

DRAWING UP FARM MANAGEMENT PLANS FOR AGRI-ENVIRONMENTAL SCHEMES

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ABSTRACT

The role of and the approach to the countryside and the environment has undergone dramatic changes in recent decades as relations between sustainable, multi-functional agriculture and the need for preserving natural resources were realised. On the other hand, to be successful in a commercial environment farmers need financial planning and control. However, at this stage of privatisation process and development of rationalised farm businesses within Hungary, there exists a large number of small family-managed holdings where business and production skills are at an elementary level.

Moreover, application for agricultural state support and planned subsidy priorities of agro-environmental programs will be linked to the condition of having clear business and management plan. These facts represent a growing demand for establishing of rural extension services and an increased need for sound farm business planning.

*The objective of the research is to elaborate a computerised **planning methodology** that help farmers not only to exercise effective management controls over the financial aspects of their business through proper planning and record keeping based on calculations of up-to-date information but to encourage the introduction and use of farming practices compatible with the increasing demands of protection of the environment and natural resources (multifunctional agriculture) as well.*

The methodology is suitable for producing sustainability indices in order to characterise the environment. Well-known and widely applied methods, such as calculation of gross margin, internal rate of return and net present value linked to issues which were previously little focused on, such as manure production and use, or studying the N cycle within the farm.

The methodology is tested in selected case study areas and it is investigated what sort of changes are required on farm level to achieve environmental and economic sustainability and how should farm-level based systems be designed to prevent increased negative externalities of agricultural production with respect to Hungarian circumstances.

Keywords: Farm Management; Agri-environmental Programme; Planning.

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AGRICULTURAL AND RURAL POLICY CHANGES

In many regions of Europe the role of the rural landscape and environment has undergone significant changes in the last decades as the model of the eco-social market economy gained ground.

A significantly wider interpretation of the concept of agriculture is needed today, increasingly supplemented by environmental and management aspects, so that nature and environment protection as well as production and consumption service functions should be considered equally.

The multifunctional agricultural, environmental and land-management approach embody not only production functions but such public welfare factors (food safety, caring for cultivated land, conserving sustainability, maintaining the ecological and technical infrastructure, ecological stability, keeping the population, equality in the labour market, providing base for tourism, taking care of traditional farming methods, etc) which have a greater significance in maintaining the balance of the countryside population and environment.

This finding seems to be backed by the fact the main direction of the Common Agricultural Policy reform has also gradually shifted the focus of support in a way to promote economically efficient and environmentally sustainable agriculture, integrated development of rural areas and provision of the long term protection of natural resources.

Sustainable land management systems use structures and sectors which are appropriate to the environmental conditions, adapting to the environment, expressing the environment's potential to the greatest possible extent.

Such integrated production systems keep and stabilise the productivity, structure of the soil at high level mainly with biological methods (organic residues, manuring, agrotechnical weed control, variety selection, crop rotation etc.), but applies fertilisers in moderate quantities and plant protecting agents in the smallest possible doses with proper timing only if other methods do not prove to be sufficient.

The key areas and main components of environment conserving farming are as follows: preserving the versatility in agricultural areas,

- land use, field structure emerging from the harmony of field functions
- adjustment to the land and site
- site specific agrotechnics

- soil conservation instead of fertilising
- preventive plant protection
- harmony in animal production and stocking rates

The development and the propagation of ecological and integrated, adaptive agricultural production in Hungary promises to be a profitable venture in economic, market, ecological and environmental aspects equally, and in the long term it can create the balance between the production and environmental protection aspects, offering the potential for rational management of the environment.

Farmer business planning and management will play a key role in agricultural activities in Hungary very soon. Formal plans will provide important benefits and may be not also necessary for obtaining loans but environmental payments as well through the agri-environmental schemes. Let's have a look at the present situation of agri-environmental issues in Hungary.

