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SCIENTIFIC PAPER

EXTENT AND CHARACTERISTIC OF DIVERSIFICATION AMONG HUNGARIAN AGRICULTURAL HOLDINGS

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Abstract: *Through the connection to rural resources agriculture has an impact on the three functions of countryside: ecology, society and economy. Resources of economy and production environment are continuously changing thus farmers have to adapt to these changing circumstances. One of the adaptation methods is the diversification of activities to promote effective capacity utilization and additional profit. However there is no standard definition of diversification from the point of agricultural economics aspect both traditional approaches and the influence of European Union should also be considered to define it.*
Diversification and alternative income opportunities could be subsistence possibilities for several farmers. This could be defined not only at private holdings' but at enterprises' level. According to a traditional approach Hungarian statistical databases collect on-farm and off-farm agricultural activities depending on the connection to resources of a farm business. Analysing this database an overall picture could be defined considering the position and characteristic of diversified farmers and the popularity of each activity among agricultural producers. Based on a study, published in 2011 (Hamza, 2011) this paper also involves the latest statistical data (2010, 2013). Analysing dataset of period 2000-2013 this paper gives an overall overview about national and regional position and characteristics of diversified holdings and activities.

Keywords: *on-farm, off-farm agricultural activities, diversification, statistics, analysis, enterprises* (JEL code: *Q19*)

INTRODUCTION

Rural policy has an impact on the farmers' every day. Diversification improvements could strengthen diversified holdings. The aim of the study was to analyse national differences of agricultural diversification considering holding size and types. The review of this paper gives an exact definition of diversification. Results show statistical trends of diversification among agricultural holdings in Hungary between 2000 and 2013. Characteristics of diversification were also examined among small- and large-scale farmers and even among crop production and animal husbandry. This study also analysed the effects of land concentration. Trends of diversified activities and relation between farm size and these diversified activities were examined.

REVIEW OF LITERATURE

As a definition diversification is a widely used term. According to *general agricultural economics* approach it means the extension of production structure (Szakál, 2000; Nagy 2002; Magda, 2003; Kovács, 2009). According to general business economics diversification is defined as a contrary process to specialisation and it is equal to the increasing number of activities and sectors based on spare production capacities. Therefore diversification could be one of the potential market tools for growing businesses to adapt needs but a careful use is needed to avoid too-fragmented resources or making optimal production level and size impossible (Szakál, 2000).

There are several different approaches in connection with agriculture. In accordance with some authors agricultural businesses are a significant part of rural economy, they have an important role in rural development. Analysing this, a *multifunctional role* comes to the front. According to Szakál, 2000 traditional approaches of defining agriculture as a production sector should be broken with. The view of Nemes, 2000 is also in close connection with it so the aim of diversification (diversity) is to diversify economic and social activities based on initiatives of local communities and individuals. Diversification is compared with multifunctionality by Fehér, 2005. As his opinion multifunctionality is a broader

targeting because it includes all activities of a holding while diversification does not cover the conventional production. Several authors do not agree with this definition to determine diversification as an activity of a business.

Diversification is often parallel with *pluriactivity*: as some experts diversification is wider sense (DELGADO and SIAMWALLA, 1997, BOULAY, 2002). GYULAI and LAKI, 2005 used the definition of pluriactivity not in primary connection with agricultural activities. There are two different cases: firstly, farmers carry out non-agricultural activities based on the resources of their holdings such as food trade or tourism. Secondly, additional incomes are not in connection with these resources such as having a part-time job.

According to Gyulai and Laki (2005) diversification is also parallel with *sustainability* so traditional species are potential tools of sustainable agriculture. As their opinion diversification could be established using resources of farm businesses, introducing new products or new structures – growing traditional species such as Einkorn wheat (*Triticum monococcum)*. The view of Kopasz, 2005 is also in close connection with it since agriculture can only reach all three functions of countryside (economic, social and ecological) if farm businesses are diversified and activities are sustainable. Therefore diversification could be a great tool for reaching sustainability as a potential target of local communities but tools of economic development should be introduced considering all the resources of local ecology, society, economy and their relations moreover implementations should be based on local initiatives (Czene Et Al, 2010; Biró (Ed) et al, 2012).

