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Contents

Editors' welcome

These numbers of Apstract are the result of the AVA4 International Congress, held in Debrecen March 26–27, 2009. An impressive number of papers of high quality were presented during the well organized sessions. From each of the 17 sessions the two best papers were chosen to be published in numbers 3 and 4 of volume 3.

During the opening session of the congress Professor Nagy, the president of the Centre for Agricultural Sciences and Engineering of the University of Debrecen as well as Professor Molnár, Hungarian Minister of Science, Research and Innovation emphasized the crucial role of knowledge in European economic development. The AVA4 Congress contributes to that and therefore is important.

I also would like to take the opportunity to draw your attention to the web site "ageconsearch": http://ageconsearch.umn.edu/ of the University of Minnesota (US) where you can find a wealth of articles and papers (including the Apstract articles) in our field. This really is a rich resource for research.

As Professor Nábrádi, the organizer of the conference, and Deputy Editor of Apstract indicated the bi-annual AVA congress has become a bi-annual Agrimba activity. The Agrimba Network, the AVA Congress, and our journal Apstract together form the three institutional pillars of the Agrimba activities. I am confident that this triple A is a success formula for the years to come.

Next time in 2011 the congress will be organized in Wageningen, the Netherlands. Everybody who is interested in research in the areas of applied economics, agribusiness, informatics or tourism is invited to take part in it. I am looking forward to meet you all in Wageningen.

Wageningen, Augustl 2009.

Wim Heijman
Editor in chief

Effect of uncertainty on farmers decision making: case of animal manure use

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1. Introduction

Due to the high levels of manure application and the poor use efficiency of manure, the European agriculture is held responsible for a considerable negative impact on surface water quality (*Langeveld* et al., 2007). This problem has emerged particularly in Western-European countries such as the UK, Belgium, The Netherlands and Denmark, facing a large expansion and intensification process in the livestock production since the 1960s (*Van der Straeten* et al., 2008). Policy measures related to the application of manure on the land encompass two major measures: emission rights, understood as the amount of nutrients which can be applied on the land, differentiated by crop and the N spreading calendars, whereby the manure can only be applied when the crop needs nutrients. The fundamental aim of this pillar is to maximising application rate while avoiding overfertilisation. Maximizing the application rate is related to the economic sustainability of the agricultural sector, by altering the manure surplus, while avoiding overfertilisation is imperative in enhancing ecological sustainability, by preventing nitrate leaching to surface and soil waters. For nitrate policy to meet its target, the farmers should not exceed their emission rights, however make optimal use of their emission right for manure. Consequently, the successful implementation of sink-related measures will strongly depend of the absorptive capacity of farmers towards new ways of nutrient management in general and of animal manures in particular.

The concept of absorptive capacity dates back to the seminal work of Cohen and Levinthal in the early 1990s, who defined it as "the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (1990). In this paper, this concept is applied to agriculture. This is different from a vast stream of absorptive capacity studies which focus on innovation or overall performance measures as outcome of absorptive capacity (*Lane et* al., 2006). This is a narrowed focus in compared to the initial work of Cohen & Levinthal, which stressed the general commercial application of knowledge (1990). As a consequence, *Lane* et al. argue that absorptive capacity should also be explored in non-R&D contexts (2006). Sustainable farming is indeed a case where absorptive capacity is relevant. In fact, the adoption of sustainable farming practices can be considered complex, knowledge intensive and non-prescriptive. This goes beyond the classical notion of knowledge transfer to- and adoption by farmers and moves towards learning based on social interaction (*Ingram,* 2008). Moreover, it is stated that the adoption of new agricultural practices requires autonomous learning instead of the reliance on standardised external knowledge (*Morgan and Murdoch,* 2000). This suggests that the challenge for contemporary extension lies in enhancing the realised absorptive capacity and moving beyond pure acquisition of standardized knowledge.

Absorptive capacity and uncertainty are strongly linked. Uncertainty plays a crucial role both in new innovation development and in the adoption of innovations. Recently, many authors have stressed the role of uncertainty in environmental innovations (*Meijer* et al., 2007; *Pannell* et al., 2006; *Serra* et al., 2008; *Torkamani*, 2005). Some authors argue that the risk involved with environmental innovations is higher as failure does not only have effect on sales but also on future production (environmental degradation) and threatens their licence-to-produce (*Vanclay,* 2004). Specifically related to the use of animal manures following kinds of uncertainty have been identified in literature:

- Policy uncertainty which manifests itself in a double way: on the one hand changes in the regulatory framework may force changes in the production process, on the other hand the farmer's choices regards the regulatory framework (e.g. tradable quota) suffer from uncertainty's in the farm's production level and in its production environment (*Lehtonen* et al., 2007; *Wossink and Gardebroek,* 2006).
- Effect of climate conditions on nitrate leaching (*Chambers* et al., 2000; *Sheriff,* 2005)
- Within-parcel and site-to-site variability in nitrification, surface runoff, volatilization and leaching (*Sheriff,* 2005).
- Uncertainty with respect to the exactness of analytical techniques. This relates to the fact that knowledge about some processes is still limited and that most models rely on the quality of data collection and may suffer from measurement errors (*Oenema* et al., 2003).

Therefore this paper investigates to what extent the perceived uncertainty about the use of animal manures affects

the farmers' absorptive capacity and how this finally results in higher satisfaction about external knowledge provision. In particular our research will focus on the late-adopters, specified as farmers exhibiting low animal manure use.

The research investigates two research hypotheses:

1. Perceived uncertainty has a negative effect on the absorptive capacity towards animal manure use.
2. Absorptive capacity towards animal manure use has a positive effect on the satisfaction about external knowledge provision.

2. Research method

Partial-Least Squares (PLS) path modelling allows to link absorptive capacity to its determining factors (uncertainty and control variables) on the one hand and to its outcome (satisfaction with knowledge provision) on the other, within one statistical model. A PLS path model consists of two models: a structural model, defining the relationship between latent variables and a measurement model, linking latent variables with a set of manifest variables (outer model) (*Tenenhaus* et al., 2005a). The structural model situates different latent variables within a causal chain. PLS path modelling is capable of analysing complex relations with many latent variables. The measurement model describes the latent variables indirectly, by blocks of observable variables. There are two possible relations between the latent and manifest variables: reflective and formative (*Coltman* et al., 2008; *Tenenhaus* et al., 2005b).

The PLS path model analysis is applied by the following steps. First, qualitative research methods (focus groups and expert-interviews) are applied to develop relevant scales for the studied concepts. Second, a survey is implemented to measure farmers' relation with the concepts. Third, cluster analysis is done in order to make a segmentation in terms of famers' manure use. Fourth, a PLS path model is developed and tested in order to answer the research hypotheses.

3. Analysis

3.1. Defining manure use profiles by cluster analysis

The nutrient strategy of arable farmers is characterised as a trade-off between animal manure and chemical fertilisers, each having both agronomic, economic and environmental advantages and disadvantages. By means of cluster analysis the farms are classified into four groups with an optimal internal resemblance, based on a set of variables that indicate the trade-off between manure and fertiliser[1] (*De Pelsmacker and Van Kenhove,* 2005; *Malhotra* et al., 2005). Cluster variables are the application rates for manure and fertiliser. The application rate is the proportion of the amount of applied N to the maximum admissible application right for N. The application rate for manure also included other organic nutrients (until 2005), which only represent a fraction of the total amount of applied organic N.

The results of the cluster analysis are summarised in *Figure 1.* A four-cluster solution is obtained. Clusters are labelled as manure users, varied users, fertiliser users and non-users. The analysis has also been made for the total Flemish population of farmers with low application rates, which permits to evaluate representativeness. The sample clusters indeed are representative in terms of size and cluster centres. For the fertiliser users in the sample the application rate for chemical fertiliser is slightly higher than in the whole of Flanders.

By interpreting the application rates of each of the clusters and describing them by FLA data the clusters can be interpreted as follows:

Manure users

The nutrient strategy of these farmers is almost entirely based on animal (and other) manures, although their application right is still below the Flemish average. Consequently the application rate for chemical fertilisers is very low. On average, these companies have an own production of 5.200 Kg. N. in 2005, of which 3400 Kg. was exported from the farm. It concerns mainly pig and cattle manure. Correspondingly, these farms primarily produce feed crops (grassland and corn). These farms own application rights and even own manure production, but obtain a lower application rate compared to the overall average. This can not be explained by a preference for chemical fertilisers, which is even lower. Consequently, this cluster relies almost entirely on manures.

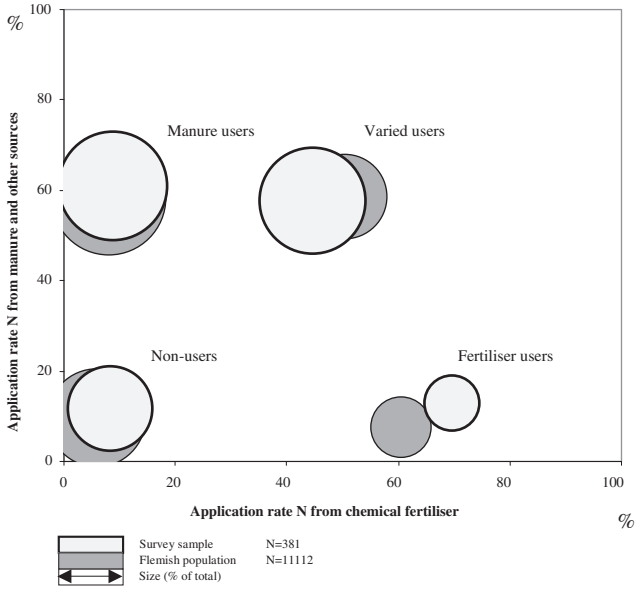

Figure 1: Application rates and size of user profiles within survey sample and Flemish population of farmers with manure application rate below average (for N), 2005

1 Data source: FLA, 2007

Diversified users

These farms make use of both nutrients from manures (application rate 58%) and chemical fertilisers and from chemical fertilisers (45%). This cluster is specialised in the production of cereals in combination with corn and grassland. On average, these are the largest farms, both in terms of maximum admissible application right as in terms of average surface (30 ha.). On average, they have a negative manure surplus of -817 Kg N.

Chemical nitrogen users

This is the smallest cluster, primarily using chemical fertilisers, for which they have an application rate of 70%. This group is specialised in arable farming and a variety of other crops, in particular fruit and horticulture. These farms have the lowest maximum admissible application rights.

Non-users

This is a heterogeneous group with low application rates for all manure types, e.i. hardly using nutrients at all. On the one hand, these farms have a low average surface area (15 ha.) but on the other hand a high production of pig manure (2600 kg N) which is, however, not significantly different from the other nutrient use profiles. As such, this group includes a limited number of large scale pig farms with limited arable land. In line with this, on average about 4188 Kg out of 4300 Kg N manure production is exported from the farm (in 2005). Further, this nutrient use profile consists of arable farms with diverse crop specialisations.

3.2. Building the PLS path model

Following the research hypotheses and the theoretical framework, absorptive capacity, uncertainty and satisfaction with external knowledge provision are the main latent variables in our model. Further, three control variables are included in the analysis, for which existing theory demonstrates a relationship with absorptive capacity. Hereby, the impact of uncertainty will be measured against these variables. The model is depicted in *Figure 2.*

Data for the main latent variables are drawn from the survey, while the control variables combine data from the FLA with a few survey variables. The latent variables are defined as sets of manifest variables as follows. The variables and mean scores are described in *Table 3* in annex and is referred to by *Figure 2.* In the formative constructs of the model three pairs of variables exhibit high inter-item correlation. To prevent multicollinearity these variables were transformed into three factor scores.

Absorptive capacity is modelled as a reflective construct consisting of variables referring to the three moments of absorptive capacity as distinguished by *Cohen and Levinthal* (1990): valuing new external information, assimilating it, and applying it. The selected variables refer to different aspects of manure management. By implementing these variables in a reflective construct the underlying dimension, absorptive capacity, is measured. The variables relate to the evaluation of technological knowledge, learning about manure policy and nutrient management, the feasibility of planning crop succession for optimal nutrient uptake, the motivation for nutrient management and its effect on the complexity of work.

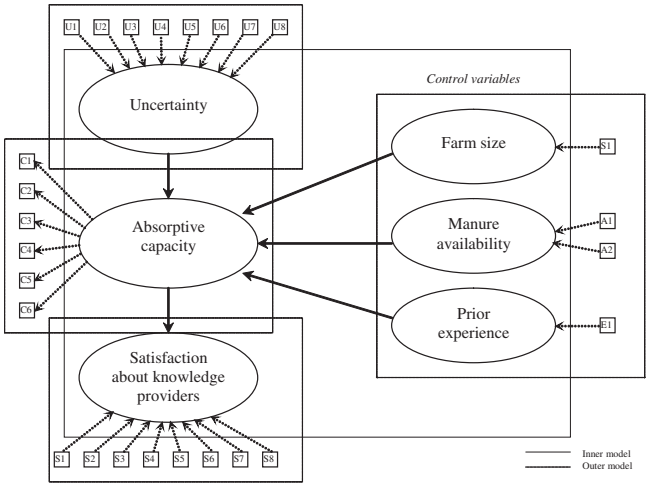

Figure 2: Conceptual framework

Uncertainty and satisfaction about knowledge providers are modelled as a formative constructs, whereby the reliability of the constructs is supported by the explorative qualitative research stage. Although this sufficiently underpins their relevance, their exhaustiveness can not be presupposed. Observing the variables the expectation is that some variables are correlated and others not. By modelling these latent variables formatively rather than reflectively, later analysis will reveal differences in loading of the manifest variables on the latent variable. Uncertainty refers to types of uncertainty: policy uncertainty (affecting investment decisions and the risk of penalties), agronomical uncertainty (climate uncertainty, autumn mineralisation and historical factors in the parcel) and the variability of manure- and soil analysis results, depending of the lab, the timing and place of sampling. Satisfaction with knowledge provision encompasses government communication: its effect on manure use, its transparency and amount of initiatives, information leaflets, personal advice and the activities of the FLA. However, reference is also made to fertilisation advices (public or private) and advice of suppliers and customers. A final variable indicates the willingness-to-pay for manure- and soil analysis.

The control variables refer to farm size, manure availability and prior experience. Farm size is understood as the surface area. Manure availability is measured by production pressure, being the net production of animal manure per ha. in the community where the farm is located. However, as this measure ignores the possibility of transport to neighbouring regions, this variable is complemented with a survey measure (*Van der Straeten* et al., 2009). Prior

experience is measured by the manure application rate for animal manure in 2005 and the percentage of surface area in vulnerable areas in 2005. As indicated earlier, in 2007 the new Manure Action Plan generalized the emission rights in vulnerable areas to the entire Flemish area. Consequently, farmers which had a higher percentage of vulnerable area had a higher prior experience with the new legal situation by the time the legislation change occurred.

3.3. Testing the model

The model is applied to four manure use profiles. It is expected that the model's predictive power will be different for each profile, as the knowledge absorption is assumed to be correlated to trade-off between animal manures and chemical fertilisers. The evaluation of a PLS path model follows three stages: first, quality criteria for the measurement model are evaluated. Second, the effects of the inner model are interpreted and finally, the outer model is interpreted. The significance of the effects is verified by the bootstrap procedure.

Table 1: Evaluation of absorptive capacity (applied to four models)

	Inner model			Outer model		
	Path coeffi-cient	Boot-strap t-value	R^2	AVE	Cron-bach's Alpha	Com-posite reliability
Manure users	0,416	5,442	0,388	0,640	0,726	0,912
Varied users	0,637	9,873	0,302	0,558	0,734	0,881
Fertiliser users	0,720	13,774	0,538	0,521	0,709	0,863
Non-users	0,462	6,144	0,380	0,410	0,614	0,790
t-value	sig. > 2					

Our measure for absorptive capacity can be evaluated by three criteria, as depicted in *Table 1.* The average variance extracted (AVE) is the amount of variance that is captured by the construct in relation to the variance that is captured by measurement error (*Fornell and Larcker,* 1981). Except for the non-users our measurement model for absorptive capacity fulfils the AVE-criterion for both reliability and discriminant validity. Two other measures reflecting internal consistency are composite reliability and Cronbach's Alpha, where the threshold is 0,7 (*Hulland,* 1999). For composite reliability, all user profiles pass the threshold, while the non-users do not pass the threshold for Cronbach's Alpha (0,614). This, together with the poor AVE, implies that our construct for absorptive capacity is not relevant for farmers who do not use any nutrients, or that it is multidimensional. Indeed it could be argued that if farmers do not use nutrients at all, the variables with respect to learning about manure are perceived less relevant by the respondent. On the other hand, multidimensionality could also play a role as this cluster encompasses a number of cattle farms with land which is not actively used. The reliability of formative construct relies on theory. In this research the relevance of the formative constructs is supported by the qualitative research (focus groups and expert interviews) which resulted in an identification of bottlenecks for using manure. This supports the relevance of the variables in the model but does not guarantee exhaustiveness. Conclusions about the latent variables should therefore be restricted to the aspects of uncertainty covered by the manifest variables.

The effects between the manifest variables in the inner model are evaluated by the R^2 and the path coefficients. The path coefficients should be understood as standardized linear regression coefficients representing possible causal linkages between the latent variables. As the analysis makes use of four distinct models with four distinct sets of path coefficients and indicator loadings, one should be cautious in comparing them between user profiles in absolute figures as the size of each coefficient is relative to the set of coefficients within the model. The significance of the path coefficients is assessed by the bootstrap t-values, which should be higher than 2.

The four models exhibit moderate potential to explain farmers' absorptive capacity, with R^2 ranging between 0,302 and 0,538 (see Table 1). It is clear that the models do not permit accurate prediction of absorptive capacity, for which an R^2 higher than 0,5 is recommended. This criterion has been met for the fertiliser users (0,538) but is below 0,4 for the other profiles. However, as the main aim is to test the role of uncertainty and not to offer the full explanation of absorptive capacity, this is no obstacle for developing research findings about manure users as well as non-users.

Uncertainty has a strong negative effect on farmers' perceived absorptive capacity, as depicted in

Table 2: Evaluation of the formative latent variables (applied to four models)

	Path coefficient	Bootstrap t-value	R^2
Satisfaction knowledge providers			
Manure users	*n.a.*	*n.a.*	0,173
Varied users	*n.a.*	*n.a.*	0,406
Fertiliser users	*n.a.*	*n.a.*	0,519
Non-users	n.a.	n.a.	0,213
Uncertainty			
Manure users	-0,583	8,794	*n.a.*
Varied users	-0,520	6,757	*n.a.*
Fertiliser users	-0,523	5,029	*n.a.*
Non-users	-0,603	5,172	*n.a.*
Farm size			
Manure users	0,186	2,423	*n.a.*
Varied users	0,109	1,585	*n.a.*
Fertiliser users	0,256	3,691	*n.a.*
Non-users	0,062	1,254	*n.a.*
Availability of manure			
Manure users	0,046	0,712	*n.a.*
Varied users	0,101	1,338	*n.a.*
Fertiliser users	-0,133	1,614	*n.a.*
Non-users	-0,033	0,451	*n.a.*
Prior experience			
Manure users	-0,090	1,308	*n.a.*
Varied users	0,081	1,101	*n.a.*
Fertiliser users	-0,344	3,657	*n.a.*
Non-users	-0,122	1,181	*n.a.*
t-value sig. > 2 n.a. not applicable			

Table 3: description of the manifest variables (One-way ANOVA)

	Mean scores				
	Manure users	Varied users	Fertiliser users	Non-users	Sig.
Satisfaction knowledge providers					
"If government would communicate better this would not have effect on my animal manure use"	2,59	2,69	2,44	2,69	,636
"Fertilization advices are sufficiently detailed to achieve a good result"	3,42	3,58	3,83	3,55	,197
"I know which public knowledge partner I should address with my questions"	2,75	2,79	2,50	2,72	,651
"I can address my suppliers and customers for various advice"	2,71	2,58	2,89	2,53	,333
"The personal support by public institutes is a good help"	3,23	2,86	2,92	2,97	,033**
"The Flemish Land Agency should put more effort in counselling farmers"	1,83	1,74	1,94	1,91	,484
"The amount of extension activities is appropriate for having an overview over available information"	3,12	3,07	3,08	2,94	,621
"The price of manure- and soil analysis is not a burden for making use of these techniques"	2,24	2,15	2,52	2,33	,375
Absorptive capacity					
"I succeed in comparing and assessing different available technologies"	2,99	2,91	2,88	2,82	,698
"I succeed in planning crop succession in order to optimize nutrient uptake"	2,46	2,33	2,72	2,36	,274
"I can deal with the increased complexity of work which follows from manure issues"	2,10	1,94	2,22	1,97	,418
"I succeed in remaining up-to-date about manure policy"	2,68	2,58	2,80	2,69	,779
"I succeed in remaining up-to-date about nutrient management techniques"	2,96	2,90	3,22	3,22	,246
"The difficulty of nutrient management does not discourage me"	2,88a	2,83a	3,42b	2,66a	,030**
Uncertainty					
"I would use more animal manure if the result was more predictable"	3,72	3,62	3,83	3,49	,311
"Because of the risk on penalties and income loss I choose to use less animal manure than my crop can take"	4,07	4,01	3,92	3,82	,443
"Due to the frequent changes in manure policy I am more reluctant to take investment decisions"	3,72	3,79	3,69	3,91	,566
"Climate unpredictability has great effect on nitrate leaching on my parcels"	4,11a	4,36a	4,14a	4,05a	0,045**
"Past activities on my parcel are influencing my nutrient management result up to date"	3,27	3,29	3,22	3,28	,305
"I experience strong variability in manure- & soil analysis results between labs"	3,24	3,29	3,22	3,28	,956
"I experience strong variability in soil analysis results depending of place & timing of sampling"	3,52a	3,83a	3,75a	3,65a	,045**
"I do no trust manure transporters"	2,56	2,50	2,50	2,37	,620
Farm size					
Surface are in 2005 (ha.)	22,54bc	29,30c	18,92ab	15,07a	,000**
Availability of manure					
Production pressure of animal manures per community	218,85b	186,14b	118,49a	215,87b	,000**
Manure available in region	2,04	1,94	2,25	2,10	,439
Prior experience					
Manure application rate in 2005	61,06b	57,50b	9,42a	12,19a	,000**
Pct. vulnerable area in 2005	40,96	47,16	38,29	49,00	,424

Sig. < 0,05
Letters in superscript indicate subgroups with significantly different mean scores (Duncan's Post-hoc Test)

Table 2. The higher importance attributed to uncertainty factors, the lower the perceived absorptive capacity will be. This holds true for all four user profiles, but the effect is strongest for the manure users and non-users. These are the profiles which rely on animal manures primarily, showing that uncertainty increases with reliance on animal manure. The profiles also using chemical fertiliser (varied- and fertiliser users) have a lower path coefficient. However, for fertiliser users this coefficient should be interpreted as high, as it could be assumed that their very low animal manure use would result in lower importance of uncertainty factors specific to animal manure.

In our model the effect of uncertainty is stronger than of the control variables. Farm size has a moderate, but highly significant positive impact on the absorptive capacity of manure- and fertiliser users. Further, prior experience with animal manure in 2005 has a negative impact on fertiliser users' absorptive capacity today (-0,344). There is no significant impact of manure availability on absorptive capacity. As such, the proximity of manure producing farms does necessarily stimulate learning among farmers with low application rates.

Absorptive capacity has a positive effect on the satisfaction with external knowledge provision. Alternatively, the poor absorptive capacity of some farmers explains why they are not satisfied about the available knowledge. The effect is significant for all four user profiles, but it is strongest for the varied users and fertiliser users. This is striking as these are the user profiles which also make use of chemical fertiliser intensively. Considering that most variables measuring satisfaction with extension are related to nutrient management in general and not manure specifically, this indicates that knowledge absorption about animal manures is also beneficial for farmers combining both nutrient sources.

4. Conclusion

The negative effects of uncertainty and on perceived absorptive capacity indicates that identified problems with respect to the use of animal manures do not motivate farmers to search for external knowledge in order to solve these

problems but, in contrary, they will be less inclined to learn about better ways to make use of manure. Furthermore, this will make them also less satisfied about the external knowledge which is offered and particularly will make them less willing to invest in soil analysis techniques which could help them to develop a more reliable nutrient management.

These conclusions are problematic for policy makers, counsellors and consultants.

First of all, while uncertainty could lead to problem identification and start a learning process in some contexts, it might discourage all learning in others, such as in the case of manure use. Policy makers should be aware that uncertainty following policy changes might lead to diminishing capacity of farmers to adapt to these changes and eventually lead to undesired effects of the measure.

Second, while extension is the main instrument to help farmers adapt to the changing production environment, farmers with low absorptive capacity – being the main target group for these actions – will be less open towards these extension activities. This shows that more policy attention should be devoted to enhancing the learning skills and openness towards external knowledge.

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The importance of logic planning in case of IT and innovation projects

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Abstract: In case of using methodology of project planning, in the first step we had to create a "good" logic network. We had to determine the successors and predecessors of the tasks. However, usually successors and predecessors proceed from the technology, sometimes (especially in case of IT and innovation projects) these relations between tasks are not explicit.
In case of projects, especially IT and innovation projects, one of the most critical points of view is the phase of logic planning. However, it is a very important phase, only slightly supported by any kind of Project Management tools. Our goal was to support the logic planning phase. In our paper a new planning method, namely SNPM (Stochastic Network Planning Method) is introduced through some practical applications. SNPM can determine all feasible solutions with the help of stochastic variables and can also take into consideration all possible precedents. The parameters of logic relations can be changed if the impacts on the project change. With this method the most probable project scenario can be determined taking into account costs and resource demands.

Key words: Stochastic Network Planning Method, Project Expert Matrix, logic planning of IT projects

1. Introduction

IT projects play an important role in businesses; however their time and cost demands are very high. (*Szabó*, 2006) As a result of stochastic characteristics of IT projects, the planning phase has high priority. (*Dawson,* 1998)

There is an important difference between construction and IT projects. In case of IT projects certain task sequences can be repeated and reversed. According to the specialties of IT and innovation projects, the classic project scheduling techniques cannot be used exactly, because sometimes the sequences of the tasks cannot be determined. Therefore simple AoA and AoN project networks are not the best methods for modeling these projects.

A typical IT project could be the introduction and installation of an ERP system which could be a large project. (*Yusuf,* 2004) If the parent company intends to introduce the selected system at its subsidiaries the experiences of earlier installations can be used in the new introductions. Previously it was hardly possible to use the experiences of earlier installations. Although project templates could be reused it was not a great solution, since every implementation differs from each other. Instead of storing complete project templates it is more useful to store relations between various tasks. This paper aims to solve above mentioned problems with the help of a new method.

IT projects can be approached from two directions. On the one hand the process of software development can be regarded as a project. There are several models to plan software development. The oldest is the waterfall model, which is very inflexible, since there is a lack of feedback. The agile program planning and extreme programming are becoming more and more popular.

On the other hand there are the procurers and users. A typical example of an IT project is the introduction of an ERP system. The task sequence of the introduction can be regarded as a project. Although in case of more introductions following each other at different subsidiaries they are rather regarded as processes. (The practical example relates to an ERP system introduction, so details are not provided here.)

A software developing process has six phases: analysis, specification, planning, implementation, testing and installation. All program development models contain these phases. There are two kind of marginal cases: the unique and the standard software introduction and development. The difference between them is, that the analysis is realized on different sides and in case of a standard software the planning and implementation phase can be drawn together and replaced by configuration.

For example at a spiral model the process of development runs again and again. Closing down each cycle the planning phase will start again to develop the software, to correct the errors, as a result of new demand. These activities assure the continuous compliance of the software.

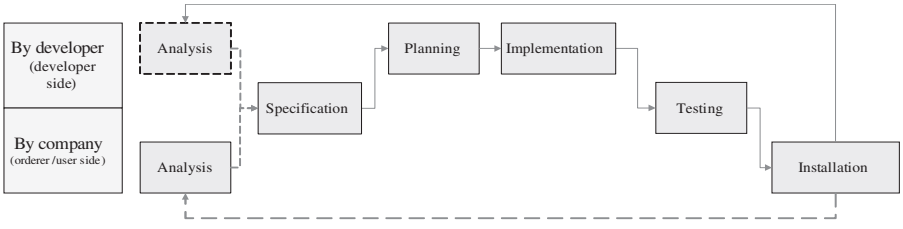


Figure 1: The process of software development with spiral model

It can be seen on *Figure 1* that on the developer side it is not certain whether an analysis need to be completed or not, so that it is illustrated by dashed lines. Between some of the phases the relation is represented by dashed lines, it refers to an uncertain relation. The classic AoN project planning techniques cannot be suitable to depict such a logic plan, because they cannot handle the possible solutions and possible relations between two tasks. GERT and eEPC are suitable to handle the selection between tasks, branches and interconnections, but they cannot handle possible relations. In the course of our research a method was developed which can solve these problems. In this paper we concentrate on handling of uncertain relations. Later research will focus on handling of possible circles on project network.

2. Materials and Methods

In case of IT projects it is practical to handle possible project structures on the level of relations. Therefore it is important to make a distinction between certain and uncertain relations. In case of certain relations tasks have successors and predecessors, and the order of tasks is determined (in our method we use probability value 1 to describe certain relations). In case of uncertain or possible relations two tasks can follow each other, but it is not certain that there is relation between them. The intensity of relation in case of possible relations is between probability 0 and 1. There are some important questions to consider. For example: how can the intensity of relation be determined, how can possible solutions be determined and how can the best solution be selected from these with a quick method? Our method described below gives answers to these questions.

2.1 Supporting logic planning with matrix methods

It is an easy way of planning and scheduling projects and processes using adjacency matrices. **DSM** (Dependency Structure Matrix) serves to plan the order of tasks. The great advantage of the matrix method is the consistency and the easy review independent from the size and the relations between tasks. The matrix is a useful tool of planning tasks' order. (*Maheswari,* 2005) It provided the idea of making the Stochastic Network Planning Method (**SNPM**). The advantage of SNPM is that this method can identify the feasible solutions while taking into consideration the intensity of relation between tasks. The probability variables of the intensity of relation between the tasks show the preferences of the decision makers. But this model with some restrictions can also use the management preferences. The SNPM can determine all feasible solutions with the help of stochastic variables and taking into consideration all possible precedents. (*Kosztyán,* 2008)

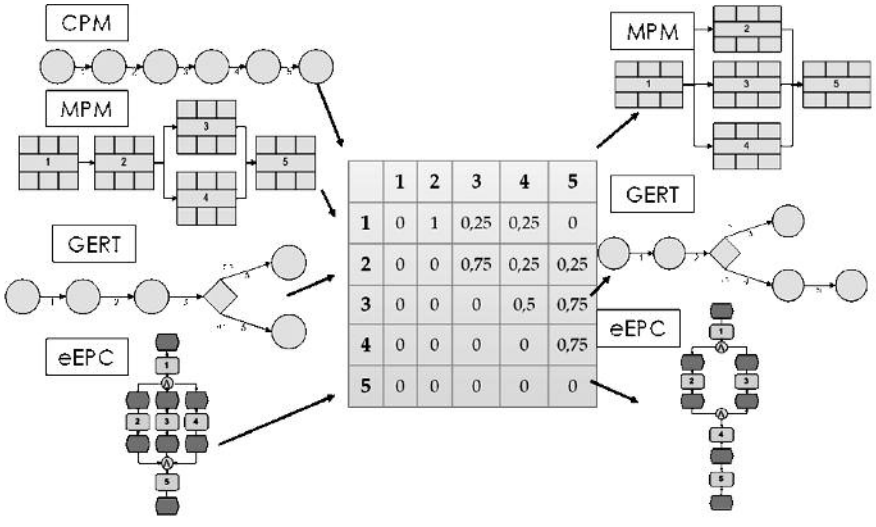
2.2 Representation of SNPM – finding possible solutions

The inputs of the method are the logic plans derived from experts or from earlier experiments, which can be indicated by different techniques (like CPM, MPM, PERT, GERT, eEPC – on *Figure 2*). (*Stoop,* 1996) (*Fatemi Ghomi,* 2003) (*Pritsker,* 1966) (*Scheer,* 2000) (*Van der Aalst,* 1999)

Relation matrices can be made taking into account each possible logic plans. The intensity of relations could be a (weighted) average of every possible project scenario, which was taken as adjacent matrices. In this way the earlier experiences of success projects can be taken into account.

2.3 The improved method – handling logic plans

The SNPM, showed earlier, can give and represent all possible solutions taking into account the restrictions; moreover it is possible to select the optimal solution from the feasible solutions according to a target function (like minimal duration time, minimal cost demands etc.).



	1	2	3	4	5
1	0	1	0,25	0,25	0
2	0	0	0,75	0,25	0,25
3	0	0	0	0,5	0,75
4	0	0	0	0	0,75
5	0	0	0	0	0

Figure 2: Representation of SNPM

Table 1: Relation matrix

$SNPM_k$	A_1	...	A_i	...	A_n
A_1	0				
⋮		0			
A_i			0		
⋮				0	
A_n					0

Table 2: Modified relation matrix

PEM_k	A_1	...	A_i	...	A_n
A_1	δ_1				
⋮		⋱			
A_i			δ_i		
⋮				⋱	
A_n					δ_n

Our method can summarize more input logic plans, which can derived from earlier experiences or from experts. So probabilities can be objective or subjective. The intensity of relations determined by experts could be handled as a vote of these experts.

If we take some possible project scenarios, there could be some tasks, which is not in every possible project scenario. SNPM could not handle this problem so we had to improve our method. In order to handle this problem we can determine the modified relation matrix, where the diagonal represents the occurrence of tasks in the input project plans. (For example, if the given task can be found in all project scenarios, the value is 1.) The values of **PEM** (Project Expert Matrix) are the averages of the probabilities in the cells of the modified relation matrix, also included in the average of the probabilities in the diagonal.

After representing all possible relations in SNPM or in PEM matrices, the next phase is to represent all possible solutions in a representation graph, and from this the most probable solution can be determined. The SNPM can give and represent all possible solutions according to restrictions; moreover it is possible to choose the optimal solution according to a determined target function.

Henceforward, we summarize the steps of the algorithm method which is the base of our research, and after that we detail the usage of the method. Our method can find good solution relatively quick, because it proceeds from all possible solutions and it searches logic nets with the most possible occurrence probabilities.

2.4 Details of the method

Logic planning is difficult, because it is hard to predict the tasks, the order of tasks, successors and predecessors, durations, cost and resource data. It is true especially in case of stochastic time projects and processes, eg. IT projects.

If there are lots of uncertain factors in the course of planning, practically more experts are requested to make logic plans. It is possible to determine the optimal logic plan from the different plans, so it is already a good estimation of the expected duration of the project and process.

Experts can make their plans with using of different techniques and methods. Plans have to handle as AoN nets, which show the logic structures.

Depending on that all plans given by the experts include all tasks or not, relation matrices (SNPM – $\delta = 0 \iota = j$) or modified relation matrices (PEM – $\delta(A_i, A_i) \in [0,1]$) are made to all logic plans.

The number of experts: $k=1,2,\ldots,m$, kN.

The average of the probabilities by cells in the relation matrix gives the intensity of relation between two tasks, and in the diagonal it is the occurrence of the tasks in the logic plans. The average values are depicted in averaged relation matrix or in project expert matrix.

Count of occurrence probability:

– **In case of SNPM:** it is the product of the intensity of relation of tasks, which are in the logic plan and the negated probabilities of tasks (it means the probability multiple –1), which are not in the logic plan.

– **In case of PEM:** it is a complex product, which concludes three components. One of them is the product of the probabilities of the diagonals in case of the logic net included in the tasks. The second part is the product of opposite probability of tasks, which are not in the logic plan. The third component is the product of the weights of the edges (intensity of relation) of the graph.

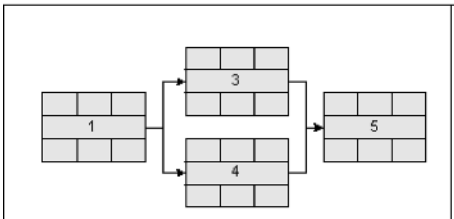
On the basis of the averaged relation matrix or PEM the representation graph is drawn up, which includes in all possible relations between tasks. The graph edges show the intensity of relation between tasks.

Finally from the representation graph the optimal solution(s) have to be chosen on the basis of occurrence probability. All tasks have to be in the solution, because the graph is built up according to the most probable relations. To solve the minimal cost spanning tree problem, (where the cost could be the logarithmic values of 1-probabilities of relations) the Kruskal can be used. After using any kind of MST algorithm, we received a directed acyclic graph, where product of probabilities is maximal. The only disadvantage of this method is this tree could have more than one source (initial activity), and more than one sink (finish activity). This problem can be handled, if we use virtual tasks as start and finish point, or use relations (where intensity of relation is under 0,5) to give project net (directed acyclic graph with only one source and only one sink).

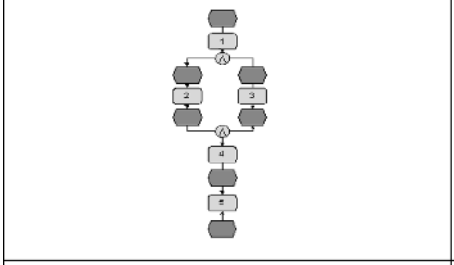
A simple exercise is shown on Table 3 according to the exercise of representation (on *Figure 2*) to the usage of these methods. The activity 2 is left from the MPM, so PEM has to be used.

The relation matrices were made on the basis of the logic plans in *Table 3*. **Table 4** shows the Project Expert Matrix, which includes in the average of relation matrices.

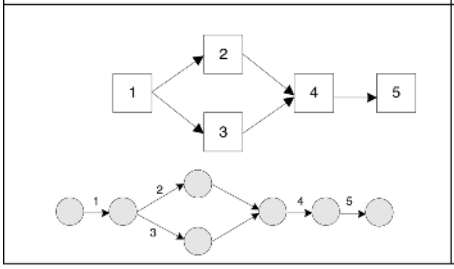
Table 3: Logic plans and their relation matrices



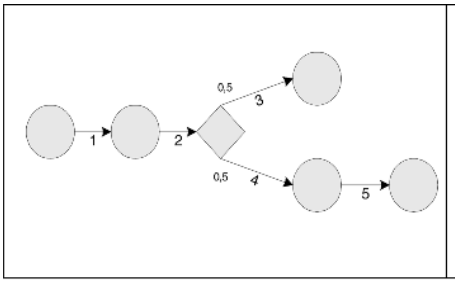
MPM 1m	1	2	3	4	5
1	1	0	1	1	0
2	0	0	0	0	0
3	0	0	1	0	1
4	0	0	0	1	1
5	0	0	0	0	1



eEPC 1	1	2	3	4	5
1	1	1	1	1	0
2	0	1	0	0	1
3	0	0	1	0	1
4	0	0	0	1	1
5	0	0	0	0	1



CPM1	1	2	3	4	5
1	1	1	0	0	0
2	0	1	1	0	0
3	0	0	1	1	0
4	0	0	0	1	1
5	0	0	0	0	1



GERT 1	1	2	3	4	5
1	1	1	0	0	0
2	0	1	1	0	0
3	0	0	1	1	1
4	0	0	0	0,5	0
5	0	0	0	0	0,5

The representation graph (on *Figure 3*) contains all possible relation including in the averaged relation matrix.

Optimal solutions can be selected from representation graph with the help of Kruskal algorithm (in *Table 5*).

Table 4: Project Expert Matrix

PEM	1	2	3	4	5
1	1	0,750	0,500	0,500	0,000
2	0,000	0,75	0,500	0,000	0,250
3	0,000	0,000	1	0,500	0,750
4	0,000	0,000	0,000	0,9	0,750
5	0,000	0,000	0,000	0,000	0,9

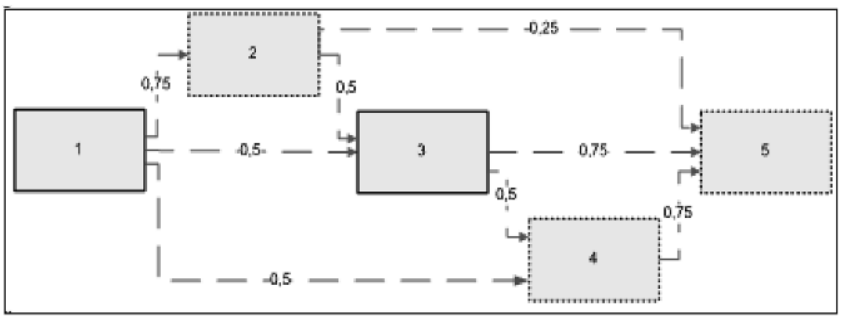


Figure 3: The representation graph of PEM

3. Results and discussion

A practical exercise to an ERP introduction

By a company group an ERP system is introduced following a roll-out strategy firstly by a subsidiary. Before the actual introduction a pilot version is introduced, but the tasks are nearly the same in both introductions. As an example the series of tasks are presented, which have to be completed in the pilot version. In case of two task packages (2.3 and 2.5) tasks have to be carry out in a given period of time, but they can be realized earlier. Hencefor-ward, we show the completing plans of the task package 2.3. Planning serial and parallel and in a possible executing order are represented in Gantt diagrams and in their relation matrices (in *Table 6).*

After that the average of the probabilities of the three possible solutions gives the averaged relation matrix (in Table 7).

On the base of the averaged relation matrix we can draw up the representation graph which shows all the possible relations between tasks (on Figure 4). From these we can choose the optimal solution(s) according to the occurrence probabilities.

To execute an IT project successfully it is necessary to plan the project accurately. But the classic methods were not developed for these projects, so they cannot be used properly. Project planning methods are not applied in many cases so probability of unsuccessful projects is increasing. The reason for this is that the planned project time, cost and resources are exceeded.

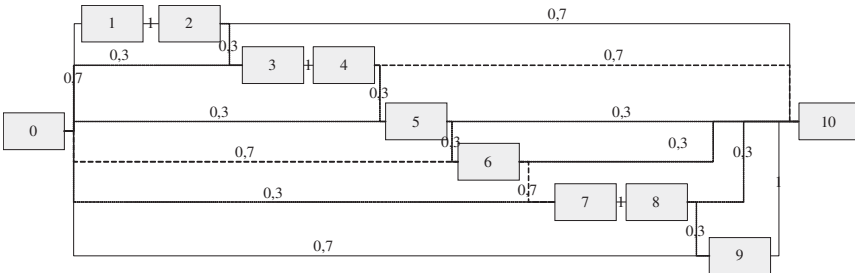


Figure 4: The representation graph of the example

Table 5: Optimal solutions

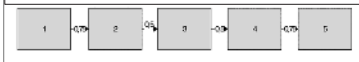
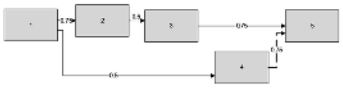
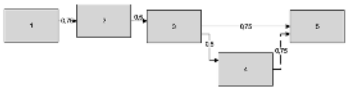
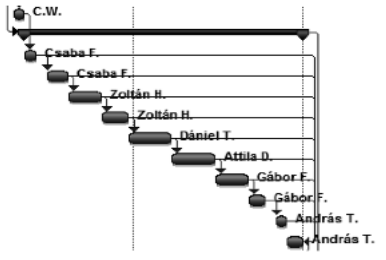
Logic plan	Occurrence probability (P)
	P = (0,75*0,9*0,9)*0,75*0,5*0,5*0,75 = **0,08543**
	P = (0,75*0,9*0,9)*0,75*0,5*0,75*0,5**0,75 **=0,0640**
	P = (0,75*0,9*0,9)*0,75*0,5*0,5*0,75**0,75 **=0,0640**

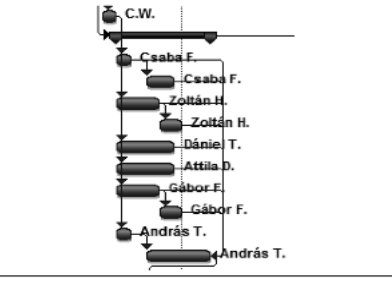
Table 6: The possible executing ways of the task package 2.3.

Serial



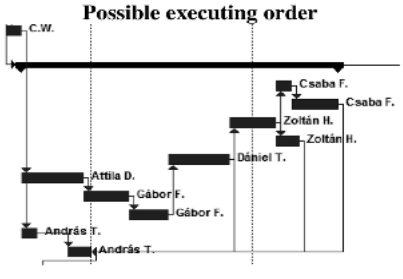
	0	1	2	3	4	5	6	7	8	9	10
0	0	1	0	0	0	0	0	0	0	0	0
1	0	0	1	0	0	0	0	0	0	0	0
2	0	0	0	1	0	0	0	0	0	0	0
3	0	0	0	0	1	0	0	0	0	0	0
4	0	0	0	0	0	1	0	0	0	0	0
5	0	0	0	0	0	0	1	0	0	0	0
6	0	0	0	0	0	0	0	1	0	0	0
7	0	0	0	0	0	0	0	0	1	0	0
8	0	0	0	0	0	0	0	0	0	1	0
9	0	0	0	0	0	0	0	0	0	0	1
10	0	0	0	0	0	0	0	0	0	0	0

Parallel



	0	1	2	3	4	5	6	7	8	9	10
0	0	1	0	1	0	1	1	1	0	1	0
1	0	0	1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	1
3	0	0	0	0	1	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	1
5	0	0	0	0	0	0	0	0	0	0	1
6	0	0	0	0	0	0	0	0	0	0	1
7	0	0	0	0	0	0	0	0	1	0	0
8	0	0	0	0	0	0	0	0	0	0	1
9	0	0	0	0	0	0	0	0	0	0	1
10	0	0	0	0	0	0	0	0	0	0	0

Possible executing order



	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	1	0	0	1	0
1	0	0	1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	1
3	0	0	0	0	1	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	1
5	0	0	0	1	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	1	0	0	0
7	0	0	0	0	0	0	0	0	1	0	0
8	0	0	0	0	0	1	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	1
10	0	0	0	0	0	0	0	0	0	0	0

The goal of our research has been to develop a new method, which is suitable to support the logic planning, which depict the relation between tasks. Our method can determine all possible solutions, but it represents a great combinatorial problem, because it can be 2^k solutions (where k means the number of the relations between tasks). With our method the number of possible solution are restricted, because starting from the representation graph we choose the solutions with the greatest occurrence probability. From these we can choose the optimal solution according to a given target function. The optimal solution can be easily estimated by the summary of expert opinions or previous experiences.

SNPM and PEM can be the base of an expert or decision support system in the future. Such a system can be a useful help for the company experts and project managers especially in case of IT projects which contain great uncertainty. Through this method the experiments of the earlier, similar projects and processes will be usable to increase the success and effectiveness of the execution of later projects and processes (shorter duration, less cost, optimal use of resources, etc.)

The experiences about the realization of the project can modify the intensity of the relation, and this way the number of feasible nets can be modified. Logic net can be used or reused not only as a project template, but also indicating the intensity of the relation and this way all alternative solutions can also be determined. Besides finding the relevant logic plan and determining the durations of tasks, the cost and resource demands (e.g. minimal total cost and minimal total project time, etc.) can be useful to find the best project plan. This method can even help the project manager to rank the feasible solutions sorted by TPT, total cost etc, and find the most probable project scenario.

Acknowledgements

The authors would like to thank Polák-Weldon Réka for her support.

Table 7: Averaged relation matrix of the task package 2.3.

	0	1	2	3	4	5	6	7	8	9	10
0	0,0	0,7	0,0	0,3	0,0	0,3	0,7	0,3	0,0	0,7	0,0
1	0,0	0,0	1,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
2	0,0	0,0	0,0	0,3	0,0	0,0	0,0	0,0	0,0	0,0	0,7
3	0,0	0,0	0,0	0,0	1,0	0,0	0,0	0,0	0,0	0,0	0,0
4	0,0	0,0	0,0	0,0	0,0	0,3	0,0	0,0	0,0	0,0	0,7
5	0,0	0,0	0,0	0,3	0,0	0,0	0,3	0,0	0,0	0,0	0,3
6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,7	0,0	0,0	0,3
7	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	1,0	0,0	0,0
8	0,0	0,0	0,0	0,0	0,0	0,3	0,0	0,0	0,0	0,3	0,3
9	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	1,0
10	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

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Implementing Learning Design by lams to improve teaching and learning

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Abstract: Learning Design has the potential to revolutionize e-learning by capturing the process of education, rather than simply content. By describing sequences of collaborative learning activities, Learning Design offers a new approach to re-use in e-learning.
E-learning has a well developed approach to the creation and sequencing of content-based, single learner, self-paced learning objects. While definitions of Learning Design vary, the main elements tend to include greater focus on context dimensions of e-learning, a more activity based view of e-learning, and greater recognition of the role of multi-learner environments. While Learning Design does not exclude single learner, self-paced modes of elearning, it draws attention to a wider range of collaborative e-learning approaches in addition to single learner approaches.
This paper shows an example, which is applied to speciality of economic and rural development agricultural engineer at University of Debrecen and its implementation in the Learning Activity Management System. We created a learning design was implemented at this speciality with LAMS, which is a learning design editing and play back tool that puts the learning process, rather than collections of content, at the heart of e-learning

Key words: e-learning, Moodle, Learning Design, Learning Activities, LAMS

1. Introduction

Online courses are moving into the mainstream and the software commonly used to deliver online courses can be prohibitively expensive. Classes take place online through the use of software packages that have special classroom features such as discussion forums calendars, chat rooms, where participants can communicate in real time with each other, and quiz and polling capabilities. Files such as word processing documents, sound files, pictures, and videos can be uploaded to the virtual classroom for viewing by students. Thus, the "platform" is essentially a place that looks like a private website and is intended to work like an electronic classroom. The classes taught on these platforms are accessible via the Internet, and are usually private, meaning that only individuals who are registered for the class can see the password-protected website. A platform for online courses may also be called an LMS (Learning Management System) or LCMS (Learning Content Management System).

Learning Design has the potential to revolutionize e-learning by capturing the process of education, rather than simply content. By describing sequences of collaborative learning activities, Learning Design offers a new approach to re-use in e-learning.

E-learning systems should be designed in a way that they provide easy access to all levels of learning objects from atomic to the most complex structures in the learning process. (*Cebeci* et al., 2005)

For the e-learning community, the "learning object (LO)" has emerged as the most dominant concept among various approaches and methods in asynchronous Web based teaching and learning (WBT/WBL). LOs can be any electronic file format such as text, image, graphics, audio, video or an interactive program. (*Cebeci* et al., 2008)

2. Moodle at the University of Debrecen

Moodle (Modular Object-Oriented Dynamic Learning Environment) is a software package for producing internet-based courses and web sites. It is an ongoing development project designed to support a social constructionist framework of education.

Moodle is provided freely as Open Source software (under the GNU Public License). Basically this means Moodle is copyrighted, but that you have additional freedoms. You are allowed to copy, use and modify Moodle provided that you agree: to provide the source to others; to not modify or remove the original license, and apply this same license to any derivative work. Moodle will run on any computer that can run PHP, and can support many types of database.

We have been using Moodle at the University of Debrecen, Business- and Agricultural Department since January 2007. Moodle has more and more function at our Department in education. In January 2008 we introduced

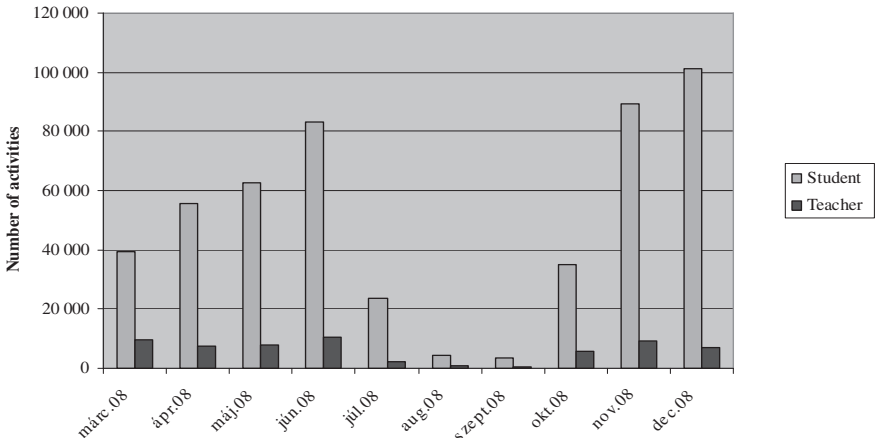

Figure 1: Statistics of a Moodle system in the number of activities

Moodle in our Faculty. Therefore, we gave lessons for the tutors about the usage of the Moodle. Our aim was to develop such a learning system, which is an integral part of educational process (*Lengyel* et al., 2008).

We used the Moodle in classworks in the framework of 5 subjects in the beginning, in the 2nd half of the 2006/2007 academic year. In the informatics category the number of the active courses increased to 17 in the 1st half of the 2007/2008 academic year.

We showed Moodle system on the courses organized for the instructors where we took an introduction of the system and where we outlined the function of the system and its applicability. The aim of the course was to make our trainings more coloured and more efficient, and the rest of the departments of the faculty use it in the educational process with our vocational support.

We use the system in BSc, MSc, PhD and Erasmus trainings. Our department took advantage of the functions of the framework system in a training and NODES Project beside this (Herdon et al., 2008).

Currently 91 instructors of the 6 departments of the faculty – on 26 specialisations with 167 courses – use the system, through which more than 3600 students were involved in the educational process. On the Figure 1 there is a diagram about the usage of Moodle from 2008 March to 2008 December.

3. LAMS

LAMS (Learning Activity Management System) is a revolutionary new tool for designing, managing and delivering online collaborative learning activities. It provides teachers with a highly intuitive visual authoring environment for creating sequences of learning activities. These activities can include a range of individual tasks, small group work and whole class activities based on both content and collaboration. LAMS can be used as a stand alone system or in combination with other learning management systems (LMS) such as Moodle.