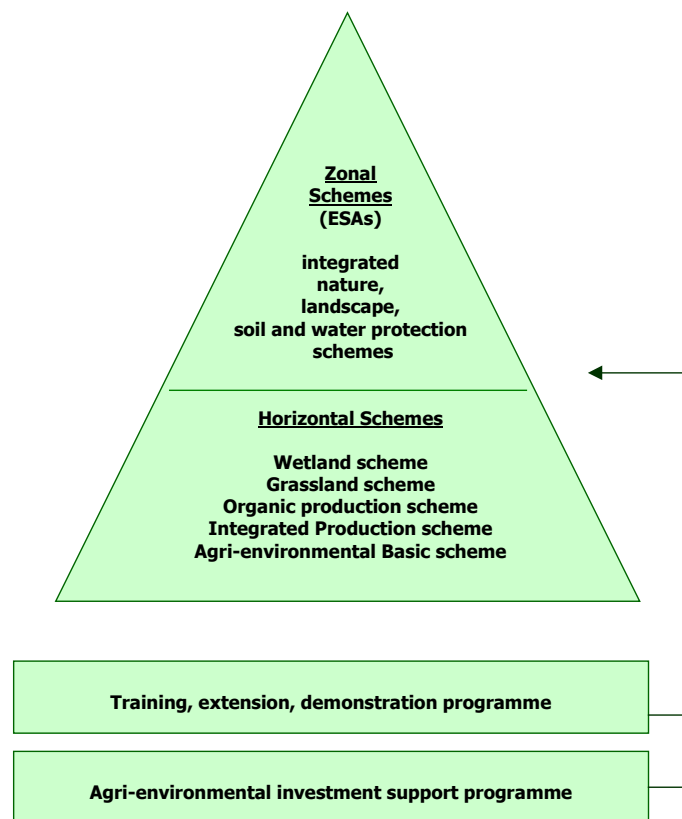
BASIC STRUCTURE OF THE HUNGARIAN NATIONAL AGRICULTURAL ENVIRONMENTAL PROGRAMME (NAEP)

Within the Hungarian Ministry of Agriculture and Rural Development, the Agri-environmental EU Harmonisation Working Group analysed the legislative framework of EU Regulation 2078/92 as well as EU member States' experience with its implementation. As a result, the Ministry took legislative and institutional steps to introduce the Hungarian Agri-Environmental Programme (AEP). In the first step, a land zone study prepared by the Institute of Environmental Management, Szent István University in 1997 evaluated the suitability of areas for agricultural production (i.e. agricultural potential) and environmental sensitivity, and to make a comparison between these two sides in order to balance natural resources and to identify target areas for different agri-environmental schemes. Furthermore, a proposal for a future Hungarian AEP was elaborated in 1999.

A very important finding of the land use zone study was that in the vast majority of the areas an increase in agricultural potential goes together with a decrease in environmental sensitivity and the environmental and agricultural interests in most areas do not conflict; they can be combined well in a land-use zoning system and can be considered as regionally compatible.

The structure of the AEP is pyramidal. Its base is formed by several horizontal schemes that apply to all agricultural land. The schemes provide support for environmentally friendly production methods (reduced use of fertilizers and pesticides, environmental farm plans) and nature oriented land use systems targeted at quality food production. Horizontal measures combine environmental protection (soil, water) with nature conservation targets. Higher on the pyramid are area specific zone schemes that target environmentally sensitive areas.

Figure 1 The Structure of the National Agri-Environmental Programme



a) Horizontal schemes:

- Agri-Environmental Basic Scheme (farmers and expert advisors drawing-up farm plans according to local farming conditions on fertilizer and pesticide use, crop rotation, anti-erosion measures, GAP, based on-farm nature conservation) and related training programmes;
- Integrated Farm Management Scheme (use of integrated pest management, optimisation of input use);
- Organic Farming Scheme;
- Grassland Scheme (grassland management according to environmental guidelines);

- Wetland Scheme (maintenance and development of wetland areas).

b) Zone (regional) schemes: the System of Environmentally Sensitive Areas

Zonal programmes are primarily the schemes for areas with low production potential but with significant natural value. In these programmes the emphasis is placed on the nature, landscape, soil and water protection aspects.

