

Land Consolidation Model in the County of Varaždin

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Summary

During the long period of time, Croatian agriculture was characterized by double structure of ownership. In the past, in Socialism, the ownership of agricultural land in Croatia and development investments in agriculture were directed toward a small number of large agricultural companies in social ownership, while small family farms were marginalized, just as it was the case in the majority of former socialist countries. In the County of Varaždin there are 33,415 family farms which own 52,723.35 ha of agricultural land with an average size of a parcel of 0.336 ha. Such fragmentation of land cannot guarantee profitable agricultural production, so one of the priorities of agricultural policy of the County of Varaždin is land consolidation. The County of Varaždin subsidizes consolidation of existing lots with 480 Euros/ha, and if the total size of the land that belongs to a family farm enlarges, with 345 Euros/ha. Between 2003 and 2007 a total of 683 farmers received subsidies. A recipient of the subsidy on average increased his farm by 1.2 ha. The County of Varaždin is going to continue such stimulation of consolidation, but without significant interference of the state the process of consolidation is not going to intensify. The state should participate more considerably because it is necessary to remove the causes of unfavorable land structure used by family farms, such as unlimited division of plots of agricultural land as a consequence of inheritance procedures or other forms of dissolution of joint ownership. Processes opposed to consolidation of the agricultural land should also be prevented.

Key words

the County (of Varaždin), subsidy, parcels, land fragmentation

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Introduction

Different land consolidation processes have been performed for centuries in all parts of Europe. Their aim was to enlarge family farms' land and to decrease a number of parcels per family farm. During the time, as a result of a prior experience and technological progress, different processes of consolidation have developed. The aims of consolidation have also changed. The process of consolidation is a result of the period in which it takes place (Van den Brink, 2004). After the Second World War, the collectivization of agricultural holdings was carried out in Central, Eastern and South-eastern Europe. After collectivization was completed, followed reallocation, re-parceling and other processes of consolidation of agricultural land based on special regulations (Budanko-Penavić, 2003). Since the beginning of 1990s the countries in Central, Eastern and South-eastern Europe have begun to implement land and agricultural reforms in order to restructure agricultural holdings to the condition before collectivization.

During the long period of time Croatian agriculture was characterized by double structure of ownership. In past, in Socialism, development investments in agriculture were directed toward a small number of large agricultural companies in social ownership. Just as in the majority of former socialist countries, small family farms were marginalized (Sklenicka, 2006). This is the cause of current agricultural holdings structure, characterized by a large number of small family farms which cannot earn income necessary for decent living and for necessary investments into agricultural production. The current structure of ownership still reflects forty years of the rule of Socialism and of implementation of unsuitable inheritance regulations.

When it comes to agricultural land, its social component must not be forgotten. The social component is reflected in the age of landowners, their education, the position in society and advisory approach when exchanging or selling land (Coelho et al., 1996). New generations of farmers are more apt to selling or exchanging the land than elderly generations.

Condition of agricultural land in the Republic of Croatia

In the Republic of Croatia, a problem of development of agricultural production is land fragmentation. According to data, there are over 20 million plots per 4.5 million inhabitants. According to the latest census (2003) in Croatia there are 448,532 agricultural households and 1,162,612 ha of used agricultural land. Only 1.2% of agricultural households have at their disposal over 20 ha of land, 3.5% of households have 10-20 ha, 9.4% have 5-10 ha, 10.2% 3-4 ha, 25% 1-3 ha, and 50% of agricultural households have less than 1 ha of agricultural land at their disposal (Šipić, 2004, cit. Ivković et al., 2008). Over 70% of farms have less than 3 ha at their disposal and as a rule their land is highly fragmented. Even among those who own larger areas, there is a small number of vital and market oriented farms which could in present circumstances be able to meet foreign competition on equal terms.

Table 1. Loss of agricultural land in Croatia comparing to Slovenia

Year	Total agricultural land (ha)	
	Croatia	Slovenia
1991		561.294
1996	1.935.000	
2005	1.202.000	508.759
Loss	733.000 (37.88 %)	52.535 (9.33%)

Source: DZS RH, Statistical Yearbook 2006 and Statistical office RS, Slovenia in numbers, 2006

Table 2. Structure of agricultural land in Croatia (in 000 ha)

Year	Total agricultural land	Arables and gardens	Orchards	Vineyards	Meadows	Pasture land
1996	1.935	986	67	58	350	474
2005	1.202	864	43	30	155	110
Loss	733	122	24	28	195	364

Source: DZS, Statistical Yearbook 2006

We are faced not only with a large number of small parcels but with a constant loss of agricultural land (Table 1).