LAMS provides teachers with a visual authoring environment for creating, storing and re-using sequences of learning activities. Teachers drag and drop activities into the authoring interface and then join the activities together to produce a learning sequence. This workflow model is what principally distinguishes LAMS from other more content based LMS by providing teachers and learners with sequences of activities with a high level of interactivity and collaboration. LAMS has a wide range of tools designed to be used for a range of pedagogical approaches, by teachers and students with varying levels of technical expertise.

Moodle is an open source course management system. LAMS is to be integrated with Moodle, with LAMS acting as either a course format or as an activity within Moodle. The integration will be done using Moodle 1.8.2 and LAMS 2.0.4. (*Lengyel* et al., 2007).

4. LAMS integrations

LAMS works well as a stand-alone e-learning system. It can also be integrated with other educational software such as a Learning Management System (LMS)/Virtual Learning Environment (VLE), or Student Management System (SMS).

For example, we can use LMS for general course administration and to provide a central webpage for our course. We can then add a link (URL) from this course page into LAMS for sequences of online activities. When students log in to the LMS, one of the links on the course page could read Click here for LAMS activities, and when students click on this link, they are taken into LAMS to choose the relevant activity sequence.

In this example, the simplest type of integration just requires to add a link (URL) on the course page to LAMS server. When students click on this link, they would need to log in to LAMS using their LAMS username and password. This type of integration is possible today with almost all web-based educational software. (*Lengyel* et al., 2007)

A more sophisticated type of integration is where LAMS relies on the LMS to provide student details to it in the background so that students do not have to log in separately to LAMS. Similar integration is also possible for teachers so they do not need to log in separately to LAMS, and also to make it easier for teachers to author LAMS sequences and add them into the LMS course page directly.

Sophisticated integration requires two steps: (1) initial development of integration software to link the two systems, and (2) configuration of this integration software with your local LAMS system. The second step would normally be conducted by your local system administrators. The first step is the subject of this paper.

The integration between LAMS and other educational software systems are either supported by or approved by the LAMS Foundation and LAMS International. *(Figure 2.)*

A LAMS Activity Module and a LAMS course format will need to be written for Moodle. They will have access to the Moodle tables, and will be responsible for meeting the requirements of a Moodle tool. They will communicate with the LAMS server via web services. A LAMS Activity Module may be based on the sample module template available from the Moodle.org website or by an existing module. A LAMS course format will also need to be written. This should be done based on the topic course format.

There will be a number of cron-based tasks that will be needed for both the activity and course module. These include

- Adding new users to a lesson, based on recent enrolments (call to a LAMS webservice, updates LAMS).
- Marking a user as left, based on recent unenrolments (call to a LAMS webservice, updates LAMS).
- Get the user's current progress in a LAMS lesson (call to a LAMS webservice). If it has changed since the last event, create a log entry for display in the recent events section.

When a teacher runs the LAMS authoring client (when adding an activity) and the teacher saves a sequence, the Saved message will have a button Close and return to {request_source}. If this button is clicked, then the LAMS authoring client will close and the list of sequences on the add activity screen will update automatically. So the request_source should be set to a name that your users understand e.g. Moodle, the add LAMS activity screen.

An integrated Moodle and LAMS will behave in two distinct manners: LAMS running as course format and LAMS running as an activity in another course format.

When the teacher wishes to make heavy use of LAMS to run a number of sequences within a course, they will use the LAMS course format. In this manner, LAMS will occupy the bulk of the Moodle window and will remain in the window while the user is in the course. LAMS will probably be inserted using an IFRAME.

When using LAMS as a Course format, other Moodle activities will still be available. They will appear at the bottom of the screen. Clicking on such an activity needs to pop up a new window, with the breadcrumbs at the top altered to start with the Activity Name. That is, the entries for Moodle and the course name will need to be removed to stop the user bringing up the main course window in the popup window, as that would result in LAMS being displayed twice.

When the teacher wishes to use a few of LAMS sequences within much larger Moodle courses, they may use the activity manner. In this way, the teacher selects LAMS as they would any Moodle activity, uses an activity creation page to link across to the authoring module. Once the activity is created, the lesson is started automatically.

It will display a simple screen in the activity page, similar to the base LAMS screen. It would open a popup window for

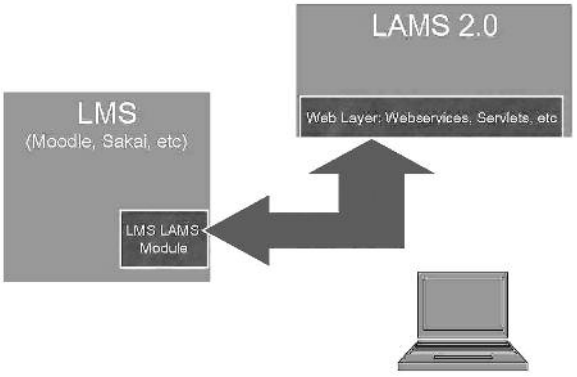

Figure 2. Communication bothways between LAMS and LMS

LAMS. This will allow the maximum amount of screen space for the LAMS interface. As with the standard LAMS, if the user has only one role then the appropriate interface will pop up automatically. If the user has multiple roles then the user will have to select which interface they want.

5. Overview of Learning Design

The field of Learning Design is based on the concept of a standardised language or framework to describe educational activities. In particular, it has a special focus on processes that involve group tasks, not merely individual students interacting with content on a screen – rather students interact with each other over a structured series of activities. Learning Design is a superset of Instructional Design, as it incorporates the application of instructional design principles to single-learner contexts, but extends this to include collaborative learning activities and teacher-led environments as additional components of a broader model of education.

To understand how typical Learning Designs are different from other e-learning approaches, consider this generic example: an educator decides to break their seminar/tutorial class into small groups to debate an idea; then each group reports back to the whole class; then the whole class debates the different group ideas; then the educator presents an article from the literature with a new perspective; then, the whole class discusses how their initial debate compares to the article; then, students choose one of three extension topics for further investigation and debate; then each student submits an essay on the topic (*Dalziel,* 2007).

This design also exemplifies current understanding of good pedagogy by: fostering active consideration of the topic by students, encouraging students to construct their own understanding of the issues; engaging students in a conversation with their peers and with the views of experts; providing student choice within the relevant content, etc. There are many other possible pedagogical principles that could be considered here, such as authentic assessment, negotiation of learning pathways, etc, but the above is sufficient for the current purposes. Further discussion of good pedagogical principles can be found in the higher education teaching and learning literature.

A Learning Design can be thought of as having a number of activities – and for each activity, it is necessary to specify who is involved, what they are doing, and how the task is conducted. These individual activities are then combined to create a sequence of activities, which may incorporate stop points that allow the educator to control the progress of students through the activities. The concept of Learning Design is not just applicable to e-learning; rather, it can be used to describe both online and face-to-face contexts (*Dalziel,* 2007).

6. Conclusion

There are many technical and educational challenges yet to be solved, but the success of open education in other areas (open source course management systems and open content) provides hope for finding a solution to the challenge of sharing "open teaching". We would like to use LAMS to make our education more efficient.

We integrated the Moodle and the LAMS systems. We started to create a learning design which is implemented at an informatics course (speciality of economic and rural development agricultural engineer). We hope that we may make our education more efficient with LAMS usage and the integrated environments might prove to be a very satisfactory platform for online continuing education (*Gaceu* et al., 2006).

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Examination of Pig Farm Technology by Computer Simulation

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Abstract: Agricultural production is among the riskiest production activities. Similarly to other branches of agriculture in animal breeding the finished product is the result of complex procedures. The biological-technological procedure, the creation of the product is affected by an outstanding number of environmental factors which also cause uncertainties.
In the North Great Plain Region of Hungary, sows, gilts and slaughter pigs are produced on a corporate farm. The reliable operation data of this company provide a stable basis for and estimating future costs and revenue and their distributions.
Monte Carlo methods are one of the generally accepted tools for modeling risks. The significant independent variables, their ranges and probability distributions, and the correlation between them were inputs to the model. The values of the variables were produced using a random number generator. The computer simulation was performed using @Risk (Palisade Corporation) software. The study concentrates on the factors affecting the number of offspring (piglets). Model inputs were the mating, mortality and farrowing rates; the costs and the income values based on these rates have been analysed as the output data of the model.

Key words: pig production, computer simulation

1. Introduction

At the time investment decisions are made, agricultural producers cannot know how external and internal factors will influence the outcome of their decisions (*Bácskai et al., 1976; Hardaker et al., 1997; Drimba,* 1998a). Important decisions influencing the future of the company have to be made under conditions of risk, when reliable information is available only for the most recent time period. (*Buzás*, 2000). Risks are present in every economic sector and must be considered by every economic agent.

Economic agents should apply methods that are capable of measuring, monitoring and suggesting responses to risks, provided that the information required for decision-making is current and of sufficient amount and quality. The evaluation of this information should enable decision-makers to formulate and analyze multiple decision alternatives.

When sufficient data is available, there are numerous statistical analyses for measuring risk. Risk management tools, often tailored to evaluate specific types of risk and provide a variety of metrics, provide users with accurate measurements and allowed them to make informed decisions regarding alternative courses of action. Risk evaulation has been an increasingly important component of economic analysis over the past ninety years, with applications to and significant results for every sector of the economy, including agriculture. Developments in information technology and of the Internet have facilitiated the development of applied risk management tools, which have become affordable for even the smallest of enterprises and easy to use.

New, complex and wide-ranging types of risk have arisen, the measurement of which requires sophisticated mathematical and financial models. The development of computers has supported the development of these models, which can evaluate risks considerably support the faster and more accurate determination, measurement and handling of risks (*Beaver – Parker*, 1995). Simulation models, whose use in agriculture has grown rapidly, attempt to mimic the operation of real systems so as to allow accurate measurement of uncertainty and risk.

The study was based on data from HAGE Ltd.'s 1100-swine farm at Mezőhegyes. Our aims were to study the operation and expected results of the farm's operation in 2009.

2. Materials and methods

Simulation models are the simplified mathematical representations of real systems for studying their behaviour under different conditions and varied circumstances. In contrast to the point estimates provided by other analytic methods, these methods require multiple implementations of

the model in order to determine representative samples of performance indicators for describing the operation of the system (*Winston*, 1997). Simulation models are designed to consider randomness; stochastic simulations using Monte Carlo methods are a generally accepted tool for evaluating system performance and associated risks. Values are randomly drawn from probability distributions of independent variables in order to develop distributions for desired performance metrics. (*Russel-Taylor*, 1998).

Models for analysis specify the set of variables that influence outcomes, their potential range, probability distributions and correlations. Given the ranges and distributions, the values of the variables are produced using a random number generator. The model is run 1,000–10,000 times and an expected value and a range of values are obtained for the desired result variable. These values can then be used to determine the probability that its value will fall into a given interval (*Winston* 2006, *Ertsey* et al. 2008).

A frequent output of simulation models as applied to firm operation is revenue; the metric of interest is the probability of exceeding or falling short of a given value. By increasing the number of runs, the distributions of result variables can be derived with arbitrary accuracy, as follows (1) (*Watson, 1981; Jorgensen*, 2000):

$$\psi = E_{\pi}\{U(X)\} = \int U(x)\pi(x)dx\,, \qquad (1)$$

where $X=\{\theta,\phi\}$ a θ is a vector including decision parameters, ϕ state parameters and π denotes the distribution of x. U(x) is a utility function usually expressing revenue, the function E π() gives the expected utility under the given distribution. An advantage of the method is that the model can be run for separate decision variants and the risks of various decision variants can be compared. For the numerical determination of the above values the following formula (2) is used (*Jorgensen*, 2000):

$$\overline{\psi} = \frac{1}{k}\left\{U(x^{(1)}) + ... + U(x^{(k)})\right\}, \qquad (2)$$

where k represents the number of experiments, i.e. the number of runs.

Excellent, easily manageable simulation software is readily available; @Risk4.5 (Palisade Corporation) was used for this study. The model of the system is constructed in Excel (Microsoft); the user can select from several probability distributions and chooses the values of the parameters that characterize the distribution. The simulation runs provide the result variable, which is used to estimate the probability that it will take a value in a given interval (*Palisade*, 2005; *Winston*, 2001; *Drimba-Ertsey*, 2008).

In our study we applied the @Risk4.5 simulation software.

Introduction of the company

The headquarters of Mezőhegyesi Sertéstenyésztő és Értékesítő Ltd. is situated in Békés County. The company, whose primary activities are swine production and wholesale trading of agricultural products sales, was established in 1993. The company operates two swine farms: a 500-swine farm at Pereg, and an 1100-swine farm at Mezőhegyes.

The two farms jointly have the capacity for producing 35,000 porkers. Both farms raise Topigs, a breed that has excellent maternal inheritance, and therefore above average performance indicators (e.g.: animal yield, farrowing percentage) and piglet-rearing ability. For sow insemination, the company purchases boar semen from HAGE Ltd.'s Topigs boar farm.

The performance indicators of the farm at Mezőhegyes are presented in Table 1. The swines are fed with following feed concentrates: "Pregnant sow", "Suckling sow", "Sui-Fer", "Piglet", "Piglet I – II.", "Prestarter", "Fattening pig I-II.", and "Breeding store pig".

Model data:

Input data consisted of targeted calving rate, number of live birth piglets (animal yield), culling and emergency slaughter data, weight gain, the weight of purchased and bred gilts, and fixed and variable costs, notably fodder prices.

The inputs variables were considered random variables. The normal distribution was used to model biological indicators, and a triangular distribution was used to model fodder costs. Using a triangular distribution is a general practice when initial values, either minimal, maximal or the likeliest, are known. (*Evans* et al., 2000). A truncated normal distribution was used for the biological factors to prevent unrealistic values from being generated doing the simulation runs; 0.15 percent of the values were truncated from the upper and lower ends of the distribution. The triangular distribution used for fodder prices used the current price as the most likely value, with the minimum and maximum values equalling 95 percent and 150 percent of the current price, respectively. This was done to emphasize the likely increase of fodder prices rather than a decrease. Fodder prices were simulated assuming a high degree of correlation (0.9) as they are all similarly influenced by changes in crop prices. We assumed a weak negative correlation (r=–0.25) between weight gain and animal yield, and a weak positive correlation (r=0.25) between weight gain and mortality, because vividity is less at higher litter sizes.

Output data consisted of per unit revenue, per unit cost, per unit profit, per unit feed cost in relation to the total farm output. In addition, we take the total farm revenue, expenses and profit into consideration.

For the purposes of this study, 10 000 simulation runs were performed 10,000 simulation runs were performed, after which the sensitivities of per unit profit, per unit total cost, per unit variable cost and per unit fodder prices were examined. This analysis was based on standardized regression and Spearman's rank correlation coefficients (β). The standardized regression coefficient (β) indicates the influences of the explanatory (input) variables, and can be calculated if both the dependent variable and explanatory

Table 1: Performance indicators of the swine farm and their intervals applied in the simulation

Performance indicators of the pig farm			Applied intervals in the simulation
Number of farrowing / number of sows		2.41	2.30-2.46
Farrowing rate		89%	86%-92%
Animal yield (live birth piglet/farrowing)		11.9	10.95-12.85
Emergency slaughter rate of fattening pigs		1.0%	1.0%
Weight of purchased gilts (kg)		140	130-145
Weight of bred gilts (kg)		140	130-145
Culling rate	Suckling piglet	8.6%	8.17%-9.03%
	Brood sow	0.5%	0.475%-0.525%
	Battery pig	2%	1.9%-2.1%
	Fattening pig	3%	2.85-3.15
Weight gain (g/day)	Suckling piglet	260	234-286
	Battery pig	450	405-495
	Fattening pig	800	720-880
Specific Food Consumption Index (food consumption kg / weight gain kg)	Battery pig	1.72	1.72
	Fattening pig	2.80	2.80
	Farm level	2.82	2.82

variables are standardized (*Moksony*, 2006). The significance of the standardization lies in that the explanatory variables and the risk associated with them can be ranked independent of their unit of measurement (*Hajdu*, 2003). The sign of â shows the direction of the change: positive value indicates an increase in the value of the dependent variable if the explanatory variable's value increases, while a negative value indicates a decrease. In addition to the sensitivity analysis, we calculated the probability of the company's earning a loss in 2009, another risk metric frequently calculated (*Mun*, 2004).

3. Results and discussion

The results indicate that the fattening pig price has the greatest effect on per unit profit: a one unit change in the standard deviation of the price caused a 0.583 (β) change in the standard deviation of per unit profit. There is a modest correlation between the fattening pig price and per unit profit (Spearmann's rank correlation coefficient: ρ=0.585); the strongest correlation (–0.73≥ρ≥–0.76) is between the fodder prices and per unit profit; increases in fodder prices result in a decrease in per unit profit. Among the fodder prices, "Fattening pig I." has the most impact (β=0.198;); a one unit change in the standard deviation results in a 0.20 unit change in the standard deviation of the per unit profit in the opposite direction. The standardized regression coefficient was near zero (β<0.1) for every other variable *(Figure 1).*

The per unit total cost is mainly determined by the "Fattening pig I–II." and "Piglet I–II." fodder prices. Among the farm performance indices the most influential factor is the number of live birth piglets; the standardized regression coefficient was near zero (β<0.1) for all other variables. The sensitivity analysis revealed the same relationships between all the variables and the per unit profit or per unit total costs, although the signs of the standardized regression coefficients differ: increases in fodder prices increase the per unit total cost and decrease the per unit profit. The price of fattening pigs had no influence on the per unit total cost for obvious reasons; the variable is omitted from *figure 2.* in terms of the per unit variable costs, the values and rankings of the standardized regression coefficients differ only slightly from the results obtained from the analysis of the per unit total cost.

Taking the fodder costs into consideration, the regression coefficients for the most widely utilized fodders were between 0.160–0.246. The positive value indicates a definite increase in fodder costs. Changes in the price of "Fattening pig I." are the greatest source of fodder cost risk ($|\beta|$ 0.246). Values for "Fattening pig I–II." and "Piglet I–II." ranged from 0.160–0.211. The standardized regression coefficient was almost zero ($|\beta|$ <0.1) in the case of the other fodder cost variables *(Figure 3).*

The 10,000 model runs yielded the distribution of the total cost presented in Figure 4. The mean is 905 million HUF, the lower and upper quartiles are 848 and 953 million HUF, and the distribution is right-skewed. Descriptive statistics are presented in *Table 2.*

Figure 5 presents the distribution of the total revenue of the swine farm. The mean value is 1005 million HUF, the lower and upper quartiles are 964 and 1045 million HUF, and the distribution is slightly left-skewed.

In case of the total profit, these statistical indices are as follows: the mean is 101 million HUF, the lower and upper

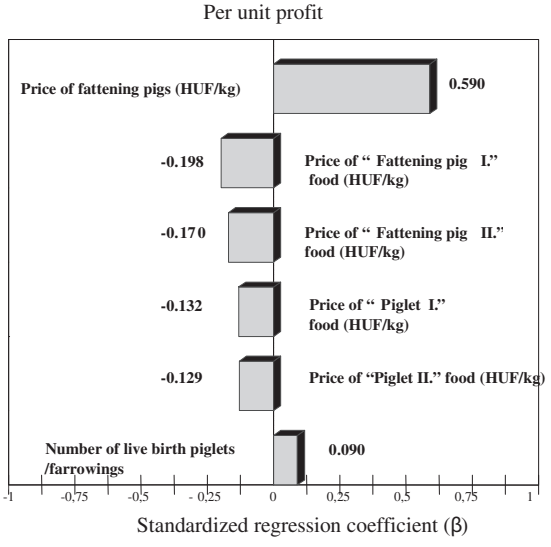

Figure 1: Tornado chart of the standardized regression coefficient pertaining to the per unit profit

Table 2: Statistical indices of the distribution of total cost, revenue and profit

Statistical indices	Total cost	Total revenue	Total profit
Minimum	756.766	828.774	-198.432
Mean	904.618	1005.123	100.505
Maximum	1141.625	1167.870	313.246
Standard Deviation	71.075	57.964	87.247
Variance	5051.685	3359.849	7612.086
Skewness (γ_1)	0.520	-0.147	-0.328
Kurtosis (γ_2)	2.544	2.577	2.668

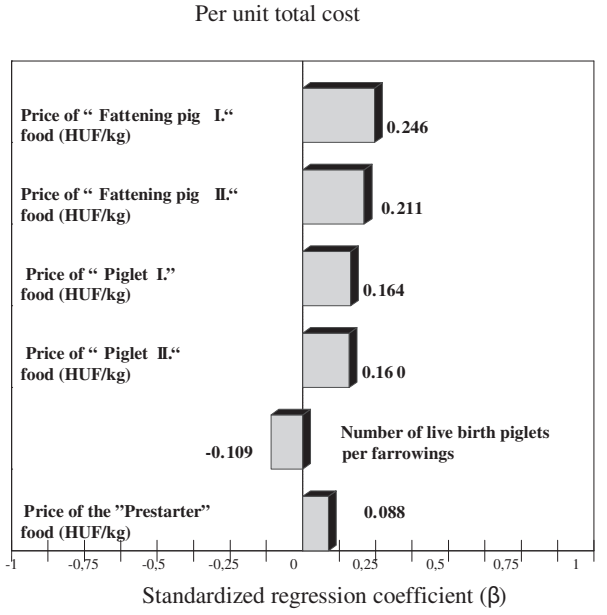

Figure 2: Tornado chart of the standardized regression coefficient pertaining to the per unit total cost

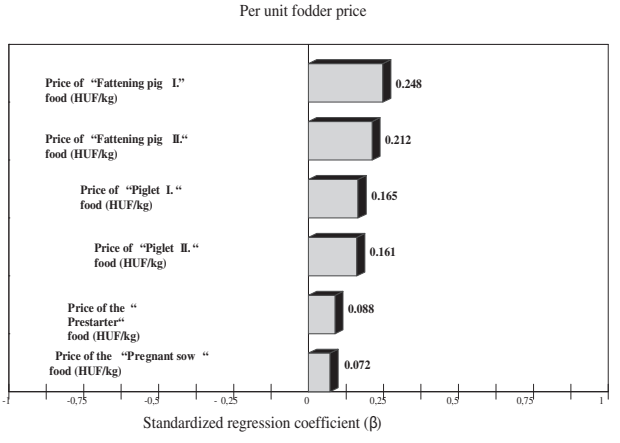

Figure 3: Tornado chart of the standardized regression coefficient pertaining to the per unit fodder cost

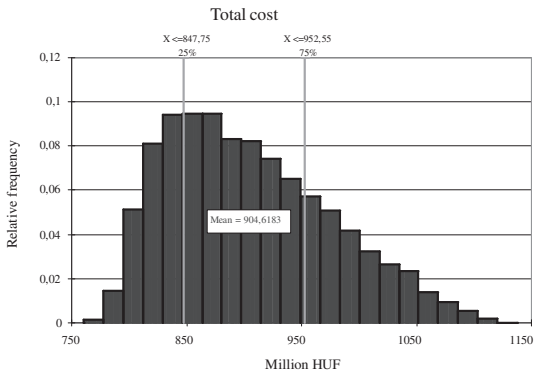

Figure 4: Relative frequencies of the total cost after 10.000 simulation runs

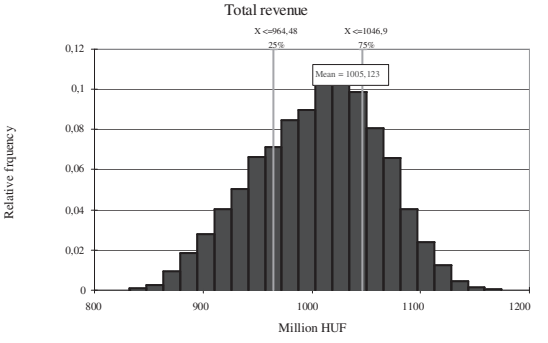

Figure 5: Relative frequencies of the total revenue after 10.000 simulation runs

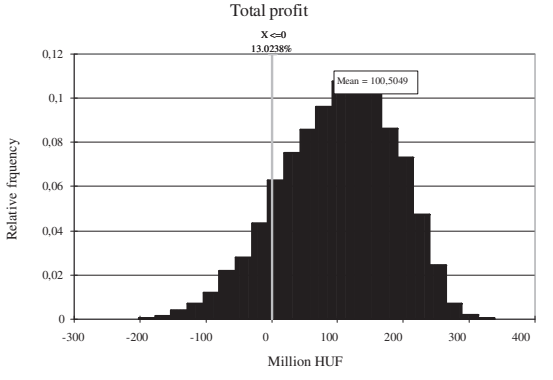

Figure 6: Relative frequencies of the total profit after 10.000 simulation runs

quartiles are 42 and 165 million HUF. The probability of the loss in farm's operation is 13.02 percent considering the above mentioned model settings *(Figure 6).*

4. Conclusion

The primary determinants of swine production costs are fodder costs. During the past several years, enormous fluctuations in fodder prices contributed to a reduction in investment in swine production in Hungary, reducing output in the sector and threatening its future prospects.

In our study we used Monte Carlo simulation to model that the stock changes in a Hungarian farm and determine the factors that have the largest influence on profit and costs. Input and output prices and the major performance indices were the (random) variables considered.

Our results indicate that changes in per unit profit are influenced most by the price of fattening pigs as indicated by the relative magnitude of the regression coefficient ($\beta = 0.59$)

Among the fodder prices, only "Fattening pig I–II." had an significant effect on per unit revenue, costs, profit, and fodder costs. These two fodders constitute most of the annual fodder purchases and farm costs. The standardized regression coefficient was nearly zero ($\beta < 0.1$) "Prestarter", "Pregnant sow", "Suckling sow", "Piglet", "Breeding store pig" fodders.

While simulation techniques provide insight as to the operation of economic systems, they necessarily entail simplification; the system as modelled is less complex that that whose performance it attempts to reproduce. It is axiomatic that this reduction in complexity introduces errors, whose magnitude depends upon both the model chosen and the variables it considers; these errors are the inevitable result of simplified mathematical representation of real systems.

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Sustainable development of the rural economy

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Abstract: This paper seeks to provide an overview of those economic social and enviromental issues which could be relevant for sustainable development of the rural economy. Rural development is of great significance for the future of both the EU and Hungary. We must reduce migration, create new jobs and focus on sustainability and the principles and goals of environmental protection and nature conservation. Rural economy is a complex and dynamic system, and agriculture should be treated as a part of it. The development of rural settlements and their infrastructure, the manifold exploitation of the agroecological potential, the rationalization of farming remain, extremely important components of rural development.

Key words: competitiveness, sustainability , cohesive force, rural economy

Introduction

Hungary's future success mainly depends on the adequate use of the potentials of rural areas, the development and vitalization of rural economy and appropriate regional policies. The full exploitation of natural resources and the maintenance of workplaces in the country are remarkably important in order to fulfil the economic, ecologic and social functions of rural areas. The conception of the sustainable development of rural economy requires a multidisciplinary and multiple objective approach which can only be expanded with the consideration of an extremely complex activity range.

The impacts of the global financial crisis on Hungary imply further difficulties, as the inhabitants of rural areas can only consider over survival, because of their initial long lasting detrimental situation.

Migration from rural areas has been more and more intense over the past decade. The majority of people presumably leave because of the lack of job opportunities and in the expectation of employment and better subsistence. From this point of view, there has been a positive change in the middle and at the western part of the country. On the other hand migration is more and more disadvantageous in northern-Hungary.

The significance of rural development is appreciated by the EU, so the pecuniary assistance is more emphasised in the field of rural development than it is agriculture production. Agriculture and agribusiness are handled in a multifunctional context, where along with the production, environmental protection, the capability of population stability, the preservation of cultural heritage and sustainable development all have equal roles. Sustainability cannot be separated from the barriers of growth. The Earth is finite and no growth can last forever. The boundaries of expansion are given by the continuous stream of energy and substance needed for the living conditions of the population. We cannot exceed the productive and absorptive capacity of the world in the course of extracting resources and emitting waste (*Meadows* el al. 2004).

Results and evaluation

The projects of rural development have to contribute to the three main goals of the EU, which are the following:

- competitiveness,
- sustainability,
- cohesion.

Marselek (2005/a) refers to sustainability, where rural development serves for the observation of geographical regions and sustainability, in which each of the followings each has a key role:

- local participants,
- local resources,
- operating integrations in favour of the community,
- respect for traditions and the reinforcement of identity awareness.

According to *Csete-Láng* (2005) "rural policy is the complex system of long-distance interest, aims, implements, conditions and operation based on principles. Rural policy implements rural development in an operative way, which is the local chain of objectives".

Rural economy is a complex and dynamic system, within which agriculture can be managed. *Szakál* (1999) starts from the fact, that "rural area is an extremely complicated, versatile, multifunctional system of resources. Some

subsystems can be mentioned in individual cases (natural resources, soil, land, human resources, cultural values, etc.), but the separation of them is not possible without their serious damage or often the breakdown of their original identities. As a consequence, there is an intense integration in the agricultural and non-agricultural activities, along with non-economic activities (cultural and other social activities, lifestyle, etc.) built on this integrated system of resources. That is why rural area can fundamentally be distinguished from the urban area. This economic system built on the rural system of resources is called rural economy".

The importance of rural areas, demarcation

The New Rural Development Program 2007–13 of Hungary states that according to demarcation criteria (unfavourable demographic conditions and life-structure, economic and infrastructural backwardness) used in previous projects, 88% of Hungary's area were classified as rural area between 2004 and 2006. Rural areas cover 96% of the settlements of the country, giving home to 47% of the total population. Definition of rural areas has been elaborated since, based on experiences from previous rural development programs. Between 2007 and 2013, settlements with no more than 120 inhabitans per km^2 or having a population less than 10000 can be considered rural areas – except for the settlements of the Budapest agglomerate, but including the outskirts of non-rural settlements where more than 2% of the total population live. This means the 95% of the total surface of the country, 87% of the outskirts and 45% of the total population is considered. Rural areas represent this specific type of area, where the density of population is lower, land is the means of living, and also the non-urban type (country-like, provincial or farm-like in certain regions) of settlement-structure is common. Rural areas include the outskirts of settlements with high number of inhabitants, but not belonging to the group mentioned above, and where 2% of the settlement's population lives. There are 33 settlements altogether with 71 000 inhabitants living in the outskirts. The definition of rural areas change with every step taken conforming to specific target groups and the characteristics of each arrangement of the III axis.

The augmentation of the EU has increased the importance of rural areas, because of the rural dominance of new members. The European Commission (2006) announced that rural regions cover 92% of the EU 25 territories. 19% of the population lives in primordially rural regions, whilst 37% of the population lives in typically rural regions, producing 45% of the gross value added and ensuring 53% of places of employment, defined by the OECD.

At regional level, rural development and sustainable development are closely interlinked. In certain regions, efforts have to be made to establish dynamically developing rural areas with the creation of highly developed services and infrastructure (*Deme* 2003).

The Leader Program

Forgács (2003) explains that the Leader Program which started in 1991 and lasted for three years inspired the expansion of partnerships between the areas. The Leader II program expanded the territory of the previous program concentrating on the innovative quality of the project. In the period 2000–2006, some EUR 2000 million was provided by the Leader + Program for the elaboration of integrated rural development strategies.

Between 1991 and 2006, the Leader Approach was developing and getting stronger, during the Programs of Leader I, Leader II and Leader +, maturing the authorities of member states and action groups to get onto the next stage of the implementation of the Leader Approach.

According to Council Regulation (EC) No 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD), Leader is the fourth pillar between 2007 and 2013, differing from the other pillars not in contents, but in the way of accomplishing arrangements and how they are connected in rural communities.

Sources of the Leader Program have to contribute to the objectives of the other headings of the EAFRD, having a main role in the improvement of governing and in the mobilization of internal developmental potential.

Support given in the framework of Leader built on local needs and strengths consider three goals from the view of a local, community-driven developmental strategy:

1. Intensification of local internal development: One of the main advantages of the bottom-up approaches that they are able to mobilize many local resources for the sake of local developments
2. Structural capacity-building in the governing of rural communities: Action groups made local civilians, entrepreneurs and local governments co-operate, and elaborate the methods of common tasks accumulating the necessary knowledge for the sake of future actions
3. Encouragement of innovation: Leader can play a valuable role in innovation, because action groups can freely and supplely decide what they want to support. This also has an effect on the concept of program choosing.

Changing and sustainability of the Common Agricultural Policy (CAP)

Dorgai (2008) writes that the objectives and support system of the CAP has continuously been changing. One of the very important elements is that rural development has become an integral part of CAP, including environmental protection, the observation of rural communities and protection of rural qualities.

The possibility of a Common Agricultural and Rural Policy for Europe (CARPE) has emerged with principal rules such as:

- sustainability on environmental, social and economic level,
- the strengthening of market-orientation by means of direct support, total separation of production and integration of EU regulation,

- financial recognition of public welfare (food safety, environmental protection, animal welfare, protection of culture),
- reinforcement of competitiveness (modernization, flexible adaptation, exploitation of resources),
- urge of local initiatives.

In our paper sustainability is dealt with in details, because of several reasons.

According to the World Commission on Environment and Development, the simple definition of sustainable development is the following: "It is a kind of development which satisfies human needs and aspiration of present generations, without endangering the activity of future generations". *Brundtland* (1987) says that "the strategy of harmonious development aims at the realization of harmony between human beings and harmony between mankind and nature".

While analyzing sustainable development, the stages of sustainability (global, regional, local) and the dimensions of sustainability (natural environment, society, economy) all have to be distinguished (*Csete L.* 2005).

In order to reach social justice, catching up and narrowing of social asymmetry are unavoidable.

Causes of the crisis

Hungary is in a difficult situation. The employment rate being 53,7% is one of the lowest in the EU – after the economic structural change of the 90's 1,5 million workplaces were diminished and the number of retired people is more than 3 million. There are only 2 million people working in the competitive sector who cannot cover the expanses of 10 million people. Dual economy has been created, subsidiary companies of developed multinational companies produce 85% of the export, while micro small and medium enterprises (MSME) are not competitive on an international level. Although in the last 20 years only the MSME sector has been creating workplaces, providing jobs for 72% of the people employed in the competitive sector (*Hágen,* 2008). MSME are undercapitalized and lack resources with bad productivity indexes and not more than 20% of them are creditable. In public procurement procedures domestic enterprises are at a disadvantage loosing a significant market place (*Vadász,* 2008). The global financial crisis which started at on the American property market has affectes on Hungary as well. According to experts, domestic difficulties can be originated in the bad interest rate policy of the central bank. Loans in foreign currency seemed favourable because of the high base rate, so 75% of domestic loans are kept in foreign currency. The weakening of the forint because of the weak economy had put those having debts in a difficult situation and made them apply for more loans. The outflow of the capital is notable, partly because of the interest burden of the dept and also, because of the repatriation of profit.

The current crisis has been created by greediness. *Schumacher* (1980) writes: "How can we actually start the disarmament of greediness and envy? We could be less greedy or envious, or we could surmount the temptation and stop turning our needs to luxury. We could even take stock of our needs to see how to make them simpler or cut down on them".

Economists had warned a decade ago about the dangers of the foreign sector being outbalanced.

Simai (1999) writes the following: "In Hungary, the foreign sector already has a considerable influence on state revenues, residential incomes, employment and technological development. The impact of internationally owned enterprises on the balance of payments has also been growing because of the exports, imports and the repatriation of profits. There are significant positive consequences of the presence and function of the foreign sector. Presumably, the Hungarian economic situation would be worse and its foreign competitiveness would have deteriorated without the foreign owned companies. The Hungarian system and especially the citizens are still not ready for the presence and function of the foreign sector in the Hungarian economy. Privatization has played an important role in the rapid increase of the foreign sector being the consequences not only of the weakness of the Hungarian negotiating positions and supposed corruption, but of the lack of competence and experience in relation with transnational companies".

In our opinion, the continuous and extensive disinvestment can create an economic impossibility of performance, the modification of which should be proposed by those competent to deal with it to avoid bankruptcy.

Causes of the rural economic crisis

Of course, the economic situation of a country determines the chances of rural areas. The degradation of the socialist large-scale industry affected the rural population in the first place, because a notable part of commuters became unemployed. At the same time, the unsuccessful process of compensation and the ill-advised agrarian policy both ruined the fundamentals of rural agriculture.

Gögös (2008) explains that "in that time, the Hungarian agriculture suffered a loss of approximately 1000 billion forint in possessions. Unfortunately, it was clearly established that the situation could not be recovered and extremely small estates are complete failures in mass production. The larger, labour-intensive sectors like horticulture cannot lack co-operation and integration. The biggest advantage of household integration was that country people only provided labour, while the co-operative had to take the consequences of organizational, production and market risk management. Above all the economic difficulties, the ability of subsistence farming in village families increasingly died out. Local governments standing on week financial grounds were forced to solve problems such as utilization of waste and infrastructural development.

Inhabitants in villages who had not paid for energy previously are unable to pay their gas and telephone bills or sewage dues, as in some villages there is no income because

of unemployment and the total discontinuance of production. Local governments started to manage schools, sport centres and other institutions without financial reserves. Nowadays conditions in the countryside are exasperating. In general, great masses of village people have not been working for years except for settlements where long-established factories still remained at some stage.

There are some rare exceptions, where an enthusiastic teacher now and then gives support and some kind of art group functions. Otherwise, gardens are not in use and animal husbandry does not exist. It adds considerably to the fact that in many villages regulations for animal husbandry make it almost impossible for people to do it so.

People entirely withdrew into themselves instead of going to communities. No one subscribes to papers, the only culture you can get is the soap operas on commercial television channels. In our opinion, village production and commerce should be re-established even with governmental interventions.

Csányi (2008) writes that "through at least two or three generations a type of workplace-network should be maintained which is close to the residence of those in need. Its aim would be formation and maintenance of a workplace culture to teach participants how to perpetuate the culture of a systematic work performed. It costs a lot of money, but idleness costs even more. A workplace-network and a national sales system have to be founded with subsidy where products could be marketable with the direct help of government". Local governments could participate too in this initiative and public money could be used to provide part of the wages or benefits in kind, without making usurers wealthier. Until the realization of this plan, carousing is present to a high pitch and the children grow up without seeing anyone work in the family.

The most exasperating fact is that despite virtually no one has a job, they do not even engage themselves in seasonal work. They rather settle down to a certain kind of vegetation, proving the deficiency of benefit providing techniques (*Gögös,* 2008).

In the countryside, the role of employment in agriculture keeps declining. In small villages the possibility of employment is minimized, so the number of residents depending on social and child benefits often exceeds 70% of the local population.

One of the main obstacles of rural economic development is that there is a great inconsistency between the real needs of the economy and the structure of education and vocational training. Workforce with qualifications and professional knowledge needed for growing economic sectors is not sufficient in rural areas. Sustainability of rural economic development is hindered by backwardness. According to *Borsos-Nábrádi* (2005) closing up is the only solution, because any kind of maintenance of the settlements who stayed behind in the general social development in Hungary is a more serious problem than closing the cap.

Crisis management and sustainability

First of all, domestic economy has to be sorted in order to make rural economy develop. The following tasks are recomended:

- Impacts of a dual economy have to be regularized by new deals and negotiations with multinationals considering the endurance of the country,
- MSME have to be reinforced,
- Increase of employment is a basic task, taking every possibility into consideration,
- Breaking points have to be found – there are great opportunities to develop agro- and food industry, renewable resources and services, such as tourism.

Nowadays agriculture and the related economy are both under transformation. It enforces new kind of arrangements in agriculture, where agro-production and non-agro economy of rural areas are integral. In this framework, local initiatives and the role of micro communities are appreciated in connection with efforts focusing on the general improvement of living conditions and the closing up of rural areas. The fundamental condition of a long-distance development of agriculture is the development of social and corporeal infrastructure.

Since the changing of the regime, Hungarian agriculture has gone through significant changes. Compared to the 1990's, production in certain sectors has declined and the position of the same sectors both in Europe and outside Europe has deteriorated. In 2007 agriculture added only 3,6% to the GDP, while the employment rate of the sector was 4,7%. The volume of Hungarian agriculture and food production is still 25% lower than before the changing of the regime, and our loss on markets is a huge disadvantage too *(Magda S.*, 2008).

Unemployment is a growing matter in rural areas. The introduction and development of intense cultures – producing labour-intensive products and greater value-added of production – is recommended to improve the situation. Vegetables and fruits can be mentioned here, where watering is needed for an increased output. Holding up the decline in animal husbandry and viticulture would be extremely important.

The plantation of a somewhat 90 thousand acres of ligneous energy plants is reasoned for biomass production by 2015. The utilization of by-products and waste-material is desired besides the biomass produced (*Marselek,* 2007).

In order to decrease energy dependence, the economical and efficient use of available energy resources is very important. According to *Kerek* et al. (2006), the use of renewable resources would be desired in smaller villages and settlements. In our opinion, gas supply can be replaced with small size biomass power stations and the feedstock can be produced on the fields of the given village.

Accordingly, *Dávid* et al. (2007) says that rural tourism is not a concrete type of tourism, but a mass of tourism types and groups providing the completeness of a rural experience, with which the nowadays popular hunting tourism and observation can be connected too (*Fábián* el al. 2008).

- too strict regulations have to be reconsidered, authorities should help with the complete organization of services,
- the whole educational system has to be reconsidered– nowadays, it is not enough to say that changes have to be made and that inputs and outputs of different levels cannot be separated. Education should be handled as a unified and practice-oriented system guaranteeing multi-level outputs.
- The protection of the domestic economy is a serious task. Hungary has been a target spot for investors since the 90's, because of its favourable potentials. The liberal economic policy provided a beneficiary environment for foreign investments. A lot of multinational companies settled in Hungary, although the value produced here is not invested at home in many cases.
- Protectionism is present in economic policy of the USA, but it has to be seen that initiatives certain can endanger jobs connected to exports.
- The increase of the current 3% part-time employment is an opportunity.
- We have to aim for using local resources. Opportunities of clusters and network organizations have to be exhausted. Hungarian clusters are still undeveloped and they are in an early phase (MARSELEK, 2005/b).
- There should be a healthy balance between the regions beside in- and outflow of materials. A strongly limited material consumption and energy utilization have to be carried out.
- Motivation for people has to be ensured. The emerging of eco-regions is bottom-up initiative, not a top-down strategy.
- The establishment of sustainability indicators has to be done as soon as possible, and centralized collection of data has to be organized to let local leaders analyze the situation.
- The formation of an organization guiding sustainability with governmental help is needed. It should be able to observe, inform and organise according to the principles of sustainability – existing organizations can be involved. Local media (television, radio, papers, etc.) should broadcast the need for sustainability along with its principles, advantages and non-avoidance.

According to *Magda S. – Gergely S.* (2006) we are in advance of a paradigm shift in land utilization. The production of energy-materials is a possible way of land utilization and it will be a constraint in the future. It will be unavoidable because of the deterioration of exchange ratio in agricultural products.

It has to be answered whether forestry, extensive farming based on pasture lands or biomass production would be effective on areas with unfavourable conditions. The practice of the rational land utilization is characterized by regional (natural, economic) potentials. These conditions considerably differ from each other in domestic regions (*Magda R. – Szűcs I.,* 2002).

The proportion of land utilization has to be defined according to ecological conditions – it should be changed with redistribution of land use, if needed. Currently, the increase of the national proportion of grass land and forests can be rendered to the detriment of arable land. If the system of land use is not suitable for the potentials of the area, then the problem could not be solved successfully with agricultural engineering later (*Nagy,* 2008).

Production has moved towards the direction of extensive farming, so the export-import balance keeps deteriorating because of the less effective production. The integration is incomplete, Organizations of Production and Sales and clusters are insufficient, the flow of information and technical advise are inappropriate. Instead of private producers, farmers in Organizations of Production and Sales and clusters have to be given grants, as they are partners in commercial chains.

In Hungary, the size of uncultivated land is 1,582 million acres. We have to endeavour to keep the cultivable land in good condition, so the increase of infrastructural use of land is not supported in any ways. *Kádár* (2008) says that in Hungary, the size of cultivated land has dropped by 500 thousand acres since the changing of the regime, out of which 80 thousand acres have been taken from agricultural production to develop industry, urban area and motorways.

Alternative economics

By now, such social, economic and ecologic tension have accumulated in the world, part of which is out of the boundaries of traditional economics. In the past 20 years, different alternative economic trends have appeared. One of the most influential basic works in alternative economs is "Small is beautiful" by *E. F. Schumacher* (1973)

There are sharp differences between the views of traditional and alternative economics. The object of traditional economics is the total of economic processes with the help of money limiting itself from any other question (e.g. from ecological and human influences). The alternative economics on the other hand sees the economy as part of a system where natural environment and humans are part of it, beside economic organizations.

Because of this, there are notable differences between the scales of values of the two trends. The traditional goal in microeconomics is to reach a maximum profit. According to alternative economics, the basic value is the preserving utilization of natural environment and the service of humans.

The fundamental principle of alternative (human-centred) economic trends: "the economy is for humans, and not the humans are for the economy". By this time, economics being the theoretical fundamental of economic policies can be characterised by intuitional and methodological diversity.

The conceptions of ecological economics have to be considered, as economy should be developed not towards the direction of modernization (globalization, mass-production, unified markets, small amount of multinationals ruling the world, hierarchy in management), but towards the bio-regional model (flexible production systems, production based on local needs, subsistence regions, small enterprises,

decentralized management) in order to maintain life on Earth (*Kerekes – Kiss,* 2001).

Moser (2001) says that the concept of eco-regions (sustainable islands, bio-settlements, eco-settlements, sustainable regions) can be traced back from ecological principles and its essential conditions can be determined:

- Self-controlled (self-)sufficiency in point of basic needs, which are independent from opportunities outside the community and they are also better in quality.
- Complexity and diversity are the pledges of an internal based separateness
- The presence of duality is important as an inducement promoting the formation of new patterns and structures.

In Sweden and in northern countries "eco-settlements" are popular. In Hungary, the foundation of "Gyűrűfű" is an example and it has model qualities. The plan of an economic system is in progress with considering economic conditions and sustainable development, to make it possible for member of the community to produce their incomes and to increase common sources (*Anonym,* 2007).

Conclusion

The operation of rural economy is the pledge of the future. The complex system of agrarian and rural development is composed of sustainable production from agriculture and forestry, sustainable economic systems, sustainable enterprises, sustainable settlements and rural areas. In rural development, the shift towards sustainability deserves a multidisciplinary and multi-objective approach.

The global financial crisis has had an effect on Hungary's economy too. Globalization is above nations, but the regulation is on a national level – so anomalies are built into the system. Hungary can answer to the crisis by the full exploitation of natural resources and opportunities. The state of the economy and rural economy can be made better by the consideration of sustainability principles, the improvement of the effectiveness in traditional activities, the start of new services and the recognition of the opportunities of innovation and complexity

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Potential for Hungarian Grasslands in integrated rural development

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Abstract: Sustainability and multifunctionality, two key principles, which will determine future development in any activities. On the bases of these principles, society as a whole has already outlined future expectations towards rural areas. Rural functions (economic, ecological and socio-cultural ones) have been declared in European Charter for Rural Areas. To what extend can different rural development initiatives meet these functions? The question may be answered by using the method of multifunctional rural resource analysis (NAGY, 2007). The paper is investigating the potential for Hungarian grasslands by using this methodology. It is concluded that our grasslands, as land use systems in their present conditions can participate in integrated rural development in the most balanced way compared to other land use systems in the county. Economically their potential is good. Ecologically their potential is outstanding. The socio-cultural potential of grassland use in Hungary is also outstanding due to the historical roots. As a future prediction the relative importance of the three grassland functions has been outlined in integrated agriculture and rural development.

Key words: sustainability, multifunctionality, grasslands, future potential

Introduction

The future scenarios of agriculture and rural development will be determined by two basic principles. These are sustainability and multifunctionality. Sustainability, which originally was referred to environmental issues, has got comprehensive approach by now. It includes not only environmental, but economic and social sustainability as well. It is a recent development, that society identifies its expectations towards the utilizations of different resources, towards the effects of different activities, or even towards the human individuals as well. These expectations are called as common functions, which should work in favour of society. In fact broadening the spirit of sustainability has multiplied the one-sided expectations and has led to a model of multifunctional mission. This specially refers to the future of agriculture and rural areas, as whole society nature of their mission is obvious. The multifunctional agriculture and rural development can be achieved if each branches of agriculture and each single actors of rural development can operate on multifunctional bases as well. That is the reason why elements of multilateral systems should be investigated individually. The objective of this paper is to look for potential role of Hungarian grasslands in multifunctional agriculture and rural development.

Material and methods

One million hectare existing grasslands, with their ecological conditions, practical situations and scientific opportunities will be considered. Widely known and technically accepted descriptions and statements as well as scientific references will be used in the investigations.

The definition of multifunctional agriculture and rural development will be cited from EUROPEAN CHARTER FOR RURAL AREAS (1996). This document outlines economic, ecological and socio-cultural functions for rural areas, including agriculture in modern and developed societies. Following these guidelines, grasslands as land use systems will be investigated with the multifunctional resource analysis method (*Nagy,* 2007). The target of the investigation is to find the economic, social and socio-cultural potentials of grasslands in integrated rural development and to compare grasslands with other land use systems in this respect.

Economical potential of Hungarian grasslands

Considering the ratio of our grasslands in land use in Hungary, grasslands are the third most important land use systems. Grasslands and grassland farming will be constant actors in rural areas and agriculture for some reasons: soils of our grasslands are of low fertility and so are not suitable for other land use systems; as a consequence of our EU membership, predictions regarding changes between different land use systems will result in increase of total grassland area in the country.

According to the different aspects of evaluating the economic potential of grasslands, judgements of investment and input needs are in favour of grasslands. As grasslands are

existing ecosystems there are no needs for investments (grass establishment, renovation etc.). The present farming practices use negligible farm inputs, so grassland systems are unique in this respect, and what is more, they can produce harvestable forage year by year without any inputs. As a result, in case of grasslands there are no needs for investment capital and do not have to face the problem of timing the input costs.

Aspects regarding outputs and returns of grassland farming show different picture. Although grasslands can produce harvestable forage without any inputs, the value of return from production in this case is fairly low compared to any other land use system in the country. This is due to the unfavourable ecological conditions of present Hungarian grasslands.

The social responsiveness to grassland use is positive. It is not a new, innovative land use system. Rural areas in the country have historical traditions in grassland farming. Labour for grassland farming is available in rural areas. However, technical skills for developed grassland farming systems may be missing in most rural areas.

Aspects regarding market conditions for products from grassland farming can be evaluated at a low rate in general. Unfortunately direct products of grasslands (green grass for grazing, grass hay or silage) are not marketable. Animal products from grasslands are already marketable products, but their production cycle is a relatively long procedure in time. Beef and mutton at the same time represent only small proportion in meat consumption per head and at the same time foreign market for these products is limited. Recently, however a promising market opportunity is opening for special animal products from grasslands. Labelled beef and mutton from organic grassland farming is a real chance for the future. Hungarian grasslands, as natural ones, are able to serve bio farming even in their present state.

Considering the relative importance of the previous aspects negotiated, it can be concluded, that grasslands may have average or even a bit higher potential in meeting the economic function of rural areas.

Ecological potential of Hungarian grasslands

The point which should be judged first is the effect of grassland use on the lifeless environment. As any other vegetation systems grasslands my have multiple positive effects on this environment. Utilizing carbon dioxide from the atmosphere and producing oxygen to it, grasslands are safeguards for the optimum balance of atmosphere components. They are enriching soils with organic matter. They can increase the resistance of soils against erosion and deflation, which has to be evaluated on sandy soils and on sloppy grasslands, occupying approximately 20% of Hungarian grasslands. In general grasslands are able to improve soil fertility, persistency of soil particles against water. No doubt, from the point of sustainability, grasslands are the most environment friendly land use systems (*Várallyai* and *Németh,* 1996). Grasslands with their most dense vegetation cover can serve as natural filters and may protect lakes and water flows from pollutions by run off water.

The effect of grassland use on human ecology is also favourable, but to a less extend. Pollution of dust in the air from grassland is zero, as soil cultivation is not practiced on grasslands and plant vegetation covers the ground through the year. This is unique compared to the most common land use systems, the arable lands in the country. The pollens from grasses may be a danger for the human ecology, but in case of farmed grasslands this danger may be minimized.

From the point of ecological function of grasslands, the role of grasslands in nature reservation is internationally outstanding. The proportion of grasslands in nature reservation areas is three times higher than their proportion in land use in the country. Presently about 30% of nature reservation lands are grasslands. Beyond that, 43% of animal and 63% of plant species, getting any nature reservation attention in the Hungarian *Red Book* (1989), requires grassland habitat. If diversified habitats and wildlife diversity are key points in sustainable and multifunctional development, Hungarian grasslands have to be given the highest ecological potential among land use systems.

Socio-cultural potential of Hungarian grasslands

Labour requirements of grassland farming are relatively low, so socio-cultural potential in this respect can be evaluated as negligible. However looking at the cultural heritage of grassland use (e.g. pastoral's folk) one can estimate grassland potential as outstanding. Material and non-material ethnographic heritage of grazier's culture (dressing, ancient Hungarian animal breeds, historical life style, regional architecture, folk songs, folk music etc.) are

Table 1. The potentials of different land use systems in meeting different expectation from society in multifunctional agriculture and rural development

Land use systems (A)	% of A from productive land[1]	Potential in meeting different functions		
		Production	Ecology	Amenity
Arable	58,3	*****	*/**	*
Garden	1,3	***	*	***
Fruit	1,3	***	*	**
Grape	1,2	***	*	****
Grassland	13,7	****	*****	****
Forest	23,0	**	*****	***
Reed	0,8	*	***	*
Fishpond	0,4	***	***	***

Indications for potential: * = negligable, ** = below average, *** = above average, **** = autstanding

[1]KSH, 2003. Source: Nagy, 2007

outstandingly attractive for rural tourism. Beyond these our grasslands can provide wide range of some other services for society. The Hungarian "Puszta", the open steppe landscape can even be considered as the image of the country (Hortobagy became a part of the World heritage in cultural landscape category). Our grassy landscape may serve different tourism branches (eco-, equestrian-, hunting-, rural ones). All together the socio-cultural potential of Hungarian grasslands can be evaluated as outstanding, as well.