Scheme measures vary by areas and include conversion of arable land to grassland, use of extensive farming methods, maintenance of endangered breeds, habitat restoration and development, landscape reconstruction measures, provision of favourable condition for important bird species.

In addition, the establishment of a training, demonstration and extension network is planned to improve the understanding, update and implementation of the schemes by farmers.

SUSTAINABLE FARM PLANNING AND MANAGEMENT

Business planning and management

Business activity can be considered as a series of decisions of different nature. The process of decision making for long term is called planning. Time spent planning a business will reward the manager in several ways

A well thought out and properly constructed plan will

- help avoid expensive mistakes
- enable the best use to be made of all the resources of the business
- provide confidence that the business is viable and capable of existing in the long term
- help in the attainment of the objectives for the business
- provide a means of controlling the financial side of the business

Business planning and management is a relatively straightforward procedure, providing that certain basic steps are followed. Reliable information, however, is the key to any business planning activity. Farm records are a vital management tool.

To be successful in a commercial environment there is a need for financial planning and control. Farmers are no exception. Up-to-date and practical information is required on a wide range of topics. This is an essential part of the process of using standard data for an individual farm business.

Farms need to respond to the rapidly changing market conditions and develop along lines which will make them competitive in a global market context.

Rural enterprise planning has manifold purpose:

- to enable farmers to exercise effective management controls over the financial aspects of their business through proper planning
- to enable farmers to make sound investment decisions through the application of a planning methodology based on financial calculations of up-to-date information. This will also enable the farmer to prepare proper Business Plans with which to approach outside investors or commercial Banks in order to obtain credit.
- to give an impetus and create an increased need for sound farm business planning.
- encourage farmers to introduce and continue to use farming practices compatible with the increasing demands of protection of the environment and natural resources and upkeep the landscape and the countryside and which can help to adapt a number of sectors to market requirements.
- in order to assist farmers within the rapidly developing private farm sector to optimise the various opportunities for investment and profitable business activity available to them at any given moment in time. Markets are never static and farmers need to respond to changes in the market place which enable them to develop and sustain a farming strategy which will fulfil their business and personal objectives both in the short and long term. Planning is one of the key ingredients for achieving these objectives.

Why is there a need for rural enterprise planning in Hungary?

According to figures released by the Ministry of Agriculture and Regional Development, there has been a steady increase in the number of private farmers and the area of cultivated land held by them. This has occurred largely at the expense of land farmed by co-operatives and other farming organisations.

Table 1 Structure of the cultivated area according to business types

	1994	1995	1996	1997
	1000 hectares			
Enterprises and partnerships	1 163,5	1 086,9	1 090,3	967,0

Co-operatives	2 306,1	1 886,5	1 748,5	1 611,8
Farming organisations	3 469,6	2 973,4	2 838,8	2 578,8
total				
Private farmers	2 740,5	3 205,9	3 345,7	3 615,8
total	6 210,1	6 179,3	6 184,5	6 1946

Source: Ministry of Agriculture and Regional Development, 1998.

At this stage of privatisation process and development of rationalised farm businesses within Hungary, there exists a large number of small family-managed plots where business and production skills are at an elementary level.

Moreover, application for agricultural state support and planned subsidy priorities of the National Agri-Environmental Programme (NAEP) will be linked to the large-scale registration of farmers and the condition of having clear business plan and farm environmental management plans.

These facts represent a growing demand for establishing of rural extension services and an increased need for sound farm business planning.