Such a serious loss of agricultural land and at the same time its great fragmentation left mark on competitiveness and agricultural production of Croatia. Slovenia managed to keep agricultural land in function and today it is obvious that Slovenian agricultural production is more stable than our and that it depends less on food import. In the structure of lost agricultural land (Table 2), what is especially worrying is the loss of meadows and pastures is greatest.

In the period of nine years, the areas of meadows and pastures have decreased by 559,000 ha which is 67.84%. This points to the fact that we have lost natural resources for development of cattle breeding and cheap production of milk and meat in a traditional, almost extensive way. In general, standard of living in the majority of rural areas of Croatia is low and life conditions are bad. A trend of migration of population from rural to urban areas continues. A general characteristic of rural areas is a poor access to physical infrastructure (poorly developed water supply and sewage system, poorly maintained local and unclassified roads). Farm tracks are poorly maintained as well. Current situation negatively influences development of the whole economy including agriculture, which is the main economic activity in rural areas.

Condition of agricultural land in the County of Varaždin

Despite favorable conditions for agricultural production, the number of animals and arable land in the County constantly decreases. Similar trend is present in the other counties so Croatia is one of few European countries which, in spite of exceptionally good conditions and very low consumption, does not produce enough food for its own needs. The County

Table 3. Structure of an average* family farm in the County of Varaždin

Category of land	Own land	Leased land	Total
Number of parcels	12	3	15
Total size (ha)	4.5	1.5	6
Average size of parcels (ha)	0.4	0.4	0.4
Agricultural land (ha)	4.2	1.5	5.7
Meadows (ha)	1.5	--	1.5
Arables and gardens (ha)	2.7	1.5	4.2

*Data are related to 2,150 family farms which applied to subsidies and which have a minimum of three production units

is characterized by an extremely large number of small settlements and dispersed population: predominant settlements are those under 1000 inhabitants. Almost a half of population lives in these settlements. The settlements are mostly rural. In the Register of agricultural subjects there are 8,166 family farms. Ownership structure of agricultural land is marked by a large number of parcels. When defining long-term and serious projections of agriculture development, this is the central problem. The structure of an average family farm in the County of Varaždin can be seen in Table 3. Average size of agricultural areas of examined farms is only 4.5 ha of own land i.e. 6.0 ha including leased land. Additional problem is fragmentation of holdings (Figure 1). These two characteristics (small farms and fragmentation) are main restrictive factors in creating modern family farms (Posavi et al., 2008). According to the agricultural register from June 1, 2003, on the area of the County of Varaždin there are 33,415 agricultural households which own 52,723.35 ha of agricultural land with an average parcel of 0.336 ha.

In order to achieve larger and more intensive production it is necessary to consolidate and improve (drainage, irriga-



Figure 1. An example of spatial arrangement of agricultural parcels (colour-one owner)

tion, flood protection) agricultural land. When Croatia becomes a member of the EU, the producers in the county will have to cope with an average EU farmer, who owns larger land parcels at only two or three locations. Fragmentation and the size of parcels cannot guarantee profitable agricultural production. Thus, in the following period of time the number of agricultural households is to decrease, and the size of land parcels to increase. One of the priorities of agricultural policy of the County of Varaždin is consolidation of agricultural land.