Conclusions

The potential of different land use systems in rural development has formerly been estimated (*Nagy,* 2005).From the summarizing table of that study *(Table 1)* can be seen, that less frequent land use systems in the country can provide the widest opportunities for the multifunctional agriculture and rural development. Statements of the international grassland literature (*Hervieu,* 2002; *Carlier* et al., 2005.) may be referred to the Hungarian grasslands as well. Possibilities for grassland use in modern societies are very diversified, grasslands are the only land use systems, which can meet so many functions in serving human society.

Summary and future scenario

The relative importance of different grassland functions *(Figure 1)* for society reflects the future scenario for Hungarian grassland use. The economic potential can hardly be increased due to the existing socio-economic conditions in the country. Perhaps organic farming may have some prospects to improve the utilization of economic potential of our grasslands. The importance of ecological functions of grasslands is well known and broadly accepted in scientific circles. The future will harden this huge potential of natural-like Hungarian grasslands. The amenity services of grasslands as part of the socio-economic functions have been recognized by now. Changes in EU agricultural and rural policy towards the second pillar will enhance growing attention to better use of grassland products and services for the whole society.

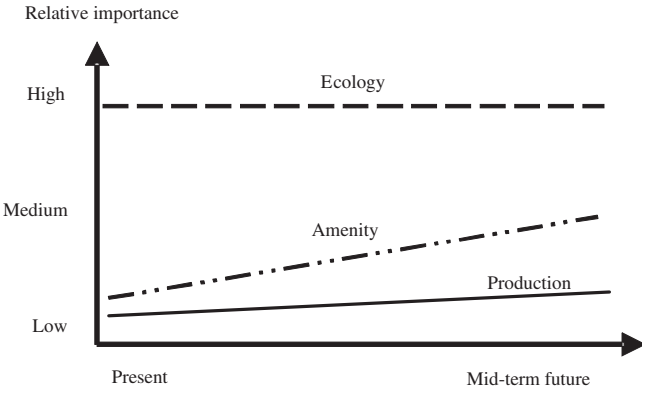

Figure 1. The relative importance of the three main grassland functions for societies and their future scenarios in Hungary

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European traditional food producers and marketing capabilities: An application of the marketing management process

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Abstract: The purpose of this paper is to evaluate the marketing management capabilities of SMEs producing traditional food products, in order to analyse the market orientation of SMEs in the food industry. Following the theoretical approach of Market Orientation, our analysis is based on an assessment of the marketing management process. The methodology refers to a survey developed through a questionnaire published on the web, and a sample of 371 firms based in Belgium, Italy, Spain, the Czech Republic and Hungary was used in the analysis. Cluster analysis was applied to find the different levels of market orientation of the firms. The results revealed a certain lack of appropriate skills in marketing management in the firms of the sample, confirming the evidence found in economic literature concerning SMEs. Nevertheless, cluster analysis outlined a group of firms with good marketing capabilities and market oriented, and these represent a great part of the sample (40%). With regard to the stages of the marketing management process, the most problematic are those of planning and implementation, and control and evaluation, highlighting the difficulties SMEs encounter in carrying out coordinated marketing; which appears to be generally characterised by poor organisational capacity.

Key words: marketing management capabilities, SMEs, traditional products, food sector

1. Introduction

Small and medium sized enterprises (SMEs) constitute the majority of firms in the EU food industry, and the sector of traditional food products (TFPs) especially is composed mainly by SMEs (O'Reilly and Haines, 2004; Spillan and Parnell, 2006). Over the past ten years competition among firms has increased due to globalization, and the EU food market has become less protected, which makes it very difficult for SMEs to adapt their strategies to market changes and to survive alongside large firms (*Knight,* 2000; *Banterle* et al., 2008).

Nevertheless, consumer preferences are evolving continuously, revealing an increasing interest in food quality, thus providing good opportunities for firms to reshape their strategies to meet consumer preferences (*Traill,* 1998; *Jaworski* and *Kohli,* 1993). In this context, TFPs could play a significant role in the market because they are increasingly requested by consumers, who associate them with quality and a return to tradition (*Jordana,* 2000; *Banterle* and *Carraresi,* 2007; *O'Reilly* and *Haines,* 2004).

For this reason SMEs characterised by flexibility and agility (*Heathfield,* 1997) could shift the orientation of their strategies from the product to the marketplace, in order to profit from new opportunities arisen in the market. Indeed, several studies in the literature show a relationship between the market orientation of firms and business performance (*Narver* and *Slater,* 1990; *Jaworski* and *Kohli,* 1993; *Kara,* et al., 2005).

However SMEs often lack appropriate tools to face increased market competition, especially in marketing activities, making it more difficult for SMEs to apply a market oriented strategy. Nonetheless, there is also evidence of successful cases of SMEs applying a market oriented strategy (*Kara* et al., 2005).

Being market oriented means that SMEs have to improve their marketing capabilities; indeed, within the firms, the marketing area is the one closest to the marketplace, therefore information concerning competitors and consumers needs to be disseminated to the other areas of the firm starting from marketing (*Kohli* and *Jaworski,* 1990; *Shapiro,* 1988; *Kara* et al., 2005).

The purpose of this paper is to evaluate the marketing management capabilities (MMC) of SMEs producing TFPs, in order to analyse SME market orientation within the food industry.

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In our analysis we consider TFPs with the following characteristics: the key steps of the production must be national, regional or local; they must have an authentic recipe and/or an authentic origin of raw material and/or an authentic production process; they have to have been commercially available to the public for at least 50 years, and they must have a gastronomic heritage.

The methodology refers to a survey, carried out with a questionnaire published on the web, aimed at evaluating MMC. A sample of 371 firms, based in Belgium, Italy, Spain, the Czech Republic and Hungary was used in the analysis. These countries were chosen as they are involved in a survey being carried out within the framework of the European research project *Truefood*[2].

The paper is organised as follows: the theoretical framework is presented in the next section; the methodology is described in the third section; the results are analysed in the fourth section, and concluding remarks are presented in the fifth section.

2. Economic issues

Marketing management capabilities derive from a well-performed marketing management process, which consists of analysing market opportunities, formulating clear marketing objectives, and developing a marketing strategy that should be implemented and controlled (*Kotler,* 2004). Therefore, any evaluation of the marketing capabilities of firms means carrying out an analysis of whether or not such firms apply appropriate marketing management processes.

The marketing management process consists of four stages (*Kotler,* 2004; *Bagozzi,* 1998; *Padberg* et al., 1997): *market research*, *marketing strategy*, *planning and implementation*, *control and evaluation*.

The objective of *market research* is to collect information to analyse the competitive environment within which the firm operates. Only in this way will it be possible to understand market opportunities and the behaviour of the people dealing with the firm, such as suppliers, buyers, competitors and final consumers.

Marketing strategy aims at formulating objectives and organizing activities in line with the opportunities opened up in the market. By applying a marketing strategy the firm is able to shape product business so as to obtain profits (*Kotler,* 2004; *Kohli* and *Jaworski,* 1990). Indeed, the firm has to adapt its products to various kinds of consumers as consumers do not all act the same way and have different tastes. Thus, firms must apply segmentation and targeting (*Bagozzi,* 1998; *Porter,* 1985).

Planning and implementation are key points in marketing management, and the objectives of the marketing strategy can only be achieved through the formulation of an appropriate marketing plan. This plan should be adapted to market conditions and in line with the budget allocated for marketing activities (*Kotler,* 2004). In order to be successful, the marketing plan must be in good coordination with the activities of the firm and consistent with its overall strategy, and must be implemented constantly to guarantee efficiency over time.

Control and evaluation is connected to the checking of the results achieved with marketing activities. The main objective of this stage is to verify that the sale and profit goals of the firm have been reached (*Kotler,* 2004). A periodical examination needs to be made of the planned activities and, if needed, the firm should be ready to take corrective action. If profitability does not reach a satisfactory level the firm must re-plan the activities to achieve the desired results.

Finally, besides the four stages of the marketing management process, our analysis also included *innovativeness* as an indicator of marketing capability. Indeed, new products, new markets and new distribution channels represent important elements to satisfy changing consumer needs, and to face increasing market competition (*Knight,* 2000).

A well-performed marketing management process allows firms to be market focussed. Indeed, this focus on the market is the main object of the Market Orientation approach (MARKOR), which argues that a firm can obtain good profitability through *customer focus* and *coordinated marketing* (*Kohli* and *Jaworski,* 1990; *Spillan* and *Parnell,* 2006; *Kara* et al., 2005).

Within the theoretical framework of the MARKOR approach, *customer focus* allows firms to gear their products to consumer preference, and this plays an important role in the actual globalised market where consumers find the satisfaction of their needs in a wide variety of products (*Jaworski* and *Kohli,* 1993; *Kohli* and *Jaworski,* 1990; *Narver* and *Slater,* 1990). Thus, the marketing area of a firm must take into consideration not only information concerning the targets of consumers addressed by the firm, but also the features of the entire market, including customers, suppliers, competitors, and final users. Therefore, customer focus concerns the carrying out of *market research* and the formulation of the objectives of the *marketing strategy,* in line with the information taken from the market.

The concept of *coordinated marketing* is related to the dissemination of information from the marketing area towards all areas of the firm, in order to let them participate and collaborate with each other for the achievement of the common objective of the firm (*Shapiro,* 1988; *Kohli* and

2 TRUEFOOD – "Traditional United Europe Food" is an Integrated Project financed by the European Commission under the 6th Framework Programme for RTD (Contract n. FOOD-CT-2006-016264).
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Jaworski, 1990; *Narver* and *Slater,* 1990). The stages of marketing management connected to coordinated marketing are *planning and implementation*, and *control and evaluation*. The consequence of customer focus and having coordinated marketing is *profitability* (*Kohli* and *Jaworski,* 1990).

Therefore, by assessing the marketing management process we can achieve an outline of the extent to which firms are market oriented, even though in our analysis profitability is not considered.

3. Methodology

A survey was carried out through an interactive on-line questionnaire[3] to evaluate the MMC of SMEs producing TFPs. The questionnaire was structured in five sections, reflecting the stages of the marketing management process, plus one concerning the general data of the firms (for the specific questions see *table 4*).

The firms' general data are related to company name, address, country, legal status, employees, turnover, membership of a consortium, voluntary quality certification, main distribution channels, and major selling markets. The first section of the questionnaire investigates the firms' *market research* with questions exploring whether or not firms take information about the market in which they operate. The second section, dealing with *marketing strategy*, investigates the firms' objectives and the strategic choices regarding the product business. The third section is dedicated to the *planning and implementation* of the marketing activities within the firm. The fourth section concerns the *control and evaluation* of the results of marketing activities. The fifth section is addressed to the level of *innovativeness*.

Except for the part of the questionnaire concerning the general data of the firms, the other sections oblige the firms to answer with a Likert-scale from 1 to 5, reflecting, respectively, the worst capability and the best one. The questionnaire is a self-evaluation tool for the marketing managers of the analysed firms. Although this method is affected by a subjective view, the results outline the firms' perception of their MMC levels. The sample consists of 371 firms producing TFPs, and belonging to the following countries: Hungary (7%), Italy (34.5%), Czech Republic (23.7%), Spain (19.7), and Belgium (15.1).

The values of the variables connected to marketing capability, expressed by the interviewed firms, were subjected to cluster analysis. However, due to missing values 56 firms were excluded, leaving 315 firms to be considered. For the cluster analysis we utilized a hierarchical approach. Similarity between cases was measured by the Chebychev distance, and the 'average linkage within groups' method was used to combine nearest clusters into broader groups. This technique led to the identification of 4 clusters that seemed the best results in terms of some important criteria, such as the minimum number of firms for each cluster, the degree of inter-cluster distances, and the different characteristics of the resulting clusters.

4. Results

4.1 Descriptive analysis

The sample is composed mainly by SMEs that represent 88% of the firms analysed, instead 11% are large enterprises, and 1% of the firms did not answer the question regarding employment *(Tab. 1).* Among the SMEs 30.5% are micro-sized firms, 31.5% are small, and 26% are medium. The micro-sized firms constitute a relevant part of the sample in Hungary (53.8%), Belgium (50%), and Italy (41.4%). In Italy and Belgium also the small firms are well represented, respectively 37.5% and 28.6%, together with the Czech Republic (30.7%) and Spain (30.1%). Medium-sized firms predominated in the Czech Republic (42%) and Spain (35.6%), whereas the percentage of large firms was small in all the countries except Spain, where 30% of the firms had more than 250 employees.

With regard to the main distribution channels chosen by the firms, supermarkets predominated in the sample, though the percentage of firms making main use of this distribution channel was not so high (37%); supermarkets are followed by direct sale (16.4%), wholesalers (14.6%), and specialised shops (12%) *(Tab. 2).* The importance of supermarkets is

Table 1: Size of the firms of the sample

	Belgium	Czech Rep.	Hungary	Italy	Spain	Total	Belgium	Czech Rep.	Hungary	Italy	Spain	Total
	n						%					
Employees												
< 10 empl.	28	15	14	53	3	113	50.0	17.0	53.8	41.4	4.1	30.5
10-50 empl.	16	27	4	48	22	117	28.6	30.7	15.4	37.5	30.1	31.5
50-250 empl.	9	37	5	19	26	96	16.1	42.0	19.2	14.8	35.6	25.9
> 250 empl.	2	8	2	6	22	40	3.6	9.1	7.7	4.7	30.1	10.8
n.d.	1	1	1	2	0	5	1.8	1.1	3.8	1.6	0.0	1.3
Total	56	88	26	128	73	371	100.0	100.0	100.0	100.0	100.0	100.0
Turnover												
< 2 M	10	7	1	45	2	65	17.9	8.0	3.8	35.2	2.7	17.5
2-10 M	12	11	3	29	16	71	21.4	12.5	11.5	22.7	21.9	19.1
10-50 M	7	13	1	17	22	60	12.5	14.8	3.8	13.3	30.1	16.2
50-100 M	2	9	0	3	13	27	3.6	10.2	0.0	2.3	17.8	7.3
>100 M	4	37	0	7	14	62	7.1	42.0	0.0	5.5	19.2	16.7
n.d.	21	11	21	27	6	86	37.5	12.5	80.8	21.1	8.2	23.2
Total	56	88	26	128	73	371	100.0	100.0	100.0	100.0	100.0	100.0

Source: own calculations

[3] www.truefood.eu and http://users.unimi.it/truefood

Table 2: Distribution channels and geographical market of the firms of the sample

	Belgium	Czech Rep.	Hungary	Italy	Spain	Total	Belgium	Czech Rep.	Hungary	Italy	Spain	Total
	n						%					
Distribution channels												
supermarkets	14	23	5	46	49	137	25.0	26.1	19.2	35.9	67.1	36.9
specialised shops	7	13	4	18	3	45	12.5	14.8	15.4	14.1	4.1	12.1
direct sale	13	17	9	19	3	61	23.2	19.3	34.6	14.8	4.1	16.4
wholesalers	7	9	6	25	7	54	12.5	10.2	23.1	19.5	9.6	14.6
others	2	16	0	5	0	23	3.6	18.2	0.0	3.9	0.0	6.2
small grocery shops	6	7	1	13	10	37	10.7	8.0	3.8	10.2	13.7	10.0
n.d.	7	3	1	2	1	14	12.5	3.4	3.8	1.6	1.4	3.8
Total	56	88	26	128	73	371	100.0	100.0	100.0	100.0	100.0	100.0
Sale markets												
local	13	15	13	14	0	55	23.2	17.0	50.0	10.9	0.0	14.8
regional	7	23	3	21	8	62	12.5	26.1	11.5	16.4	11.0	16.7
national	16	34	8	69	50	177	28.6	38.6	30.8	53.9	68.5	47.7
international	14	5	1	23	14	57	25.0	5.7	3.8	18.0	19.2	15.4
n.d.	6	11	1	1	1	20	10.7	12.5	3.8	0.8	1.4	5.4
Total	56	88	26	128	73	371	100.0	100.0	100.0	100.0	100.0	100.0

Source: own calculations

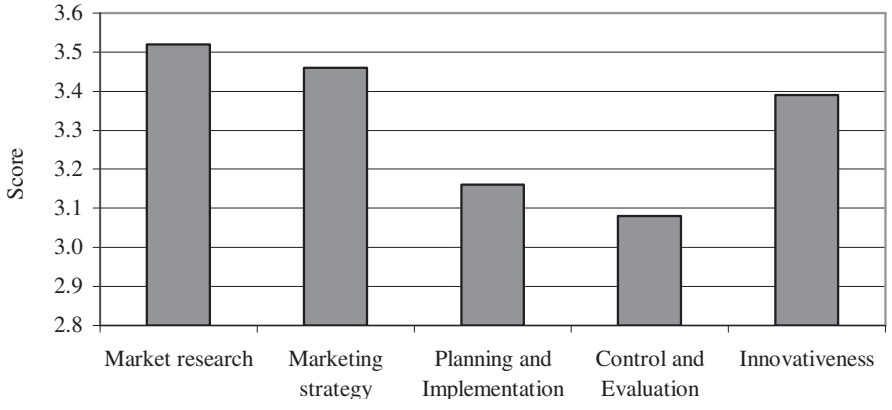

Figure 1: Marketing management capabilities of the sample firms
Source: own calculations

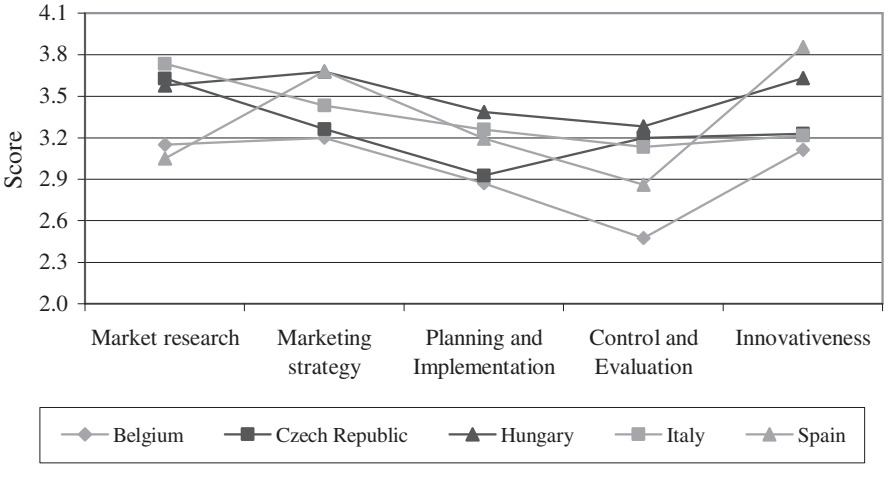

Figure 2: Marketing management capabilities per country
Source: own calculations

revealed in all the countries analysed, especially in Spain (67%), the only exception was Hungary where direct sales constituted the most frequently used channel (34.6%). The majority of the firms in the sample sell their products on the national market (47.7%), whereas only 15.4% operate in the international market. The rest of the considered firms place their products at local (14.8%) and regional (16.7%) levels. Note that the local market is quite relevant for Hungarian firms (50%).

Considering MMC, the general results of the analysed firms highlight the lack of appropriate tools in marketing management, confirming the literature findings concerning SMEs. Indeed, the average results in the different areas of marketing management range between 3.1 and 3.5[4], which, on our scale, reveal not such good performance, demonstrating the weak market orientation of traditional food producers *(Fig. 1).* The most problematic stages of marketing management are seen in *planning and implementation,* and *control and evaluation*. Indeed the major bottlenecks are connected to the formulation of the marketing plan and the control of the results achieved, showing weakness in the internal organisational activities of the firms, namely their coordinated marketing. This is a typical problem connected with SMEs, which are characterised by poor organisational capacity.

On analysing MMC per country, the results show that the *marketing strategy* scores of the countries are similar (around 3.5), a strong point for the firms considered, whereas for *market research* we note that Italy, the Czech Republic and Hungary have good capability whereas Belgium and Spain are weak *(Fig. 2).* The weakest points are the stages of *planning and implementation,* and *control and evaluation*, as mentioned above, but in the former the scores are relatively similar while in the latter differences

[4]The average MMC of each stage of marketing management was calculated by summing the scores (ranging from 1 to 5) obtained in each section of the questionnaire and dividing this sum by the maximum score reachable by each firm.

among countries are observed. Moreover, the firms obtain quite good scores in innovativeness, especially the Spanish firms.

4.2 Cluster analysis

The cluster analysis resulted in four significant different clusters *(Tab. 3).* A great part of the respondents, i.e. 40%, is grouped into the cluster *market oriented* (average score is 4.1) and shows good results in all five areas.

About the 27% of the respondents are grouped in the cluster *intermediate market oriented* (average score is 3.5). The members of this cluster achieved lower scores than the members of the first cluster, but they obtained results in all five areas in line with the average values of the sample.

The third cluster, that groups the so called w*eakly market oriented* firms, represents 22% of the sample, and shows an average score of 3.1. In this case the respondents have a low market orientation, especially with regard to specific marketing areas.

Finally, the firms grouped in the fourth cluster are *not market oriented* and present the lowest scores in all five marketing areas (average score is 2.4). However, this cluster includes a minority of the sample because it groups only 37 firms (12%).

It must be pointed out that, on comparing the four clusters, some of the variables have similar scores while other marketing variables lead to quite different results. For example, the firms' capability of influencing price setting differs slightly from cluster to cluster. This is probably due to the size of the considered firms, most of which are micro- and small firms; therefore they can be only price takers.

On the other hand, variables referred to certain marketing areas such as *planning and implementation*, *control and evaluation,* and, partially, *marketing strategy,* presented high differences among the clusters. For this reason, the variation in marketing performance highlighted in the survey is mostly dependent on these areas.

Table 3: Cluster analysis

		Cluster			
		1) Market oriented	2) Intermediate market oriented	3) Weakly market oriented	4) Not market oriented
Size of cluster	**N**	126	84	68	37
	%	40.0	26.6	21.6	11.7
Market research					
Brand analysis		3.86	2.95	2.34	2.16
Supplier analysis		4.25	3.92	3.26	2.89
Retailer analysis		4.26	3.96	3.28	2.73
Competitor analysis		3.91	3.08	2.96	2.35
Market analysis		4.04	3.65	3.41	2.46
Consumer analysis		4.21	3.77	3.71	2.97
Marketing strategy					
Existence of clear objectives		4.48	3.44	3.32	2.41
Strategy well-known inside firm		4.02	3.24	3.12	2.30
Product tailoring according the consumer needs		4.16	4.00	3.57	2.81
Product differentiation		4.25	3.98	3.56	3.00
Influence on price setting		3.63	3.62	3.62	2.84
Investment in dynamic and qualified sales forces		4.25	3.24	3.25	2.14
Choice of distribution channel		4.17	3.76	3.88	2.05
Investment in promotion and advertising		3.90	3.15	2.53	2.16
Planning & Implementation					
Planning in advance		4.25	3.36	2.91	2.16
Adaptation of promotional activities to changes in market		4.13	3.37	2.76	1.89
Adaptation of budget to changes in market		3.83	3.31	2.51	1.86
Control & Evaluation					
Evaluation of results		4.40	3.76	2.54	2.19
Cost analysis		4.29	3.69	2.50	2.24
Benchmarking with competitors		3.37	2.61	1.88	1.68
Innovativeness					
Investment in product improvements		4.40	4.00	3.76	2.54
Search for new markets		4.37	4.02	3.74	2.81
Innovative distribution channels		3.24	2.99	2.66	2.11
Average total score		4.07	3.52	3.09	2.38

Source: own calculations

Cluster 1 – Market oriented

The first cluster scored good results in all five areas, except for some weakness in points such as brand analysis, influence on price setting, adaptation of budget to market change, benchmarking with competitors, and innovative distribution channels. With regard to the last two aspects, the marketing activity of market oriented SMEs should improve with concentrating marketing efforts on an ex-post evaluation of such activities, and on the search for new ways to distribute food products in line with the quantity produced.

Cluster 2 – Intermediate market oriented

The firms grouped in this cluster show a lower level of marketing capability than those belonging to the first cluster, in spite of the fact that these firms achieved some good scores. In this cluster, the main points of SME weakness are brand analysis, competitor analysis, promotion and advertising investment, benchmarking with competitors, and innovative distribution channels. Compared to the first cluster, the low level of promotional activity in these firms could depend on the different selling markets.

Cluster 3 – Weakly market oriented

In the third cluster brand analysis, promotion and advertising investment and the choice of the distribution channel are all problematic for SMEs. Moreover, the critical points for a good level of marketing capability are related to all the variables of the *planning and implementation,* and *control and evaluation* areas, which are clearly the weakest for the firms grouped in this cluster. The scores from these two areas are much lower than the scores of the other areas and the average score of this third cluster.

Cluster 4 – Not market oriented

In the fourth cluster, the choice of the distribution channel and the benchmarking of marketing strategy are two of the weakest activities for SMEs. The area *planning and implementation* is not an exception in this cluster; all the variables belonging to this area show a lower average score than that of the cluster taken into consideration.

Summarizing, the weakest points of the analysed firms are brand analysis, the adaptation of the budget to changes in the market, the benchmarking of marketing strategy and the selling through innovative distribution channels. Moreover, as already shown in our descriptive analysis, it is clear from the present cluster analysis that the most problematic aspects are *planning and implementation,* and *control and evaluation*. This means that SMEs with a low level of marketing capability should develop a more intensive marketing activity organisation, both ex-ante and ex-post, and try to build up a system able to efficiently evaluate marketing activity targets and the results obtained by the firms.

5. Concluding remarks

The analysis revealed a certain lack of appropriate marketing management skills in the firms of the sample, confirming the evidence found in economic literature concerning SMEs and highlighting the weak market orientation of traditional food producers.

Nevertheless, cluster analysis outlined four clusters with significant different MMC and different levels of market orientation. The first cluster grouped *market oriented* firms that represent a great part of the sample (40%). Note that the firms of this cluster show the two main pillars of the MARKOR approach, *customer focus* and *coordinated marketing*, both well developed though the second one reveals some weaknesses.

With regard to the stages of the marketing management process, the most problematic ones are represented by *planning and implementation* and *control and evaluation*, highlighting the SME difficulties, generally characterised by poor organisational capacity, in carrying out coordinated marketing. On the other hand, the areas of *market research* and *marketing strategy* appear less problematic.

The weakest points of the analysed firms were brand analysis, adaptation of the budget to market change, benchmarking of marketing strategy and selling through innovative distribution channels. Moreover, the firms show little capability in influencing price setting. This is probably due to the size of the considered firms, most of which are micro- and small firms and, therefore, only price takers, not price makers.

An interesting managerial implication derived from our analysis concerns SMEs with low marketing capability. Needless to say, the improvement of MMC requires effort on the part of the firms to develop a more intensive organisation of marketing activities, both ex-ante and ex-post, and to build up a system able to efficiently evaluate the targets of marketing activity and the results achieved by the firms. Indeed, improved MMC is a crucial point for SMEs.

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The operation of the Hungarian Broiler Product Chain

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Abstract: The general objective of this paper is to present the inner connections of the broiler product chain and the process of value generation in the economic situation of 2007. I introduce the input-output model of the broiler product chain adapted from macro-economic analysis, in which I calculated the direct connections of the product chain phases and between the national economic branches outside the chain. Then I point to the disproportion of the product chain through the profit distribution. Moreover, to evaluate the process of the value generation I demonstrate the value added generated along the value chain (year 2007). On the basis of the results 825 EUR of value added is realized to one ton of ready product (chicken meat), from which the major portion is shared by processing. The paper also determines the added value and the major factors influencing its ratio within the product chain.

Key words: broiler, product chain, input-output model, value generation, value added

1. Introduction

Changes of the economic and market environments as well as the more and more strengthening marketing competition make the investigation of economic factors influencing the competitiveness of the Hungarian poultry sector especially of the broiler sector important and necessary both in a farm level and extended to the whole product chain. Furthermore, it is essential to reveal the product chain connections and to introduce the value generation and partial markets continuously. *Felföldi* (2007a) stated that „to develop a successful competitive strategy, it is vital … to reveal the operation of the whole chain … and always essential to plan and calculate." In association with these, the general objective of my research is to investigate the inner connections of the product chain and the process of value generation.

2. Materials and Methods

In order to realize the research I used the farm-level data of a whole and closed vertical integration in Hungary. The reason is its significant role played in producing broiler in Hungary and the limited available database and data sources relating to the certain phases of the product chain. To carry out farm business analysis I used the simulation model of the broiler product chain (*Szőllősi,* 2008), which input parameters includes several economic and technological variables, the output results contain data necessary for other analysis.

To introduce and investigate the inner connections of the broiler product chain I adapted the input-output model (Balance of Enterprise Connections), which is used to measure macro-economic performance. In 1925 the statistical office in the Soviet Union published a national economy balance in which input-output model (*Wassily W. Leontief* (1906–1999)) firstly described the structure of macro-economy (*Nagy,* 2004). The input-output model is the first formal and numerical expressible model of economic circle (*Augusztinovics,* 1996). According to my mind this model is able to illustrate and introduce the direct connections of the participants of product chain and other national branches both in natural quantity and value.

Determining the value added we should apply the value chain analysis, which illustrates the most important participants of the examined industry during the production. *Apáti and Felföldi* (2007) and *Felföldi* (2007b) analyzed product chains in the fruit and vegetable sector which had resulted in stressing upon the post harvest technology and logistics as weaknesses of those industries. These weaknesses also refer to the importance of operations to produce added value. During the value chain analysis numbers of participants, type of competition, value generation of the certain product, and the profit of the certain chain phases may be studied (*Szűcs,* 2006). In this paper I focus on the last two methods.

Calculating the value added between certain chain phases as a category of the production value, I considered phrasing of *Pfau and Posta* (1996): "The value added is the difference of gross production value and reuse and the value of purchased goods." On the other hand I took into account the method used by KSH (Hungarian Central Statistical Office)

(2007): "In macro-economic circumstances the gross value added (Gross Domestic Product) is equal to difference of the gross output and cost of commodities used to produce. Moreover, I had respect for professional standing of *Pupos* (2007): "The value added can be calculated as the difference of production value and material cost."

3. Results and Discussion

3.1. Operation of the Broiler Product Chain

On the basis of the data of the year 2007 of the simulation model (*Szőllősi,* 2008) and accordance its general aspects, a production cost of 3 475 EUR/ton chicken meat incur in the level of the modeled product chain, and parallel to this a production value of 3 557 EUR/ton chicken meat is realized. On the other hand, if we analyze economic situation at the level of product chain, we need to consider that certain product chain phases transmit their products to each other, in this way the value of products means revenues in one phase and it comes up as a cost in other phase. In order to filter these accumulations, I applied the structure of input-output model in a novel approach. The input-output balance of the product chain contains the input and output of certain product chain phases that is it reflects the direct connections of the producing and utilizing product chain phases (*Table 1*). The table rows contain the output enterprises, in contrary columns show input chain phases. The dark-grey matrix includes enterprises within production chain, and the light-grey matrix contains participants out of the chain.

According to *Table 1* the feed production is in direct connection with three other chain phases in which transferred value to the broiler growing phase is determinative. It is 92% of total production value of feed production. Looking at this value from the consumption side it reveals that feed cost come from value transmit takes 63% of the total broiler production cost. Moreover, I concluded that the produced mixed feed and hatching chicks are responsible for 80% of the production cost of broiler growing. Near 25% of the production cost of rearing parent stock, 73% of the cost of egg production, 75% of the cost of hatching and 60% of processing cost come from value transmit within the product chain. Only the last processing phase plays a role in the marketing outside the product chain (99%), and only the by-products of the products of the other enterprise get into markets outside the product chain. Even the fact can be determined from the input-output model that in what ratio the broiler product chain contributes to the revenue of national economic branches providing the poultry enterprise. In case of purchased inputs, producing mixed feed has determent significance (70%) through its utilization of feed raw material. The processing (67%) and broiler growing (17%) phases of the product chain have outstanding roles in direct employment. In case of material assets and required services, even these two phases are determent.

By the help of the input-output model, I constructed the non-cumulative form of the costs, production value and profit conditions of the product chain. The production costs takes 1 549,33 EUR/ton chicken meat, in contrary the production value is 1 630,79 EUR/ton chicken meat. As a result of this cost and value the profit of production chain is 81,46 EUR projected to chicken meat as a ready product of one ton.

Table 1: Output-Input Model of the Broiler Product Chain (2007)[1]

Unit: EUR/ton ready product (chicken meat)

Input enterprises / *Output enterprises*	Feed production	Parent stock rearing	Parent stock hatching egg production	Hatching	Broiler growing	Processing	Selling	Other factors increasing production value	Total
Feed production		9,46	45,84	-	616,00	-	-	-	671,30
Parent stock rearing	-		37,96	-	-	-	0,51	-	38,47
Parent stock hatching egg production	-	-		111,19	-	-	10,67	-	121,86
Hatching	-	-	-		166,79	-	0,06	-	166,85
Broiler growing	-	-	-	-		938,80	2,77	-	941,58
Processing	-	-	-	-	-		1 616,78	-	1 616,78
Purchased inputs	565,25	22,35	7,08	15,72	87,70	107,74			805,84
Personal inputs	14,98	1,66	6,27	10,68	35,52	139,78			208,89
Depreciation	7,20	2,27	4,20	3,14	14,47	24,81			56,10
Required services	10,46	0,97	2,45	4,67	34,11	153,39			206,04
Other inputs	19,08	1,89	10,55	3,37	25,80	211,77			272,46
Total	616,96	38,59	114,36	148,78	980,38	1 576,30			3 475,37
Net profit	54,33	-0,12	7,50	18,07	-38,80	40,48			81,46

Source: Own construction and calculation used results of Szőllősi's model (2008)

1 Supposing a product chain without capital uniformity

3.2. Disproportion of the Production Chain

I looked for the answer of the question that under what price the profit of the product chain can be divided proportionally among the certain phases. I used two approaches. The criteria of distributing the profit in the ratio of the cost are decreasing the price of mixed feed by 5,9%, as well as reducing the prices of hatching eggs and hatched chick by 6,35% and 13,03%, respectively. On the other hand it is necessary to increase the selling price of reared parent stock by 1,23% and the price of broiler by 0,3%. In accordance with the value of fixed assets feed prices should be decreased by a greater degree, by 7,24%, the price of hatched chick by a smaller degree, by 7,47%. At the same time the value of reared parent stock should be higher by 7,91%, the price of hatching eggs by 2,09% and the selling price of broiler should grow by 2,48%.

It is clear from the results of the investigation that besides the profit distribution in the ratio of costs improving the results of phases showing a deficit may be realized only at the expense of the lower phases (feed production, egg production, hatching) of the product chain. Parallel to this, the broiler growing is exposed to a greater extent within the product chain in the input side (feed mixture and hatched chick) than in the processing side. In case of investment rated profit distribution the ratio of defencelessness is more emphasized, though its tendency cannot be defined in an expressed way (*Figure 1*).

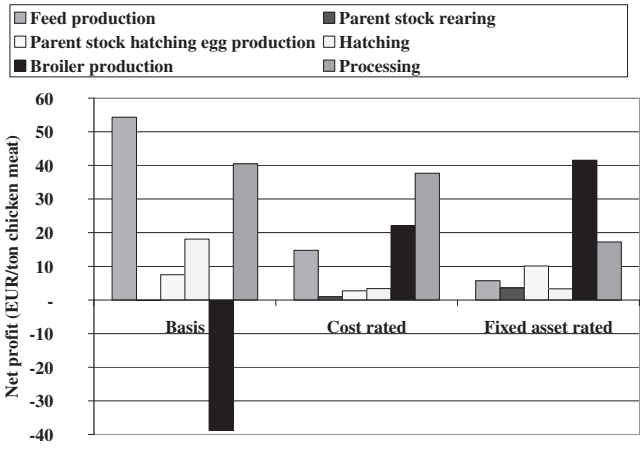
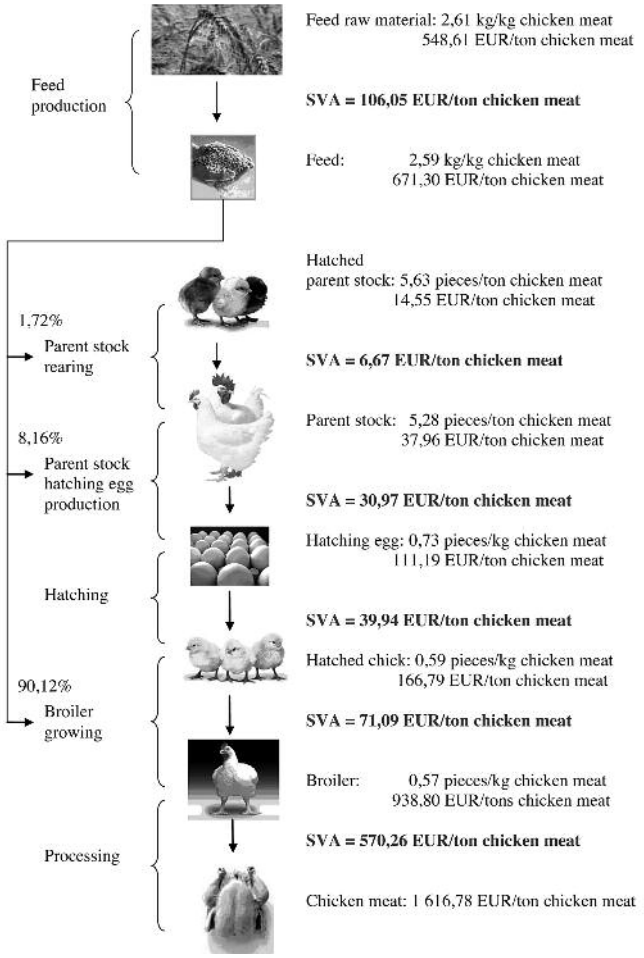


Figure 1: Profit Distribution among the phases of product chain
Source: Own calculation used results of Szőllősi's model (2008)

3.3. Examining Value Added in the Broiler Product Chain

The value generation of broiler product chain is realized as *Figure 2* reflects which shows the per unit value added of the modeled product chain, furthermore it contains the specific natural quantity and value of the products from the certain phases of the product chain. The arrows show the process of the value generation (*Figure 2*).



SVA: Specific Value Added
1 EUR = 260 HUF

Figure 2: Value Generation along the Broiler Product Chain (2007)[2]
Source: Own illustration and calculation used results of Szőllősi's model (2008)

On the basis of the value chain analysis, starting from the feed raw material (548,61 EUR/ton chicken meat) getting into the product chain and the imported hatched parent stock (14,55 EUR/ton chicken meat) we go through rearing, egg production, hatching then growing, and we reach processing, where ready products of 1 616,78 EUR/ton chicken meat get to the market. The whole vertical integration realizes 824,95 EUR/ton chicken meat of value added. I revealed by the value chain analysis that the determining phase is processing as it constitutes 69% of the total production value. Besides, feed production (13%) and broiler growing (9%) have highly significance within the value chain.

The ratio of value generation between the certain phases of product chain is influenced by the tendency of economic and technological parameters. According to the results of elasticity analysis on the generated value most of the input parameters definitely affect on the total performance of the product chain. The inner ratio is influenced by the selling price of broiler by increasing the value added of growing and

2 Supposing a product chain without capital uniformity

by this it side by side decreases the produced value of the processor. I highlight the effect of the price of feed mixtures as well, which concerns the other three phases of the product chain and most of all decreases mainly the performance of growing. Relating to the generated value of the whole product chain the selling price of processed products and the daily weight gain of broiler are relevant factors. There are other significant factors such as number of eggs per hen housed, hatching ratio, ratio of hatching eggs and finishing weight of broiler. Factors influencing the value added of enterprises mainly in a negative way are prices of feed raw material and per kilogram feed consumption of growing.

4. Conclusion

By adapting the input-output model to the broiler product chain, I revealed and calculated the direct connections of the certain product chain phases and between the participants outside the product chain.

Then by drawing attention to the disproportion of the broiler production chain, I found cost rated the broiler growing is exposed to a greater extent within the product chain in the input side (feed mixture and hatched chick) than in the processing side.

I revealed and calculated the value generating process realizing along the broiler product chain and I concluded that processing is dominant (69%). Moreover, I determined the most important factors influencing the value added and its ratio within the product chain.

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New Rural Economy: Challenges and Diversity in Eastern Croatia

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Abstract: Eastern part of Croatia is agricultural region according to natural resources (fertile soil, first of all), as well as human potential (long experience in traditional agriculture). Besides agriculture as traditional activity, a characteristic of rurality is also added to this region. Rural area is dominant in Eastern Croatia and it effects on relatively small urban areas. This paper represents new possibilities of rural economic activities on family farms in Eastern Croatia. Role and significant of rural economic activities is analyzed through indicators overview (land structure, GDP, population, population density, TEA index, unemployment ect.). Challenges through diversification of rural economic activities in this paper includes added economic activities realized on family farms through tourism, crafts, handy work, processing, renewable energy etc. Added economic activities on family farms in Eastern Croatia participate with only 3.9%. Suggestions and possibilities measures of rural economic activities diversification are reflected through two main streams. First stream is diversification of activities through added value of agricultural products as vertical connection (organic food, autochthony products, functional food, renewable energy sources etc.). Other one economic activity diversification indicates distribution function of final products through different services on the family farm (direct sale, specialized shops, rural tourism and many other services).

Key words: diversification, agriculture, new rural economy, Eastern Croatia

1. Introduction

The natural and economic characteristics of Eastern Croatia provide a substantial potential for successful new rural economy. Large areas in this region are covered with forests and have adequate basis for the development of forestry and strong wood and lumber-processing industry. This type of industry along with the dominant primary agricultural production enables the development of food industry that is food production; the basis agricultural function. The areas that are furthest to the east are covered with extremely fertile grounds, whereas the middle and western parts of the region are both rolling country and highland-country. Eastern Croatia has a moderate continental climate influencing the area from the west toward east. The summer temperatures increase and the amount of precipitation decreases in the same direction. The yearly amount of precipitation is lower here than in the rest of the Republic of Croatia. The east of the region consists of lowlands and plains, whereas in the west there are the mountains of western Slavonia and its foothill regions intersected with river and brook valleys. The natural characteristics, especially relief, but also climate and pedological characteristics of the agricultural area are crucial for determining the way the agricultural grounds are used *(Strategy for rural development, 2008)*.

The counties in the region of Eastern Croatia are: Osječko-baranjska, Vukovarsko-srijemska, Požeško-slavonska, Brodsko-posavska and Virovitičko-podravska County. Taking up as much as 91,2% of the arable land, the dominating type of agricultural grounds are plow fields and gardens (the average for the Republic of Croatia is 70%). Orchards and vineyards take up 4,2% whereas meadows and pasture grounds take up the remaining 4,6% of the agricultural ground. The total arable land (owned or leased) in Eastern Croatia amounts to 318.719 ha, that is 37% of the total arable land in the Republic of Croatia. The method of parallel analysis of the size of the arable agricultural land has shown that the east of Croatia is in a proportionally homogenous relation to the average of the Republic of Croatia *(Croatian Agricultural Census, 2003).*

2. Materials and methods

The role and importance of rural new rural economy is analyzed through an overview of the most important indicators for the rural area of Eastern Croatia (size, GDP, population, population density, unemployment and so on). In this paper TEA index were individually calculated and compared with Croatian level. A graphical representation of the cumulative distribution function of family farms were

analyzed through Lorenz curve. In order to make a detailed analysis, the methods of induction, deduction, synthesis as well as comparative analysis have been used. Through all those methods the aim of this paper is to point out the importance of new rural economy on family farms in Eastern Croatia. The paper refers to the statistical data published in the Agricultural census 2003, as well as relevant literature.

Results and discussion

The economic system of the Republic of Croatia is heavily characterized by the transitional period and the transfer from a closed into an open market system. The effects of the transition can be seen in the disproportional economic and social development, social conflicts and increasing disproportions in income, negative rate of population growth, population aging, internal migrations and so on.

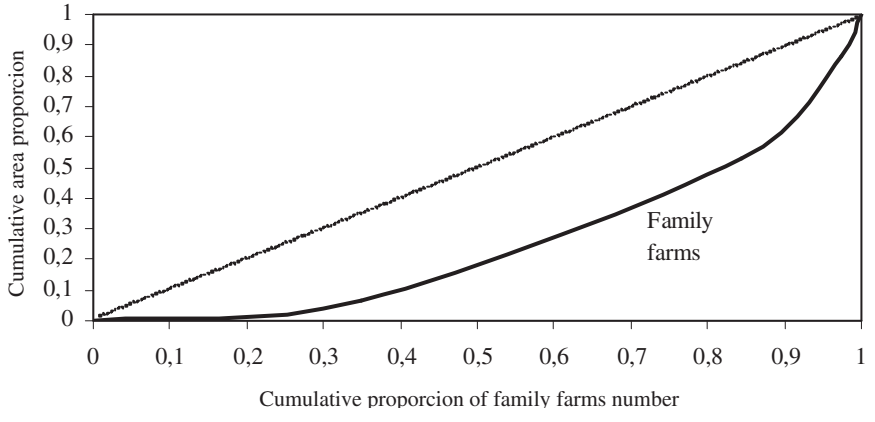
By comparing the economic situation of Eastern Croatia with the results for the whole of Republic of Croatia there is an evident gap, that is all macroeconomic indexes are significantly lower than the country average, as shown in *table 1*.

Assimilating changes in development of family farms in last thirty years we noticed that the total number of family farms increases, but the average size is decreasing by average annual rate 5,10%. Our data are represented through Lorenz curve in order to analyze and predict concentration changes in land structure of family farms in the Republic of Croatia *(Zmaić, 2008).*

Table 1. Comparative overview of macroeconomic indexes

	Eastern Croatia	Republic of Croatia
Higher educated population (%)	3,9	6,5
Density per km²	71,4	78,4
Unemployment rate (%)	24,4	16,7
GDP p/c	6.637	9.684
TEA index	4,91	6,11
Employed (%)	23,4	31,2

Source: www.mvpei.hr



Graph 1. Lorenz curve of family farms

Lorenz curve show that 2,5% family farms had only 13,8% area bigger than 10 ha, or o 49,7% family farms had 46,6% areas of 1–5 ha, what is shown in *Graph 1.*

The rural area is an important part of the Eastern Croatia and it is characterized by low population density (34 inhabitants/km²), depopulation, population extinction, lack of vital population, disappearance of the traditional population structure, lack of infrastructural connections, and so on. Family farms are the most important and the most numerous subjects in the rural area, which is why this paper analyzes 120.706 family farms in Eastern Croatia *(Croatian Agricultural Census, 2003).* In the total number of family farms there are two groups of farms based on their selling of agricultural products. Most of the family farms comprise an area of up to 3 ha. They make up 75,9% (91.641) of all farms and they usually work to sustain their own needs, whereas it may be presumed that the 29.065 farms that are bigger than 3 ha (24,1%) are selling their products on the market. This data shows that marketability in Eastern Croatia is very low and that economic resources of the rural area are mostly made up of small family farms, where more than a half of them only have 1 ha of agricultural land, are modestly technologically equipped, poorly organized and have low knowledge level.

The characteristics of family farms in Eastern Croatia are highly differentiated. Namely, the fact is that more than a half of the farms (53,8%) have less than 1 ha of land, and they occupy only 408 ha (0,1%) of the total area of engaged agricultural land. On the other hand there are farms having more than 5 ha (15,4%) and they occupy 80% of the total area of engaged agricultural land. This type of polarization of farms in Eastern Croatia is similar to the average of the Republic of Croatia.

However, in Eastern Croatia there are larger areas of arable agricultural land within farms that stretch on more than 5 ha. In the whole of Republic of Croatia there are 63.304 (14%) family farms larger than 5 ha which occupy 553 868 ha (64%) of arable land, whereas in Eastern Croatia there are more smaller farms that occupy less area and less large farms that occupy most of the arable land. The small farms are usually situated near towns, i.e. they practice outlying agriculture that is oriented on work intensive agricultural production. On the other hand, a relatively small number of larger family farms have managed to increase in size during privatization process and so they doubled their average size. Despite the positive privatization processes the size of family farms in Eastern Croatia is 2,6 ha, but it is still significantly larger than the average for the Republic of Croatia (1,9 ha).

Quantity analysis of agricultural land points to the production potentials of Eastern Croatia in the production of crops: cereal crops, industrial and fodder plants and vegetables, as well as fruit- and wine-growing. There is potential in the development of cattle-raising, especially pig and cattle breeding. Every type of agricultural production should be related to market and selling. Many direct and indirect factors influence the market, such as population size, certain customer area, age and education structure, customers' income and retail prices, organization and quality of supply, as well as quantity and quality of the products. The analysis of family farms in Eastern Croatia according to sales shows that 21,4% of crop products are marketed and sold, 21,0% of cattle, whereas the sales of products made on a farm by nonagricultural activities is only 2,6%.

Table 2. Number of family farms, rural population and activities in Eastern Croatia

Land structure	No. family farm	No.of population on family farms			
		Agricultural activities		Non-agricultural activities	
				Basic activity	Added activities
<1	58.896	129.073	43.939	41.168	1.288
1-3	23.151	49.964	13.881	14.839	862
3-5	10.368	24.394	5.748	6.217	494
5-10	11.032	28.089	6.078	6.153	704
10-20	4.969	14.384	2.813	2.405	452
>20	2.695	8.260	1.559	1.117	299
TOTAL	120.706	254.164	74.018	71.899	4.099

Source: Croatian Agricultural Census, 2003.

The Agricultural census of 2003 shows that 1.613 518 people or 36% of the total population live on family farms in the Republic of Croatia, whereas 400.081 people live in the rural area of the East, i.e. 44,9% of the total population in this region.

The analysis of family farms according to the number of members they have, working hours spent on agricultural activities, and the number of members who practice other economic activities on family farms as basic or additional activities shows that family farms in Eastern Croatia on average have 2-3 members, proving thus the emptiness and depopulation of the rural area. In such area, examined according to the structure of the activities performed, it was established that (actively or passively) 81,5% of the total rural population practices agricultural activities.

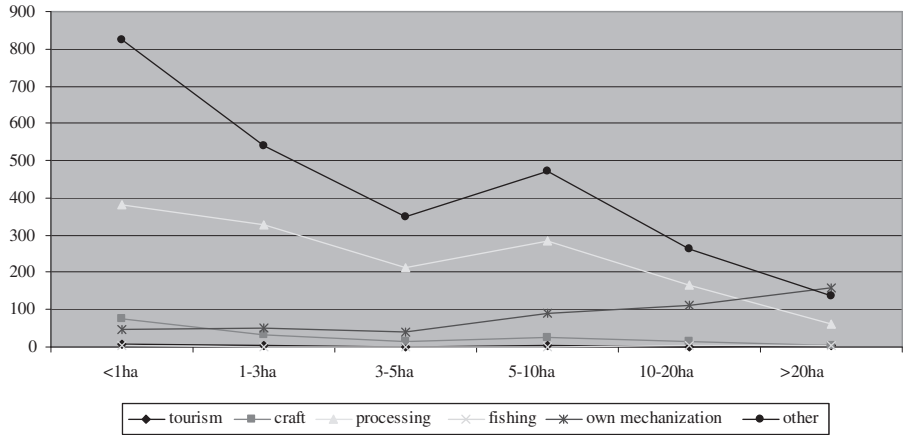
In comparing the size and working hours spent on agricultural activities, there is increase in the number of members on smaller farms, i.e. on family farms that occupy less than 1 ha, 25% of the members do not work at all, whereas fewer people live and work on farms that occupy more than 10 ha – only 8% of the total number of members who practice agricultural activities. The members of family farms who practice only nonagricultural activities, i.e. other rural economy, are characteristic for small farms of up to 3 ha, and the members of these farms make up 78% of the total number of farm members who do not practice agriculture. The number of members who practice economic added activities in Eastern Croatia is insignificant, since of the total number of rural population who practice only agricultural activities only 1,2% practices economic added activities which make up 66% in all the farms that have the size of up to 3 ha, and that is typical for small farms (as shown in *table 2*).

However, there are two types of rural economy: they may be connected to agricultural production, or not. Rural area is a compact unit in which different industries should be developed: processing industry, construction industry, distribution, transport, textile and leather industry, renewable energy and so on. The paper analyzes rural activities which are performed or practiced on family farms and which can be additional or basic activities on the farm. The following rural activities have been identified: tourism, accommodation and other activities connected to free time, handwork/handicraft, manual trades, processing of agricultural products, wood/lumber processing, breeding fish and freshwater and saltwater organisms, production of renewable energy (wind, gas and so on), contractual work with one's own mechanization and so on.

The development of agriculture and a bigger farm result in the fact that added rural activities are less important and make up a smaller portion of all rural economy. The comparison of the total size and non-agricultural activities in Eastern Croatia resulted in conclusion that 48,7% of all family farms that practice other economic activities are smaller than 3 ha. This is shown by the fact that as the size of the farm increases, the number of family farms that practice other economic activities decreases, apart from the activities connected to working with own mechanization on contract. This is an exception because this activity is related to the so-called "mechanization clusters" that include larger machines used on family farms with more land. *Graph 2.* shows the correlation of economic activities and the size of the farm.

The most important economic activities on family farms in Eastern Croatia are the processing of agricultural products, handicraft/handwork, manual trades, wood/lumber processing, fish breeding, production of renewable energy (wind, bio-diesel, bio-gas and so on), contractual work with own mechanization, tourism, accommodation and other activities connected to free time and so on. The income earned by added economic activities is very small in the total income structure due to the fact that only 4% of family farms in Eastern Croatia practice added economic activities.

