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LAND CONSOLIDATION AS UNUSED POTENTIAL

The effects of implementation, barriers and potential relevance of agricultural land consolidation in Serbia





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TABLE OF CONTENT

Foreword	4
Summary	5
1. Introduction	11
1.1 The concept and relevance of land consolidation	11
1.2 The research subject	16
1.3 Motivation for the research	17
1.4 Methodology applied	18
2. Land consolidation in international practice	20
3. Land consolidation in Serbia: historical, legal and institutional frameworks	23
3.1 Land consolidation history in Serbia	23
3.2 Legal acts regulating land consolidation	24
3.3 Steps in the land consolidation implementation	27
3.4 Implementers of the land consolidation procedure	31
3.5 Civic participation in decision-making and representation of land consolidation participants' interests	40
3.6 Duration of the land consolidation procedure	43
3.7 The scope of land consolidation implementation	45
4. Costs and funding of land consolidation implementation	49
4.1 Quantification of specific land consolidation costs	50
4.2 Financing of land consolidation implementation	54
5. The effects of land consolidation on settling ownership and legal relations	57
6. Economic effects	59
6.1 The effects of land consolidation on the distance to estates	59
6.2 The effects of land consolidation on land fragmentation	61
6.3 Preliminary effects of land consolidation on the agricultural production costs	63
7. The effect of land consolidation on the living standard and social aspects of beneficiaries' lives	77
7.1 Analytical framework of the analysis of the land consolidation effects on the standard and social aspects of beneficiaries' lives	77
7.2 The effect of land consolidation on economic activities and employment of household members	78
7.3 The effect of land consolidation on the household revenues and economic position	80
7.4 The effects of land consolidation on exercising of labour rights	86
7.5 The effect of land consolidation on household relations	86
7.6 The effect of land consolidation on social relations in the local community	91
7.7 Evaluation of land consolidation effects on living standards and social aspects	92
8. Other effects of land consolidation	93
8.1 The effects of land consolidation on infrastructure	93
8.2 The effects of land consolidation on the environment	94
8.3 Overview of land consolidation costs and benefits	95
9. Conclusion and recommendations	98
Literature	106

FOREWORD

“Land consolidation as unused potential” is an analysis of effects and potentials of implementing land consolidation in Serbia, prepared by the NALED expert team in cooperation with the Ministry of Agriculture, Forestry and Water Management, with the support of German Development Cooperation (GIZ) within the “Strengthening Municipal Land Management in Serbia” project. The purpose of this analysis is to provide as specific basis as possible for evaluation of land consolidation effects and the need for its further implementation, same as to present conditions to be ensured for a broader and more efficient use of this public policy instrument. The analysis is primarily aimed at policy makers at the Republic, provincial and local levels, as support to decision- making on whether, to what extent and in which manner to invest in land consolidation, and to serve as a baseline for improvement of legal and institutional frameworks for the land consolidation implementation.

In scope of the NALED expert team, the following experts were engaged in this analysis, Tatjana Volarev, project director, prof. dr Branko Radulović, lead economist, prof. dr Natalija Bogdanov, dr Jordan Hristov and mr Saša Todorović, agri-economists, prof. dr Marija Babović, sociologist and Ljiljana Parezanović, geodetic engineer. The research was coordinated by dr Dušan Vasiljević, in cooperation with the research associates: mr Jasmina Radovanović, mr Irena Đorđević and Lazar Lunić. Expert contribution to drafting of this analysis was made by Nenad Gvozdenović, project manager on behalf of GIZ. The field work related part of the research was conducted by the SeConS development initiative group.

NALED hereby extends its gratitude to the GIZ “Strengthening Municipal Land Management in Serbia” project, for financial support provided for this research, but also for invaluable information on the details regarding the land consolidation implementation in Serbia, available only to those living land consolidation over years. We would also like to thank all others who have supported this research, primarily Ministry of Agriculture, Forestry and Water Management and Directorate of Agricultural Land, Republic Geodetic Authority, Provincial Secretariat for Agriculture, Water Management and Forestry, Municipalities of Svrlijig, Knjaževac, Negotin, Bačka Palanka, Bački Petrovac, Paraćin and Opovo, geodetic organisations and all other institutions and individuals willing to share the data available to them and their knowledge and experience gained while implementing land consolidation procedures.

One of the challenges in working on this analysis was to maintain an adequate critical distance towards the research subject, given that some characteristics of the land consolidation concept tend to turn researchers into supporters. If by reading this analysis you take the side of the land consolidation supporters’ group, we hope such determination would be based on the objective findings laid down herein.

dr Dušan Vasiljević



SUMMARY

Land consolidation is an agrarian measure implemented by the State to enlarge parcels of individual agricultural land owners, thus achieving numerous positive effects: ensuring access to roads for all parcels; ensuring land for public purposes that would otherwise require expropriation (construction of roads, canals, irrigation systems, etc); grouping land for non-agricultural purposes like formation of industrial zones, construction of children playgrounds, construction of landfills or extension of village graveyards; reducing distance to be traveled by farmers from their farmstead to their estates; more optimal shaping of parcels and their orientation so as to improve productivity of such land; regulating property and legal relations over such land. Over the past period, by encompassing construction area in the land consolidation area, land consolidation also contributes to addressing the issue of legalisation of construction facilities.

Land consolidation has a long history in Serbia, however, there is still a major need for its further implementation. While in some areas land consolidation has never been implemented, there are other areas where it was implemented in the second half of the 20th century, but the procedure needs to be repeated due to the changes which took place meanwhile. It has been estimated that only in Vojvodina, land consolidation needs to be implemented on over 800,000 hectares of agricultural land.

Land consolidation has, especially lately, proven to be an instrument for infrastructure equipment of land, namely as a model for resolution of ownership and legal relations in the procedure of constructing facilities of public importance, industrial zones, etc. The advantages of resolving property relations over land via land consolidation compared to expropriation, are also reflected both in duration and cost of the procedure. Ensuring the rights over land by means of land consolidation helps avoid long-lasting administrative procedures, and even more importantly, court proceedings which are quite common when the land is being secured by expropriation. Land consolidation helps avoid high expropriation costs- when the land for common facilities (e.g. irrigation systems) is ensured through balanced take-in of smaller areas owned by the land consolidation participants (by applying the so called reduction percentage) or even without any reduction of private owners' areas- by ensuring the land convenient for specific purposes (e.g. industrial zones) is reallocated to public sector, instead of the parcel in public property situated in the location not suitable for the given purpose.

Fragmentation of parcels is the best indicator of the need for further implementation of land consolidation. So the average parcel size entered in land consolidation in Vojvodina amounts to approx. 0.75 ha, while in Central Serbia it amounts to approx. 0.28 ha. Let us state here, for the purpose of comparison, that agricultural estate area amounts to 16 ha on average, divided into parcels of average area of 2.99 ha; in the Czech Republic, characterised by extremely large area of agricultural estates for European circumstances (over 120 ha), average parcel size amounts 0.85 ha; in Italy average size of individual parcel of agricultural land equals 2.1 ha, in Spain 2.3 ha, and 1.7 ha in Switzerland.

The effects of implementing land consolidation in Serbia after 2006 are significant primarily in regards to land enlargement. The coefficient of land enlargement in Vojvodina is 2.97 which means that the average parcel size in the land consolidation area has been increased from 0.75 hectares prior to land consolidation to 2.23 hectares after the land consolidation; in Central Serbia the enlargement coefficient is somewhat lower and equals 2.54, meaning that the average parcel size was increased from 0.28 to 0.73 hectares- notably to the level similar to the average parcel size in Vojvodina, but in areas where land consolidation was not implemented.

Additional important effects pertain to the reduced share of parcels without access to public roads. In three land consolidation areas in Vojvodina, prior to land consolidation, average number of parcels not having access to public road was above 14%, while in Central Serbia it amounted to 61% even. After land consolidation had been implemented, the access to designed or constructed road is still lacking for only 6% of parcels in Vojvodina and 12% of parcels in Central Serbia. (Following the land consolidation, almost all parcels are provided with the road access, apart from those left in “factual situation”, namely those not being the subject of reallocation due to the existence of some facilities or permanent crops). In practice, this means that in the average land consolidation area in Vojvodina road access was provided to 424 parcels previously not having such access, while in Central Serbia the number of such parcels totaled to 2,535 per land consolidation area. It has been recored that in one of the land consolidation areas in Central Serbia prior to land consolidation only 2.5% of all parcels had road access; whereas after the land consolidation majority of parcels was provided with an access to roads from two sides.

New field roads network is designed, and often constructed, in scope of land consolidation. In Vojvodina, where more data compared to Central Serbia is available, the increase of 9.5% in the length of designed roads within the land consolidation areas was identified compared to the situation preceding land consolidation. The improvement reflected in the road access is not the only effect of the new road network design within the land consolidation area. In addition to the road access, width of the roads is also vital for the more intensive agricultural production, having in mind that modern agricultural machinery requires road width of six and more meters. This is why we have explored the effects of land consolidation on the road area, which reflects the effects in terms of both the road width and length. The total area of the designed field roads in five land consolidation areas the data is available for has been increased by minimum 15%, median increase amounts to 20%, while the average increase is more than double and it amounts to 119%. The very designing and marking of roads, even when such roads are not constructed in scope of land consolidation, enables farmers to use the designed roads, without trespassing parcels of others, which is most frequently the case prior to land consolidation implementation, and thereby helps avoid damage, court proceedings and violation of interpersonal relationships.

The unsettled legal and ownership relations among the land consolidation participants are a common phenomenon- even 11% of parcels are entered in the land consolidation procedure with unsettled legal and ownership relations (not taking into account the parcels where the only element lacking for regulation of ownership relations pertains to the fact that the person considered owner is not registered as such in the real estate cadastre). This can lead to land being left unfarmed, or even more often, not invested in, given that the current tenant does not know whether the land will stay in their possession. All ownership and legal relations over the real estates in the land consolidation area are resolved in the land consolidation process. Particularly important for the land owners is the fact that regulation of ownership relations, conclusive with registering land in the cadastre, is being performed without any costs incurred outside the land consolidation procedure, typically including the costs of a lawyer, notary public, payment of administrative fees, and property transfer tax.

Owing to land consolidation, fuel costs have been reduced by almost 30% in the total costs structure of agricultural holdings. The analysis has identified a statistically important link between the land consolidation and reduced costs of fuel in the total cost structure of agricultural holdings amounting to approx. 27%; another cost reduction was detected in relation to seeds (around 6%) and machinery costs (around 4%), along with increased tax costs. At the level of one hectare of agricultural land, these land consolidation effects are being translated into reduced costs of agricultural production in the amount of RSD 4,100 annually in Vojvodina, and RSD 3,313 in Central Serbia.

On the other hand, the land consolidation costs are significant, and they mostly depend on the scope of investments implemented in scope of land consolidation, same as on whether land consolidation includes construction area or not. The range of land consolidation costs per hectare of land consolidation area varies from a bit under RSD 20,000 per hectare of consolidated land area to over RSD 100,000 per hectare. The land consolidation costs in Vojvodina are on average lower than in Central Serbia calculated per hectare of consolidated area, and more often amount to RSD 25,000 per hectare of consolidated area, especially when more significant investment works (road and canal network, windbreaks, etc) have not been planned.

Most expensive are the road and canal network and clearing works jointly comprising between 17 and 75 percent of total land consolidation costs, with average share of investment costs in total land consolidation costs being at 44%. The share of these costs in Central Serbia is, as a rule, significantly higher than in Vojvodina. Within these investment costs, the most significant portion pertains to field road construction and development, accounting for 31% of total land consolidation costs on average. The field roads- related costs amount to from RSD 7,000 to even RSD 44,000 per one hectare of the land consolidation area, with an average slightly above RSD 23,000.

Right after the field roads, clearing is the second largest investment cost pertaining to land consolidation implementation in Central Serbia. In the total land consolidation cost structure, clearing costs account for approx. 3% to 48%, with an average of 15% of the total land consolidation costs. The share of areas to be cleared against the total land consolidation area varies from 0.4 to 12.7%, with an average share of slightly above 6%. This is where certain asymmetry was identified given that the part of the land consolidation budget, 15% on average, is being spent to service only a bit more than 6% of the land encompassed by land consolidation. In the most extreme example of the available data set, 48% of the budget earmarked for land consolidation pertains to clearing covering 5.8% of land in the land consolidation area. The average clearing costs per hectare equal to RSD 180,000. Concerning the canal network construction, the data on the related share of costs in the total land consolidation costs is available for the three land consolidation areas only. It shows that the canal network share amounts to 10%-22% in the total land consolidation costs, with an average share of 13%.

When it comes to the non-investment costs, by far the most important cost item pertains to geodetic and technical works (including supervision), accounting for 13% to even 58% of the total land consolidation costs. The cost of geodetic and technical works ranges between approx. RSD 8,000 to slightly below RSD 16,000 per hectare, with an average of around RSD 13,000 per hectare of the land consolidation area.

The commission costs show a significant range in the share in total land consolidation costs (from 4 to 27 percent, with an average at 11%), but also a relative balance when compared against the total surface of the land consolidation area. In this case, the range varies between RSD 2,600 to RSD 8,500, with an average of RSD 5,200 per hectare of the land consolidation area. .

With median land consolidation costs amounting to RSD 35,000/ha, annual savings stemming from the reduced fuel, seeds and machinery costs amount to approx. RSD 4,100 per hectare of consolidated land in Vojvodina, or around RSD 3,313 in Central Serbia. In situations when significant overgrowth clearing emerges in scope of the land consolidation implementation, these costs reach the level of RSD 180,000/ha; direct benefit generated by clearing for the owner of the cleared land amounts to approx. RSD 11,300 per hectare annually, whereas the increased revenues collected by the public sector equal to RSD 17,500 annually. In total, the benefit for the public sector and land owner amounts to around RSD 28,800 per hectare of cleared land annually, not taking into account the opportunity for increased revenues enabled by the land clearing to owners willing to farm that land themselves.

Continuity applied by the Republic and AP Vojvodina in co-funding land consolidation makes a factor contributing to a broader application of this measure, although the calendar of approving these funds is not well-aligned with the budget calendar of the local government units and the land consolidation works execution pace, thus bringing the local government units in a rather unfavourable position regarding the planning of works. Besides this, given that the multi-annual funding of land consolidation by the higher level of government does not exist, municipalities are forced to re-apply for support funds for implementation of land consolidation each year during the land consolidation process duration. This absence of predictability does not contribute to successful implementation of land consolidation. In terms of co-funding of land consolidation by the Republic and AP Vojvodina, a question arises in relation to limitations to the level of support provided to local governments. These limitations ought to be reconsidered in the context of available funds at different levels of government and benefits incurred by each level of government from the successfully implemented land consolidation procedures.

The dynamics of land consolidation implementation in Serbia is not at the high level. Since 2008, 39 land consolidation procedures have been initiated- of which 27 in the territory of AP Vojvodina and 12 in Central Serbia. The area covered by these land consolidation procedures amount to approx. 125,000 ha. Out of this figure, around 86% is located in the territory of Vojvodina, with the remaining 14% being in the territory of Central Serbia. If we were to assume that land consolidation would be completed in all these areas, we come to the data of around 12,500 hectares of consolidated land area annually. At this pace, consolidation of around 400,000 hectares, which makes only a half of the estimated need for land consolidation in Vojvodina, would take more than 30 years. The said scope of 12,500 ha of consolidated land annually is an optimistic outlook, given that this concerns the average area of initiated, however not finalised land consolidation processes at annual level in the past ten years. This scope can be compared against 1.4 million hectares of land consolidated in Serbia in the period between 1955 and 1990- during this 35-year period, 41,306 hectares were consolidated annually on average.

In 16 land consolidation areas with Land Consolidation Programmes approved by the Ministry, land consolidation has not yet been initiated. The total area of these 16 land consolidation areas amounts to somewhat less than 29,000 hectares. Although we can hope that the majority of those may be activated in a relatively short period of time, we have identified those where Land Consolidation Programme was adopted even back in 2003, without the land consolidation being launched even to date.

Duration of the land consolidation procedure is something we can hardly be satisfied with, given that out of 43 initiated land consolidation processes in the period since 2006 onwards, only in five cases the process was completed with registration of ownership rights in the cadastre (and out of this number in one land consolidation area only the rural farming area was recorded, without the construction area comprising the land consolidation area), whereas in 15 land consolidation areas owners have been vested into property, which is considered to be the key moment in the implementation of land consolidation, not taking into account only the registration of changes in the cadastre.

The average duration of the procedure from the moment of the land consolidation programme adoption by the local government assembly to vesting owner into property in the land consolidation areas was around three years and four months. It has to be taken into account that this average significantly improved the results of pilot municipalities where GIZ was engaged in implementation of land consolidation, given that in these municipalities average duration of land consolidation from the moment of programme was adopted to vesting into property lasted for less than 26 months; the average for the remaining land consolidation areas was 50 months, namely more than four years. (The area of the four pilot land consolidation areas in Central Serbia with an average of 26 months is almost four times lower than the average land consolidation area in Vojvodina, therefore this has to be taken into account as a factor affecting shorter duration of the procedure, apart from the innovative methods applied in implementing land consolidation supported by donors). We would hereby like to stress that there is a large number of land consolidation procedures initiated in the last 10 years which have still not reached the phase of vesting new owners into property. On the other hand, such a long land consolidation procedure duration is not entirely unheard of in the practice of European Union member states. Despite the fact that land consolidation process in Norway lasts from two to four years, in Sweden from five to seven years, in the Netherlands only preparation for land consolidation may take about 10 years, with the land consolidation taking as long. Lengthy duration of the land consolidation procedure, primarily up to vesting owners into their property, and then up to implementing changes in the cadastre, is limiting owners in disposing of their real estates and affects postponing of all relevant investments.

Key deficiencies in legal and institutional frameworks for the implementation of land consolidation are as follows:

- a. Sub-norming (insufficient level of detail) of legal provisions regulating land consolidation and obsolescence of bylaws regulating particular segments of land consolidation;
- b. Insufficient resources on the side of land consolidation participants, reflected in the non-systematic monitoring of the land consolidation procedure, long period of decision-making upon appeals, insufficient training of municipal land consolidation commission members and limited capacities of geodetic organisations;
- c. Untimeliness of approving funds by the competent authorities in the budget year context, leading to inability to contract works in line with the land consolidation programme;
- d. Excessive steps in the real estate cadastre registration phase which is why this procedure takes much more time than necessary;

Key recommendations for the improved land consolidation implementation:

- a. Strengthen legal framework for land consolidation implementation, including **passing of a separate law or significant elaboration of the existing provisions of the Law on Agricultural Land**, same as modernising bylaws, so as to regulate this area in line with best international practices;
- b. In addition, work on drafting **innovated bylaws** to regulate with the sufficient level of detail and referral to adequate technological standards, actions in different segments of land consolidation implementation;
- c. Define a single **central body to ensure systemic dealing with land consolidation**, including development of multi-annual plans for the land consolidation implementation, provision of support to local land consolidation commissions and other stakeholders, coordination with state authorities, monitoring results and detailed reporting on the effects of individual land consolidation processes, same as drafting of annual report on the land consolidation plans delivery, including the data on the pace, budget execution and effects of ongoing land consolidation processes, i.e. those that are underway;
- d. **The allocation of shares in land consolidation financing among different levels of government** (Republic, autonomous province and local government) is to be determined **mid-term at least, with multi-annual budget projections**;
- e. **Capacity building of the competent authorities** in segments where it has been identified that their decision-making represents a bottleneck in the land consolidation implementation;
- f. Consider new models of **professionalisation and reimbursement for the local Land Consolidation Commission members**;
- g. **Introduce software for land consolidation procedure management**, same as for monitoring their direct results, and effects achieved after a particular longer time period;
- h. Once the Land Consolidation Commission has started its operation, **all competences regarding changes on the real estates are to be transferred to the Commission**, until effective decisions on the reallocation of land consolidation mass had been passed, and after receipt of the land consolidation study and update of the real estate cadastre, the competence for the real estate cadastre maintenance is to be resumed by the local cadastre office;
- i. Strengthen mechanisms for informing and inclusion of land consolidation participants in the decision-making process, using the **Board of Participants concept** and other examples of good practice as the starting point;
- j. **Establish ongoing consultation mechanisms** between the land consolidation commission, geodetic and technical works contractors and RGA so as to identify potential problems in the land consolidation implementation in due time and address them with the participation of all stakeholders;
- k. **Promote land consolidation as a measure with multiple positive impacts on the territory and the society.**

1. INTRODUCTION

1.1 The concept and relevance of land consolidation

Along with water and forests, land represents one of the major resources of any country, and as such requires implementation of accountable policy for its rational and sustainable use as a non-renewable resource.

Land consolidation is an agrarian measure implemented by the State, aimed at enlarging parcels of individual agricultural land owners, and implementing new concept of land territory development, with regulation of legal and ownership rights over such land. It is implemented as a system of activities comprising grouping of land, formation of better shaped parcels and more favourable position, regulation of legal and ownership relations over land, allocation of areas for common facilities and execution of investment works, such as development of road and canal network, clearing of land and formation of windbreaks, with the purpose to raise productivity of land and improve quality of life of people who own such property or live in the land consolidation area or in its vicinity.

The Law on Agricultural Land¹ sets forth that “land consolidation includes planning, organisational, legal, economic and technical measures implemented to enlarge and enhance natural and environmental land properties”. This highlights that land consolidation represents a focused effort of public authorities, given that its purpose is not only to reverse fragmentation in cases when it has become a predominant tendency in agricultural estates size and when it leads to unfavourable effects on the cost-effectiveness of land use, but also to ensure new quality in land use and life and work on such land.

Let us hereby briefly reflect on the concept of agricultural land fragmentation and associated problems. Fragmentation implies a situation in which land available to an agricultural holding comprises several spatially separated estates. Such a situation leads to, inter alia, costs related to travel from economic household to the land being farmed, i.e. between separated estates of a holding; reduced cultivation intensity of land located farther away from the farmstead; longer margin lines, and thus larger land areas used for borders; existence of parcels without road access, thus leading to reduced opportunities for the use of modern machinery and range of other problems². The existence of these problems related to parcel fragmentation in real life, and not only in theory, is illustrated by the following two pieces of data: a) farmers in Cyprus travel on average 4,000 km a year between their farmstead and 22 parcels in their ownership; b) a tractor may consume up to one third of the time needed to farm a field of 1 ha only to turn around³. In addition, the time wasted is not the only damage incurred by frequent turning of agricultural machinery as a result of fragmented parcels: operation of agricultural machinery causes compression of soil, but of different intensity, thereby leading to greater soil compression in headlands, due to lower speed while turning⁴.

From an instrument to overcome problems of land fragmentation, land consolidation has over time evolved into a broader approach to improving conditions for a more efficient agricultural production and addressing the issue of infrastructure equipment and space development.

1 “Official Gazette of RS”, No. 62 of 19 July 2006, 65 of 5 July 2008 - other law, 41 of 2 June 2009, 112 of 30 December 2015, 80 of 29 August 2017.

This provision is contained in Article 2, paragraph 1, item 5) of the Law.

2 Demetriou (2014), p. 13.

3 Demetriou (2014), p. 15.

4 Demetriou (2016), p. 15.

The practice of using land consolidation to ensure land for public needs, construction of infrastructure and ensuring land for industrial zones and other economic purposes has already been established in our practice; the aspect of land consolidation which is yet to gain its importance concerns improvement of the state of the environment, through harmonisation of often conflicting interests of intensive agricultural production and environmental protection⁵.

The reasons underlying land consolidation are defined in the **Law on Agricultural Land** as follows:

1. when due to the high fragmentation and ill-shaped cadastral parcels agricultural land can not be rationally used;
2. when irrigation or drainage system is being constructed;
3. when field roads network is being constructed;
4. when due to construction of larger infrastructure facilities (public roads, railway tracks, lakes, etc), water courses development or extension of construction area further fragmentation of the existing cadastral parcels, disturbance of the field roads network and irrigation and drainage systems is being exercised;
5. when anti-erosion works and measures need to be implemented.

Most often, land consolidation is conducted due to the reasons representing a sublimation of several, if not all reasons envisaged under the law.

Despite not being listed in the law, land consolidation represents an instrument to address many other issues. In a large number of cadastral municipalities, especially in the territory of Vojvodina, cadastral survey from the 19th century is in force, actually, from the 18th century and the period of Maria Teresa. This is often a graphic survey, without numerical surveying data. The working originals of cadastral plans are in analogue form and almost unusable for the needs of survey maintenance, torn, worn, with physically missing parts of plans. Besides this, the lack of numerical data and insufficient accuracy of available data result in the inability of its use for the needs of survey and real estate cadastre maintenance, same as for the needs of renewing parcel margins, but only to identify parcels. This situation is reflected in the large number of conflicts due to parcel margins and court proceedings, which all sets back the use of agricultural land for its main purpose- agricultural production, and requires significant financial resources on part of the parcel owners.

The mismatch between the real estate cadastre and factual situation in the field is reflected both in graphic part and in the overview of legal and ownership situation. This is why a special relevance of land consolidation lies in the fact that it enables establishment, namely update of the real estate cadastre, as records on the real estates and respective rights over them, based on the data of the commission, thus resulting in a completely up-to-date records in digital form.

⁵ Cakić and Mihajlović (2017), p. 534.



1.1.1 Land consolidation as a specific development measure

Land consolidation is primarily a development measure and this is the key motivation of public authorities' decision on whether to implement such measure, i.e. to ensure funding for its implementation. Development potential of land consolidation lies in its ability to create conditions for long-term productivity improvement of agricultural land use- via enlargement of agricultural estates, improved road network, irrigation system construction, etc. As such, land consolidation has a specific importance in the context of agricultural production development.

Land consolidation facilitates construction of infrastructure projects and of facilities of public importance, which are not or do not necessarily have to be linked to agriculture. Construction of roads through land consolidation area, and roads to the land consolidation area, enables positive effects not exclusively related to agriculture. Allocation of land for common facilities like graveyards, directly contributes to resolution of some of the burning issues faced by local communities, while ensuring land for industrial zones, where land consolidation was also used in some examples, can provide a key incentive to changed model of the particular territory development. Even when land consolidation does not serve ensuring land for industrial zone, enabling more intensive agricultural production or infrastructure construction conditioned by the land consolidation implementation, may have a decisive impact on development of other economic activities, like food processing primarily.

Besides activities focused on enhanced productivity of agricultural production and regulation of legal and ownership relations, land consolidation is becoming a more complex measure with a broad range of objectives set before it. This is what the positions rest on regarding land consolidation becoming "a measure of overall development of rural area with modified and extended objectives serving to achieve compromise between environmental protection, aesthetic and functional spatial development and intensive agricultural production"⁶.

Bearing in mind the increasingly closer link between land consolidation and spatial, i.e. urban planning, land consolidation is becoming the most comprehensive measure of rural areas development. These tendencies of expanding focus from agricultural production productivity to different aspects affecting the quality of life in rural environments certainly go in parallel with the practice of inclusion of construction areas, actually construction land stripes into land consolidation areas.

1.1.2 Land consolidation serving agriculture development and rural development

The basic idea underlying the launching of land consolidation process is improved agricultural production, with the most typical effects of land consolidation being enlargement of estates, formation of better-shaped parcels, design and construction of road and canal network for irrigation/drainage and windbreak planning. In this way conditions are being laid down for rational use of agricultural land with optimum application of agricultural and technical practices, i.e. modern scientific achievements in the area of agriculture and machinery aimed at enhancing soil fertility, and thus yield.

The goals of Serbian agriculture development are defined in the Strategy of Agriculture and Rural Development for the period 2015-2020, which, inter alia, include:

- Construction of sustainable and efficient agriculture sector competitive in the global market and contributing to national income increase;
- Ensuring food meeting the needs of consumers in terms of quality and safety.

One of the limiting factors for development of agriculture is fragmentation of parcels, their improper shape, same as the fact that large number of parcels does not have road access, which prevents the access to machinery. Inter alia, these are the reasons why a large number of parcels is abandoned, namely not being farmed. In addition, due to the climate change, there is a growing need for irrigation and drainage of soil. Land consolidation creates conditions for modernisation of agricultural production, significant increase in the use of machinery, given that each parcel is provided with road access. Moreover, canal network system resolves the soil irrigation/drainage problem.

