

Research on the Preconditions of Land Consolidation in Rural Districts

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Abstract. The concept of land consolidation is new in Latvia. Its main tasks are to eliminate land fragmentation and to facilitate farms of optimal size. One of the most important preconditions of land consolidation is forming of optimal size farmland plots in property and use, and land fragmentation, which has a major impact on both the operating conditions and other rural development processes. Land fragmentation affects not only land management, but it also increases transport costs.

Already during the land reform in rural areas, land plots in property and land in use were divided per several land units. The other factor contributing to the fragmentation of farmlands is the development of land market, since it is not always possible to find land next to the owner's farmland for purchasing or leasing the land to increase the land area.

Within the course of the research, the analysis of the areas and fragmentation of economically active farms was conducted as well as the land owners were surveyed on variety of land use related and various rural environment characterising issues in Vircava parish. It was found that the growth of farm areas increases the fragmentation, and the results of the landowners survey show that the majority of the landowners are willing to expand their land plots in property, thereby increasing production rather than selling the land or leasing it to other farmers.

Consequently, preconditions for land consolidation are being formed in Latvia as well as in other countries. It is important to find the most appropriate and efficient methods for their implementation.

Key words: size of farms, land fragmentation, consolidation.

Introduction

Land use in agriculture occurs within particular farms, and the outputs depend not only on the work, materials, resources, and soil fertility but also on the farm area and the mutual arrangement of the land plots in use. The land size, its quality and geographical location of the farms affect significantly the choice of specialisation of production, productivity, production, and its competitiveness. The issue of land rational and efficient use arises, as an inefficient use of land and a surplus can be considered one of the problems in Latvia, while other countries are considering land shortage.

The land quality, climatic conditions, location of the land plot, and the level of its infrastructure are the main factors affecting the type and intensity of land use and its adequacy for a particular economic activity (The National Land..., 2008).

The latest land reform in Latvia has substantially altered the structure of use of farmland plots in property and in use. It resulted in the development of plenty of very small agricultural land properties. According to the authors' previous studies, which relied on the data of the State Land Service of the Republic of Latvia (LR), in 2001, the average total area of farmland plots in property and the land plots in use were only 5.14 ha; moreover almost one fifth of them was represented by farmlands of land area less than 2 ha (Jankava, 2003).

In practice, forming of farms was affected by various objective and sometimes subjective factors, so farmland plots in property were developed on several land units, thus resulting in land fragmentation and inter-areas (Jankava, 2003). Although in the beginning of the reform, the legislation provided favourable territorial preconditions for successful development of agricultural production, recommending to form compact farms and to avoid inter - areas (Nolikums par ..., 1991).

No competitive and efficient agricultural production is possible with that structure of rural land property; thus, large areas remain raw in rural districts. However, along with the

processes of land privatisation, the land market has evolved gradually on more favourable conditions for agriculture. As result, larger farms are being formed through the sale and leasing, or other transactions. This is indicated by the results of the authors' (Янкава, Менготс, 2009) research on dynamics of land areas of the economically active farms (2003 - 2007), derived from the data of the Central Statistical Bureau of Latvia. The average size of farms in total area, in land used for agriculture, and in arable land is increasing over the years.

However, the average area is still very small. A significant proportion of all the farms are represented by very small farms. In 2007, division of farms of Latvia by their land area was as follows - nearly 80% of their total number and more than 30% of their total area was represented by farms in area of up to 2 ha (Янкава, Менготс, 2009).

The development of land market contributes to the fragmentation of farm areas, because it is not always possible to find land next to the owner's farmland for purchasing or leasing the land to increase the land area. Land fragmentation makes the farming and land management difficult, and increases transportation costs. Similar processes are going on also in rural areas of Latvia's immediate neighbouring countries - Lithuania (Lankelis, 2002) and Estonia (Maasikamae, 2005) as well as in other Eastern and Western European countries. Consolidation is used as one of the measures for farmland usage optimisation abroad, which is known in the Western Europe already since the end of the 18th century.

The first land consolidation initiatives were implemented in Denmark in the 1750s, in years when obligations of citizens to land owners were simplified and private family farms were created as result of important social reforms. At that time, the consolidation of the fragmented land plots did not lead to increase of agricultural production, although it was not the only aim of these reforms (The Design of ..., 2003).

The first legislative act in the field of land consolidation was adopted in England in 1801. The agricultural lands (land property) registry was developed and implemented based on the measures of land survey towards the land consolidation.

In the Netherlands, there is one of the highest activity levels of land consolidation measures in Europe, because, three agricultural land consolidation programmes have been developed since 1924 until nowadays.