At this time in the development of the Hungarian agricultural sector into a largely privatised and free market sector, it is necessary for farmers to recognise the constraints within the economy and the legislative framework of the country which must be borne in mind when investment decisions are being considered:

- a fully liberated land market has yet to materialise
- an economic land valuation is still to be developed
- a long term mortgage instrument is not yet available
- land cannot yet be used as collateral for borrowing
- long term finance for agricultural investments is not available
- there has not yet developed the strategy of using land as an alternative equity investment for non-farming investors
- the difference between the cost of borrowing (bank interest) and underlying annual inflation rates in the national economy mean that borrowing money is both expensive and burdensome to a business like agriculture which deals in production cycles frequently lasting longer than one year.

THE STRUCTURE OF PLANNING

Modelling should start from an examination of the agricultural production potentials of the area and as a result farming structure, size and technology adapted to the given conditions of the area could be defined in order to ensure that production functions are established and the best approximation of sustainable land use.

The prerequisite for the creation of a sustainable agriculture, that is operational on the long run is the environmental adaptation, i.e. the land should be used everywhere with appropriate intensity for the most suitable purpose or for what it can tolerate without damage.

One of the most important characteristic of the value preserving production practice is the establishment of a system of functions, activities and sectors and degree of intensity that fits to the landscape and the environment.

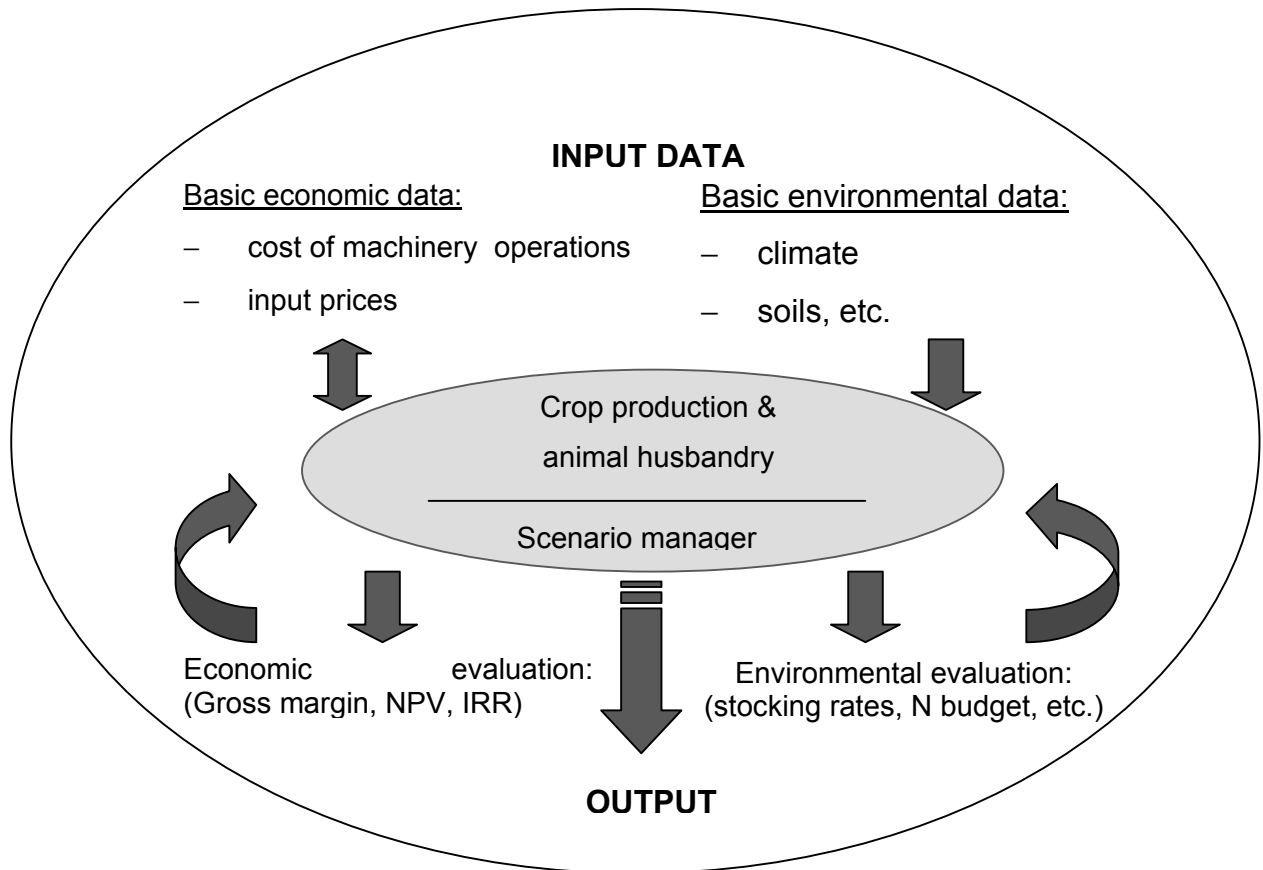
The basis of agriculture is crop production which utilises natural resources (soil, water, solar energy, etc.) and artificial resources (fertilisers, chemicals, machine work, etc.). Site specific cropping patterns must be developed based on agro-ecological properties of land and acceptable livestock density. It is important to match the environmental demands of crops (species, varieties) to the agro-ecological properties of land. The greater the mismatch between the two the more money and agrotechnical and ameliorative measures are needed to make the land capable of meeting the demands placed upon it.

