmental farm plans is justified when one participates in agri-environmental schemes. It is evident that preparation of such farm plans require multi-level knowledge. Therefore farm planning can go along with the help of a skilled farm planner who has local expert knowledge and closely cooperate with the farmer.

Based on my investigations and its results I concluded several practical recommendations. Of these I highlight the following.

- Planning help farmers in understanding their environmental obligations coming from domestic and international legislation and realising changes made to their farming accordingly
- When considering participation in an agri-environmental scheme during the preparation of an agri-environment farm plan
    - the applicant farmer can think over how he could fulfil the prescriptions of a certain scheme, what changes and what trade-offs should be made to become eligible for claiming agri-environmental payments,
    - secondly, the farmer can justify his application with the concrete plans of the undertakings to be carried out with having the agri-environment farm,
    - thirdly, the agri-environmental farm plan together with the farming records can serve as a proof of the quality of farming that might not only mean a kind of reference at a future participation in quality assurance schemes but can also help restoring the social acceptance of farming as a type of lifestyle.
- For the preparation of agri-environmental farm plans the support from a proficient farm planner is indispensable. However, the preparation of farm plans and consequent agri-environmental advising is a confidential job. A farm planning expert educated in agri-environmental issues who also has local knowledge can achieve the countenance and trust of local farmers. This form of agri-environmental advising and regular discussions is the most effective as the planner knows well the both the area and the tasks that the farmer enrolled for. Consequently, he can come up with customized recommendations tailored to the particular farm.
- A nation wide network of agri-environmental farm planners should be developed to make the system operational and widely available. The basis for this network, a group of accredited farm planners already exist in the form of a list in the Ministry of Agriculture and Rural Development. For the preparation of quality farm plans, however, specific trainings and a regular forum for the planners should be organised where experiences could be exchanged.

  A national agri-environmental farm planning and advising network that is subdivided by districts and also specialising by schemes, could undertake the following tasks
    - the preparation of farm plans for farmers enrolling into agri-environmental schemes,
    - continuous liaison with farmers specifically on agri-environmental issues (this could also help make farmers understand the requirements and practical realisation of Good Farming Practice), that could also mean a two way information channel between farmers and scheme developers,
    - agri-environmental advising tailored to individual farms,
    - through registering farm plans database for regional or national evaluations could be developed that could provide a basis not only for scheme adjustment but also basic information for scheme monitoring.

- It is a further research task to help agri-environmental farm planning to assess and fine tune the requirements both of the Good Agricultural and Environmental Condition and the Good Farming Practice at the regional level. The results of this research direction could significantly contribute to the spread of environmentally sound farming in practice if the recommendations could reach farmers in the form of planning guides, good practice publications and practical trainings.
- In Hungary there has been no observing system developed so far for monitoring agri-environmental measures. It is a future research task to elaborate monitoring systems that take the Hungarian specificities into account and measure the ecological performance of farms. Such a monitoring system could provide information on the effectiveness of agri-environmental measures of the National Rural Development Plan, i.e. what effects agri-environmental measures and schemes have on wildlife, landscape and natural resources at the level of farms.

Beyond the above recommendations and tasks, the further development of the methodology and betterment of technical solutions for agri-environmental farm planning and record keeping is equally important. This current work wish to contribute with a hopefully useful basis to this aspect with identifying the contents and logical structure of agri-environmental farm plans, with exploring the possibilities for keeping agri-environmental farming records and with using the support of computer applications.

NEW SCIENTIFIC RESULTS

Based on the methodological principles applied and investigations made I concluded the following scientific results:

1. In the dissertation I introduced and evaluated the historical development of farm planning and farming record keeping methods in Hungary with special regard to the development of considering environmental aspects during the development of the various methods.
2. I explored and evaluated the practice of agri-environmental farm planning in the European Union. I gave an overview on the international experiences of integrating environmental aspects into farm plans and evaluated the international farm planning practices that are related to agri-environmental programmes.
3. I assessed how the environmental aspects can be integrated into the planning process. I classified the environmental problems of agricultural origin by environmental elements. After analysing the reasons, influencing factors and results caused by each environmental problem, I gave recommendations for how a certain environmental problem can be considered during planning. I concluded the environmental requirements to be handled within the specific modules of the planning system.
4. I identified the building blocks that the specific agri-environmental farm plans should contain according to the management requirements of the various schemes of the National Agri-environmental Programme. I prepared the farm plan worksheet system for the National Agri-environmental Programme and concluded the experiences gained with the practical application of the worksheet system for the Environmentally Sensitive Scheme.
5. I developed the spreadsheet version of the agri-environmental farm planning system and its IT support on the Internet. With the Excel spreadsheet system I made the automation of calculations possible. With the application operable through the Internet I prepared an on-line decision support and data managing system.