Land consolidation model in the County of Varaždin

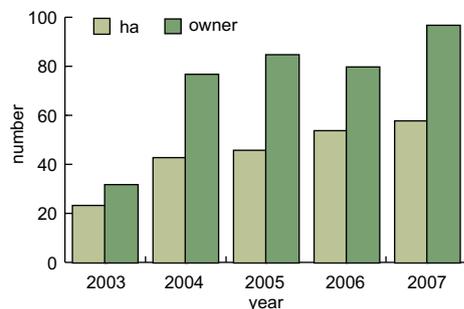
Today, the majority of former socialist countries face the problem of small and fragmented agricultural land on which it is impossible to competitively produce agricultural products. In majority of these countries the projects of agricultural land consolidations are in progress. (Sklenicka, 2006; Ravnikar et al., 2006). On the other hand, some of them are still preparing legal basis for the implementation of consolidation projects that are based on implemented pilot- projects (Budanko-Penavić, 2003; Bengt-Olof et al., 2008). It is a great challenge to devise policy of agricultural land consolidation. Experience shows that the combination of a few means and instruments define the final result: effective organization of land consolidation, suitable legal frame, effective agricultural land market, suitable agricultural subsidies and rural development subsidies, trust of farmers. In 2002, the Assembly of the County of Varaždin adopted Program of encouragement, consolidation and improvement of agricultural land of the County of Varaždin. Consolidation and enlargement of agricultural land are based on Decision on financial subsidies for consolidation and enlargement of agricultural land on family farms with two bases of co-financing:

- 2,500.00 kn (345 EUR) per 1 ha of agricultural land which was purchased in order to enlarge a total amount of agricultural land on a family farm
- 3,500.00 kn (480 EUR) per 1 ha of agricultural land which was purchased in order to consolidate existing parcels, either by purchase or by exchange with the neighboring agricultural parcel.

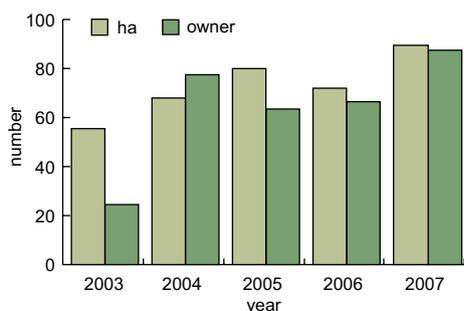
As it can be seen (Graph 1 and 2), the number of subsidy recipients increases every year. During the last five years, a recipient of subsidy has on average increased his land for 1.2 ha. It is well-known that land consolidation is a long-term process. Nevertheless, the encouraging fact is that in this short period of time the Croatian underdeveloped agricultural land market has grown.

Discussion

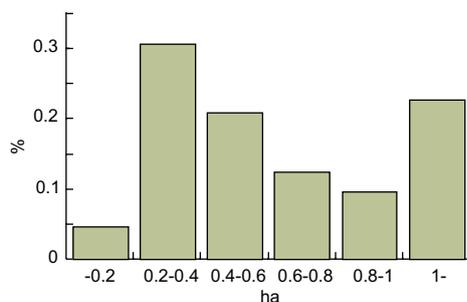
The size of an average agricultural farm in the EU varies between 3.5 ha on Cyprus and 67 ha in the Czech Republic (Beširević, 2007). Nevertheless, it should be emphasized that in the EU-15 countries until 2004 an average farm had about 18 ha of agricultural land on 3-4 parcels. With the EU en-



Graph 1. Ratio of a number of owners and area concerned at consolidation



Graph 2. Ratio of a number of owners and area concerned at enlargement



Graph 3. Size of subsidized plots

largement to 27 countries, this figure decreased since new member countries such as Slovenia (6.3 ha), Hungary (5.6 ha) and Poland (7 ha) significantly influenced the average. It should also be said that the mentioned countries were a part of the Socialist block. This means they share the destiny of the County of Varaždin (Graph 3). Namely, the land in these countries is also fragmented and plots are small. From the Graph 3 it could be seen that 77% of the plots which were purchased i.e. subsidized by the county were smaller than 1 ha.

Benefits of land consolidation are well known. One of them is saving time necessary for the cultivation of a parcel. For instance, if a parcel is enlarged from 0.25 ha to 4 ha, depending on the culture, between 33% and 63% of time can be saved. In Vinkovci area, after re-parceling, hydro melioration and enlargement of production parcels, the expenses of cultivation decreased between 7% and 12% and at the same time the wheat yield increased 60%, corn yield 23% and

sugar beet yield 28%. Longer parcels are more suitable than short because the number of turnings of machines is lower. Lengthening parcels from 100 to 400 meters enables saving time. The amount of time saved is between 3 and 24 h/ha, depending on the culture. Distance of a parcel from a family farm significantly influences the expenses of production. The longer the distance, the higher the expenses of transport and the time used. Increase of distance for a kilometer, when it comes to small parcels (0.25 ha) increases total amount of time necessary for cultivation, from 7 to 28 h/ha, depending on the culture, (Ivković et al., 2008).