After comparing the family farm size and economic activities, it becomes obvious that certain activities are severely underdeveloped in Eastern Croatia. For example, one does not take advantage of the activities related to tourism, accommodation and other activities connected to free time, as well as of the activities connected to the production of renewable energy sources. This area has potential for tourism and services as well as for production of renewable energy because there are large agricultural



Graph 2. Correlation of economic activities and the size of the farm
Source: Croatian Agricultural Census, 2003.

grounds with crop cultures and with a high degree of animal production. In the structure of economic activities there is a very high rate of other activities that are not described in detail.

Further development of new rural economy on family farms in Eastern Croatia should be based on the diversification of agricultural and non-agricultural activities. The proposal for possible diversification measures for rural economy is based on the two basic directions applicable in rural areas. The diversification of agricultural activities refers to creating added value through vertical connection of agricultural and food products. These activities are mutually conditioned because they will enable the primary product such as wheat or sunflower to be processed into the final product, e.g. wheat-flour-bread-pasta-cakes or e.g. sunflower-oil-butter. This kind of diversification can be directed toward more modern trends, i.e. it depends on the food industry which aims to satisfy market needs *(Baban, 2003).* Therefore the depth of the production program according to this diversification includes also organic food, autochthonous products, functional food and so on.

The diversification of agricultural activities through vertical integration is connected with diversification of new rural economy as seen in the development of marketing for agricultural products, in different services such as rural tourism, specialized shops, direct sale and other services. Implementing adequate rural activity into rural space includes the new employment of rural population, reducing risks for farms that practice only agricultural production, supplementing agricultural income with a new economic activity, new possibilities of making income in case that agricultural production does not create income, using the rural comparative advantages (resources, location, labor costs) and all for one purpose: faster rural development and improvement of the quality of life (living standard) in this area. Apart from what has been said, new rural economy can also include a wider perspective and develop different industries such as: renewable energy industry, mineral fertilizers industry, wood packaging industry, industry of alcoholic beverages (wine, fruit brandy, beer), new textile industry, leather production and leather products and so on.

3. Conclusion

Economic and social developments represent basic elements of rural development. Through the economic and social development of a community it is possible to improve the living standard and wellbeing of the population. The development of new rural economy will influence the rural development that is directed towards economic and social elements according to which the inhabitants of the rural regions will not be forced to leave the rural areas. On the contrary, they will both have the opportunity to stay in the rural area and to return from the urban areas back into the rural. The rural area of Eastern Croatia is a region of possible development, i.e. its largest part remains unused although there is potential for development of new rural economy. Despite the fact that a proportionally small number of family farms in Eastern Croatia practices added economic activities, there is potential for development both for many new rural activities such as rural tourism, different manual trades, services, production of renewable energy sources, and for activities characteristic for urban areas, such as different industries (processing, construction, distribution, transport, textile industry, renewable energy and so on). By implementing adequate rural activity the quality of life and living standard will be highly influenced which will result in a more proportionate rural-urban development and in a complete integration into market economy.

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The choice between conventional and organic farming. a Hungarian example[1]

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Abstract: The paper deals with organic produce in one of the largest and, concerning organic production one of the most diffused counties in Hungary, Pest County located in the north-central part of the country. Factors influencing farmers' decision on adopting or not e.g. farm size, farm type, location, structure, market for organic products, existence of organic AEM were analysed. Hypotheses based on previous empirical literature were tested by a model explicitly accounting for the effects of farm-specific variables like age, education, size of farms and share of rented land. Logit model was estimated on a cross-section data set of Hungarian farmers for the period 2007. It appears that education has a positive impact on the choice between conventional and organic farming, and, the size of the farm in hectares has a negative effect on this choice. Age and some general considerations on environmental friendly technologies do not have a significant effect on choice between conventional and organic farming.

Key words: innovation, attitudes, organic production, diffusion, agri-environmental measures.

1. Introduction

The organic agriculture represents a promising alternative for the future of European agriculture. It is consistent with the notion of sustainable development set forth already in the 1992 CAP Reform. Despite of increasing importance of organic farming in European agriculture, the research on organic farming is rather limited. The recent papers analyse the situation and motivations of organic farms only in some European countries: for example in UK (*Burton* et al., 1997, 1999; *and Rigby* et al, 2001), in Spain (*Albisu and Laajimi,* 1998) in Portugal (*Costa* et al, 2005) and in Netherlands (*Gardebroek,* 2002). This scarcity of the research is especially true for New Member States of the enlarged EU. Our contributions to related literature are twofold. First, this paper investigates the choice between conventional and organic production technologies for individual farmers in a New Member State, namely in Hungarian agriculture. Second, similarly to previous research we apply simple binary logit model for investigation of farmers' motivations.

The rest of the paper is organized as follows. Section 2 describes the survey design and the variables. The results are presented in section 3. The last section summarizes and offers some conclusions on the implications for the development of organic farms in Hungary.

2. Survey design and variables

In Hungary focusing on organic produce started in early eighties of the last century by founding a Club of Organic Producers in 1983. The successor of the Club, the Hungarian Federation of Organic Producers (Biokultura Egyesület) (HFOP) was founded in 1987. HFOP has 13 members of legal entity covering organic production across the country. Its profile covers wide range of activities from diffusing philosophy of organic farming through representing the interests of stakeholders up to supporting related research. Meanwhile HFOP has established Biokultura Hungary Ltd and the latter was authorized to register new applicants, controlling them at least once in every year and, releasing certificate if the producer met the requirements. 95 per cent of released certificates of organic farming come from Biokultura Hungary Ltd.

Looking at main tasks of HFOP the following can be mentioned: Communicating organic produce to the public; representing the philosophy of organic production to authorities; supporting organic programs; making the administrative requirements of organic production clear to producers; receiving new applicants; collecting, processing and spreading information on organic produce; protecting to establish new local units for a network of organic producers; helping to develop rural tourism.

Legal basis for organic productions is provided by Council directive of 2092/91/EGK and two more national directives as

[1] The paper is based on research outcomes of IDARI project financed under the EC's FP5, Quality of Life and the Management of Living Resources (QLK5-CT-2002-02718).

140/1999 released by the government and one, 74/2004 of Ministry of Agriculture and Rural Development (MoARD). HFOP keeps record of all organic producers in this country and provides producers with information related to production, quality, market and, technology issues. Producers can put data and information on the website of NFOP after having the permission of Biokultura Hungaria Ltd.

Organic production has had an upswing in the late 80s and 90s of the last century and early this decade in Hungary, however, the dynamic was slowed down during last years.

Table 1. Diffusion of organic production in Hungary (1995–2005)

Year	Number of organic farms	Total area covered by organic produce
1995	108	8232
1996	127	11937
1997	161	15772
1998	330	21565
1999	327	32609
2000	471	47221
2001	764	79178
2002	995	103672
2003	1255	113816
2004	1420	128690
2005	1353	122615

Source: http://www.biokontroll.hu/biokontroll.php

Data on organic production besides Central Statistical Office (CSO) has also been produced by HAOP and Biokultúra Hungária Kht, however, data from CSO and from the latter two sources were not in line with each other. CSO recorded 3300 organic farms with 217402 ha in 2000 (AMÖ, Agricultural Census) at national level and, 382 individual farms and 11 agricultural companies for Pest county. According to CSO report in 2004 the number of organic farms amounted to only 118 in Pest county half of them converted and another half in conversion, while for the Pest county HFOP recorded only 88 organic farms in the same year. During the survey, the latter made it possible to contact all recorded 88 organic farms, 52 of which were still in operation.

As accessing individual data of organic and conventional producers is very limited and such data cannot be found in published statistics, finally, two databases were used for sampling. First, a nationwide database of HFOP covering all counties and keeping records on organic producers on a voluntary basis. Second, concerning conventional producers a database of Agricultural Chamber of Pest county was used.

Concerning conventional farms the target was to have 99 farms in the sample with more or less equal distribution between sub-groups of ESU 1.00–1.99, ESU 2.00–5.99 and ESU 6.00–49.99. As no data on farm size by ESU was available in the database an iterative approach in sampling was required to be applied. In the Agricultural Chamber's database 677 conventional farms were recorded with ESU mostly above one. Farms with less than one ESU (not market oriented) were dropped. Only during the interviews it was turned out which size category the farm belongs to. In the first run 99 conventional farms out of those with ESU above one were selected. However, to find the right number of farms for the sample in each category additional runs of sampling were needed. In the second, the third, and the fourth run further 35, 30, and 30 farms were selected. In number of cases it also turned out that the farms did not exist any more. In the four runs we have randomly selected total 194 farms. 127 out of 194 were interviewed. Among them there were 31 farms with 1.00–1.99 ESU and 31 with 2.00–5.99 ESU, and 35 farms with 6.00–49.99 ESU. In addition, interviews with further 30 farms with 50 ESU and above were done. Data on the latter farms were not dropped, but used in the analysis.

Descriptive analysis shows that organic farmers are on average almost in the same age and higher educated. Furthermore, organic farms have on average less land with smaller rent.

3. Results

We analyse the farmers' intentions in two steps. First, we investigate the motivations of farmers for being organic producers using descriptive and multivariate statistics. Second, we analyse the potential determinants of the adoption decision (both economic and demographic variables) using logit analysis.

3.1. Reasons for being organic producers

The theme concerned with potential reasons for being an organic producer employed a 12-item scale that measured the importance of these features in a co-operative choice context (1 = not at all important, 7 = very important). *Figure 1* shows the importance in descending orders attached by producers to various factors for being an organic producer. The most important factors are for being an organic producer healthy environment, market for organic products, existence of organic AEM and existing contract. Interestingly, successor and risk of crop failures are unimportant factors. Furthermore, other factors such as farm type, labour availability, structure, and farm size are also not too important factors for farmers.

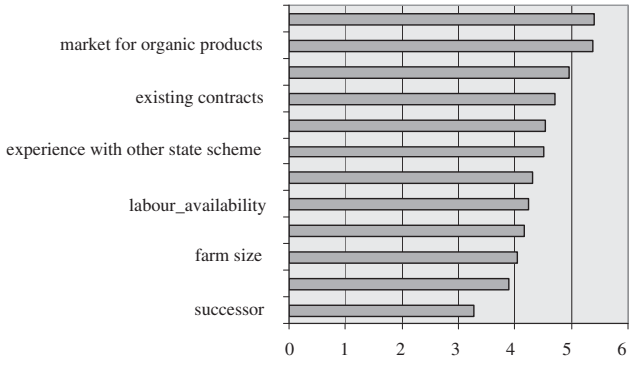

Figure 1: Importance of various factors in the decision to produce organically (1 no importance; 7 very important)
Source: Own estimations based on the survey

The factors were further analysed to explore underlying dimension of the producers' decisions for being organic farmers. The original variables consisted of 12-item seven-point scale concerned with the importance of factors for the decision of organic producers. However, the communalities for the attributes concerned with "Successor" and "Labour availability" and "Risk of crop failures" were judged to be too low (< 0.50) indicating that the set of derived factors explained a low proportion of the variance of those attributes. Consequently the three attributes were excluded from the subsequent analysis. The final solution was derived on the basis of varimax rotation and the extraction criterion was to derive factors with eigenvalues greater than unity which generated a solution in two factors.

Table 1: Rotated factor matrix solution: the factor influencing on farmers' decisions

	1	2	communalities
farm size	0.7563	0.2336	0.6275
farm type	0.7891	0.2977	0.7171
Location	0.7743	0.2260	0.6522
Structure	0.8059	0.2487	0.7217
healthy environment	0.5498	0.4928	0.5553
market for organic products	0.2835	0.7052	0.6492
existing contracts	0.2720	0.6760	0.6135
existence of organic AEM	0.2357	0.8334	0.7511
experience with other state scheme	0.2684	0.7737	0.6786
Variance (per cent)	0.5754	0.1576	
Cummulative variance (per cent)	0.5754	0.7330	
Eigenvalue	5.1787	1.4186	
Bartlett test (p value)	0.000		
Kaiser-Meyer-Olkin measure of sampling adequacy	0.891		

Source: Own estimations based on the survey

The Kaiser-Meyer-Olkin measure of sampling adequacy is 0.891, indicating that data matrix has sufficient correlation to justify the application of factor analysis. Bartlett's test of sphericity accounts for the significance of the correlation matrix. In our case it is large and statistically significant at the one per cent level, so that hypothesis that analysed matrix is the identity matrix can be rejected. Consequently, the factor analysis is meaningful.

The two-factor solution explains 73.3 per cent of the total variance in the data set, which is satisfactory. The cut-off for interpretation purposes is factor loadings greater or equal to 0.5 on at least one factor. The first factor is most strongly correlated with the variables "farm size", "farm type", "location", "structure" and "healthy environment" (Table 1). The second factor is associated with "market for organic products", "existing contracts", "existence of organic AEM" and "experience with other state scheme".

3.2. Adoption of Organic Agriculture

We apply a model that explicitly accounts for the effects of farm-specific variables like age and education, size of farms, share of rented land. We focus on the following hypotheses based on previous empirical literature (*Padel and Lampkin,* 1994; *Burton* et al., 1999).

Age. It is often stated that organic farmers are younger on average than conventional farmers. The hypothesis for this observed difference in age is that organic farms' practices are often implemented with a change of farm ownership (e.g. farmer's child taking over farm control from parents). An additional hypothesis is that older farmers are more conservative than younger farmers are and therefore more resistant to organic farming.

Education. Another often stated difference between organic and conventional farmers is the education level. Explanations are given those organic farmers that are new entrants to organic farming are usually high-educated and idealistic. However, it could also be that higher educated farmers expect to cope with difficulties in organic farming better than conventional farmers.

Size of farm. The relation between organic farming and farm size differs by country. However, the hypothesis is that there exists a positive relation between organic farming and number of hectares. Organic farms are more extensive than conventional farms requiring more land for pasture. Moreover, organic farms use more roughage than concentrated feed and this roughage may be produced on the farm, requiring more land.

Rent. If the major part of the farm is rented, deciding to farm organically may raise objections from the landlord. This conflict may also have an impact on the decision process.

In addition, we consider three additional control variables, namely being full time farmers and family farms, and diversification of production.

Therefore, the theoretical model we test is:

Prob(Adoption of organic farms)=f(Age, Education, Size of farms, Rented land, Full-time farm, Family Farm, Diversification).

The expected signs of the variables are as follows:

f1<0, f2>0, f3>0, and f4<0. For f5-f7 variables we do not have any a priori expectations

Dependent variable. The dependent variable in our model is Adoption, taking value one if farm is organic, otherwise zero.

Explanatory variables.

Age: the age of farmers.

Education: farmers' final level of education.

The size of farm. The size of the operation is measured by two variables: the total area in hectare (Hectares) and number of European Size Unit (ESU).

Rented land. The share of rented land in total area.

Full-time farm. Binary variable taking value one if a farm is full-time otherwise zero.

Family farm: Binary variable taking value one if a farm is family otherwise zero.

Diversification. Production diversity is measured number of products in production

We consider various specification estimating two farm size proxies separately. In addition, we check whether does

Table 2 Binomial Logit Results for Adoption of Organic Agriculture

	1	2	3	4
Age	0.003	0.004	0.001	0.004
Education	0.341**	0.360**	0.363**	0.373**
Hectars	-0.000		-0.002	
Hectars2			0.000	
ESU		-0.003		-0.005
ESU2				0.000
Rented land	-0.003	-0.002	-0.002*	-0.002
Full-time	0.848**	0.855**	0.826**	0.874**
Family farm	-0.930*	-1.047**	-0.981*	-1.089**
Diversification	1.743***	1.805***	1.787***	1.821***
constant	-4.014***	-4.069***	-3.849***	-4.088***
N	179	179	179	179
Pseudo R^2	0.1591	0.1653	0.1626	0.1662
Correctly classified	73.18%	73.18%	71.51%	73.18%

Source:Own estimations based on the survey
legend: * p<0.1; ** p<0.05; *** p<0.01

nonlinear relationship exist between the size of farm and the adoption of organic farm, thus we apply squared size variables (Hectars2 and ESU2). Our estimations reveal that being family farmers has negative, whilst being full time farmers, higher education and having more diversified production structure have positive impact on the adoption organic farmers. Interestingly, age of farmers and size variables in both forms have no significant impacts on the farmers' decision.

4. Conclusions

Bio-production was rather low in the first half of the eighties but expanded very fast and production by land use was 14 times more in 2004 than that of 1995 followed by a decline in production. Against expectations, mid-term projection on fast expansion of organic produce has not been justified.

Motivations on encouraging adoption were connected with healthy environment, market for organic goods, existence of Agro Environmental Measures and existing contracts.

Determinants for switching to organic produce can be grouped into two main factors. First: farm size, farm type, location, structure, healthy environment. Second: market for organic products, existing contracts, existence of AEM and experience with other state schemes.

Looking at estimation on becoming organic producer one can conclude: positive impact on adoption came from the following factors: full time farmers were more ready for starting organic production. Farmers with higher education background found more convincing arguments and were more prepared to start organic produce. Diffusion was more significant among farms with more diversified production. Age of farmer had no significant impact on adoption, although, it was expected that young farmers are less resistant to organic farming. Size of farm did not play an important role on adoption either. Surprisingly, being family farmer had a negative impact on switching the farm to become an organic one.

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An ICT-based traceability system in compound feed industry

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Abstract: The term traceability refers to recording of flow of products along the food chain from production to consumption with inclusion of all intermediate applications involved in processing/packaging stages. The aim for establishing traceability in the food chain is to provide the timely identification and recall of batches of product from the market when a risk threatens the health of consumers. Since compound feed products are basic inputs in livestock and poultry production, ICT-based feed traceability systems can be considered as a initial step in food traceability management. These systems are simply information recording systems that are designed to trace and track the flow and characteristics of animal feed along the feed supply chain. This paper describes the architecture and some functional properties of a feed traceability system called as the "feedTRace", focusing particularly on compound feed and integrated poultry meat industries. The feedTRace aims to improve compound feed supply chain management, to increase feed safety and quality control, and to gain marketing competencies with traceable products in compound feed industry. The system is currently under beta stage, and is tested in two high capacity feed milling plants and an integrated broiler company located in Adana province of Turkey.

Key words: compound feeds, feed traceability, traceability systems, food safety

Introduction

In the last 3 decades, many food hazards have been outbreak due to several biological agents such as the zoonoses infections (HIV, SARS, AI, vCJD, West Nile, streptococcus, salmonella etc.) in addition to physical and chemical residues and contamination in various stages of agricultural production, food processing and transporting. These food-borne health risks and problems have revealed the need for food safety related regulations that should be enforced to protect public health and to increase the trust of consumers. The demand and expectations for safe and high quality food have directed governments to take some action measures and issue some regulations to ensure food safety and security (*Cebeci et al*., 2008).

Probably the first of food safety regulations in the world has been enacted by European Commission (EC), which is titled the European Union Food Safety Law, and numbered EC 178/2002 (*EC,* 2002). In the United States, the Congress responded by passing the "Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (also known as the Bioterrorism Act shortly) (*US Congress,* 2002). Like EU and US, many other countries have also published laws regulating food safety. For instance, Japanese Government enacted Food Safety Basic Law in May, 2003 (*Yokoyama,* 2007), and the Law of Traceability for Agricultural Products was put into operation in August, 2005 in Korea (*Seo & Lee,* 2007). Turkey also has ensured food safety by enforcing Law 5179, titled as "Law of adoption of the amended decree by-law on the production, consumption and inspection of foods" in 2004 (*TBMM,* 2004).

Since traceability is defined as the ability to follow a feed or food through specified stage(s) of production, processing and distribution (*ISO, 2007*) the term traceability refers to recording of movements of products along the food chain from production to consumption. It also includes data from all intermediate applications involved in processing and combining inputs into new products throughout the supply chain. Therefore, traceability can be considered as a tool in food safety**,** which aims for establishing systems to provide the timely identification and removal of any batches of product from the market when it threatens consumers' health.

Even though traceability is decreed by the governments**,** the regulations do not outline the methods and techniques to

meet the rules for traceability. So there is a strong need for standards, guides and/or best practices in order to apply traceability in food supply chain, properly. Although, there are currently 413 different international standards on several aspects of food safety, a few of them also cover traceability requirements (*Kho,* 2008). The standards such as Codex Alimentarius, ISO 22000:2005, ISO 22005:2007, GLOBAL-GAP, British Retail Consortium (BRC), Global Food Standard, Safe Quality Food (SQF) 1000 & 2000 and CIES Global Food Safety Initiative defines the traceability and traceability requirements in some levels. Among the others, ISO 22005:2007 is the latest in a series of food safety standards launched in 2005 by International Standards Organization (*ISO,* 2007). The new standard of ISO titled "Traceability in the feed and food chain" establishes the principles and requirements for the design and implementation of a feed and food traceability system. It offers a solution for good practice on a worldwide basis and thus contributes to lowering trade barriers.

Food traceability systems record the flow of food products or ingredients in food products from its initial supplier through all processing stages until they reach the consumers. Similarly a feed traceability system can simply be considered as a subsystem of an animal-originated food traceability system. Feed traceability systems are designed to trace and track the flow of animal feed and their characteristics along any feed supply chain. Safe feed for animals is an absolute requirement for the food chain. Feed traceability systems facilitate to document and track any batch of a product through the stages and operations involved in the production, processing, distribution and handling of feed, from primary production to consumption. They can therefore enable the identification of the cause for any hazard with products, and the ability to recall them if necessary.

Although, today, many food traceability systems are already in place around the world**,** there are a limited number of projects which are specific to feed traceability. One of the projects on feed traceability has been realized by Product Board Animal Feed of the Netherlands in 2002 (*PDV, 2002*). It outlines the structure and principles of traceability in feed chain. Considering ISO and PDV approaches and standard on feed traceability, this paper describes the architecture and some functional properties of the "feedTRace", a feed traceability system which is focusing particularly on compound feed and integrated poultry industries. The feedTRace aims to improve compound feed supply chain management, to increase feed safety and quality control, and to gain marketing competencies with traceable products in compound feed industry.

System architecture and functional aspects of feedTRace

Design principles

In general, the food safety regulations decree all businesses in the food supply chains must implement traceability with one-up and one-down basis. Although this kind of traceability approach is enough for finding the origin of any problematic food it may not efficiently work for ensuring consumer protection in a desired level because it has some intrinsic inadequacies. At first, farmers, processors, distributors and other businesses in the chain apply various solutions from very simple paper-based filing systems to ICT-based traceability systems in different complexity levels in order to meet traceability requirement. Secondly, vertical and horizontal data exchange between businesses through the chains is very difficult for some reasons. Aside from using paper-based traceability, many of existing ICT-base systems also cannot perform data exchange between them. Consequently, data recording and information flow become scattered and too costly with one-up/one-down traceability applications. Moreover, tracing of the product to its origin and then recalling cannot be realized in a short time in any emergency case due to the factors mentioned above.

As stated in the ISO 22005:2007 standard, a traceability scheme would allow organizations operating at any step of the food chain to (1) *trace the flow of materials, including feed, food, their ingredients and packaging;* (2) *identify necessary documentation and tracking for each stage of production*; (3) *ensure adequate coordination between the different actors involved*, and (4) *require that each party be informed of at least his direct suppliers and clients*, and more (ISO, 2007). The approaches listed above points to establish traceability systems that can ease and quicken data recording from one business to other. The goals listed above can be achieved by several ways:

- All businesses can use a central traceability system and/or central database,
- Even if their systems are unconnected**,** a data exchange mechanism can be applied between them.

It is obvious that a network infrastructure and connectivity is needed for both cases mentioned above. Quantitative and qualitative measures on type and level of connectivity differ between the countries, regions and also for communities in the food chain. For instance, since the availability of xDSL internet connection is limited in rural areas, web-only applications will not work for rural communities, efficiently. On the other hand mobile phones are widely used as communication devices for the farmers living in rural areas in most of the developing and less developed countries SMS like mobile services would be successful for the farmers to participate to ICT-based traceability systems. Beside technical properties of traceability system there are more constrains on organizational, financial and socio-cultural aspects that should be taken into consideration in the design and architecture of a traceability system. Some of them are governmental support, organizational culture, administrative maturity, informatization/computerization, staff skill, staff cost, and government online presence and services (*Grönlund et al*., 2005).

Today, within "farm to fork" traceability, it is a fact that they are mostly not visible to consumers as the owner of

forks, at the point of sales. Whilst a traceability system is accessed by consumers food safety could be more ensured and improved. If the consumers can query barcode number labeled on packs in markets they may more safely choose their foods during shopping. Online tracing of products by consumers will help for choosing foods on their geographic origin and applied processes along the chain. In this way, querying on the traceability system will involve the consumers in system to control and improve safety mechanism, and also to increase consumer trust.

As a final conclusion, quick identification and recalling a commodity of problematic food and its ingredient sources from the chain is very crucial to ensure recall and prevent/reduce the hazard to public health. For this aim, the ability of trace and track querying and reporting components in a traceability system is important for managing tracing and recall procedures and processes.

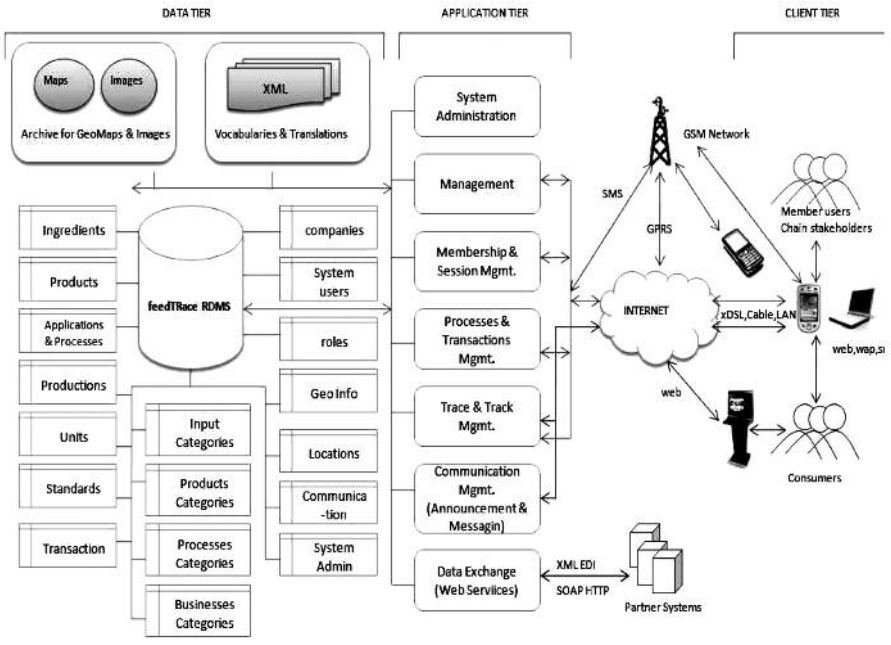

Figure 1. General architecture of the feedTrace traceability system

In the design of feedTRace a networked, multi-interfaced (web, sms, i-kiosk), multilingual and interoperable traceability system was aimed in order to meet the issues mentioned above.

General architecture

As it can be seen from Figure 1, feedTRace system has been designed as a system having three-tier architecture: client, application and data tiers. Access in client tier was aimed to be established through cellular phones, PDA devices, and Internet kiosks in addition to traditional computer systems. Application tier of feedTRace is composed of the following components:

- Registry data and organizational management
- Membership and session management
- Transactions and internal applications management
- Traceability (trace and track) reporting and management
- Communication and messaging management
- Data exchange management
- System administration

Registry data and organizational management consists of software components which ensure recording and updating data including system users and roles, inputs, businesses and types of businesses, applications and treatments realized in production process in businesses, finished and semi-finished products (outputs), and geographical data. The procedures in this component could be employed by users having "administrative" status and those roles are assigned by the feedTRace system administration. Main objective of administrative procedures is forming records which ensure rapid and uniform entry of procedures such as input, output transactions and transportation, as well as carrying out recording activities of farms and users within those farms who are using the system.

In other words, all likely inputs to be used, all likely processes and applications to be performed, and all likely types of products to be produced within every node of chain enterprises are recorded to the relevant database of the administrative procedures as internal procedures applied in any place of production. In this way, user of a business can rapidly enter all his/her daily processes in the production place through user processes section by selecting related item from the pop-up menu instead of rewriting them in new-process-application entry section. Hence, standard and uniform data entry is ensured through recording main input, output process and applications by registering them to the database.

Membership and session management components are those components which supervise log on and authorization levels of the system users and ensure management of the started sessions. These components carry out system log on and log out activities. Security applications could be enabled on users' log on-log out times, system IPs and authorization levels as soon as they log on the system.

Management of inputs, production, process application and output movements is a central component of the feedTRace system and this component provides management of records subject to traceability. Transactions and internal applications component of the system consists of three subcomponents:

- Input processes: Recording, updating and listing of production related purchases of an enterprise, such as cereals, seed, seedling, nursery, pesticide and medical

stuff, fertilizers, feeds, and chicks.
- Production processes: Recording, updating and listing of any production activity in an enterprise (for example: wheat, broiler feed production etc.)
- Output processes: Recording, updating and listing of products produced at the enterprises (for example: wheat, feed, milk, broiler etc.)

feedTRace produces a unique production code for each production activity and inputs, treatments and applications performed are all related to the relevant production process through this code. In this way, inputs, outputs, processes and applications of any production activity can be easily determined.

Another service provided by the feedTRace system is that an input purchasing company which buys an input from another firm can see the name of this item in the list of inputs waiting for approval and can change the status into input records just by approving the purchase. In this way, no reentry is required for input definition data during input transactions and also speed and convenience are provided for enterprises having intensive input transactions.

Traceability management component of feedTRace covers software components providing determination and reporting facilities for process and applications which a product is subjected to, locations which a product is produced, distributed and transported through. When any problem occurs related to a product, all required measures can be taken including roll back since source of problem is identified through backward tracing and locations where the product is distributed to is determined through forward tracing. Traceability activity, which is one of the major functions of a traceability system, can also enable a traceability which takes into consideration consumer preferences in addition to problem identification and enabling recall procedures. Consumers can also access to relevant production and process data by entering traceability codes written on the product packages at Internet connected kiosks located at places where the end products are sold. This search will be accomplished through traceability barcode reading systems integrated into the Internet kiosks and automatically searching related codes in feedTRace database. Participation of consumers into the system with this kind of technologies at sales point will provide transparency and meet ideal expectations regarding food safety to keep consumers' trust.

Communication management section of feedTRace consists of applications handling**,** generating and mailing of monthly newsletters, traceability reports as well as sending announcements and messages from system administration to the system users and vice versa.

Data exchange between institutional traceability systems and/or ERP systems becomes very important in food supply chains. In sector specific traceability systems such as feedTRace, when products are transferred to the network of any other sector, it becomes very important that all product-related data should also be transferred (exported) to the traceability system or the institutional information system of the network where the product transferred. The same also applies for the products entering into feedTRace system from other channels and also particularly for inputs coming from input suppliers. For this reason, data exchange applications were developed to manage data import and export processes for the feedTRace database.

System administration within the application tier covers applications ensuring technical and administrative management of feedTRace itself. This component provides services such as error reporting, usage statistics, backing up databases, analysis of system performance.

Data tier of feedTRace is the back end tier that stores registry data, transactions and production records**.** System database consists of tables for users, enterprises, transactions (inputs, outputs, processes and applications) as seen in Figure 1. In addition to central database management system in data tier, a directory system for images and maps is also allocated for storing aerial maps, satellite maps and photographic views of the registered farms and other enterprises. These images and maps are used both by users for forming consumer preferences at barcode based viewing systems located at Internet kiosks and also for rapidly locating farms for recalling when required.

Since products within food supply chain are marketed not only at national level but also on a global scale, feedTRace was developed on architecture with a multilingual interface. Multilingual interfaces allow product traceability to be accomplished on international level and enhance competitiveness of the business. However, present alpha version of the feedTRace has Turkish and English translations; inclusion of files in other languages is as easy as uploading a simple text based XML file to translation space of the system. System automatically detects proper translation interface based on the language of the browser used, and presents the appropriate interface to the user. Additionally, users can also work by selecting any other interface as they like. Adding other language files can be managed very easily, as easy as translating master English language files in the language they wish and then transferring the translated files into "languages" directory.

Conclusions

Today various traceability systems are already in service for establishing safety in the food supply chain. In fact, many food processors had traceability systems for meeting their specific needs including management of recall mechanisms even before food safety regulations came into force. But these systems have been mostly developed as ERP-based systems, and work as standalone applications within the company itself. Since quick tracing of the origin of foods and recalling in a short time are very difficult and costly with this kind of scattered and distributed traceability systems, integrated and full traceability systems will be more efficient. The demand can only responded by using modern ERP systems, which may be able to solve the problems of today's quality food industry problems as stated by *Herdon & Füzesi* (2006).

As a matter of fact many countries seize upon regional or country-wide central traceability approaches recently (*AAFRD,* 2007). For example, Canadian food trade associations (Canadian Council of Grocery Distributors, Food and Consumer Products Manufacturers of Canada and Canadian Federation of Independent Grocers) have joined forces with the Electronic Commerce Council of Canada to try to develop a national traceability standard and system for food products in Canada. Similarly, feedTRace is designed to work in national level to involve all businesses in compound feed sector in Turkey.

Also, when compared with the traceability systems of other sectors such as fresh fruit and vegetables, meat, milk etc., compound feed industry traceability systems faces some specific technical, administrative and financial difficulties. feedTRace is one of the full traceability systems aiming to solve sector specific traceability issues in compound feed industry. These problems are usually originated from the spatial position of the feed sector in food chain. First of all, feed industry is the closest link to the primary producers in the food chain. Therefore, feed industry has to solve data recording problem about grains and other ingredients used as input from the farmers. This is a serious disadvantage for feed industry because most farmers have no enough IT ownership and networked working style for quick data collection. As an efficient solution in data gathering from farmers, thus feedTRace offers mobile interfaces based mobile phone communication in addition to the use of web based interfaces.

With feed traceability there are also some other technical difficulties. One of them is the problem of breakdown of the feed raw materials used as inputs, such as wheat and maize, based on their origins starting with their primary production. Another difficulty is the fact that a great majority of the feed is sold as bulk material without any cover material. The same applies for many countries including European Union. For example: it was reported that 96% of the animal feed produced in the Netherlands is sold in bulk form, 0.3% in big bags and 3.7% in bags. (*PDV, 2002*). This situation makes it difficult to switch to barcode and RFID based applications**,** and also prevents users from taking advantages of automation provided by automatic input and output recording systems.

Full separation, breakdown and traceability of grains discharged into the silos are very difficult. For example; feeds discharged into a 50-300 ton capacity silo can mix each other when they are used in production, and ingredients of any produce of them could only be determined through an approximate estimation. This is so, because traceability with a First-In-First-Out (FIFO) technique could not be accomplished. There is a need for switching to separate and small storage systems or for development of some type of electro-mechanical equipment in order to achieve a net traceability. This may be discouraging since it causes a significant amount of investment within the enterprise and R&D investments. At present finding out and using some algorithms giving approximate estimations based on silo structure, type of the raw material and speed of the flow could be recommended.

Above mentioned problems cause some difficulties in integrating barcode and RFID technologies into the traceability systems in compound feed industry. feedTRace system searches for solutions to above mentioned problems specific to the feed industry and tries to enhance and develop system quality elements as a flexible and scalable system. However it is clear that some specific studies are required in this situation.

feedTRace compound feed traceability system which was developed within the context of this study aims at forming a sector-wide pioneer model system. feedTRace also gives an example to a central system formation, with its data structure and flow and design approach combining all stakeholders end-to-end within the supply chain.

There are redundancies causing cost increases in paper based and traditional ERP base traceability systems. Web based feedTRace, covering integrated chain, eliminates these redundancies. Input sales performed by an enterprise are listed as inputs for waiting approval for the purchaser enterprise and can be approved by the purchaser just with a click to check a checkbox indicating approval. Hence, separate recording of a product both in seller and buyer enterprises is eliminated and recording costs are decreased.

Although traceability related legislations stipulates recording for inputs used and products sold in order to use those data in an accidental situation, it takes a great deal of time to determine the source of the problem and recall the products in paper based systems. On the other hand, in ICT-based systems such as feedTRace, finding the origin of a product, determination of the places where it was distributed and warning those places are basic activities carried out almost in real time. Hence recall activities could be accomplished in a short time and threats to health could be minimized. FeedTRace, with its architectural structure covering the whole chain, can provide a full traceability and can report all the history of the products being examined.

In general the user interfaces are web-based in most ICT-based food traceability systems. Although satisfactory for office environments, web based applications are not so for remote rural areas and also field conditions. For example; there might be a need for approaches and designs providing very simple and fast recording facilities in order to record harvests and/or production related processes into the traceability system in the field. In feedTRace system, users would be able to do this by using SMS messages through their mobile phones. Simple and formatted text data sent by a farmer through GSM networks would be analyzed by message analyzing services and transferred to the system database. Another facility provided by feedTRace in this sense is the offline storage of the data recorded in PDAs in the field and in areas without an Internet connection and then transfer of recorded data to the system database through an online connection. So, feedTRace system is a very flexible system since it supports both online and offline working and also takes advantage of using mobile devices in rural areas.

feedTRace system is developed in a way allowing extension of the database records. In this way, additional fields could be added to database tables when required. In addition, it was designed in such a way that it could be used by international stakeholders thanks to its multilingual interfaces. Today, several protocols do exist for realizing data exchange between the traceability systems. agroXML and Trace-XML in TraceP2P are widely implemented and most promising examples of EDI-XML standards and technologies in the agri-food industry (*Füzesi & Herdon, 2007*). Therefore feedTRace system will be powered to import and export traceability data built with these EDI-XML schemas by its own web services on SOAP protocol over HTTP.

We try to realize the following targets with feedTRace: development of a traceability system that can function as a base and sector model; determination of and finding solutions to feed specific problems. Currently, alpha version of the system is being tested in two high capacity feed factories which are operating within the Cukurova region in southern Turkey. The system will be completed within the first half of 2009 and will be populated to cover primary producers (farmers), commissioners (suppliers), and customers (livestock farm), slaughterhouses and processing facilities and lastly the supermarkets. After finalizing the project the plans on sustainability of our system will be carried out by the project team and local associations of growers and processors in the region. Even though "Who will pay?" is still a question which has not been answered enough at present, we plan to apply a sustainable model in the future, which will be co-financed by several companies and supported by the government, based on lots of reports prepared and works carried out up to now. Actually, there is a trend towards being motivated not only governmental regulations but also by economic incentives in developed countries such as US, Canada, Japan and many EU countries. However, it should not be overlooked that governments should support traceability systems in the beginning of transition period in developing countries because of lack of organizational culture and/or inadequate finance of investment and operation of the systems. Thus the feedTrace will be administrated by a jointly founded traceability administration office of the national association of compound feed manufacturers but will demand partial support from the government for some operational costs for some years.

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Experiences on organisation of fruit and vegetable sector in Hungary

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Abstract: The objectives are (1) to reveal some current issues on organisations founded by fruit and vegetable producers and (2) to stress upon those factors that should be highlighted in the very next future. In Hungary, POs have been accounting for bigger share of fruit and vegetable trading in Hungary, which refers to a better organisation in the sector. Bargaining force and level of experience on running such businesses, although, are still much behind the level expected. Flexibility and speed of a running business are highly determined by the legal form of Pos. The most favourite form is cooperative that is not flexible enough as a business form, especially for starting businesses. Low yearly turnover and weak market power feature the POs, preferring short time solutions to strategic thinking. It is macro environmental factors that generate short term thinking, but coupled with mismanagement on different levels of corporate management.

Key words: producer organisation (PO), fruit and vegetable, management

1. Introduction

Cooperation of producers in the EU dated back to the twentieth century, which is a continuous development more-a-less. But at least there was no break down in the process concerned as a development. By now, cooperation focusing on product chain could not response properly to the fast change of markets. Therefore, a new approach come from the force of fast and proper response to the market, that bodied in a new type of organisation called producer organisation (PO). This organisation, which is called producer group at the beginning of its lifecycle, is meant to be an organisation to communicate the market needs to the farmers and to assist them in order to turn those needs into operations for the farmers to be competitive (*Felföldi*, 2005).

Producer organisations play their role and secure their weigh by different but basic operations such as sorting, packaging, storing and marketing. POs in the fruit and vegetable sector are of great importance, since over 70% of yearly turnover of fruit and vegetable products has been done by such organisations in The Netherlands and Belgium. Furthermore, they have also significant roles in Spain and Italy with the extent of 50% and 27%, respectively (*Felföldi*, 2007).

2. Materials and methods

To find out organisational status and dynamics of producer organisations in the fruit and vegetable sector in Hungary, I applied databases of authentic organisations such as AKI (Agricultural Economics Research Institute) (*Dorgai*, 2005), FVM (Ministry of Agriculture and Rural Development, Hungary) and Fruitveb Hungary (Hungarian National Fruit and Vegetable Interprofessional Organisation). I also made interviews with managers of organisations concerned and regular personal monitoring had been done in several cooperatives (with the title of PO) in order to get the real picture of their operation, assets and status.

3. Results and discussion

3.1 Experiences and features in general

There are such experiences which feature these organisations in general in the EU. There has been an increase in numbers of organisations operated by producers and investors among their members. In the meanwhile, total number of them has been decreasing, which is concentration, forming international organisations. They gain more value and market power at international level, providing more developed vertical integrations. Integrations have focused on effective production and marketing. They produce goods of high quality that couple with stronger export activities, while becoming more decisive the environmental and quality aspects.

Flexibility and speed of a running business are highly determined by the legal form of the organisation. Most applied legal form of PO is cooperative that is not flexible

enough as a business entity. At the same time it does not mean that this legal form can not be successful. Evidence exists in the agro-food sector in the EU, which has successful cooperatives coming from dairy and meat sectors. See in *figure 1.*

Sectoral comparisons show the size of successful organisations featuring specific sectors and their potentially competitive scale within the EU.

Considering a product chain, this has some defects such as the decisive fact that producer organisations are not involved in the retail sector. This statement, although, includes many factors responsible for circumstances dominating nowadays. Despite of its complexity it is true, and parallel with power issue mentioned in the previous paragraph these allow retailers to drive sector patterns.

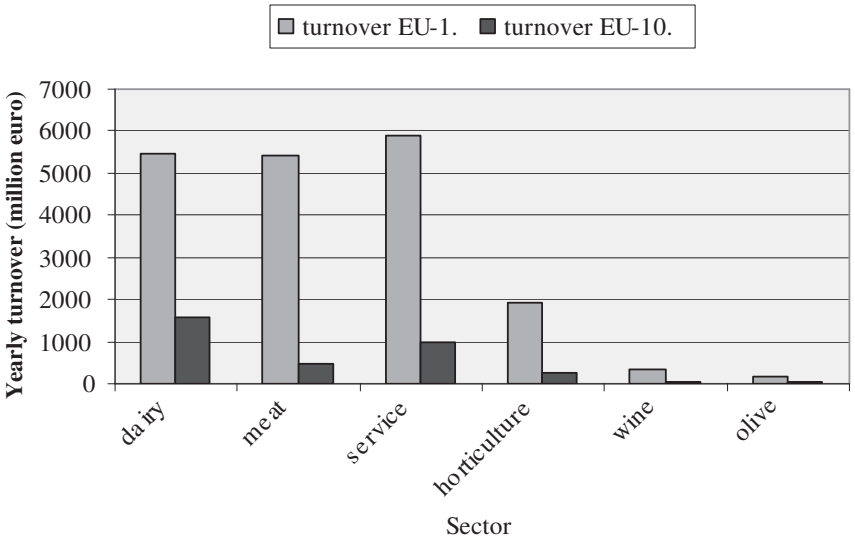

Figure 1. Yearly turnover of coops in agro-food sectors in the EU in 2003
(1. =First and 10. = tenth of the best ten of that sector)
Source: EUSTAT, COPA-COGECA, 2006

Globalisation results in concentration in this sector too. Experiences say that there are good reasons to be worried about the concentration in the retail sector. Concentration is faster among customers and competitors than among fruit and vegetable producers. This has significant effects on every day business transactions, proving that there is no doubt about the stronger market power of retailers.

3.2 Experiences on organisations in Hungary

Unfortunately, there still exist POs of which formation were generated by only grants. Most of them have been disappeared as entities, and a process featured by amalgamation helped solving that unfair state. Related pattern of decreasing number of producer organisations and their share out of sectoral is shown on *figure 2.*

In spite of that fact, it is rather the subsidy to motivate forming and operating such producer organisations than recognising and making decision on competitive factors. Organisations operating as expected have reasonable strategic management generating necessary investments and essential value added. They are featured by diversification focusing on how to fit those activities. These are important from the company aspect. From the members' aspects, there are expectations to be met by such processes as clear and precise accounting, procurement, and post-harvest. To fortify the members' positive approach to their own companies, it is vital to follow the basic regulations on operation, since such decisions have often failed.

3.3 Outlook for producer organisations

External effects derive at European Union level express the trends they have to realise and follow. There is a statement saying that opportunities on cooperation are highly not utilised as expected in member states in general. It is specifically true for new member states (Hungary is included of course) (*Felföldi*, 2009). Furthermore, it is high time to improve the flexibility of the operational features of the cooperative as a legal form, focusing on practical aspects to be competitive compared with other legal forms. This means

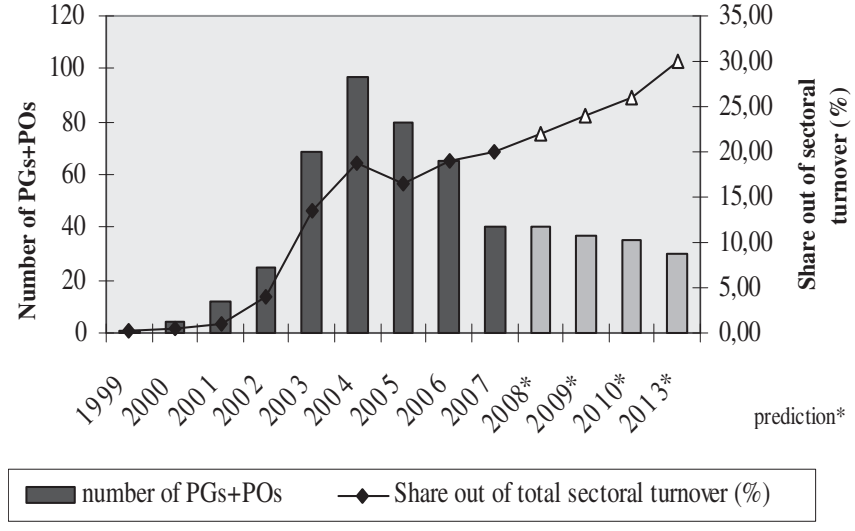

Figure 2. Number of producer groups (PGs) and organisations (POs) and their share out of the sectoral total turnover in Hungary (1999-2007) and prediction
Source: Felföldi,2008; FVM ,2008; and Fruitveb, 2008

such changes that can defence the interest of members and their equity in the cooperative generated over many years of time before.

Roles of cooperative in the social- and employment policy, and in the regional and rural development will be stressed upon again, parallel with the agricultural activity.

Ability to solve the challenges coming from defects and failures of the sector can represent the internal effects. Here are some of the most important challenges to which they must find out the right responses.

Mainly organisations with low turnover and weak market power dominate the supply side of the sector, which are often motivated by short time solutions. Formation is generated by „middle-men" in the sector, in spite of bottom- up formation that would be reasonable. At the same time it means that access to profit is still closed for real producers. Lack of post harvest infrastructure is a general issue, but this rather features those organisations which were formed by small scale producers than the others whatever they are. Short term thinking exists that is forced by macro environmental factors, but coupled with mismanagement on different levels of corporate management.

4. Conclusions

There are organisational defects and failures in general in Hungary, which are still not killing factors. Yet, these factors might be killing ones from strategic point of view. There are no generally right size of operation (economies of scale), but Hungarian organisations must be aware of the huge difference that exists among competitors in specific sectors. Unfortunately, it is rather the subsidy to motivate forming and operating such producer organisations than recognising and making decision on competitive factors. Mainly organisations with low turnover and weak market power dominate the supply side of the sector, which are often motivated by short time solutions. Short term thinking exists that is forced by macro environmental factors, but coupled with mismanagement on different levels of corporate management.

Organisations operating as expected have reasonable strategic management generating investments such as post harvest ones and essential value added by them.

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Consumption habits of "Free range chicken" in Hungary

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Abstract: Poultry is highly ranked in the World meat production and consumption (it accounted for 32% in 2007), and, in the past 20 years it was growing with an annual rate of 3–6%, higher than in case of any other meat-types. This tendency is also valid for Hungary: poultry has the largest share (29.8 kg/person/year, 47%) in the domestic meat consumption since 2000, which is among the EU top (KSH, 2007).

As the result of the animal health and nutrition scandals, the EU animal welfare and quality requirements and the advancements in health-consciousness the Master-Good group launched the production, processing and trade of free-range poultry under the brand "Free-range chicken". The new products had good consumer responses, because at present 1.5% of the processed chicken in Hungary (25 tons/week) is under this brand. As it regards the future of this product, we can expect the decrease of the current 1.5 times higher production price over broiler chicken, due to the increasing energy, labour and other cost items, thus the increase of the domestic consumption by 25–30% per annum can be foreseen. Besides the growth in domestic demand, increasing foreign consumer demand can also be expected because of the space requirement of the production. Summarising the above mentioned: „Free-range chicken" can be one of the most successful products of the Hungarian poultry industry.

In order to realise the prognosis mentioned above, it is inevitable to learn the consumer attitudes towards the brand. A primary market research programme supported by the Master Good group has been launched to study the main features of the domestic chicken meat consumption – including the „Free-range chicken" as highlighted brand. The primary aim of the research was the complete assessment and evaluation of the Hungarian chicken consumption habits and the identification of the possible take-off points.

The research undertaken resulted basic information concerning the internal structure of the Hungarian poultry consumption (including that of the „Free-range chicken"), the potential consumer groups and their requirements, provided information on the consumers' knowledge of the products and identified the elements of the consumers' judgements. This will serve as basis for a marketing communication programme to increase the domestic „Free-range chicken" consumption.

Key words: poultry consumption, health-conscious nutrition, food pyramid, "Free-range chicken" questionnaire survey, consumer attitudes.

1. INTRODUCTION

The poultry meat consumption in Hungary was continuously increasing since the 1970's. It overtook the pork since 2000, and at present is the most popular meat type (*Figure 1*). The share of poultry from the total meat consumption is around 45–48% which is also remarkable in international context, since it is only around 25% at EU average (EU-25). However it is also a notable phenomenon that import products accounted for 10% at early 2000, while this was doubled by 2008 (21%).

Share of chicken in the internal structure of poultry consumption is determinant, and accounts for about 70% (16,9 kg/person/year in 2008). The remaining is dominated by turkey (average 7 kg/person/year), the water-fowl and other species are consumed at decreasing quantities in the past years. This is especially so in case of the gees.

At present the shrinking size of households is a tendency among urban consumers, thus there is a continuously growing need for smaller package and oven-ready products. Price and especially "special" price is the key factor during weekday shoppings, this was summarised by an employee at a leading hypermarket as: "the price sells the product". Factors such as freshness, quality, origin, etc. is ranked only below this.

Increase in the demand for products of higher processing level and added value (i.e. convenience food, such as "party food" products) is tendency identified for urban consumers, as well.

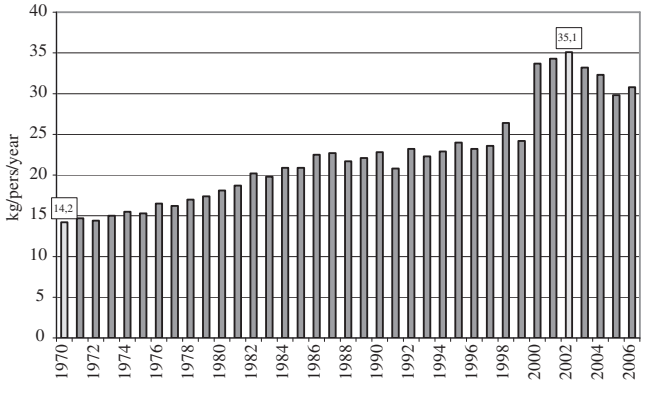

Figure 1. Trends in the per capita poultry meat consumption (1970–2006)
Source: KSH, 2009; *Balogh,* 2008.

It is also important to draw the attention to the tendency observed at the urban citizens with higher living standard: that is the decreasing consumption of red meat parallel with the increase in that of poultry and fish. The major cause of the decrease is the drop in pork consumption, and it is also a tendency that there is a growing number domestic meat products traditionally made of pork where poultry meat is used as replacement.

If the dietetics literature is reviewed, one can observe the appreciation of poultry consumption is almost all cases. Most food pyramids (*Figure 2*.) recommend the consumption few times weekly. Despite the recommendations, the domestic population does not follow the health guidelines, and the major problem is the lacking health-consciousness. The consumers are not aware the factors influencing their health, so the authentic communication is a key element in this field (*Fülöp N. – Szakály Z.* 2008).

Figure 2. Food pyramid
Source: www.erinvenier.blogspot.com;

Multinational companies are dominating the retail market in chicken meat trade, and their share is continuously increasing with the parallel decrease in the significance of smaller butcher's or poultry retail shops. These multinational retail chains are those setting the price-level, and their strategy for attracting consumers is exclusively focusing on decreasing prices. As the result of this the domestic suppliers (vendors) are more and more defenceless, and the overall quality of the poultry products are often fall prey to this price competition. The key element of the productivity of the whole poultry business is the status of the "price war" between the retail chains and processing suppliers (vendors). This trade situation is also causing a certain lack in product development in the processing sector, which paradoxically comes with a need for product development, but this is not by all means serving the improvement of food quality and safety.