Around 85% of area and around 40% of population of the Republic of Serbia belongs to rural areas. With the planning practice being more focused on urban areas, rural environments were left neglected in terms of development planning and spatial development, without institutional and organisational support. Republic of Serbia is facing notable unfavourable tendencies in rural areas concerning demographic and economic population structure and increase in idle, unfarmed agricultural areas. These are the basic segments of the context explaining why the renewal of villages and rural areas make one of the strategic elements of the Republic of Serbia Spatial Plan, as its basic planning document.

Rural areas in the Republic of Serbia are generally characterised by weakly developed rural infrastructure and low level of road equipment and other important living standard elements. Land consolidation is also implementing the road network project with planned horizontal and vertical links with regional centers. The estate enlargements as such, with the better shaped parcels and resolution of irrigation/drainage issues, is the driver for development of agricultural production, as a basic branch of rural economy.

Land consolidation is also implemented for the needs of implementation of the more important infrastructure projects, like roads, railways, flood protection embankments, which are as a rule, important drivers of local economic and regional development.

Land consolidation also plans areas for common facilities relevant for local population like sports courts, graveyards, playgrounds, industrial zones, processing capacities for primary agricultural produce, freezer facilities, drier facilities, cycling tracks, picnic sites, green markets, flood protection embankments and other needs.

Land consolidation is used as a measure of regional development in areas specific for their vineyard and fruit production, as a way to prepare the land suitable for these crops for future investments. Here one must emphasise the importance of land consolidation for settling of unresolved legal and ownership relations creating one of the basic barriers to capital investments.

1.1.3 Land consolidation serving urban development

The applicable legislation enables land consolidation to include all lands, namely, it allows the **land consolidation area to encompass agricultural, construction and forest land**. This enables development planning of farming and construction areas within the same procedure, actually by means of the land consolidation implementation. The experiences have shown that land consolidation makes an opportunity to, besides improving the organisation of agricultural land in non-construction farming part, pay attention on the population needs in urban- construction area. Through land consolidation procedure spatial plans laying down the borders of construction area, residential, business, industrial, sports zones are being implemented, same as the plans related to linking construction and farming areas by communication links, areas for planned by-pass routes. Land consolidation improves the quality of the living environment by fostering different aspects of its protection and improvement, therefore the land consolidation project also takes into account planning and implementation of the water treatment plants, sewerage systems, but also forest complexes separating construction area from agricultural land.

It is of utmost importance for the local government and citizens to include construction area into the land consolidation survey through renewal of the survey, actually surveying of factual situation along with settling of legal and ownership relations. This possibility to resolve ownership and legal relations in construction and farming areas enables implementation of significant infrastructure facilities and strategic plans for new industrial zones or sports facilities, while avoiding expropriation as more unfavourable and the most expensive way of resolving legal and ownership relations.

Surveying of factual situation of the construction area results in the surveying study, as a basis for legalisation of illegally constructed facilities. Moreover, the same procedure allows gathering of data for mass valuation of real estates, which will along with the utmost up-to-dateness of data, serve to the local government as a database for property tax assessment.

Furthermore, by entering into force of the cadastral real estate records, established based on the land consolidation data, digital database is being obtained including graphic and alphanumeric data of the spatial database enabling local government and all investors faster and simpler implementation of urban plans, as a starting point for all investment works.

1.1.4 Land consolidation as a social policy measure

Development potential of land consolidation is reflected in its broader effects on the local community. **The initial effect of land consolidation is enhanced productivity of agricultural production, owing to the shorter time of travel between the farmstead and land estates, same as between individual land estates**. Owing to this, land consolidation sets conditions for improved quality of life through increasing time available for engagement in non-agricultural activities. This saving in time spent before the land consolidation on transport between the household and estate, namely, within the land consolidation area, may be used for additional agricultural, i.e. economic activities, thus generating additional household income, and reducing the risk of poverty for some of them. Alternatively, time savings owing to improved productivity of agricultural production enable spending more time with the family, engagement in cultural and sports activities, that is, engagement in democratic processes at local level.

Settling of ownership and legal relations over the real estate brings about larger share of ownership rights registered in favour of women in the real estate cadastre. This helps empower the role of women in economic and social context. These are some of the key reasons why land consolidation should not be observed exclusively as an agrarian measure focused on economic effects, but also as a measure bringing about broader social effects, with the potential to improve the most the position of persons most at risk of poverty- women in villages and aging agricultural households. On the other hand, research results are warning that effects of land consolidation as isolated measure are not sustainable, namely, that the increased share of women as holders of ownership rights resulting from the land consolidation, tends to get lost in time, i.e. to restore the condition as it was before the land consolidation.

1.2 The research subject

The subject of this research are the **effects of land consolidation procedures in Serbia**, in the context of experiences in the land consolidation implementation in the developed market economy countries, same as in the context of land consolidation implementation in Serbia over a longer period of time. Second research segment comprises the **barriers to broader implementation of this public policy measure and evaluating options for their overcoming**. This analysis addresses consolidation of rural land, therefore urban land consolidation, despite being increasingly present in the public discourse and professional debates, is not the subject of our research. The rural land consolidation concept is wider than agricultural land consolidation, given that it may include construction land serving rural communities by its nature- for example, construction area of a rural settlement belonging to the cadastral municipality in which land consolidation is being implemented.

As the subject of research, land consolidation is an extremely complex institute. First of all, **it is a measure directly affecting the ownership rights of the land consolidation participants and therefore evoking strong emotional reactions, which makes objective understanding of its effects more difficult**. It is not a rare case that a land consolidation participant instead of the land owned by their family for generations, leaves the land consolidation process as the owner of land practically unfamiliar to them. Regardless of the fact that value of new land is similar as a rule, and often even exceeds the value of land the owner has entered into the land consolidation process, this measure leaves a deep trail in local communities, same as in the psyche of individual participants.

Second important characteristic of land consolidation as a research subject lies in the fact that **this is a measure with a pronounced planning aspect**. First of all, land consolidation plan has to fit into the existing spatial , i.e. urban development plans of the local government. The land consolidation programme comprises two plans: one of them determines how the land consolidation area should look like after the land consolidation had been implemented, whereas other contains the steps to be taken so as to reach the desired state of affairs. Both of these plans are as a rule implemented to a certain extent- almost never in full. On the other hand, besides the ownership and legal and planning interventions, land consolidation procedures are often linked with the execution of physical works (clearing, windbreaks, road planning and construction, etc). This is why in the research of the land consolidation effects it is very difficult to make out planned effects from those that have materialised.

When it comes to the land consolidation procedure effects, at least two groups of sources of such effects may be distinguished:

- a. effects stemming from the land consolidation implementation in a narrower sense, actually from the measures focusing on grouping of estates, forming of better-shaped parcels and more favourable position in relation to the roads and regulation of legal and ownership relations;
- b. effects of land consolidation in a broader sense, which primarily includes execution of physical works in the land consolidation area, same as allocation of land for common facilities for the purpose of construction of facilities of public importance.

The subject of this analysis are both types of land consolidation effects.

In terms of the analysis of barriers to broader use of land consolidation as a public policy measure, the analysis addresses space for improvement not of the legal framework only, but institutional framework for the land consolidation implementation as well, and capacities of key stakeholders in implementing land consolidation programme. To that end, the subject of this analysis are primarily practical problems faced by the stakeholders in the land consolidation process.

In line with this approach is the determination for the recommendations aimed at improving land consolidation implementation to also include measures that are to facilitate stakeholders in deciding to join the land consolidation procedure, same as the measures focusing on accelerated delivery of initiated procedures, without unnecessary spending of financial resources and in a way that is to produce optimum results.

The subject of this research is not voluntary grouping of land, as a measure often linked with land consolidation, although these two make distinctly different institutes. The scope and range of this measure are not only significantly limited compared to land consolidation, but the experiences regarding successful implementation of voluntary land grouping are rather poor. All this has contributed to the decision to leave out this measure from the scope of this analysis, apart from indicating its possibilities and shortcomings as an alternative to implementation of the land consolidation procedure.

1.3 Motivation for the research

The key motive underlying this research lies in the answer to the following question: **is, and to what extent, investing in the implementation of the land consolidation procedure cost-effective?** At the first glance, this question may seem redundant- the assumption is that land consolidation as a public policy measure would not persevere for so long, both in international and national practices, and that investments in the land consolidation project would not be made if this measure was not cost-effective. However, such an answer must not satisfy those wanting to decide on public policies and spending of budgetary funds based on objective, verifiable and quantifiable indicators. Namely, the position denoting that land consolidation is cost-effective does not speak about how cost-effective it is for whom: to those who own land in the land consolidation area, to those living on such land or in its vicinity, or to public authorities investing in land consolidation: local government, province and the Republic. Motivation for this analysis also includes providing multiple grounds for evaluation of the land consolidation cost-effectiveness.

Furthermore, if the position implying that land consolidation is cost-effective as a measure would be accepted a priori, another question arises, and that is why is it then not being implemented much more often than it is the case. If the existing level of investments in land consolidation is cost-effective, would the higher level of investments be much more cost-effective? These are the questions underlying motivation behind the research about the effects of land consolidation.

The latter question leads to another motivation for this research. It is about **identifying barriers to a broader and more efficient implementation of land consolidation as a land policy measure**. Therefore, if land consolidation proves to be cost-effective as a measure, the lack of funding, which makes a universal barrier to wider implementation of the majority of public policy measures, must not be the barrier for wider use of this measure. This is why we embark into the analysis of land consolidation application also with an aim to identify barriers to more intensive implementation of this development measure.

1.4 Methodology applied

Land consolidation is a phenomenon requiring multidisciplinary approach to be researched. In this paper we have started from the study of international experiences in implementing land consolidation, and then continued with the analysis of legal and institutional frameworks for implementation of land consolidation in Serbia. After that, we have addressed direct results brought about by land consolidation (enlargement of land, regulation of ownership and legal relations, execution of works in scope of land consolidation, etc), so as to finally focus on economic and other effects of land consolidation (production costs, income of land consolidation participants, etc).

Key sources of information for this analysis comprise the data contained in the records of competent state authorities (Ministry of Agriculture, Forestry and Water Management, Provincial Secretariat for Agriculture, Water Management and Forestry, Republic Geodetic Authority), local government units and geodetic organisations, same as contractors implementing land consolidation. An immense benefit in drafting of this analysis was ensured through thorough interviews with land consolidation stakeholders- representatives of competent authorities, participants in land consolidation, geodetic organisations, land valuers, representatives of GIZ actively supporting implementation of land consolidation in different parts of Serbia, etc. All data in this part of our research was acquired for all areas where land consolidation was initiated after 2006, where such data was available.

An important place in the methodology applied belongs to the in-depth analysis conducted in eight areas- six where land consolidation was implemented after 2006, and two where it was not. The six areas where land consolidation was implemented were selected so as to include three areas from the territory of Vojvodina, and three from the territory of Central Serbia. In all six observed land consolidation areas vesting participants into property was completed in three land consolidation areas ownership rights were registered in the real estate cadastre, whereas in the remaining three this procedure is under way. Out of the two observed areas where land consolidation was not implemented (control areas), one is located in Vojvodina, and other in Central Serbia, and by its basic characteristics they correspond to the areas where land consolidation was carried out. (As seen later on, certain differences between land consolidation and control areas could not be avoided.)

In addition to collecting data from local government units in whose territories these areas were located, and interviews with land consolidation stakeholders, an important source of data for this part of the research was a

survey conducted in the field with land consolidation participants conducted for the needs of this paper by the SeConS Development Initiative Group.

The use of data from the records of competent authorities relating to all land consolidation areas active since 2006, same as of data from the eight areas collected via the survey and provided by competent authorities and geodetic organisations, enables two directions for comparison of land consolidation areas- against the situation in the area prior to land consolidation, and against the situation in similar areas not being subject to land consolidation.

The methodology applied and the data available imply several limitations to be taken into account when evaluating the scope of the analysis and interpreting its results:

- The data from the competent authorities' records is far from being complete and comprehensive. While the data on the expenditures of higher government levels spent on land consolidation implementation may be considered complete and accurate, the data concerning the area and structure of land consolidation areas, expenditures of local government units, scope and dynamics of executed works and similar, is often incomplete, unreliable or even unavailable. The lack of reliable data was a challenge particularly in the analysis of the land consolidation effects.
- The field survey with the land consolidation participants provided grounds for a major portion of findings in scope of this analysis. The survey was conducted on the representative sample, using control areas both in Vojvodina and Central Serbia, while complying with high professional standards. The fact remains that the survey findings are by definition rooted in subjective attitudes of respondents, with all advantages and disadvantages typical for this method.
- Time distance in relation to land consolidation implementation period creates a special challenge in this type of a research. Namely, certain land consolidation processes covered by this research were initiated more than ten years ago, which creates problems both for data collection by survey and for data collection from the records of competent authorities. On the other side are the land consolidation areas where the key implementation phase- vesting into property- took place less than three years ago. This is a separate challenge in efforts to determine the effects of land consolidation, given that short time distance makes it more difficult to conclude which of the detected differences compared to the period prior to land consolidation represent the result of seasonal trends, and which are the result of land consolidation.
- A special challenge in the evaluation of land consolidation effects lies in the small number of areas where land consolidation was fully implemented, including registration in the real estate cadastre. Having in mind that settling of ownership and legal relations, including ensuring registration of corresponding property rights, makes one of the key objectives of land consolidation, a small number of cases where this had actually happened makes detection and calculation of these effects particularly difficult. The fact is that land consolidation projects analysed as case studies, selected based on them being finalised (at least up to the vesting into property stage), have been finalised relatively recently, thus preventing full effects of land consolidation to have enough time to materialise.

Although the applied methodology and collected data have enabled progress in our understanding of the land consolidation effects, this analysis also underlines segments that are yet to be explored. Whether this will happen will depend on the thoroughness in collecting data on land consolidation to be demonstrated primarily by the republic, provincial and local authorities competent for its implementation.

2. LAND CONSOLIDATION IN INTERNATIONAL PRACTICE

Rural land consolidation has been used as one of the key instruments of rural development and land development for several centuries already worldwide. Land consolidation is being implemented in the majority of European states (26 EU member states) and in the large number of countries outside Europe: Turkey, India, China, Thailand, etc. Land consolidation was recognised as a useful tool in the Western Balkans countries, therefore it is being implemented in Bosnia and Herzegovina, Croatia, Macedonia and Albania.

Land consolidation has been used for the longest period of time in the North of Europe. The first law on land consolidation was passed in Denmark in the beginning of the 18th century.⁷ In the most developed European countries in terms of agriculture, such as the Netherlands and Germany, land enlargement process was mostly completed mid last century. Privatisation processes at the end of the 20th century in Central and Eastern European countries have created the need for land consolidation projects, given the high level of land fragmentation and domination of small agricultural holdings.

When it comes to the legal framework for land consolidation, conclusive with 2006, national land consolidation programme was adopted in the following states: Czech Republic, Lithuania, Poland, Slovakia and Slovenia. Additionally, a separate land consolidation law was passed in Croatia, Czech Republic, Poland, Slovakia and Slovenia, etc.⁸

Within the land consolidation procedure implementation, certain aspects significantly differ from country to country. In line with this, in the next section we will briefly list some of the differences, but also similarities, in approach to land consolidation in international practice, and especially in the following segments: duration of land consolidation, motives for its launch and land consolidation objectives, forms of participation of land consolidation participants and land consolidation effect on the environment.

Land consolidation duration

One of the most important identified problems pertains to the time needed for completion of all segments of the land consolidation process. In Germany, average time needed to complete the land consolidation project amounts to 8 and 16 years, whereas in the Netherlands and Finland land consolidation takes between 8 and 12 years. Specificity for the Netherlands is that preparation phase only may take up to 10 years. On the other hand, in Norway land consolidation processes last shortest, from 2 to 4 years, while in Sweden this period amounts to 5 to 7 years.⁹

Motives for initiation and objectives of land consolidation

Legally defined objectives and motives underlying initiation of rural land consolidation projects vary from country to country. So the basic objective of land consolidation in Finland is the change in structure of agricultural holdings, while in Norway the objective is to enhance efficiency of land use via exchange. Unlike many other countries,

⁷ Ivković et al. 2010, p. 299.

⁸ Hartvigsen, 2006, p.3

⁹ Marošán, 2013, p. 22

the exclusive objective of land consolidation in Finland implies reduction of farmers production costs, without any other motives being listed, like environmental protection, social effects, etc¹⁰. One of the main objectives of land consolidation in Sweden is more efficient use of land and overcoming the problem of unfavourable distribution of agricultural holdings. Denmark has determined the largest number of different land consolidation objectives: promotion of environmental protection, management of natural protected areas, creation of recreational space and of other facilities relevant to the land consolidation participants¹¹.

In Central and Eastern European countries, main objective of land consolidation is rural development. In the majority of Central European countries, basic objective of land consolidation is improvement of preconditions for efficiency in agriculture and forestry. In addition to this, in certain countries focus on protection and development of natural beauties (Belgium and Slovakia), promotion of other legally recognised land uses in rural life and working environment (Germany), improved structure of rural environment in line with agricultural activity predominant in the land consolidation area (the Netherlands). In the Netherlands, the land consolidation process had multiple use: irrigation, village renewal, wetland drainage, construction of economic yards, etc¹². Later these functions of land consolidation were also recognised in Spain and Poland.

In Spanish region of Galicia, one of the land consolidation objectives is, inter alia, fight against depopulation. In the Galicia region, suffering from major changes in the agricultural land use, it was determined that depopulation was significantly lower in areas where land consolidation was implemented than in other areas¹³.

Engagement of land consolidation participants

Based on the manner of its implementation in international practice, land consolidation can be divided into mandatory and voluntary. In practice, mandatory land consolidation can further be divided into land consolidation implemented without prior agreement with the majority of agricultural land owners, and mandatory land consolidation with previous agreement. First of these options of mandatory land consolidation is nowadays not being implemented in practice anywhere, given that it can provoke resistance in farmers and land owners. In order to build trust and good relationship with the land consolidation participants, second option is much more commonly found¹⁴. The practice implies that majority of participants agree with the land consolidation project, with this majority varying from country to country (somewhere it is 2/3, while in other places it implies simple majority, etc). On the other hand, voluntary land consolidation implies consensus of all land consolidation participants. So in Denmark land consolidation is carried out on a voluntary basis, while in Germany and the Netherlands participation of land consolidation participants may be obligatory¹⁵. In Finland, land consolidation is also set as obligatory. On the other hand, in Eastern European countries there were land consolidation projects where participation was entirely voluntary, so as to implement successful projects and reach rural development and lesser parcel fragmentation through development of good relations with farmers.¹⁶

10 Hiironen and Riekkinen, 2016, p. 1

11 Tenkanen, p. 3

12 Tenkanen, p. 3

13 Miranda et al. 2006, 517

14 Hristov, 2009, 14

15 Hartvigsen (2006), p. 16.

16 Hristov (2009), p. 14.

In the example of Austria, 33% of land consolidation participants disposing of minimum 50% of land, have to agree to the land consolidation project in order for it to be implemented¹⁷. In certain parts of India, land consolidation is implemented only after minimum one third of land owners in a particular area have agreed to the programme. And many other countries lay down the share of land consolidation participants or land under their disposition, that have to agree to the land consolidation programme prior to its implementation.

Land consolidation and the environment

One of the identified goals of land consolidation in European countries is environmental protection and raising awareness of the citizens about the importance of this topic. The link between land consolidation and environmental protection can be illustrated on the example of the Netherlands and Austria. Positive effects of land consolidation on environmental protection in Austria primarily refer to development of ecological networks aimed at conservation of flora and fauna, irrigation system improvement and development of the pastures protection system. On the other side, negative impact of land consolidation on the environment has also been detected, mainly due to the fact that land consolidation enables increased specialisation of agricultural production through increase in monocropping, reflected in impoverishment of flora and fauna, that is in reduced biodiversity.¹⁸ Positive effects of land consolidation in the Netherlands include conservation of natural areas, landscapes and facilities of special importance. Another positive effect relates to improved flora and fauna, farm transfer from nature to other areas, aiming to conserve nature reserves. Adverse effects of land consolidation on the environment are primarily related to reduced water levels in canals, which may pose a serious threat to flora and fauna living in the land consolidation area. Negative effects of land consolidation include soil erosion caused by wind¹⁹.

The positive effects of land consolidation on the environment recognised in other countries include soil protection, nature enrichment via construction of plantations, development and maintenance of antique roads of cultural importance. On the other side, a large number of countries have not identified any obvious positive effects on environmental protection.

17 Hristov (2009), p. 16.

18 Tenkanen (1994), p. 7.

19 Tenkanen (1994), p. 8.



3. LAND CONSOLIDATION IN SERBIA: HISTORICAL, LEGAL AND INSTITUTIONAL FRAMEWORKS

3.1 Land consolidation history in Serbia:

The land consolidation history in the Serbian territory is older than the history of land consolidation in Serbia. Namely, in the territory of today's Vojvodina, then part of the Austrian-Hungarian Monarchy, land consolidation was elaborated in the law in the first half of the 19th century. General view is that it was actively implemented since the 1848 Revolution which provided significant incentive to development of agrarian relations²⁰. In the second half of the 19th century, in force were the "Urban land consolidation law from 1836, Imperial patent from 1857, Order of the Ministry of Interior and Justice from 1859 and Legal article V from 1870"²¹. In transition from 19th to 20th century, implementation of land consolidation as agri-technical practice continued in Vojvodina, so that in 1908 Hungarian Assembly passed the Land Consolidation Law in the territory of Banat and Backa, representing one more incentive for the implementation of land consolidation in this area²². This law remained in force until 1941.

During that period, land consolidation in the territory of Central Serbia found it hard to survive. Not sooner than in 1901 first land consolidation project was launched, entitled 'The exchange-based grouping of rural estates'²³. In the period between the two world wars, land consolidation was not implemented in the territory of Central Serbia, primarily due to non-existence of land survey and cadastre. On the other hand, up until the period after the World War II, land consolidation as a measure is being intensively implemented in the Vojvodina region. The total area covered by land consolidation only in the region of Srem until 1947 amounted to around 526,000 cadastre acres, i.e. over 300,000 hectares²⁴.

After 1945, one of the difficulties in implementing land consolidation in addition to lacking survey and cadastre, related to ideological reasons, given that land consolidation was perceived as a capitalist idea leading to strengthening of private estates²⁵.

As of 1956, land consolidation re-emerged in Serbia, mainly with the purpose of grouping socially-owned estates at the time. Land consolidation projects were first launched in the territory of Vojvodina, whereas in Central Serbia this process was initiated much later, namely starting from 1965²⁶. The law regulating implementation of land consolidation in Serbia (Law on Arrondissement and Consolidation of Agricultural and Forest Land) was passed in 1974. This law has, on one hand, acknowledged the relevance of land consolidation as important measure in implementation of agricultural policy, and on the other, provided a strong incentive for its more intensive implementation²⁷.

20 RGA, 2003, p. XI.

21 RGA, 2007, p. 20.

22 Marinković et al, p. 178.

23 Marinković et al, p. 178.

24 RGA, 2003, p. 33.

25 RGA, 2003, p. XI.

26 Marinković et al, p. 180.

27 RGA, 2003, p. XI.

The first mid-term (five-year) land consolidation programme was passed in 1981 and it envisaged consolidation of 254,000 hectares; second mid-term programme (from 1961) envisaged implementing land consolidation on an even larger area- 272,000 hectares, taking into account areas where land consolidation had been already launched. The same programme envisaged land consolidation to be implemented on 1.2 million hectares by 2000²⁸. The record year in the territory of Vojvodina was 1979 with almost 100,000 hectares of consolidated land, whereas in Central Serbia record year was 1980 with over 40,000 hectares of land where land consolidation was implemented.

The results achieved in the period from the mid 1950s to the beginning of the 1990s are rather impressive: land consolidation was implemented on 1,445,720 ha, i.e. on 25% of agricultural land in Serbia. It covered 60% of agricultural land in Vojvodina and around 9% in Central Serbia²⁹. On that occasion, 69,500 ha of socially-owned land was detected that was usurped by illegal owners; canal network surface was increased by approx. 60%; road network areas, primarily field roads, was increased by approx. 26%; number of cadastral parcels was reduced from 2,085,649 to only 727,017 or almost threefold. This data becomes even more important when said that in parallel with development of agricultural areas in implemented land consolidation projects, significant works were executed to develop settlements³⁰.

Since the beginning of the 1990s up until 2005, only the land consolidation projects launched before that were being finalised. As of 2005, Government of the Republic of Serbia has each year been passing a decree determining the type and scope of works on protection, use and improvement of agricultural land, including land consolidation works³¹. In the forthcoming year of 2006, the Law on Agricultural Land was passed regulating the implementation of land consolidation.

3.2 Legal acts regulating land consolidation

At the level of laws, land consolidation is regulated solely by one chapter (“2 Land Consolidation”) in scope of the heading four of the Law on Agricultural Land³² (“Agricultural land development”). This concerns 17 articles in total regulating this extremely complex institute.

The Law on Agricultural Land (LAL) defines in which cases land consolidation is to be performed. The five different cases have been listed, with the first one being sufficient to justify implementation of land consolidation in the area of practically any rural cadastre municipality: “when due to the high fragmentation and ill-shaped cadastral parcels agricultural land can not be rationally used”³³. Probably nowhere in Serbia an area could be found with agricultural land parcels in such sizes that by their enlargement agricultural land use could not be made more rational. The remaining reasons for land consolidation implementation indicated by the LAL concern construction of infrastructure facilities (irrigation/drainage systems, field roads), extension of construction area and execution of anti-erosion works and measures.

28 RGA, 2003, p. 71.

29 Marinković et al, 2014, p. 179.

30 RGA, 2003, p. XI.

31 Marinković et al, 2014, p. 179.

32 “Official Gazette of RS”, No. 62 of 19 July 2006, 65 of 5 July 2008 - other law, 41 of 2 June 2009, 112 of 30 December 2015, 80 of 29 August 2017.

33 LAL, Article 31. Paragraph 1. Item 1).

The Law on Agricultural Land regulated competences of state authorities in implementing land consolidation, making the role of local government unit central in this process. As the key document in the land consolidation implementation, the LAL identifies the land consolidation programme, passed by the assembly of the local government unit, with the approval of the ministry in charge of agriculture.

The LAL in addition regulates the land consolidation subject, actually the land consolidation mass, the manner of rendering decision on the land consolidation implementation, the role of the land consolidation commission, treatment of facilities and perennial crops, an option of forming the land consolidation board, manner of ensuring land for common facilities, rights of land owners in case of construction of larger infrastructure facilities, principles and rules of reallocation of the land consolidation mass, same as procedural rules- including inadmissibility of reinstatement, passing the decision on reallocation of land consolidation mass, competence on deciding upon appeals and exemption from the administrative fee payment. This exhausts the land consolidation subject matter regulated under the Law on Agricultural Land.

Another key law relevant for the land consolidation implementation is the **Law on State Survey and Cadastre**³⁴. This law primarily regulates land consolidation survey, as a type of survey in the procedure of land territory development, and determines competence of the Republic Geodetic Authority (herein after referred to as: The Authority) to implement expert supervision over geodetic works and cadastre classification, valuation and evaluation of land, with the classification, valuation and evaluation of land being identified as geodetic works conducted by a geodetic organisation. This law sets forth conditions for execution of these works and lays down that for execution of works pertaining to classification, evaluation and valuation of land responsible person of agricultural background shall be responsible to execute such works. The Law on State Survey and Cadastre (LSSC) sets forth that the land consolidation survey data is to comprise the survey study and is to be used for establishment, i.e. update of the real estate cadastre.

The LSSC regulates that the real estate cadastre is established not only based on the cadastre or land consolidation survey data, but also based on the data of the commission not registered in the land cadastre, i.e. land books- therefore based on the data on the non-implemented land consolidation, pursuant to the decision on the reallocation of the land consolidation mass.

The basic conclusion in relation to the legal grounds for the land consolidation implementation concerns its conspicuous sub-norm. Taking into account that in scope of the land consolidation procedure implementation it is being decided in the most direct manner on the ownership rights of the land consolidation participants, procedural norms should be particularly more detailed. In the absence of such level of detail, the implementers of land consolidation procedures, primarily land consolidation commissions, are left on their own.