Extensive experience and methodology in carrying out the land consolidation projects are also possessed by Germany, where the Law on Land Consolidation is in force since 1998 (Flurbereinigungsgesetz, 1998). Several methods of land consolidation are listed in the law and used successfully in the production; their choice depends on each particular case.

Latvia's neighbouring country Lithuania has relatively extensive experience in the development of land consolidation projects. More than 10 land consolidation projects have been developed during the recent 10 years with help of Danish colleagues and support of the European Union.

Being acquainted with the results of the land consolidation project development in Lithuania, Germany, Moldova, and other countries, it can be concluded that land consolidation has a very important role in agricultural development, and it can be used as a high performance tool for rural development providing land users with new opportunities to improve the situation. Land consolidation may contribute to the creation of competitive agricultural businesses, forming larger farms with less isolated land plots and better location, as well as to the extension of properties.

However, the land consolidation projects in Latvia, with some minor exceptions, have not received any response compared with the above-mentioned countries. Of course, taking into consideration the current situation in the country, the management of measures of land consolidation is not a low cost event. Therefore, in order to handle these large and expensive projects in rural development, first, it is necessary to assess their necessity, i.e. there has to be a system of indices and their numerical data on the land fragmentation and other factors delaying the development of competitive farming. Only comprehensive information on it could justify the efficiency of the land consolidation projects.

Nevertheless, there are a number of information sources in Latvia, like the Real Estate Cadastre Information System (IS RESC), the Central Statistical Bureau, and one may have an overall view of farmland sizes, fragmentation, the number of land-forming land units according to their data, each of them has also its disadvantages. According to the IS RESC data, it is not

possible to clarify the exact areas of farms, since not all rural farms' owners register the lease lands in the information system. Yet, the latest data of the Central Statistical Bureau is only for the year 2007.

Therefore, in the summer of 2010 the Department of Land Management and Geodesy of Latvia University of Agriculture conducted an inspection and a population survey with assistance of students within the framework of the research at Vircava rural territory of Jelgava district in order to clarify the real situation in the countryside. The land areas and locations of the economically active farms (*the economically active farms are defined to be the farms, which are producing agricultural produce, regardless of production quantity and its type of use*) were identified, and a population survey was conducted along with the other issues related to land use.

The data obtained during the territorial inspection and the population survey, and the analysis of the situation determined the choice of the subject. Therefore, the following **aim of the research** was set: to explore the preconditions for carrying out land consolidation in rural areas and to clarify the importance of land consolidation nowadays.

Tasks to accomplish the aim are set as follows:

- 1) to conduct a theoretical analysis on land consolidation and its role in creating competitive farms and rural development;
- 2) to analyse the size of economically active farms by their land areas and land fragmentation in Vircava rural territory;
- 3) to assess the results of Vircava rural territory population survey on future opportunities of use of their land properties.

There are two similar terms used in the paper- land fragmentation and inter-area. The term *land fragmentation* describes the situation where farm plots in property or land in use consists of a number of land units that are separated by other owners' lands. *Inter – area* is defined as *a separately situated land plot, which is separated from the main land plot by land owned by another person* (Law on Land Survey, 2006).

The research is based on monographic, analysis and synthesis, deductive and inductive, statistical data study, and graphical representation methods.

Results and discussion

1. Land consolidation and its role in competitive farms and rural development

The term "*consolidation*" comes from the Latin word "*consolidation*", which means stabilisation, strengthening, and amalgamation.

In Latvia, the concept of land consolidation appeared in the 1990s. One of the first scientists who mentioned this concept was a doctor of agricultural sciences J. Zuševics who considers land consolidation as a certain type of agrarian reform, arguing that it should not be confused with collectivisation in his book "Introduction to Agrarian Policy". Consolidation, according to the professor, is not expropriation of land, but its joining in the collective, more useful, and manageable object (Zuševics, 1994).

Professor M. Locmers (Locmers, 1999) has also pointed out that in order to create a compact rationally sized farm, it is necessary to form new lands in property and in use, taking into consideration all requirements of rational territorial organisation and performing consolidation of the existing lands in property and in use. The professor together with his colleagues (Locmers, 1999; Butāne Lasteniece, 2000) has attempted to define the land consolidation, thus determining its content: the farm consolidation should be understood as the systematic elimination of inter-areas, border regulation, business transactions dealing with the land and its buildings to develop a compact rationally sized farm with the land and its building owned by a single individual or legal person, or several persons as intercommunity.