LIST OF REFERENCES PUBLISHED IN THE TOPIC OF THE THESIS

Journal Articles

Ángyán J.; **Balázs K**.; Podmaniczky L. ; Ónodi G.; Skutai J.; Nagy G. (2002): A Nemzeti Agrár-környezetvédelmi Program (NAKP): A többfunkciós európai agrármodell megvalósításának magyar kerete, *Agrárium*, Magyar Agrárkamara, Budapest, 12. évf., 10. szám, 15-22. p.

Ángyán J., Ónodi G., Podmaniczky L., Skutai J., **Balázs K.**, Nagy G. (2003) A természeti érték nem importálható. *Környezetvédelem*. Ökológiai, környezettechnikai és környezetvédelmi szaklap. XI. Évf. 2. sz. 2003. március-április. Magyar Mediprint Szakkiadó Kft. Budapest. 9 p.

Szabó G., Fésűs I., **Balázs K.**, Katonáné Kovács J. (2003): A Nemzeti Agrár-környezetvédelmi Program pályázatainak elemzése. *Gazdálkodás*. 2003. 47. évf. 1. sz. 26-39.p. ö:eng. B:39.p Agrárpolitikai és vállalkozási tudományos folyóirat.

Szabó, G., **K. Balázs,** L. Podmaniczky, A. Zellei (2003): Agricultural and environmental policy issues in the CEESA project (1999-2002) from a Hungarian point of view. (In: AKII Studies in Agricultural Economics No. 99. Research and Information Institute for Agricutlural Economics. Budapest. P 132.) 53-72 p.

Ángyán J.; Podmaniczky L.; Németh T.; Büttner Gy.; Tar F.; Fésűs I.; Vajnáné M. A.; Ónodi G. ; Klár Z.; Skutai J.; Grónás V. ; Lőrinci R.; Nagy G.; **Balázs K.** ; Belényesi M. (2001): Land-use system of Hungary, ENV-010208-A, *Hungarian Electronic Journal Of Sciences*, Environmental Engineering Section, Győr, Széchenyi István Főiskola, 21. p.

Full articles in conference proceedings published in foreign language

Lőrinci, R.; **Balázs, K.** (2001): Landscape Evaluation: the First Step of Ecological Infrastructure Planning – A case study of István grange periphery. *In: Publicationes Instituti Geographici Universitatis Tartuensis 92. Conference proceedings. International Association for Landscape Ecology (IALE) European Conference – Development of European Landscapes*, 734-741 p. Sweden, 30 June 2 July 2001 – Tartu, Estonia, 3 6 July 2001. 804p

Lőrinci, R.; **Balázs, K.** (2001): Biotope Survey & Analysis for Local Ecological Network Planning – A case study for István grange periphery. *In: Publicationes Instituti Geographici Universitatis Tartuensis 92. Conference proceedings. International Association for Landscape Ecology (IALE) European Conference – Development of European Landscapes.*, 728-734 p. Stockholm, Sweden, 30 June 2 July 2001 – Tartu, Estonia, 3 6 July 2001. 804 p.

Balázs, K.; Ángyán, J.; Podmanicky, L. (2001): Land use analysis for delimiting target areas of different agri-environmental measures – An approach to environmentally fragile areas. *In: Publicationes Instituti Geographici Universitatis Tartuensis 92. Conference proceedings. International Association for Landscape Ecology (IALE) European Conference – Development of European Landscapes*, 395-400 p. Stockholm, Sweden, 30 June 2 July 2001 – Tartu, Estonia, 3 6 July 2001. 804 p.

Lőrinci, R.; **Balázs, K.** (2001): Comparative historical map analysis – a tool for tracing landscape changes. International Geographical Union, Study Group on Land Use and Land Cover Change. Land Use / Land Cover Changes in the Period of Globalization Conference (IGU –LUCC). Prague, Czech Republic. 14 18 July 2001.

Belényesi, M.; Kristóf, D. ; Skutai, J.; **Balázs, K**. (2001): Introducting the system of Environmentally Sensitive Areas in Hungary.: A case study – Kiskunság National Park. Land Use/Land Cover Changes in the Period of Globalization (IGU-LUCC). Prague, Czech Republic. 14-18 July 2001.