2. Objectives of the research

Overall objective of the research was the consumers' assessment of chicken meat, and especially „Free-range chicken". The following special objectives were identified:

? In case of consumers' assessment of conventional chicken meat:
   1. Assessment of consumption frequency;
   2. Learning the consumers' opinion on the most reliable (safe) sources and locations for obtaining fresh chicken meat and processed products;
   3. Assessment of the purchasing and consumption attitudes, as well as the price consciousness for chicken meat.

? In case of free range chicken, especially for the brand „Free-range chicken":
   1. Survey of the consumers knowledge of the product;
   2. Assessment of their price acceptance, purchasing and consumption attitudes
   3. Learning the consumers' opinion on product promotion and their requirements for the present and planned products.

Because the whole study can not be presented within the frames of this article, we are focusing on the main results of the survey of consumers' opinion on „Free-range chicken" products.

3. Materials and Methods

A primary market research programme – supported by the Master Good group and the University of Debrecen, Faculty of Agricultural Economics and Rural Development – has been launched to study the main features of the domestic conventional and free-range chicken meat consumption using standardised questionnaires and quantitative methods. The survey was preceded by a test-survey in order to finalise the adequate questioning method, questions, respond options and the correct sequence of questions.

During the questionnaire survey the surveyed population was those poultry consumers – including chicken – which were selected by question 1 ("*How often do you eat chicken or chicken products?"*); those responded "*never*" were excluded from the survey. The expectation for questionnaires were: at least 1000 valuable responses including cities significant for chicken sales (Budapest, Debrecen, Nyíregyháza, Szeged, Győr, Székesfehérvár). Budapest and the other cities were represented in the responses nearly 50% and 10%, respectively. The over-representation of Budapest is caused by the fact, that app. 60% of the poultry is sold there, moreover 40% of the spending power is also situated here.

The survey was undertaken during May 2008 by interviewers in domestic hypermarkets (Interspar, Spar, Cora, Tesco, Kaiser's). There were 1011 questionnaires suitable for assessment, during which descriptive (average, variance, maximum, minimum and distribution) and non-parametric statistics (Pearson Chi^2 test, Mann-Whitney U- test, Kruskal-

Wallis test) were made. Significance was calculated at p=5% confidence level.

The responders were grouped by several categories for the significance-analyses. This was done by segmenting questions raised at the end of the interviews (gender, marital status, health-consciousness, chicken products purchased personally or not, education, type of present occupation, age, income category).

4. Results and Discussion

4.1. Characteristics of the domestic chicken consumption

The first question was asking the consumption frequency of chicken meat or chicken meat products ("*How often do you eat chicken or chicken products?"*). The majority of the interviewed had chicken or chicken products several times a week (52.6%) or weekly (34,9%). Insignificant amount (7.4%) were monthly or occasional (5%) consumers. The number of responders in the category "never" was insignificant and excluded form the survey.

Assessing the results from health-consciousness point of view – how often the respondents take into consideration the additives in the product – it is concluded, that the more conscious the consumer, the more chicken or chicken products are eaten (Pearson chi^2 test, p=0,001; Cramer V coefficient = 0,109)

Additional question in this group was asking the responders to rank the meat products by consumption frequency (*Table 1*).

Table 1 Average ranking of meat types by consumption frequency

Meat type	N	Average	Variance
1. chicken	1 011	6,34	1,22
2. prok	1 011	4,86	1,75
3. turkey	1 011	4,85	1,65
4. fish	1 011	3,78	1,67
5. beef	1 011	3,23	1,70
6. duck	1 011	2,21	1,48
7. mutton	1 011	1,83	1,35

Question No 2 of the questionnaire: „How significant is the chicken in your diet-, please rank the following meat types in decreasing order, according to the frequency of consumption! (7 – most often consumed; 1 – least often consumed)"

Table 1 is representing well that chicken is the mostly consumed meat type, so it is in the first place in the preference system of the respondents. Please note, that this result corresponds with the meat consumption statistics of HCSO (Hungarian Central Statistical Office – KSH).

4.2. Knowledge and consumption of „Free-range chicken" brand products

The first question within this group was asking if the respondents know the products under the brand „Free-range chicken". More than half of the respondents (58.5%) replied positively, and 41.5% replied that he/she never heard of it. Those doing the regular shopping knew the product group better i.e. women (63.7% of them replied positively in contrary to 49.3% of men), those of having family with elder children (73.7%) and the elderly, especially those 50–64 years of age. At the same time only 40.1% of the 15–14 years age group knew the products in question.

The responses of the health-conscious were also markedly distinguishable – the more health-conscious was someone the more he/she was aware of the „Free-range chicken" brand. This was also connected to the grouping by education, in which 45.2% and 68,5% of those with elementary or higher education knew the brand, respectively. It is inevitable that health-consciousness increases with the level of qualification.

The question asking the consumption frequency of those knowing the brand „Free-range chicken" was also within this group (*Table 2*)

Table 2.Consumption frequency of "Farm chicken" brand products

Frequency category	**Responses** (person)	**Distribution** (%)
Occasionally (monthly) consumed	246	41,6
Never tried	182	30,8
Tried once	130	22,0
I eat only this	33	5,6
Total	591	100,0

Most of them (41.6%) have the products under „Free-range chicken" brand occasionally (monthly) but the rate of those who never tied was also high (30.8). Another 22% of the respondents tried once and 5.6% are eating these products exclusively.

The majority of the respondents aged 15–24 years have never tired the products under this brand, and the most frequent consumers are those 25–34 years age group.

Fragmenting the respondents by marital status we concluded the majority is category of occasional consumption (except for those living with their parents, where 56% have never tired none of the products). This is especially significant for those with family and raising small child(ren) (66.7% are having these products occasionally).

Connected to the previous question, the respondents were asked to indicate the reason for not trying the products (more reasons could be marked) (*Table 3*).

Table 3. Reasons for not trying the products of the brand

Frequency category	**Responses** (number)	**Distribution** (%)
Never heard of	354	56,6
Too expensive	102	16,3
Not easy to obtain	54	8,6
Not interested	50	8,0
Not believing in it	32	5,1
Other	33	5,3
Total	625	100,0

Most of the respondents (56.6%) explained their behaviour – i.e. that they never tired the products under this brand – with the fact that they have never heard of them before. Many (16.3%) selected the reason "too expensive". The remaining reasons were indicated only occasionally (*Table 3*)

There was an optional "other reasons", where the respondents mentioned: that they have own grown chicken or they obtain poultry meat from the country (N=33).

4.3. Consumer attitudes towards the products under the „Free-range chicken" brand

There were statements formulated within this group of questions and the respondents were asked to agree or disagree using a scale 1–5 (1-totally disagree, 5-fully agree).

The first statement was: "*I am purchasing „Free-range chicken" because it embraces all the features of a chicken grown at village houses*". The responses (agreements) on a scale 1–5 had the average of 3.82 (variance 1.2) which corresponds the category "somewhat agrees".

According to the health-consciousness of the respondents it could be concluded that the more health-conscious the respondent is, the more he/she agreed with this statement. The significant differences in the result of the fragmentation by age group was determined by the group 15-24 (this group was evaluating this statement the lowest – avg. 3.54). Fragmentation by location of the interviews also came with significant differences. In general the respondents agreed the statement the least in Debrecen (3.45) and the most in Székesfehérvár (4.08) (*Figure 3*)

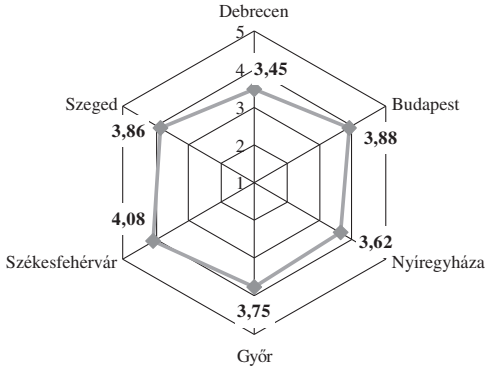

Figure 3. Average values representing the agreement of the respondents fragmented by cities (N=1011)
("*I am purchasing" "because it embraces all the features of a chicken grown at village houses*")

The next statement was: "*I am purchasing/would purchase „Free-range chicken" because I surely know that it was raised outdoors under humane circumstances"*. The average of the selected values was 3.72 (variance 1.17) meaning that the respondents somewhat agreed this statement.

According to the level of education, unfortunately the higher the level, the less important the animal welfare concerns are (*Figure 4*).

According to the fragmentation by location of the interviews the statement was agreed the most in Székesfehérvár (4.12) and the least in Debrecen and Nyíregyháza (3.58 and 3.57, respectively.

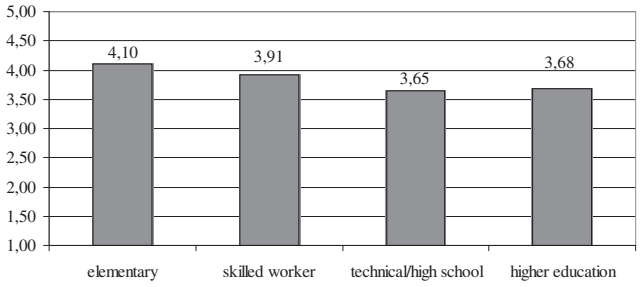

Figure 4. Distribution of the respondents agreement fragmented by the level of education
("*I am purchasing/would purchase „Free-range chicken" because I surely know that it was raised outdoors under humane circumstances")

4.4. Knowledge and opinions on the promotion, outlook and packaging of the "Free range chicken" current products and those under introduction to the market

At first we wanted to know if the respondents have seen/heard a commercial promoting the „Free-range chicken". The research concluded that 67% responded negatively. Only 21.1% of those living with their parents (the younger generation) were reached by any commercial, while this at those without children was 47.3%. At the same time, the more health-conscious the respondent, the more he/she is susceptible for commercials promoting the „Free-range chicken".

The next question was asking if the respondents met any promotion of „Free-range chicken" in the supermarket before. The word "before" was included in the question because a promotion campaign was undertaken during the time of interviews, and we were interested in knowing if the respondent came across any before, but not that whether he/she was noticing or not the one currently running.

It was also asked if those meeting supermarket promotion for „Free-range chicken" before have purchased it during the campaign. 43.4% of the respondents did, the share was the highest for those raising elder children and the lowest for those living with their parents (23.9%). The more health-conscious the respondents were the more „Free-range chicken" products they were purchasing during the promotions.

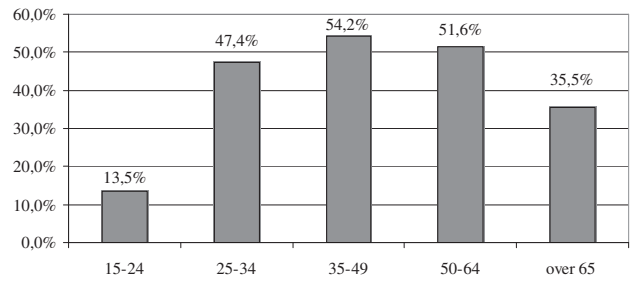

Figure 5. Rate of respondents by age group purchasing products under the promotion campaign for "" (N=142)

Figure 5 show that the promotion in supermarkets were primarily influencing the decisions of the mid-aged, especially those 35–49 years (52.4% bought products under the campaigns) and the least of those 15–24 years (13,5).

4.5. Product safety

Three questions were dealing the issue of food safety, the result of one of them is shown here. We intended to know how the H5N1 virus – bird flu – influenced the poultry purchasing habits of the consumers.

The majority (68.8%) did not change his/her habits, but 13.2% did not buy any poultry products. 6.9% neglected the poultry meat and 3.8% bought „Free-range chicken".

Table 4. Distribution of the responses on the reactions on H5N1 (bird flu) appearance

Frequency category	**Responses** (number)	**Distribution** (%)
I did not changed my poultry purchasing habits	696	68,8
I did not buy any poultry products	133	13,2
Other	71	7,0
I did not buy fresh poultry meat	70	6,9
I bought „Free-range chicken" because I trusted in it more	38	3,8
I have never heard of this virus	3	0,3
Total	1 011	100,0

Question No 14: „What was your reactions when the H5N1 virus – i.e. the bird flu, dangerous also for humans – appeared in Hungary?

The respondents could formulate their own opinion on this issue (N=71). The most frequent answers were: decreased poultry purchasing, became more aware of what is purchased, consumed poultry raised at home, preferred pork, bought poultry from small producers.

The fragmentation by gender resulted in significant results (Pearson Chi^2 test, p= 0,0003; Cramer V coefficient = 0,151). Male replied not changing the poultry purchasing habits (77.5%). The other possible responses were dominated by female replies (15.7, 7.3 and 4.5% did not buy and poultry products, did not buy fresh products or bought „Free-range chicken", respectively).

The more health-conscious the respondent was, the more he/she alters the poultry purchasing habits (Pearson Chi^2 test, p= 0,004; Cramer V coefficient = 0,113). This statement is valid for each possible responses.

91.7% of the underclass respondents did not change the poultry purchasing habits (Pearson Chi^2 test, p= 0,017; Cramer V coefficient = 0,091), but it is surprising, that the rate of changing did not increased with the income levels – as we have expected in advance. In contrary, those living near the underclass level changed their habits (14.5%) and in "other" ways, and these were those not buying fresh poultry meat at all in the highest number (15%). Also the respondents from this and the highest income category were those buying „Free-range chicken" the most (7 and 7.1%, respectively).

5. Conclusions

In harmony with the statistical data the present study is also representing the significant role of chicken meat in the domestic meat consumption followed closely by pork. It was inevitably proven that the so-called health-conscious segment consider chicken as one of the healthiest meat types, thus the health-consciousness should be emphasized during the individual or common marketing campaigns, especially in case of „Free-range chicken".

„Free-range chicken" brand is considered mainly by middle class consumers, typically those urban population with higher education and who are intend to follow health-conscious lifestyles as much as possible.

It was also proven that bird flu affected primarily women and those in the health-conscious category, i.e. these turned down the products usually bought before. It is not surprising that the relative rate of those buying pork was increasing against poultry, however the trust in „Free-range chicken" was increasing.

According to the results of the survey we can state, that consumers require the safe, traceable, healthy and good quality chicken products that was produced under "natural circumstances".

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Impact of CAP's pillars on Romanian rural employment

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Abstract: This paper aims to clarify the direction of change in rural employment on short- and medium term in Romania, while CAP regulations are being introduced and the global economic crisis emerges. First we put into evidence the decrease of the role of agriculture as buffer for unemployment and the poor contribution of non-agricultural activities to provide employment for rural residents. Then we analyse the main characteristics of the rural labour force. Finally we synthesize the opinions expressed by 33 consultants (working at the Offices for Agricultural Consultancy from different counties in Transylvania) about the estimated short term evolution of rural employment and the impact of CAP on Romanian rural areas.

Key words: change of agricultural structure, rural employment, impact of the Common Agricultural Policy on Romanian rural employment

1. Introduction

In Romania the problem of rural employment is of special importance, as 46% of the active population lives in the rural area and about 60% of the rural population are employed in agriculture. The problem could became vital because of the global economic crisis, as due to the crisis many of the young Romanians working abroad (an estimated number of 2 million people) could loose their jobs and be forced to return home, increasing the number of job seekers.

Romania is benefiting from the SAPS direct payment system and financial support for rural development measures only since 2007, from its accession to the EU. The preparation of rural areas for the EU accession by the SAPARD pre-accession programme and the gradual legal harmonisation necessary for the introduction of the Common Agricultural Policy have already impacted the structure of agriculture structure and rural development. In this paper we will concentrate more on the impact on rural employment.

2. Material studied, area descriptions, methods, techniques

The paper is divided in two main, complementary parts. In the first part, based on official statistical data, we analyse the evolution of the structure of agricultural holdings between 2002 and 2007, as well as the evolution of the rural workforce between 2002 and 2008 and its main characteristics in the 3rd quarter of 2008 (the most recent period where data is available). The second part of the paper presents the opinions regarding the impact of the Common Agricultural Policy on the development of rural areas and on rural employment, expressed by consultants working at the County Offices for Agricultural Consultancy from Transylvania.

The methods used in the first part of our study are techniques of descriptive statistics: the collection and processing of statistical data. For the second part we have used a questionnaire conceived by us to collect data from a sample of agricultural consultants (*Vincze* & et al., 2005); following the survey the information was synthesized.

3. Results and discussion

3.1. The evolution of the structure of agricultural holdings and of non-agricultural activities

The main subject studied in this part is the capacity of the agriculture to remain also after EU accession a buffer for unemployment, a role which it had in the transition period (*Swain & Vincze,* 2001; *Dumitru &* et al., 2004).

The first question concerns the process of land concentration. Based on statistical information from the General Agricultural Census 2002 and from the nation-wide survey on agriculture from 2005 and 2007, we can draw conclusions about the changes of the structure of agricultural holdings in Romania.

The overall analysis of the Romanian agriculture show a 10% decrease in the total number of farms between 2002 and 2007. An important decrease (with 22%) of the number of small farms (less than 1 ha, not eligible for direct payments)

Table 1. The evolution of the agricultural holdings' number and area in Romania between 2002–2007, by size of the holding and type of ownership

Agricultural holdings' size	Values from 2007 reported to values from 2002					
	Total holdings		Individual farms		Commercial companies	
	Number	UAA (ha)	Number	UAA (ha)	Number	UAA (ha)
<1 ha	0.78	0.86	0.78	0.86	0.26	0.33
1–5 ha	0.95	1.00	0.95	1.00	0.57	0.58
5–10 ha	1.37	1.40	1.38	1.41	0.63	0.62
10–20 ha	1.87	1.96	1.92	2.00	0.93	0.94
20–50 ha	1.70	1.71	1.78	1.79	0.95	1.00
50–100 ha	1.24	1.29	1.30	1.35	1.06	1.12
>100 ha	0.94	0.79	1.11	1.14	1.03	0.90
Total	0.90	0.99	0.90	1.16	0.87	0.90

Sources: General Agricultural Census 2002, Survey on Agriculture 2007

was registered. The number of farms of 1–5 ha also decreased (with 5%) and farms over 100% as well (with 6%). In the same time the number of farms of 5–100 ha increased, the highest increase (with 87%) being registered for farms of 10–20 ha, followed by farms of 20–50 ha (with 70%). We can clearly observe the concentration of parcels into bigger farms, mainly of 10–20 ha and 20–50 ha. In the case of individual agricultural holdings, the number of farms under 5 ha decreased and the number of those above 5 ha increased; the highest increase in number was registered for farms of 10–20 ha. In the case of commercial companies farms with more than 100 ha are dominant (63%); these work about 97% of the land used by all commercial farms.

We can't conclude that the introduction of the Single Area Payment Scheme directly caused the concentration of land in larger farms, as direct payments were applied first in March 2008. However, as the examples from the more developed EU countries demonstrate, we can consider that land concentration is a middle- and long-time process.

From the perspective of the Romanian agriculture's competitiveness the fact, that between 2002 and 2007 the number of farms with less than 5 ha decreased with more than half a million (568,383), can be considered as a positive development. On the other hand this situation raises some social problems, as subsistence farming ensured everyday existence for many rural residents (*Bezemer & Davis,* 2002; *Davis & Cristoiu,* 2002; *Sandu,* 2003). Therefore the need to provide jobs in the rural areas, mainly in non-agriculture has increased.

In Romania the privatization of state agriculture created the class of big landowners or land concessionaires that operate several thousands of hectares of land (*P.I. Otiman,* 2008). The concentration of land into big, commercial and generally well-equipped farms reduces the capacity of agriculture to provide jobs for low-educated persons (*Vincze* & al., 2005).

Concentration can also be observed in cattle-breeding. In 2002 around 77% of the cattle were registered in farms with less than 5 ha and for 2007 this share decreased to around 65%. In the same time the share of cattle in farms over 20 ha increased from 5.8% to 9.7%. This concentration accelerated after the introduction of CAP subventions for milk and cattle and also because EU hygienic norms were step by step made compulsory. The decrease of the number of heads with 431,238 in farms smaller than 5 ha in the period 2002–2007 put into evidence the reduction of an important source of subsistence for small farms.

From the perspective of employment, giving up cattle-breeding in subsistence farms means the increase of underemployment of individual farmers and a decrease of their income, which again lead us to the conclusion that non-agricultural jobs has to be created in order to avoid the depopulation of the villages and to stop the extension of unused agricultural areas. In the present situation, when about 1.7 million agricultural holdings are smaller than 1 ha and 1.8 million have between 1–5 ha, underemployment in subsistence farms is a reality, which impose rural job creation (*Kerekes,* 2007a; *Vincze,* 2007).

Even if we observe an increase in the dimension of the holdings, the economic scale of market sale is still very low. Statistical figures show that 79% of agricultural holdings were less than 1 ESU in 2007, meaning that only 850 thou farms (21%) have a gross margin above 1 ESU.

The share (8.3%) and the evolution of the number of the agricultural holdings carrying out non-agricultural activities

Table 2. The structure of cattle-breeding farms in Romania, in 2002 and 2007

Size of holding	2002				2007			
	Cattle heads	%	Utilised agricultural area (ha)	Cattle heads per UAA	Cattle heads	%	Utilised agricultural area (ha)	Cattle heads per 100 ha UAA
<1 ha	572232	19.93	758815.08	0.7541	365104	13.36	649530.35	56.21
1–5 ha	1626081	56.64	4180568.33	0.3890	1401971	51.29	4179874.35	33.54
5–10 ha	358481	12.49	1440944.55	0.2488	502891	18.40	2017538.56	24.93
10–20 ha	90552	3.15	471097.55	0.1922	198208	7.25	924227.9	21.45
20–50 ha	40240	1.40	281172.09	0.1431	94783	3.47	481253.26	19.70
50–100 ha	18053	0.63	258042.66	0.0700	44819	1.64	333053.59	13.46
>100 ha	109728	3.82	6540069.84	0.0168	125781	4.60	5167568.48	2.43
Total	2870782	100.00	13930710.10	0.2061	2733557	100.00	13753046.49	19.88

Sources: General Agricultural Census 2002, Survey on Agriculture 2007

Table 3. The changes of number of agricultural holdings carrying out non-agricultural activities in Romania between 2002–2007, by size of the holding and type of ownership

Type of non-agricultural activities	**2005/2002**			**2007/2005**			**2007/2002**		
	Indiv. farms	Com. comp.	Total	Indiv. farms	Com. comp.	Total farms	Indiv.	Com. comp.	Total
Food processing	6.11	0.55	6.04	0.67	0.71	0.67	4.08	0.39	4.04
Wood processing + other proc.	0.73	0.27	0.72	1.10	0.65	1.10	0.81	0.18	0.79
Agro-tourism	1.75	0.37	1.66	0.74	1.24	0.74	1.29	0.45	1.24
Services	2.98	1.27	2.95	0.09	0.15	0.09	0.26	0.19	0.26
Production of non-conv. energy	2.33	0.50	2.16	0.93	0.88	0.93	2.18	0.44	2.02
Handicraft	0.63	0.27	0.63	0.87	1.27	0.87	0.55	0.35	0.55
Aquaculture	2.47	0.23	1.88	1.55	0.94	1.53	3.83	0.21	2.88
Other activities	1.87	0.23	1.74	0.63	0.55	0.63	1.17	0.13	1.09
TOTAL	4.49	1.23	4.41	0.53	0.33	0.53	2.39	0.40	2.35

Sources: General Agricultural Census 2002, Surveys on Agriculture 2005 and 2007

(363,377 in 2002) is also not encouraging. In the period 2002–2007 the extension of non-agricultural employment could not compensate the decrease of agricultural employment. Between 2002–2005, due to the SAPARD programme, an important increase of the number of individual holdings carrying out food processing or agro-tourism activities can be observed. The number of service provider individual holdings tripled, of those producing non-conventional energy and dealing with aquaculture increased with around 2.5 times. The process slowed down in the period 2005–2007. This slowdown is on one hand explained by the fact that EU norms and standards were increasingly applied, which raised investment costs, therefore the necessary amount of own contribution as well. On the other hand conditions for sale also changed: small processing units were not able to meet the requirements set by of big commercial chains and the strong Romanian currency was also facilitating import (*Toderoiu,* 2005; *Sofer & Bordânc,* 2006).

Between 2007 and 2013, even though and important amount (around 8 billion euro from EARDF) can be used for rural development and, within RD, for the development of rural SME's, we do not foresee a big increase in the number of rural SME's because of the effects of the global economic crisis, which restrict credit opportunities and decrease local demand.

3.2. The evolution of the structure of the rural workforce between 2002 and 2008

In the next part we will analyse the characteristics of the rural labour force. First, we observe the different evolution of the urban and rural labour force in the analysed period.

The favourable macroeconomic environment from Romania in the period 2002–2008 (about 5%–9% real growth of GDP and decreasing inflation) had a different impact on the labour force market in the urban and rural areas.

Besides that activity rates' evolution had a different direction in urban areas (increasing) than in the rural areas (decreasing), we can also notice that activity rates decreased for young age-groups (15–34 years). The evolution of unemployment rate between 2002 and 2008 was also unfavourable in the rural area.

After this short comparative description of the urban and rural labour force market dynamics, we will analyse in more detail the present characteristics (3rd quarter 2008) of the Romanian rural labour force.

Table 4. Romanian population, by economic activity and area, in 2002 and 2008

Area / Period	Economically active persons			In- active persons	Activity rate	Employment rate	ILO unempl. rate
	Total	Employed	ILO				
	thou.pers.	thou.pers	unemloyed thou.pers	thou.pers	%	%	%
URBAN							
2002 Q III	5259	4681	578	6320	53.9	48	11
2008 Q III	5503	5143	360	6305	53.9	50.4	6.5
RURAL							
2002 Q III	5127	4927	200	5089	62.1	59.7	3.9
2008 Q III	4675	4484	191	5021	58.2	55.8	4.1

Source: Labour force in Romania. Employment and Unemployment in the 3rd quarter 2008

Table 5. Activity rate of the population aged 15 years and over, by age group and area, in 2002 and 2008

	Total population aged 15 years and over	Total 15–64	of which:					
			15–24 years	25–34 years	35–44 years	45–54 years	55–64 years	65 years and over
URBAN	**%**							
2002 Q. III.	53.9	61.2	32.8	83.3	84.5	70.2	18.5	2.9
2008 Q. III.	53.9	62.2	25.9	81.2	84.9	73.3	34.4	1.9
RURAL	**%**							
2002 Q. III.	62.1	70.7	52.5	80.4	84.8	77.8	60.1	32
2008 Q. III.	58.2	67	41.4	72.9	84.4	78.4	62.9	27.7

Source: Labour force in Romania. Employment and Unemployment in the 3rd quarter 2008

Table 6. ILO unemployment rate, by age groups and area, in 2002 and 2008 (%)

	Total	of which:				
		15–24 years	25–34 years	35–44 years	45–54 years	55–64 years and over
URBAN	**%**					
2002 Q. III.	11	29.1	10.5	8	7.2	3.4
2008 Q. III.	6.5	24.8	5.3	5	4.9	3.1
RURAL	**%**					
2002 Q. III.	3.9	11.6	4.5	3.4	2.3	0.1
2008 Q. III.	4.1	14.8	4.3	3.1	2.3	0.9

Source: Labour force in Romania. Employment and Unemployment in the 3rd quarter 2008

Table 7. The labour force in Romania, 3rd quarter 2008

Age group	Total population	Economically active persons			Activity rate	Employ-ment rate	ILO unemploy-ment rate
		Total	Employed	ILO unemployed			
	(pers.)	(pers.)	(pers.)	(pers.)	(%)	(%)	(%)
RURAL							
15 years and over	8030518	4675602	4484463	191139	58.2	55.8	4.1
young (15–24 years)	1369254	566938	483206	83732	41.4	35.3	14.8
adults (15–64 years)	6230976	4176374	3985459	190915	67	64	4.6
aged (55–64 years)	1067010	671433	661127	10313	62.9	62	1.5

Source: Labour force in Romania. Employment and Unemployment in the 3rd quarter 2008

Figures from table 7 show a relatively positive picture of the situation of rural employment, but a more detailed analysis put into evidence some important problems.

Table 8. The rural labour force in Romania, by age groups, 3rd quarter 2008

Age group	Activity rate	Employment rate	ILO unemployment rate
	(%)	(%)	(%)
RURAL	**58.2**	**55.8**	**4.1**
15-19 years	25.7	19.8	22.8
20-24 years	56.3	49.9	11.3
65 years and over	27.7	27.7	–

Source: Labour force in Romania. Employment and Unemployment in the 3rd quarter 2008

The relatively high level of activity, employment and unemployment rate in the 15–19 and 20–24 years age groups on one hand, and of the 65 years and over age group on the other hand illustrate the main specificities of the Romanian rural labour force. We can conclude immediately that education level will remain low in the near future, as an important share of the 15–19 years old are not attending school. It is evident, that many young rural persons haven't got adequate education and skills to meet job requirements (*Kerekes,* 2007b).

Another specificity of the rural employment is the unfavourable distribution of labour force by economic activities. In present Romanian economy, the lowest level of labour productivity is in agriculture, where more than 61% of rural labour force is employed.

3.3. The impact of CAP on the development of rural areas and on rural employment

In the last part of this paper we summarize the subjective opinions regarding the impact of the Common Agricultural Policy on the development of rural areas and on rural employment, expressed by consultants working at the County Offices for Agricultural Consultancy. The questionnaires, completed by 33 consultants from different parts of the NUTS1 macro-region no. 1 (formed by the NUTS2 regions North-West and Center), reveal the fact that CAP is only seen as a source of support for farms and the potential advantage of the huge single market is completely neglected, even by persons who are local experts in agriculture. CAP is considered an opportunity for big commercial farms and a threat for subsistence farms.

The experts mostly agree on that the number of small subsistence farms will continue to decrease in the near future and that land concentration, as well as market orientation of small producers will intensify. Experts also foresee the increase of the income of agricultural producers, mostly through the extension of complementary activities, like rural tourism. There is a growing demand for extension services, because of the implementation of the SAPS system and of the different rural development measures. The County Offices for Agricultural Consultancy offer free consultancy services on these issues.

Opinions regarding the evolution of agricultural production and rural employment are diverse and they differ from county to county. The seasonal external migration of the rural workforce will continue to increase according to many respondents. Some experts foresee a small increase of the rural unemployment rate.

Table 9. Rural population, by age groups and level of education

	Total (persons and%)	of which:					
		15–24 years	25–34 years	35–44 years	45–54 years	55–64 years	65 years and over
RURAL	**9696740**	**1369254**	**1403851**	**1338069**	**1052792**	**1067010**	**1799542**
High (%)	1,9	1.4	4.7	2.1	2.9	2.5	0.9
Medium (%)	34,6	40.8	55.6	72.8	56.4	30.5	6.9
Low (%)	63,5	57.8	39.7	25.1	40.8	67.0	92.2
of which	1800389	100506	58198	33561	60585	190978	932797
Primary (%)	18,6	7.3	4.1	2.5	5.8	17.9	51.8
No education (%)	15,4	1.8	2.1	1.3	1.4	1.4	9.7

Source: Labour force in Romania. Employment and Unemployment in the 3rd quarter 2008

Table 10. Structure of employment, by age groups and sectors of economic activity

Economic activity	Total employment	Total	Age groups					
		15–64 years	15–24 years	25–34 years	35–44 years	45–54 years	55–64 years	65 years and over
	(persons and%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
RURAL	**4484463**	**88.9**	**10.8**	**21.8**	**23.5**	**18**	**14.8**	**11.1**
Agriculture	2748251 (61.3%)	82	9.5	17.3	17.8	16.6	20.8	18
Industry	928241 (20.7%)	99.9	14.4	30.2	32.1	19.1	4.1	0.1
Services	807971 (18%)	99.7	10.8	27.6	33.1	21.8	6.4	0.3

Source: Labour force in Romania. Employment and Unemployment in the 3rd quarter 2008

Young rural people have low interest for carrying on the activity of the inherited family farm, they prefer to rent or to sell the farm and try to find a job in the cities or abroad. One third of the respondents, mostly those from Harghita and Satu Mare counties, foresee a small increase, and during the global economic crisis this seems to be a more realistic view.

Many experts see the future of agricultural employment connected to the growing SAPS and to rural development measures, as these sustain employment in agricultural production. Others think that the differences among agricultural and non-agricultural income levels, as well as the availability of non-agricultural jobs are decisive factors for staying or not in agriculture. In the opinion of the experts, direct payments provided within the CAP are mostly used for inputs and partly for household consumption. Most respondents consider aging of the villages will speed up, but opinions differ as regards future commuting patterns and the evolution of the number of SME's.

This survey shows that the introduction of the CAP has already some effects on the Romanian agriculture and on rural areas, but a more extensive analysis can only be carries out when the amount of direct payments will grow and when all rural development measures will be implemented.

4. Conclusion

We can state as a general conclusion that in Romania the role of agricultural employment is decreasing and that local non-agricultural labour market is limited, at both of demand and supply side. The emerging global economic crisis will, on one hand, force to return those working abroad and, on another hand, will decrease work opportunities from the cities. The comparative analysis of the urban and rural labour force put into evidence that the present structure (by age and education level) of the rural active population is unfavourable and that this unfavourable structure will be maintained in the future, too. If urgent measures will not be taken for a better education of children from the rural areas, there will be no chance to equilibrate the rural labour market.

The critical points of the Romanian rural employment are represented by the low education level of the 15-24 years old rural population, combined with a relatively high income-expectation and the limited opportunities for non-agricultural jobs. The analysis of the rural labour market is strongly connected to the territorial characteristics of the rural areas; therefore identification of the local labour-market problems can be a starting point for reaching the solution.

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Destination managament in Hungarian tourism

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Abstract: The principle of the regional concentration – as one of the important means of regional competitiveness – and the cooperations being organised more consciously have big parts in the development and operation of the tourist destination management. The principle of complexity is emphasised differently that means, on the one hand, the more effective use of the connection possibilities of tourism to other branches, on the other hand, it takes for granted the development of the background infrastructure supporting tourism more intensively beside the development of the tourist infrastructure. The basic principle of the competitive developments are the sustainable developments and the innovative approach. Tourist destination can be identified with the tourist supply (product) from the elements of the tourist system: the tourist supply and the tourist destination are consisting just of the same elements. The difference is that the tourist product can be only one product and destination can be characterised as a complex pile of attractions and services being in connection with each other. The cooperation of the characters of destination are organised by the tourist value chain of which elements are the experiences in connection with the formation of the image, preparation of travel, travel, destination, return from the point of view of the tourist and the service providers of destination. Services of different level provided by the suppliers can influence the opinion and experience of the tourist in connection with destination negatively. The independent destination management system with suitable competence and specialists, running a coordinating activity can make a connection between the tourist and the receiving area.

Key words: destination, destination management, tourist value chain

1. Introduction

The globalisation of tourism, the fast and constant change of the tourist market, the increasing competition between tourist areas require faster and more flexible changes, reactions on behalf of the macro- and microenvironment of tourism. That is the reason why the current management and operation process of tourism need to be changed and renewed. The present structure of tourism management and operation is being revaluated and replaced by the ***modern tourism management and operation system, the regional and organizational system of destination management***.

Destination management means the current practice of complex and integrated planning and operation of tourism with the difference that ***„the principle of regional concentration"*** – as one of the important means of regional competitiveness –, and the regional ***cooperations*** operating more consciously and reasonably are getting a more significant role in reconsidering the system of tourism in a more modern form.

The principle of ***complexity*** is emphasised differently, which means on the one hand, the more effective use of the connection possibilities of tourism to other branches, on the other hand, the more intensive development of the background infrastructure supporting tourism beside the tourist infra- and superstructure. The basic principles of the competitive developments are the ***sustainability*** and the ***innovative approach.***

Present publication focuses on the development of the above complex system, it mentions the characteristics of tourism destination and those of tourist destination management, their places in the system of tourism and it also deals with the operation of the tourist value chain. At the same time the article explains the connection between *tourist product and tourist destination* as well as the behaviour of destinations, which influence the duties of destination management organisations.

2. Methods and Materials

The publication reviews the characteristics of the destination and the destination management. For analysing the principles of the tourism destination management, the searchers used the wider literature of the tourism destination management. On the bases of the studies, we offered an opinion about the necessity and the set-up of the destination management system, specially in Hungary.

3. Results and discussion

3.1. Necessity of the development of tourism destination management

The destinations – as organizational systems based on regional concentration and cooperation – have to take into consideration the global economic processes. The basic

principle of these processes is that the durable industrial and business competitive advantages appear to be more and more concentrated geographically. The participants of the competition are not individuals, but the basic units of the market, companies, enterprises and regional institutions. The establishment and operation of these systems are helped by the EU orders as well as financial support.

The regional concentration principle plays a determinant role in the effective operation of the destination, because it generates competitive advantages. The tourist target areas are worth settling to a regional concentration being significant from the point of view of tourism, based on definitive basic principles, so that the economic potential of the region can be increased.

Determinant factors of the tourist competitiveness of each region are the development and operation of the management system with the effective, suitable competences and calculable financing and organisational background.

Modern tourism management and operation, that is the revaluation of the current traditions, are necessary for the development of an effective management system organised on the basis of the regional concentration principle. The integrated planning, management and operation of tourism are needed on all levels of tourism. Development of the system is taking for granted such kind of regional and organisational planning basic principles as the:

- Revaluation of cooperation, development of consciousness in the cooperation, development, planning, organisation, operation of the forms of cooperation;
- More close cooperation with other regions, branches in the processes of planning and development originating from the multiplier effect of tourism;
- More complex approaches in the development of the service system of tourism: beside the development of the tourist infra- and superstructure the development of the background infrastructures, the supporting factors have to be emphasized too;
- The use of innovative, modern, up to date technologies in the processes of development.

3.2. Concept of the tourist destination, its characteristics

The characteristics of the destination, its concept, can be revealed in forming factors and of the „behaviour", nature of destination.

In the ***conceptual estimation*** of destination different standing-points can be followed. In the whole, *destination* (*Dr. Roger Carter – Dr. Mike Fabricius,* 2007) *is a physical location where the tourist is spending at least one night. It is containing tourist attractions, products, relating services that are necessary to meet the stay of a tourist on the place at least for one day.*

Destination has physical and administrative limits, which are determining its management, and has an image and perception. It includes a lot of elements being concerned, it is capable for constructing a network, a cooperation and to become a bigger destination; the determination of destination is made from the point of view of the tourist.

To create a tourist destination the location, or region has to have the factors that determine the tourist destination. These factors are determinants in the bordering, determination of the core area destination; their development is essential by the increase of the competitiveness of the specific destinations. According to Buhalis (2000), the ***determinants of the destination*** are as follows:

- Tourist attractions, e.g. natural factors, man-made factors, heritage, special events, etc.;
- Approachability, e.g. the entire traffic system, including roads, traffic means, etc.;
- Tourist services, e.g. accommodation, host services, other tourist services, etc.;
- Product packages;
- All kinds of activities that can be enjoyed by tourists during their stay; public-utility services, e.g. banks, telecommunication, hospitals, etc..

Summarizing the aspects regarding the nature of destination and its determining factors (*Angelo Presenza – Lorn Sheehan – J.R. Brent Ritchie,* 2005), the ***characteristics of destination*** can be listed as follows:

Destination:

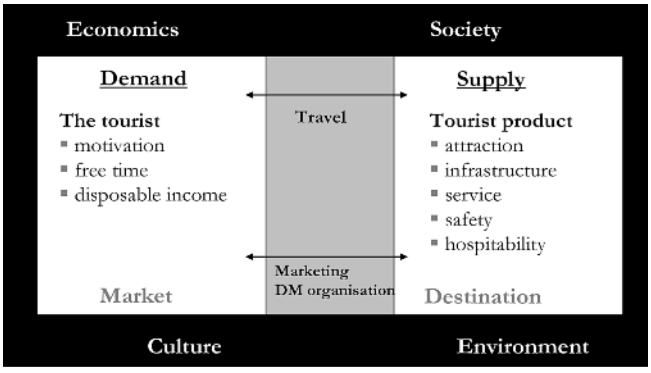
- Area target chosen by the tourist as the target of his travel
- Receiving area that provides services for the tourist and people living on the spot
- It is defined from the point of view of the tourist
- A place/region that is confinable physically and geographically
- A place/region that contains tourist attractions, products, services and other background-services necessary for spending at least one day
- The tourist spends at least one night there
- It contains a lot of persons concerned who are cooperating with each other
- It has an image
- It has perception (it means that each of the tourists can form an opinion about a destination through their own "screen" subjectively)
- It provides integrated experience for the tourist
- In a wider sense, it is a tourist product that competes with other tourist products (destinations) on the market of tourism
- A kind of complex and integrated modern tourism controlling and management system necessary for a destination's successful operation
- It is a system built from below and supported from above

Not all locations, regions can become a tourist destination. There are certain basic criteria that have to be met so that a location, region can become a tourist destination. The above mentioned are only the most basic criteria. The determination and bordering of the destinations or the core area destinations suppose the development of a special system of criteria that is made according to preferences, expectations, points of view of the tourist first of all.

3.3. The connection between the system of destination and tourism

The place of destination in the system of tourism is demonstrated by the system of tourism. Destination can be found on the side of supply (the product) from the two sub-systems of the tourism system. The tourist supplies consist of the factors of the receiving area that are used by the tourist during his stay. The central element of the supply is the tourist product that contains the services meeting the demands of the tourist.

Tourism is an integrated, open, complex system operating dynamically, each element of which (its micro- and macro environment) is interdependent. *(Figure 1. "The system of tourism")*



1Figure 1: The system of the tourism
After Márton Lengyel: General theory of tourism, Budapest, 1992. edited by *Anett Tőzsér,* 2007.

From the factors forming the two sub-systems of the tourism market, the *supply (tourist product)* consists of the following elements: attractions, accessibility, services, safety, hospitability, etc.. The elements of the tourist destination according to the above definition (*Buhalis,* 2000) run as follows: tourist attractions (natural and man-made, special events, etc.), accessibility, tourism services, product packages, activities, and public services. From the above-mentioned, one can say that the elements and combination of the **factors of supply and the ones forming the destination are the same.** However, there is a **difference** because the tourist product can be only one product or some services or even a pile of services meeting the demands of the tourist being away from his home. From the tourist's point of view only the pile of complex services means a product because it has to meet all of his demands (*Márton Lengyel,* 1992)**. The product can be only one or several products as well, however destination can be characterised as a set of complex services and attractions related to each other.**

Some scientists put an equal sign between the tourist product in a wider sense and the tourist destination: e.g. according to Bieger (1998) destination is just like a tourist product that competes with other products on the tourist market.

Destination management system being responsible for the tourist destination controlling and management **forms a connection with the poles of demand and supply.**

3.4. The operation of destination management as the tourist value chain

The simple value chain represents a process that delivers a product from the idea through the product development phase to the end user.

Michael Porter characterises the value chain with the connection of activities whose elements represent the different levels of providing offers. The principle of destination operation is similar to the one of the traditional value chain, too. However, destination management as the tourist value chain leads the tourist through the entire process of travel, right from the decision of travelling to the return. The **traditional value chain puts the product and its development in the centre; the leading actor of the tourist value chain is the tourist who wants to use tourist products (tourist supply of destination) in a more complex way to be able to meet his demands.**

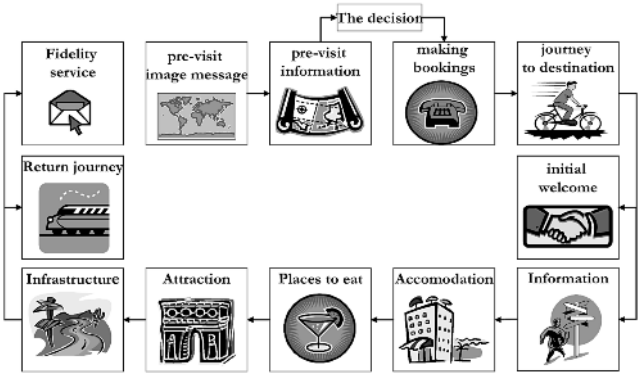


Figure 2: The tourist value chain
After „Using natural and cultural heritage for the development of sustainable tourism in non-traditional tourism destinations (2002); Key success factors: Designing a tourism offer", 28.p.; edited by *Anett Tőzsér,* 2007.

The tourist value chain consist of the elements determining and influencing the travel process and of the elements provided by the specific destination.

There can be different actors behind the offering factors that form destination, just like e.g. the local self-government, the owners and operators of the attractions, services, local tourist consortiums and partnerships, civilian organisations, institutions supporting enterprises, tourism developing institutions, organisations, etc.. The effective operation of destination is taking the conscious cooperation of the characters for granted that is realized in the harmonized organization and operation of the products and services mostly.

It is important that service providers should provide the same high level of quality because a service of different levels of the key and supplementary functions of destinations can influence the judgement of the whole destination negatively.

For the operation of a destination as a tourist value chain an organisation is necessary that can establish a connection between the tourist and the receiving area, that is independent, has the suitable competences and means, and is capable to coordinate the characters and to build up the activities.

3.5. *Characteristics of the tourist destination management*

On the basis of some definitions, we can sum up the **point of the tourist destination management organisation in the following way:**

- The tourist destination management organisation (*Buhalis,* 2000) takes the entire responsibility for the tourist products of the whole destination, for their development through controlling, encouraging and other means and for the development of a partnership that is able to provide positive experience for the tourists;
- Its main role, function is the establishment of the cooperation and coordination between the non-profit and private characters of tourism. Its purpose (*Dr. Hilda Faragó,* 2006) is to increase the tourism, the tourist income of the specific area and to strengthen the image of the territory. It usually introduces the tourist supplies of a specific area for the tourists and the branch of tourism in a way free of competition.

Table 1: Tourism destination management and its organisational characteristics

VIEWPOINT	CHARACTERISTICS OF DESTINATION MANAGEMENT
Character:	• Directing • Management • Coordinating activity
Mission: Purposes:	• To establish the sustainable and competitive tourism in a specific area through the comprehensive creation and operation of the system of tourism • To meet the demands of the tourists • To ensure the profitability of the branch • To get the local community take part in the processes of development, to improve the quality of life • To protect and take care of the environment
Means:	• Tourist planning • Development • Monitoring • Business federation (and lobby activity)
Main working practices:	• Establishment of the communal partnership • To get to know the demands and interests of the characters (tourists, inhabitants, authorities, partner organisations, tourist enterprises)
Structure:	• From the bottom to the top (at the same time it is supported from the top), it means that the organisations with regional level are forming the small regional and regional co-operations
The characteristics of the organisation:	• Prepared professionally, skilled organisation • Decision are made with the contribution of the persons being interested • Has the suitable independence (own resources and means) needed to the execution of its decisions
Financing:	• Self-maintaining (provided by the characters) • Supported from the top

After Márton Lengyel: Regional (destination) tourism management. Proposal for Hungarian Tourism Committee, 2005. edited by *Anett Tőzsér,* 2007.

According to the ***tourist destination management model*** (*Márton Lengyel,* 2005) the **tourism destination management and its organisational characteristics** can be described with the following points of view:

3.6. Conclusions

On the whole, tourist destination management (*Márton Lengyel,* 2005) means an activity that keeps an eye on the interests both of the tourists and the receiving communities and serving them as well. Its mission is: to provide adventures for the tourists, economic, social and environmental advantages for the receiving communities. Tourist destination management has to be carried out by an independent organisation with the suitable competence, means and experts to be able to perform its involved tasks.

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On corporate risk management practices in Romanian companies

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Abstract: The purpose of this paper is to provide an understanding of corporate risk management practices in Romanian companies, by investigating the risk management approaches Romanian companies take. Our main findings are that Romanian managers are not aware of the magnitude of exposure their companies have to various types of risk – hazard, operational, financial and strategic risks, while they are able to manage rather well all these risks, even the ones that have the lowest impact on the business. At the same time, risk management systems employed by Romanian companies are rather inarticulate and based on traditional approaches towards risk management, which might represent by itself a major source of risk, given the complexity of the business environment they face.

Key words: corporate risk assessment, risk management, Romania

1. Introduction

Risk management is a field that has enjoyed an exponential development in the last decades. The main factors that can explain its development are the increased volatility of the markets trading real and financial assets, the financial innovation surge generated by the appearance of new financial products and derivative instruments, and the development of international transactions, fueled by the accelerated globalization of markets. In the past decades we have seen an increase of the sophistication degree in the field of risk management, triggered by the evolution from the traditional approach to assessing and controlling risks, to an integrated approach, based on proactive risk management. From the traditional risk management techniques, developed due to utility and portfolio theories by *Markowitz* (1952), *Sharpe* (1964) *and Lintner* (1965), to the subsequent development of financial markets in the area of derivative financial products, due to the models proposed by *Black and Scholes* (1973) *and Merton* (1973) and to the emergence of risk assessment standards such as Value at Risk developed by RiskMetrics, we observe today an increasingly integrated approach to risk both in practice and especially in research. The legislative initiatives such as the Sarbanes-Oxley Act in the United States or the Financial Security Law in France require public companies to be more transparent when it comes to risk management. At the same time, the institutional organizations such as the Global Association of Risk Professionals (GARP) or the Professional Risk Managers' International Association have led to the standardization and the development of the professional risk manager.

Romanian companies face financial, commercial, political and technological changes with a considerable impact on the complexity of the risks that influence them. Quite often, the business environment generates new types of risks at a national, and especially at an international level. The speed of these changes has as direct consequences the diminishment of companies' reaction time and the increase in the magnitude of business risk. In this context of an increasing complexity of the business framework, a correct assessment of the business risk that companies are exposed to, as well as the design of effective risk management strategies have stopped representing mere options of the managerial teams, becoming indispensable components of the business strategy, aiming at consolidating company's competitiveness. In this context, understanding the level of corporate exposure to different types of risks, on one hand, and risk exposure management techniques, on the other hand, are critical issues for companies' evolutions, in either normal or turbulent times.

The purpose of this paper is to provide an understanding of corporate risk management practices in Romanian companies, by investigating the risk management approaches Romanian companies take. The results reported in this paper are backed-up by a survey of non-financial Romanian companies conducted at the end of 2007 within the framework of a research grant financed by the Romanian Government[1]. The survey is the first one that addresses directly the risk management policies of Romanian companies. The paper is structured as follows: Section 2 outlines the survey methodology and describes the respondents, Section 3 discusses the survey results, and Section 4 concludes.

[1] "Assessing risk management strategies in the case of Romanian companies. Recommendations for competitiveness increase policies in the perspective of the post-accession period to the European Union", CEEX Program, 2006–2008

2. Survey methodology and respondents description

The survey was conducted in October 2007 by the means of a questionnaire that included 17 questions that addressed the issue of companies' perceptions regarding the risks they are exposed to, from a static and a dynamic perspective, on one hand, and the approaches towards risk management and the techniques employed by Romanian companies in order to mitigate the risks they consider to be exposed to, on the other hand. Since the size of the questionnaire is significant, an interpretation of its overall results is impossible, but we selected a number of five questions that are able to provide a good understanding of the overall results in terms of Romanian companies' approaches to risk management. These questions, along with the responses, are presented in the next section of the paper.

Starting from the number of active Romanian companies in various industries, four main economic sectors have been chosen to participate in the survey, as follows: (1) Manufacturing industries; (2) Construction industries; (3) Trade industries; (4) Transportation, warehousing and communication industries. The 2006 Romanian Statistical Yearbook represented the source of information regarding these companies – *Table 1* presents the turnover of companies from these four sectors and the number of companies from each sector, as well as the industry concentration in terms of turnover and number of employees. The manufacturing industries show a high degree of concentration, with only five companies generating almost half of the industry turnover (47.25%) and 20 companies generating 70% of the turnover. The same concentration is present for the transportation, warehousing and communication industries, while the other two industries display a lower degree of concentration, as the first 20 companies do not generate more than 20% of the turnover. Given the total number of 318,728 companies, the sample that reflects a 5% representativeness level includes 381 companies. In order to avoid a high non-response rate, the questionnaire was sent to 560 companies, selected with the support of the National Commission for Forecasting.

The number of companies that responded to the questionnaire is presented in *Table 2*. The overall response rate (35.71%) is encouraging for such an endeavor in an emerging market, where companies are typically more reluctant in providing information about their activities, and leads to a good understanding of risk management practices in Romania in the non-financial sector.

Table 2. Number of survey respondents

Sector and industry	**Number of companies that received the questionnaire**	**Number of respondents**	**Response rate** (%)
Manufacturing, of which:	264	103	39.02
– Extracting industries	9	7	77.78
– Manufacturing industries	253	94	37.15
– Energy and utilities	2	2	100.00
Construction	114	39	34.21
Trade	107	32	29.91
Transportation, warehousing and communications	75	26	34.67
Total	*560*	*200*	*35.71*

Albeit addressed to financial and general managers of the Romanian companies, the range of respondents in terms of their position in the company is rather high, as illustrated in *Figure 1*. Sill, around half of respondents (51.5%) hold a managerial position in the company, either at a departmental level or in top management. A high percentage of respondents is represented by accountants or chief accountants (9.50%) and by representatives of the financial/accounting/economic department. Only two respondents hold a position that is somehow related to risk management: one respondent is an evaluator of the company risk level and another is responsible for the risk level. No respondent comes from the risk management department, which is a solid indication, in our opinion, of a low profile of risk management activities at the level of Romanian companies.