The secondary legislation for the land consolidation implementation is even poorer. It is extremely outdated and insufficient in the sense of the scope of the norms. To the specific extent, the rudimentariness of the secondary legislation framework for the land consolidation implementation is enforced. Namely, the key gaps in the legal framework left behind by the legal regulation of this matter, and primarily procedural provisions, are not to be filled out by bylaws. Besides, the Law on Agricultural Land, as an umbrella law in this area, does not envisage passing of additional bylaws to regulate the land consolidation procedures implementation.

34 "Official Gazette of RS", No. 72 of 3 September 2009, 18 of 26 March 2010, 65 of 25 July 2013, 15 of 6 February 2015 - CC, 96 of 26 November 2015, 47 of 15 May 2017 - authentic interpretation, 113 of 17 December 2017 - other law, 27 of 6 April 2018 - other law, 41 of 31 May 2018 - other law.

The elements of the secondary legislation framework for the land consolidation implementation is comprised of the following:

- a. Acts of unlimited duration
 - Instruction on the manner of execution of geodetic and technical works and determining the value of land in the land consolidation procedure³⁵ and
 - Rulebook on the cadastre classification and evaluation of land³⁶,
- b. Acts passed annually:
 - Decree determining the Programme of Execution of Works on Protection, Development and Use of Agricultural Land
 - Annual Programme for Protection, Development and Use of Agricultural Land,
- c. Acts passed for the purpose of implementation of specific land consolidation procedures:
 - Land consolidation programme,
 - Decision on the land consolidation implementation,
 - Final design of the land consolidation survey.

Amongst the listed acts, the Rulebook on the cadastre classification and evaluation of land, Decree determining the Programme of execution of works on protection, development and use of agricultural land and Annual Programme of protection, development and use of agricultural land do not directly concern land consolidation. Hereby it has to be mentioned that the Instruction on the manner of execution of geodetic and technical works and evaluation of land in the land consolidation procedure was passed back in 1977, namely four decades ago, and that it contains provisions related to municipal geodetic authorities and other institutes not being in place for decades already. Both acts under the category of those with unlimited duration concern methodology of geodetic works execution, and do not help in giving answers to questions concerning proper implementation of the land consolidation procedure in part relating to the land consolidation commission competences. Other acts, apart from the land consolidation programmes, do not address directly land consolidation procedure, but inter alia, contain provisions related to land consolidation.

The Programme for Execution of Works on Protection, Development and Use of Agricultural Land (hereinafter referred to as: Works Execution Programme), passed in the form of the Serbian Government conclusion, determines the value of funds allocated to support the land consolidation procedure implementation. For this purpose, the funds are being allocated in the account 463 (transfers to other government levels). Requirements for application for these funds imply passing of the Annual Programme of Protection, Development and Use of Agricultural Land for 2018, same as the land consolidation programme.

³⁵ "Official Gazette of SRS", No. 3 of 22 January 1977

³⁶ "Official Gazette of SRS", No. 63 of 17 June 2014

As for the land consolidation projects in the territory of AP Vojvodina, an important part of the legal framework for the land consolidation implementation includes Provincial Assembly decision on the Programme of Protection, Development and Use of Agricultural Land in the Territory of AP Vojvodina³⁷ and the Rulebook on the award of incentive funds via the public call for co-funding of activities in the land consolidation procedures in the territory of AP Vojvodina. These acts are also one of those being passed recurrently on annual basis, whereby the rulebook on the award of incentive funds is being passed following the adoption of the AP Vojvodina Assembly, representing a correlation to the Decree determining the Programme of works on protection, Development and Use of Agricultural Land passed by the Government of the Republic of Serbia.

3.3 Steps in the land consolidation implementation

Land consolidation is a rather complex process the implementation of which implies participation of a larger number of institutional stakeholders. Most often, its initiator is the local government unit, i.e. municipality passing the decision on the land consolidation and elaboration of project and design documentation, i.e. land consolidation programme.

The land consolidation implementation unfolds in several, rather standardised, phases.

First is the preparatory phase, where legal framework for the land consolidation implementation is being laid down. After then, geodetic and technical works are being conducted, also in several phases, where the following can be singled out preparatory and preliminary works, design, and implementation.

In scope of the geodetic and technical works it is possible to implement investment works as well, such as field road and canal network construction, clearing, etc. The land consolidation procedure is finalised by vesting owners into their property, same as by updating the real estate cadastre, i.e. by registering rights into the real estate cadastre based on the implemented land consolidation.

What follows is the overview of key steps in implementing the land consolidation procedure:

- 1. Land consolidation programme development:** The land consolidation programme is developed based on the terms of reference passed by the competent authority of the local government unit, at the proposal of the Expert Commission³⁸.
- 2. Land consolidation programme adoption:** This programme is adopted by the local government unit assembly:
- 3. Issuing approval to the land consolidation programme** The approval is issued by the ministry in charge of agriculture.
- 4. Passing the decision on implementing land consolidation by the local government unit assembly:** Within this step the principles of the land consolidation implementation are also being passed and the Land Consolidation Commission established. Only after this step land consolidation is deemed to have been launched.

³⁷ "Official Gazette of APV", No. 57/2017 and 3/2018- corr.

³⁸ Cakić and Mihajlović (2016), p. 535.

5. Implementing public procurement for the works envisaged under the land consolidation programme:

This step precedes works contracting. The investor, competent local government unit, based on the announced tender, selects the contractor for execution of geodetic and technical works. Contractors for all investment works in scope of land consolidation are also thereby being selected- for construction of road and canal network, clearing and other works.

6. Elaboration of the final design for geodetic and technical works: Up until the adoption of the Law on State Survey and Cadastre in 2009, all land consolidation- related works were executed based on the land consolidation programme. The Law on State Survey and Cadastre defines land consolidation as an area of state survey, where geodetic and technical works are executed based on the construction works final design.

7. Determination of factual situation: The initial phase of land consolidation includes determination of factual situation, which implies settling of unresolved ownership and legal relations and identification of land consolidation participants in line with the factual situation. Determining the status quo in the real estate cadastre represents the first step in the procedure of factual situation determination. In scope of this phase, presentation of old situation is being presented, same as determination and surveying of margins in the land consolidation area, permanent facilities and perennial crops, same as land consolidation land evaluation; additionally, the land consolidation mass stock book and old land situation overview are developed. This makes a unique opportunity for the land consolidation participants not holding their corresponding right over the real estate registered, to submit to the commission the evidence they have available and based on them register their rights. In certain situations this is possible even with documents not meeting the requirements for registration when the request is submitted to the competent Real Estate Cadastre Service instead to the commission (e.g. because they are not certified or represent a copy, and as such do not represent an appropriate document for registration in the real estate cadastre).

The Land Consolidation Commission resolves all unsettled ownership and legal relations aiming to identify land consolidation participants, including sale, gift, inheritance, land restitution, and all other changes not meeting requirements to be registered in the cadastral records of the real estate cadastre. The land consolidation participants, upon being summoned by the Land Consolidation Commission, submit all documents suitable for the implementation of the ownership change over the real estate, that have not been submitted to the real estate cadastre for registration. In case of discrepancies between the real estate cadastre records and factual situation, Land Consolidation Commission determines the land consolidation participant based on the factual situation.

8. Development of the land evaluation: Important in this phase is the role of the Land Evaluation Subcommission. General practice is for the land evaluation map to be displayed for public review.

9. Development and public display of individual detailed designs (e.g. road and canal network): These designs are presented for public review after being developed. After having obtained positions of the participants in the public review, i.e. deciding upon objections, land consolidation commission adopts these designs.

- 10. Reallocation of the land consolidation mass:** In this phase, the commission first summons the land consolidation participants so as to introduce them to the value of reductions for common areas and facilities, principles underlying land consolidation mass reallocation, and takes their wishes in regard to location of their future parcels. Based on the information collected in this step, the commission presents for public review the land consolidation mass reallocation layout map. Public review lasts fifteen days. The land consolidation participants may file their objections to the land consolidation mass reallocation³⁹. The Commission decides on such objections.
- 11. Vesting into property:** For many participants this is the most important step in implementing land consolidation. It is implemented by the Land Consolidation Commission, in autumn/winter most often, so as to disturb the pace of agrarian year least possible. Prior to vesting into property, concrete marks are being set, with the minutes compiled thereof after vesting into property has been done.
- 12. Passing the Decision on the land consolidation mass reallocation:** The Land Consolidation Commission passes these decisions, that can be appealed to the competent ministry.
- 13. Deciding on the appeals:** On the appeals to the land consolidation mass reallocation decisions, passed in the first instance by the Commission, decides the ministry in charge of agriculture.
- 14. Handover of geodetic works studies to the Real Estate Cadastre Service:** This study is elaborated by the geodetic organisation implementing geodetic and technical works.
- 15. Review and acceptance of the study by the Republic Geodetic Authority:** In this phase, Republic Geodetic Authority has the option to accept the study or not, namely to return it to the contractor for geodetic and technical works for additional processing.
- 16. Presentation of the real estate cadastre:** The Commission for presentation of data on real estates and related rights is managing the implementation of this step, with the Republic Geodetic Authority being competent to issue approval for the onset of presentation of data on the real property and related rights in the process of establishment/ update of the real estate cadastre.
- 17. Establishment of the real estate cadastre based on the land consolidation data:** Registration of property rights following passing of decisions on the reallocation of the land consolidation mass, i.e. update of the real estate cadastre is the final phase of the land consolidation survey. After the presentation has been completed, Republic Geodetic Authority is competent to verify cadastral records of the real estate cadastre established based on the land consolidation data and real estate cadastre database. The decision on the verification passed by the RGA rounds up the procedure of cadastre update in the land consolidation area, and thus of the land consolidation implementation.

The construction area survey via the cadastral survey procedure

Since the adoption of the Law on State Survey and Cadastre in 2009 when cadastre and land consolidation survey were defined as special areas of state survey, the rule was established to in parallel to implementing land consolidation in the farming- non-construction area, conduct the cadastral survey of the construction area. Methodology and technical norms applicable when surveying factual situation in land consolidation and cadastral survey are identical and as a rule, are contracted with the same contractor.

The essential difference between the cadastral and land consolidation survey lies in the competence for the procedure of survey data presentation. The competence of the Land Consolidation Commission in land consolidation is lacking in cadastral survey, therefore presentation of the construction area cadastral survey data is performed in scope of the presentation of data on the real estates and related rights, in the procedure of the real estate cadastre establishment/ update.

At the local government unit request, Republic Geodetic Authority passes a decision on the cadastral survey implementation. The RGA is responsible to publish such decision in the public media, same as to individually summon all registered holders of rights over real estates to mark the boundaries of their estates. The Republic Geodetic Authority is expected to adjust to the deadlines local government has agreed on with the contractor, without being neither consulted nor informed thereof. This phase may be avoided by inclusion of construction area in the land consolidation survey, as survey of factual situation in the land consolidation area, given that same owners hold real estates both in construction and non-construction area and can obtain all necessary information from the Land Consolidation Commission.

Due to the unsettled ownership and legal relations in the construction area, the procedure of the real estate cadastre establishment/ update in the construction area takes significantly longer than the procedure applicable for the non-construction area. These areas are most often treated as separate procedures, so the parties are being summoned to the real estate cadastre data presentation twice, once for the real estates in the non-construction area, and second time for the real estates in the construction zone. Such a practice was introduced due to faster establishment/ update of the real estate cadastre in the non-construction area and to enable owners to exercise their rights with other authorities based on the agricultural land (subsidy).

The experiences obtained in the last decade have led to the joint position of the local government and Republic Geodetic Authority to, in case of the need to perform new survey of the entire cadastral municipality, include construction zone in the land consolidation as factual situation in the land consolidation area (i.e. as areas not subject to reallocation, i.e. reallotment, but surveying is done in line with the factual situation in the field). In the past year, this approach to survey was taken in cadastral municipalities of the town of Vršac and municipality of Čoka. In these cadastral municipalities, Land Consolidation Commission is performing resolution of ownership and legal relations in the construction zone as well, through cooperation with other local government authorities, aiming to collect other data on the real property contained in the real estate cadastre, relating to determining legal status of the facility, legalisation of facilities, their age, etc.

This is expected to significantly reduce time needed for the real estate cadastre update and simplify the process for the property owners, given that ownership and legal relations are being resolved before the Land Consolidation Commission, but also due to the fact that they have been informed about all data on the real estate by means of the decision on the land consolidation mass reallocation.

3.4 Implementers of the land consolidation procedure

Successful delivery of a complex task like land consolidation survey, requires cooperation between all entities involved in land consolidation- Ministry of Agriculture, Forestry and Water Management, Provincial Secretariat for Agriculture, Water Management and Forestry, local government unit, Land Consolidation Commission, contractor and Republic Geodetic Authority, each within their own competences.

3.4.1 Distribution of competences in land consolidation implementation

Ministry/ Provincial Secretariat in charge of agriculture

Ministry of Agriculture, Forestry and Water Management is competent for implementation of agriculture development strategy and policy and is a key factor in implementing land consolidation in the Republic of Serbia. The Ministry plays multiple roles in planning and implementing land consolidation. First, Ministry issues approval to the developed land consolidation programme, which is a necessary precondition for passing the decision on initiating land consolidation and land consolidation launch.

Supervision over the implementation of land consolidation, as a measure for the land territory development, implemented pursuant to the Law on Agricultural Land, apart from geodetic and technical works in the land consolidation procedure, is also under the competence of the Ministry. It is also responsible to decide upon appeals to the decisions on the reallocation of the land consolidation mass.

In addition, Ministry is also a direct participant in the land consolidation process, given that it is responsible for the state-owned agricultural land management. By implementing agriculture development and improvement policy, Ministry provides financial support to local government units in the procedure of land consolidation planning and implementation.

In the territory of the Autonomous Province of Vojvodina, responsibility for monitoring of the agriculture development strategy is assigned to the Provincial Secretariat for Agriculture, which actively monitors implementation of land consolidation projects in the territory of Vojvodina and provides financial support for their implementation.

Local government unit

Local government unit is most often the initiator of land consolidation launch in its territory, it adopts land consolidation programme, passes the decision to initiate land consolidation, forms the land consolidation commission and ensures financial resources for implementation of land consolidation. Bearing in mind all possibilities that can be implemented through land consolidation regarding the entire spatial planning, it is very important for the local government unit to deploy all of its capacities so as to successfully implement land consolidation and thus maximise broader development goals of the local community.

Key role in this process on behalf of the local government is played by the **Land Consolidation Commission** practically leading the entire process. It is rarely encountered in our legal system that a temporary body is given

such broad decision-making powers, especially having in mind that it all revolves around sensitive ownership and legal relations:

- it determines actual rights over real estates in the land consolidation area by determining factual situation, i.e. through the cadastral data presentation procedure, and then passes the decision on the reallocation of the land consolidation mass;
- it implements the land evaluation procedure and adopts the number, coefficients and margins of evaluation classes through the public review procedure;
- it displays for public review layouts and adopts practical solutions relating to ensuring land for common facilities and areas (field road network, irrigation and drainage systems, windbreaks and utility and other needs of settlements and population);
- it passes decision on the reduction in the land value for common facilities and areas and performs reallocation of the land consolidation mass.

In addition to these broad competences to decide on property rights, the commission also has wide powers concerning the land consolidation process management. So it:

- cooperates with the competent authority for geodetic tasks and takes over and forwards corresponding documentation in relation to cadastral data;
- cooperates with competent state authorities, public enterprises, land consolidation board of participants, designers and contractors;
- conducts vesting into property (new parcels) of land consolidation participants, passes dynamic plan and monitors dynamics and compliance with the deadlines for execution of works;
- informs expert supervision and investor on completion of individual phases of works execution;
- compiles periodical reports on the progress of works;
- certifies invoices for works⁴⁰.

In order to be able to perform all of these tasks, the commission, comprising minimum seven members and the same number of substitute members, establishes subcommissions for delivery of particular tasks: subcommission for land evaluation, and subcommission for evaluation of permanent crops and facilities.

Apart from this, Commission is authorised by law to establish other expert bodies for delivery of individual actions within the land consolidation procedure. The LAL sets forth that expert and administrative tasks of the commission are performed by the commission secretary, graduated lawyer appointed by the local government unit assembly from the ranks of municipal/town administration staff.

Despite playing a central role in the land consolidation procedure implementation, Commission does not play a lead role in the implementation of some key segments of the procedure, but in that sense depends on other authorities of the local government unit. So the Commission is not compiling tender specification and does not select contractors for infrastructure works, land consolidation evaluation contractors nor contractors for geodetic and technical works. The Commission also does not select supervision contractors for these works, but this is done by other municipal departments. These represent significant limitations in the Commission powers.

⁴⁰ Cakić and Mihajlović (2016), p. 535.

Although there are no reasons underlying such limitations, they lead to the Commission members often feeling as if their hands were tied in certain segments of land consolidation implementation, same as that the powers for implementation of the land consolidation procedure made available to them are inadequate compared to the level of responsibility vested in them.

Within the land consolidation procedure, Land Consolidation Commission needs to cooperate with authorities in charge of urban planning, agriculture, cadastre, local tax administration, finance and other local government authorities. Besides coordination of work of competent authorities at horizontal level which is primarily the responsibility of the Land Consolidation Commission, local government needs to develop cooperation at vertical level- with the ministry in charge of planning and implementation of capital projects, Restitution Agency and other state authorities.

Authority competent for issues pertaining to state survey and cadastre and contractors of geodetic and technical works

Republic Geodetic Authority, as a state institution responsible for maintenance of records on real property and related rights, within its legal competences plays an important role in the land consolidation implementation.

The Republic Geodetic Authority makes available, free of charge, to local government- Land Consolidation Commission- valid data of the real estate cadastre and other survey data, serving as a starting point for determination of factual situation and land consolidation participants, same as for the needs of urban planning. The Republic Geodetic Authority performs supervision over geodetic and technical works within land consolidation, review and endorsement of the study and establishment/ update of the real estate cadastre based on the land consolidation data.

In accordance with the applicable legislation, the onset of land consolidation, namely the beginning of the Land Consolidation Commission work, does not terminate the competence of the local real estate cadastre regarding maintenance of survey and real estate cadastre. This regulation leads to the fact that in land consolidation area, two institutions are simultaneously competent, namely Republic Geodetic Authority (Real Estate Cadastre Service) and Land Consolidation Commission. Parallel work of the two authorities requires their exquisite cooperation, which if not in place, creates many problems.

In certain cases, RGA, as expert supervision, is required to get involved in dispute resolution, actually to issue its opinion in case of disagreement between the local government unit and contractor for execution of geodetic and technical works on issues like follow-up works not precisely defined between the investor and contractor, in case of differences between the land consolidation area defined in the Land Consolidation Programme and that actually implemented in the field. Namely, the area is imprecisely determined in the Land Consolidation Programme, so only after the land consolidation has been implemented, area actually realised in the survey becomes evident. Besides this, often in scope of the land consolidation extension of the construction zone is being implemented, and this gives rise to disputes given that the cost of geodetic and technical works is approx. three times higher than outside construction zone. Likewise, it happens that contractor executes follow-up works based on the verbal order of the Commission. For example, following the adopted reallocation and parcel demarkation, Commission issues an order for the entire block to be reallocated once again, implying that the contractor needs to remove dug markings, recalculate elements and mark the block. Disputes emerge when subsequent works are of such scope that significantly increase engagement of geodetic organisation.

In case of non-compliance with deadlines, RGA may perform inspection supervision over the geodetic organisation executing works. However, key element of supervision pertains to contractual obligations. The works contract defines obligations of both contractor and local government, i.e. Land Consolidation Commission. If the contract does not define sanctions for non-compliance to deadlines, expert and inspection supervision does not have instruments to affect their compliance with the deadlines. Given that the most important objective is reflected in the delivery of contracted works and successful completion of land consolidation, contract termination or license cancellation does not represent an optimum outcome for none of the participants in this process, since in such a case land consolidation would remain unfinished to an indefinite period of time, with all negative consequences it would bring along.

One of the most sensitive issues in the land consolidation procedure is harmonisation, or the lack of it, between the interests of the Land Consolidation Commission and geodetic organisation. Geodetic organisation has contracted fixed value of works and it is in their best interest to complete works as soon as possible, whereas the Commission, if being paid per day of their engagement, does not share such interest, therefore it may seem as if they are doing everything to prolong land consolidation as much as possible, and thus operate at lower intensity. These are the issues requiring systemic approach, from contract signing to definition of sanctions, and monitoring work of the Land Consolidation Commission and contractors, all aimed at completing land consolidation in an optimum period of time.

Despite the fact that the Republic Geodetic Authority is not performing supervision over the operation of the Land Consolidation Commission, given their competence in the real estate cadastre update, cooperation is almost regularly being maintained with the Land Consolidation Commission also in terms of determining the type of ownership, registration of rights or encumbrance on the real estates. In cases when construction area is included in the land consolidation, educational, advisory, expert and any other cooperation is established including real estates in the construction zone, especially having in mind the ongoing legalisation procedure, but also in terms of identification of the building construction period, namely, collecting all data necessary for proper registration in the real estate cadastre following the land consolidation implementation.

Expert supervision over execution of geodetic and technical works

Expert supervision over geodetic and technical works is included in all phases of works. The 2009 Law on State Survey and Cadastre provides a possibility for the supervision over works to be delegated to the Republic Geodetic Authority or geodetic organisation holding an appropriate license. Taking into account a range of problems arising in relation to endorsement of the land consolidation study by the Republic Geodetic Authority for works supervised by geodetic organisation, the amendments to the Law on State Survey and Cadastre from 2015 have abolished performance of expert supervision by geodetic organisations, so nowadays expert supervision and endorsement of the land consolidation study for permanent use is exclusively being performed by the Republic Geodetic Authority.

Expert supervision, inspection and handover of executed works in the area of cadastre and land consolidation survey and land territory development by means of land consolidation has been defined in the Rulebook on Performance of Expert Supervision, Inspection and Handover of Works (“Official Gazette of RS”, no. 43/2010) and it covers the following:

1. control of fulfillment of conditions for execution of geodetic works in the land consolidation procedure;
2. quality control of measuring instruments and their metrological safety;
3. control and enforcement of technical norms for data collection on factual situation;
4. control and overview of establishing land sheets and land consolidation mass stock book;
5. control of fulfillment of conditions for execution of works pertaining to land evaluation;
6. review and control of provisional land valuation;
7. review and control of detailed land valuation;
8. review and control of the minutes on determining the value of land in the land consolidation area;
9. review, control and certification of the layout plan of old situation;
10. control and application of technical norms for setting geodetic basis for transfer of canal and road network and parcel demarkation;
11. control and application of technical norms for transfer of canal and road network to the field;
12. numerical control of the land consolidation mass reallocation;
13. control and enforcement of technical norms in demarkation of new situation;
14. control of cadastral classification and evaluation pursuant to provisions of Articles 16 and 18 of this Rulebook;
15. control of quality and elaboration of land consolidation survey plans;
16. control of quality and completeness of technical documentation and land consolidation survey study;
17. certification of the land consolidation study;

Points 1. to 9. represent the first phase of the land consolidation survey. Points 10. to 13. represent the second phase. Final, third phase is covered in items 14. to 16.. After handover of all works phases, the land consolidation study is certified in line with point 17.

One of the obligations of expert supervision is certification of financial invoices conducted in line with percentage value of individual work phases in relation to the overall land consolidation survey. The contract on execution of geodetic and technical works, concluded between investor (local government unit) and geodetic organisation, as a contractor, lays down the value of each works phase. Work phases are defined so as to represent rounded-up sections, allowing the works to be continued by another contractor in case of an interruption. In this way the investor secures their investment, which implies that the contractor is paid only for the works completed and endorsed by supervision. Given that local governments are rather inexperienced when it comes to contracting, some of them have established cooperation with the Republic Geodetic Authority aiming to accurately set the value of each phase of works.

The responsibility of supervision is to, in addition to control of the executed geodetic and technical works, supervise the dynamics of works execution and take steps oriented on compliance with the defined deadlines. The experience so far has shown that contracted deadlines, as a rule, are not being complied with the reasons underlying delays pertaining to all key stakeholders involved in the land consolidation implementation. These reasons are different, whereas the consequences of delays may be very serious, especially taking into account that

agri-economic year has to be respected in land consolidation. In case of failure to adhere to the agri-economic calendar and failure to conduct vesting into property in an optimum period of time, all deadlines are being delayed by one year.

Expert supervision is performed in the field, in the premises of the contractor or in the premises of the Republic Geodetic Authority. Based on the performed expert supervision, provisional invoices are being certified, most often on a monthly basis, and final invoice, following the completion of the land consolidation procedure and handover of the land consolidation study. The land consolidation study is submitted to the local real estate cadastre service for permanent use.

Expert and administrative supervision aimed at granting approval to presentation of data on the real estates and related rights, is performed in the premises of the real estate cadastre service, i.e. at the display venue (in the premises of a local neighbourhood or municipality), and in the presence of the commission on presentation of data on the real estates and related rights. After the completion of this display, it is being endorsed and this is followed by passing of a decision on the confirmation of the real estate cadastre cadastral records based on the land consolidation data.

3.4.2 Capacities of the key land consolidation stakeholders

Ministry of Agriculture, Forestry and Water Management is burdened with a large number of activities related to land consolidation, which are rather diverse in their nature. The first place is taken by the ministry's planning function, implying planning of budgetary funds for this purpose, in the context of other needs for financing by this ministry. This planning function is being exercised through regulatory aspect of the Ministry's work as well, given that appropriate acts determining the framework for support to land consolidation funding are being passed annually in the form of corresponding bylaws.

In addition to planning and regulatory roles of the Ministry, ensuring support for the land consolidation implementation also includes fostering granting of funds to local government units. Related to this is the need for execution of expert tasks including control and issuing approval to the land consolidation programmes submitted by the local government units. This involves monitoring ensuring financial resources to local government units. Finally, the Ministry is responsible for the second-instance decision-making upon appeals to decisions on reallocation of land consolidation mass, passed by the Land Consolidation Commissions.

These tasks listed above are performed by the Directorate of Agricultural Land, as an authority within the ministry in charge of agriculture. The Directorate is performing land consolidation-related tasks in parallel to its fundamental assignment- taking care on the manner of agricultural land use, primarily of those owned by the state. All this speaks about the need to strengthen the capacity of the Ministry for monitoring of the current scope of land consolidation projects, and especially if intensifying of land consolidation implementation is being planned.

When it comes to the situation in the local government units, the impression is that this segment maybe has the strongest need for capacity building. Namely, the attitude towards land consolidation, as a manner of ensuring funding from the higher level of government, seems to be predominant in local government units lacking capacity to fundamentally get involved in this line of business, apart from establishing the Land Consolidation

Commission. What is especially worrying is the insufficient use of powers vested into municipalities regarding the supervision of works in scope of land consolidation- the so called, investor supervision. The result is that the works within land consolidation are not always executed in the required quality and in line with the agreed deadlines.

The focus of capacity building at the local government level should be on Land Consolidation Commissions, as implementers of these procedures. Land Consolidation Commissions consist of members who, in their own saying, often lack knowledge to optimally handle the challenges related to the implementation of such complex tasks like those brought about by land consolidation. Their position is made even more difficult by major discontinuity in implementing land consolidation leading to the fact that it really rarely happens that a single composition of the commission, without any changes or with the smaller number of member changes, completes more than one land consolidation project. This circumstance will represent a particular challenge for all future activities focusing on the local government capacity building in managing land consolidation.

Contractors for geodetic and technical works are geodetic organisations possessing an adequate license. The Law on State Survey and Cadastre envisages that the license for execution of works based on the final design may be issued to geodetic organisation with minimum five employed experts of geodetic profession, of whom minimum two with geodetic license of the first rank. According to the records of the Republic Geodetic Authority, there are 61 registered geodetic organisations holding licenses for execution of work based on the final design. In practice, around one fourth of registered geodetic organisations apply to calls for contractors in scope of land consolidation. The experience has shown that we do not have geodetic organisations able to independently execute works related to land consolidation, but usually those are consortia comprising 3 to 15 contractually grouped members. What is also unclear is the motivation for establishing consortium with the large number of members, given that in practice only a smaller part of the consortium is actually executing works.