Lőrinci, R.; **Balázs, K.** (2001): Local ecological network planning – a case of Istvan Grange. International Geographical Union, Study Group on Land Use and Land Cover Change. Land Use / Land Cover Changes in the Period of Globalization Conference (IGU –LUCC). Prague, Czech Republic. 14 18 July 2001.

Balázs K.; Ángyán J.; Podmaniczky L. (2002): Evaluation agricultural potentials and environmental sensitivity for land use planning (in: Bicík I. – Chromy P. – Jancák V. – Janu H.: Land Use / Land Cover Changes in the period of Globalization, Proceedings of the IGU-LUCC International Conference, Prague, 2001, 215 p.) 88-94. p.,

Balázs, K. ; Skutai, J. ; Ángyán, J. ; Podmaniczky, L. (2001): Planning multifunctional agriculture – a case study of Babat Valley Ecological Model Centre. In: T. D. Lekkas (Ed.): Proceedings of the 7th Conference on Environmental Science and Technology. Volume 'C' pp. 21-28. Global Network for Environmental Science and Technology and Department of Environmental Studies , University of the Aegean, Hermoupolis, Syros, Greece, 3-6 September 2001.

Szabó, G. ; **Balázs, K.** ; Podmaniczky, L. (2001): Agri-environmental policy in environmentally fragile areas II. Central and Eastern European Sustainable Agriculture (CEESA). The ACE – Phare Programme. Seminar on Sustainable Agriculture in Central and Eastern European Countries: The Environmental Effects of Transition and needs for Change, Nitra, Slovakia, 10 16 September 2001.

Belényesi M.; **Balázs K**. ; Podmaniczky L.; Skutai J. (2001): Encouraging environmentaly friendly agricultural practices. 1st International Conference for Young Researchers. Gödöllő, Hungary. 4-5 September 2001. In book of abstracts pp. 60-63.

Balázs, K. ; Podmaniczky, L. (2000): Sustainable rural business planning for the Hungarian agri-environmental programme. In: conference proceedings of The 2000 Business Strategy and the Environment Conference. September 18th and 19th, University of Leeds, UK (426 p.), 33-40 p. (in English)

Abstracts in conference proceedings published in foreign language

Balázs, K. (2004): Approaches and Results in Agri-environment Scheme Research. In: Programme and Book of Abstracts. Landscape Tomorrow International Workshop: Issues of Sustainable Land Use in European Landscapes. Problems, Conflicts and Solutions. Gödöllő. Hungary. 2004. április 14-18.Hungary.

Balázs, K. ; Podmaniczky, L. (2002): The prospects of the Hungarian agri-environmental programme for sustaining land use and biodiveristy. In: Proceedings of the Workshop on CAP for Man and Environment – Natural Resources in the Enlarged EU and Means of the Agricultural Policy to Safequard them. 15-16 January 2002. ICC – International Green Week – Berlin, Germany.

Lőrinci, R. ; **Balázs, K.** (2002): Exploring and evaluating landscape traditions and features for sustainable land use planning. In: Abstract Proceedings Conference Visegrad Agenda 21. Transition from a Centrally Planned Economy to a Sustainable Society? April 04-06 2002 Prague, Czech Republic, 50 p.

J. Skutai ; **K. Balázs** ; M. Belényesi ; D. Magyari (2002): GIS applications in land use study for setting local environmental plan, 3rd Student Conference on Conservation Science, University of Cambridge, 25-27 March

Balázs, K. (2001): Agri-environmental practices at farm level in order to preserve biodiversity and landscape. Student Conference on Conservation Science, University of Cambridge, UK, March 28-30, 2001. In book of abstracts p. 3.

Lőrinci, R. ; **Balázs, K.** (2001): Historical landscape development analysis – a background study for local ecological network planning. Student Conference on Conservation Science, University of Cambridge, UK, March 28-30, 2001. In book of abstracts p. 3.

Lőrinci, R. ; **Balázs, K.** (2001): Habitat analysis for local ecological network planning. Student Conference on Conservation Science, University of Cambridge, UK, March 28-30, 2001. In book of abstracts p. 3.

Balázs, K. (2001): Introduction to the National Agri-Environmental Programme. European Union Workshop on "Cadastral data as a component of spatial data infrastructre in support of agri-

environmental programmes" Ministry of Agriculture and Regional Development. Budapest, June 7-9 2001

Balázs, K. ; Podmaniczky, L. (2000): Rural enterprise planning – an applied approach to address new challenges. In: conference material of the 5th European Conference on Higher Agricultural Education 10-13 September 2000 at Seale Hayne Faculty, Univ. Of Plymouth, Newton Abbot, Devon, UK. „From production agriculture to rural development: challenges for higher education in the new millenium".(in English)

Abstracts in conference proceedings published in Hungarian

Lőrinci R.; **Balázs K.** (2001): Történeti tájfejlődés elemzés – háttértanulmányok a lokális ökológiai hálózattervezéshez. Gödöllő, Tavaszi Szél konferencia. 2001. április 20-22.