Farm diversification is a popular definition in recent years (Elek, 1994, Kovács, 2002, Czimbalmos, 2004; Fehér et al. 2010, Hamza, 2011). It covers *on-farm* (activities using resources of farm businesses) and *off-farms* (activities outside the farms) diversification methods as well. The description of on-farm activities is parallel with Ilbery et. al, 1996: the enlargement of agriculture includes all those non-agricultural activities which are in close connection with resources of a holding except conventional agriculture (crop production, animal husbandry, horticulture, vineyards, orchards). Furthermore, ecological farming, production of special species (not conventional in a region), aquaculture and forestry can be identified in these activities, too.

Nagy, 2007 used this classification method to analyse the incomes of family farms: both incomes only from agriculture (on-farm) and farms with a few off-farm incomes.

I do agree with the classification of Hamza, 2011 about diversified holdings:

- *The enlargement of agricultural core activities*: producing new (or novel) plant and animal species, energy crops, ecological farming, animals under contract, aquaculture in a region.
- *Increased added value* (vertical diversification): processing products from agricultural core activities (food or non-food) including direct sales and marketing tools.
- *The enlargement of non-agricultural activities*: "rural and agro-tourism, catering, services related to leisure activities (horse riding, hunting, sport fishing), handcraft, services done by the machinery of the holding (contractual work), storage, country planning (landscaping, maintenance of ditches, mowing of slopes, afforestation), collecting herbs and non-wood forest products (Hamza, 2011).

It is also important to analyse the relation between diversification and rural policy since resources of rural development are essential in agricultural production. In the nineties Elek, 1994 pointed out that not all the farm businesses have economic stability which effects the increased number of lagging regions since farmers without successor may induce the marginalisation of a region. To avoid it European Union tries to establish measures.

In Hungary, rural policy was characterised by the New Hungary Rural Development Programme between 2007 and 2013. Contrary to earlier definitions, on-farm diversification could be equal to the enlargement of existing supply (related products, related technology) without changing the ATECO (Classification of Economic Activity) codes. In a rural policy approach traditional business sectors even under vertical integration and introducing new activities are kinds of diversification too. Moreover, off-farm diversification is only considered among non-farm producers (ÚMVP, 2007). This is corroborated by the new Hungarian Rural Strategy (2014-2020) which highlights on the reduction of plant production dominance and the strengthening of animal husbandry, horticulture and ecological farming (VIDÉKSTRATÉGIA, 2014-2020). It is obvious that rural policy takes a different approach of diversification from other agricultural literatures mentioned earlier. In my opinion expectations regarding diversification are set to the reality of Hungarian economy and farmers are supported in all activities to facilitate their subsistence (Kissné Nagy, 2014).

It is already defined in this paper how activities could be classified within diversification depending on their connection with agriculture and whether they are on-farm or off-farm activities. Using this information agricultural diversification has been defined in a rural policy approach considering bibliographical references, rural policy and rural development approaches (**Table 1**).

Table 1. Classification of diversified activities considering rural policy approaches

	Agricultural activities		Non-agricultural activities
On-farm	New activities in accordance with rural policy	Ecological farming	Sport/recreation
		Producing bio-fuels and energy crops	Tourism, catering
	Crops	Producing new (or novel) plant species	Forestry, aquaculture
	Animal husbandry	Producing new (or novel) animal species	Processing
	Horticulture	Animals under contract	Washing/sorting/packaging
	Vineyards	Agricultural contract work	Direct sales/marketing
	Orchards		Transportation
		Rental of buildings around the farm	
Off-farm			Other jobs
			Other business

Source: Author's construction based on Department for Environment Food and Rural Affairs. 2003., New Hungary Rural Development Programme (2007-2013) and new Hungarian Rural Strategy (2014-2020)

To define diversification in a traditional way, the approach of Biró (ed) et al, 2012 should be took into account: "In Hungary, major capitalised businesses producing goods are characterised by diversification. Introducing new activities within the businesses stocks, professional skills and entrepreneurships are needed."

MATERIALS AND METHODS

Using national statistics the aim of this paper is to present the extent and characteristics of diversification. Based on scientific results, published in 2011 (Hamza, 2011) this paper involves the latest statistical data (2010, 2013) to compare with.