The vast majority of companies have a medium to high turnover (87.26% of the respondents), while in terms of employees 45.41% of respondents dispose of 500 to 1,000 employees. In terms of capital used, 74.04% of the respondents benefit from a capital above 1,000,000 RON (approximately 270,000 EUR). Given this structure of respondents, which indicates that they are mostly important companies in these sectors, we believe that an interpretation of results as applied to the entire Romanian economy is appropriate. In terms of their capital origin, most companies are totally or partially privately hold (91.81% of respondents), while the origin of capital is mostly Romanian (61.31% are hold by Romanian shareholders). In terms of beginning year of activity, 31 companies (15.82%) started operations before 1990, 126 companies

Table 1. Romanian companies turnover and number of employees

Sector according to CAEN	**Turnover** (2005)		**Number of companies** (2005)	**Companies' cumulative weight in total sector turnover (%)**		**Companies' cumulative weight in total sector number of employees (%)**	
	Mil. RON	Mil. EUR		First 5	First 20	First 5	First 20
Manufacturing	17,702.5	4,890.2	59,060	47.25	70.00	45.61	65.95
Construction	7,919.4	2,187.7	30,372	8.10	12.98	8.40	13.14
Trade	7,336.7	2,026.7	200,380	11.85	18.64	5.04	8.75
Transportation, warehousing, communication	5,208.3	1,438.8	28,916	43.21	60.47	55.48	69.60
Total	38,166.9	10,543.3	318,728	–	–	–	–

Source: 2006 Romanian Statistical Yearbook, National Institute of Statistics

(64.29%) began their activity between 1991 and 2000, only 39 companies (19.90%) being quite young, with activity starting after 2000.

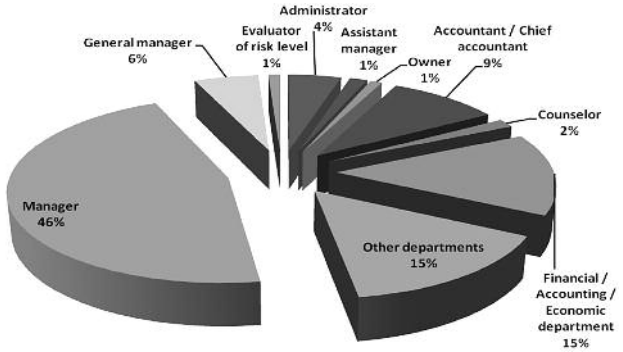

Figure 1. Structure of respondents according to their position in the company

3. Survey results and discussion

Three questions from the questionnaire represent the source of information concerning the approach Romanian companies take towards risk management policy and activity. The first of them asked respondents to assess the way the company manages various types of risks indicated in the questionnaire, while the other two look at the overall risk management policy of the company and the nature of the risk management system employed by companies. We address first the management of specific types of risks and then discuss our findings regarding the overall risk management policy.

The types of risks that we structured our question around are hazard, operational, financial and strategic risks. Each risk category addresses a particular area of sources of concern for business operations, as follows: *hazard risks* refer to risks typically associated to natural disasters, accidental destruction of company's assets or even to business closing; *operational risks* include the risks related to the company's dependency on processes, employees and products; *financial risks* take into account fluctuations in macroeconomic variables such as exchange rates and interest rates, volatility of commodity prices and the default on payments from customers; *strategic risks* may negatively affect business growth and lead to major difficulties in attaining the business objectives due to the organization's inability to adjust to a dynamic and volatile competitive

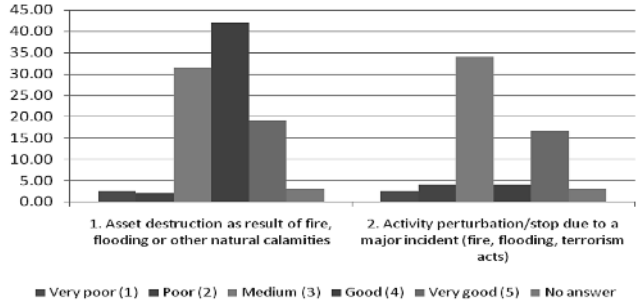

Figure 2. Management of hazard risks – percentage of responses

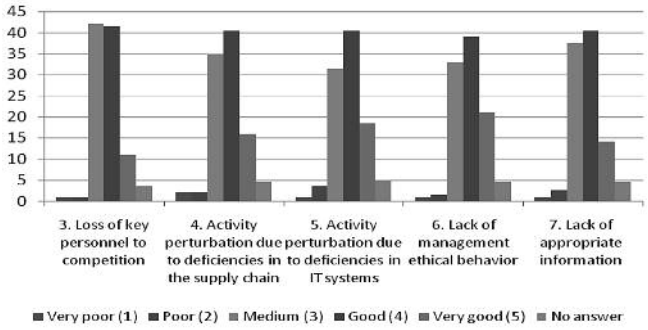

Figure 3. Management of operational risks – percentage of responses

environment. We asked the respondents to assess company's performance in managing these types of risk on a scale from 5 – Very high to 1 – Very low. *Figures 2 to 5* present the distribution of responses.

In terms of companies' ability to manage the risks they are exposed to, a number of issues are noteworthy, as they emerge from our survey. First, regardless of the type of risk, the overall perception is that Romanian companies manage them in a rather well manner – for all 19 categories of risks, the highest percentages of responses indicate a medium or good performance in risk management. Second, a significant proportion of answers indicate a very good management of risks, particularly for hazard and operational risks.

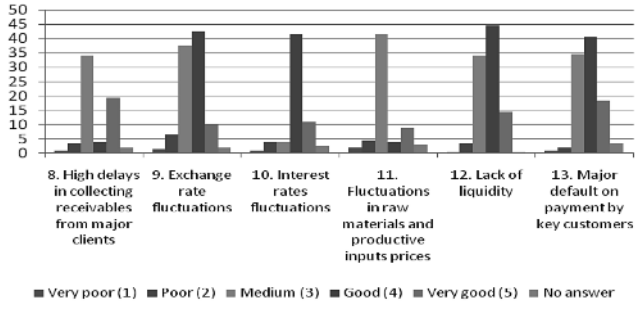

Figure 4. Management of financial risks – percentage of responses

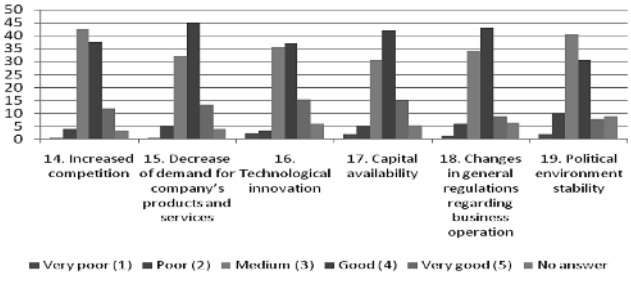

Figure 5. Management of strategic risks – percentage of responses

Figure 6 offers another perspective on the Romanian companies' perception regarding their performance, based on an average score for each type of risk, as a weighted average of the scores from 1 to 5 attributed to companies' performance in the field, the weights being given by the number of responses for each particular score. The general opinion is that Romanian companies manage their risks rather well, which indicates quite an optimistic view on their ability to mitigate risks. At the same time, the risks that are

best managed are the "lack of management ethical behavior" (average score 3.81), followed by "activity perturbation due to deficiencies in IT systems" (average score 3.76) and "no payments for the contracted financial obligations" (average score 3.76). Romanian companies seem to manage in a worse manner the "political environment stability" (average score 3.36), "fluctuations in prices of raw materials and productive inputs" (average score 3.51) and "exchange rate fluctuations" (average score 3.54). For what concerns the stability of the political environment the low score is normal, in our view, but the low scores in the other two risks case may be explained by the lack of appropriate financial instruments on the Romanian market that can be used to manage these risks.

Besides the management of particular categories of risk, we were interested in the respondents' opinion regarding the overall management of risk in their company. The respondents could provide more than one answer (see results in *Table 3*). We observe that almost half of answers (49.09%) indicate an efficient management of risks at the level of Romanian companies, only 5.45% of respondents recognizing a deficiency in risk management. In our opinion, this points to a lack of proper understanding of the magnitude of risks that businesses are exposed to, coupled with an incorrect approach to risk management. This conclusion is illustrated by the low number of responses that designate risk management as a key strategic function in the company (17.27%) and as part of the organization culture (10.90%). At the same time, few respondents understand the importance of a performing risk management function as a source of competitive advantage for the company, in an environment that is becoming more and more exposed to competition from European and global companies.

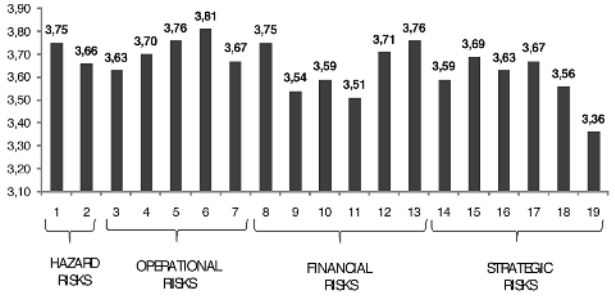

Figure 6. Risk management in Romanian companies – average scores
Note. The numbers from 1 to 19 in the figure correspond to the types of risk in Figures 4 to 7.

Table 3. Risk management performance in Romanian companies

	Overall	As% from total answers
The company manages risks in an efficient manner	108	49.09
Risk management is a key strategic function in the company	38	17.27
Risk management is part of the organizational culture in the company	24	10.90
Risk management is a source of competitive advantage for the company	25	11.36
The company does not manage risks in an efficient manner	12	5.45
No response	13	5.90
Total answers	*220*	

In order to have a wider view over the risk management systems employed by Romanian companies, the respondents were asked to describe this system on five levels, starting from the isolated approach to the Enterprise Risk Management (ERM) approach (see *Table 4*). As expected, Romanian companies mostly manage their risks using the isolated approach (33.49% of respondents) or have no such a system in place (15.09% of respondents). At the same time, it is encouraging to observe that 25% of respondents indicate the integrated approach to risk management, and 14.62% have also adopted the ERM approach, which might suggest the effects of demonstration effects from their regional or global competitors, on one hand, but also the compulsory adoption of such approaches at the level of affiliates of foreign companies operating on the Romanian market.

Table 4. Risk management systems in Romanian companies

	Overall	As% from total answers
(1) – No risk management system	**32**	15.09
(2) – The isolated approach	**71**	33.49
(3) – The aggregated/global approach	**18**	8.49
(4) – The integrated approach	**53**	25.00
(5) – The ERM approach	**31**	14.62
No response	**7**	3.30
Total answers	**212**	100.00

IV. Conclusions

In an environment that is more volatile than ever and shaped by increased competition, risk management may represent a competitive advantage for Romanian companies, allowing them to stabilize their cash flows and to avoid financial distress. Unfortunately, our findings show that managers might not be aware of the magnitude of exposure their companies have to various types of risk – hazard, operational, financial and strategic risks. At the same time, in their view, they are able to manage rather well all these risks, even the ones that have the lowest impact on the business.

There may be identified a number of possible explanations for our findings. First, managers of Romanian companies have little expertise in properly assessing the impact of risks on operations and lack the appropriate understanding of the exposure to various types of risks. Second, the risk management systems they currently employ are rather rudimentary, as risks are managed in an isolated framework, without taking into account links created between risks. Third, the economic growth process that started in Romania after 2004, coupled with the country's accession to the European Union, made Romanian managers rather optimistic

and overconfident about the future of their businesses. Over the long run, and even over a shorter one, given the current financial and economic crisis at the global level, such an attitude may generate possible problems for Romanian companies, as they are vulnerable to threats and rather unable to capitalize on business opportunities.

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Analyse the Financing Structure of Agricultural Enterprises in 2002–2006

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Abstract: The capital structure of agricultural enterprises notable modified since the change in Hungary's economic system. The study discusses the capital structure of agricultural enterprises in Hungary and analyses the most significant indicators, that we can use to describe the financing situation of the firms. My empirical analysis is based on data containing 192 agricultural enterprises between 2002 and 2006. I try to assess the reasons of the changes in the structure of resources of enterprises in order to find the determinants effecting the capital structure. Furthermore, I assess the index numbers illustrating the management of the enterprises.

Key words: capital structure, Hungary, agricultural enterprises, profitability

1. Introduction

The capital structure is the mixture of sources of funds a firm uses, that can be viewed as the permanent financing the enterprise represented primarily by long-term debt, preferred stock, and common equity but excluding all short term credit.

Defining the optimal capital structure is an important decision for any organization. This decision is critical not only because of the need to maximize returns, but also because of the impact such a decision has on an organization's ability to deal with its competitive environment. There are many theories for this theme, but all the same, researchers have not found the optimal capital structure. (*Baker and Wurgler,* 2002)

In Hungary the capital structure of agricultural enterprises changed significantly since 1990, but their decisions about the capital can't fit with neither theoretical appeal totally. The change in Hungary's economic system was in 1989/90, and from this time the capital structure of agricultural enterprises notable modified. These changes affected the ownership and possession conditions and the agrofinancing system. The agricultural enterprises suffered from lack of capital and the level of their capital accumulation was low. These increased the need for external financial resources.

The changes in financial situation concerned the parameters illustrating the management of the enterprises, influenced the competitiveness, profitability, effectiveness, etc. Therefore my goal is to examine the capital structure of agricultural enterprises in Hungary between 2002–2006, and to draw conclusions about the agricultural financing.

2. Material and methods

During my research I elaborate the main national and international literature connecting with well-known economic theories. The formation of capital status and structure of agricultural enterprises is evaluated between 2002 and 2006. 192 examined economic organisations provided the data for the survey. Data concerning the agro-industry is based on the publications of the Agro-Industrial Research Institute (AKI). By using the database provided by the Tax and Financial Auditing Office I examine the changes of capital structure in the agricultural sector, and their effects on the enterprises' financial situation.

By primary data survey I present the capital structure of Hungary's agricultural enterprises, their main parameters that characterized the economy. I deal with only joint enterprises operating in the sector. During the research I determine with time-series the values of balance sheet and earnings reports for every company and the averages, then I calculate the most important financial ratios in order to draw conclusions about the capital structure.

3. Results and dicsussions

3.1 Literature review

Defining the optimal capital structure have for a long time been a focus of attention in many academic and financial institutions that probe into this area. One of the most significant issues in corporate finance is responding "How do firms choose their capital structure?". This is comprehensible as there is a lot of money to be made advising firms on how to improve their capital structure.

The mix of the different securities is known as its capital structure, so it can be defined as the combination of debt and equity used to finance a firm. There are many methods for the firm to raise its required funds, the most basic instruments are stocks or bonds. The target capital structure is the ideal mix of debt, preferred stock and common equity with which the firm plans to finance its investments. (*Pataki,* 2003)

Every enterprises has liabilities that must be dealt with, regardless of the enterprise's incomes or revenue. These liabilities raise the fluctuation of revenue, the instability of revenues. The risk-raising effect of constant liabilities is called leverage. Two types of leverage can be distinguished, the leverage effect of constant expenses related to using assets is called working leverage or operating leverage (DOL). The risk-raising effect of constant expenses related to liabilities is called financial leverage (DFL). Using both types of leverage by an enterprise is called combined leverage (DCL). Firms tend to avoid the very high gearing levels, because of the financing distress risk. This could be induced by the requirement to pay interest regardless of the cash flow of the business. (*Harris and Raviv,* 1991)

There are many theories of optimal capital structure. The first breakthrough came with Modigliani and Miller's theorem, which specifies conditions under which various corporate financing decisions are irrelevant. MM Proposition I. concerns about the irrelevancy of the value to capital structure.

MM Proposition II. implies that, the higher the debt-equity ratio, the higher the expected turn on equity. (*Modigliani-Miller,* 1958)

Later Modigliani and Miller showed that when corporate taxes are included, the value of the levered firm is equal to the value of an unlevered firm plus the present value of the tax shields associated by debt. This third step in capital structure theory was first suggested by Baxter and later modified by others. In this way, bankcruptcy costs are introduced. Now the value of the firm in bankruptcy is reduced by the fact that payments must be made to third parties other than bond- or shareholders.

The next step in capital structure theory was the introduction of personal taxes in 1977. Miller showed that, a "nothing matters" situation arises when you combine corporate and personal taxes. Most recently, the assumption of comple contracts is relaxed. Instead, contracts are assumed to be oncomplete, i.e. they don't specify precise provisions for every conceivable future event. And apart from the theoretical literature hundreds of papers try to empirically test all the different capital structure theories.

3.2 Analysing the capital structure by hungarian agricultural enterprises

In Hungary the capital structure of agricultural enterprises changed significantly since 1990. For 19 years since the change in Hungary's economic system, the capital structure of agricultural enterprises notable modified. *(1.table)* The self-financing ability of these firms became worse and worse, which enhanced the enterprises's need for foreign capital, and it stressed the long-term liabilities.

The reason of this modification was the new effect of credit construction to substitute for capital. The next change was the joining the European Union, which brought fundamental changes regarding agricultural subsidies meaning from 2004 subsidies are granted according to the prosterior financing policy. This has resulted liquidity problems in many cases.

Table 1. Accorded credit to the non-financing enterprises in Hungary

Milliard HUF

Year	Total loans outstanding in Hungary	Total bank credit in Hungary	Agriculture, forestry, fishery
1995	1062,9	938,2	69,0
1996	1260,0	1193,8	96,8
1997	1773,2	1706,1	151,9
1998	2073,6	1969,1	192,1
1999	2443,4	2306,3	211,1
2000	3183,2	3027,6	237,2
2001	3486,6	3389,8	226,0
2002	3693,3	3571,8	239,7
2003	4415,7	4278,2	269,2
2004	5004,0	4829,4	329,8
2005	5704,2	5499,9	358,8
2006	6494,2	6255,0	328,7
2007	7283,1	7002,4	338,8
2008	8076,8	7747,0	330,2

Source: Private construction made by National Bank of Hungary [4]

2. table: Distribution of the amount of credit by the agro-industry

Milliard HUF

Year	Short term credit			Long term credit	
	Credit in HUF	*Credit in foreign currency*	*Charge account in HUF*	*Credit in HUF*	*Credit in foreign currency*
2002	84,7	5,1	39,4	106,8	3,7
2003	58,3	15,1	12,7	177,9	5,2
2004	43,9	24,4	12,4	238,1	11,0
2005	63,5	36,1	13,1	227,1	19,0
2006	69,9	23,0	16,3	194,3	25,2

Source: Private construction made by National Bank of Hungary [4]

The change in the structure of liabilities can only be possible by distributing subsidied medium and long-term liabilities. (2. table) Inside the short term liabilities the role of „compulsory creditors" (state, suppliers) is still significant. (*Pataki,* 2003)

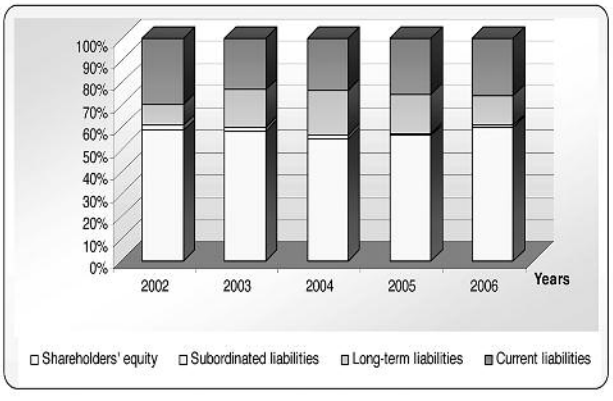

Figure 1. Distribution of the total sources by the examined agricultural enterprises

Source: Agricultural Economics Research Institute, 2007

In my research the examined enterprises switched to the use of a conservative financing strategy, which raise the expenses of financing. The own capital of the examined enterprises compared to total capital from 2002 – except of year 2003/2004 – increased, therefore the sector's need for external sources decreased. The distribution of own and debt-capital was all year above 50 percent (*Figure 1*.).

Figure 2. illustrate the distribution of own capital by the examined enterprises. In the period of 2002–2006 the mean value of the shareholder's eguity compared to the year 2002 increased by 30 percent, reach 263 mrd HUF. It can be seen from the figure that in the own capital the subscribed capital, the capital reserve and the accumulated profit reserve play the main role with a whole rate of 80 percent.

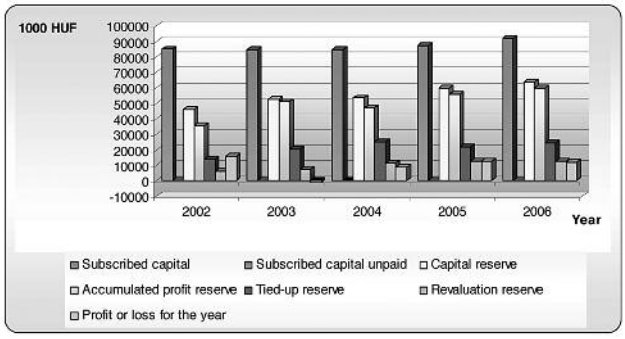

Figure 2. Distribution of own capital by the examined agricultural enterprises
Source: Agricultural Economics Research Institute, 2007

The proportion of long-term credits within the total credit from 2003 is nearly 40 percent. I concluded that in the case of enterprises with a more diverse production structure the ratio of foreign capital was higher than the average and within it the ratio of long term liabilities also became higher, expect of the year of 2006 (*Figure 3*.).

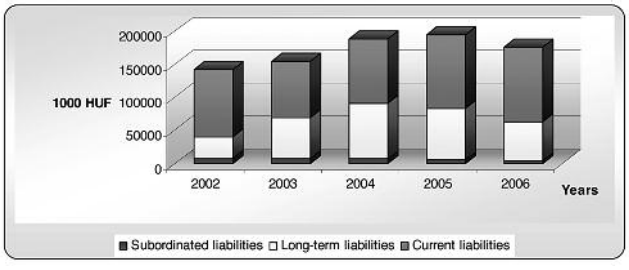

Figure 3. Distribution of liabilities by the examined agricultural enterprises
Source: Agricultural Economics Research Institute, 2007

The favourable change in the structure of short and long term debts went on well. Significant change was in 2003, when the value of long term debts per one hectare has increased by more than 40 percent. In the case of small size farms vine, fruit and vegetable growing as well as poultry farming is the most common.

In this the followings have played a major role:

- Need for debt resheduling and debt compounding in 2002 due to EU expetations.
- The amount of credits from banks for the compensation of losses and credits from holders has expanded by 18% percent reaching an average 21,900 HUF per hectare.
- Due to the drought farms were allowed to take out middle term credits with preferential interest conditions raising the level of long term liablities by about 51 percent to 61,000 HUF per hectare.

These changes in the structure of liabilities have modified the two-third one-third of short and long term liabilities of former years almost to half-half. The amount of the short term liabilities increased by 10 percent in the 5 years, in which the accounts payable play the main role *(Figure 4.)*. The accounts payable increased by 50 percent from the year 2002, represent 18–20 percent from the total liabilities.

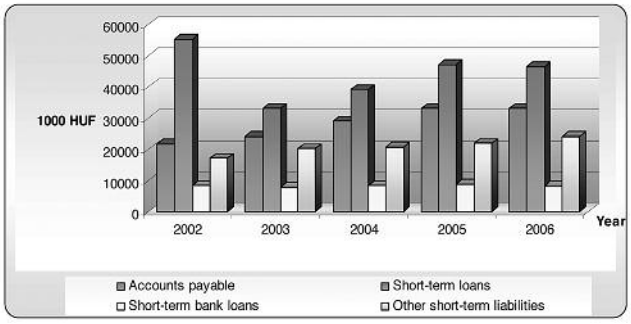

Figure 4. Distribution of short term credit by the examined agricultural enterprises
Source: Agricultural Economics Research Institute, 2007

3.3. The profitability of the examined agriculture enterprises

The proceeds of assets used in agriculture continously lag behind the expenses of foreign capital. So, the profitability of private, is low and lags behind the profitability of the total capital. The role of amortisation became greater within cash flow and the reason for this is the decline of profit. As a reasult of the insufficient profit the level of investment activity primarily depends on state subsidies.

The results can be examined in connection with the equity, but I state that the dispersion of individual results is very significant also in economic organisations. The ratio of profitable and unprofitable farms differ according to legal form of the business: the ratio of profitable farms is the highest among the joint stock companies while the ratio of unprofitable farms is among deposit companies. In the observed period the profitability of the examined enterprises in Hungary was the lowest in 2003. The difference between the profit ratios can be observed by the sector-specific enterprises.

Due to the unfavourable weather and some other negative market tendencies (downside of the pig cycle the market prices have decreased etc.) farms have suffered a loss in 2003. In this time the profitability of total capital was 2,96 percent and the profitability of own capital was 0,14 percent. I illustrate this by the Graph 5.

The consequent of the bad weather in 2003 reflected in the income of the enterprises. In this time the firms suffer losses, amount of – 904 000 HUF *(Figure 6.)*.

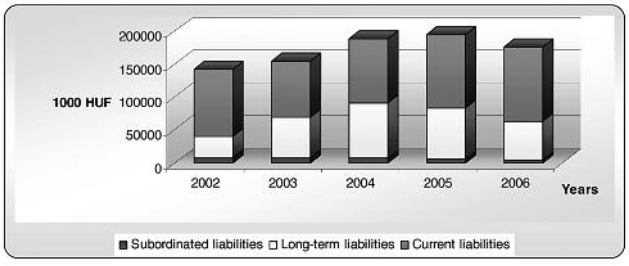

Figure 5. The profitability of total and own capital between 2002–2006
Source: Own calculatons by the database of AKI

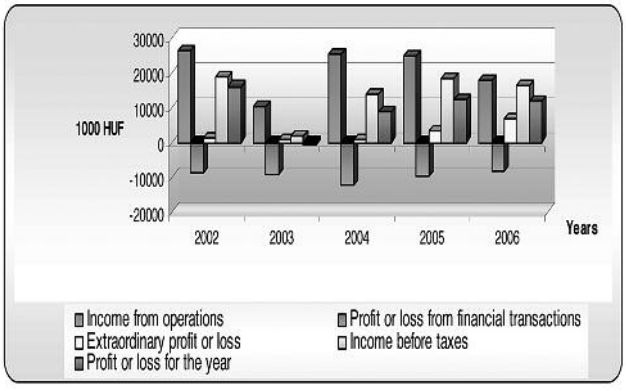

Figure 6. Income of the examined enterprises between 2002–2006
Source: Own calculatons by the database of AKI

4. Conclusions

Considering the theme of optimal capital structure is aktually. The decisions of it is critical not only because of the need to maximize returns, but also because of the impact such a decision has on an organization's ability to deal with its competitive environment. There are many theories for this theme, but researchers have not found yet the optimal capital structure.

In this survey I aimed to analyse the capital structure of the agricultural enterprises in Hungary between 2002-2006. I can state that the change of the capital structure of agricultural enterprises infuenced by the fact of change in Hungary's economic system. The rate of foreign capital reached the 46 percent to 2004. The amount of foreign capital was increased, due to the investment activity. The indexes of profitability show the lowest value in 2003, for example the profitability of own capital was 0,14 percent. Above all I have to draw attention to the fact that bigger farm size and better supply of assets in general goes hand in hand with better results. On top of this it is likely that farmers' management skills make a difference when it comes to the effeciency and productivity of farming.

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Sheep production in Hungary – is it a sustainable sector?

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Abstract: The question of sustainability of agricultural **production** especially animal production and events leading to its development can be dated back to the second part of the last century. Sustainability is a priority subject matter as it is a core element in our existence and in the survival of the forthcoming generations. The notion of sustainability comprises three aspects: ecological, social and political and economic target systems, which by now have been supplemented with cultural and regional elements including the protection of environment, local traditions, scale of values, cultural and historical heritage. The principles of sustainable development also include the improvement of human and animal health and the maintenance of vital rural communities. The priority notion of sustainability of agricultural production refers also to animal husbandry and especially sheep production. Sheep have contributed substantially to the grassland-based agricultural production in Hungary for centuries. Sheep sector is important in rural areas as the tool of sustainability of animal production. It should also be highlighted that contrary to numerous efforts, the globally difficult process of sustainable development poses almost unsolvable problems for implementers even on local and regional levels. This paper will review briefly the levels of sustainability in the Hungarian animal production with a special regard to sheep production and their content and then points out the most significant economic issues by the application of "SWOT" – analysis, "problem tree' and "structure of objectives" methods, on the grounds of the received findings.

Key words: *sheep production, sustainability, problem tree, swot*

Introduction

Sustainable agriculture and livestock production covers three main goals novadays: environmental, (ecological) health, economic profitability, and social and political equity. Local levels have failed to receive that much attention, although certain tasks such as sustainable agriculture or regions are much more likely to be solved on local (national) levels. *Csete L.–Láng I.* (2005) asserted that the sustainable development of agro-economy can results within the system of correlations and interactions among content, tasks and levels. Geographically scattered different size agricultural producers play a significant role by the introduction of sustainable farming systems and the operation of sustainable enterprises; however, they provide new opportunities for the exploitation of regional and national levels as well. Utilizing livestock in agriculture often improves the sustainability of the system of an environmental (ecological), economic, and social viewpoint. Animal production can be economically sustainable because of its role in trade, market and feed supply disruptions, diversifies producers' activity, decreases controls risk at farm and national level, and enhances farm maintenance, increases job possibilities for the rural population. But in a globalised and also highly regulated economy is a more complex problem. Sustainability of course next to economic aspect depends on the two other aspects and especially the attitude of people and politics. The evaluation of sustainability also basing on the level of examination: local, regional or national.

Material and method

In 2007 the Department of Agricultural Economics and Rural Development, Centre of Agricultural Sciences and Engineering, University of Debrecen organized a series of venues entitled "Generation of projects based on sector-specific innovation in various sectors of animal production". The program was supported by NKTH (National Office for Research ans Technology) and ÉARFÜ (North-Great Plain Regional Development Agency) in the framework of the Gábor Baross tender dossier. The participants of the events were requested to expand their ideas concerning the conference lectures; moreover, their proposals in relation to the problems of the sector. In all the issues related to the industry (improvement, variety, foraging, technology, processing, trade, animal health, sectoral control, watchdogs, economics), well-renowned experts were invited to give lectures and to introduce discussions. The event was interactive, as after certain vertical blocks of lectures participants could give their comments and

ask questions. All the participants of the conference were asked to prepare a written memorandum on the advantages, weaknesses, potentials and threats of the sector and send them for the organizers. Based on this material I and my colleagues prepared the SWOT analysis and the problem tree of the sectors and also the structure of objectives leading to the solution of the problems. We are introducing the result regarding to sheep sector.

We did not revise what was mentioned and written down there (we did not supplement them and did not take away anything from them). In our opinion, we were not allowed to do so, as all the sectoral players have a good understanding of their own special areas. We merely strived to systematize what was said and written down at the conference. In the subsequent part of the present study I present and evaluate the focal economic issues of sustainable animal production especially sheep production on the basis of this work. As the first step of the relation of cause and effect we considered weaknesses and threats. On the strength of these findings we prepared a so-called problem tree showing elements in logical relation with each other. To eliminate the problems, we outlined a so-called system of objectives.

Results and Discussion

Weaknesses and threats, the problem tree: The weaknesses and threats of sheep sector were grouped in logical groups. Human factors, production, consumption, processing, trade, capital supply, animal health and factors affecting the environment are included in separate factors. Our listings follow the alphabetical order and not ranks.

Weaknesses: If we consider sectoral problems, it can be seen that they have a lot of elements in common and several similar weaknesses. In sheep sector where forages are consumed, the lack of sectoral strategies was highlighted. "Hunger" for cutting-edge knowledge, low capacities for pushing their interests and low social prestige, the lack of experts and producers joining their forces were mentioned. In the productive sector high forage prices and cost level were mentioned. Naturally, in accordance with the characteristics of technical sectors, specialities also emerged: the size of plants, indicators of progeny, slurry, forage supply etc. In the problem area of consumption and processing, non-competitive processing structures, product improvement and the lack of innovation, inflexibility were shed light on. In the sheep sector, low national consumption, the lack of processing capacities, the low level of processing were mentioned. In the category of capital supply sheep sector opinion were: lack capital! Even the equity ratio needed to make use of supports and for pre-financing is not available. A characteristic problem of capital for fodder users is that in ownership conditions the forage area, livestock and stables are separated from each other. In landscape-protection areas, producers of sheep pointed out existing anomalies.

Threats: In the analysis of threats it seems to be apparent that the number of human factors has reduced as compared to threats. If the existing system prevails for long, threats will include the contradiction between ageing labour force and the simultaneous problem of the ceasing layer of small-scale producers, which can further impair the prestige of animal production. The danger that the forthcoming political leaders may outweigh agricultural experts has also emerged. The spreading of bureaucracy and its unnecessary expansion can set back producers' and processors' vigour. In the production sector, in the case of forage users, the characteristic danger of fodder price rise can already be prognosticated in relation to bio ethanol and bio diesel production. In parallel, income losses due to the prospective increase of energy prices and labour costs can be pointed out everywhere. In the area of consumption and processing a source of danger threatening could not be detected. Several sources of threats have loomed in the commercial sector. The apparent threat endangering the sudden advance of international competitors, the survival of weak market bargaining power, the enhancement of asymmetric successes of interests dictated by trade and the survival of the black market all impair the position of the sector and enhance the fear that Hungary may become a net importer in several sectors. As regards animal health and environment, all sectors of animal production face several threats. These include diseases, epidemics, inland water and flood dangers, environmental restrictions and extra expenses in relation to climate changes.

The problem tree: If we build the categories of weaknesses and threats on to each other in a logical process, we receive a so-called sectoral problem tree. The complexity of the figures shows that several causes lead to the before mentioned serious causal relations, namely to competitive weaknesses, to increased national and international defencelessness, to social-societal, economic, environmental, sectoral and market problems. The logically connected elements of the problem tree show the relations of cause and effect from bottom to top.

The problem tree of sheep production: The problem tree of sheep farming shows that the resultant of problems is focused in a single great block of effects, which is entitled "a sector reacting to economic, social and environmental changes and challenges with difficulty". This indicates that there is not merely one solution for solving the relation of causes and effects and sometimes only various approaches can yield results.[1] *(Figure 1).* The lower part of the problem tree lists the problems, which is the same as in the previous ones. If we recall the definition of sustainability, actually we can see that the sector is not stable from this aspect either. This is a relation of cause and effect which further weakens the competitiveness of Hungarian sheep farming, its added value and innovation are of low level, and thus it is not sustainable in the long run. For all these reasons the region cannot retain its population, enterprises are liquidated, landscape gets transformed; production and commerce become unviable. Social and societal problems are embodied

[1] This problem tree is published by Nábrádi András – Jávor András – Madai Hajnalka (2007)

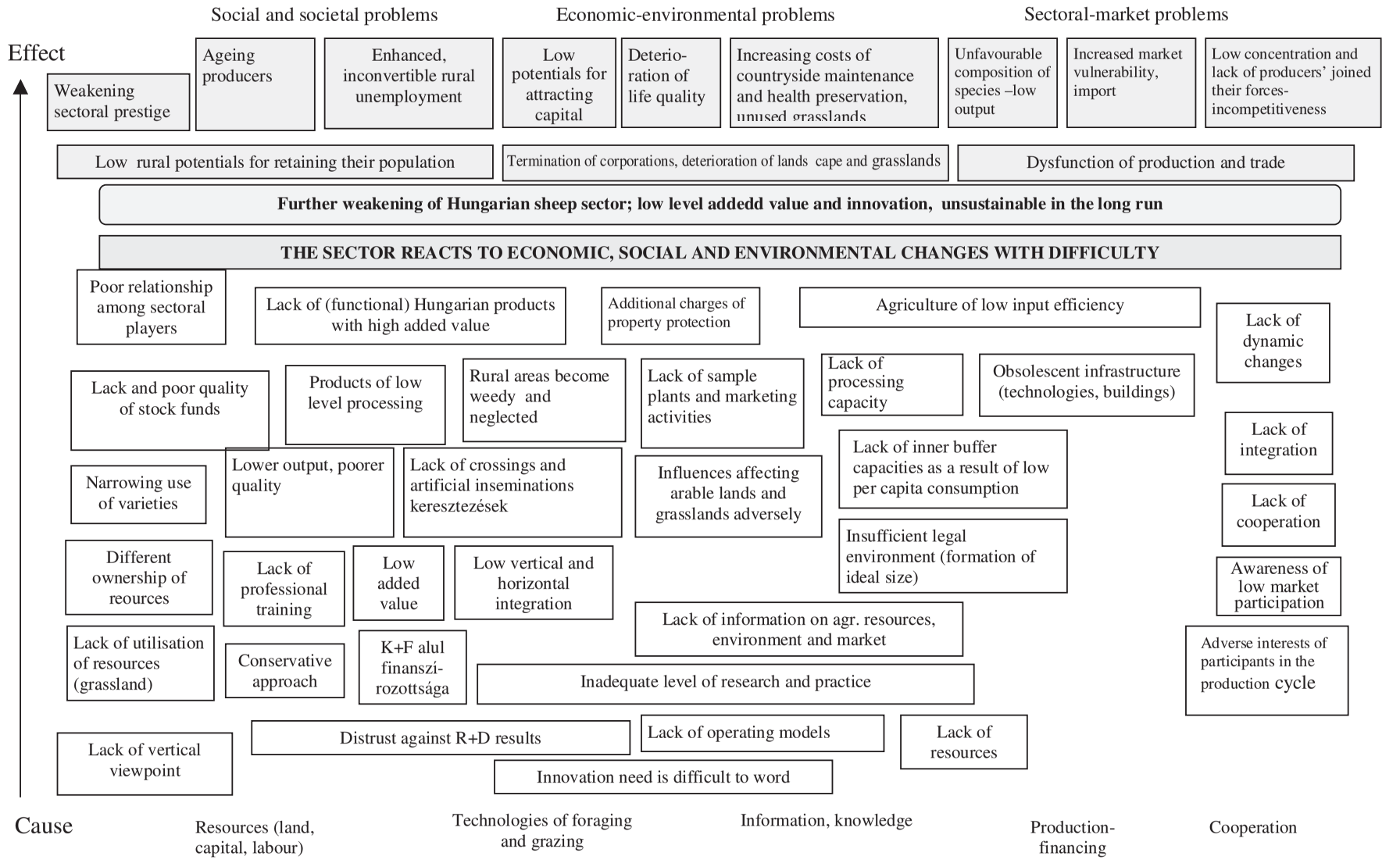

Figure 2. *Problem tree of Sheep sector*

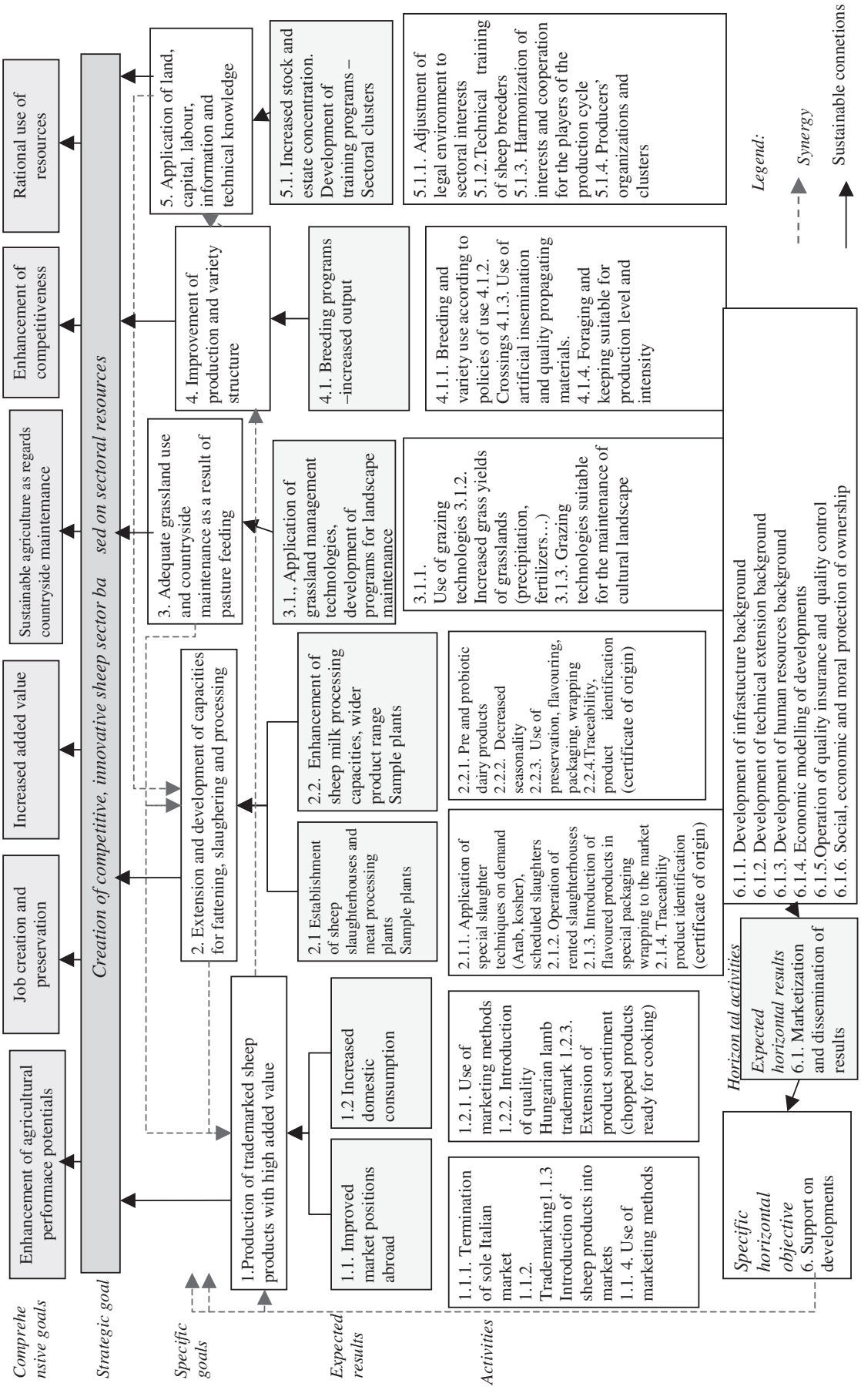

Figure 2. *Objectives' tree of sheep sector*

in the fact that the sector loses its prestige, the production layer is ageing; however, provincial unemployment, which cannot be converted into other areas, soars. Economic-environmental problems are due to the fact that the capital attraction potentials of sectors are low and as a result of unexploited and neglected grasslands the costs of landscape maintenance and health care increase. A direct consequence of the liquidation of enterprises is the deterioration of the quality of life. Sectoral-market problems are manifested in the fact that due to unfavourable variety structure, yields are low, defencelessness on markets can further increase and the lack of import, low concentration and producers' cooperation can render the sector non-competitive from the outset. To our understanding, the presented example represent that the logical system of relations in the problem tree built on the SWOT analysis can be well applied for the investigation of sustainability and for the exploration of cause and effect relations.

Structure of objectives, hierarchy of targets: In animal and sheep production, one of the most outstanding and significant areas of agriculture, our objective is to increase productivity, job creation, job preservation and added value, to improve competitiveness and simultaneously to rationalize the use of resources. The strategic objectives of the sector can be summarized in one sentence, as follows: to achieve competitive production in Hungary again. To realize this, specific objectives should be worked out, under which we can subordinate concrete, expected results, which can be achieved by the simultaneous performance of activities. *Figures 2.* brings together the comprehensive sectoral objectives, expected results and the factors describing realizable activities in the so-called structure of objectives. The layers build on to each other in the system of the problem tree and we modified it to disclose the relations of cause and effect so that the factors causing disadvantageous situations can be terminated. As it can be seen, the structure of objectives displays 5 well definable specific features (from top to bottom): comprehensive objectives, strategic objectives, specific objectives, expected results and activities. Our comprehensive objective is the one directly above the concrete target, while our results are objectives linked to the concrete target from the bottom, to the realization of which we rendered concrete activities. From among these we highlight some economically significant issues.

Evaluation of Sheep production in point of sustainable view: In the system of the structure and hierarchy of objectives it must be stressed that certain elements of potentials and their realization separately can improve the situation of a producer or trader, but it should be noted that in the case of the whole sector of sheep farming, merely complex measures can lead to sound effects. There is another extremely important element, which is true not only of sheep farming but of the whole sector of animal production as well. Responsibility on the policies for the development of the strategic, operational and support system of the sector cannot be fitted into the system of the hierarchy of objectives easily. On the table of the structure of objectives in sheep farming a special element of activities occurs, which is collectively called a horizontal activity (then result, specific target built on to it). The word "horizontal" denotes that it is related to all activities. If we have a look at this figure, it shows background developments for infrastructure, extension and human resources necessary to realize these activities. If we survey the first system of objectives, the following logical series can be set up*: By the application of marketing methods, by the introduction of sheep products into markets, by trademarking, by the termination of the single Italian market, our foreign market position can improve, which, besides the simultaneous increase of domestic consumption, incites the production of trademarked sheep products with high added value and thus promotes the creation of competitive and innovative sheep farming.*

Sheep, milk, wool and products made from them, the production of breeding animals, the production and marketing of reproductive materials can be focal points among the objectives of the cluster. In the interest of the future, tenacious labour is coming now, as the successful solution of problem requires adequate political or social background and sectoral climate. The organization of the sheep sector cluster or clusters has been started by the University of Debrecen.

Acknowledgement

Our hypothesis, which claims that under stationary conditions sustainable animal production with a lot of factors and animal breeding enterprises cannot be maintained, has been duly justified. The reasons behind the negative tendencies are manifold and various. They can only be disclosed by the inclusion of the whole industry of sectoral players. We cannot state that the problem of sustainable animal and sheep production has already been solved now. We have just taken the first steps to achieve this noble purpose. What is clear and inevitable, follows like this:

1. The precise and expedient clarification of all the problem spheres relating the sectors of animal production is reasonable by the inclusion of all the participants of the product cycle in similar structures.
2. The starting point of analysis is to disclose the relations of cause and effect.
3. By setting up the structure and hierarchy of objectives, activity tasks can be identified.
4. All these tasks should be coordinated according to a time schedule and included in a complex system, and after this, the strategic plan in sectoral breakdowns and then for the whole sector shall be developed. If only certain activities are pointed out and realized, this can pose a lot of threats.
5. The triple pillars of sustainability, the fulfilment of environmental, social and economic expectations can only be realized by laying down the strategy.

Although our production and consumption are insignificant globally, the export-import activities of our animal production are measurable in world trade, even if only slightly. On regional level its impacts are of medium power, on national and local level its impacts are distinctly

strong. Its relation to the countryside, natural resources and natural, social, economic correlations and interactions is weak on regional, medium and national levels and strong on local level. To my thinking, the greatest problem in the relation of sustainability and animal production are posed by the way people think and live. As I have mentioned, my judgement is subjective. From among the major content elements of sustainability, purposeful ways of thinking, behaviour and lifestyles matching them are decisive.

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The role of the time factor in the manager functions

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Abstract: The role of the time factor in management is increasing. Change directs attention to the time factor from the point of view of the organisation, and management does the same from that of the person. I examined the time management practice of managers of organisations related to agribusiness, and the reaction time characterising the adaption ability of the organisations through a questionnaire survey. I analysed the collected data with scientifically established statistical methods. During studying resources, managing tasks, change, reaction time and effect I explored the features of time as resource, the significance of the time factor, the improvability of time efficiency in the different managing functions, the factors supporting and hindering the quick reaction of organisations, and what rearrangements can be seen in management work nowadays.

Key words: time factor, resource, managers' time management, and reaction time.

1. Introduction

Managers are overburdened and exhausted due to their tight schedule of work. They suffer from a constant shortage of time, which may lead them to anxiety, deteriorating performance and manager diseases. This is due to the fact that in the middle of the 20th century people realised that the improvement of technics and technology will soon reach its limits, therefore increasing productivity and efficiency has to be approached from the human side. Improving company efficiency has become a demand towards managers, thus, in order to be successful; they overtake tasks beyond their abilities. At the same time, they search for ways of improving personal efficiency, as well. Related to this, the time paradox has come into the limelight, which is the fact that although the time available to us is limited, the possibilities of its utilisation are unlimited. This means that, on the one hand, efficient time management, and personal and company efficiency might be in relation, and on the other hand, managers can get rid of their anxiety caused by shortage of time, and their tiredness caused by their tight work schedule. Thus, efficient managers have to try to manage their own time and the time of the company well. This way they can discover hidden reserves and gain surplus resources, which may improve competitiveness and efficiency.

Nowadays companies try to maintain and increase their efficiency among environmental conditions which are constantly changing, often unstable and are difficult to predict. In the last few decades changes have dominated the operation of organisations. Earlier, boom periods could be predicted relatively well, whereas today dynamic improvement and uncertainty are more common. The pace of technological improvement and that of the process of product development has increased incredibly, while the life cycle of products and services has decreased. This means there are not only continuous changes in the environment of organisations but the pace of the changes themselves has also risen.

Organisations are forced to adapt to changes by this turbulent and unstable environment. The question how fast the company is able to adjust to its environment does not only determine its competitiveness but often its existence, too. Therefore, the reaction time of organisations – that is the time of adjustment to changes – may become a key factor.

These phenomena drew my attention to studying the personal time of managers and the reaction time of organisations. I chose organisations belonging to agriculture and related supplying, food processing and food trade branches as the target group of my study. One reason for this is that, due to agricultural processes being dependent on nature and production being seasonal, and due to the fact that the different processes are based on each other, the time factor has an outstanding significance in this branch. The other reason is that there have been especially big transformations in agriculture since the change in the political system. The most significant one was the transformation in the owners' structure related to privatisation and compensation, which brought along a decrease of company size, a change of company structure, product structure and volume, and a fall in the number of employees. All these highlight the significance of reaction time related to the adjustment ability of organisations.

My research topic is integrated in the framework of the research program 'A Functional Study of Company Management in Agriculture' (*Berde* et al., 2009), elaborated in the Management and Work Science Department of the Agricultural Economy and Rural Development Faculty of the

Centre of Agricultural and Technical Sciences, Debrecen University.

My main objectives were to create a complex picture of time according to literature, a theoretical approach and my own research; to explore the function of time in management work; and to prove that time as a resource can serve to improve the effectiveness of the management and the company.

2. Material and method

2. 1. The precedents of the research

My research area was identifying the role of the time factor in management work, and exploring how time as a resource can serve to improve the effectiveness of the management and the company. This topic is integrated in the research program (*Berde* et al., 2009) elaborated in the Management and Work Science Department of the Agricultural Economy and Rural Development Faculty of the Centre of Agricultural and Technical Sciences, Debrecen University.

The aim of the research program, as its name shows, is 'A Functional Study of Company Management in Agriculture'. The structure of the program is characterised by a modular construction. This means that the research covers three main areas related to one another, each of which consists of sub-topics. With this structure it is possible to do more thorough and detailed research, and the results can continuously be integrated in the study of the main areas, as well. Thus, the topics and sub-topics of the research program can constantly be restricted both horizontally and vertically. Due to the modular structure, establishments can be made according to chronological order, and the observations of the same topic made in different periods of time can ensure chronological continuity, too. This study method can be regarded as functional because the main objectives of the research are to determine the tasks of the manager and to analyse the factors influencing these tasks. Through the questionnaires applied during the collection of data, the basis of the establishments was constituted by the opinion, experience, value judgement and preferences of the interviewed managers. Due to this fact, the research method is not only functional but also empirical. My research topic is related to the main area of process management and, within that, to the sub-topic of time management.

My study consisted of interviews in the form of questionnaires, and company data collection.

I had constructed the questionnaires with regard to the recommendations of specialized literature, and first I tested it by personal trial interviews with 50, randomly chosen managers. According to the experience that I gained, I finalised my questions and elaborated the method applied during the research with the help of a case study.

The finalised questionnaires were taken to the organisations involved in the study by inquirers. Collecting data by inquirers is considered to be one of the most reliable methods (*Babbie* et al., 1999), which ensures relevant answers and the proper level of completing the questionnaires.

The character of my study determined the target group of the questionnaires. I asked the employees of the particular companies in top positions to answer my questions.

The questionnaire can be divided into three parts:

- The first part is the 'General data form', which contains the organisational parameters of the person's workplace.
- The second part consists of 'The interviewed person's (personal) identification data'.
- The third part, which contains the main information, is the 'Management interview'. It is made up of 14 questions. In the first eleven questions I gave 7–8 factors, which the interviewed persons had to grade on a scale of one to five. The influencing effects of the 9 factors given in the last three questions had to be graded as neutral, positive or negative. With the data collected in the management interview, I accomplished effect studies concerning resource, management tasks (functions), change, reaction time and time factor.

2. 2. Applied statistical methods

Considering the type of collected data, I applied several kinds of applied statistical methods in accordance with the objectives of the study. I started the evaluation of the questionnaires with a descriptive statistical analysis, then I made a hypothesis analysis, an analysis of the main components, and a variance analysis.

I accomplished the studies of resource, management tasks, change and reaction time following the same analysis structure. To compare factors belonging to different quality model groups created according to the personal characteristics of the interviewed managers and the parameters of the organisations, I compared their mathematical averages. To avoid the possible distorting effects of mathematical averages, I examined the dispersion of the factors, and the frequency of the versions of the different group-forming conditions. I also examined the distribution and priority of the point values of the factors.

With all the question groups I analysed if there is a difference between the different groups of organisations involved in the study, which were formed by activity, operation form, size and transformation, in judging the time factor, time efficiency and immediate reaction.

I also examined whether there is a significant difference between the managers' opinions according to their sex, age, highest qualification, position, work experience and the number of their working hours and employees. I performed a hypothesis study of the averages of the groups belonging to the same aspects.

For the questions measured on an ordinal scale, I created main components by question groups. During the analysis six main components evolved in each question group, i.e. 36 main components altogether. I performed a variance analysis on the main components according to the group-forming

conditions, and I examined the relations between the main components with correlation analysis. For examining the relation between the questions of low measuring levels and the group-forming conditions, I applied a Chi-square analysis.

I tested the reliability of the set of data with a reliability analysis. The analysis creates a Chronbach alpha index, which determines reliability. According to this index, I considered the data suitable for further investigations. I also analysed whether any of the questions should be cancelled in the questionnaire if I wanted to improve reliability. I did not find such questions in any of the question groups.

2.3. Presenting the research model

I analysed 625 managers' interviews in my study, for which I collected data with the help of inquirers.

In the case of missing data the given person was left out of the analysis according to the given study aspect. The proportion of missing data for the whole model was 1.83%.