The land evaluation and classification within land consolidation may be performed by geodetic organisations employing agricultural engineers with the corresponding license of the Chamber of Engineers, and holding a license for performance of tasks pertaining to land classification, categorisation and evaluation. So far, only five geodetic organisations have been registered to whom the license was issued for these tasks. Given that in the public procurement procedure a contractors for all geodetic and technical works in land consolidation is being engaged, including land evaluation and classification, these five geodetic organisations appear as members in almost all consortia of contractors. In the scope of works in land consolidation so far, the number of experts of agricultural profession engaged in land evaluation and classification has proven to be sufficient. Both the number of engaged experts and their professional work, so far have not been seen as a weak link in the land consolidation implementation. However, if the government were to decide to implement land consolidation on significantly larger areas, for sure there would be a need to engage additional experts of agricultural profession. In that case it would be necessary to timely educate professional staff, taking into account that there is a small number of experts who are experienced in dealing with land evaluation and land classification tasks.

A relatively small number of contractors in practice leads to the situation that the same geodetic organisation at the same time executes works in several land consolidation projects, and even that a single geodetic expert with geodetic license of first rank appears as the construction site manager in several land consolidation projects. Simultaneous engagement in several projects which are extremely demanding for the contractor may be one of the reasons for non-compliance with deadlines and untimely and incomplete actions as ordered by expert supervision.

On the other side, contracts on execution of geodetic and technical works as a rule do not envisage penal provisions for such situations, which would serve as a guarantee for compliance with contractual provisions and completion of works within the anticipated period of time.

Relatively low interest of licensed geodetic organisation for execution of works in land consolidation partly stems from the lack of experience with such works, given that there was an interruption in the implementation of land consolidation lasting for approximately three decades, i.e. the entire working service length. The same problem is notable in Land Consolidation Commissions, leading to reduced security in work, which is again reflected in the land consolidation implementation pace.

Contractors use modern technologies and automate all phases of work that can be automated. However, bylaws do not keep up with technological development, so we find ourselves in the situation where different softwares used today produce different output documents whose content is not standardised. Due to these reasons, regulatory framework at the bylaw level needs to be modernised so as to define the form and content of documents included in the land consolidation survey study. Contractors invest into software for the needs of land consolidation, but those performing expert supervision do not have the possibility to use such software, which makes another aggravating circumstance for execution of works on land consolidation survey. A separate problem is that contractors for geodetic and technical works do not use the same software for reallocation and elaboration of digital cadastral plan, therefore certain inconsistencies have been noticed between the areas in the digital cadastral plan and reallocated areas stated in the decisions on the land consolidation mass reallocation. Decisions on reallocation of the land consolidation mass passed by the Land Consolidation Commission are not the subject of expert supervision performed by the Republic Geodetic Authority, however they make an integral part of the real estate cadastre cadastral records and subject of the study review in the procedure of the study review and endorsement.

Supervision over the implementation of land consolidation, in addition to supervision over the geodetic and technical works, is performed by the ministry in charge of agriculture. This segment poses the question related to the capacity of the Ministry to deal with the land consolidation implementation. Namely, supervision over the implementation of several dozens of land consolidation procedures in different implementation stages is a demanding task requiring allocation of significant resources.

The **Republic Geodetic Authority** performs expert supervision over geodetic and technical works in the land consolidation procedure, carried out by geodetic organisations in the capacity of contractors, but also expert and administrative supervision aimed at issuing approval for the onset of display of data on the real estates and related rights in the process of establishing/ updating the real estate cadastre, conducted by the Commission for presentation of the real estate cadastre data, and handover of this presentation, i.e. verification of the cadastral records and real estate database.

The practice so far has shown that the lack of staff represents a weak link in the procedure of the real estate cadastre update following the land consolidation. President of the Commission for presentation of data on the real estates and related rights, formed by the Republic Geodetic Authority, is a graduated lawyer with the passed Bar exam. Local real estate cadastre services do not possess sufficient number of expert staff, especially lawyers meeting the requirements to become the commission presidents, taking into account the workload in regular maintenance of the real estate cadastre.

Following the establishment of the real estate cadastre, for the purpose of update of the real estate cadastre based on the land consolidation data, most often cooperation is being established with the local government unit, therefore the president of the Land Consolidation Commission continues to be engaged as the president of the Commission on the presentation of real estate data and related rights, for the needs of the real estate cadastre update. Financing of the land consolidation is entirely borne by the local government unit, including the operation of the Commission for the presentation of the real estate data, however the decision on the establishment of the commission is passed by the Republic Geodetic Authority. This cooperation between the local government unit and cadastre has proven to be a weak link, in terms of staff, finance and time, given that land consolidation participants and local government deem land consolidation project completed by passing the decision on the land consolidation mass reallocation, and not by registration in the real estate cadastre when the entire procedure actually ends.

The capacity of the Republic Geodetic Authority for the needs of carrying out expert supervision over geodetic and technical works during the land consolidation implementation, same as expert and of administrative supervision over the real estate cadastre update based on the land consolidation data, are at the satisfactory level. Pursuant to the applicable Rulebook on Job Classification in the Republic Geodetic Authority, the tasks of expert supervision over geodetic and technical works in scope of land consolidation implementation were assigned to nine geodetic experts, whereas on the tasks of expert and administrative supervision over the establishment/ update of the real estate cadastre nine experts of geodetic and six experts of legal profession were engaged.

However, the capacity of the Republic Geodetic Authority for presentation of real estate data and related rights over them is not even close to the required level, given that such workplaces have not been systematised.

3.5 Civic participation in decision-making and representation of land consolidation participants' interests

Besides all benefits it is bound to bring about in an ideal case scenario, land consolidation is a type of stress for the local community. Land consolidation involves making decisions of long-term importance, always concerning sensitive ownership relations. The land which was within one family for centuries changes owners, roads and canals are being designed where they never existed before without the possibility for the land consolidation participants to reject decisions passed by the Land Consolidation Commission.

One of the keys for successful implementation of land consolidation is intensive and careful communication with its participants. Availability of timely, accurate and complete information in each phase of the land consolidation implementation is a basis for ensuring full cooperation of the land consolidation participants; enabling participants to affect decisions made in scope of land consolidation creates value added strengthening support of the participants which is vital for the successful finalisation of land consolidation.

Launching communication with the land consolidation participants rights at its beginning is in a certain sense already too late. The right time to include the public is still in the phase when the proposal for land consolidation implementation is to be elaborated in a local government. Participation of the representatives of the public in this phase may provide decision-makers at local level with a clear indication about the mood of potential land consolidation participants in certain territories. In all this, the level of interest of real estate owners to be included in land consolidation should be one of the criteria when deciding on whether and when to launch land consolidation in the particular territory.

In Serbian practice of land consolidation implementation, several typical forms of informing the public and public participation in decision making on the land consolidation implementation have been identified:

1. Membership in bodies implementing land consolidation

This primarily refers to participation of land consolidation participants in the land consolidation commission and subcommission, or in other bodies to be discussed later.

2. Presentations

Presentations represent one of the standard forms of informing the public on the course of the land consolidation project. Presentations enable citizens to gain insight into proposals of key decisions, i.e. acts concerning land consolidation (e.g. old situation in the real estate cadastre, land evaluation, land consolidation mass reallocation plan, individual detailed designs, like road and canal network designs, same as in the data on real estates in the procedure of the real estate cadastre update, etc), and at the same time create an opportunity to obtain attitudes of the land consolidation participants, and other citizens, on the documents being presented. As a rule, they last for 15 days, and displayed documents are made available for insight at the municipal assembly, local neighbourhood, culture center or some other similar building.

3. Summons

Summons as a manner of informing the land consolidation participants and their engagement in the decision-making is particularly important, given that this is the only way based on the direct contact

with each individual land consolidation participant. It is applied at the most important moments of land consolidation implementation:

- a. in the phase preceding land consolidation mass reallocation when the commission summons the land consolidation participants so as to introduce them to the value of reductions for common areas and facilities, principles underlying land consolidation mass reallocation (when taking their wishes in regard to location of their future parcels) and
- b. when presenting data contained in the real estate cadastre in the procedure of the real estate cadastre update.

Land consolidation participants are often being summoned to the real estate cadastre data presentation twice, once for the real estates in the non-construction area, and second time for the real estates in the construction zone.

4. Informing using the media

Local government units reply on the local media when it comes to informing the public on the implementation of the land consolidation project. Advertisements in the printed media are being used, same as special shows on land consolidation in electronic media. On the website of the local government unit, and sometimes on the website of the contractor, most important phases of the land consolidation process are being advertised, with key documents related to this process also made public. Finally, there is a legal obligation to publish the decision on initiating land consolidation project, passed by the municipal/town assembly, in the official gazette of such local government unit.

5. Citizens assembly

Informing citizens via the media can hardly be measured based on the quality of information obtained by the citizens at citizens assemblies organised with the participation of the representatives of the Land Consolidation Commission and contractor. According to the testimonies of the land consolidation participants, this way of communication with the citizens turned out to be one of the most important ways to fully inform them and ensure support for the implementation of the procedure. The number of citizens assemblies organised within one land consolidation project varies between two and five as a rule.

6. Referendum

In at least one case concerning land consolidation, referendum was organised regarding the support to the land consolidation implementation. On that occasion referendum failed, and land consolidation project was postponed by several years, however it was subsequently re-activated.

Legal regulation of citizen participation in decision-making on the land consolidation procedure implementation

The Law on Agricultural Land, stingy in regulating land consolidation in general, does not speak much about civic participation either. First of all, local government unit is obliged to, when establishing land consolidation commission, include in its membership at least three representatives of land consolidation participants, each of which will have their substitute. Given that the commission numbers minimum seven members, representatives of the participants by all means represent minority in the land consolidation commission. The size of this minority depends on the total number of the land consolidation commission and number of members from the ranks

of land consolidation participants. When it comes to membership of the land consolidation participants in the Commission, our observation is that the LAL does not lay down the manner of selection of representatives of the participants to be members of the Commission. This means that the entire selection of participants is entirely left to discretion of the local government unit assembly. There is no legal obligation, but there is practice, to include participants in land consolidation as members of the land consolidation subcommissions; in case of the subcommission for land evaluation, according to the LAL minimum two representatives of the land consolidation participants are to be included. Special problem is reflected in the fact that commission members from the ranks of land consolidation participants do not have obligation to consult with other participants, nor there is a defined procedure for harmonisation of interests to be represented by the participants before the commission.

The Law on Agricultural Land envisages a possibility for the land consolidation participants to establish Board of Participants, not deciding on the rights of the land consolidation participants, but represents their interests. In addition to this, Board of Participants prepares proposals of the land consolidation programme and projects submitted to the land consolidation commission and discusses reports on land valuation and land consolidation mass reallocation. The set-up of the board of participants raises several issues, with the first one relating to the relationship between the board and members of the land consolidation commission from the ranks of the land consolidation participants. Besides this, legal provision stipulating that the board of participants advocates interests of the land consolidation participants in the situation when the board has not been established, given that the commission members from the ranks of participants are not defined by law to be advocates of the land consolidation participants' interests.

Land Consolidation Board of Participants

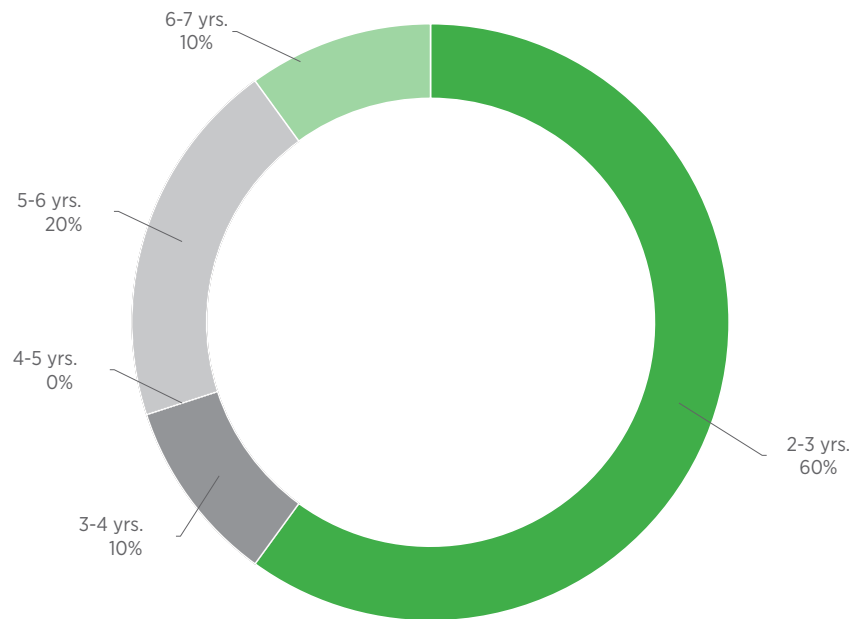
The existing legal gaps in relation to public participation in implementation of land consolidation underline the appropriateness of the approach applied in several pilot municipalities in Central Serbia, insisting on formation of the Board of Participants. The existence of such a board, including all land consolidation participants, represents an optimum way to provide all participants in the land consolidation with an opportunity to present their views, actually allowing this option not to be reserved only for the commission members from the ranks of participants. This is even more so taking into account that commission members from the ranks of participants do not have the mandate to represent interests of the participants, neither has the manner been defined for articulation of interests of land consolidation participants to be represented by the commission and subcommission members in the course of the land consolidation project implementation.

The findings of the field survey conducted in scope of this research, demonstrating higher level of participants' satisfaction by the level of information concerning the land consolidation implementation than by the possibility to influence decisions passed in the course of its implementation, points out the need for a body which would articulate positions of the land consolidation participants and give mandate to representatives of the land consolidation participants to represent their interests. In order to allow the board of participants to make full contribution to informing participants on the land consolidation implementation, same as to ensure their participation in decision-making, it is necessary to, inter alia, set forth in regulations the manner of its establishment, manner of decision-making, power of these decisions and relationship between the board of participants and the land consolidation commission.

3.6 Duration of the land consolidation procedure

Duration of the land consolidation process is something we can hardly be satisfied with. Out of 43 launched land consolidation projects since 2006, only in five cases the procedure was finalised by registration of property rights in the real estate cadastre. Out of this number, in one land consolidation area registration was performed for the arable land area only, while concerning the construction area forming a part of the land consolidation area registration is still under way. In another 15 land consolidation areas vesting owners into property has been completed, which is considered a key moment in the land consolidation process implementation, not taking into account registration of changes in the real estate cadastre. On the other hand, long duration of the land consolidation procedure is not entirely typical for Serbia, it is not rare in the practice of European Union member states either. Despite the fact that land consolidation process in Norway lasts from two to four years, in Sweden from five to seven years, in the Netherlands only preparation for land consolidation may take about 10 years, with the land consolidation taking as long⁴¹.

The average duration of the land consolidation procedure for all projects launched since 2006 the data is available for, from adoption of the land consolidation programme by the local government unit assembly to vesting owners into property, is more than 40 months, actually around three years and four months.



Source: NALED research

Graph 1. Duration of the land consolidation procedure from the programme adoption to vesting into property

⁴¹ Vitikainen (2004), p. 38.

It has to be taken into account that this average significantly improves the results of pilot municipalities where GIZ was engaged in implementation of land consolidation, given that in these municipalities average duration of land consolidation from the moment of programme adoption to vesting into property lasted for less than 26 months; the average for the remaining land consolidation areas was 50 months, namely more than four years. We would hereby like to stress that there is a large number of land consolidation procedures initiated in the last 10 years which have still not reached the phase of vesting new owners into property. There are also land consolidation areas where factual situation has not been determined even three and a half years after the land consolidation project launch.

What is interesting is that in the land consolidation procedure implementation, least time elapses from the moment when land consolidation programme is developed, adopted by the municipal assembly and approved by the Ministry of Agriculture, Water Management and Forestry. According to the data available, the approval process lasts around 45 days, and more often less than 30 days. As already mentioned, the average period from the adoption of the land consolidation programme until vesting land consolidation participants into property is somewhat under three and a half years. However, there are examples of land consolidation projects where the decisions on reallocation of land consolidation mass were passed seven years after participants were actually vested into property.

The average time lapsed from the moment land consolidation participants have been vested into property to registration of changes in the real estate cadastre is impossible to account for, due to the small number of land consolidation areas where this procedure was implemented. What we can say is that in the majority of cases where land consolidation project was completed by registration in the real estate cadastre, such projects were launched in 2008 and 2009. On the other hand, there are examples of land consolidation projects which even after 10 years since their beginning, have not resulted in updated real estate cadastre and registration of property rights, same as those where not even after eight years of the land consolidation project launch owners have not been vested into property.

Long duration of the land consolidation procedure, not only up until the moment when changes are registered in the cadastre, but until owners have been vested into property, limits the owners in disposing of their real estates and affects delay in all important investments. The Law on Agricultural Land explicitly states that as of the day when the decision on initiating land consolidation project is published, construction of facilities and planting of permanent crops and plantations in the land consolidation area can not be conducted, namely, the owner is not entitled to reimbursement for investments made in facilities or permanent crops on the land included in the land consolidation mass, if such investments were made after the decision on the land consolidation implementation was published.

There are many reasons for delays in implementing land consolidation- those resulting from the lack of funds, but also those which do not. As problems which are not, at least directly, a consequence of the lack of funds, land consolidation participants have listed insufficiently active approach of the land consolidation commission, especially as explanation for the unjustified long duration of the procedure up until vesting participants into property. In terms of prolonging implementation of changes in the real estate cadastre, certain participants have pointed out gaps in the decisions on the land consolidation mass reallocation (failure on part of the land consolidation commission to enter encumbrance on the land subject to land consolidation), same as errors in geodetic studies compiled by geodetic organisations in the capacity of contractors. Other participants have

stressed the unjustified practice of the Republic Geodetic Authority to, in performing supervision in the last phase, issue remarks to results of work of geodetic organisations which were subject to RGA supervision also in earlier stages of the land consolidation implementation.

Whatever the reasons for extension of land consolidation implementation, the impression of the participants needs to be kept in mind: the longer land consolidation takes, the greater the chances it will not be successfully completed. Long duration of this procedure leads to the fact that certain actors in this process, willingly or due to the circumstances, cease to deal with land consolidation, with an adequate substitute hard to find. The extension of duration exhausts enthusiasm and finances of the land consolidation actors, and erodes patience of the land consolidation participants. Changes in factual situation before, during and after the land consolidation mass reallocation pile up, thus making the completion of land consolidation additionally difficult. All these are elements of a vicious circle very difficult to get out of. This is why it is very important to adequately prepare the land consolidation procedure and initiate it when all previous issues that could be resolved before the land consolidation, have been resolved.

3.7 The scope of land consolidation implementation

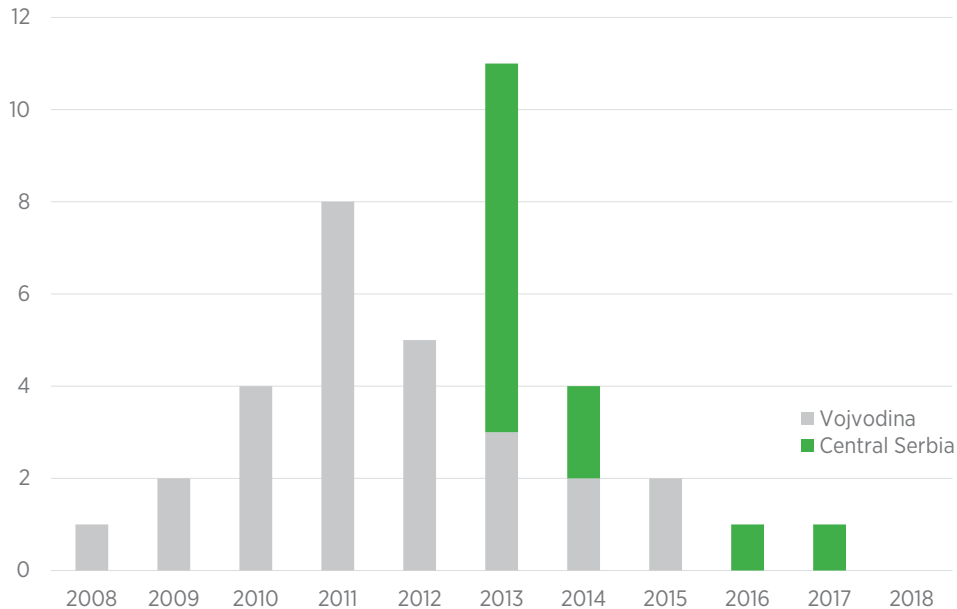
The dynamics of land consolidation implementation in Serbia is not at the high level. Since 2008, 39 land consolidation procedures have been initiated- of which 27 in the territory of AP Vojvodina and 12 in Central Serbia. The land area covered by these land consolidation procedures amounts to approx. 125,000 ha.

Year	Vojvodina	Central Serbia	Total
2008	1	-	1
2009	2	-	2
2010	4	-	4
2011	8	-	8
2012	5	-	5
2013	3	8	11
2014	2	2	4
2015	2	-	2
2016	-	1	1
2017	-	1	1
2018	-	-	-
Total	27	12	39

Source: NALED research

Table 1. The number of adopted land consolidation programmes, by years

If we were to assume that land consolidation would be completed in all these areas, we come to the data of around 12,500 hectares of consolidated land area annually. At this pace, consolidation of around 400,000 hectares, which makes only a half of the estimated need for land consolidation in Vojvodina⁴², would take more than 30 years. Here we need to emphasise that according to the 2012 Agriculture Census, total area of agricultural land in Vojvodina amounted to 1.7 million hectares, and in Central Serbia around 2.2 million.



Source: NALED research

Graph 2. The number of adopted land consolidation programmes, by years

Optimistic view of 12,500 hectares of consolidated area annually in the past ten years (optimistic because this is the average area of launched, and not completed land consolidation processes at annual level) may be compared against the 1.4 million hectares of consolidated land area in Serbia in the period between 1955 and 1990- during this 35-year period, 41,306 hectares of land were consolidated annually on average.

At this point there are 16 land consolidation processes with Land Consolidation Programmes approved by the Ministry, however not yet initiated. The total area of these 16 land consolidation areas amounts to somewhat less than 29,000 hectares. Although we can hope that the majority of those may be activated in a relatively short period of time, we have identified those where Land Consolidation Programme was adopted even back in 2003, without the land consolidation being launched even to date.

⁴² Estimation of the Republic Geodetic Authority from 2007 (see RGA, 2007, page 634). The area in which land consolidation was completed after this period is, as illustrated in the further text, relatively small. The most controversial assessment of the need for agricultural land consolidation in Vojvodina, shows that this implies approx. 400,000 ha, based on the assessment of the area still in the so called "old survey of Maria Theresa".

Support to land consolidation implementation by GIZ project “Strengthening Municipal Land Management in Serbia”

Ministry of Agriculture, Forestry and Water Management (Directorate of Agricultural Land) and GIZ project “Strengthening Municipal Land Management in Serbia” have initiated and launched land consolidation procedures in Southeast Serbia after the break of 40 years. Pilot municipalities participating in this project are: Paraćin (CM Donje Vidovo), Boljevac (CM Krivi Vir), Knjaževac (CM Vlaško Polje), Svrljig (CM Plužina), Žitorađa (CM Voljčinac), Negotin (CM Radujevac) and Pirot (CM Izvor i Berilovac) with total area of approx. 5,500 ha and around 4,000 owners of real estates (with share of women of approx. 30%). Prior to this project, not a single application for land consolidation project was not addressed to the Directorate of Agricultural Land from this region. Now we have a situation that almost all pilot municipalities, including the surrounding municipalities, are planning to launch or have already launched land consolidation projects covering 25,000 hectares. Given that land consolidations went live in Vojvodina and Southeast Serbia, it should be considered to apply the approach used in this project to those areas where land consolidation procedures have not yet been launched.

One of the main objectives of this project was to improve and modernise the land consolidation model in Serbia in line with best European Union practices. This primarily refers to the following:

- a. improved transparency, active participation, promotional campaigns and awareness raising about land consolidation;
- b. improved land valuation;
- c. environmental impact study conducted for the first time in scope of the land consolidation procedure;
- d. elaboration of the Plan of Common Facilities, including environmental assessment;
- e. training of the land consolidation Board of Participants.

All these activities were implemented in pilot land consolidation areas, same as in three cadastral municipalities in Vršac: Uljma, Vlajkovac and Izbište, with total area of 15,000 hectares.

For almost 30 municipalities (pilot municipalities, municipalities from Southeast Serbia and municipalities from Vojvodina) where currently in Serbia land consolidation project are being implemented on 120,000 hectares trainings were delivered by international experts (prof. dr Joachim Thomas, geodetic engineer and dr Wolfram D. Knipp) on best practices for the members of the land consolidation commission, but also other local practitioners in this area (geodetic engineers, environmental engineers, lawyers, land valuation experts, agricultural engineers, etc). Local experts (prof. dr Manojlo Miladinovic, geodetic engineer and doc. dr Rajica Mihajlovic, geodetic engineer) delivered trainings for the members of the land consolidation commission, focusing on topics like determination of factual situation, road and canal network plan, wish-taking and land consolidation mass reallocation. In addition to this, seven land consolidation programmes were developed for all pilot municipalities. These trainings were attended by 300 experts and commission members.

The land consolidation commissions in all pilot municipalities have, with technical support of geodetic organisations, successfully completed procedures of vesting participants into property (except in the municipality of Paracin, where this phase has not been reached) and are now trained to engage in new land consolidation projects. The Republic Geodetic Authority (Supervision and Control Sector) and local real estate cadastre services have supported pilot municipalities and project throughout the implementation of the entire procedure, and especially in final phases, so as to bring these procedures successfully to an end. What is left to be done is to implement all newly arisen changes due to the land consolidation procedure implementation to be registered in the real estate cadastre in all pilot municipalities.

The project supported the campaigns to launch land consolidation procedures based on the experiences of participants from other land consolidation projects in local governments of Nis, Bela Palanka and Sokobanja, and informed farmers and land owners from 14 villages about the advantages and benefits of land consolidation.

In the last six years, the project has constantly supported implementing land consolidation projects in pilot municipalities, same as in certain municipalities where land consolidation was launched or is about to be launched. To this end, 500 events were delivered: promotional campaign- awareness raising on the importance of land consolidation based on the experiences of participants in other land consolidation projects, presentation of the land consolidation programmes, presentation of the most important phases in land consolidation, citizen assemblies were organised in villages on all issues, joint meetings with the Ministry and municipalities, meetings in municipalities, trainings, seminars, conferences, delivered informative activities (faculties, institutes, schools, advisory extension services), same as PR activities (development of flyers, brochures and documentary on land consolidation), etc.

The experience and lessons learned from pilot projects were used for development of model bylaws regulating this area. Cooperation was established with the National Assembly of the Republic of Serbia and support was obtained of the Subcommittee on monitoring situation in agriculture in marginal-underdeveloped regions in the Republic of Serbia (National Assembly Committee on Agriculture, Forestry and Water Management) in regards to further promotion and improvement of legal framework for this procedure.

GIZ project has contracted NALED to compile analysis on the effects of land consolidation. The analysis is aimed at identification of economic, social and demographic effects imposed on the land owners, community, local government and the state by the implementation of the land consolidation process, same as to provide recommendations for the improvement of regulatory framework regulating this very process. The study is based on specific data gained during the implementation of pilot projects and other land consolidation projects in Serbia launched after 2006.

4. COSTS AND FUNDING OF LAND CONSOLIDATION IMPLEMENTATION

Land consolidation is not a cheap measure. Its implementation implies a number of costs, both direct and indirect. Direct costs include the costs directly linked with development and implementation of the land consolidation programme. First place is taken by the **land consolidation programme drafting**, and after its adoption, development of the final design for land consolidation survey and land territory development. The land consolidation programme drafting may be included in the costs of geodetic and technical works given that in practice contractors executing these works usually also draft this programme; the programme drafting accounts for under 1% of the total land consolidation costs, and usually much less than that. The costs of final design are, quite expectedly, significantly higher than the land consolidation programme costs, and generally range from five to ten percent of the total land consolidation costs.