Hungarian Central Statistical Office collects all the relevant national data about activities other than agricultural primary production. The analysis is based on data of General Agricultural Census (GAC 2000, 2010) and on Farm Structure Surveys (FSS 2003, 2005, 2007, 2013). Since official statistics do not collect any data related to rural policy this study can neither involve any information about it. Methods of national surveys cover only the area of diversified activities (16 different types are defined) and the characteristic of diversified holdings but information about economic importance of such activities is not involved at all. Diversified activities are the following:

1. Meat-processing
2. Milk-processing
3. Fruit- and vegetable-processing
4. Wine-making, wine-bottling
5. Other activity related to food-industry

All of the activities related to food-industry

6. Fodder-mixing
7. Forestry
8. Wood-processing
9. Tourism, catering
10. Trade and sales of unprocessed production
11. Transportation, delivery
12. Renewable energy-production
13. Other activity done by the machinery of the holding (contractual work)
14. Handcraft (plaiting, folk-art, etc.)
15. Aquaculture
16. Other activity

RESULTS

European Union overview

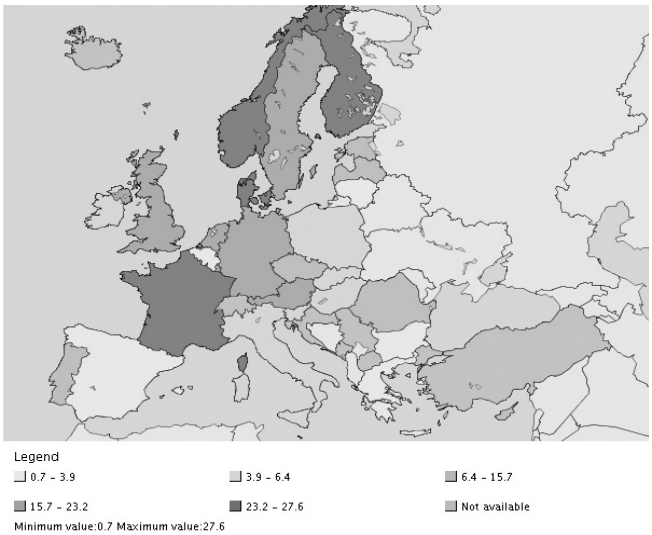


Figure 1. Share of diversified farm businesses throughout the European Union (%, 2007)
Source: EUROSTAT, www.ec.europa.eu

Figure 1 shows clearly how frequent the diversification of farm businesses are throughout the EU. Statistics include on-farm activities with economic outturn. The most diversified Member States could be find in Western Europe meanwhile Central and Eastern European or Southern European countries have the less holdings with wide range of activities. Diversified farmers are less common in these Member States whereas one in four producers have alternative incomes in France and in Scandinavia.

Present situation of and changes in agricultural diversification in Hungary, 2000-2013

National overview

During the reference period the number of diversified farm businesses changed considerably however there were significant temporary fluctuations. Number of diversified holdings analysed in accordance with the business entities (**Figure 2**) changed parallel with the number of private holdings but the number of agricultural enterprises differed slightly from it. The crisis of the reference period was in 2007 when the fewest diversified holdings were observed: the reduction reached 30% among all entities compared with the 2000 situation. In 2010, General Agricultural Census observed an increase in the number of diversified farm businesses and

it represented 44 000 in 2013. However it was a significant growth (almost reached the 2000 level of 47 000 holdings), at the same time great decrease could be observed in the number of farm businesses (from 967 000 to 491 000). In case of private holdings a rise could be noticed as well: in 2013 the number of them almost reached the 2000 level. In accordance with the 2000 level a 57% growth could be observed in the number of agricultural enterprises since there were 6260 of them in 2013 however there were only 1502 diversified agricultural enterprises in Hungary in the 2003 crisis.

The share of diversified farm businesses compared with the total number of holdings has not changed significantly by 2007 (5.1%) which could be explained by the concentration processes in farm structure (Hamza, 2011). Whereas a significant increase could be observed in the share of diversified farm businesses in the period 2007-2013: the rate was 7.5% in 2010 while in 2013 it reached 9.2% (**Table 2**).