Although the concept of land consolidation is new in Latvia, its aim and tasks - to eliminate land fragmentation and inter-areas, and to contribute to the optimum size farms - has been well known in the Republic of Latvia already during the first Agrarian Reform (1920-1937). Then, farmland fragmentation was eliminated by land survey projects. The so-called land survey works among the collective farms was carried out to remove inter-areas. In addition, other land use disadvantages were known in the Soviet times.

However, as A. Auziņš (Auziņš, 2008) has indicated, in Latvia, the concept of land consolidation is not really used, even though for the first time it was included in the legislation by adopting the Law on Land Survey (Land Survey Law, 2006) on September 14, 2006, in which *land consolidation* is included as one of the land survey project development tasks of and *interpreted as package of implemented events proposed by individuals or legal persons, state or local municipality to optimise the land use in the public interest*. However, further development of land consolidation has not yet been made in the legislation of Latvia.

Acquisition of experience of the Western countries could help in solving the situation. Within the methodological material prepared by the UNO Food and Agriculture Organisation (FAO) on the designing of the land consolidation experimental project concept (The Design of ..., 2003), agricultural land consolidation is defined as the social, economic, legal, and technical event package with the main basic aim, considering respect to the interests of residents:

- improvement of structure land properties;
- development of rural areas;
- consolidation of too fragmented land plots;
- increasing of agricultural enterprises until their optimum sizes;
- implementation of modern technologies and techniques;
- developing of sustainable agricultural and socio-economic infrastructure in the countryside;
- nature protection and creation of sustainable ecosystems.

Land consolidation is sometimes understood incompletely just as a mere redistribution of land plots, which is performed to prevent consequences of land fragmentation. In fact, land consolidation is associated with major socio-economic reforms already since its initial implementation in the Western Europe.

Mainly, land consolidation is carried out on purpose to develop a territory for sustainable use of land resources, and to provide rational and sustainable use and protection of the land and natural resources. It is necessary to meet the following principles of land consolidation (The Design of ..., 2003):

- not only improvement of raw food production but also facilitation of food production of rural residents;
- preservation or restoration of the rural environment as well as environmental protection;
- state institutions have to intervene in the process of land consolidation in order to ensure the use of resources and control as well as to downstream spatial elements;
- the land consolidation process shall be democratic, an active participation of involved landowners and other rural residents is an essential condition;
- the approach shall be comprehensive, combining rural and overall regional development elements, and incorporating rural and urban inter-linkages.

In some countries, the preparatory works have started including land consolidation action plans - outlines and implementation of the pilot projects to test problem solutions and to establish a link between the administrative and local institutions that is of great importance. For instance, in Lithuania, the land consolidation projects are already known since 2000. Alike, projects are already developed and implemented in cooperation with experienced Danish colleagues. One of the key terms of the process in the implementation of projects of land consolidation is that it includes at least five landowners with the total land area of not less than 100 hectares (Leimontaite, 2006).

The Danish colleagues are certain that the state aid is required addressing the issues of land consolidation. In Denmark, LVL 4 million are spent for this purpose each year (Čepāne, Rumbēna, 1998). They believe that minimum size for dividable land plots as well as the ceiling of land areas owned by a single owner have to be defined.

Considering the above, it can be concluded that one of the most important preconditions for land consolidation is the development of optimum size farms and land fragmentation of land in property and in use, which has major impact on both the farming conditions and other rural development processes. Therefore, the land structure of farms in Vircava rural territory of Jelgava district has been analysed further within the article.

2. Sizes of the farms and land fragmentation in Vircava rural territory

Vircava rural territory is located in one of the most favourable regions for agricultural production in Latvia. The analysis includes 16 farms that are economically the most active farms in Vircava rural territory. Their total area is 4021.3 ha (Table 1), representing about 40% of total land area of the rural territory. The largest part of the total area is utilised agricultural area, as percentage of forests is small in the rural territory - about 10%, which is mainly the land under the competence of the state.

As it is shown in Table 1, the range of the farms area is comparatively large - from 36.4 ha to 1117.3 ha, besides the owner of the largest farm (according to the information by the land surveyor of the rural territory) has the land also in other territorial units. The average area of these farms is 251.3 ha, the majority (6 farms) of them ranging between 200 and 300 hectares in size by the total land area.