Ownership structure of agricultural land is dynamic and constantly changing. Agricultural holdings are sold on the open market or they are leased by lessees who want to enlarge their land. Farmers agree to exchange their parcels in order to improve the structure of their farms. Additionally, agricultural land is bought or confiscated in order to build roads and similar. Taking all this into consideration, land consolidation cannot be seen as one-term process, it is a long-time process which changes constantly.

A market of agricultural land in private ownership is not developed, although in various parts of Croatia there are important differences in the efficiency of the mentioned market. Obstacles for development of the market of agricultural land in private ownership are following:

- small parcels of agricultural land as a consequence of applying often unsuitable regulations on inheritance
- often unsolved property rights on plots and not implemented inheritance decisions
- unsuitable regulations of taxes on uncultivated agricultural land and breach of regulations
- sales tax on agricultural land (double taxation when exchanging agricultural land)
- mortgages on agricultural land
- absence of a unique database of market of agricultural land in private ownership
- model of income subsidy which does not encourage elderly people households to sell or lease their land
- insufficient interest of commercial banks in financing purchase of land under favorable conditions
- emotional attachment to land and the tradition of preserving land as a family guarantee

It is an undisputed fact that Croatia, if it wishes to increase the level of competitiveness of its production, has to irrigate much larger areas than are irrigated now. But before reaching final decisions and preparing expensive irrigation plans, two criteria which are preconditions for irrigation should be satisfied:

1. Starting consolidation process in the areas that are to be irrigated.
2. Defining products which are going to be placed on the market.

This is necessary since irrigation is an expensive and demanding process and it will surely influence the final price of a product. It is also necessary to conduct studies of profit-

ability that will reveal to which level would be necessary to subsidize the construction of irrigation system.

As it is already known, the County of Varaždin is one of the areas with most fragmented agricultural land. Additionally, it has almost insignificant share of agricultural land owned by the Republic of Croatia (only 2,300 ha). Without a crucial precondition such as consolidation, it is impossible to start a long-term and more serious projection of agriculture development as well as to invest into irrigation systems.

Other countries experience

In the end of the Second World War the Swedish agriculture was behind other economy sectors in both efficiency and productivity. The main reason was fragmentation of land. In 1947 the Swedish parliament passed new agricultural laws with the aim to facilitate development of profitable and efficient farms, based on the Law on land transaction. The law had two aims:

1. For agriculture and forests facilitate to remain in the ownership of family farms.
2. Contribute to the improvement of structure of agricultural farm and its form i.e. to enlarge agricultural farms and rationalize the size and expansion of their fields.

In the period between 1947 and 1995 an average size of a farm increased from 12 to 32 ha (Evtimov, 2005), and at the same time there was a decrease in the total number of farms from 280,000 to 90,000. In spite of more unfavorable conditions than in many other European countries, Swedish agriculture proved to be competitive. Land consolidation has continued since mid 1990s (Bengt-Olof et al., 2008).

In the period 1995 to 2003, Slovenia implemented 27 Land Consolidation projects but generally in Slovenia, about 300 Land Consolidation projects were implemented with the total area of 60.000 ha (Ravnikar et al., 2006).

A new law on agricultural land was adopted in 1995. The law stipulates that the initiative for consolidation of the land must come from owners of parcels (80% of owners must agree with consolidation). The difference between this law and the old law on re-parceling which dates from 1979 is that owners of parcels have a democratic right to decide whether they would like to enlarge their parcels. As a rule, all the projects of consolidation are financed from public sources. Present expenses of consolidation in Slovenia were about 1,000 EUR/ha. A very good example of the land before and after consolidation is given in Table 4. It shows the area of Prigorica – Dolenja Vas.

In the period between 1992 and 1999 Slovakia carried out 82 projects of land consolidation. The projects were worth about 27.5 million Euros. In order to continue the process of consolidation, Slovakia has to solve another problem. This is the problem of a large number of cadastral municipalities which inhibit the process of consolidation. In order to organize land registers, about 400 million Euros are to be reserved in the following 8 to 10 years. The land which has to be returned to former owners as well as between 300,000 and 400,000 ha of *undefined* land i.e. land without clearly defined ownership represent problems.