The next direct cost concerns the **execution of geodetic and technical works**. Execution of these works makes the very essence of the land consolidation procedure, so with no exception they comprise one of the most important items in the land consolidation- related expenditures. Costs of the land consolidation commission operation are the next significant cost item in implementing land consolidation. This segment also includes costs of procurement and installation of margin demarcation marks, same as costs for compensation for the lost wells and facilities, namely lost perennial plantations.

In addition to the costs representing a constant in implementing land consolidation programme- drafting of the land consolidation programme and final land consolidation design, operation of the land consolidation commission and execution of geodetic and technical works- there are also other costs depending on what has been precisely envisaged under the land consolidation programme for the particular land consolidation area. Depending on the manner of land use, infrastructure condition, need for construction of facilities of general interest and a number of other criteria, additional activities in the land consolidation programme implementation may include **clearing of old plantations/ overgrowth, construction, reconstruction, rehabilitation, development of field roads, canal network for drainage/ irrigation, namely drainage-related investments in construction of underground piping drainage, construction of windbreaks, etc.**

Direct costs of land consolidation implementation are also the **costs of reduction in land for common needs**. These costs are invisible in the land consolidation budgets since they represent a kind of “contribution” ensured by the land owners in the land consolidation area for implementation of projects envisaged under the land consolidation project. This contribution is not being ensured on voluntary principle, but pursuant to the LAL each participant in the land consolidation process may receive from the land consolidation mass the land which is up to 20% smaller in size and up to 10% of lesser value in relation to that entered in the land consolidation mass. In practice, these reductions are usually much smaller, often a few per cent only.

Unlike the costs financed from the public funds, reduction of land for public purposes is borne by the owners of land in the land consolidation area. When the land is taken for the purpose of construction of the facility of general interest serving primarily to land owners in the land consolidation area- for example, field road or canal network, ensuring necessary land by the land owner in the land consolidation area is by all means justified. On the other side, sometimes through land consolidation land for the needs of the broader social community is being ensured (graveyards for example), including the needs of people not participating in land consolidation, and thus not participating in securing land for such purposes. In those cases, a question arises whether the land for the needs

of a broader community should be secured by reducing the land of participants in land consolidation, or should it be secured by the local government unit, or the level of government competent for the item requiring land for common needs. In all this one should bear in mind that securing land by participants in land consolidation for common facilities of even broader community still may be justified to the extent in which broader communities (the Republic, autonomous province and local government unit) participate in funding of land consolidation activities of which participants in land consolidation proportionally enjoy much more benefits than other citizens participating in securing budget funds for the implementation of land consolidation. Therefore, the land is taken from the participants in land consolidation for common needs also benefiting the people not participating in the land consolidation process, but out of budgetary funds ensured by the broader community for delivery of land consolidation activities by far greatest benefits are enjoyed by the land consolidation participants.

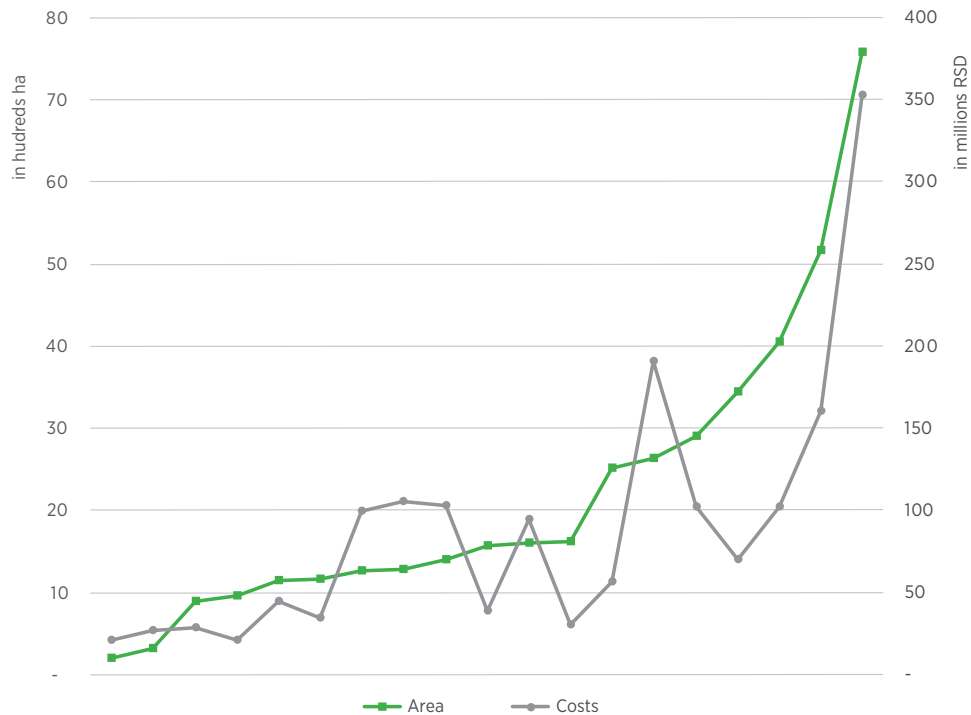
Indirect land consolidation costs include primarily **lost gain due to delayed investments while expecting land consolidation mass reallocation**. Namely, after determining factual situation, and prior to land consolidation mass reallocation, it would not be rational for land owners to invest in such land, except for those measures where return on investment is expected in the same agrarian year, unless they are certain that the land they would invest in would be re-allotted to them after the land consolidation mass reallocation.

The land consolidation costs include **public revenues disclaimed by the legislator**, that would have to be paid by the persons in possession of real estates who have acquired such rights in unregistered trade (namely, without registering related rights in the real estate cadastre) at the moment when they decide to register such rights in the real estate cadastre records. These persons leave land consolidation with registered property rights, for which they would, without land consolidation, have to pay corresponding administrative fees, and in majority of cases and property transfer tax. Although this is an obvious loss for the public sector given that beneficiaries are exempt not only of payment of corresponding tax, but also administrative fees, in reality only the costs of recording changes in the real estate cadastre represent a loss for the public sector. This is because practice has shown that without land consolidation unregistered trade in real estates often leaves the rights over the real estates unregistered for not only years, but generations, therefore it would be difficult to speak of the lost revenues that would have been generated otherwise.

4.1 Quantification of specific land consolidation costs

In 24 land consolidation areas where land consolidation projects were initiated in the last 10 years, where it has been completed or where the approval was issued to the land consolidation programme, where the data about the land consolidation costs listed in the land consolidation programmes is available, or based on the realised expenditures (based on the data of the competent ministry, i.e. provincial secretariat and local government unit), the range of costs **varies from approx. RSD 20 million to over RSD 350 million**. The average for these 22 land consolidation projects is RSD 82 million, but the median value is significantly lower and amounts to RSD 62 million. On average, land consolidation projects in Vojvodina cost less per hectare of consolidated land, since the works executed in Central Serbia in scope of land consolidation (like construction/ development of roads and canals and clearing overgrowth) are performed outside land consolidation project in Vojvodina. This is probably connected with the approach to land consolidation programme financing applied in Vojvodina compared to the one in Central Serbia.

As shown in the Graph below, land consolidation costs range from RSD 20 to 30 million for land consolidation areas covering smallest area, to over RSD 350 million for land consolidation area of more than 7,000 ha

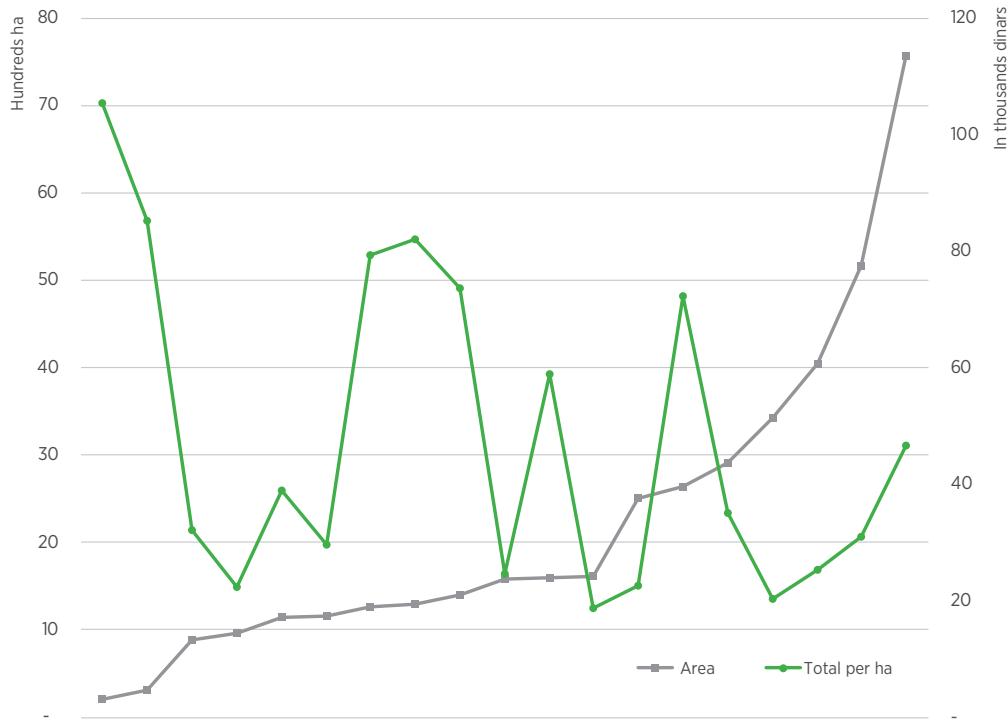


Source: NALED research

Graph 3. Land consolidation area and total land consolidation costs, per land consolidation area

Such a large range of land consolidation costs is conditioned by two basic variables: land consolidation area and scope of investment works. While the ratio of total costs between the most expensive and most inexpensive land consolidation project amounts to 1:19, when observing costs per hectare of consolidated land area, the ratio between highest and lowest costs per hectare is, quite expectedly, lower and amounts to slightly less than 1:6. Namely, the range of land consolidation costs per hectare varies from a bit under RSD 20,000 per hectare to over RSD 100,000 per hectare. The average price of land consolidation per hectare is around RSD 48,000, with weighted average of RSD 40,000 per hectare, and median of RSD 35,000 per hectare.

Highest costs per hectare are found in smallest land consolidation areas, as expected, due to fixed costs, i.e. economy of scale. However, as shown in the Graph below, expected values are notable only in the two smallest land consolidation areas, and this is where this regularity stops.



Source: NALED research

Graph 4. Land consolidation area and costs per hectare, per land consolidation area

For other land consolidation areas, the amount of costs of land consolidation per hectare does not demonstrate any regularity. As already stated, this difference primarily depends on the type and scope of the envisaged investment works. An element additionally affecting the costs of land consolidation implementation concerns the fact whether the land consolidation project includes construction area or not, given that in construction areas instead of land consolidation survey cadastre survey needs to be performed, in a smaller volume, which contributes to increased survey costs in these areas. To illustrate this, let us use the data from the land consolidation programme where preliminary value of geodetic and technical works in the construction zone amounts to RSD 43,736, and in non-construction RSD 14,885 per hectare (other costs- commission, stone markings, etc. have been estimated to RSD 13,621 per hectare). More notable differences were also identified: estimated cost of geodetic and technical works in non-construction area is around RSD 10,500, and in construction area (approx. 200 hectares in surface) around RSD 56,000, with other costs accounting for approx. RSD 5,000 per hectare.

In land consolidation areas we have the data for, the share of construction of field roads, canal network and clearing costs, same as of investment works in scope of land consolidation, ranges between **17% and 75% of total land consolidation costs**, with an average share of investments costs in total land consolidation costs amounting to 44%. **In scope of investment costs, most important are the costs pertaining to construction and development of field roads.** In five land consolidation areas the data is available for, these costs make up between 10 and 42% of total land consolidation costs, with an average being 31%. Since we do not have reliable data on the length and width of roads and types of works on the construction and development of roads, we deem most useful to bring these costs into correlation with the total surfaces of land consolidation areas. In this way we can conclude that the field roads- related costs amount to from RSD 7,000 to even RSD 44,000 per one hectare of land consolidation area, with an average slightly above RSD 23,000 for roads to every hectare of land consolidation area.

Right after the field roads, clearing is the second largest investment cost pertaining to land consolidation implementation in Central Serbia. In the total land consolidation cost structure, clearing costs account for 3% to even 48%, with an average of 15% of the total land consolidation costs. Unlike roads, land consolidation costs can not be justifiably observed in the context of total surface of the land consolidation area, but should be observed in the context of those areas covered by clearing. On the example of eight land consolidation areas the data is available for, the share of areas to be cleared against the total land consolidation area varies from 0.4 to 12.7%, with an average share of slightly above 6%. This is where certain asymmetry was identified given that the part of the land consolidation budget, 15% on average, is being spent to service only a bit more than 6% of the land encompassed by land consolidation. In the most extreme example of the available data set, 48% of the budget earmarked for land consolidation pertains to clearing covering 5.8% of land in the land consolidation area.

Clearing costs per hectare of cleared land range from RSD 24,000 to RSD 331,000. Such a large span may be explained by differences in the types of overgrowth to be cleared and configuration of terrain, i.e. characteristics of land where clearing is being performed, same as by contractual obligations concerning treatment of cleared shrubs. The average clearing costs per hectare equal to RSD 180,000. Concerning the canal network construction, the data on the related share of costs in the total land consolidation costs is available for the three land consolidation areas only. It shows that the canal network share amounts to 10%-22% in the total land consolidation costs, with an average share of 13%.

When it comes to the non-investment costs, by far the most important cost item pertains to geodetic and technical works (including supervision). These works comprise between 13% to even 58% of the total land consolidation costs. Such a range may be deceiving because it is mostly the result of major fluctuations in other, primarily investment expenditures. This confirms our finding once the costs of geodetic and technical works are put in correlation with the land consolidation area surface. Then we can see that these costs are relatively grouped, ranging from RSD 8,000 to slightly under RSD 16,000. On average, the cost of geodetic and technical works amounts to RSD 13,000 per hectare of consolidated land area. As already mentioned, the costs of geodetic and technical works largely depend on the fact whether and to what extent, land consolidation area includes construction area, i.e. construction land outside construction area.

The costs of the commissions demonstrate similar tendencies as the execution of geodetic and technical works: a significant range in the share in total land consolidation costs- from 4% to 27%, with an average of 11%, but also a relative balance when compared against the total surface of the land consolidation area. In this case, the range varies between RSD 2,600 to 8,500, with an average of RSD 5,200 per hectare of the land consolidation area.

Other costs emerging in land consolidation are lower than those we have presented and concern demarkation stones, compensation costs for lost wells and facilities, and permanent crops.

4.2 Financing of land consolidation implementation

Local government units are, principally, investors in the land consolidation programme implementation. However, Ministry of Agriculture, Forestry and Water Management, i.e. Provincial Secretariat for Agriculture, Water Management and Forestry, participate with significant funds in financing elaboration of project and technical documentation and execution of works, same as accompanying works that success of land consolidation as a whole largely depends on.

The Programme on the execution of works on protection, development and use of agricultural land, passed by the Government of the Republic of Serbia, determines the value of funds allocated to support the land consolidation procedure implementation. For this purpose, the funds from the account 463 (transfers to other government levels) are divided into two categories:

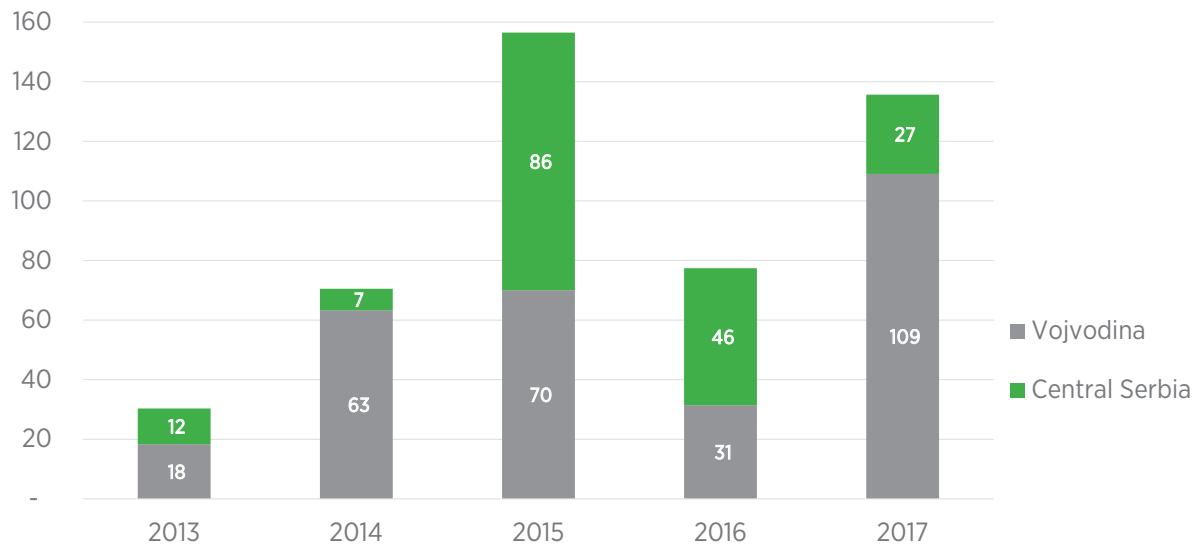
- a. launched, namely completed works, and
- b. new works, e.g. investments.

So the 2018 Works Programme for 2018, as support to development of agricultural land through land consolidation, envisages RSD 43 million for initiated works and RSD 95 million for new works. The amount of RSD 43 million related to payment of funds based on the Works Programme for the previous year, 2017.

In terms of land consolidation, the Works Programme sets forth that municipalities and towns may be eligible for funds planned for investment works and geodetic and technical works. A requirement for eligibility for these funds on the basis of support to implementation of land consolidation, is the 2018 Annual Programme of Protection, Development and Use of Agricultural Land, same as the Land Consolidation Programme. As a rule, even for the works in land consolidation that it supports, Government does not ensure funds covering 100% of costs, but only a particular portion thereof. Although the Government may determine different shares in financing works eligible for support in the less favoured areas in agriculture compared to the areas not included in this category, in the 2018 Works Programme this opportunity was not used for land consolidation, therefore the same percentage of the Republic share was determined for both categories of these areas: 70%. For comparison, percentage of share of the Republic funds in financing other works based on the Works Programme varies from 60% (procurement of irrigation equipment) to 100%- for control of arable agricultural land soil fertility. Unlike all other works, where the amount of funds is limited per application, in case of support to land consolidation, this amount is not limited. This seems like a significant incentive to local governments to plan larger scope of works in their land consolidation programmes, primarily in the category of investment works.

In terms of the funds allocated for the land consolidation implementation by the Autonomous Province of Vojvodina, these funds in launching of a new land consolidation project, may be used only for the land valuation in scope of land consolidation, and for geodetic and technical works, same as for supervision over the execution of such works. The funds for support of the land consolidation procedures initiated previously may be used for geodetic and technical works and supervision of execution of such works, works pertaining to land development necessary for the land consolidation implementation, cadastral land classification and evaluation, procurement of demarkation stones, etc. The funds are being allocated for execution of works concerning canals, dams, pump stations and other canal network facilities, same as for the field roads development. It has been explicitly said that costs of the land consolidation commission, subcommissions, public procurement commission, consulting services, clearing of forests and felling of trees, procurement of office consumables and equipment, land consolidation programme drafting, phone, electricity, office lease costs, entertainment costs, etc. are not subject to co-funding. The total amount of funds allocated by the Province may amount up to 30% of the total eligible costs excluding VAT. Maximum amounts are set per phases, i.e. types of works: up to RSD 5 million for initiation of new proceedings, up to RSD 10 million for continuation of implementation of land consolidation projects started previously, and up to RSD 5 million for canal network and field roads related works. If a local government unit could ensure for a particular land consolidation area maximum amount of funds for each phase, i.e. type of works, it would be provided by RSD 25 million in grants ensured by the Province.

Given below is the overview of funds allocated as support to local government units in implementing land consolidation projects in Vojvodina and Central Serbia.



Izvor: Istraživanje NALED-a.

Graph 5. The Republic and AP Vojvodina funds allocated for land consolidation funding*

*The data for Vojvodina refers to the funds allocated in the budget, whereas the data for Central Serbia relates to paid funds.

As illustrated by data, the funds ensured by AP Vojvodina are in all years except one, higher than the funds provided by the Republic, as expected. The total amount of funds allocated in the Vojvodina budget for land consolidation in the stated five-year period, equals RSD 292 million, while the Republic has paid out of its budget RSD 178 million in the same period.

Similarities and differences emerging in the practice of ensuring support between AP Vojvodina and the Republic for implementing land consolidation arise certain questions decision-makers should take into account. First, there is an issue of justification for the local governments to apply each year all over again for the funds to implement land consolidation projects, although these are projects of multi-annual character. Despite such practice being probably imposed by the budget system regulations, all possible efforts should be made to review such a practice and provide municipalities with specific certainty by allowing them to know in advance before starting land consolidation project what the provisional volume of funds they will have available to finance land consolidation over two or three-year period, and even longer, in case execution of complex infrastructure works has been envisaged in scope of land consolidation. Such an approach provided security to local government units and encouraged them to initiate such procedures, and on the other hand it would enable provision of these funds to local governments to be conditioned by meeting certain criteria which would, primarily, include compliance with deadlines in implementing land consolidation.

An additional issue concerns justification of the tendency to allocate up to 30% for land consolidation co-funding in the territory of Vojvodina, and up to 70% in the territory of Central Serbia. It is justified to remind to the principle that the key role in financing of particular expenditures should be played by such entity which will enjoy most benefits out of it. Having in mind that only a part of benefits produced by land consolidation are enjoyed by local governments (based on the potential increase in revenues generated from the tax on revenues from agriculture and property tax), and that large portion is used by the Republic (from VAT, owing to improved productivity of agricultural production and enhanced purchasing power of land consolidation participants and reduced amount of potential social benefits due to the better economic position of land consolidation participants, etc), an option should be considered to increase the share of higher government levels in land consolidation funding.

5. THE EFFECTS OF LAND CONSOLIDATION ON SETTLING OWNERSHIP AND LEGAL RELATIONS

In the period prior to the year 2000, there were double records on the real estates in the Republic of Serbia: land cadastre- as a land registry and land book- records on the holders of rights over real estates. The cadastre system reform was implemented in the period 2004-2012, and it encompassed development of the real estate cadastre by merging data on the real estates, related rights and encumbrances and limitations. The real estate cadastre was established based on the land cadastre data, land book and other records, survey update, i.e. cadastre and land consolidation survey data, and after the implemented procedure of presenting data on the real estates and related rights. At the moment of its establishment, real estate cadastre represented a synthesis of alpha-numerical data on the real estates and related rights, developed in digital form and graphic data on the real estates, which mainly remained in analogue form.

Nowadays, the real estate cadastre represents a single public registry on the real estates and contains data on the following: land, buildings and specific parts of buildings (apartments and business premises, garages) and actual rights, encumbrances and limitations on real estates. In the Republic of Serbia each cadastral parcel has its owner registered in the real estate cadastre, basic and public registry on the real estates and related rights, while the Law on State Survey and Cadastre sets forth an obligation to report all changes on the real estates.

Lack of up-to-dateness of the real estate records is still wide-spread, with the underlying reasons being diverse: obsolescence of previous records, weak response of parties in the procedure of presentation of the real estate data, non-compliance with provisions of the Law on State Survey and Cadastre referring to registration of all changes on the real estate, not having suitable documents for entering changes in the real estate cadastre, etc.

The state of the real estate cadastre represents a starting point for the procedure of factual situation identification, as the first stage in the land consolidation process. Land Consolidation Commission is responsible to resolve all unsettled ownership and legal relations so as to identify participants in the land consolidation process. More accurately, identification of land consolidation participants is performed based on the evidence not entered in the real estate cadastre (for example, because they are not certified, or exist in a copy, and as such do not represent a document suitable for registration in the real estate cadastre).

Based on the effective decision on the land consolidation mass reallocation, each land consolidation participant acquires the property right over the land they “take out” of land consolidation. Each parcel is marked in the field by permanent demarkation stones and it has been shown to the participant in land consolidation, who has been vested into property by the Land Consolidation Commission. This procedure is important both to natural persons and local government implementing the procedure of leasing state-owned land.

Following the completion of land consolidation, completely new up-to-date records of the real estate cadastre are being compiled, which is extremely important for all land owners for the purpose of unhindered trade, lease, mortgage registration, new investments, obtaining benefits or applying for IPARD funds and other needs.

The importance of speediness of the real estate cadastre update following the implemented land consolidation is recognised in the procedure of leasing state-owned land, when deadlines for the procedure preparation and implementation need to be respected, and which is being implemented with respect to agri-economic year calendar, therefore any delay leads to loss.

Establishment of a digital base of geospatial data

Starting from the need of the modern society for fast information in digital form, since the establishment of the real estate cadastre, Republic Geodetic Authority has been investing efforts to digitize graphic data, so today the records on real estates are fully digitized. Since the real estate cadastre represents public records, all data on real estates is publicly available to all interested entities on the website of the Republic Geodetic Authority. Graphic overview of cadastral data in digital form enables integration with planning documents (spatial and urban development plans) and is also important for creation, maintenance and implementation of each individual process in the course of the entire cycle of sustainable regional development.

Geospatial data represents the basis for analysis of spatial and urban organisation of space encompassing the following:

- Determining land purpose and use;
- Research of changes in urban structure and space morphology;
- Overview of open and green spaces and linking of constructed and unconstructed areas;
- Research of most optimal and different traffic solutions;
- Repositioning of planned models of spatial organisation⁴³.

Space visualisation based on the geospatial data is necessary for the analysis, planning and decision-making in relation to development and further improvement of living environment over the longer period of time. Integrated cadastre and geospatial data from other areas create a potential for planning and control of land purpose and manner of use, control of agricultural land use for non-agricultural purposes, overview of the intensive construction zones, defining key points in traffic problems, and in line with this, proposal of optimum traffic solutions, control of the state-owned land use, which was often illegally occupied by other entities in the past. In the light of climate change we have witnessed over the past decades, integrated real estate cadastre data and other geospatial data open a possibility of fast and precise action in the case of natural disasters and weather conditions, aimed at protection of human lives and nature and the environment, individual protected natural resources and cultural and historical resources.

Taking into consideration that land consolidation projects are nowadays, especially in the territory of the Autonomous Province of Vojvodina, being implemented in cadastre municipalities with the valid survey from the 19th century, which is conducted by graphic methods without numerical data, in low accuracy not meeting the needs of modern survey, the importance of land consolidation is reflected not only in the digital form of cadastre survey data, but also in the fact that execution of works is performed using modern technologies ensuring necessary accuracy over a longer period of time.

By implementing land consolidation, real estate records are not only being digitized, but are absolutely up-to-date in relation to factual situation in the field. Coming into force of the Law on the Procedure of Cadastre Registration of Real Estates and Lines in June 2018 and determining obligation of competent authorities (notaries public, courts and others) to submit electronic data on all changes on the real estates, it is to be expected the the level of the real estate cadastre up-to-dateness is going to be increased.

⁴³ Branković et al (2016).

6. ECONOMIC EFFECTS

Economic effects of land consolidation discussed in the follow-up primarily result from the enlargement of agricultural land parcels, and their reallocation so as to be closer to the farmstead. According to the data collected in this research, the average size of agricultural land parcels entered in land consolidation in Serbia amount to approx. 75 ares in Vojvodina, and approx. 28 ares in Central Serbia.

For the purpose of comparison, agricultural estate area in Poland amounts to 16 hectares on average, divided into parcels of average area of 2.99 hectares⁴⁴ in the Czech Republic, characterised by extremely large area of agricultural estates for European circumstances (over 120 hectares), average parcel size amounts 0.85 hectares⁴⁵; ⁴⁶in Italy average size of individual parcel of agricultural land equals 2.1 ha, in Spain 2.3 ha, and 1.7 ha in Switzerland. Given that the coefficient of land enlargement in Vojvodina amounts to 2.97 it means that the average parcel size in the land consolidation area has been increased from 0.75 hectares prior to land consolidation to 2.23 hectares after the land consolidation; in Central Serbia the enlargement coefficient is somewhat lower and equals 2.54, meaning that the average parcel size was increased from 0.28 to 0.73 hectares- notably to the level similar to the average parcel size in Vojvodina, but in areas where land consolidation was not implemented.