Table 1

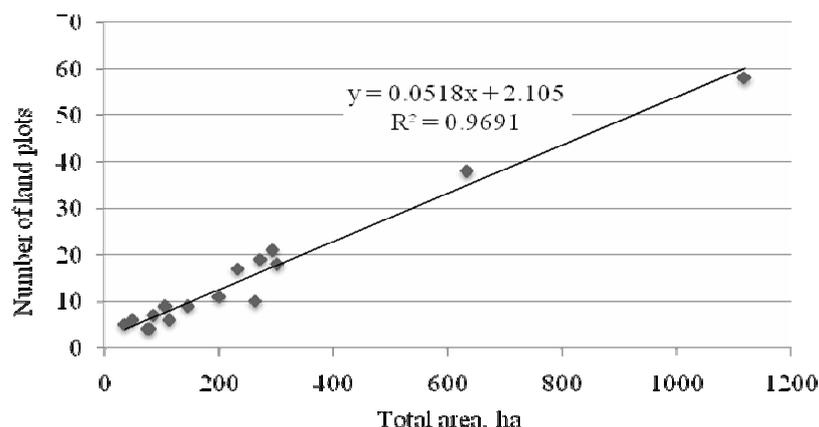
Total area and number of land plots of economically active farms in Vircava rural territory on 1 September 2010

| No. of farm | Total area, ha | Number of land plots | Land plots in property | | | | Land plots in use (lease) | | | |
|----------------|----------------|----------------------|------------------------|---------------|--------------------------|-----------|---------------------------|---------------|--------------------------|-----------|
| | | | number | area | | | number | area | | |
| | | | | ha | | % | | ha | | % |
| | | | | total | average per unit of land | | | total | average per unit of land | |
| 1 | 36.4 | 5 | 5 | 36.4 | 7.3 | 100 | 0 | 0.0 | 0.0 | 0 |
| 2 | 49.9 | 6 | 2 | 10.1 | 5.1 | 20 | 4 | 39.8 | 9.9 | 80 |
| 3 | 76.8 | 4 | 2 | 53.8 | 26.9 | 70 | 2 | 23.0 | 11.5 | 30 |
| 4 | 80.5 | 4 | 1 | 36.5 | 36.5 | 45 | 3 | 44.0 | 14.7 | 55 |
| 5 | 87.4 | 7 | 5 | 32.1 | 6.4 | 37 | 2 | 55.3 | 27.7 | 63 |
| 6 | 107.5 | 9 | 3 | 54.3 | 18.1 | 51 | 6 | 53.2 | 8.9 | 49 |
| 7 | 114.5 | 6 | 4 | 63.9 | 16.0 | 56 | 2 | 50.6 | 25.3 | 44 |
| 8 | 147.1 | 9 | 5 | 74.7 | 14.9 | 51 | 4 | 72.4 | 18.1 | 49 |
| 9 | 200.9 | 11 | 6 | 159.7 | 26.6 | 80 | 5 | 41.2 | 8.2 | 20 |
| 10 | 233.5 | 17 | 6 | 85.1 | 14.2 | 36 | 11 | 148.4 | 13.5 | 64 |
| 11 | 264.4 | 10 | 4 | 26.3 | 6.6 | 10 | 6 | 238.1 | 39.7 | 90 |
| 12 | 273.1 | 19 | 7 | 114.5 | 16.4 | 42 | 12 | 158.6 | 13.2 | 58 |
| 13 | 295.1 | 21 | 7 | 71.6 | 10.2 | 24 | 14 | 223.5 | 16.0 | 76 |
| 14 | 302.9 | 18 | 16 | 255.0 | 15.9 | 84 | 2 | 47.9 | 24.0 | 16 |
| 15 | 634.0 | 38 | 19 | 306.0 | 16.1 | 48 | 19 | 328.0 | 17.3 | 52 |
| 16 | 1117.3 | 58 | 33 | 612.0 | 18.5 | 55 | 25 | 505.3 | 20.2 | 45 |
| Total | 4021.3 | 242 | 125 | 1992.0 | 255.7 | x | 117 | 2029.3 | 268.2 | x |
| Average | 251.3 | 15 | 8 | x | 16.0 | 51 | 7 | x | 16.8 | 49 |

Source: authors' calculations

All farms, with the exception of one - the smallest analysed, use lands in lease besides the lands in property. On average, almost half (49%) of the farms are increased by leasing. As illustrated in Table 1, the leased land ranges from 16% of the total land area of Farm 14 up to 90% of Farm 11 with the total area of 264.4 ha. Both owned and leased lands are located on several land units.

A strong correlation between the land areas of the farms and the number of land units was found - the larger the land areas of the farms, the greater the number of their constituent land units (Figure 1).