Lőrinci R.; **Balázs K.** (2001): A jelenlegi állapotfelmérés módszere a lokális ökológiai hálózattervezésben. Gödöllő, Tavaszi Szél konferencia. 2001. április 20-22.

Lőrinci R.; **Balázs K.** (2001): A táj adottságaihoz, hagyományaihoz illeszkedő földhasználati rendszer kialakítása Bonyhád mellett, István-major külterületen, XLIII. Georgikon Napok, „Vidékfejlesztés – Környezetgazdálkodás – Mezőgazdaság" „ című tudományos konferencia, 219-225. p. Keszthely 2001 szeptember 20-21. 1168 p.

Lőrinci, R.; Hegedűs, Sz.; **Balázs, K.** (2001): Három élőhelyértékelő módszer tanulmányozása erdőterületeken- Előtanulmány az ökológiai hálózattervezés állapotfelméréséhez, XLIII. Georgikon Napok, „Vidékfejlesztés – Környezetgazdálkodás – Mezőgazdaság" „ című tudományos konferencia, 225-230 p. Keszthely 2001 szeptember 20-21. 1168 p.

Book, book chapter published in foreign language

I. Higuero, Y.R. Hoogeveen, J.E. Petersen & **K. Balazs**. (2004): High Nature Value Farmland. Character, trends and policy challenges. Joint Message UNEP/EEA. (http://reports.eea.eu.int/report_2004_1/en)

Ángyán J.; Podmaniczky L. ; **Balázs K.** (2003): Elvi szerkezeti javaslatok az állami költségvetési törvényjavaslat mezőgazdaságra vonatkozó feezeteihez (in.: Lukács A. – Szabó Z. (szerk.): Az államháztartás ökoszociális reformjának szükségessége és lehetőségei, Ajánlások a 2004. évi állami költségvetéshez, Levegő Munkacsoport, Budapest, 334 p.), 237-241.p.

Podmaniczky L.; **Balázs K**.; Ángyán J. (2003): A mezőgazdálkodás nitrogénellenőrzésének gazdasági eszközei és a nitrogénadózás lehetőségei (in: Kerekes S. – Kiss K. (szerk.): A megkérdőjelezett sikerágazat (Az EU környezetvédelmi követelményeinek teljesítése), MTA Társadalomkutató Központ, Budapest, 453 p.), 261-274. p.

Lőrinci R., **K. Balázs** (2003): Historical land use analysis and landscape development investigations for devising systainable land use structure: case from Hungary. (In: Ü. Mander, M Antrop (eds) Multifunctional Landscapes Vol. III. Continuity and Change. WIT Press Southampton Anglia . 289 p.) 243-262 p

Ángyán J., **Balázs K**., Podmaniczky L., Skutai J. (2003): Integrated land use zonation system in Hungary as a territorial base for agri-environmental programs. (In: Helming K., Wiggering H. (eds): Sustainable development of multifunctional landscapes. Springer-Verlag Berlin-Heidelberg-New York, 286 p.), 125-141 p.

Podmaniczky, L. ; **Balázs, K.** ; Szabó, G. (2002): Analysis of alternative sustainable farming systems and effects in Dévaványa, Hungary. In.: Sipilainen, T. & Backman, S. (eds.) Comparative analysis of alternative sustainable farming systems. Sustainable Agriculture in Central and Eastern European Countries (CEESA). Project under EU 5th Framework Programme, Contract No. QLK – 1999-01611, Helsinki June 2002. p 84-108.

Podmaniczky, L. ; **Balázs, K**. ; Szabó, G. (2001): Agri-Environmental practices at farm level in order to preserve biodiversity and landscape – Dévaványa case study area. In: Tanics, S. et al. (eds.): Description of current farming systems in Central and Eastern European Countries.

Sustainable Agriculture in Central and Eastern European Countries (CEESA). Project under EU 5th Framework Programme, Contract No. QLK – 1999-01611., Budapest, Hungary, p 129-160.

Szabó, G. ; **Balázs, K.** ; Podmaniczky, L. (2001): Agri-environmental policy in environmentally fragile areas, Hungary. In: Lowe, P. et al. (eds.): Description of agri-environmental policies in Central and Eastern European Countries. Sustainable Agriculture in Central and Eastern European Countries (CEESA). Project under EU 5th Framework Programme, Contract No. QLK – 1999-01611., Newcastle-upon-Tyne, UK.