The objective of the research is to elaborate *a computerised **planning methodology** that help farmers* to exercise effective management controls over the financial aspects of their business through proper planning and record keeping based on calculations of up-to-date information as well as encouraging the introduction and use of farming practices compatible with the increasing demands of protection of the environment and natural resources (multifunctional agriculture).

This *farm planning methodology* helps *estimating the economic efficiency of enterprises* in order to *evaluate the total business value of a farm* and to provide a guideline for the economic decisions of farmers. On the other hand environmental performance assessment is also included in the form of sustainability indices. A paramount issue of the methodology is the integration of well-known and widely applied methods, such as calculation of gross margin, internal rate of return and net present value linked to issues which were previously little focused on, such as manure production and use, or studying

the N cycle within the farm. This is important mainly due to the subsidy priorities of agro-environmental programs starting in the near future.

Figure 2 The structure of the planning methodology



This *computerised planing model* is suitable for

- planning and evaluating different business strategies.
- providing potential crop production, animal husbandry production technologies at an operation level, determine expected costs and income, analyse the possible production alternatives from economic point of view by elaborating mainly farm economy indices,
- preparing cash-flow calculations from the annual values of necessary investment costs, operational expenses and sales income,
- forming dynamic(considering the time factor, too) indices (NPV, IRR, etc.) in order to show the capital utilising and profit-making ability of agricultural enterprises,
- tracing the changes of some important input parameters in the key figures of plans (computer-aided sensitivity analyses),

- elaborating and evaluating forage and manure (and fertiliser) balances at farm level,
- modelling the nitrogen cycle of the farm and linking the N balance with profitability

The model in fact consists of computer spreadsheet systems built up on each other. With this we intended to make it relatively easier to follow the modifications to the prices and natural indices of production (e.g. size of arable land, animal stock groups, animal number, yields, fodder needs, etc.) in all the worksheets. In addition to this, of course, any modification concerning the basic data can be shown in the outcome immediately.

CONCLUSIONS

The basic objective of our work was to elaborate a rural business planning methodology that provides farmers with sustainable business plans. As a result the whole business value, economic and ecological feasibility of a farm can be assessed based on site specific issues like environmental sensitivity and agroecological suitability of the land and livestock density.

With the help of the planning methodology several scenarios for one farm can be modelled and the most suitable one can be realised. Feasibility of the scenarios are evaluated with indices characterising the level of sustainability both in environmental and economic sense. Cost-return relations, profitability and interactions of different agricultural enterprises and investments can be examined.