Table 4. Comparative sheet of characteristic data before and after land consolidation

	Before land consolidation	After land consolidation
Number of owners	660	628
Average size of parcels (m ²)	867	3.444
Average number of parcels per ha	11.5	1.9
Average number of parcels per owner	7	1.9

Source: Ravnikar and Tanko (2006). Land consolidation in Slovenia

Conclusion

Land consolidation is a long-time process. In the countries where consolidation projects are implemented, from the moment it is decided to start with the consolidation to the usage of new consolidated plots takes five years on average. Additional two years are needed to enter new data into land registers. The whole process, according to experience, lasts about seven years. The County of Varaždin is going to continue with such a method of consolidation, but without significant influence of the state, the process of consolidation is not going to intensify. It is necessary to deal with the causes of unfavorable land structure used by family farms, such as dispersion of plots of agricultural land, which again is a consequence of inheritance procedures and other forms of annulment of joint ownership. Processes opposed to consolidation of the agricultural land should also be prevented. Besides, agricultural land owned by the Republic of Croatia is often converted into business zones without prior inquiry into the quality of the land and the degree of consolidation of a parcel, so it is a way of losing already consolidated agricultural land. When choosing a land which is to be converted into a business, industrial or a similar zone, agricultural land should not be wasted but taken care for. It is necessary to invest into rural areas in order to prevent depopulation trend and to encourage economic and social development. Such initiatives demand not only investment into infrastructure but investment into development of human resources as well. Fragmented agricultural land, undeveloped human resources and poorly developed infrastructure are main restrictive factors of rural development.

References

- Bengt-Olof, Sv., Nilsson, S. (2008). Swedish Experiences from Modernisation of the Agricultural Sector, 43th Croatian and 3th International Symposium on Agriculture, Opatija, February 18th-21st, Hrvatska
- Beširević Nataša (2007). Kako u EU ?, 85 pitanja i odgovora za hrvatske poljoprivrednike o Europskoj uniji, Ministarstvo vanjskih poslova i europskih integracija, drugo izdanje
- Budanko Penavić Ana (2003). Fact finding tour, Izvješće Ministarstva poljoprivrede, šumarstva i vodnog gospodarstva, Uprava gospodarenja poljoprivrednim zemljištem
- Budanko Penavić Ana (2008). Provedba pet pilot projekata okrupnjavanja poljoprivrednog zemljišta u Hrvatskoj, 43th Croatian and 3th International Symposium on Agriculture, Opatija, February 18th-21st, Hrvatska

- Coelho, J., C., Portela, J., Pinto, A., P. (1996). A social approach to land consolidation schemes, *Land Use Policy*, 13, 129-147
- Državni zavod za statistiku, statistički ljetopis, više godišta
- Evtimov, V. (2005). Land Consolidation, Phased Approach to a National Strategy, Food and Agriculture Organization of the United Nations, Prva radionica, 15. prosinca 2005., Hotel Palace, Zagreb, Pilot projekt `Okрупnjavanje poljoprivrednog zemljišta u Hrvatskoj
- FAO (2006). Materijali za edukaciju o provedbi pilot projekata okрупnjavanja zemljišta, Radni materijal
- Geodetski zavod Slovenije (2005). Annual Report 2004, Ljubljana
- Hrvatska Akademija Znanosti i Umjetnosti (2007). Melioracijske mjere u svrhu unaprjeđenja ruralnog prostora s težištem na Nacionalni projekt navodnjavanja, Znanstveni skup, Zaključci, Zagreb
- Ivković Mira, Džapo, M., Dolanjski, D. (2008). Komascija zemljišta-preduvjet uspješne poljoprivredne proizvodnje, 43th Croatian and 3th International Symposium on Agriculture, Opatija, February 18th-21st, Hrvatska
- Posavi, M., Vincek, D., Ernoić, M. (2008). Modeli govedarske proizvodnje, Varaždinska županija, Varaždin
- Ravnikar, L., Tanko, D. (2006). Land consolidation in Slovenia, Ministrstvo za kmetijstvo, gozdarstvo in prehranu, Sektor za strukturno politiko in podeželje, Radni materijal
- Sklenicka, P. (2006). Applying evaluation criteria from the land consolidation effect to three contrasting study areas in the Czech Republic, *Land Use Policy* 23, 502-510
- Van Den Brink, A.(2004). Modern Land Consolidation in the Netherlands, Volvic, September.

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