Podmaniczky, L. ; **Balázs, K.** ; Szabó, G. (2001): Agri-Environmental practices at farm level in order to preserve biodiversity and landscape II. Central and Eastern European Sustainable Agriculture (CEESA). The ACE – Phare Programme. Seminar on Sustainable Agriculture in Central and Eastern European Countries: The Environmental Effects of Transition and needs for Change, Nitra, Slovakia, 10 16 September 2001.

Podmaniczky L. ; **Balázs K**. ; Ángyán J. **(**1999): The role of economic instruments for nitrogen control in Eastern Europe – a case study for Hungary, In: Zeijts, H. van (Ed.): Economic Instruments for Nitrogen Control in European Agriculture, Centre for Agriculture and Environment, CLM 409-1999, Utrecht, (246 p.) 125-148. p.

Book, book chapter published in Hungarian

Ángyán J., **Balázs K.**, Jancsovszka P., Kohlheb N., Laki G., Podmaniczky L., Szakál F., Tar F., (2003): A többfunkciós európai agrármodell kialakulásának állomásai (in Ángyán J. ; Tardy J. ; Vajnáné Madarassy A. (szerk): Védett és Érzékeny Természeti Területek mezőgazdálkodásának alapjai) Mezőgazda Kiadó, Budapest, p. 71-78.

Ángyán J., Avar B., **Balázs K.**, Belényesi M., Grónás V., Márkus F., Nagy G., Nagy Sz., Néráth M., Podmaniczky L., Skutai J., Tardy J., Vajnáné Madarassy A. (2003): Alapmodellje: az Érzékeny Természeti Területek (ÉTT) rendszere (in Ángyán J. ; Tardy J. ; Vajnáné Madarassy A. (szerk): Védett és Érzékeny Természeti Területek mezőgazdálkodásának alapjai) Mezőgazda Kiadó, Budapest, p. 118-137.

Ángyán J., **Balázs K**. (2003): Gazdálkodási, üzemi méretek (in Ángyán J. – Tardy J. – Vajnáné Madarassy A. (szerk): Védett és Érzékeny Természeti Területek mezőgazdálkodásának alapjai) Mezőgazda Kiadó, Budapest, p. 220-221.

Ángyán J., **Balázs K.** , Baumann A., Belényesi M., Kazi J., Kupi K., Lőrinci R., Márkus F., Skutai J., Turcsányi G. (2003): A földhasználat tervezése (in Ángyán J. – Tardy J. – Vajnáné Madarassy A. (szerk): Védett és Érzékeny Természeti Területek mezőgazdálkodásának alapjai) Mezőgazda Kiadó, Budapest, p. 452-470.

Balázs K., Podmaniczky L. (2003): Közgazdasági tervezés (in Ángyán J. – Tardy J. – Vajnáné Madarassy A. (szerk): Védett és Érzékeny Természeti Területek mezőgazdálkodásának alapjai) Mezőgazda Kiadó, Budapest, p. 473-476.

Balázs K., Podmaniczky L. (2003): Az ökológiai birtoktervezés alapjai. (In: Radics L. (szerk): Ökológiai gazdálkodás II.) Szaktudás kiadóház, Budapest. p. 594-615.

Balázs K. (2002): A természetvédelem fogalma, célja, feladata (in.: Hartman Mátyás (szerk): Mezőgazdaság a természetvédelem szolgálatában). Szaktudás kiadó. Budapest. 11-15. p.

Ángyán J., **Balázs K**., Barbayiannis, N., Barbáth P., Barczi A., Belényesi M., Cummings C., Grónás V., Kalburtji K. L.,. Kiss Á., Kristóf D., Kokkini S., Lőrinci R., Malomos A. P., Márkus F., Menyhért Z., Nagy G., Neuber J., Néráth M., Onate J. J., Pataki., R., Peco B., Podmaniczky L., Prado C., Skutai J., Szabó M., Szakál F., Szalai T., Tar F., Tardy J., Tóth L., Tsiouris. S. E., Turcsányi G., Vajnáné Madarassy A., Zsembery Z. (2001): Az Érzékeny Természeti Területek (ÉTT) rendszere. In: Szabó, M. (sorozatszerk.): Tanulmányok Magyarország és az Európai Unió természetvédelméről. TEMPUS Institutional Building Joint European Project “EU-training for Nature Conservation Officials”. Budapest – Gödöllő – Berlin – Madrid – Thessaloniki. 133-137 p.