Farmer business planning and management should be a key activity for most farmers. If done properly, it will provide important benefits. Formal plans may also be necessary for obtaining loans.

Available key resources of land, labour, capital and management skill need to be measured and/or assessed for quality. Once this has been done, a realistic physical plan or series of plans for the business can be prepared.

Developments for the future

So far the methodology is still under a research phase. We have promising results with the practical application of the model presented in several studies and also teaching basic applications to students studying at the Institute of Environmental Management. Though we wish to develop further branches of the package more thoroughly. Such branches will include separate fertiliser planning module for nutrient budgeting, a pesticides database and adviser for pesticides optimisation, soil and climate database as well as a separate environmental performance monitoring module.

Along with the implementation of the agri-environmental schemes we wish to launch and test the planning system. As implementation interface we desire to use the Internet as the best option for accessing and using the planning methodology that is based on the same principles but could be working in a decentralized way through a network of national extension and advisory service at regional level. The implementation of this idea requires the building of a national database and further experience with special respect to methodological, legal and organisational issues of remote data handling

BIOGRAPHY

Katalin Balazs – She is MSc in Environmental Management, Doctoral Researcher and Research Assistant in sustainable land use and agri-environmental planning at the Department of Environmental Economics, Institute of Environmental Management, Szent Istvan University, Hungary. By training she is agronomist (MSc) specialised in environmental management. She has experience in farm level modelling, agroecological and economic land use planning, building farm level agri-environmental management scenarios, computer aided planning of alternative rural business.

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REFERENCES

Ángyán, J. – Fésűs, I. – Németh, T. – Podmaniczky, L. – Tar, F. (ed.) (1997): Magyarország földhasználati zónarendszerének kidolgozása a EU-csatlakozási tárgyalások megalapozásához (Land use zone study of Hungary, a background document for EU accession negotiations)(Alapozó modellvizsgálatok munkaközi anyaga II.), készült az FM Agrárkörnyezeti, Erdészeti, Biogazdálkodási és

Vadgazdálkodási EU Harmonizációs Munkacsoport megbízása alapján, Gödöllő, 46 p.

Ángyán, J. – Podmaniczky, L. – Fésűs, I. – Tar, F. (ed.) (1999): National Agri-Environmental Programme in Hungary, Budapest, 1999.

Ángyán, J. – Márkus, F. – Ónodi, G. – Podmaniczky, L. (1997): A természetvédelmi, ökológiai szempontok üzemi szintű integrálása a mezőgazdasági birtoktervezésben, (Farm-level integration of nature protection and ecological aspects into rural planning) “Zöld Belépő: EU-csatlakozásunk környezeti szempontú vizsgálata”. MTA Stratégiai kutatási program, Gödöllő-Budapest, 57 p.

Ángyán, J. – Menyhért, Z. (1988): Integrált alkalmazkodó növénytermesztés (ésszerű környezetgazdálkodás), (Integrated adaptive crop production) Közgazdasági és Jogi Könyvkiadó, Bp., 162 p.

FAO (1999): Central and Eastern European Sustainable Agriculture Network, First Workshop Proceedings, Gödöllő, Hungary 2 to 7 March 1999. – REU Technical series 61., FAO Rome, 1999.

Ministry of Agriculture and Rural Development (1998): The Hungarian Agriculture and Food Industry in Figures 1998

OECD (1999): The agri-environmental situation and policies in the Czech Rep., Hungary and Poland, OECD, Paris

OECD (2000): Environmental indicators for agriculture: methods and results, OECD, Paris

Podmaniczky, L. – Ángyán, J. -- Illés B., Cs.—Straub, T. (1997): Farming in protected landscape – Economic Analysis of the Possibilities for Sustainable Agriculture on the Outskirts of Kerekegyháza Village, Hungary – IUCN Gland (Switzerland) and Budapest, 1997.