In the follow-up we will discuss what effects these results of estate enlargement, same as some other measures when undertaken within land consolidation, have on the land consolidation participants.

6.1 The effects of land consolidation on the distance to estates⁴⁷

If we observe the effects of land consolidation on the change in distance, i.e. time farmers need to reach their estate, it has been observed that **on average distance between the farmstead and their estates was reduced by 2.6 km.** It should hereby be stressed that this concerns subjective feeling of the respondents, rather than data obtained based on the precise geodetic data before and after the land consolidation project implementation.

Based on the responses of respondents, the average time needed to reach the estate has also been reduced by slightly more than ten minutes. After the implemented land consolidation, agricultural producers have increased the average number of trips to their estates. The increase in itself is not relevant since the number of trips was increased by three only. Likewise, the total annual time savings (needed time, i.e. distance multiplied by frequency-number of trips) is also not relevant (only somewhat above an hour on average, namely 18 km annually). It should be taken into account that this concerns a short time period, and that there are multiple effects affecting the number of trips (type and intensity of agricultural production, weather, specific activities, etc). Table 2. shows survey results based on 289 observations from the land consolidation areas.

⁴⁴ Jedrejek et al. (2014), p. 1119.

⁴⁵ Janovska et al. (2017), p. 4.

⁴⁶ Demetriou (2014), p. 299.

⁴⁷ Parcels grouped into a coherent, uniform piece of land- arable field, garden, forest and alike.

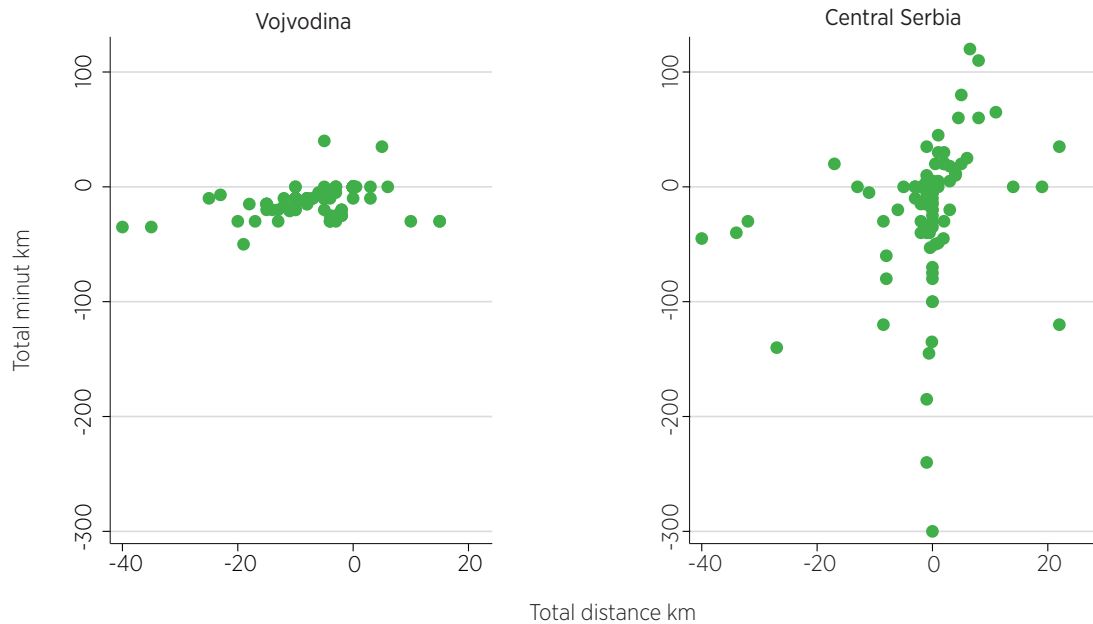
Variable	Average	Standard deviation	Min.	Max.
Δ time needed from farmstead to estate (min)	-10,7	37,1	-300	120
Δ distance from farmstead to estate (km)	-2,6	7,6	-40	22
Δ number of trips to the estate	3,1	27,2	-180	359
Weighted annual change in distance	-17,7	237,3	-1980	1735
Weighted annual change in trip duration	-76,5	738,5	-6850	5115

Source: Author's calculation based on the NALED and SeConS research (2018)

Table 2. Change in the time needed and distance to reach the estate before and after the land consolidation

Graph 6 shows the ratio of change between the unweighted distance of all estates from the farmstead after land consolidation and the change in time needed to reach all estates in the land consolidation areas in the territory of Vojvodina and Central Serbia. In the majority of agricultural holdings reduction in average distance to their estates was identified. In some of them, after the enlargement the average distance to estates remained the same, but the time needed was shorter due to the enlargement.

It should be noted that the sample is characterised by significant deviations. So in Backi Maglic distance of estates was on average reduced by 1 km, in Pluzine by less than half a kilometer, whereas the distance was significantly reduced in Opovo (3.1 km) and Despotovo (even 8.2 km on average). Still, a part of the agricultural holdings were made losers by land consolidation, given that after land consolidation distance to their estates was made longer. Moreover, notable is the difference in terms of distribution of changes in the time needed in Vojvodina and Central Serbia. Due to the terrain configuration, the change in distance produced smaller effects in Vojvodina compared to the change in time in Central Serbia.



Source: Author's calculation based on the NALED and SeConS research (2018)

Graph 6. Change in the time needed and distance to reach the estate before and after the land consolidation

The results relating to the total time spent to reach/return from the estate (before and after land consolidation) should be taken into account with reserve. Namely, increased frequency may result from different types and intensity of agricultural production, weather conditions and a series of other factors. .

6.2 The effects of land consolidation on land fragmentation

In order to be able to analyse the effect of the land consolidation procedure, we have estimated the index of land fragmentation before and after land consolidation, based on the data of geodetic organisations for the land consolidation areas of Ppovo and Maglic acquired for the needs of this analysis. We did not have adequate data available for the territory of Central Serbia. In addition to already presented data on the larger fragmentation of cadastral parcels in the territory of Central Serbia compared to Vojvodina, we may point to the conclusion presented by Berkum and Bogdanov (2012)⁴⁸ regarding the land area disposed of by households in Southeast Serbia owing to larger surface permissible for the households located in mountainous areas in the time of Communism and high

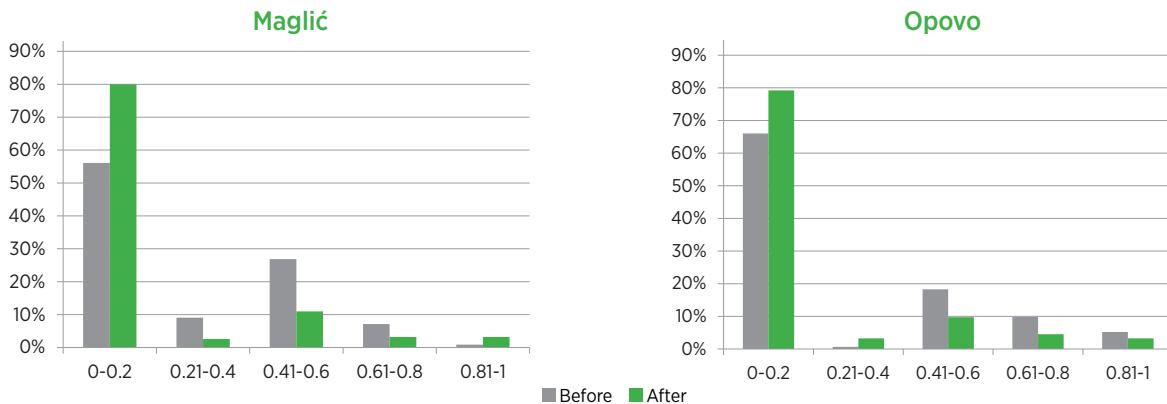
migration rates from these areas into cities and abroad which have led to lesser fragmentation of estates in these areas compared to the areas with better development performance.

The geodetic organisation data for Opovo and Maglic refer to the number and size of parcels, based on the land consolidation participants, which is sufficient for calculation of Simpson's index which is the most frequently used measure of land fragmentation (Blarel et al, 1992). Simpson's index is expressed by the following formula:

$$S = 1 - \frac{\sum_{i=1}^n a_i^2}{A^2}$$

Where a_i is the size of i -th parcel, and A land area of a single land consolidation participant. Simpson's index (SI) accounts for values between 0 and 1, where 0 denotes full land consolidation. The limitation of Simpson's index is that it does not reflect other aspects of land fragmentation, like distance from the farmstead, shape of the estate and the manner of merging fragmented parcels.

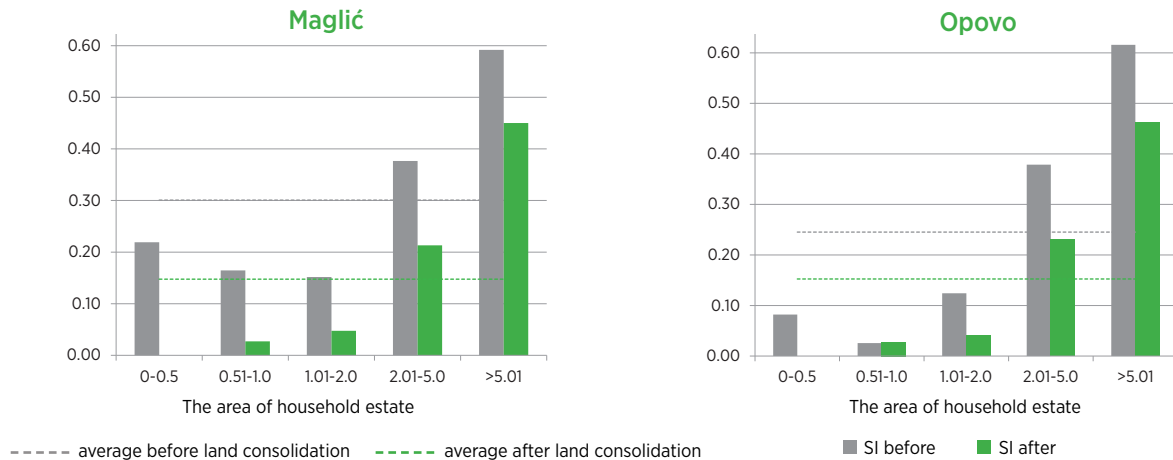
The data in Graph 7. shows that more than a half of holdings in Maglic and Opovo had farmed the land that was already consolidated or had a low level of fragmentation. The explanation is that majority of holdings were in possession of a single parcel, which according to SI corresponds to full land consolidation. Besides, the area of agricultural land parcels in Vojvodina is generally larger compared to the rest of Serbia. However, in other considered holdings, the fragmentation level was moderate or low. **As the result of implemented land consolidation in both considered areas, the share of holdings with observed moderate or high fragmentation level has been halved. In accordance with this, the share of holdings with consolidated land was increased to approx. 80%.**



Source: Author's calculation based on the NALED research

Graph 7. Percentage of holdings based on the Simpson's index

Graph 8. shows that the average fragmentation level in Maglic and Opovo was reduced by 50%, i.e. 40% respectively. It also shows the increase in land fragmentation index trend with the increase in total land area per land consolidation participant, given that land fragmentation was measured by the number of parcels. Therefore, even when the land area per participant is large, large is also the number of parcels comprising such land. Consequently, these findings confirm the tendency that in households possessing larger land areas the larger level of land fragmentation is also found, which is somewhat contrary to expectations that consolidation of large estates is the source of their cost reduction per product unit, owing to the economy of scale potential.



Source: Author's calculation based on the NALED research

Graph 8. Ratio between the Simpson's index (SI) and agricultural estate size

6.3 Preliminary effects of land consolidation on the agricultural production costs

Potential effects of the reduced land fragmentation (land consolidation) depend on the series of factors. So in the case of the capital intensive agricultural production costs in small and fragmented estates are as a rule relatively high. On the other hand, if the labour intensive agricultural production is concerned, then benefits of land consolidation may be insufficient for it to be cost-effective (Sengupta, 2006).⁴⁹ Likewise, the effects may vary depending on whether the objective of land consolidation is exclusively to increase productivity or also rural development in a broader sense.

In order to evaluate the effects of land consolidation, two approaches are usually used in the literature.

1. First implies comparison between the areas not participating in the land consolidation process against the areas where such process was implemented.
2. Second implies comparison between the areas participating in the land consolidation process by observing the results before and after land consolidation.

Methodological problems emerge in both of these cases. In the first case, rather similar areas need to be selected, whereas in the second sufficiently long period needs to be taken into consideration. Therefore the number of ex post land consolidation analysis is limited in the literature (Crecente, et al, 2002).⁵⁰ Our analysis uses the first approach, so in addition to consolidated land areas, neighbouring and similar areas are being used as control groups.

Based on the survey results, land consolidation effects on different costs per hectare have been determined. What was used is the larger number of models by including multiple variables, however the **effects of land consolidation** (observed as artificial variable taking into account value of one in case of land consolidation areas, or zero in case of control areas) are **stable and statistically relevant for certain costs** regardless of inclusion of additional variables. Just the same, all signs in econometric models are in line with the expected.⁵¹

Based on the econometric findings and depending on the specification, land consolidation has statistically relevant effects on the **reduced costs of fuel, seeds and machinery**. Likewise, there is a statistically relevant effect on the increase in **costs based on tax liabilities**. The considered models used several controlled variables (region, agricultural holding characteristics, estate size⁵² ...) to determine the robustness of obtained results. Table 3. shows basic findings of the models based on the costs listed in the questionnaire.

⁵⁰ Crecente et al (2002). In the last several years the number of these studies has significantly increased, however they differ based on the applied methodologies, available data and objectives. See, for example Hiironen et al. (2016); Muchová and Jusková (2017); Demetriou et al (2012); Cay and Iscan (2010).

⁵¹ Unfortunately, this is not the case if we separately consider observations for Vojvodina and Central Serbia, where we have a problem of very influential observations and the problem of small number of observations, especially in the case of Vojvodina. This is why in the follow-up as an approximation we have used the data acquired based on the total sample.

⁵² Due to limited data, in developing model specification the change in the size of total estate was used as a sum of areas of kitchen gardens, arable land, orchards, meadows, pastures, and other forms of the holding land use. Likewise, the analysis concerned the effects in case of change in the size of estate in ownership and total estate size used by the holding in the period concerned.

Cost type	Effect	Effects of land consolidation on costs (%)- range		Statistically relevant effect
Lease costs	increase	1.78	0.56	No
Fuel costs	reduction	-27.19	-27.65	Yes
Fertilizer costs	reduction	-3.95	-2.93	No
Seed costs	reduction	-5.76	-5.04	Yes
Irrigation costs	increase	4.04	5.72	No
Machinery hire costs	reduction	-3.92	-4.38	Yes
Hired labour costs	reduction	-4.05	-3.33	No
Insurance costs	increase	1.90	2.27	No
Taxes	increase	4.99	5.59	Yes

Source: Author's calculation based on the NALED and SeConS research (2018)

Table 3. Estimated costs of land consolidation on agricultural production costs

Land consolidation produced most significant effect on fuel cost reduction in the land consolidation area in relation to the control group- between 27% and 28%. One quarter of the respondents have listed that they considered there has been a reduction in the fuel costs after land consolidation, in relation to 0% of respondents in the control group. This was in line with the expectations, given that the reduced distance from the farmstead was achieved.

The effects on seeds and machinery costs reduction were also reduced by approx. 5% and 4% respectively. This was also expected taking into account the expected more efficient production and use of the said resources after land consolidation. The majority of respondents (69%) from the areas where the land consolidation process was implemented considered there was no change in the seeds costs, whereas 29% of them considered an increase had occurred. Still, when the data is compared against the control group, what becomes notable is the significantly higher number of respondents (89%) stating there was an increase in the seeds costs. The differences between the groups show the impact of land consolidation on the reduced seeds costs against the control group. According to the research results, in land consolidation areas, majority of respondents stated that the cost of machinery hire have not been increased. On the other hand, over one half of respondents from the control group

considered these costs to be increased in the last three years (against only 10% of households from the land consolidation group).

Finally, land consolidation has positive effects on the increased tax payments. According to the findings, this increase amounts to between 5% and 5.5%. In other words, land consolidation creates potential for increased tax revenues. Other signs are also in line with expectations, however the results are not statistically relevant so they will not be included in the subsequent calculations.⁵³ Still, a predominant position of respondents was that the increase in the costs of labor is lower in areas where land consolidation was implemented compared to those where it was not (there was an increase of 13% in the land consolidation group, against 63% in the control group).

It will be possible to evaluate the effects with greater reliability only after a longer period of time, when it will be possible to evaluate in detail the effects of land consolidation on the technical efficiency of holdings. Until then, potential agri-economic effects of land consolidation can be evaluated with the assistance of previously evaluated land consolidation effects on different costs per hectare. In order to do so, it is necessary to determine an average amount of agricultural production costs per hectare and the structure of agricultural production costs in the research area. This further requires considering a large quantity of data both from primary and secondary sources. The key challenge relates to availability of data at lower territorial units from the official public sources in the Republic of Serbia (statistics, registries, FADN⁵⁴, etc), with the economic data at the level of individual holding being often scarce and of questionable accuracy and reliability, given different methods of their gathering and integration. This is why for the needs of this part of the research the following approach to data collection was used:

- The data gathered from different secondary sources (Agriculture Census⁵⁵, FADN⁵⁶, and research studies) was combined with primary data:
- Primary data includes:
 - Data on economic and structural characteristics of agricultural holdings in the research area obtained from the own researchers database and
 - The data obtained through survey-based research on the effect of land consolidation in the Republic of Serbia, relating to the effect of land consolidation on the selected costs of agricultural production in the research covered areas (region of Vojvodina and Southern and Eastern Serbia).

Due to the lack of official data on economic results of agricultural holdings in the time period covered by this research, the described approach may be considered sufficiently reliable and justified. A retrospective questionnaire on the selected sample would be less reliable way of estimating agri-economic effects of land consolidation. In that case, it would be required to collect a large number of technical and technological and organisational-economic indicators from previous years (prices, yields, agricultural production costs, etc) based on the (unreliable) recollections of agricultural producers⁵⁷.

⁵³ According to the obtained results, land consolidation reduced the costs of fertilizer and hired labour between 3% and 4% while increasing irrigation costs (between 4% and 5%) and insurance based payments (approx. 2%).

⁵⁴ Farm Accountancy Data Network - FADN).

⁵⁵ 2012 Agriculture Census in the Republic of Serbia

⁵⁶ The region represents the lowest level based on which it was possible to perform territorial classification of agricultural holdings in the submitted FADN database for the Republic of Serbia.

⁵⁷ Agricultural holdings not subject to VAT are not liable to keep accounting records, and this comprises a major number of agricultural holdings in the Republic of Serbia.

Taking this into account, it is rather plausible that the reliability of the results obtained based on the so collected data would be at lower level.

In addition, a better insight may be obtained if economic effects of land consolidation are observed on specific types of agricultural holdings. The selection of agricultural holdings was performed in line with the classification of agricultural holdings based on the type of production⁵⁸ taking into account predominant types of agricultural holdings in the research area. Therefore special attention was paid to the crop producing holdings in the Vojvodina region and mixed holdings in the region of Southern and Eastern Serbia.

Having in mind current trends in economy and agriculture, it is very difficult to expect lower level of agricultural production. This is why it is extremely important to identify dominant cost groups in agricultural production in selected types of agricultural holdings in the research area.

In relation to this, in the following tables we provide the amount and structure of agricultural production of selected types of agricultural holdings both for the region of Vojvodina (Table 4) and for the region of Southern and Eastern Serbia (Table 5).

Elements	Average amount (RSD per ha)	Cost structure (%)
Selected costs	71,090.33	78.86%
Land lease costs*	21,402.82	23.74%
Fuel costs	12,701.44	14.09%
Seed costs	12,296.16	13.64%
Fertilizer costs	17,489.39	19.40%
Irrigation system costs	0.00	0.00%
Machinery hire costs	3,636.75	4.03%
Labour hire costs	1,728.72	1.92%
Crop insurance costs	495.71	0.55%
Tax costs	1,339.33	1.49%
Oher costs	19,052.42	21.14%
Total costs	90,142.75	100.00%

*Costs of lease expressed per hectare of the total used agricultural area, and not in the price of lease of 1 ha of agricultural land..

Source: Author's calculation

Table 4. Amount and structure of costs of agricultural production of crops in the Vojvodina Region

It has been established that the share of selected costs in total costs of agricultural production is especially high in specialised field crops holdings in the Vojvodina region, where it exceeds 78% and significantly higher than the share of selected costs in total agricultural production costs of mixed holdings in the Southern and Eastern Serbia

58 Commission Regulation (EC) No 1242/2008 of 8 December 2008 establishing a Community typology for agricultural holdings.

region (63.34%). The reasons underlying such a high share of listed costs in the total agricultural production costs of specialised field crops holdings in the Vojvodina region should be sought in the fact that selected costs are mainly comprised of the crop production costs. In all this, the amount of selected costs expressed per hectare of total used agricultural area is significantly higher in specialised field crops holdings in the region of Vojvodina (RSD 71,090.33) in comparison with the mixed holdings in the region of Southern and Eastern Serbia (RSD 64,275.68) which demonstrates more intensive agricultural production in specialised field crops holdings in the Vojvodina region.

When it comes to other costs one should bear in mind they are mostly comprised of fixed costs (depreciation and other fixed costs). In relation to this, a well-known saying applicable to fixed costs is that their total amount at the holding level does not change with the change in the volume of production or level of capacity use, i.e. their total amount remains the same regardless of the quantity of produced products or services rendered (Gogić, 2009). Just the same mixed holdings typical for the region of Southern and Eastern Serbia, which are on average smaller with less intensive agricultural production compared to specialised field crops holdings, have a higher amount per hectare of total used agricultural area. It is quite clear that specialised field crops holdings in the Vojvodina region enjoy numerous benefits stemming precisely from their size (economy of scales effects).

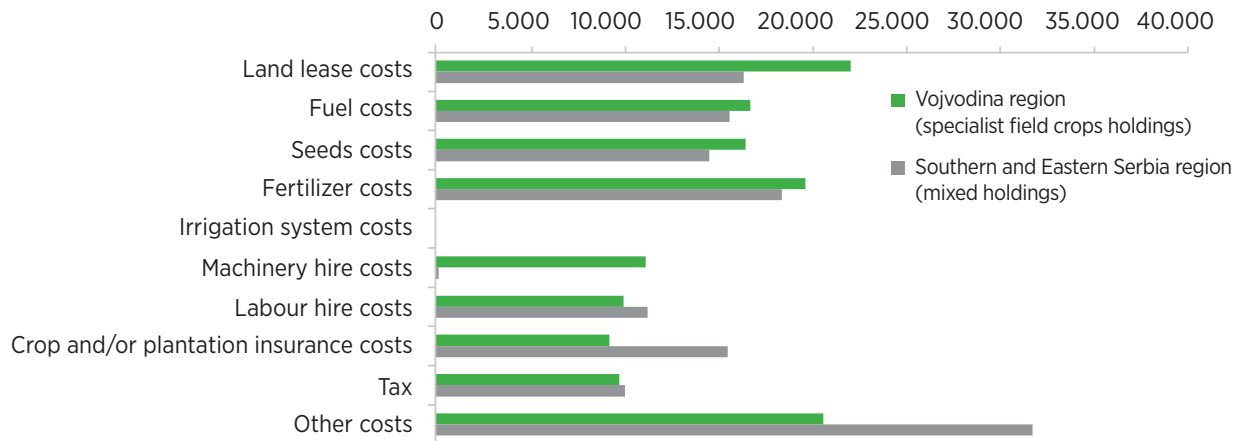
Elements	Average amount (RSD per ha)	Cost structure (%)
Selected costs	64,275.68	63.34%
Land lease costs*	12,158.74	11.98%
Fuel costs	10,934.64	10.78%
Seed costs	9,154.35	9.02%
Fertilizer costs	15,453.94	15.23%
Irrigation system costs	0.00	0.00%
Machinery hire costs	210.28	0.21%
Labour hire costs	3,786.75	3.73%
Crop insurance costs	10,739.85	10.58%
Tax costs	1,837.14	1.81%
Oher costs	37,201.50	36.66%
Total costs	101,477.18	100.00%

* Costs of lease expressed per hectare of the total used agricultural area, and not in the price of lease of 1 ha of agricultural land.

Source: Author's calculation

Table 5. Amount and structure of costs of agricultural production of mixed holdings in the Southern and Eastern Serbia Region

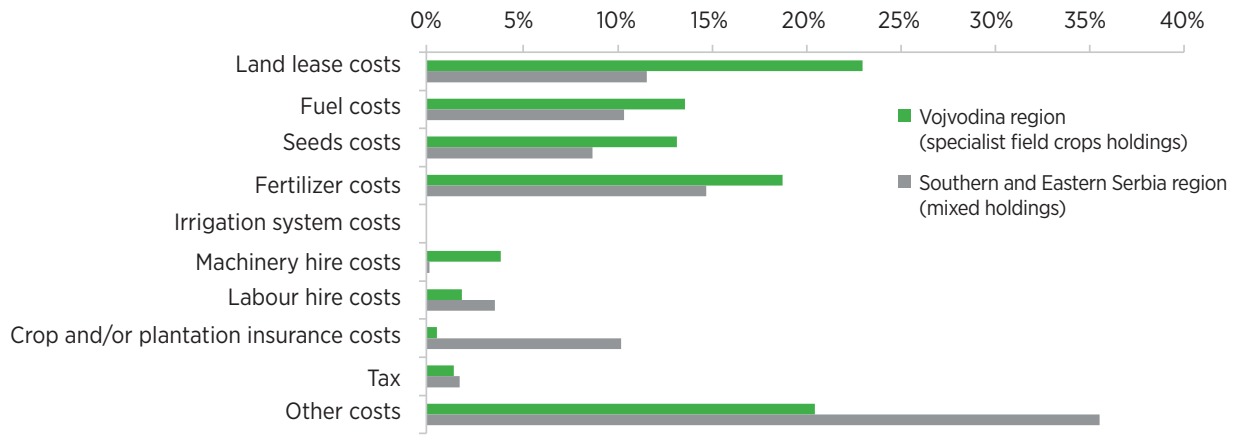
The difference in the amount (Graph 9) and structure (Graph 10) of agricultural production costs in the area subject to research is best seen in the following graphs.