The activities of all the organisations are related to agribusiness. Half of the companies specialise in agricultural activities, and a further 5.4% of them in food industry. The research model mainly consists of medium sized, limited liability companies. More than 40% of these companies have gone through remarkable transformations in the last few years.

Most of the interviewed persons are men with higher level qualifications, and with positions mainly in medium and lower management. Among them you can find men in their thirties, forties and fifties, approximately in the same proportion, but there are a significant number of persons in their twenties, as well. 60% of them keep to the legal eight-hour working day, but 40% of them spend more time at work.

3. Results and discussion

3. 1. Resource studies

Resources are all the material and immaterial goods and services that companies use in order to realise their launches. According to their functions in the production process, natural resources (soil, raw materials, etc.), human resources, capital, and business abilities are traditionally regarded as production factors. In the 20th century a new type of resource joined these traditional resources, and that was information. Time also possesses features of resources: with its utilisation it is possible to gain profit, while it appears as a special expenditure, it has value and price, there is shortage of it, it can be replaced and completed by other resources, and, in a way, it can be mobilised.

The time factor plays an important role in organisational processes and in management activities**.** Thus it can be established that, from the organisational and managing viewpoint, time is an objectively existing, well-definable economic factor which can be regarded as a resource, as well. Its effect has two directions: it may serve as limit and advantage at the same time. According to all that, in my studies I regarded time as a resource. This did not cause any problems to the interviewed managers, they were able to handle and evaluate time as a resource. My aim with the resource studies was to determine the place of time as a resource among the other resources.

In these studies I analysed the time factor from two aspects. On the one hand, I wanted to know what role time has in managers' opinions in increasing company efficiency and performance. On the other hand, I asked them how much they consider this resource to be expandable. As from the answers you can find out about the classification of the other resources too, it is possible to draw further conclusions from their rankings.

First I tried to find an answer to the question where the place of time as a resource is determined by managers with regard to ranking resources in increasing company efficiency and performance. I represented the ranks with mean values. When analysing the averages, as *Figure 1* shows, the following ranking evolved: financial resource, material and technical resource, human resource, market, information, connection, and time.

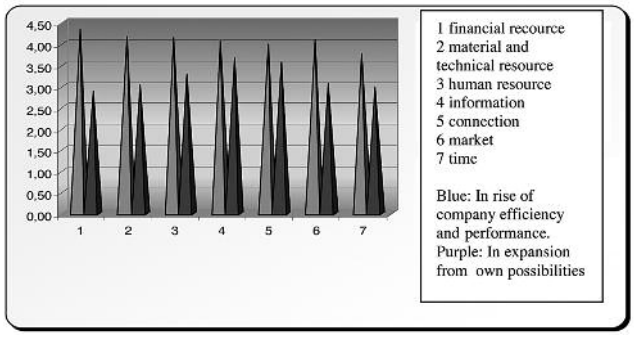

Figure 1: Study of the significance of resources
Source: own research

The interviewed managers placed all the resources before time. Thus, it can be established that managers do not value the role of the time factor as required. A company may possess sufficient financial, material, technical and human resources, and it may have market connections and information about its constantly changing economic environment, but if it does not react to these changes in time, it possesses its resources unnecessarily as it cannot utilise them efficiently. This highlights the fact that it is necessary to explore the features of the time factor, and to confront managers with the results of the research.

An interesting feature of the model is that the bigger the company size is, the more important managers consider the time factor. Another is that young managers regard time as important more than elder ones. They probably believe in time management techniques, i.e. in the fact that they may be able to use their time more intensively. Whereas elder managers carry out most of their tasks as routine jobs, they have completed the rationalisation of their time management, and they believe they cannot increase the efficient utilisation of their time any more.

In the second part of the resource studies I analysed how much managers of the organisations involved in the research

consider the different resources to be expandable from their own possibilities. In this question managers' opinions were the same, regardless to sex, age and qualification. From this aspect time only precedes one resource, which means that managers consider time rather as a limit. It is true that time is a limited resource, but in the case of the other production factors it is limitation that is the motivation of business.

In the analysis of the main components the role of resources in increasing efficiency and performance is the following: time behaves the same way as market and connections (Table 1). Concerning importance, these resources follow material, technical, and financial resources, and precede human resources and information. The correlation between the elements of the factor can be explained by the fact that these resources are independent of the aims and inner conditions of the organisation; they are 'outer environmental factors'. Thus, it seems they cannot be influenced by the company, as opposed to the other resources which depend on inner conditions, and can be formed according to the company's own objectives and abilities, therefore their role in influencing productivity and efficiency may be greater, as well.

Table 1: Main components created by the importance of resources

Resources	***Main components***		
	1.1a	***1.1b***	***1.1c***
Material and technical resources	0,835		
Financial resources	0,809		
Connections		0,769	
Market		0,709	
Time		0,571	
Human resources			0,808
Information			0,708

KMO = 0,739; explained variance proportion = 67%
Source: own research

In the study how much they can be expanded, market and time represented a main component. These two resources are completely independent of the company's objectives; they are outer environmental factors, which cannot be expanded from inner sources.

3. 2. Study of management tasks

In the study of management activity I analysed management tasks dividing them into two groups. One of the groups contains classical management tasks, which show the logically built order of management work (*Gulyás* et al., 2008). Thus, this group consists of obtaining information – communication – planning – decision making – commanding – organising – checking, named as functions related to organisational processes ('process tasks' in short). I examined separately the tasks that cannot definitely be placed in this logical process, and which can be related to several elements and functions. Therefore, the other group is made up of motivation management, forming organisational culture, change management, quality management, organisation improvement, human resources management and forming organisational behaviour. As they are related to management work due to their content, I named them as content managing tasks. This division follows the *Berde* et al., 2003 classification of management tasks.

My aim with both groups was to find out in which management tasks time is considered significant, and in which tasks managers believe that time efficiency can be improved.

In the **process task** tests my objective was to explore how important managers consider the time factor and how much they suppose time efficiency can be increased in the case of obtaining information – communication – planning – decision making – commanding – organising – checking. The time factor classification of the interviewed managers is illustrated by the following numbers:

1.	Organising	3,981
2.	Decision making	3,978
3.	Planning	3,932
4.	Obtaining outer information	3,912
5.	Checking	3,902
6.	Communication	3,897
7.	Obtaining inner information	3,876
8.	Commanding	3,574.

The high values show that the interviewed persons regard the time factor to be remarkable in the management tasks related to organisational processes.

Among the process tasks, only commanding has a slightly lower ranking compared to the other ones. In contrast, agricultural organisations ranked commanding as having the highest value *(Table 2)*.

Table 2: Time factor in process tasks according to branches

Branch/ Task	**Obt. inner information**	**Communication**	**Decision making**	**Commanding**	**Organising**	**Checking**
Agriculture	3,9502	3,8689	4,1180	3,7294	4,0492	3,9967
Food industry	3,9000	3,7576	3,7576	3,2333	3,8788	3,5000
Industry	3,9667	4,0333	4,1525	3,6102	4,1017	4,0172
Services	4,0000	4,1852	3,8375	3,5185	4,1235	3,9506
Trade	3,4651	3,6047	3,7209	3,4884	3,5814	3,7442
Other	3,7241	3,8488	3,7471	3,3103	3,8161	3,6744
TOTAL	3,8887	3,8997	3,9835	3,5871	3,9885	3,9022

Source: Own research

Commanding means interpreting the company's objectives to employees in a way that makes them committed to them, and that motivates them to perform at a high standard. This might be problematic indeed in agriculture, as continuous employment is difficult there due to agricultural work processes being seasonal, and work load being constantly changing and unbalanced. A number of employees can only be employed as occasional or seasonal

workers. Occasional or seasonal workers are less committed, and there are fewer tools available for managers to encourage them to perform at a high level (*Gulyás – Turcsányi* et al., 2008).

According to the main component analysis, managers – especially those of larger companies – thought that the time factor has the greatest significance in exploring problems. Within the organisation efficient communication and quick inner information flow are of vital importance, thus the proper operation of the organisation can be provided, and this is manifested in results as well. In addition, obtaining outer information in due time and planning provide an advantage in the market competition. Besides, time efficiency can be improved the most in the functions of preparing the task, in decision making, planning and commanding.

The different **content management tasks** have very different averages as values. As it can be seen in *Figure 2,* according to the managers of the organisations involved in the research, among the content functions time has the greatest significance in quality management, organisation improvement and human resources management. These are represented by the averages of 3.7–3.8. Motivation management, change management and influencing company behaviour have medium rankings with values around 3.5. The last place is taken by forming company culture, with an average of 3.38.

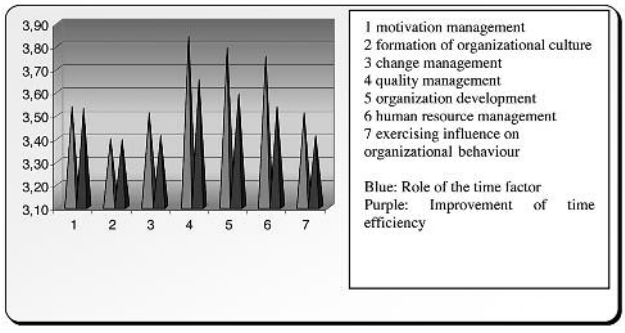

Figure 2: The role of the time factor in content management tasks
Source: own research

The aim of quality management is quality control, creating and operating quality control systems. The attitude to quality has changed significantly in the last ten years. From quality control based on standards, which was based on checking the parameters of the final product and measuring product quality (*Rácz* et al., 1997), it went through process regulation to process control. According to today's attitude, quality is not only related to the final product. It is not only influenced by the product-making activity, but also human factors like company culture, management and marketing. Successful quality improvement requires the absolute commitment of the management, the active involvement of all the employees, and extensive training (*Berde* et al., 2003). This explains why quality management, organisation improvement and HR management are connected in the issue that I studied.

The highest level of quality is satisfying the customer's hidden needs. It is easy to understand that the company that realises this sooner can gain an advantage in the competition and more income. Therefore, in the tested model it is the time factor that has the highest value concerning quality management.

It reflects branch peculiarities that in motivation management it is the service branch, and in quality management it is industry and food industry that gave the highest ranks to time. In the case of production branches, the chances of organisations in market competition are greatly influenced by the question what quality products they are able to release, how much these products meet consumers' needs, how balanced the quality of product release is, and how much companies are able to strengthen their market positions by improving the quality of their products (V*arga and colleagues* et al., 1997). In the last few decades the level of customers' quality requirements has especially grown in food industry. Thus, industrial and food industrial companies can only maintain, or increase, their market potentials if they launch products of the highest quality in the market.

According to the main component analysis of content tasks, the time factor has the most significant role in the case of forming company culture, motivation management and influencing company behaviour, which provide 'inertia'. This is acceptable, as all the three functions have effects for a long time (*Gulyás* et al., 2006). The longer period of time means more time expenditure. However, it is refunded as on a long term basis stabile companies are characterised by efficiency.

I also created main components for describing the connection between the improvability of time efficiency and content management tasks. The structure that evolved is almost the same as the previous one, concerning the role of the time factor. The further improvement of time efficiency is the most possible in forming motivation management, company culture, and influencing company behaviour. These functions are determined by the company objective. The main objective of a company at all times is effective operation. It is encouraging that the interviewed managers believe the efficient utilisation of time can be most improved in this aspect.

3.3. Studies of change

The interest of company managers is to maintain the level of performance they have achieved, and to be able to improve it continuously. That is one of the conditions of the company's survival, capability of living and growing on a long term basis. At the same time, however, there are constant changes in the outer environment of most companies, and these companies are forced to adjust to their outer environment. That is why companies can only ensure their existence and survival by constant, smaller or bigger modifications and changes. In this respect companies can be regarded as dynamic organisations. It is a rather difficult task, and a constant activity at the same time, for companies and their managers to create a dynamic balance between permanence and change, or in other words, between stability and flexibility. This especially causes problems when there are such enormous changes in the outer environment of companies as, for instance, the ones that have occurred in our

region in the past few years (*Dobák* et al., 2007). It might be decisive for organisations how fast and how effectively they can adjust to the outer environment. This encouraged me to study the role of the time factor in the change processes, and the improvability of time efficiency.

I started the analysis of change processes with studying the averages. *Figure 3* shows the classification of the time factor and the improvability of time efficiency in the case of organisational, technological, culture, market, management, profile and regulation changes. As it can be seen in the figure, the interviewed managers regarded the time factor as the most remarkable in market and technological changes. They considered it to be of medium importance in the case of organisational, management, regulation and profile changes. In this study time has the smallest significance in culture change.

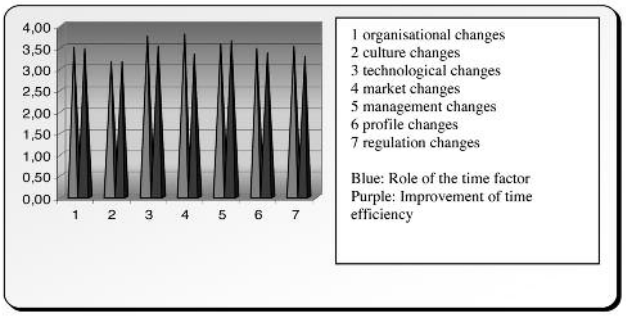

Figure 3: Analysis of change processes
Source: own research

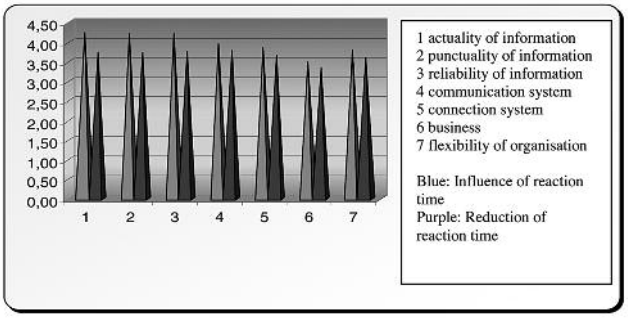

Figure 4: Study of reaction time
Source: own research

I found significant differences in opinions examining them according to branches, as well. In technological, market and profile changes it is industrial companies, and in management changes it is agricultural companies that classified time as having the highest value. The managers of industrial companies wish to follow, if needed, the tactics of 'reducing cost and increasing income' (*Varga and his colleagues* et al., 1997), which is part of the basic recipe of crisis management. In order to achieve that, they are ready to accomplish profile clearance, cost rationalisation, product and market development in the shortest possible time. Compared to the other branches, agriculture is more sensitive to management changes. That may result from the fact that, following the change in the political system, this branch went through company and management structure changes together with the change of the owners' structure, related to privatisation and compensation. Agricultural companies realised that immediate reaction is important in the case of the changes mentioned above, too. As for market and technological changes, time is classified with high values by the managers of industrial, limited liability companies, who work long hours.

3.4. Studies of reaction time

The success and efficiency of companies greatly depend on how fast they can react to environmental changes. Changes serve the long-term maintenance and improvement of company performance, which is only possible through constant renewal more and more. Ideas and decisions of change can only come true if there are suitable resources available as support. Successful changes can only be accomplished with sufficient time, material and human expenditure (Dobák et al., 2007).

The study of reaction time is examining time expenditure related to changes. Smaller time expenditure means more effective and more economical resource utilisation. On the basis of this, I tried to find the factors which influence reaction time the most, and to what extent reaction time can be reduced with management tools.

The average of the complex evaluation of the whole study model is shown by *Figure 4*, in which the classifications of the studied factors can be compared, and their rankings can be established.

According to the interviewed managers, the speed of reaction is the most promoted by information and communication, and the most hindered by human factors and company structure. They believe that immediate reaction is ensured if the motivated, performance oriented members of the organisation having sufficient information communicate well. In fact, if the members of the organisation are not committed to the success of the company, and if they do not possess up-to-date information, or do not communicate adequately, the adjustment ability of the company will be damaged, and it will lose its ability to adapt to changes immediately. Thus it will take a rather disadvantageous position in the competition.

3.5. Effect studies

The effect studies consist of three parts. First I examined how time as a limited resource influences management tasks. In the second part I tried to find an answer to the question how time would affect management tasks if it was unlimited. In the third part I assessed the amount of time – whether it grew, decreased or remained the same – available for the different management tasks in the last few years.

As *Table 3* shows, if time is limited, it has a positive effect on motivation, commanding, change and decision making, whereas in the case of the other tasks its effect is rather negative. Of course, if time was unlimited, it would have a positive effect on all management tasks.

Table 3: The effect of limited and 'unlimited' time on management tasks

Management task	***Time***	
	limited	***unlimited***
Information	2,32	1,84
Communication	2,19	1,78
Planning	2,33	1,93
Decision making	2,09	1,84
Motivation	1,70	1,72
Change	2,07	1,87
Commanding	1,83	1,67
Organising	2,29	1,94
Checking	2,30	1,92

1: neutral, 2: positive, 3: negative
Source: own research

In the past few years, for most managers the amount of time spent performing the different tasks has not changed. According to *Table 4,* in the case of checking most managers have experienced a decrease, and a slight increase in organising. A significant change is that almost one third of the managers has found more time to deal with information and communication, and has spent less time planning and making decisions. On the basis of these changes in time expenditure it can be established that among the tasks organising, information and communication have come into the limelight, while checking, planning and decision making are, to some extent, remain in the background in management work these days.

Table 4: Study of time expenditure in management tasks

Management task	Remained the same		Increased		Decreased	
	Db	%	db	%	db	%
Information	251	40,6	200	32,4	167	27,0
Communication	228	36,9	212	34,3	178	28,8
Planning	242	39,3	170	27,6	204	33,1
Decision making	286	46,7	121	19,7	206	33,6
Motivation	348	56,4	145	23,5	124	20,1
Change	284	46,0	162	26,3	171	27,7
Commanding	352	57,1	103	16,7	161	26,1
Organising	210	33,9	212	34,2	197	31,8
Checking	203	33,0	182	29,5	231	37,5

Source: own research

4. Conclusions

I analysed 625 questionnaires containing management preference examinations, investigating time factor and time efficiency with regard to resources, management tasks and changes, with scientifically established statistical methods. According to the available national and international technical literature, it can be stated that this kind of approach and research of the time factor is unique.

During my literary and theoretical investigation I established that even time possesses features characterising resources:

- with its utilisation it is possible to gain profit,
- it appears as a special expenditure,
- it has value and price,
- there is shortage of it, you have to manage it well,
- it can be replaced and completed by other resources,
- it can be mobilised, in the sense that it can be freed.

Unique characteristic features of time are that it is limited, irreversible, it cannot be stored, and it is available for everyone. Time is an abstract notion, and is difficult to handle among physical possessions. On the one hand, it is an objective, outer natural necessity, but on the other hand, its utilisation depends on human will.

Change directs attention on the time factor from the point of view of the organisation, and management does the same from that of the person. Thus it can be established that from the organisational and managing viewpoint time is an objectively existing, well-defined economic factor which can be regarded as a resource, as well. Its effect has two directions: limit and advantage at the same time. After I had created the definition of time as a resource, I mentioned it as one in my investigations. For the managers questioned it was acceptable, they interpreted it well and handled it together with other resources.

During the examination of managing activities, I divided managing tasks into two groups. In one of them there are the classical management tasks, which I named as process tasks in short. I examined separately the tasks that cannot definitely be placed in this logical process, and which can be related to several elements and functions. They are the content tasks.

Among the process tasks the role of the time factor was considered by the managers questioned as the most important in organising and decision making. They were followed by planning, obtaining outer information, checking, communication and obtaining inner information. Time has the least significance in commanding.

According to the managers of the organisations involved in the research, among the content functions time has the greatest significance in quality management, organisation improvement and human resources management. Successful quality improvement requires total commitment of the management, active involvement of all the employees and extensive training. This explains why quality management, organisation improvement and HR management are handled together in the question I examined.

According to the studies of change, it can be established that the time factor has the greatest importance, in the interviewed managers' opinions, in the case of industrial and technological changes. As they see it, reaction time is mostly influenced by the punctuality, up-to-dateness and reliability of information.

On the basis of the change in time expenditure, it can be pointed out that among tasks organising, information and communication have come into the limelight, while checking, planning and decision making are, to some extent, remain in the background in management work nowadays.

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Marketing aspects of consumption of Hungarian pork meat

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Abstract: The most important aim of authors' study is to get to know the Hungarian pork consumption in our days. Our aim is set to estimate pork meat consumption and purchasing habits of consumers who are living in Eastern part of Hungary.

The pork section is influenced negatively by several factors nowadays, which have a clear effect on the pork consumption and cause its declination.

During the research work a questionnaire survey was made in 2007 and 2008. 1089 persons in different locations of Eastern Hungary were altogether asked. The data were evaluated by statistic hypothesis testing.

Based on the evaluation a clear picture was got about the consumers' purchasing and consuming habits, and their ideas, opinions about the Hungarian pork as a food and as an item wearing a kind of national behaviour.

Through many questions the volume of consumption was explored, and the pork's proportion was compared to the rest of other meat types. It is verifiable that the pork consumption can be handled as a national habit, which is not the same by different age groups and educational qualifications. The importance of some factors during purchasing was also examined. Exceptionally important factors are: quality, the appearance, the origin and the price, that were mostly considered by the customers. The effect of pork promotion advertisements and its evaluation by the customers were surveyed too, which in connection with the efficiency showed a fairly stable picture both in 2007 and in 2008. The examination of price elasticity showed that this figure is influenced not just by the product group itself, but the purchasing power of the costumers, as well.

Key words: pork meat, consumption, attitude, shopping habits, price elasticity

1. Introduction, objectives

Promotions are common and well-known parts of our lives. If a man of the street hears the expression of "marketing", he thinks the promotion immediately. Often they are thought-provoking, appalling or makes us laugh and in many case they forms us.

In 2007 an amazing promotion cropped up next to the roads of Hungary in giant posters. This poster with its' baby-pink coloured background and well-known, popular performer was a very prominent phenomena, and the opinions of Hungarians were divided by it. This promotion was born for the propagation of Hungarian pork meat. The campaign started in autumn of 2007. The aim of this promotion campaign were to call up the attention for the high quality Hungarian products in the interest of the Hungarian pork producers; to increase the consumption of red meat by the population's persuasion; and their most important message, that the Hungarian pork is delicate, reliable, and of a great variety. In Hungary one could meet this advertisement on giant posters, city light posters, on the press (magazines, newspapers), and in the radio (3 different radio stations). There were some store advertisement campaigns, too. The character of this promotion campaign was Róbert Koltai, who is a really famous Hungarian actor, and he has a well-known and popular personality. His films are comedies and he is the manifestation for a typical Hungarian countryman. Here it is the advertisement and its' English translation below:

The authors were curious about, how this campaign was effective in the circle of common people. While the promotion campaign of Ministry of Agriculture and Rural Development, Agricultural Marketing Center was examined by us, some questions were raised. Are these promotion campaigns really necessary in Hungary nowadays? Pork meat is a basic part of the traditional Hungarian cuisine and could we affirm that pork meat is unhealthy? Could it be proved that this food – which was used by our grandmothers previously – today makes damage in our organisms? What could be the opinions of the consumers about it? How could be the situation of consuming and purchasing of pork

nowadays? In the last few years decline of consuming of pork meat was noticeable. How could it be reversible? Our aim is to find the answers to the most of these questions and examine the effects of changing of prices, as well. The research work started with these questions in 2007 and continued in 2008, as well, and the main research approach was surveying the "average" Hungarian consumers.

2. Methodology

Best (2008); *Boetel* et al., (2007); *Gervais and Khraief* (2007) give an extensive picture about present situation of pork industry. From article of *Mayringer* (2005) we know that other countries had similar campaigns, too. Like in Germany, where the "2% Fett (Fat) – 100% Genuss (Enjoyment)" promotion campaign operated effectively for some years. This could be a great example for Hungarian campaigns, too.

In our survey the Hungarian pork was mentioned like a product with a "quasi brand name". Authors wanted to know that how the pork meat's origin – like a brand name – attractive could be for Hungarian consumers. *Kovács-Géczi* (2007); *Elliott and Yannopoulon* (2007) say that the brand name could be really tempting for an average consumer.

Some statistic testing was made from the data collected. Hypothesis testing was used for the statistical evaluation. The necessary statistics were shown by Texas (1977). The hypothesis testing was made both 1% and 5% significant levels. The 5% significant level means a really correct result, but as an alternative method authors used 1% significant level, too. With its' use our results could be even more creditable. Where our nullhypothesis was rejected, there were different groups in the populations. In this situation the different groups were evaluated with sample t statistics and the different groups were evaluated individually.

The other important part of our research work was the evaluation of price elasticity. The price elasticity (ε) which was defined among others by *Samuelson* (1985) and *Mceachern* (1988), by the help of this formula below the effect of 1% rising of price of pork for the demand could be evaluated. The elasticity function is the quotient of changing of $f(x)$ by the effect of changing of x, see the formula below:

$$\varepsilon = \frac{\frac{\Delta f(x)}{f(x_0)}}{\frac{\Delta x}{x_0}}$$

where:

- $\Delta f(x)$ changing of quantity bought
- $f(x_0)$ a basic quantity
- Δx changing of price
- x_0 starter price

The scientific literature always mentions the price elasticity (ε) like 1 or less in foods' cases, so it is inelastic. Our aim is to examine of the real effect of price change. The basic hypothesis is that the price elasticity could not be constant in groups with different purchasing power; our H_0 is that the price elasticity is not depending from the income. Many books and studies were written about this topic like by *Rekettye* (1999); *Kopányi* (1993); *McEachern* (1988); *Samuelson* (1985), but there are not any studies in the literature which address this hypothesis according to our approach. Changing of elasticity and its' effect was published by *Farris* (2008), too, but its dependence from the disposable income was also not mentioned. How you will see in the next chapter, a part of our evaluation was confirmed by *Robinson* (1990) in the case of the so-called middle level income category.

3. Data collection

For own data collection a primary questionnaire survey was made. There were different questions about: demography; habits of pork consuming and purchasing, sensibility on promotion, sensibility on price and opinions about quality and stereotypes (unhealthy, worse than the chicken meat, etc.). People are really sensitive for their personal figures, like: age or income that is why in these questions a grouping's technique was used. *Gibson* and *Bonggeun* (2007) state that age of consumer could be an influencing factor, so the evaluation of age grouping was among our aims.

In the second part of the survey the consuming and purchasing habits were evaluated. Questions concerned to quantity of pork meat consuming in the ratio of whole meat consumption and spending for pork were evaluated. Concrete numeral-figures were collected and evaluated by household/month/person spending rate. In the questionnaire there were some yes or no questions as well, per cent definitions, classifications and exact figures' denomination, too.

The survey work was carried out in different locations of Eastern Hungary. The places were: butcher shops, streets and market places. 1089 questionnaires were totally filled out and evaluated. Our main examinations regards on the nullhypothesis in connection with different groups of age, sex, qualification and income classes. The database satisfies the conditions of normal distribution for the largest part of population. The SPSS program's Version 13 was used with its' handbook, wrote by *Ketskeméty* and *Izsó* (2005).

4. Results of the survey

The first data collection was made in October, 2007, the second one between May and September 2008. From the surveyed population 1089 persons' questionnaires were finally accepted.

4. 1. Influencing Effects of Demography Factors

In the first step the gender of respondents was examined. In these testing H_0 is: there is not any relevant difference

between males and females. Only one question was differing in significant way from the sample. This question and its' figures are presented by *Table 1.*

The result was surprising; the male consumers are more acceptant for Hungarian pork than the females. The proportion of their "yes" answers was higher in the whole database, and a plus half a per cent willing to pay more for the Hungarian pork by the males.

The age factor influencing effect was also tested. We have to mention that those consumers who are under 20 years were not included the database, because this group rarely has got their own income sources. That is why we took no notice of their answers, and respondents over 60 were contracted into one group, too.

H_0 was the same in every test: there are not any significant differences between the answers of different age groups. During testing there were some differences between the younger and older groups just in the following question: „How many% price change is needed for you that instead 1 kg pork meat you choose 1kg beef?". The different groups of age gave different answers to this question *(Table 2).*

The different age groups have diverse opinion. With additional evaluations we can mention that the younger respondents choose beef on effect of even on a smaller price change. The older consumers need a higher price rise. Averages of answers of different age groups are presented by *Table 3.*

Table 1: Willingness to Pay by Gender

(Total respondents= 100%)

"Are you willing to pay more for the guaranteed genuine Hungarian pork meat?"	**No** *(%)*	**Yes** *(%)*	**How many per cent are you willing to pay more?** *(Average %)*
Males	8	30	8.55
Females	25	37	8.01

Resource: Own database

Table 2: The Different Age Groups' Cross Price Elasticity in Case of Pork and Bee

Age groups	**Calculated t statistics**		**Student t Critical value**		**Significant difference**	
	5 %	**1%**	**5%**	**1%**	**5%**	**1%**
	S. level		**S. level**		**S. level**	
20-30 vs. 30-40	1.371	0.718	1.960	2.326	-	-
20-30 vs. 40-50	2.567	2.336	1.960	2.326	+	+
20-30 vs. 50-60	1.992	0.977	1.960	2.326	-	-
20-30 vs. over 60	0.276	0.149	1.960	2.326	-	-
30-40 vs. 40-50	2.227	2.855	1.960	2.326	+	+
30-40 vs. 50-60	2.739	4.851	1.960	2.326	+	+
30-40 vs. over 60	0.614	2.501	1.960	2.326	-	+
40-50 vs. 50-60	5.145	4.559	1.960	2.326	+	+
40-50 vs. over 60	1.315	4.474	1.960	2.326	-	+
50-60 vs. over 60	3.719	5.560	1.960	2.326	+	+

Resource: Own database (+ : there is a significant difference)

From the results above the effect of a theoretical price rise are clearly readable, namely: there is a danger that in case of a high rise in pork price the younger consumers are to change to beef easily. It shows that for Hungary needs a new, youngish promotion campaign, the place of pork in the preference systems of young consumers could be enhanced.

In the next point the effect on different educational qualification were examined. The nullhypothesis is that the examined educational groups, the result are the same. The results of analysis confirmed this H_0. No difference was found with 5% significant level, but with 1% significant level the figures were more colorful, namely the differences between answers of respondents with primary school and that of higher qualification were different. This difference in the case of the previous question (cross price elasticity) is seen in *Table 4.*

From the figures above we could see that those respondents who have got higher qualifications could change the consumption habit easily on the effect of a smaller price change. We could affirm that the parameters of consuming of pork meat show a very stable picture and perfectly fit the to Hungarians' national behavior. It could be mentioned as a national character, which is not really influenced by age, qualification, income or gender.

Table 3: Averages of Different Age Groups in Evaluation of Pork and Beef Cross Price Elasticity

"How much % price change is needed for you to choose 1kg beef instead of 1 kg pork?"	**Average** *(%)*
Younger than 30 year	18.11
31-40 years	14.83
41-50 years	17.56
51-60 years	33.63
Over 61 year	42.83

Resource: Own database

Table 4: Averages of Different Age Groups in Evaluation of Pork and Beef Cross Price Elasticity

"How many per cent price change is needed for you for you to choose 1kg beef instead of 1 kg pork?"	
Education level	**Average** *(%)*
Primary school	29.23
Vocational school	23.77
High school	18.76
University/College	6.34

Resource: Own database

Table 5: The Importance of Different Factors in Pork Consumption

Unit: Per cent

Classification / Factor	5 Most important	4	3 Decreasing grades of	2 importance	1 Least important
Price	44.09	47.6	5.72	1.12	1.47
Quality	80.35	13.77	3.86	0.73	1.29
Appearance	78.7	7.53	11.75	0.73	1.29
Origin	57.48	26.73	13.77	0.55	1.47

Resource: Own database

Table 6: Classification of Quality of Hungarian and Foreign Pork

Unit: per cent

Grading / Origin	5 (The Best)	4	3	2	1 (The Worst)
Hungarian pork	27	40	29	2	2
Foreign pork	5	13	45	25	12

Resource: Own database

Table 7: The Influencing Effect of Promotion on Purchase

Unit: Per cent

"Were you affected by the advertisement in your pork purchasing?"	**Data collected in year:**	
	2007	**2008**
Yes	16	21
No	84	79

Resource: Own database

4.2. Other Influencing Factors

Some other factors are also worthwhile to mention, these are in *Table 5*.

From the given four factors above only the price was less important than the others. Its classification was 4 while other three factors have got 5.

The Hungarian pork like a "brand named product" was also evaluated. We had to know how consumers thought about the features of this product and how they appreciate of its quality. There was a question in the questionnaire, which dealt with this point, *Table 6* contains the results:

Quality of Hungarian pork was better than the foreign meat by the respondents' views. Some uncertainty was caused by today's sentiment of globalization, because the identification of pork meat's origin is not easy to know. Interesting contradiction is that the respondents are not willing to pay more for Hungarian pork, while they keep the origin as an important factor.

In autumn, 2007, a question about effectiveness of promotion campaign was also asked. The question was about the "HUNGARIAN PORK: A WORLD HIT!" promotion. In 2008 the authors asked the influencing effect of the respondents about their behavior regarding the influencing effect of meat-promotions. Allocation of answers is shown by *Table 7*.

The influencing power of promotions is more expressed in 2008. Influencing effect of campaigns was recognized by a plus 5% on behalf of the respondents.

4.3. The Consumers' Prospective Reaction on Price Change

During the research a question regarding the price elasticity was also raised. Price elasticity is handled like a constant in cases of the given product categories by the economic and marketing literatures. Authors challenge this generally accepted approach: our hypothesis is that price elasticity of a product is also influenced by the consumers' disposable income and not just the product group itself. The reaction of consumers for a theoretical price change was evaluated by a question in the survey, namely *"If the price of pork meat would rise with by 10, 20, 30, 40, 50%, how your consumption would be declined for the benefit of other types of meat (under a relative short period of time)?"* The respondents were examined according to the different income groups. *Table 8* contains the findings.

Centers of every category are presented in the Table 8, so the average income calculated

is 384 Euro/person/month, which is smaller that the national average of Hungary. The reason of it could be the lower level of industry in Eastern Hungary, where most of the surveying took place.

For the better interpretation of information the Higher-middle and High income categories were contracted into one group, so the new category had 82 respondents and 860 Euro/person/month average income. After that the research continued with these 4 categories.

The consumers' probable reactions are presented in the *Table 9.*

Average hypothetical price-index: 0.49, which is equal to100% in our investigation shown above.

The value of 0.49 is absolutely matching to the microeconomic theories, and it nominates inelasticity. In the value system of consumers the lower price rise (0-30%) is really inelastic, while over 30% it starts to become somewhat more elastic. For the effect of a larger price change, the attitudes of mind of consumers change, too, and it becomes more flexible. Figure 1 helps in presentation of this behavior:

From the graph it is readable quite well that the elasticity over 30-40% price change becomes more flexible. The evaluation of database shows that the effects of average price change are not the same in case of the different income categories. The levels of probable reactions of different income groups for price rise of pork were examined; *Table 10* contains the summary of that.

Behavior of different categories could be surprising. Reactions were absolutely differed by every group; however their consumption is not so far from each-other. It could be more expressive if these figures were compared with the average figure of overall price elasticity: å = 0.49. For a better visualization the categories of Low-Middle and Middle ones were unified into a new category, called Average-middle. In this case

Table 8: The 5 Different Income Groups of Respondents

Unit: per cent

Income classification	Disposable Income	Respondents
Low	120 Euro/person/month	15.51
Low-middle	240 Euro/person/month	25.17
Middle	460 Euro/person/month	51.79
Higher-middle	700 Euro/person/month	7.53
High	1.000 Euro/person/month	
Total		Σ 1089 respondents = 100%

Resource: Own database (During the research the 1 = 250 HUF exchange rate was proper.)

Table 9: The Reactions of Consumers on Rising Pork Meat Price

Hypothetical price raise (%)	Prospective decline in consumption (%)	Hypothetical price elasticity ( )	Ratio per cent (average hypothetical price-index: 0.49= 100%)
10	3.84	0.384	78
20	7.76	0.388	79
30	12.75	0.425	87
40	2.42	0.511	104
50	28.58	0.572	117

Resource: Own database

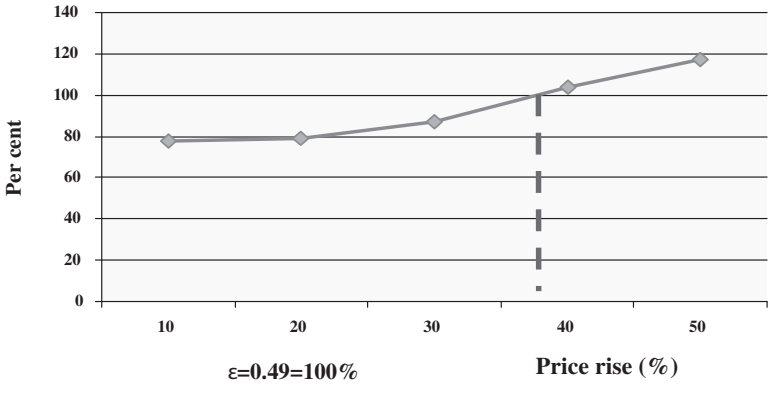

Figure 1: Change of Inelasticity by the Effect of Price Rise

Table 10: Price Elasticity Change on Shifted Price

Hypothetical price rise (%)	Low income category	Low-middle category	Middle category	High category
10	0.394	0.296	0.661	0.185
20	0.479	0.263	0.566	0.241
30	0.608	0.309	0.515	0.283
40	0.797	0.413	0.525	0.307
50	0.841	0.531	0.552	0.363

Resource: Own database

3 totally different income categories are distinguished that makes the comparison more expressive; the findings are in *Table 11.*

It can be established that the wide Average-middle category's behavior is quite similar to the overall average reactions visualized by Figure 1. In the case of the Low income category 30 per cent more elastic reaction is expected than the average figure. The High income category produces 40% less

Table 11: The Effect of Disposable Income on Price Elasticity

Hypothetical price change (%)	Low	Average middle	High	Ratio of Middle/High
10	80	98	38	1:2.1
20	98	85	49	1:2.0
30	124	84	58	1:2.1
40	163	96	63	1:2.6
50	172	110	74	1:2.32
Average	*127*	*95*	*56*	*1:2.2*

Resource: Own database

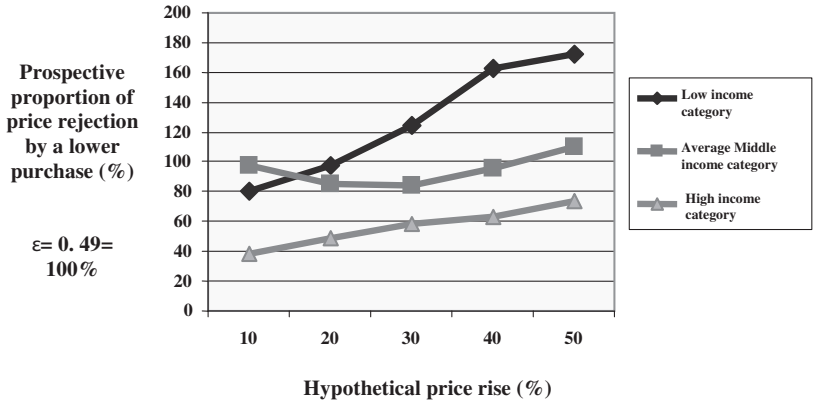

Figure 2: The Reactions of Different Income Categories on Price Elasticity

reaction. The rate between Low and High income categories shows a really stabile picture; it fluctuates between 1:2.0 and 1: 2.6, the average is 1:2.2. The next graph illustrates these relationships.

The reactions of 3 income categories are demonstrated well by Figure 2. Values are become more flexible by the effect of price rise in the lower income categories. Values of Average-middle income groups are in the average province, and values of higher income categories are stayed under the average, but it also shows a rising tendency. Probably a psychological effect of price rise causes this tendency, because otherwise they would have got sufficient income for purchasing of a more expensive pork meat.

5. Conclusion and suggestions

Uniform opinion is pled by the Hungarian consumers. Reassuringly positive opinion is made about Hungarian pork by them, its' price was better awarded than the foreign pork's price.

From the previous research we could know that most of the respondents are not influenced strongly by any promotion campaign in pork consumption, but we could call reassuring that the influencing effects of these promotions were recognized similarly in 2008 by a not large, but increasing group of respondents. It means that marketing of pork needs some development due to the increasing reaction. The declining consumption could be reversed by a correct and effective promotion campaign. In the future for the Hungarian pork meats' promoters it is worthwhile to take into consideration our findings. The German campaign is the perfect example for that, how a well set-up promotion with good marketing tools could produce positive results. These kinds of promotions are exemplary for Hungary.

In the case of price elasticity authors say that price elasticity is not only depends on the group nature of the product, but depends on the consumers' income, as well. It is worthwhile to make an experiment to unify the formulae of price and income elasticities that is our aim for the future research.

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Economic effectivity of fairs – KAVA Model Testing On Agricultural Exhibitions

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Abstract: This paper discusses the first experiences with the newly-developed KAVA-model. This model works on cash basis and evaluates cash inflow, outflow and Net Cash-Flow (NCF) in connection with four different interest groups connected to the given exhibition. The model was tested on four different exhibitions: Farmerexpo (Debrecen, Hungary) in 2005 and 2006, OMÉK (Budapest, Hungary) from 2005 and Polagra-Farm (Poznan, Poland) 2006. The different fairs can be compared by their relative „economic values" that makes the auditing more reliable.

Key words: economic effectivity, fairs, exhibitions, model testing, KAVA model

1. Introduction

Complex economic evaluation of fair and exhibition events is an actual topic in the literature. In the model running are evaluated all stakeholder groups with numerical terms, calculated with cash inflow and outflow categories. The net cash flow calculation gives (in the author's opinion) an economic value. The categories summarized give a so-called complex economic value. A KAVA numerical model was developed to carry out the calculations for the complex economic value of those events.

Fairs and exhibitions belong to the oldest marketing tools. Many authors deal with evaluation of these events, examining them from different viewpoints. In this article a model testing is presented that gives answers about this economic value, by numeric figures regarding the economic effectivity of a fair. In this paper the author presents the practical approach of the KAVA model, using it for assessment of four different exhibitions: Farmerexpo (Debrecen, Hungary) in 2005 and 2006, OMÉK (Budapest, Hungary) from 2005 and Polagra-Farm (Poznan, Poland) 2006.

2. Literature review

Participating an exhibition makes a good possibility for PR, CRM, and Direct Sale purposes, too, because an exhibition concentrates a market, making it similar to a classic free competition. "Notwithstanding the caliber of the topic, the most cited authors in the territory of marketing have no special attention concerning this type of communication and sale and the buyer-seller relationships." (*Narayandas- Rangan*, 2004)

Kotler's (1998) book contains the motivations of the exhibitors as follows: "The participating sellers want to acquire diverse advantages, for example:

- To make new contracts
- To manage existing customer relations
- Introducing new products
- Meeting new buyers
- Further sales to the present consumer public
- The "school" the consumers with printed materials, videos and other audiovisual methods."

Jobber (1999) manages the exhibitions as a part of the communications-mix. He ranks the relative significance of the sales promotion instruments comparing the exhibitions, as follows:

1. Personal sale
2. Information source of industrial trade
3. DM and printed flyers

He differentiates the fair; (concentrated place of the supply of economic sectors where not only information-exchange, but direct sale is allowed), the exhibition (offers the representative supply of one or more economic sectors, gives information, but the sales at the stands is mostly not allowed) based on the MKVSZ formulation (Hungarian Association of Exhibition- and Fair Organizers). (I1)

The objectives for a company participating in a fair can be:

1. Occasion for contacting the market-segments with special interests.
2. Strengthening the brand knowledge and building new relationships.
3. Management of existing customer relationships.
4. Possibility of introducing products.
5. Define the customer needs and modify their demand.
6. Collecting information about the competing market.
7. Market launch by newly developed products.
8. Recruiting wholesalers and/or retailers.
9. Keeping up/ development of the company image.
10. Handling the complaints.
11. Sales.

Tomcsányi (1988) differentiate the fair (market-oriented organizations of one or more economic sectors, organized regularly, on the same place, for professionals); the exhibition, or trade show (they introduce an economic sector for guidance or propaganda, and are opened for the public. The exhibition allows sales of products.) and a historic approach (market, the meeting point of sellers and buyers, which makes the product change possible). This is different from the MKVSZ's formula! He describes the exhibition as a complex advertising space where the product plays the lead. Important factors are hospitality, flyers, information collecting. In his opinion the exhibitions show a lot of common characteristics with the advertising, but belongs not to it.

In his later book (*Tomcsányi – Lehota,* 1994) he describes the exhibition, as a concentrated market, and as a part of the Sales Promotions. Here he typologies the exhibitions and the visitors, too, as follows:

- Buyer, or potential buyer
- "Buyers of buyers" (or end-consumers)
- Influentials (non-buyer, but participant in the buying process)
- Experts (engineers, specialists, etc.)

Their goals can be:

- To come to know new products and developments
- Collecting product and technical information
- Tightening the connection with the sellers
- Getting new ideas

The model of *Spiropoulos* et al. (2006) includes six major event stakeholder groups. These are the "Host organization," the "Host community," the "Co-workers" and the "Event sponsors," the "Media," and the "Participants and spectators" *(See Figure 1)*.

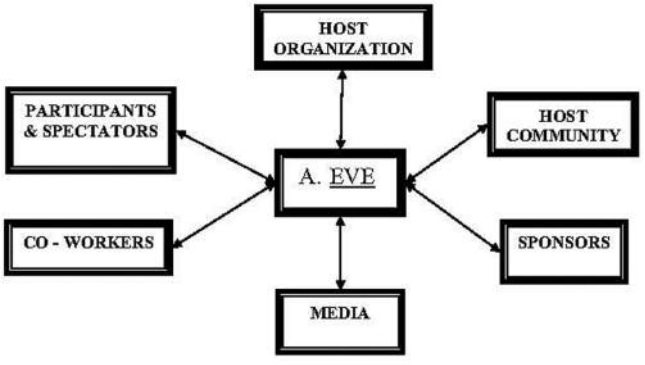

Figure 1. The relation of stakeholders to events.
Source: Spiropoulos et al., 2006. (* "A. EVE" stands for "A.ctual EVEnt")

Getz (2007) and his colleagues summarize the major stakeholder roles similarly to six groups, but different ones, as we can see in *Figure 2*.

The basis for elaborating this model was the one published by *Varga – Karpati* (2006), see in *Figure 3*., where the authors evaluated the fairs stakeholders qualitatively in a complex way. This article served as a basis for creating the complex economic model of fairs' evaluation that was named as KAVA after the family name of the authors.

Figure 2. Major stakeholder roles
Source: Getz et al. 2007.

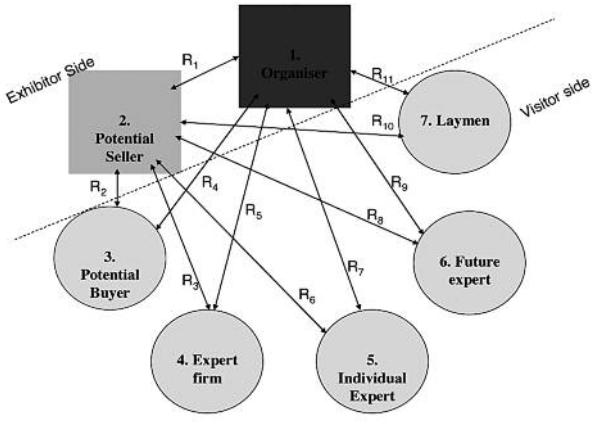

Figure 3. Relationship Network in the Exhibition Business
Source: Varga-Kárpáti, 2006.

The first step of measuring the economic value of the exhibitions was the calculation of attractiveness radius (*Varga,* 2008) and the modification of this radius (*Karpati,* 2008).

3. MAterials and Methods

The main approach of the KAVA model is to evaluate separately the stakeholders' role of a given fair economically and by summarising them to determine the complex economic value of the fair. The main stakeholder groups in connection with a fair can be distinguished, as below:

a) organizer
b) exhibitor
c) professional buyer
d) expert company
e) individual expert
f) future expert / student
g) ordinary visitor / layman
h) region / settlement (the laughing third = beneficiaries of positive externalities)

The list above contains all the stakeholders who somehow are connected financially to a fair / exhibition and that is why their role can be calculated in money terms in

connection with an event. In the KAVA model any stakeholder has three money flow categories, as below:

- money inflow for the given stakeholder, that is called yield value in the model
- money outflow for the given stakeholder, that is called cost value in the model
- net cash-flow, calculated as money inflow minus money outflow, that is called economic value in the model

The task is, therefore, that the yield and cost values have to determine at each stakeholder separately, then to determine the economic value by subtraction. In using the model we have to take into account that there are numerous values that for one stakeholder it means money inflow, but for the other one this value means money outflow. Take the example of the admission fee that is cash outflow for the visitor, but cash inflow for the organizer. Due to this characteristic of the model calculation the yield and cost values are containing accumulations. The way of calculation, namely the subtraction for the economic value, however, filters this accumulation out of the model. In the KAVA model, therefore, the figure of economic value shows the real money value of the fair for a stakeholder group that can be either negative or positive, due to the "net characteristic" of this figure. When we summarize the economic values of all the stakeholder groups by their sign and absolute values, the complex economic value of the fair / exhibition is determined.

In the following points the theoretical method of determination of economic values in case of each stakeholder group is shown.

3.1. Organizer

a) Determination of the yield value

The yield value for the organizer can be determined by addition of the factors below:

- income from the inner and outer space sold
- income from equipment rented out
- income from the admission fee
- state and local subsidization
- collected parking fee
- other cash inflows

b) Determination of the cost value

The cost value for the organizer can be determined by adding together the cost categories listed below:

- cost of the hired space (inner and outer) and the equipment hired
- cost of exhibition construction, such as logistic cost, cost of hired labor and premium wage for the own labor force
- transporting, accommodation and meals for the labor force
- cost of security service
- cost of public utility and other public services
- public relations and promotional cost
- insurance cost
- any other cash outflow connected to the organizational activities

c) Determination of the economic value

As it was shown above, the economic value for the organizer of the fair / exhibition can be determined as a product of yield value minus cost value. This calculation is the same at each stakeholder group, so in the following points it is not further shown in the paper.

3.2. Exhibitor

a) Determination of the yield value

The yield value for the exhibitors can be determined by addition of the factors below:

- average direct sales at the fair
- expected potential sales surplus supposing N years' lasting positive effect of the fair
- potential savings due to the non-executed partner visits (because they are also on the spot in the same time)
- potential savings due to the non-executed competitor visits
- potential savings due to the non-executed visits to neighboring concentrated market-place (replacing effect)

b) Determination of the cost value

The cost value for the exhibitor can be determined by adding together the cost categories listed below:

- cost of the direct sales at the fair
- surplus cost due to the surplus sales as an effect of the fair (see the point above)
- booth and space hiring fee
- cost associated with equipment purchase or hiring
- hired labor cost, premium for the own employees
- labor transporting, accommodation and meals cost
- PR and promotional cost

3.3. Professional buyer

a) Determination of the yield value

The yield value for the professional buyers can be determined by addition of the factors below:

- potential savings due to the non-executed partner visits (because they are also on the spot in the same time)
- value of savings due to special fair's discount
- "professional welfare effect" due to the professional content of the fair

b) Determination of the cost value

The cost value for the professional buyer can be determined by adding together the cost categories listed below:

– traveling cost
– cost of accommodation and meals
– admission fee

3.4. Expert company

a) Determination of the yield value

The yield value for the expert company can be determined by addition of the factors below:

– potential savings due to the non-executed partner visits (because they are also on the spot in the same time)
– "professional welfare effect" due to the professional content of the fair
– expected direct expert income connected to the fair

b) Determination of the cost value

The cost value for the expert company can be determined by adding together the cost categories listed below:

– traveling cost
– cost of accommodation and meals
– admission fee

3.5. Individual expert

The methodology of individual experts is the same as the expert company (4.4.). It is worthwhile to create a new category, however, because the individual experts are generally connected to much less partner than the expert companies.

3.6. Future expert / student

It is a novelty to create this category among the stakeholders since not any publication dealt so far with students of higher education as a separate group. For them the professional experience acquired in the fair can be potentially utilized during their studies that can be materialized as more credits, higher scholarship and as a result of that a potentially higher salary after the graduation.

In the cash outflow side in addition to the admission fee one can count on the traveling and subsistence cost in case of the visiting students.

3.7. Ordinary visitor / layman

The ordinary visitor / layman does not raise any professional question in connection with the fair / exhibition, but he / she visits this event basically for its entertainment value. For them the "money inflow side" can be determined as spending a good free time or enjoying entertainment, this hypothetical value can be compared to the cost of the admission fee. We can create several categories among the laymen from those who like the fair very much and evaluate its entertaining value equivalent 10 times of the admission fee, until the category where the people consider the admission fee as the money lost. A market research is needed to determine the number of visitors who belong to one of the categories described above. A random sampling is suggested in this case.

The cost value incorporates the admission fee, and the cost of traveling and subsistence.

3.8. Region / settlement (the laughing third)

The title of: "the laughing third" refers the situation that the settlement / region also can make profit from the fair / exhibition, although they do not do too much for the goals of this event. In the following points the main factors to take into account in this case are summarized.

a) Determination of the yield value

The yield value for the region / settlement can be determined by addition of the factors below:

– number of non-local visitors and their average spending
– surplus spending in the hotels including the potential extra "fair rate" in the region
– surplus spending on meals in the region
– surplus tourist tax income
– savings of local promotional cost due to the fair's "piggyback" effect
– potential long-term effect of increased number of tourist and their spending margin in the region

b) Determination of the cost value

The cost value for the region / settlement can be determined by adding together the cost categories listed below:

– cost ratio of the income categories listed above at point a)
– surplus costs in the region in connection with the environment protection, cleaning and security services
– higher surplus in accidents due to the increased number of visitors and the material loss caused by it
– higher criminal activity in the region and the material loss caused by it

4. the observed exhibitions

4.1. Farmerexpo

From the very first moment, FARMER-EXPO has consciously endeavored to create opportunities for widening relations, deepening partnerships, supporting agribusiness sector. In accordance with the description above Farmerexpo provides a forum for all the agribusiness employed, and also for the domestic or foreign companies connected to the agricultural sector to introduce their products and services.