Table 2. Number and share of diversified holdings, 2000-2013

Year	2000	2003	2005	2007	2010	2013	2013 2000 = 100 %
Type of holding	Number of holdings						Change in the number
Total number of diversified holdings	46 989	35 181	36 154	31 770	42 402	44 415	95%
Diversified private holdings	43 009	33 679	33 592	29 172	37 046	38 155	89%
Diversified agricultural enterprises	3 980	1 502	2 562	2 598	5 356	6 260	157%
	Shares based on the non-diversified types of holdings						Change in the share
Total number of diversified holdings	4.9%	4.5%	5.1%	5.1%	7.5%	9.2%	189.4%
Diversified private holdings	4.5%	4.4%	4.8%	4.7%	6.4%	7.8%	173.1%
Diversified agricultural enterprises	57.2%	19.2%	32.3%	35.8%	57.2%	71.2%	124.3%

Source: Author's construction based on data of Hungarian Central Statistical Office (General Agricultural Census 2000, 2010 and Farm Structure Surveys 2005, 2007, 2013)

Diversification shall be a key to remain in agro-industry because the number of diversified holdings were increased in spite of land concentration. Private holdings and agricultural enterprises showed a significant difference. The share of diversified private holdings was increased by 5.2% after a stagnation period of 2000-2007 compared to every private holding and almost 8% of this farming type carried out non-agricultural activities. However agricultural enterprises were more characterized by diversification. In 2013 only one in eleven private holdings did some kind of non-agricultural activities while seven in ten agricultural enterprises diversified their profiles. It is also supported by Biró (ed) et al, 2012: "In Hungary, major capitalised businesses producing goods are characterised by diversification." These significant changes are in close connection with the European Union support policy considering diversification but this question will be examined in a farther study.

Regional overview

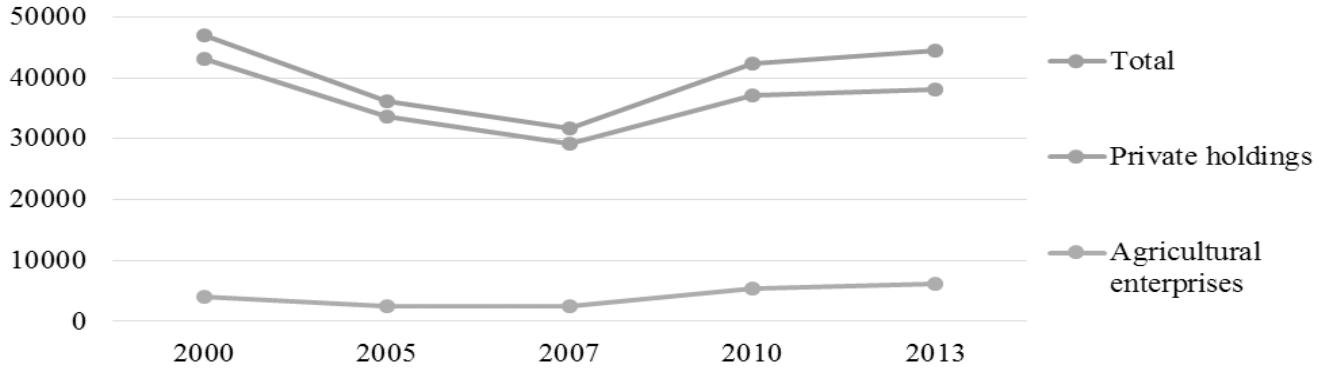
Table 3 shows the steady increase of diversified holdings in every region of Hungary. In 2010 the growth of private holdings slowed down in Central Transdanubian region. Some regions had high level of diversification in both farming types.