Source: authors' construction

Fig. 1. The correlation between the total land area and number of land units of economically active farms in Vircava rural territory

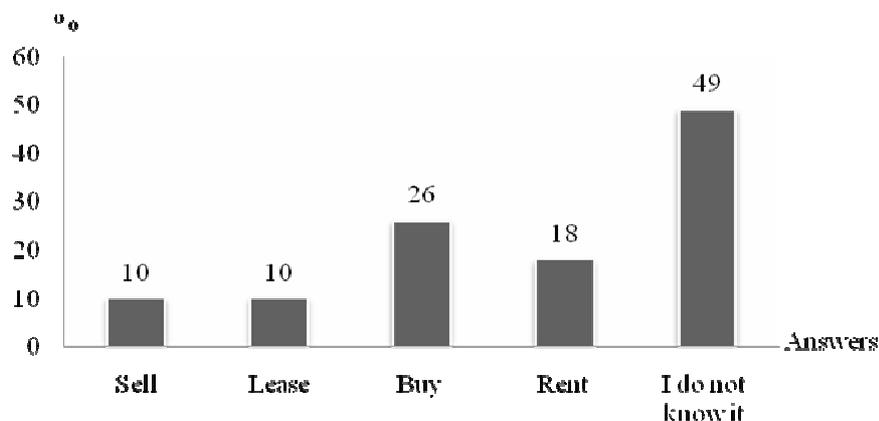
The results of the research show that rural farm production expansion, and thus an increase of the land areas are associated with land fragmentation, and formations of new inter - areas.

3. The results of the landowners survey of Vircava rural territory

Performing the inspection in Vircava rural areas, one of the tasks was to survey the landowners for a variety of characterising issues on land use and the rural environment. Totally, 142 landowners were surveyed, but regarding the land consolidation preconditions only 39 of the questionnaires could be selected (27% of all respondents), since there no answers on these questions were given in the rest of the questionnaires. The land areas owned by respondents of unanswered questionnaires were negligible, mostly below 10 ha.

In a result of the inquiry, it was found that 23% of the surveyed landowners are retired persons. When analysing the surveyed landowner education, it was found that 31% of them have a university education, 56% - secondary, while 13% - basic education, so the education level is relatively high. It is generally known that, in the result of the land reform and land transactions, there are many land properties in Latvia, which landowners do not reside in their properties. Therefore, the question arose about Vircava rural territory, which is highly suitable for agricultural production.

The analysis revealed that the majority of surveyed landowners - 30 of them or 77% - live on their owned farms, 5 (13%) landowners live elsewhere in the selected area of the research, i.e. in one of the largest population centres of the rural territory - villages, 1 (2%) landowner lives in Riga, and 3 (8%) landowners live in other city or rural area in Latvia. Hereof, it can be concluded that the place of residence for almost a quarter of the landowners is not in their land properties.



Source: authors' construction

Fig. 2. The answers given by landowners in Vircava on future use of their lands

The landowners were enquired about the future use of their lands in property. This question was given in multiple choices of answer: to sell their land, to lease their land, to buy land; to rent land, not sure about their intentions (do not know). It was possible to respond "yes" or "no" to each option. Every respondent could choose a number of affirmative or negative responses (Figure 2).

The proportion of affirmative answers is in Figure 2. There are more landowners, who want either to buy (10 respondents or 26%) or to rent (7 or 18%) lands, thus extending their property, than those who would like to sell (10%) or let (10%) their lands. A little more than a half (20 or 51%) of respondents are not sure about their intentions, which shows the current volatile situation in rural areas affected by the economic crisis. However, positive responses in terms of land expansion are more, and it confirms the previously mentioned tendency of rural farmland growth.

Conclusions, proposals, recommendations

- 1 Land consolidation can be used as a high performance tool in rural development that may promote economic development, preventing excessive fragmentation of rural farmlands, increasing the land area and thus, generating greater income and opportunities to extend the types of farming.
- 2 Land consolidation is one of the most complex, time consuming and costly land management measures, but as a result, it is possible to build territories that would serve to the sustainable use of land resources.
- 3 One of the most important preconditions for land consolidation is the structure of rural land in property and in use – building the farms of optimal sizes and land fragmentation, which has a large impact on both the farming conditions and other rural development processes.
- 4 There is a strong correlation between farmland areas and land units in Vircava rural territory - an increase of the farmland areas leads to the increase of land fragmentation.
- 5 Almost a quarter of landowners in Vircava do not live in their owned property.
- 6 There are more landowners in Vircava rural territory, who want to expand their lands in property, thereby, increasing production, than those who are willing to sell the land or lease it.
- 7 Taking into consideration the previous trends and results of the research in Vircava rural territory, the obtained conclusions can be generalised and it is relatively precise to state that the preconditions for the land consolidation are being formed in Latvia, alike with other countries, - land fragmentation is increased as the farms are seeking to reach an efficient size. Further, it would be important to find the most appropriate and effective methods for its performance.

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