The professional program of the exhibition has been widening year by year. Among the programs there are professional conferences, forums for agricultural experts to collect new, important knowledge, the latest research results and other practical, useful experiences.

The show had been developing dynamically – taking both the net exhibition area and the number of exhibitors into consideration – until 1999, when an other exhibition organizing company got interested in Farmer-Expo.

This fact and the hardenings of agriculture contributed to 30% decrease in the exhibition area and a 20% decrease in the number of exhibitors. In year 2000, the National Agricultural and Food Industrial Exhibition (OMÉK) – held in every 4 year – moderated the interest towards the exhibition, still a 10% increase could have been noticed. In 2001 the net exhibition area increased 40% (from 12.197 square meter to 17.000 square meter), and the number of exhibitors about 12% (from 369 to 412). This growth continued both in 2002 and in 2003. In 2004 expectations in terms of joining the EU and reduction of costs were typical for the companies, that resulted in a small decrease in the number of exhibitors.

The professional programs provide various subjects from business meetings through plant breeding symposiums to agricultural political forums. The Hungarian Animal Breeders´ Association acknowledges FARMER-EXPO as its official live-stock exhibition. Since 1994 – when as first member of the live-stock exhibition the pig appeared – the organizers has consciously broadened the live-stock exhibition year by year. Today 7 species of animals are shown at the exhibition – pig, horse, poultry, cattle, sheep, goat and rabbit.

FARMER-EXPO has been acknowledged as one of the most visited exhibitions. In the last 8 years, an average of 40,000 visitors came to see the four day long event. A considerable amount of visitors (approx. 50%) return to the show every year. The compound of visitors reflect the professional characteristic of the exhibition, since 70% of the visitors have some kind of relation to agriculture. (I2)

4.2. OMÉK

The first Hungarian pedigree animal breeding exhibition was organized by István Széchenyi at the turf, in 1829. The initiative of Széchenyi belongs in historical view to the oldest animal exhibitions, such as "Royal Show" in England, or the exhibition in Bern in 1804. Miklós Szabó reports over 53 rural exhibitions between 1867 and 1909. After the World War I. in 1921 participated Minister of Agriculture Nagyatádi Szabó István and Minister President Teleki Pál. After the World War II the first "bigger" international exhibition was located at the area of agricultural exhibitions in 1971: the I. Hunting World Expo. The OMÉK 1990 was represented by numerous participants of research and educational institutions (*Varga – Kárpáti,* 2007.).

"OMÉK the International Exhibition of Agriculture and Food is the oldest and largest farming exhibition in Hungary. The history of OMÉK begins with the 1896 Millennial Exposition in Budapest when Hungary celebrated its first thousand years. In 2005 will witness the 74th time this event that welcomes both representatives from the field and the general public as well. It will also see the historic first time the exhibition is being held within the European Union.

OMÉK's role has always been twofold: one, to give an account of where the sector has gone in the previous five years and of what has been achieved; and, two, to set a course for the coming years and outline the tasks that lie ahead in terms of growth and progress. With OMÉK 2005, this dual role has become all the more important in the light of our accession to the European Union: a report must be made on our experience of little more than a year as an EU member-state, one which discusses EU requirements and options for farming and the regions as well as evidence of suitability for EU membership." (I3)

4.3. Polagra

Poznań International Fair (MTP) was established in 1921. It is one of the trade show organizers with the longest history. The 1st Poznań Trade Fair, a domestic trade show, was organized between 28 May and 5 June 1921 at the initiative of Poznań merchants. In 1927 MTP joins UFI, the Global Association of the Exhibition Industry. In 1929 – General Domestic Exhibition (PWK) was an overview of the economic and cultural achievements of Poland. The exhibitions, organized on a space of 650,000 square meters, attracted 4.5 million visitors. In the 1930s the Poznań International Fair flourished and was ranked the fourth European organizer of international trade shows. In the late 1940s, the trade grounds, which were badly destroyed during the Second World War, were rebuilt. In the following years the Poznań International Fair developed its exhibition program and gradually added new exhibitions and trade shows to the program. Old exhibition halls were rebuilt and expanded and many new halls as well as other facilities were built. 1956 – a general strike against the communist rule in Poznań; the events of 28 June 1956 were witnessed by thousands of trade fair guests from Poland and abroad. 1958 – a decision to organize trade shows twice a year – in spring and in autumn. In the '60s – a rapid development of the Poznań International Fair and problems with the traditional exhibition space. Exhibitions are additionally organized around Lake Kierskie, in Edwardowo and in Wilson's Park. 1973 – the traditional June show is divided into International Technical Fair held in June and International Trade Fair of Consumer Goods TAKON held in September. In the same year specialist trade shows were organized – Salmed, Poligrafia, Drema, and Intermasz. 1990 – the Poznañ International Fair transformed into a limited liability company with the State Treasure as one of its shareholders. Every year the Poznań International Fair changes its image, upgrades the old exhibition halls and builds new pavilions and facilities. Presently the Poznań International Fair organizes over 60 events every year – different trade shows

prepared for over 100 sectors of the economy. Every year it attracts over 300,000 visitors and more than 11,500 exhibitors (I4)

Polagra Farm was a complex agricultural exhibition, including the machinery, buildings, animal husbandry and the crop production, organized yearly with it's complementary: the Polagra Food. Nowadays the Polagra brand is divided for three exhibitions: Food, Tech and Premiery.

5. Discussion – Complex economic value of exhibitions

The main findings of the calculations based on the KAVA-model can be seen in Table 1. The interested parties are divided into 8 groups, and where it was needed, also into subgroups. The calculations were refined according to the special interest of these (sub)groups.

Table 1. Economic values of different exhibitions

Category	ECONOMIC VALUE							
	FE2005		FE2006		OMÉK		POLAGRA	
	Sum (1000 HUF)	Share (%)	Sum (1000 HUF)	Share (%)	Sum (1000 HUF)	Share (%)	Sum* (1000 HUF)	Share (%)
1. Organizer	30 690	10,9%	43 364	13,0%	936 120	50,4%	1 079 975	39,5%
2/a. Exhibitor (big)	67 292	23,8%	78 669	23,7%	79 300	4,3%	290 442	10,6%
2/b. Exhibitor (midseized)	42 320	15,0%	44 065	13,2%	821	0,0%	71 132	2,6%
2/c. Exhibitor (other)	-12 951	-4,6%	-13 915	-4,2%	-87 913	-4,7%	-37 250	-1,4%
2. Exhibitors (alltogether)	96 661	34,2%	108 819	32,7%	-7 792	-0,4%	324 324	11,9%
3/a. Professional visitor (big)	37 800	13,4%	41 800	12,6%	124 500	6,7%	198 056	7,2%
3/b. Professional visitor (midseized)	22 860	8,1%	25 110	7,6%	12 600	0,7%	9 567	0,3%
3/c. Professional visitor (other)	17 900	6,3%	17 910	5,4%	21 600	1,2%	21 667	0,8%
3. Professional visitor (alltogether)	78 560	27,8%	84 820	25,5%	158 700	8,5%	229 290	8,4%
4. Expert firm (Consultant)	7 960	2,8%	9 042	2,7%	18 080	1,0%	77 642	2,8%
5. Personal expert	202	0,1%	403	0,1%	1 320	0,1%	2 280	0,1%
6. Future expert	1 802	0,6%	1 552	0,5%	2 976	0,2%	8 608	0,3%
Expert visitors (alltogether)	215 875	76,3%	248 000	74,6%	1 109 404	59,8%	1 722 119	62,9%
7. Laymen visitors	1 090	0,4%	1 460	0,4%	3 800	0,2%	-30 000	-1,1%
Experts + Visitors (Alltogether)	216 965	76,7%	249 460	75,0%	1 113 204	60,0%	1 692 119	61,8%
8. Region	65 875	23,3%	83 120	25,0%	743 166	40,0%	1 044 648	38,2%
Exhibition (alltogether)	282 840	100,0%	332 580	100,0%	1 856 370	100,0%	2 736 767	100,0%

Source: Own calculation. (*with an average exchange rate in 2006 1 PLN = 67,81 HUF)

If we take a closer look on the table above, we can see that the highest economic value is characteristic for the Polagra, what is depending basically on the size of the country, and the arisen higher distances, the exhibitors and visitors have to travel. (This information is also highlighted in the *Figure 4.*) The higher values of OMÉK are bounded to the length of the event (10 days) and the higher of visitors and exhibitors, compared to the Farmerexpo's two years' numbers. The change in case of the Farmerexpo can be explained by the quick date-changes the organizers had to make, because of the time-schedule of the OMÉK, what is a five-years-organized-event, and disturbed the usual timing of the Farmerexpo in 2005.

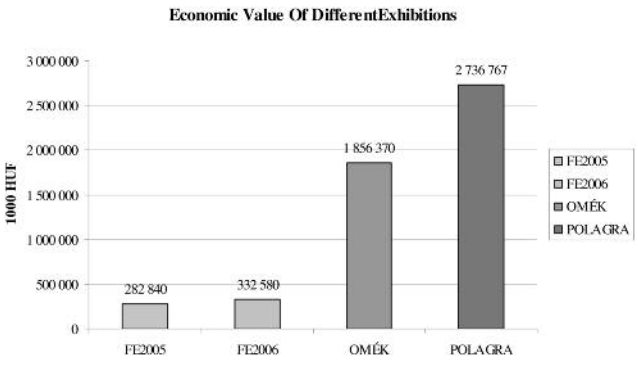

Figure 4. Calculated Economic Value of Different Exhibitions
Source: Own calculation. (*with an average exchange rate in 2006 1 PLN = 67,81 HUF)

Going further in the analysis, and taking a look on the shares of the different exhibitions, we can see, that not all stakeholder groups have a positive balance regarding the events. The other exhibitors (the smallest ones) and the laymen visitors may have a negative one, since their costs may be higher, than the benefit they gain from participating the fairs.

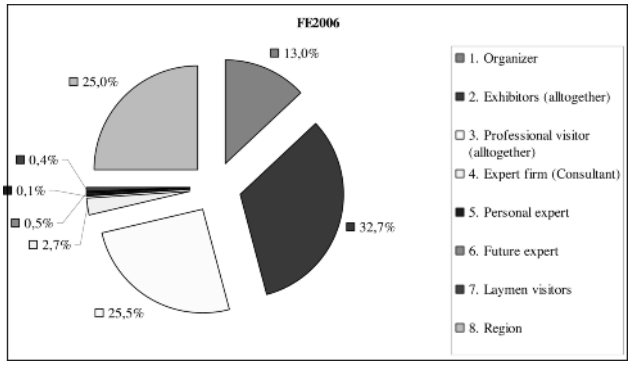

Figure 5. Share on Economic Value in Case of Stakeholder Groups at Farmerexpo in 2006
Source: Own calculation.

In the *Figure 5.* there is a graphical illustration of the share of different stakeholder groups benefiting from the exhibition. (It gains the data from the Farmerexpo in 2006, where all categories had a positive balance. The four main beneficiaries are the Organizers, the Exhibitors, the Professional visitors, and the Region, while the other groups have a marginal role only.

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A study of the causes leading to the liquidation of agricultural enterprises

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Summary: The viability of agricultural enterprises is of paramount importance. Their liquidation has harmful effects on broad strata of society. The aim of my research is therefore to analyze the leading causes of liquidation of agricultural enterprises. The research was led on 17 agricultural enterprises. This may help in the prevention and treatment of their insolvency.

The research results show that a long-term agricultural production is not sustainable with a low equity capital. For the long-term maintenance it is necessary that the investors establish the enterprise with a capital according to the type of the production. The loan can not replace the entrepreneurs own resources, it is only complementary to it. The owners of agricultural businesses should strive to ensure that the paid-up share capital is kept in the firm, because in case of payment difficulties, this can be an adequate financial provision.

Companies with financial problems can avoid liquidation if the crisis is detected in time by the leaders. However, the owners must organize the management of the enterprise so that it should have the necessary technical and economic knowledge.

With an appropriate management, and use of means of crisis management, the liquidation of the enterprise can be prevented.

Key words: agricultural enterprises, liquidation, capital lost, risk, crisis management

Introduction

In a market economy, legal regulation of winding up poorly performing, unviable companies is indispensable. The details of that regulation may vary from one country to another, but its aims are universal, namely to turn around companies that can continue in the long run despite temporary insolvency on the one hand, and to wind up those that are permanently insolvent on the other hand. Putting unviable and insolvent companies into liquidation makes it possible for other market players to use their assets more effectively and more profitably.

When Hungarian lawmakers passed the Bankruptcy Law (BL) in 1992, their primary aim was to put a quick end to the following problems that were starting to appear in the Hungarian economy and getting graver and graver in the early 1990s: chain debts among companies, liquidity problems increasing in severity and frequency, and permanent insolvency of companies (*Erdős, 2007*). Bankruptcy proceedings often failed to lead to agreement or to expedient reorganization and tended to result in liquidation (*Erdős, 2005*).

The 1993 amendment to the BL made it impossible for bankrupt companies to file for bankruptcy and changed the deadlines of the bankruptcy procedure in such a way that they became impossible to keep, consequently the proceedings could not be instituted. At the same time, the number of new bankruptcy proceedings initiated per year has been steadily growing. According to the surveys conducted by *Creditreform Magyarország* between 1996 and 2008, more than 1,000 new bankruptcy procedures were initiated in 2008, which is over 250% of the 1996 numbers.

Widespread insolvency among companies is harmful for several reasons. The employees of companies that are wound up tend to become unemployed, which on the one hand increases state expenditure in the form of unemployment and social benefits, while the diminished incomes of unemployed people may lower demand, which in turn affects the earnings of other market players adversely, on the other hand. The wage subsidy that companies facing bankruptcy may be awarded by the *Labour Market Fund* is another state expenditure with a low rate of return. Of the 5.6 billion Forints paid out in 2006 for example, only 1.1 billion Forints were paid back. Companies going out of business further diminish the state's income from taxes.

Owing to the special position of agriculture in the Hungarian economy, companies liquidated in that sector impact the economy and society negatively in a number of other ways as well:

- Agriculture plays a prominent role in meeting consumers' food requirements.
- It is essential that agriculture should exploit Hungary's natural resources.
- About 400,000 people are employed in agriculture and food processing.
- By providing livelihood for rural communities, agriculture plays an important role in slowing the stream of rural population moving to cities.

Based on the above, the fundamental aim of this study has been to analyze the causes leading to the liquidation of

agricultural enterprises in order to help them avoid and manage bankruptcy. Of the 17 agricultural enterprises that were chosen for analysis, 13 were located in Hajdú-Bihar County, and 4 in Heves County; 15 of the 17 were cooperatives. The reason why cooperatives are over-represented in the present non-representative sample is that bankruptcy procedure often cannot be instituted in limited-liability or limited partnership companies (the two types most frequently affected by the BL) for lack of the necessary documentation and information. Of the 17 companies studied, one filed for bankruptcy in the first five-year period following the introduction of the BL in 1992. In 10 companies, bankruptcy proceedings were initiated between 1997 and 2001, in a further five between 2002 and 2006, and in one in 2007.

Materials and methods

Following the literature on bankruptcy forecasting, the study analyzed the following features of the 17 enterprises on the basis of their final accounts and their annual reports of the years preceding bankruptcy: liquidity quick rate, the current assets/ total assets ratio, the proceed/after-tax profit ratio, and the customer/supplier ratio.

In addition, the following data of the enterprises were also examined: the make-up of the liabilities reported in the final account, the degree of indebtedness, the ratio between equity capital and liabilities total and the make-up of accounts payable (the rate of long-term versus short-term liabilities within liabilities total).

Further analyses were made of the net earnings by sales, the profit and loss figures of operating/ business activity, the profits on financial transactions and, finally, changes of the balance sheet profit and loss figures over time, which can throw light on the causes leading to permanent insolvency.

Claims made by creditors in the bankruptcy procedure may differ from the value of accounts payable reported in the final accounts, because it is only claims that have been made in the period between the start of the bankruptcy procedure and the deadline set by the BL (either 40 days or a year from the start of the procedure) that are satisfied, provided the creditor has paid the registration fee, which amounts to 1% of the value of his claim. The study examines the make-up of the claims registered by creditors and listed in the asset division proposal submitted by the liquidator. The asset division proposal sets creditors' claims registered during liquidation against the assets that are available for the company in liquidation for satisfying those claims.

Causes leading to the liquidation of the studied enterprises

Based on the results of the analyses, it can be concluded that the liquidation of the studied agricultural enterprises were brought about by the following problems of Hungarian agriculture after the transition in 1989:

1. Agricultural cooperatives were converted without premeditation.
2. Agricultural cooperatives lost capital following economic conversion.
3. Their domestic and foreign markets narrowed.
4. The gap between the prices of agricultural and industrial products increased.
5. Lending rates increased and subsidies decreased.
6. Losses made agricultural enterprises less adaptable to economic change.
7. Following Hungary's accession to the EU, and as a result of increasing agricultural import, a number of market players e.g. dairy farmers or fruit and vegetable growers faced losses due to poor market organization.

Of the 17 agricultural enterprises in this study, 13 were successors of converted agricultural producers' cooperatives. Following conversion, 12 of them continued operating as cooperatives, and one was converted into a joint stock company. One of the enterprises that was set up as a cooperative was not the successor of one, but it had taken over an agricultural producers' cooperative with huge debts.

Prior to conversion, two of the studied enterprises had been stripped of assets to such a degree that their lack of farm equipment doomed them to failure from the outset. The management of one of the two cooperatives that were short of capital when they were set up opted for voluntary winding up, but had to face a compulsory winding-up order in the end.

Another agricultural enterprise used to get the bulk of its income from sales of wine products on the Soviet market prior to the transition of 1989. The loss of that market, however, made the company unviable and insolvent. It was characteristic of all the enterprises in this study that they did not have any income from exports in the years before their liquidation. That was a problem, because the higher prices achievable by exporting could have offset the increasing costs of imported raw materials.

The studied enterprises were force to cut costs by not investing into development or the safety of production, which (combined with extreme weather conditions) led to significant yield losses in crop production between 1997 and 2000. In 1997, producers in Hajdu-Bihar county were struck by drought, whereas in the years 1998 and 2000 farmers in Hajdu-Bihar and Heves counties suffered water damage (due to too much precipitation) amounting to scores of billion Forints, which made it impossible to work the land or to harvest crops. The majority of the enterprises had financial difficulties due to the losses suffered earlier and had, by the time liquidation started, accumulated significant debts which were partly bank loans, partly tax arrears. In several agricultural enterprises bankruptcy was brought about by the drop in earnings caused by decreased yields. Of the 17 agricultural enterprises that went bankrupt, liquidation was initiated in 9 following drought and water damage. In order to finance production, all 9 enterprises were forced to take out loans secured by mortgage that could only be repaid by selling equipment or livestock, which further weakened their respective positions. At the end of that vicious circle or rather spiral, the enterprises lost their creditworthiness and became insolvent; liquidation could no longer be avoided.

Of the 17 liquidated enterprises in this study, one operated as a production and marketing cooperative, buying and selling vegetables. As a result of the unfavourable market situation of 2004, however, the cooperative made serious losses and, since it did not have enough capital, insolvency was unavoidable.

An analysis of the reports of the studied enterprises showed that the liquidity quick rate, the proceeds/after tax profit ratio, the equity capital/ total liabilities ratio and, finally, the rate of indebtedness had clearly indicated financial failure prior to and at the beginning of liquidation.

In the years preceding liquidation, the average liquidity quick rate of the enterprises in this study was significantly lower than the expected value of 1.00, what is more, it went on decreasing until the start of liquidation. (*Figure 1*)

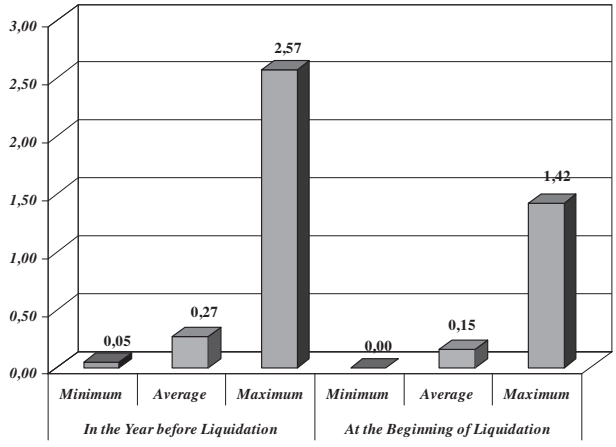

Figure 1. Changes of the liquidity quick rate prior to liquidation
(Source: the author's own calculations based on reports)

The average proceeds/profit ratio of the 17 enterprises was negative in the period immediately preceding liquidation, which means that the considerable losses suffered earlier played a decisive role in their insolvency. (*Figure 2*)

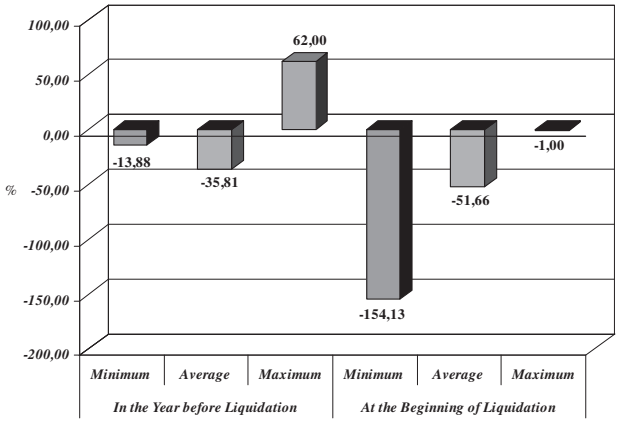

Figure 2. Changes of the proceeds/profit ratio before liquidation
(Source: the author's own calculations based on reports)

The enterprises had low levels of equity capital and a high degree of indebtedness due to the following two causes *(Figures 3 and 4)*:

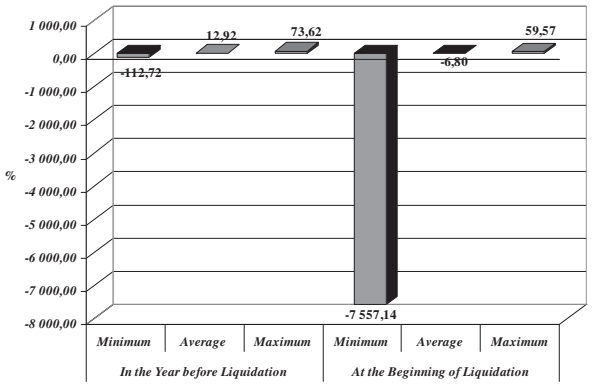

Figure 3. Changes of the rate of equity capital prior to liquidation
(Source: the author's own calculations based on reports)

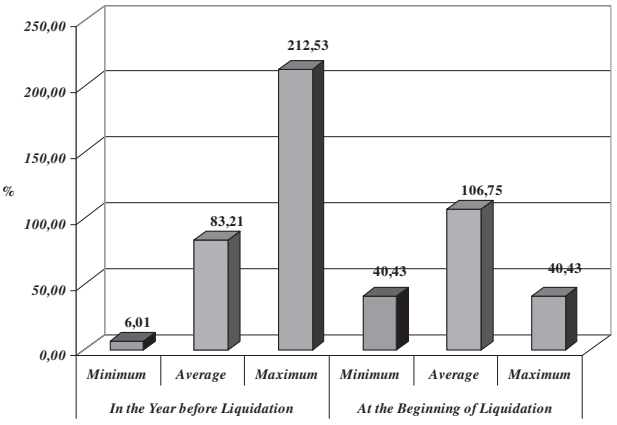

Figure 4. Changes of the degree of indebtedness before liquidation
(Source: the author's own calculations based on reports)

1. The majority of the enterprises had been making losses for years before liquidation, consequently their equity capital kept decreasing.
2. As most of the enterprises lacked the necessary income to cover operation costs, they had to take out loans which, however, did not cover tax liabilities.

In the enterprises in this study, accounts payable were mainly short-term debts, overwhelmingly tax arrears accumulated over the years.

An analysis of the indices has shown that the deterioration of the liquidity rate, the decrease of the equity capital, accompanied by the increase of the degree of indebtedness are warning signs of impending insolvency. The afore-mentioned indicators should be continuously monitored if bankruptcy is to be avoided.

Conclusion

Under Hungarian laws the minimum capital requirement to start a company is low, consequently a great many companies have been formed since the transition of 1989. The two most common types are limited partnerships — where there is no legal requirement of a minimum of issued capital — and limited-liability companies — which take no more than 500,000 Fts to form since 2007, and where the

owner's liability is limited. Those companies have often been formed out of necessity, in an attempt to escape unemployment. They tend to have a single source of income, with the loss of which the company becomes unviable. The enterprise that specialized in game management is a case in point. When the managing director fell ill, the business collapsed and had to be liquidated because of unpaid debts.

According to expert opinion enterprises most often go bankrupt over tax debts. This study has found that, in most of the studied agricultural enterprises, the Tax and Financial Audit Office was both the greatest creditor and the initiator of the bankruptcy procedure. Because of the high risks of agricultural production, suppliers sometimes secure their claims with the right of option. In two enterprises in this study that is what caused bankruptcy. The low earnings of the enterprises failed to cover their liabilities and, as a result, suppliers took possession of their implements of production.

Contrary to bankruptcy forecasting literature, which claims that bankrupt companies have characteristically low rates of current assets, this study has found that the opposite is the case in failed agricultural enterprises. The enterprises in the sample were characterized by a decrease in invested assets. As the fixed asset requirement of agricultural production is considerable, a steady decrease of those assets gradually makes their operation impossible.

An analysis of the causes of bankruptcy in the agricultural enterprises of this study has identified several problems the solution of which is the responsibility of both the state and the individual agricultural entrepreneur.

Producers to have safe market positions, they have to produce large quantities of consistently high quality products and that can only be done by forming big, capital intensive companies. The state can facilitate the formation of capital intensive agricultural enterprises with subsidies or tax incentives given to companies with high issued capital. Capital concentration could also be increased by setting a minimum requirement of issued capital for forming enterprises for certain business activities, the same way as law requires adequate qualifications for doing certain jobs.

Agriculture has always been a high risk business due to the special circumstances of agricultural production. A survey of the perception of risk factors conducted by *Székely* et al. in 2007 found that Hungarian farmers in a pilot study rated on a scale of 1 to 7 the weather as the number 1 risk factor, and that was followed by the fluctuation of prices in the second place. In order to manage the more and more frequent risk of extreme weather conditions, Parliament passed a bill in 2008 *on the national agricultural loss reduction plan and on the contribution to loss reduction*, putting it into effect with *Decree 32/2009 (III. 31) of the Ministry of Agriculture and Water Management on the procedure of agricultural loss reduction*. The plan consists of two parts: the contribution of individual framers on the one hand, and a state subsidy of matching funds of no less than the former amount. That "insurance plan" provides loss reduction in cases of frost, drought or water damage for farmers who have joined the plan. *** Participation in the loss reduction plan is compulsory for agricultural companies and small and medium businesses, but optional for primary producers. Agricultural producers can get loss reduction only if the loss is/ damages are reported within 10 days of occurrence to the special administrative division of the competent Agricultural Office, while loss reduction claims must be handed in to the regional office of the special administrative division by October 20th of the year under review.

In 2009 crop producing enterprises have been estimated to suffer approximately 50% yield loss due to various disasters. Water damage in the first couple of months of the year, drought from March on and the situation has recently been exacerbated by storm damages. The expected price increase generated by demand exceeding supply can only partly offset the above losses. The loss reduction plan may serve as an interim solution. However, loss adjustment payments may well be deferred into 2010 because the payment schedule to be submitted by the Ministry of Agriculture and Regional Development by December 10th at the latest cannot be drawn up before the EU Committee has given its approval in the notification procedure. Since claims of yield losses will not be paid in 2009, the costs of agricultural production in that year will have to be covered by the producers. In that way, enterprises lacking the necessary assets may go under despite the introduction of the loss reduction plan.

In the author's experience, managers of small businesses especially find it difficult to interpret accounting data, and they also tend to be poorly informed about tax rules. Without that information, the annual business plan (if there is one) will not be well-founded, and the enterprise may go bankrupt even if its manager knows all the ins and outs of his special field. This can only be avoided by making sure that the managers of enterprises are well-versed in business management as well as their special fields.

Should an enterprise get into a critical situation, bankruptcy can still be avoided by employing the methods of crisis management, provided the situation is recognized in time. In that way the enterprise survives the crisis, creditors get paid, and jobs are saved. Unfortunately, crisis management is not widely used in Hungary partly due to the attitude of the enterprises in financial difficulty and partly due to the creditors' lack of confidence in the method, although the latter could play an important part in turning around the ailing enterprise. As an incentive for using crisis management methods, the state could subsidize companies the same way that it subsidizes consultation.

The wave of liquidations that started in 2009 has also been enhanced by the wide-spread practice of chain debts which makes a growing number of companies face bankruptcy. Claim management as well as customer rating is becoming more and more important because they are indispensable if marketing risks are to be lowered.

Crisis management and claim management, however, require ample capital, which again underlines the fact that enterprises that are short of capital are not viable in the long run.

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Agrarian budget as an instrument of agrarian development policy of Serbia

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MBA Course in Agribusiness and Commerce Subsidized by the European Union TEMPUS CD_JEP 40067-2005 at University of Belgrade

Key words: agricultural budget, agricultural policy, subsidies, premiums, support.

Purpose of the research

Purpose of the research is to emphasize the role of agrarian budget in development of Serbian agrarian economy and to examine the problem of agricultural and rural development financing support. Furthermore, in this research initial reforms of economic measures have been analyzed concerning Serbian agrarian policy. The goal of this paper is to provide an insight into the role of agricultural budget in agrarian policy of Serbia.

Design/methodology

The first part of the study gives an overview of macroeconomic situation in Serbia and impact of the financial crisis on Serbia's economy. Second part includes analysis of the topic item, i.e. agrarian budget role in Serbian agrarian sector. It includes review of relevant literature and researches already conducted on legislation and practice of Serbian agrarian policy as well as examination of statistical data regarding present agrarian budget for 2009.

Research area

The research focuses at the Serbian agrarian budget for 2009 and agrarian policy of the present Serbian government administration.

Expected implications

A new, stable and consistent concept of agricultural policy and adjusted budgetary support is one of the prerequisites for changes. The research should provide detailed explanation how Serbian government is planning to protect Serbian agriculture during global financial crisis and what measures will implement in agrarian policy. It will provide a critical insight of agrarian budget for 2009 while using insider information from the ministry of agriculture.

The role of corporate branding in Serbian mobile phone operator market

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MBA Course in Agribusiness and Commerce Subsidized by the European Union TEMPUS CD_JEP 40067-2005 at University of Belgrade

Key words: Corporate branding, Services & Quality, Loyalty & Trust, Price, Switching and Mobile Network service providers

Purpose

This research is carried out to know the role of corporate branding in mobile phone network along with different influencing factors involved in the purchase of mobile telephone connections. This thesis discusses corporate branding from consumer's point of view that how much they value it and what type of role it has.

Theory and Method

This is a quantitative study. A questionnaire is used in order to investigate corporate branding and other influencing factors involved in purchase decision of the customers. Population selected for this study is "Belgrade University undergraduate and grad Students", which is the most of Serbian youth segment who are studying here, and is a valuable source that gives precise information with high probability about market preferences according to the Research of Serbian republic statistical office. In addition to expand my research on the national level I've used the latest research from a Serbian republic statistical office on subject of Utilization of information and communication technologies in Serbia 2008 that I've gathered and combined it with our source interview from our contact person at Telenor Serbia Public Company Limited with essential information about competitor and consumer preferences insight provided by the Company, which is absolutely in accordance with my research and gives full picture with accuracy about Serbian mobile phone operator market situation.

Primary data are obtained by collecting data from questionnaire and interview, while the secondary data are collected from various reliable sources. Primary data provide reliable content in accordance with a secondary data obtained by Serbian republic statistical office and with a Research of competitor and consumer preferences insight provided by Telenor Company, which mixed together yield complete key point information for making final analysis and conclusion for the thesis. The analysis of the data has been performed in accordance with the chosen theories and summarized in a table, which serves as a tool for deriving reliable and relevant conclusions. The sample size was determined by conducting a primary study and defining the variance of primary sample and the intended number of samples was selected carefully and randomly from the population. Then the validity and reliability of the questionnaire was determined. The used questionnaire in this research consisted of 7 common, and 30 specialized questions which were supporting the hypotheses of the research. Data was analyzed using the frequency percent techniques, and in the chapter related to the deductive statistics, one-sample t test was used to analyze and approve/disapprove the questions supporting the research hypotheses.

Target audience

My MBA Thesis analysis and conclusion will contribute very positive benefit and useful information about the role of corporate branding in Serbian mobile phone Networks along with different influencing factors involved in the customer's purchase preferences.

I strongly believe that the company's intend to use this study as a base for their further business strategies, also considering that my research could give general guidance and will be of benefit to marketers in similar fields on how to analyze competitive environment.

Conclusion

The analysis of this study reveals different set of results while making comparison between literature and empirical. It investigates the relative importance of the corporate branding to the customers in mobile phone telecommunication industry while making purchase decision.

The findings of this study provided useful information which is helpful not only for the students but also for the brand managers of mobile telecom operators that how they can improve their company's strategic position for longer period of time through corporate branding to trigger more customers and for a good brand.

Adaptations to potential impacts of climate change in the "New Hungary" Rural Development Programme

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Summary: There are evidences that the climate is changing and the effects on agriculture and wildlife are discernible. Spring is occurring earlier and autumn later, all of which have impacts on agriculture and forestry. Climate change is also predicted to result in more frequent droughts, increased flooding in Hungary, but the relationship between agriculture and climate change is more complex. Climate change has physical effects on farming and farm based wildlife. Agriculture needs to adapt to climate change by exploring, which crops and farming systems are best adapted to the changed conditions. Land management also needs to adapt to preserve biodiversity by protecting valuable habitats and species and helping them in the changing environment. With better management, agriculture and forestry can also mitigate climate change by reducing direct greenhouse gas emissions from land use, land use change and forestry, by producing crops as a source of renewable energy and by protecting carbon stored in soils and in manure.

The HRDP comprises of a series of funding based on the following overarching priorities: (i) enhance the environment and countryside, (ii) making agriculture and forestry more competitive and sustainable, (iii) enhancing opportunity in rural areas, whether in the farming sector or the broader rural economy. Actions discussed in this paper are based on the New Hungary Rural Development Programme (2007–2013) and focused on reducing the effects of climate change in rural area. Establishment of agro-forestry systems and integrated pest management help mitigation goals and increase climate change adaptation potential. Minimizing unwanted side effects of agriculture by reducing the use of fertilizer and increasing the safety for environment (soil, water, and air) and human health have positive effects on adaptation potential. Restoration of agricultural production though diversification of agriculture and pastures management, improvement in drainage and irrigation equipment are good examples of adaptation for climate change. Integrated production, which is oriented to controlled cultivation of crops, vine, fruits and vegetables, and improvement of animal rearing conditions to increase production standards and overall welfare are preferred and ecologically sound methods of adaptation.

Key words: Climate change, Rural Development Programme, Adaptation, Hungary

Introduction

Over the last 2,400,000 years the Earth's climate has been unstable, with very significant temperature changes, going from a warm climate to an ice age in as rapidly as a few decades. Collected information indicates a strong correlation between carbon dioxide content (CO_2) in the atmosphere and temperature increase (*Walther* et al. 2002, IPCC, 2007). These changes suggest that climate is very sensitive, even if temperatures have been relatively stable during the last 10,000 years. During this period, global mean temperatures have varied less than 1°C in a century, but anthropogenic emissions of green house gases (GHG) could bring the climate to a state where it reverts to the highly unstable climate of the pre-ice age period (*Baettig* et al. 2007, *Easterling* et al, 2007). Since the beginning of the twentieth century, the global average surface temperature has risen by 0.74°C, although this increase has not been continuous (Jones et al. 1999, *Fischlin* et al. 2007). The linear warming trend over the past 50 years (0.13°C per decade) is nearly twice that for the past 100 years (*Brohan* et al. 2006, Yohe et al. 2007).

Adaptation research is focused on establishing services that enable decision-makers to manage the risks associated with extreme climate conditions and allow communities to adapt to climate change (FAO 2003, *Hitz, Smith* 2004, *Parry* et al. 2005, *Tompkins, Adger* 2005, and HRDP 2007–2013). Improved understanding of the climate system can contribute to enhancing the well-being of society as climate prediction centres have the skills to produce useful climate predictions and information in the coming years (*Brooks, Adger* 2005). Results of adaptation research include maps of potential risks and opportunities, ecological potentials for renewable energy sources, urban management, disease outbreak and accurate climate predictions, but the skills of climate monitoring and prediction must be improved as the world is served by one climate system, which redistributes heat, energy and other atmospheric and oceanic constituents (*Cline* 2007). Mitigation and adaptation requirements cannot be achieved by individual countries alone.

Priorities of the New Hungary Rural Development Programme in 2007 to 2013 period

Objectives established in Regulation (EC) No 1698/2005 aim at the integration of major policy priorities as declared in the conclusions of the Lisbon and Goteborg European Council

meetings. On the basis of these strategic guidelines, Hungary has prepared its national strategy plan as the reference framework for the preparation of rural development programmes. The resources devoted to the priorities depend on the specific situation, strengths, weaknesses and opportunities of each programme area and their contribution to the Lisbon and Goteborg objectives.

Axis 1: **Strategic guideline of improving the competitiveness of the agricultural and forestry sector:** Hungarian agricultural, forestry and food-processing sectors have great potential to high-quality and value-added products that meet the demand of consumers. Competitiveness of agriculture is focused on the priorities of knowledge transfer, modernisation, innovation in the food chain, and on the investments in physical and human capital. Key actions in Hungary include restructuring and modernisation of the agriculture, which continue to play an important role in the development of rural areas. Improving the competitiveness and environmental sustainability of Hungarian agriculture and food industry are key elements of the HRDP. There is considerable scope in the rural economy to create new products, to retain more value in rural areas through quality schemes and to raise the reputation of traditionally Hungarian foods. A market-oriented agriculture helps to consolidate the position of sector. Support of advisory services to meet EU standards also contributes to the process of integration. Introduction of new products and processes could significantly contribute to the performance of smaller farm businesses in the coming years. New forms of cooperation facilitate the access to the results of R & D activities. This brings new opportunities for farm businesses, but the realisation of this economic potential depends on the strategic and organisational skills. Encouraging young farmers can play an important role in this respect as long-term sustainability depends on the production of high quality products, while achieving high environmental standards.

Axis 2: **Strategic guideline of improving the environment and the countryside:** Axis 2 of HRDP contributes to preservation and development of high nature value farming and forestry systems to protect natural resources and landscapes in rural areas. The measures integrate environmental objectives and contribute to the implementation of Natura 2000 network and the Goteborg commitment to reverse biodiversity decline. Action in the field of water policy and establishing a framework to meet the new targets for climate change mitigation are also important parts of HRDP. Hungarian farmers respect mandatory standards of EU registration and deliver services focused on specific resources, such as water and soil. In less-favoured areas, sustainable land management practices reduce the risks linked to climate change and desertification. Environmental friendly farming helps to preserve landscapes and habitats, which are important part of the cultural and natural heritage and of the attractiveness of rural areas. Agriculture and forestry are at the frontline of the development of renewable energy and sources for bio-energy installations. Sustainable agricultural and forestry practices contribute to the reduction in GHG emissions and preservation of the carbon sink effect of soil and vegetation. Organic farming represents a holistic approach in this respect and the provision of environmental goods form a basis for growth. In this way, HRDP can make a vital contribution to the attractiveness of rural areas.

Axis 3: **Strategic guideline of improving the quality of life in rural areas and encouraging diversification of the rural economy:** The measures are used to promote capacity building, skills acquisition and help rural areas to remain attractive for future generations. Multifunctional agriculture and diversification of activities are also necessary for sustainable development in both economic and social terms. Developing micro-business on new competencies and crafts build on traditional skills can increase employment, particularly when this is combined with training to promote entrepreneurship, traditional rural practices, environmental services and quality products. Innovative use of renewable energy sources are major element of growth and contribute to creation of new products in rural areas.

Axis 4: **Strategic guideline of building local capacity for employment and diversification:** Support under axis 4 is in the context of a community-led local development strategy building on local needs and strengths, to combine the objectives of competitiveness, environment and quality of life. Integrated approaches safeguard the natural and cultural heritage, raise environmental awareness and promote local services.

Material and methods

There are two main categories of response to climate change (i) climate change mitigation (actions aimed at reducing the causes of climate change) and climate change adaptation (actions aimed at adapting to the climatic changes that are already inevitable). Agriculture and forestry sector is unique in having the ability to produce and to sequester greenhouse gases, as well as to provide biomass-derived renewable energy. Climate change adaptation strategy of the New Hungary Rural Development Programme is discussed in this paper, which addresses topics, such as biodiversity, water quality, irrigation and their role in agriculture, implementation of the Nitrates and Water Framework Directives on farmland, climate change mitigation in agriculture including bio-energy, soil quality, organic farming, landscape management and protection the traditional form of land use.

Adaptations Objectives of the New Hungary Rural Development Programme

1. / Emissions of greenhouse gases in Hungary

Agriculture and forestry currently account for about 12–15% of total greenhouse gas emissions in Hungary. The focus is on methane (CH_4) and nitrous oxide (N_2O) emissions. Agriculture accounts for around 33% of methane

emissions and 70% of nitrous oxide emissions. About 77% of this methane comes from enteric fermentation in the digestive system of animals and 22% from manure management. The nitrous oxide emissions arise from manures and artificial fertiliser. Methane and nitrous oxide have global warming potentials that are 21 and 310 times greater than carbon dioxide. Emissions of carbon dioxide (CO_2) are from direct energy use, such as diesel in tractors, gas to heat and electricity in livestock buildings. Although agriculture is responsible for around 10–11% of GHG emissions, the sector can help to mitigate CO_2 emissions from other sources through carbon sequestration in soils and timber.

Carbon dioxide, the most important greenhouse gas is produced largely by combustion of fossil fuels. *Between* 1985 and 2007, total GHG emissions fell by 35% in Hungary. Much of this decline has come from the energy sector *(Figure 1)*. Emissions have fallen continually except for waste management. Energy sector including the transport accounted for over 75% of GHG emission. Agriculture is responsible for a very small share of CO_2 emissions. Agricultural practices are significant sources of methane and nitrous oxide, which are important contributors of climate change, but emissions of this sector have also declined since 1985.

The main objective of the HRDP is the improved understanding of the management of greenhouse gas emissions from soils under different forms of land use and disturbance regimes. Carbon dioxide emissions associated with the land use, land-use change and forestry are presented in *Figure 2*. The most important sink of CO_2 in Hungary is forestry, but in many years agricultural activities also contribute to CO_2 sequestration. The main objective of the HRDP is the improved understanding of the management of greenhouse gas emissions from soils under different forms of land use and disturbance regimes.

Methane emissions have declined considerably over the last 30 years. Emissions from agriculture increased up till the mid 1980s, then stabilised. Emissions have declined by about 24% in the early 1990's, mainly as a result of reduced livestock numbers *(Figure 3)*. Agricultural emissions of nitrous oxide have fallen in 1990s, probably due to reductions in fertiliser use. The level of emissions is now 50% as it was 30 years ago. However, the emissions from manure management have stabilized and from agricultural soils have increased slightly since 1994 *(Figure 4)*. Contribution of agriculture to total nitrous oxide emissions is between 65 and 75%.

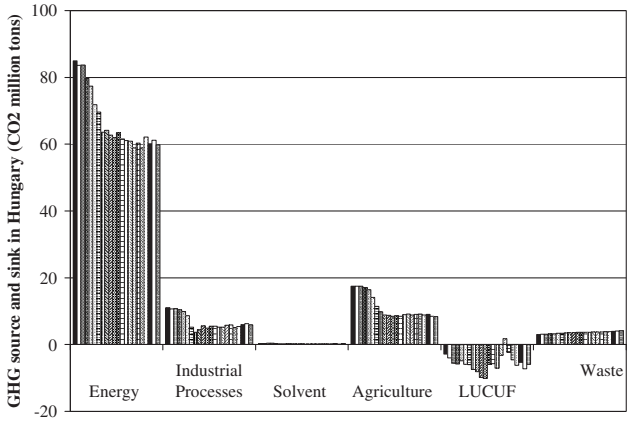

Figure 1: GHG source and sink in Hungary between 1985 and 2007 (million tons)

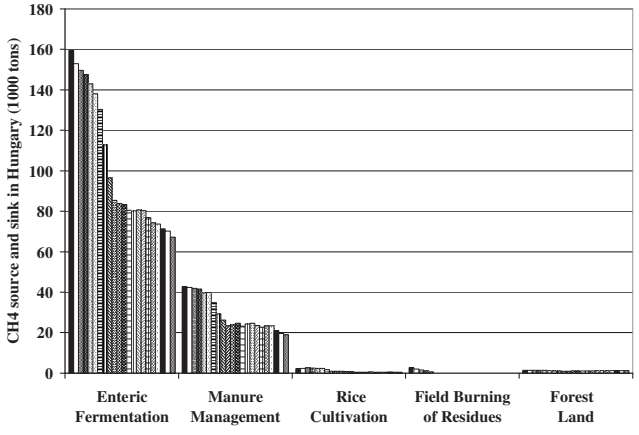

Figure 3: CH_4 source and sink in Hungary between 1985 and 2007 (1000 tons)

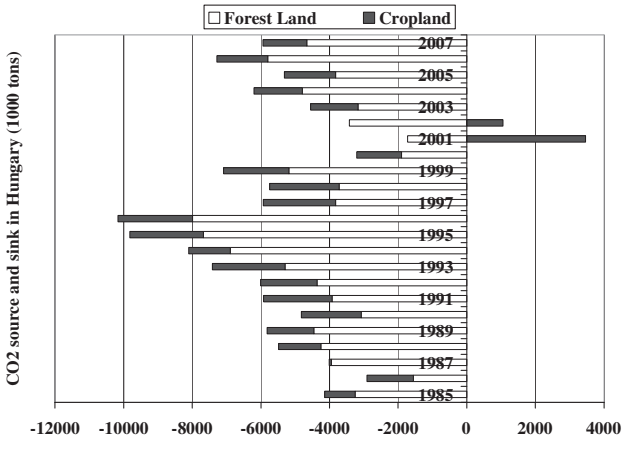

Figure 2: CO_2 source and sink in Hungary from LUCUF (1000 tons) between 1985 and 2007

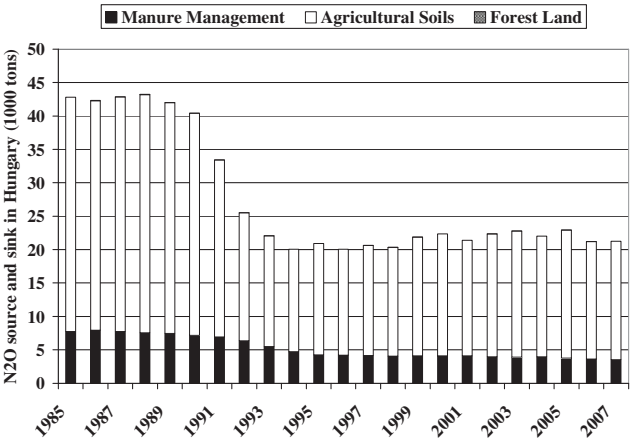

Figure 4: N_2O source and sink in Hungary between 1985 and 2007 (1000 tons)

2. / Adaptation activities in Hungary

Agriculture is central to facilitate the process of adaptation by habitats and species, especially through the provision of ecosystem services, which is increasingly important and valued by society. At present, many valuable habitats are fragmented and surrounded by intensively managed farmland with semi-natural habitat. To improve the resilience of valuable habitats and allow species to migrate in the face of changing climate, this isolation needs to be reduced and the environmental quality of the isolation matrix improved. Some of the species benefit from climate change including plants characteristic of dry grasslands. However, species that are already at the edge of their range, such as those characteristic of wetland conditions and mountain regions may face local extinction. HRDP helps agriculture; forestry and land management sector to play its full part in tackling climate change and promote resource efficient farm management. It assists the production of non-food crops to substitute fossil fuels and ensures the development of ecological farming. Forestation and to a certain extent agro-forestry systems improve landscape value and support climate change goals. Water-saving production techniques, such as diversified crop rotations are also contribute to climate change adaptation operations and have effects on competitiveness of farming.

The first objective of HRDP is the development of agricultural infrastructures to improve the overall performance and competitiveness of the agricultural holdings through modernization of production and introduction of new processes and technologies. Eligible investments include assets used for agricultural production and for environmental protection. These measures contribute to the mitigation of green house gases and adaptation to climate change. Extensive pastures management, diversification of grass species and improvement of drainage, irrigation equipment are good examples for climate change adaptation. Measures include rehabilitation of existing and construction of new draining facilities, as well as investments in irrigation equipment and rehabilitation of existing networks. Development of water storage capacity, installations for waste water treatment are well focused in the HRDP, similarly to water-saving production techniques, such as diversified crop rotations, introduction new crops, irrigation practices, and integrated pest management, which also contributes to climate change adaptation.

Actions under arable farming include the development of technology in storage and drying, while actions under horticulture include investments in environmentally sound machinery, equipment, built technology and construction measures in order to improve efficiency of irrigation equipment by modernisation of existing irrigation systems and save water. Actions also include establishment and reconstruction of water saving irrigation plants, modernising irrigation-network, which serves the needs of producers. Actions of HRDP include development of new water-management facilities to aid delivery, distribution and control of water and facilitate professional treatment of wastewater generated within agricultural and horticultural holdings. Flood prevention and management measures and preventive actions against adverse effects of climate-related extreme events are important task in the coming years. Adaptation potential of agri-food sector is also increased by storage and processing of wastewater and biological waste. Construction, reconstruction and modernization of farm buildings are important part of climate change adaptation operations and increase efficiency of production.

Integrated crop production scheme promotes environmentally friendly plant production, which includes soil protection and adequate land cultivation in order to conserve soils, surface and ground waters actions, establishments and improved management of wetland habitat. Integrated pest management scheme includes rational nutrient management, integrated plant production, crop rotation and land cultivation to conserve soil. Plant protection activities should be carried out on the basis of forecasts and documented plant protection. Integrated production is oriented to cultivation of arable crops, vine, fruits and vegetables with ecologically safer methods, which minimize unwanted side effects by reducing the use of fertilizer and plant protection products and increasing the safety for environment (soil, water, and air) and human health.

Climate change represents a risk for the countryside due to the more frequent occurrence of extreme weather conditions, which threaten both agricultural production and the property of rural inhabitants. HRDP takes these risks into account and it contributes to the fulfilment of objectives of VAHAVA programme on the mitigation of climate change impact. Adaptation goals are well expressed in the conservation of genetic resources, which includes (i) the protection of biotopes of semi-natural and natural grasslands, (ii) the protection of biotopes of selected bird species, (iii) taking care of endangered species and local varieties.

Setting up and use of advisory services, training and demonstration projects are important part of adaptation to climate change. Training young people for environmental stewardship can make an important contribution to adaptation objectives in the coming years. Developing a communications strategy to communicate climate change issues to land managers is well focused in the HRDP. Support granted to farmers and forest holders for the utilization of professional advisory services is an important part of climate change mitigation and adaptation goals and contribute to maintenance of good agricultural and environmental condition, which assist diversification of the local economy. In the HRDP, considerable support is available for upgrading local infrastructure with investment in telecommunications, transport, energy and water networks assist local services, traditional rural practices and high quality local products.

Discussion and results

The effects of climate change on agriculture and wildlife are discernible. Drought is occurring earlier and frost later, with a consequent change in the growth cycle. Agriculture itself needs to adapt to climate change, by coping with different

conditions and exploring which crops and farming systems are best adapted to the changed conditions. It is also likely, that there will be reduced availability of water in the vegetation period. Climate change suggests a pattern of drier summers, but water consumption remains very high. These problems are particularly accentuated in the drought zone of the Great Hungarian Plain. Due to the expected deficit in rainfall and loss of soil fertility, the spring crops are the most vulnerable to climate change, which will impose irrigation and additional ameliorative actions during the vegetation period for compensating the lack of soil humidity. Regions, where rainfalls are insufficient for normal plant growth even in the present climate conditions, will suffer more from the effects of climate change.

Climate change may result unforeseen floods and drought disasters in Hungary. The native ability of species to adapt to the changing environmental conditions needs to be supported. Extreme weather events like increasing temperature, humidity changes, drought, and floods could result in extinction of species and deterioration of habitats. Prevention and coping with the potential impacts of climate change is important, especially in cases, when adaptation ability of species is limited. Approximately 40% of the total budget of the HRDP is devoted to this priority. In line with the statement of VAHAVA project on potential impacts of climate change, HRDP helps the overall aim of sustainable development. Based on the need to control emissions contributing to climate change, highlights the responsibility of land owners, as providers of environmental goods and other public services.

One of the main objectives of climate change adaptation in Hungary is to lower the extent of water erosion and prevent water outflow from cultivated land. Agri-environmental measures supporting organic farming, integrated agriculture and environmental protection are important chapters of climate change adaptation in agriculture. With conservation of biodiversity, natural and cultural heritage of landscape, the potential impacts of climate change on agriculture are also reduced. The HRDP seeks to change the management practices in agriculture and improves the connections between environmental, social and economic aspects of rural development.

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ABSTRACT

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