Table 3. Shares of diversified holdings by territorial units, 2007, 2010, 2013 (%)

Territorial units	Agricultural enterprises			Private holdings		
	2007	2010	2013	2007	2010	2013
Central Hungary	31.0%	51.2%	68.1%	5.9%	9.3%	16.9%
Central Transdanubia	30.9%	58.0%	72.6%	5.9%	5.6%	5.8%
Western Transdanubia	28.4%	46.1%	68.0%	3.1%	6.5%	8.5%
Southern Transdanubia	34.4%	68.5%	81.4%	3.7%	5.9%	6.9%
Transdanubia	31.5%	58.3%	74.7%	4.1%	6.0%	7.1%
Northern Hungary	31.0%	58.8%	69.9%	7.2%	9.0%	8.7%
Northern Great Plain	44.2%	59.0%	66.2%	3.3%	5.9%	6.4%
Southern Great Plain	39.4%	55.2%	71.8%	5.1%	5.5%	6.4%
Great Plain and North	39.0%	57.6%	69.2%	4.8%	6.4%	6.9%
TOTAL	35.1%	57.2%	71.2%	4.7%	6.5%	7.9%

Source: Author's construction based on data of Hungarian Central Statistical Office (General Agricultural Census 2010 and Farm Structure Surveys 2007, 2013)

Figure 1. Number of diversified holdings between 2000 and 2013



Source: Author's construction based on data of Hungarian Central Statistical Office (General Agricultural Census 2000, 2010 and Farm Structure Surveys 2005, 2007, 2013)

Central Hungary had a significant importance with its 11% rise among private holdings between 2007 and 2013 since almost 17% of these holdings diversified their activities in this region while national average was under 8%. In 2013 only a Transdanubian and an Eastern Hungarian region reached the national average (7.9%).

Compared to the 2007 data there were no significant changes. While in 2007 the share of diversified private holdings was the highest in Northern Hungary (with poor employment rates), in Central Transdanubia and in the Southern Great Plain (Hamza, 2011), it was only average in 2013. This process is in connection with land concentration because some private holdings displaced and stopped their activities.

Regional averages of diversified agricultural enterprises were around the national average (71.2%). Southern Transdanubia had a high level of performance (81.4%) which is an important tool for generating income and employment for local society however private holdings of this region do not perform well. Overall, the development of Transdanubia (46.2% rise) exceeded both Central Hungary (37% rise) and Great Plain and North (30.2% rise). The smallest growth could be observed in the Northern Great Plain region: in 2007 it had the highest share of diversified agricultural enterprises (44.2%) but in 2013 it turned to the lowest share (66.2%). The 2013 data denied the view of Hamza, 2011: the highest share of diversified holdings could be observed in such regions where there are favourable terms for traditional services done by machinery.

"Diversification map" of Hungary has been changed since the latest reference period.

Significant differences could be observed between shares of diversification by types of farming (**Table 4**).

Table 4. Shares of diversified holdings by territorial units and type of farming 2007-2013 (%)

Territorial units	Specialist holdings – crop production %			Specialist holdings – animal production %			Mixed holdings %			Specialist holdings – crop prod. %	Specialist holdings – animal prod. %	Mixed holding %
	2007	2010	2013	2007	2010	2013	2007	2010	2013	Percentage changes (2007 = 100 %)		
Central Hungary	8.5	9.3	23.2	2.7	3.5	9.3	6.3	14.6	16.5	275	345	259.7
Central Transdanubia	6.1	4.9	6.5	4.4	3.4	4.4	6.6	10.2	5.2	106	100	78.6
Western Transdanubia	2.5	5.5	9.3	2.9	7.0	7.4	3.9	10.4	6.1	366	251	154.4
Southern Transdanubia	4.6	4.9	8.9	2.4	4.0	4.2	3.6	8.6	6.0	191	178	166.0
Transdanubia	4.4	5.1	8.3	3.1	4.6	5.1	4.4	9.6	5.8	191	164	131.4
Northern Hungary	8.3	9.5	11.3	3.5	4.8	5.9	8.2	14.3	9.0	136	168	109.9
Northern Great Plain	3.4	5.1	7.4	2.4	3.3	4.6	4.0	9.1	6.0	218	192	149.3
Southern Great Plain	6.6	5.0	7.5	2.0	2.1	5.0	6.3	8.2	6.9	113	248	109.2
Great Plain and North	5.7	6.2	8.2	2.5	3.2	5.0	5.7	9.5	6.8	144	203	120.4
TOTAL	5.4	6.0	9.6	2.7	3.5	5.5	5.3	9.9	7.1	176	208	133.9