Source: Author's calculation

Graph 9. A comparative overview of the agricultural production costs amount per hectare of the total use agricultural area of the selected types of agricultural holdings in the research- covered area

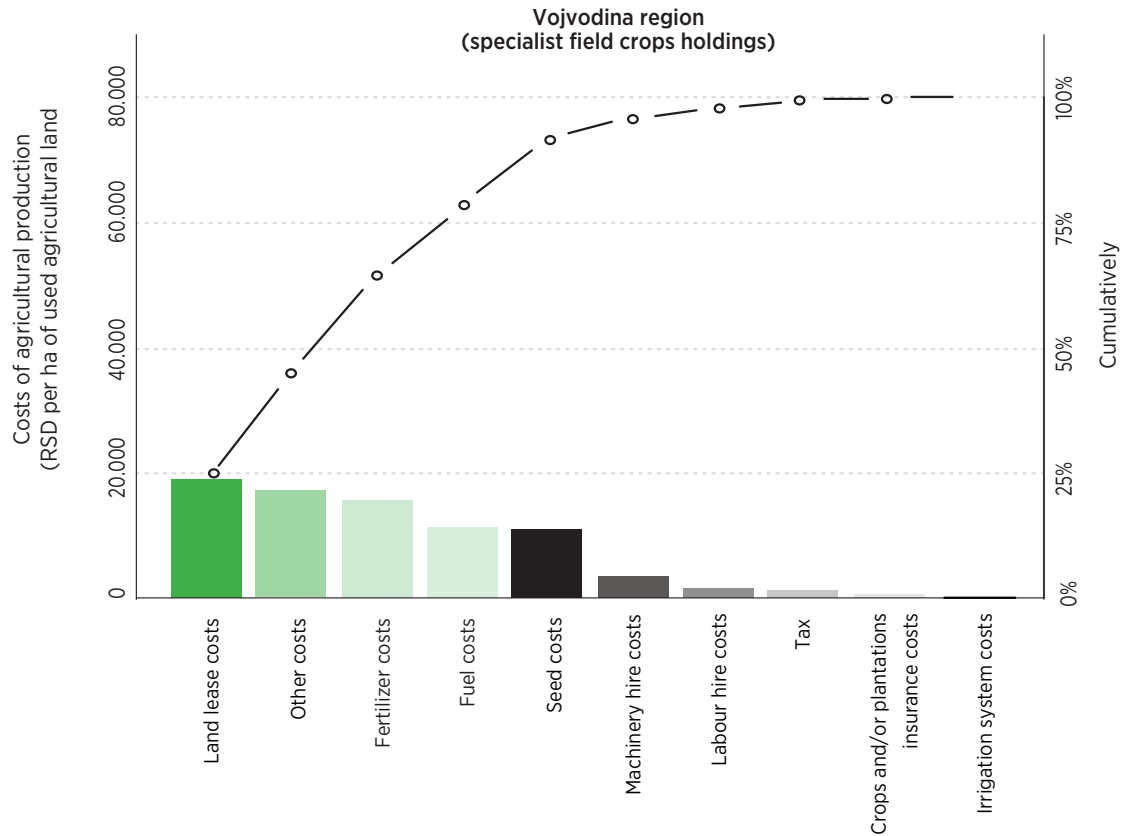
The difference in the amount and structure of agricultural production costs is particularly notable in the land lease costs. High share of the land lease costs in total costs of agricultural production in specialist field crops holdings in the Vojvodina region is not particularly surprising if high agricultural land lease prices in the said region are taken into account (Munčan et al, 2014) which are significantly higher compared to the region of Southern and Eastern Serbia.



Source: Author's calculation

Graph 10. Comparative overview of the agricultural production costs structure of the selected types of agricultural holdings in the research- covered area

In addition to this we provide a graphic overview of the relevance of previously presented selected costs of agricultural production, both for the specialist field crops holdings in the Vojvodina region (Graph 11) and for the mixed holdings in the region of Southern and Eastern Serbia (Graph 12). The data is expressed in absolute amounts per ha of total used agricultural area and as a cumulative share in total costs of agricultural production of the listed types of agricultural holdings.

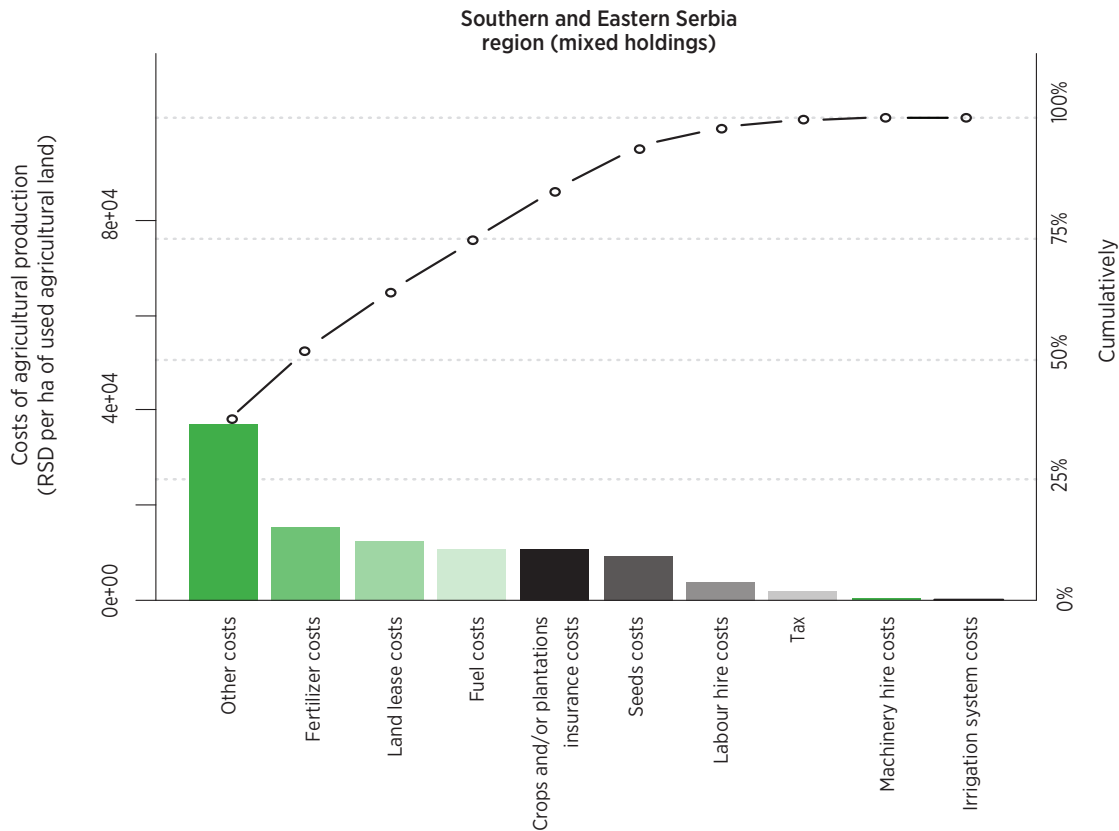


Source: Author's calculation

Graph 11. Relevance of selected costs of agricultural production of crops in the Vojvodina Region

There is no doubt that out of the selected agricultural production costs, regardless of the region and type of agricultural production, costs of material and energy in addition to land lease costs, dominant in the cost structure. However, such a high share of the said costs in the agricultural production cost structure requires additional analyses which are to show whether such high share is justified or whether it results from high prices and/or inefficient spending of material and energy in agricultural production at agricultural holdings.



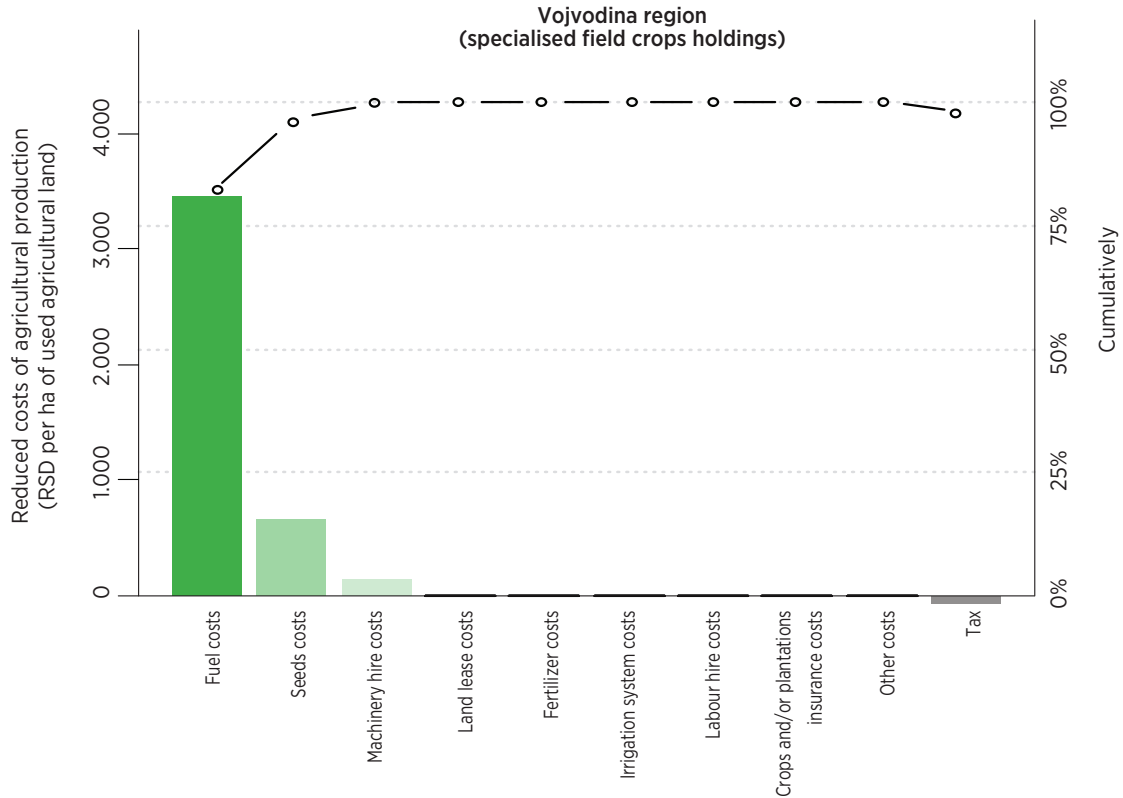


Source: Author's calculation

Graph 12. Relevance of agricultural production costs of mixed holdings in the Southern and Eastern Serbia Region

Let us remind ourselves here of the earlier presented results on the effects of the land consolidation implementation on the costs of agricultural production detected with statistical relevance. The listed results refer to reduced fuel costs amounting to between 26 and 27%, reduced seeds costs (between 5 and 6%) and reduced machinery hire costs (between 3.9% and 4.38%), while on the cost increase side increase in taxes was identified as statistically relevant, being between 5% and 5.6%.

Starting from these findings and average amounts of individual costs of agricultural production per hectare presented here and their share in the total costs structure, in the next step the potential effect of land consolidation was estimated on the selected agricultural production costs both for the specialist field crops holdings in the Vojvodina region (Graph 13) and mixed holdings in the region of Southern and Eastern Serbia (Graph 14).

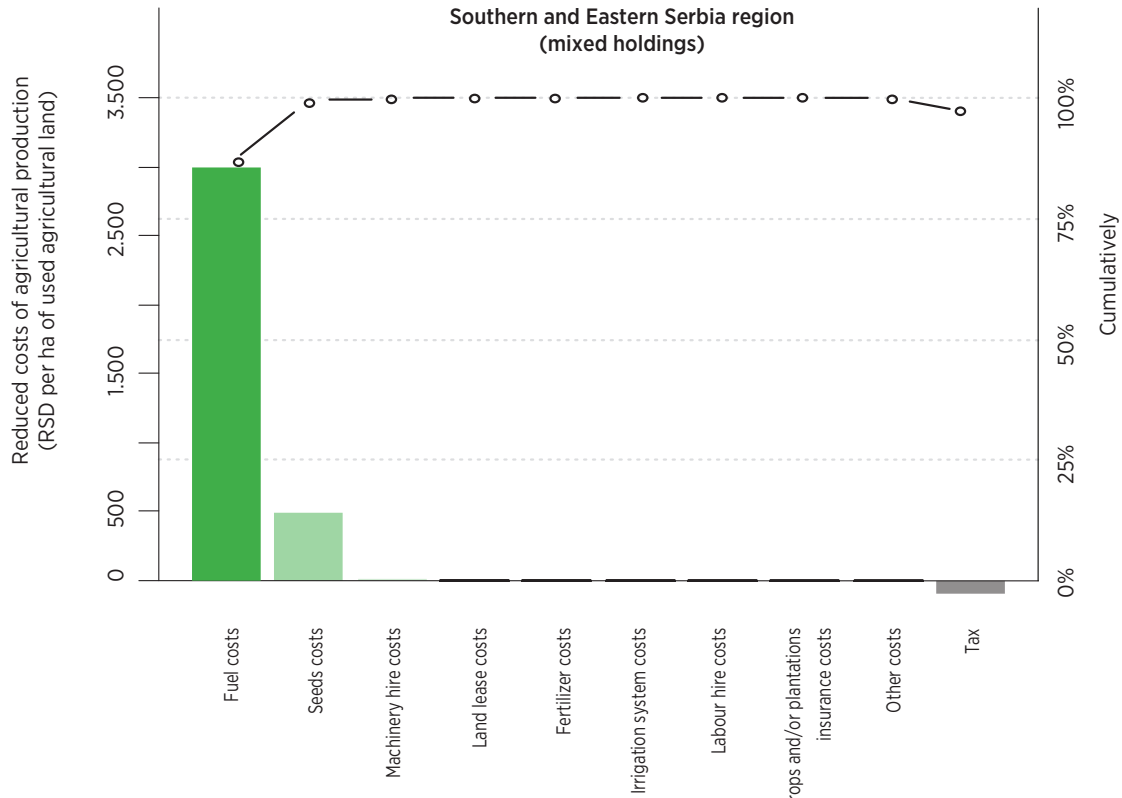


Source: Author's calculation

Graph 13. Potential reduction in reduced selected costs of agricultural production of specialist field crops holdings in the Vojvodina Region resulting from land consolidation

The stated data show that economic effect of land consolidation per hectare of used agricultural land, represented by the potential amount of reduction in the selected agricultural production costs amounts to RSD 4,197.98 for the specialist field crops holdings in the region of Vojvodina and RSD 3,404.24 for mixed holdings in the region of Southern and Eastern Serbia.





Source: Author's calculation

Graph 14. Potential reduction in reduced selected costs of agricultural production of mixed holdings in the Southern and Eastern Serbia Region resulting from land consolidation

Observed against the total costs of agricultural production, these savings amount to 4.66% for specialist field crops holdings in the region of Vojvodina and 3.35% for mixed holdings in the region of Southern and Eastern Serbia. Hereby we underline that presented savings primarily result from the grouping of agricultural estates and establishment of the new field road network.

In order to evaluate the effects of clearing as one of the most important interventions in implementing land consolidation in Central Serbia, we have evaluated potential economic effects on the cleared land in the example of mixed holdings in the region of Southern and Eastern Serbia.

Economic indicators	Region of Southern and Eastern Serbia (mixed holdings)
Owner income from leasing cleared land	
Average annual amount	17,473.97
Discounted cash flow (5 years)*	RSD 75,653.13
Discounted cash flow (10 years)*	RSD 134,929.33
Discounted cash flow (15 years)*	RSD 181,373.79
Profit from starting production on own cleared land2**	
Average annual amount	64,940.09
Discounted cash flow (5 years)*	RSD 281,156.63
Discounted cash flow (10 years)*	RSD 501,450.20
Discounted cash flow (15 years)*	RSD 674,055.98
Government revenues from taxes and excises***	
Average annual amount	11,310.37
Discounted cash flow (5 years)*	RSD 48,967.99
Discounted cash flow (10 years)*	RSD 87,335.69
Discounted cash flow (15 years)*	RSD 117,397.78

* Discount rate used in calculations amount to 5.00%.

** Profit calculation did not include opportunity costs of production resources in ownership of agricultural holdings (like for example opportunity costs of agricultural land).

*** The government revenues from taxes and excises (VAT on seeds, mineral fertilizers, etc) which will be used to start agricultural production on the cleared land).

Note: Economic effects under assumption that on cleared land structure of production will be in line with the production structure typical for the given region and type of holding.

Source: Author's calculation

Table 6. Potential economic effects on cleared land (RSD per ha)

The data shows that potential revenues of owner based on the cleared land lease for agricultural production in the region of Southern and Eastern Serbia total RSD 17,500 per hectare. The given amount does not include potential increase in revenues of the cleared land owner that could occur if the owner himself would engage in agricultural production on cleared land, but represents direct benefit of conversion of overgrown land into cleared land, that can generate revenue by leasing such land or potentially additionally increase it in case it is farmed by its owner.

State revenues from taxes and excises are estimated starting from the assumption that on cleared land production structure will be in line with the production structure typical for the respective region and holding type regardless of the fact whether the cleared land is being farmed by its owner or lessee. The estimated potential state revenues on these grounds amount to approx. RSD 11,300 per hectare of cleared land annually.

The term “state” in this context includes all levels of government, namely the Republic, autonomous province and local government. One should also bear in mind that effects of clearing can hardly be felt right after the completion of land consolidation, given that, depending on the manner of land use, it takes some time for the land to be prepared for agricultural production.

6.3.1 The effects of land consolidation on the household decisions and productivity

Majority of respondents have agreed that land consolidation did not affect the change in the manner of land use (86.5%). But if we compare this piece of data with the households from the control group where all respondents claimed that in the last three years the change did not occur, we may conclude that land consolidation still significantly contributed to changes in land use. Given the short time period, we failed to determine if land consolidation produced statistically relevant effect on the household decisions in regard to improvement and extension of production. The only relevant effect of land consolidation is reflected in introduction and extension of greenhouses. Still, this effect can not be attributed essential importance. After that the respondents were asked if land consolidation influenced changes in areas taken by orchards, vineyards, glasshouses, greenhouses, fish ponds and forests. The areas have mainly remained the same- more accurately, a rather small number of respondents indicated any change. Greenhouses were installed by 3.9% of respondents, which is the major change at the same time, however it also happened in the control group (2.1%). Only 3% of households undergoing land consolidation have started growing new crops, and the situation is quite similar in the control group as well (4.3%). Similar to this, land consolidation did not affect specialisation in growing certain crops- 92.6% households did not specialise, and the data is similar in the control group as well- 95.1%. Specialisation in production as a consequence of land consolidation occurred in 7.4% of cases, whereas 60% of respondents have stated that corn is one of the now most produced products. In case of the control group, 50% of respondents emphasised sunflower as a product with evident specialisation in production, but given the small number of respondents answering to this question in the control group, this piece of data is not much relevant.

Given the short time period and existence of numerous other factors it is not possible to undertake a detailed analysis of the land consolidation effects on technical efficiency, namely on the household productivity.

7. THE EFFECT OF LAND CONSOLIDATION ON THE LIVING STANDARD AND SOCIAL ASPECTS OF BENEFICIARIES' LIVES

7.1 Analytical framework of the analysis of the land consolidation effects on the standard and social aspects of beneficiaries' lives

The analysis of land consolidation effects on standard and social aspects of lives of beneficiaries encompassed several important dimensions demonstrating living standard, life conditions and relationships in the households participating in the land consolidation process, same as relationships in the immediate local community:

- Economic participation and employment of household members
- Household revenues and standard
- Exercising the right to social insurance
- Relationships in the household, including ownership relations, decision-making power and division of responsibilities in doing chores and care about the family
- Relationships in the local community.

The survey of the land consolidation effect on the living aspects of beneficiary households was conducted based on the two parallel axis:

- time- comparing situation before and after land consolidation:
- “experimental”- comparing situation in the sample of households participating in the land consolidation process against the situation in households not participating in the land consolidation process which can be regarded as “control” group; first are considered basic, and second control sample.

Evaluation of the land consolidation effects relies on two types of indicators: Those that are more of objective nature, namely those used to measure the facts related to the condition in relation to different aspects (for example, land size, employment status, etc) and those of more subjective nature, which imply the assessment of respondents on how land consolidation affects certain aspects of life (for example, whether relationships in the village have been improved or not).

One important remark should be taken into account when considering research findings in this aspect. Between the households participating in the land consolidation process and those not involved in such a process there are systematic differences in a series of aspects: living standard, ownership and family relations, division of responsibilities, etc. These differences, however, can not be attributed to land consolidation effects, at least not directly and in all listed aspects where these differences have proved to be significant. In major part, these differences are a consequence of differences in economic structure and economic strategies of the households, since the households in the control group are more distinctively agricultural households, more focusing on agricultural production, whereas the households participating in the land consolidation process compared to control group register higher employment in non-agricultural sector, which is why differences in the living standard and life conditions in the household may occur. In presenting the findings, it has been marked when the differences between the two groups of households are statistically relevant⁵⁹

7.2 The effect of land consolidation on economic activities and employment of household members

This chapter does not focus on economic effects of land consolidation in terms of changes in production, productivity, employment of household members. The analysis is more focused on economic strategies and social organisation of economic activities in households, with intention to explore effects on employment opportunities, same as on the potential changes in the decision-making patterns on different aspects of production at the holding.

As already mentioned in the foreword, households participating in the land consolidation process significantly differ according to economic structure in relation to the households not participating in this process. Amongst them, one fifth account for non-agricultural households, i.e. households not engaged in agricultural production at all, therefore land consolidation can not produce effects on the very organisation of economy in the household. Smaller portion of these households are mixed households, and major portion is taken by purely agricultural households (Table 7). Still, when observing economic strategies as a whole, among the households in the control group in total there are more households engaged in agriculture as basic or additional activity- 91.7% against 79.7%.

Household type	% in households	
	Participating in land consolidation	Not participating in land consolidation
Non-agricultural household	20.2	8.3
Mixed household	46.3	64.6
Agricultural household	33.4	27.1
Total	100	100

Source: Author's calculation based on the SeConS research

Table 7. Household type based on economic strategies

Among the households engaged in agriculture, in the control group more of them have declared to have a registered agricultural holding than it was the case among the households participating in the land consolidation process- 93.8% against 83.4%.

In both cases, in the households participating in the land consolidation process and those that are not (without statistically relevant differences) holders of holdings are predominantly male household members- in 80.5% of cases among the households from the basic and 86.5% among the households from the control sample.

According to estimation of respondents belonging to households participating in the land consolidation process, land consolidation did not affect changes in economic activities and employment of household members. An extremely low number of households reporting that under the effect of land consolidation they have started a new, non-agricultural activity, like food processing, rural tourism, etc. (1 household), started new individual business linked with agricultural production at holding (1 household), increased agricultural production as an additional activity, without leaving their basic jobs outside agriculture (2 households), left their employment outside agriculture so as to dedicate their time more to agricultural production (2 households).

When it comes to social organisation of economic activities at holding, the research has shown that decision-making about agricultural production is extremely centralised. Holder of the holding makes all decisions in relation to agricultural production in majority of cases, both in households from the basic and control samples (Table 8). In less than one fifth of households in both samples, there is certain decentralisation of decision-making on agricultural production, within which members of the holding have relatively autonomous power of decision-making, i.e. clearly defined responsibilities. In a rather small percentage a model was identified where along with the lead decision-making power of the holding holder, other household members do have responsibilities in some smaller domains of production. Situation is almost identical when it comes to decision-making on the production technology.

Who decides	On agricultural production		On production technology	
	Households with implemented land consolidation	Households from the control sample	Households with implemented land consolidation	Households from the control sample
Holding holder makes all decisions	55.9	71.9	58.7	78.1
One person makes all decisions, but is not a formal holding holder	8.4	5.2	7.0	4.2
Holding holder makes major decisions, but other members decide on smaller production areas	6.6	8.3	4.2	3.1
There is a clear division about who is deciding on what, no one is a leader but different members are in charge of different production types	18.2	3.1	17.5	3.1
Other	10.8	11.5	12.6	11.5
Total	100	100	100	100

Source: Author's calculation based on the SeConS research

Table 8. Participation in decision-making on agricultural production and production technology in the households in basic and control samples

In terms of women participation in decision-making about agricultural production participating in the land consolidation process in 34.5% of cases women do not participate at all in agricultural activities, and therefore do not decide on them either. In 39.1% of cases, they participate in agricultural activities only as supporting labour force at the holding, and in 26.3% of cases they manage and decide on certain activities. However, when asked on which activities those were, the answers received show traditional role of women in agriculture, so women most often decide on the garden and kitchen garden and flowers. Inclusion of women in decision-making is at the equally low level when it comes to deciding on the production technology. Among the control sample households centralisation of decision-making is even more pronounced, and only in 7.3% of cases women manage or decide on certain economic activities (most often on the garden and vegetable processing).

When it comes to the labour force at the holding, it is important to note that among certain households participating in the land consolidation process, labour hire has been increased, so 9.8% of households now employ more labour force than before land consolidation.

7.3 The effect of land consolidation on the household revenues and economic position

One of the important aspects of the research related to changes in structure and level of revenues in households and effect of land consolidation on such changes. Likewise, explored were the effects on economic position, i.e. living standard of households. It should be emphasised that living standard and different levels of revenues could not be examined in detail so instead, findings were presented deriving from the effort to measure the existence and basic orientation of land consolidation effects on revenues and living standard, with the levels of change being measures descriptively.

7.3.1 Changes in the revenue structure

Earnings from the sale of agricultural produce represented the most frequent revenue in the households participating in the land consolidation process, same as in the households from the control sample. During the reference period⁶⁰ there was a decline in the share of revenues from the sale of agricultural produce in the total revenue structure, with it still remaining the most represented source of revenues in the control group of households. In the group of households participating in the land consolidation process, the most frequent source of income was pension. Differences between the two groups of households are reflected in the frequency of state subsidies for agriculture, and this piece of data has once again confirmed that households from the control group more rely on agricultural production.

⁶⁰ For household participating in the land consolidation process this related to the period before and after land consolidation, and for the control group households this is the period three years prior to the research and in the course of research.

Revenue type	% of households generating given revenues			
	Households participating in the land consolidation process		Households not participating in the land consolidation process	
	Before land consolidation	After land consolidation	Three years preceding the research	At the time of research
Profit from the sale of agricultural produce produced at the holding	39.4	32.5	32.8	28.3
Earning from formal employment	14.7	12.9	15.8	13.5
Informal employment outside the holding	3.2	3.9	5.6	7.2
Governmental subsidies for agriculture	9.1	9.0	22.0	21.1
Land lease	2.5	3.2	1.7	2.2
Other property lease (house, machinery, etc)	0.2	0.2	4.0	8.1
Pension	27.6	34.3	16.4	16.1
Monetary social benefits	0.4	0.2	-	-
Interest, dividend revenue	0.2	0.2	-	-
Student scholarship	-	0.2	-	-
Financial aid from relatives or friends from abroad	1.8	2.1	-	3.1
Financial aid from relatives or friends from Serbia	0.9	1.3	1.7	0.4
Total	100	100	100	100

Izvor: obračun autora na osnovu istraživanja SeConS-a.

Tabela 9. Struktura prihoda domaćinstava iz osnovnog i kontrolnog uzorka u dva perioda poređenja

While the previous piece of data speaks about the frequency of revenues from certain sources in the total structure of household revenues of a particular type, other piece of data speaks about the share in total household revenues comprised by agriculture revenues. In households not participating in land consolidation, revenues from agriculture registered larger share in total household revenues than in the households participating in the land consolidation process. On average, revenues from agriculture comprise more than a half of the total revenues (54.2%) of households not participating in land consolidation, whereas the households participating in the land consolidation process registered on average a share of 45.9% in the total household revenues.

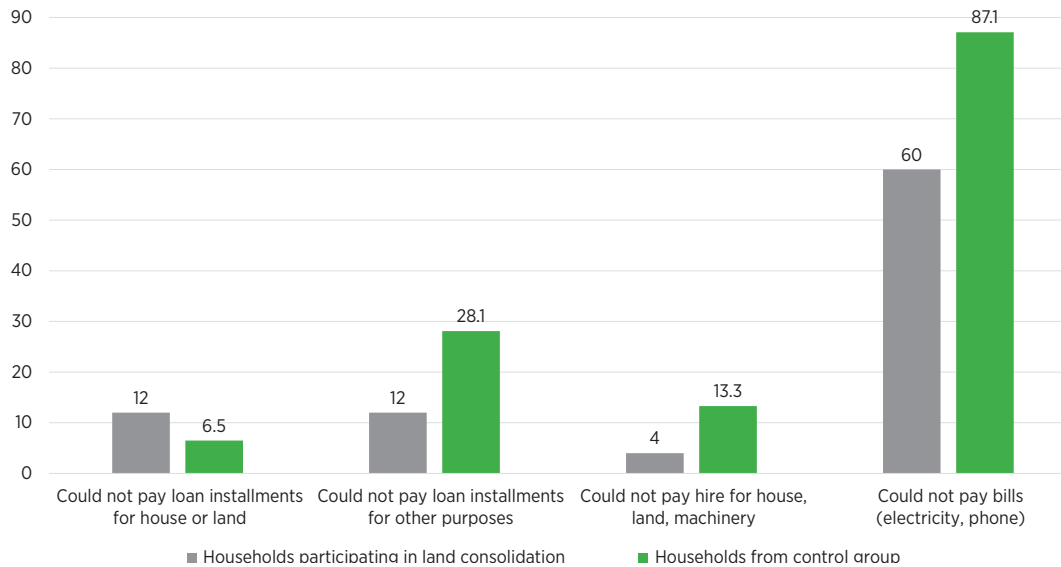
The respondents from the households participating in the land consolidation process were asked to estimate the increase in their household revenues in percentages under the influence of land consolidation and if so, to state

which revenues were actually increased. According to the respondents' reports, revenues were increased due to land consolidation only in 4% of cases and these all related to the revenues from sale of agricultural products. The respondents were asked to list the reasons why they thought their revenues were increased. Statistical analysis on the account of small number of cases is not impossible, however it may be noted that the following reasons were stated: land parcels are closer, implying reduced fuels costs and time needed to reach them, crops are grown in larger areas thus larger the yield, and greater demand for the products being produced.