Source: Author's construction based on data of Hungarian Central Statistical Office (General Agricultural Census 2010 and Farm Structure Surveys 2007, 2013)

Analysing national averages it is observable that crop sector was most characterised by diversification in 2013, since one in ten holdings did non-agricultural activities. However diversification was less characteristic for animal sector (5.5%) which requires permanent farm activities

throughout the year. A significant growth could be noticed in each category: diversification in crop sector increased by 76% meanwhile it doubled in animal sector. Mixed holdings also showed willingness to diversify: their shares rose by 33.9%. Significant increase of diversification could be observed in Central Hungary and in Western Transdanubia in every category. Analysing the three types of farming the performance of Central Transdanubia was improved the least.

The opinion of Biró (ed) et al, 2012 could be adapted: "introducing new activities within the businesses stocks, professional skills and entrepreneurships are needed". Therefore it is no wonder that developed Central Hungarian and Western Transdanubian regions became in the front line of diversification.

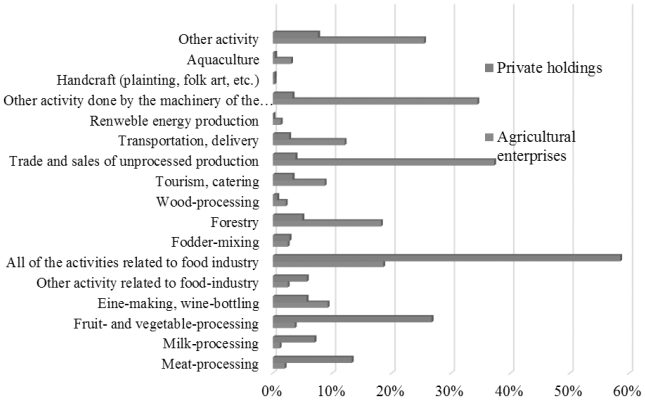
To understand these changes diversified activities should be studied as well.

Diversified activities

National statistical surveys define 16 categories of additional non-agricultural activities. **Figure 3** shows the difference between diversified holdings by these activities. In 2013 more than 58% of diversified private holdings carried out some kind of activities related to food-industry which is in connection with the willingness of crop sector to diversify. According to Biró (ed) et al (2012) this percentage was higher (80%) in 2010. This decrease was contrary to the increased number of diversified holdings. A regress could be observed in food-industry related diversification. Analysing 2010 data the number of "holdings related to fruit- and vegetable-processing increased by five times in ten years while holdings related to wine-making and wine-bottling were reduced by tenfold as a result of introducing excise purpose" (Biró (ed) et al, 2012). Fruit- and vegetable-processing are prominent sectors (27%) with their 11502 holdings and they have stagnated in recent years. Private holdings determined the milk- and meat-processing sector more (milk: 7%, meat: 13%) than agricultural enterprises (milk: 1%, meat: 2%).

Trade and sales were the most characteristic activities in case of diversified agricultural activities (37%) which was followed by other activities done by the machinery of the holdings: 1313 (34%) agricultural enterprises performed contractual work. Compared to the 2007 survey a fall could be noticed: the shares of both categories were 42% (Hamza, 2011). The popularity of transportation and activities done by the machinery came from the economies of scale. Furthermore, these agricultural enterprises had capacities, standard stocks and resources to carry out trade and sales. Holdings related to food-industry had also a significant role, holdings related to wine-making and wine-bottling rose above the others (9%). Transportation and delivery were also good tools to make full use of capacities: 12% of diversified holdings carried out such activities. 9% of diversified agricultural businesses engaged in rural tourism and catering which showed only a 1% rise compared to 2007 data however rural tourism had an important role in the period of 2007-2013 in rural development. The low incentive effect of this measure was proved by a 1.3% fall of diversification in case of private holdings. Renewable energy-production showed an upturn in the mid-2000s but only 0.8% of agricultural enterprises and 0.1% of private holdings diversified their activities in this direction.

Figure 3. Shares of diversified holdings by activities, 2013

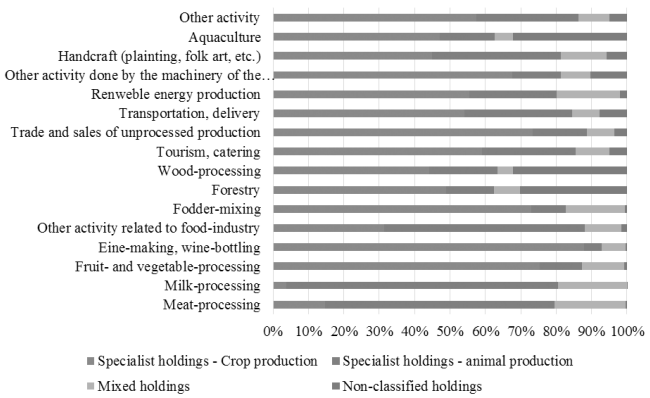


Source: Author's construction based on data of Hungarian Central Statistical Office (Farm Structure Surveys 2013)

Compared to the 2000s, transportation and delivery showed a significant regress: while one in four agricultural enterprises carried out transportation related activities at the turn of the Millennium, this number was only 12% in 2013. Fodder-mixing followed a similar tendency: the share of such diversified agricultural enterprises fell from 15% to 2.5%.

In case of private holdings fruit- and vegetable-processing showed an 8.2% rise also fodder-mixing reached a 2.4% growth. The concentration of animal production could be the reason of decreasing fodder-mixing activities in agricultural enterprises whilst increased fodder prices generated development in private holdings.

Figure 4. Shares of activities by type of farming, 2013[1]



Source: Author's construction based on data of Hungarian Central Statistical Office (Farm Structure Surveys 2013)

1 The definition of non-classified holdings was introduced in the Farm Structure Survey, 2013. It includes every holding with forests, reeds and fish ponds or carries out only services.

Figure 4 shows that crop sectors were in the majority almost in each activity. In 2013 the most characteristic diversified activities of animal sector were related to food-industry (milk- and meat-processing, other activities related to food-industry). Crop sector used a wide range of non-agricultural activities: wine-making, wine-bottling, fruit- and vegetable-processing and fodder-mixing were the most characteristic activities because they were based on unprocessed materials and effected an increased added value.

Investigating the types of activities (Figure 3) and types of farming (Figure 4) it could be observed that the number of diversified holdings related to animal production were doubled in the reference period but the share of holdings performed activities related to processing was stagnated. Diversified holdings related to animal production did not have the trend to reach higher added value. Whereas not only the number of diversified holdings related to crop production but share of holdings performed activities related to processing were expanded. While private holdings were mostly characterised by activities related to food-industry, for agricultural enterprises the most typical diversified activity was providing services.

CONCLUSION

The changes in the number of diversified holdings were not in parallel with the changes in the number of agricultural producers. There was a significant land concentration between 2000 and 2013: the number of holdings reduced to half and it does not reach half a million. Although there were temporary fluctuations in the number of diversified holdings but it did not change significantly in the 2007-2013 period, but their share increased in general. Statistically, the agricultural enterprises are more characterised by diversification but if activities done by the machinery of the holdings were considered off-farm activities this could not be stated.

In 2013 only one in eleven private holdings did some kind of non-agricultural activities while seven in ten agricultural enterprises diversified their profiles. Trade and sales were the most characteristic activities in case of diversified agricultural activities which was followed by other activities done by the machinery of the holdings which came from the efficiency of farm size. Furthermore, these agricultural enterprises had capacities, standard stocks and resources to carry out trade and sales. While private holdings were mostly characterised by activities related to food-industry, for agricultural enterprises the most typical diversified activity was providing services.

At regional level, Central Hungary had the most diversified agro-industry. Almost 17% of private holdings diversified their activities in this region while national average was under 8%. A significant growth could be observed in the number of Transdanubian diversified agricultural enterprises while Northern Great Plain were at the bottom of the rank.

Analysing types of farming crop sector was most characterised by diversification, since one in ten holdings did non-agricultural activities. However diversification was less characteristic for animal sector (5.5%) which requires permanent activities throughout the year. This was demonstrated by the fact that in 2013, more than 58% of diversified private holdings carried out some kind of activities related to food-industry, especially fruit- and vegetable-processing as prominent sectors (27%).

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