At the same time, respondents from 6% of households claimed that total household revenues have decreased, and in all cases this concerned the decrease resulting from reduced revenues from the sale of agricultural products. However, this reduction was not brought in connection with the land consolidation process or effects.

7.3.2 Household living standard

Financial situation in the household, same as economic position, i.e. living standard, differ significantly between the two samples, with the households participating in the land consolidation process being in more favourable position than the households from the control group. Among the households from the first group, in the last 12 months 10.2% of households experienced financial difficulties due to which they were late in paying bills, settling debts, whereas in the control group such households accounted for more than one third (34.4%). Taking a closer look into the structure of the type outstanding debts, it can be noticed that this concerns in all categories major part of the households from the control group were facing difficulties in this respects, except in case of the house or land loans.



Source: Author's calculation based on the SeConS research

Graph 15. Share of households facing difficulties in settling debts/ paying bills

Respondents were asked to evaluate opportunities to cover their expenditures based on the existing household revenues. Table 10. shows that among the households participating in land consolidation there are less of those claiming to have problems in settling debts than among the households from the control group, with more of those finding it rather easy or very easy to settle their financial liabilities.

Ability to cover necessary expenditures	% households	
	participating in the land consolidation process	not participating in the land consolidation process
Very difficult	10.5	25.0
Difficult	22.0	14.6
With difficulties	47.4	49.0
Rather easy	11.8	7.3
Easy	7.3	4.2
Very easy	1.0	0
Ukupno	100	100

Source: Author's calculation based on the SeConS research

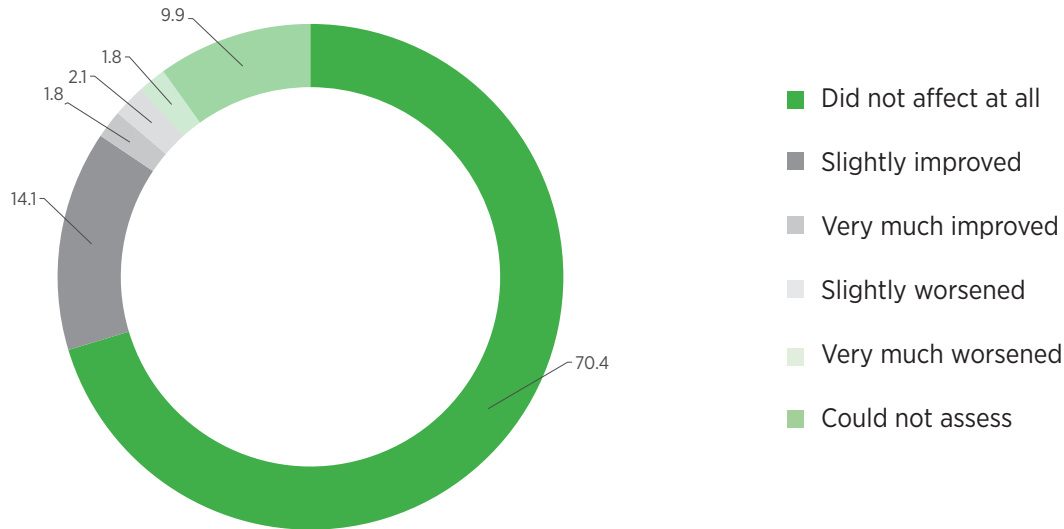
Table 10. Evaluation of possibilities for the household to settle necessary expenditures from current revenues

Respondents were asked to evaluate overall economic situation in their household compared to the reference period. For the majority of households participating in the land consolidation process (75%) economic situation remained the same, with the slightly higher share of those who have evaluated their situation as worse (13.6%) than those who have evaluated their situation as better (11.5%). In the control group estimations are significantly different, namely 40.7% claimed their situation to be worse, 42.7% that it remained the same and for 16.7% situation was better.

Economic situation	% households	
	participating in the land consolidation process	not participating in the land consolidation process
Much poorer	4.9	29.2
Slightly poorer	8.7	11.5
Same	75.0	42.7
Slightly better	9.4	14.6
Much better	2.1	2.1
Ukupno	100	100

Table 11. Economic situation of households in relation to the period before land consolidation for the households participating in the land consolidation process, compared to the period of three years ago for the control group

Respondents were asked to estimate the extent to which land consolidation process affected changes in economic position of households, and notable from the data presented in Graph 16, for majority of respondents land consolidation did not affect changes in economic position of the household, for 14% it had a slight positive effect, and for 1.8% it had a significant positive effect, for 2.1% it had a slight negative effect, whereas for 1.8% it had a strong negative effect (Graph 16).



Source: Author's calculation based on the SeConS research

Graph 16. How did land consolidation affect financial situation in your household?

When analysing data underlying the improvement of economic position of households following land consolidation, what may be noticed is that the most frequent reasons are related to the improved closeness of land and reduced fuel costs, enlarged land parcels and better soil quality, same as to improved and simpler organisation of production thus enabled.

Reason	% of households participating in the land consolidation process
Improved working engagement of household members	8.7
Enlarged and better land	13.0
Closer land, lesser fuel consumption	52.2
Better, simpler organisation	10.9
Greater demand, better yield	2.2
Reduced processing/ depreciation costs	2.2
Assistance in form of money from abroad	4.3
Other	6.5
Total	100

Source: Author's calculation based on the SeConS research

Table 12. Reasons underlying improved economic position of households after land consolidation

On the other hand, the most frequent reasons underlying negative effects of land consolidation on economic position of households imply distance and poor quality of received land, underdevelopment and poor soil quality.

Reason	% of households participating in the land consolidation process
Fuel, electricity, food price increase	14.3
Received remote and poor quality land	47.6
Arable land not developed, poor quality	28.6
Irregular, small revenues	4.8
Other	4.8
Total	100

Source: Author's calculation based on the SeConS research

Table 13. Reasons underlying worsened economic position of households after land consolidation

7.4 The effects of land consolidation on exercising of labour rights

The research findings do not imply any effects of land consolidation on exercising of labour-based social rights, i.e. payment of social benefits- health care and pension and disability insurance. There is a certain difference in the coverage of household members from the two samples by health insurance, however statistically irrelevant. In households participating in the land consolidation process, in 94.1% of cases all household members had secured health insurance, while the percentage of such households in the control sample amounted to 89.6%. Given the small number of cases stating that not all members of their household were covered by health insurance, quantitative analysis can not be conducted, but it may be stated that different reasons were mentioned like that it was too expensive for them to pay for this type of insurance, that they didn't want to pay for it, that they had to pay for medical checks and medicines just the same and they were unable to pay their social insurance debts, etc. According to the statements of respondents from households participating in the land consolidation process, it had no effect on exercising of rights to health insurance in 100% of cases.

All household members were covered by pension and disability insurance involved in agricultural production at holding in 79.9% of cases among the households participating in the land consolidation process, and in 77.1% of cases among the control group households. Differences in reasons due to which pension and disability insurance was not paid for members engaged in labour at holding among the households from the two groups stating not to have ensured pension and disability insurance for all members, are not statistically relevant. The following reasons were mentioned: lack of money, unemployment and similar, and in this case respondents from households participating in the land consolidation process stressed that it has not in any way affected payment of pension and disability insurance in 100% of cases.

7.5 The effect of land consolidation on household relations

Respondents most often live in small and medium-sized households (2- 5 members) in both samples. Differences in the structure of households from both samples, despite somewhat larger share of single households in the group of those who benefited from land consolidation are not statistically relevant. In the forthcoming chapters the effects of land consolidation to different household aspects were assessed: ownership relations, decision-making on household budget actually measuring relationships of power and division of chores.

Household type	% in households	
	participating in the land consolidation process	not participating in the land consolidation process
Single households	17.6	7.3
Small (2 members)	32.5	30.2
Medium (3-5 members)	39.5	49.0
Large (6 and more members)	10.4	13.5
Ukupno	100	100

Source: Author's calculation based on the SeConS research

Table 14. Household type by size

7.5.1 The effect of land consolidation on household ownership relations

The findings on the structure of ownership over land before land consolidation, immediately after land consolidation (30 days) and at the time of research indicate that it had slight positive effects on the ownership status of women, however also that such effects were not sustainable. As shown in Table 15, the share of land in ownership or co-ownership of women in total land of households from the sample was increased immediately after land consolidation. Prior to land consolidation total land area of households from the basic sample amounted to 1,651.2 ha, out of which 348.94 ha (21.1%) owned by women. After the implemented land consolidation, total land area in ownership of households from the basic sample amounted to 1,717.05 hectares of which 515 hectares (or 31.9%) owned by women. However, at the time of this research, total land area in ownership of households from the basic sample amounted to 1686.16 hectares of which 326.77 hectares (or 19.4%) owned by women. The total land area owned by the households was reduced, and especially was reduced the area of land owned by women. This shows that unless accompanied by other measures of support, economic empowering of women and incentives for them to engage in agriculture, positive effects of increased ownership over land in women are not sustainable. Although the share of land owned by women in total land was reduced since the period right after the land consolidation to date, land structure was improved since the ownership share of women in kitchen garden, arable lands and gardens, orchards, vineyards and even meadows was increased, while it was reduced in terms of pastures, unused agricultural land, forests and other land. In the control group of households, share of land areas owned by women was extremely low- amounting to only 7.1%.

Land type	%			
	Households with implemented land consolidation			Households not implementing land consolidation
	Before land consolidation	30 days after land consolidation	Today	
Kitchen garden	17.6	18.0	19.4	16.7
Arable land and gardens	23.9	22.7	25.0	14.9
Orchards	14.3	19.4	19.4	31.8
Vineyards	55.6	42.9	60.0	23.8
Meadows	19.4	23.8	21.0	14.8
Pastures	14.3	28.6	18.2	-
Unused agricultural land	37.5	35.3	33.3	33.3
Forests	20.4	18.2	15.2	20.6
Other land	14.3	20.0	18.2	-

Source: Author's calculation based on the SeConS research

Table 15. Change in the share of women among (co)owners of land, households participating in land consolidation and control households, by land type

The research also explored the effect on property relations in terms of ownership over land of younger people at holding (here the age limit was set at 40 in line with the category eligible for incentive measures aimed at younger farmers). Before land consolidation the share of areas (co)owned by younger people amounted only to 1.9%, immediately after land consolidation it was 1.8%, while nowadays it totals 2.4%. Among the households which have not undergone the land consolidation process, the share of land owned by younger people in total land area owned by these households was significantly higher and amounted to 17.5%.

Property relations were explored also through ownership over other real estates, and moveable property as well, primarily over means for production. The extreme majority of households in both subsamples live in a house owned by a household member. Only 1% live in the house given to them for use without any compensation, and 0.3% rent residential space. Women are (co)owners of residential space in which the household lives in 22% of cases in the sample of households participating in the land consolidation process, whereas in case of control households this share is lower and totals 16.3%.

Women are owners of cars in 16.5% of cases in the households that have benefited from land consolidation, and in 13.8% in households from the control sample, however this difference is statistically not relevant.

7.5.2 Decision-making on the household budget

Relationships in the household were examined using decision-making on the household budget. Such decision-making has proved to be a good indicator of the power relations in the household and family⁶¹. The research findings about the effects of land consolidation show that in households from both samples household budget management practices were organised around centralised budgets, with the system being significantly more present in the control sample households. This finding is not surprising, given that in households participating in the land consolidation process employment outside the holding was higher, therefore the autonomy of the employed household members in managing one part of the budget is somewhat higher.

Household type	% in households	
	participating in the land consolidation process	not participating in the land consolidation process
Earnings of all members go to joint account	69.0	90.5
Part of earnings of all members goes to joint account, other part kept by the members for themselves	19.2	3.2
Everybody keeps their money, there is an agreement as who is paying for what	9.1	6.3
Other	2.8	0
Total	100	100

Source: Author's calculation based on the SeConS research

Table 16. Households as per the manner of household budget management

When it comes to deciding on everyday spending, what is obvious is this role is most often played by men in both samples. A joint decision-making model is more frequent in households participating in the land consolidation process, but the pattern is mostly the same, dominant role is played by male household members.

Household type	% in households	
	participating in the land consolidation process	not participating in the land consolidation process
Man	41.9	41.7
Woman	20.4	29.1
Man and woman together or more woman and man together	36.7	27.1
Other	1.0	2.1
Total	100	100

Source: Author's calculation based on the SeConS research

Table 17. Who in the household is allocating money for everyday spending most often?

Still, in terms of strategic management of funds, when larger investments are being decided on, differences become important between the households in both samples. In households which have undergone the land consolidation process, joint decision-making represents a predominant decision-making model, whereas in households from the control group decisive power still rests on the male household members.

Household type	% in households	
	participating in the land consolidation process	not participating in the land consolidation process
Man	39.7	57.9
Woman	14.1	6.3
Man and woman together or more woman and man together	45.2	35.8
Other	1.1	0
Ukupno	100	100

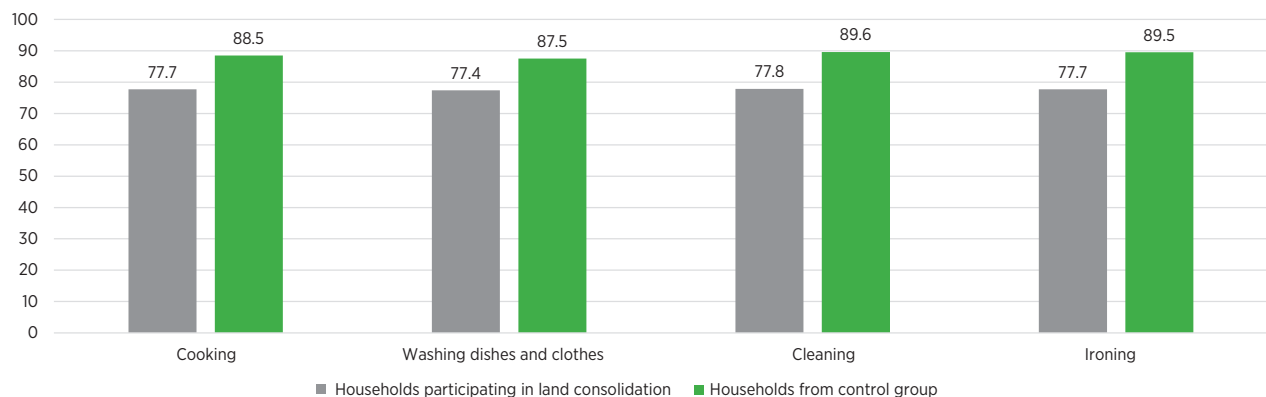
Izvor: obračun autora na osnovu istraživanja SeConS-a.

Table 18. Who has the final saying in strategic decision-making on spending?

Respondents were asked to estimate if land consolidation had affected changes in the decision-making on the household budget and with no exception they have estimated that land consolidation had no impact on this type of relations.

7.5.3 Distribution of responsibilities in the household

Division of chores and care about children, the elderly and chronic patients in the household is an indicator of distribution of responsibilities. Numerous researches of this aspect in Serbia have shown that domestic labour is predominantly the responsibility of women and in that respect households from both samples do not lag behind the average picture in Serbia. Differences among them are reflected in the extent to which women are taking the exclusive responsibility for these obligations, since in the households participating in land consolidation process there was a slightly smaller share of households where women predominantly perform the said chores than in the control sample households. Still, even in this group majority is comprised by households where chores represent predominantly the sphere of women labour.



Source: Author's calculation based on the SeConS research

Graph 17. Share of households where women predominantly do the listed chores

In terms of care of children, the elderly and chronic patients, the research findings show that men are slightly more included in the care of the elderly, with the care of small children, school duties and chronic patients primarily representing the responsibility of women. In the extremely high number of cases (98.6%) respondents claimed that land consolidation did not affect redistribution of chores.

7.6 The effect of land consolidation on social relations in the local community

The survey of social effects of land consolidation also encompassed relationships in the immediate local community. These effects are affected by expectations preceding the process. According to the research findings, 64.8% of respondents had positive attitude towards land consolidation, while 7.7% had negative attitude, and 27.5% had no attitude at all. Judging based on the responses of the respondents, land consolidation in the sample environments did not raise major resistance. Majority of respondents (61.1%) claimed there was no resistance in their community towards land consolidation, whereas 29.9% claimed there was some resistance, and 9% that there was major

resistance. Resistance was most often exercised by land owners (in 92.3% of cases), representatives of local authorities (in 2.6% of cases), representatives of companies (in 1.7% of cases), representatives of cooperatives (2.6%) and others (0.9%).

Based on the experience with land consolidation process, 41.5% of respondents estimated it was fairly implemented in their environment, 21.1% claimed it was not fairly implemented, while 37.3% were not able to make an estimation. The most frequently stated reason for the opinion that land consolidation was not fairly implemented was unfair land reallocation inflicting damage to certain households (57.4%), then corruption, protection (36.2%) and other reasons (6.4%).

Village population satisfaction by the results of land consolidation is not uniform. Respondents were most often unable to assess the extent of village population satisfaction by the land consolidation results (34.9%), while 35.8% claimed that village population was predominantly satisfied, and 20.4% claimed that the village was primarily dissatisfied by the land consolidation process and results.

Majority of respondents estimated land consolidation did not affect relationships in the village (73.1%), with the share of those evaluating that relationships in the village have worsened due to land consolidation exceeds by far the share of those who considered relationships in the village improved owing to land consolidation (23.8% to 3.1%).

7.7 Evaluation of land consolidation effects on living standards and social aspects

Having in mind the presented research findings, land consolidation effects on the living standard and social aspects of households are extremely low. In small number of households improved financial situation in the household and living standards is brought into connection with the land consolidation effects. This connection is primarily visible in better organisation of production due to closer, better connected, higher quality land, larger surfaces producing greater yields and reduced costs brought about by better closeness of land. On the other hand, negative effects of land consolidation did not subside, however they have hit only a small number of households. These negative effects were recognised through receipt of low quality, neglected land.

Land consolidation had the potential to economically empower women by increasing their ownership over land. Unfortunately, in conditions of other unfavourable factors relevant as incentives for women to engage in agricultural production and make the land serve their economic empowerment, positive effect of land consolidation was not sustainable.

This is probably the reason why land consolidation did not bring about more significant changes in social relationships within households in terms of a more equitable division of chores and unpaid domestic labour on one side, and more equitable decision-making on agricultural production and production technology on the other. Differences in these aspects noticed among the households participating in the land consolidation process and those that did not, primarily stem from different structure of economic activities and economic strategies of households. Namely, control sample households were more agricultural households, with lower level of their members' employment in non-agricultural sectors, more centralised decision-making and more traditional relationships in the household.

8. OTHER EFFECTS OF LAND CONSOLIDATION

8.1 The effects of land consolidation on infrastructure

From the measure designed as a tool to ensure enlargement of agricultural estates aimed at more efficient agricultural production, land consolidation is ever more often becoming a measure expected to resolve some of the vital infrastructure problems in the land consolidation area. Design, i.e. construction of field road and canal networks are nowadays considered classical activities implemented in relation to land consolidation. A novelty becoming more and more noticeable is the use of land consolidation to meet other infrastructure needs of the local community. This primarily refers to irrigation systems, landfills, village graveyards, playgrounds, but industrial zones as well.

The aspect of land consolidation especially suitable for infrastructure construction is a possibility to resolve ownership and legal relations through land consolidation over the land necessary for construction of such infrastructure, without engaging in land expropriation procedure. The advantages of resolving ownership relations via land via land consolidation compared to expropriation, are also reflected both in duration and cost of the procedure. Namely, the experience has shown that duration of land consolidation, from passing the decision on initiating land consolidation to vesting owners into property, may be shorter than two years. Duration of the expropriation procedure costs, on the other side, may take significantly longer than that, especially in case of appellate procedure followed by court proceedings, often accompanying expropriation. In relation to ensuring funding, when the needs for land acquisition for its construction are moderate, the land may be secured by applying certain level of reduction for common facilities. Even when it is not possible to secure land for particular purposes, or when it is not justified, through reduction for common needs (for example, for industrial zone establishment) it is still possible to secure land through land consolidation without deploying additional financial resources, by grouping land in public ownership, namely through reallocation of the land consolidation mass so as to ensure that the land suitable for the industrial zone construction would be allocated to public sector, instead of some other land which will be reallocated to land consolidation participants holding corresponding rights over the land suitable for infrastructure equipment.

Respondents from the areas where land consolidation was conducted, as a result of the land consolidation process most often indicate development of field roads. Namely, 62% of respondents recognised this activity as a consequence of land consolidation. However, in the control group, over 80% of respondents have indicated that roads were developed in the past three years, therefore the conclusions on the relevance of the land consolidation effect could not be made.

In addition to clearing, construction of landfills was singled out as a change evidently happening under the influence of land consolidation, since these changes did not occur in places where land consolidation did not happen. In regard to other activities that are to contribute to improved agricultural production, like windbreaks and hydromelioration interventions, respondents did not indicate they were implemented during the land consolidation process or owing to it.

8.2 The effects of land consolidation on the environment

The claim that land consolidation did not produce any effect on the environment was reported by the majority of respondents (85.7%), however the number of households reporting positive effects on land consolidation on the environment is not negligible (12%). As positive effects listed were the construction of landfill (landfill was constructed in Pluzina) and construction of field roads, reducing fuel costs and air pollution. On the other hand, in those municipalities where landfill was not constructed (Opovo, Radujevac, Vlaško polje), it appears as main criticism for the land consolidation not contributing to positive environmental effect.

The fuel cost reduction, in addition to the distance of estates from the farmstead and distance between the estates themselves, is affected by the quality of field roads. Their construction and development by means of land consolidation contributes to mitigated adverse effects of agricultural production on the environment.

The land consolidation process also includes design, and sometimes construction, of windbreaks, i.e. buffer zones. In this way land is significantly being protected from wind erosion, and also the conditions are being ensured for life of a number of plant and animal species whose survival in large agricultural land areas would not be possible without such buffer zones. The installation of windbreaks and buffer zones helps achieve reduced wind speed, scope of wind erosion and evaporation intensity, thus positively affecting soil and air humidity, so these zones also represent an anti-drought measure. In addition, buffer zones represent an instrument for protection from sand storms and snow deposits.

In the light of the climate change we have witnessed over the past decades, integrated real estate cadastre data and other geospatial data open a possibility of fast and precise response in the case of natural disasters and weather conditions, aimed at protection of human lives and nature and the environment, individual protected natural resources and cultural and historical resources. This is one more benefit of land consolidation often being neglected.

Implementation of land consolidation, preceded by the land consolidation programme elaboration, makes an excellent opportunity to, while planning the use of a compact area, apply a detailed environmental impact analysis, which is a practice not yet being sufficiently often implemented. So the land consolidation programme may be assigned a role of one of the important documents for protection and improvement of environmental situation, by taking into account the needs to preserve the beauty and character of landscapes, linking areas of special ecological importance and for biodiversity conservation, protection of natural land and water, prevention of wind erosion, etc.

In terms of adverse effects of the land consolidation implementation on the environment, in practice of execution of works on the canal networks it has been noticed that excavated soil is being left along the road, on arable fields or that is simply spread out in a 20 cm- layer across the surrounding fields, thus reducing fertility of such soil.

8.3 Overview of land consolidation costs and benefits

In the previous part of the analysis, many arguments were presented on the multiple and important benefits of land consolidation, along with the encompassed key costs that are not negligible. Here we will summarise key elements of land consolidation costs and benefits, as a basis for decision-making on the cost-effectiveness of its implementation.

First we will summarise findings in connection to direct costs of land consolidation that could have been quantified. As a remainder, median value of a single land consolidation project implementation is around RSD 62 million. For the continuation of this analysis even more important is the piece of data on the land consolidation costs per hectare of consolidated mass, amounting to RSD 40,000 (weighted average), or RSD 35,000 which is the median value we consider to be most relevant and that is why it will be used in the follow-up. On the benefits side, in the previous part of the analysis we have calculated savings of approx. RSD 4,100 per hectare of consolidated land in Vojvodina, or RSD 3,313 in Central Serbia, only based on the savings resulting from geodetic and technical works and field road network development.

In situations encompassing major clearing works in scope of the land consolidation process, land consolidation costs per hectare of consolidated land are higher. Clearing costs per hectare of cleared land vary significantly, however for the needs of this analysis they were estimated at RSD 180,000. The benefit generated by clearing for the cleared land owner amounts to RSD 11,300 per hectare annually; in addition, increased revenues collected by the public sector based on agricultural production on cleared land now being used amount to approx. RSD 17,500 annually. In total, the benefit for the public sector and land owner amounts to around RSD 28,800 per hectare of cleared land annually, not taking into account the opportunity for increased revenues enabled by the land clearing to owners willing to farm that land themselves.

The next benefit of land consolidation implementation concerns registration of ownership rights over the land within land consolidation. Benefits of registration of ownership rights over land for which without land consolidation, due to unresolved property and legal relations, would not be possible, is very hard to estimate since it depends on the interest of the land users to sell it, i.e. to use it as a collateral or in some other way implying that corresponding right over the real estate has been recorded in the real estate cadastre. Another benefit for the land owners based on the recording of property rights free of any costs at the same time create savings based on the expenditures they would otherwise have in performing such registration through the usual procedure (hiring a lawyer, notary public fee, administrative fees for registration of rights, property transfer tax, etc).

What has been identified, but not calculated in terms of land consolidation benefits

1. Benefits of land consolidation brought about to large agricultural systems have not been adequately reflected in the analysis, given that the survey included agricultural holdings only. On the other side, large agricultural systems are the first ones, and often the only ones, to use the full potential of systems constructed owing to land consolidation, like irrigation systems. Likewise, design and construction of field roads of greater width compared to the roads entered into land consolidation much more contributes to large production systems in the position to hire machinery requiring greater road width.

2. The available data did not provide a basis to determine statistically important correlation between land consolidation and improved productivity of agricultural land, apart from individual findings on the somewhat more intensive production methods (existence of greenhouses) in areas participating in the land consolidation process. These results would have probably been more striking if our sample has included a larger number of land consolidation areas where land consolidation process was completed sufficiently long ago so as to allow the effects of land consolidation to first of all materialise, and then for them to be identified by the land consolidation participants. However, earlier literature covering this topic in Serbia has already provided some indications about the relevance of land consolidation. So Đikić (2016) while discussing major compression of soil in headlands due to turning of machinery showing that such soil compression before the harvest in headlands is higher by 34% compared to the inner part of the parcel, thus leading to reduced yield in headlands between 32.7% and 48.7% (average at 38.7%) . Land consolidation, namely land enlargement, makes an optimum way to reduce the area of headlands in the total land areas.
3. Benefits from the increased land value are enjoyed both by owners of such land, and based on the increased revenues from the property tax. The benefit for land owners on these grounds could not be calculated, given that we did not have reliable data on the sales/lease price of land in the land consolidation area, before and after land consolidation. Calculation of benefits for the public sector based on the increased value of land would involve even more difficulties. Namely, liabilities based on the property tax for agricultural land depend on the so called average price of agricultural land in a particular zone. On one side, we have a number of local government units not collecting tax on agricultural land at all, i.e. they didn't before the land consolidation, thus making comparison with the situation after the land consolidation impossible. Apart from this, average land prices are determined for the zones which most often overlap with area where land consolidation was implemented. Consequently, trends in the level of liabilities based on the property tax in the land consolidation area may result from changes in the market concerning the land outside the land consolidation area.
4. The benefit of resolution of property and legal relations through land consolidation is practically unmeasurable, especially having in mind that in land consolidation property rights may be determined based on the evidence that would not otherwise be accepted as suitable for registration of rights in the real estate cadastre applying the regular procedure.
5. In areas with larger volume of the state-owned agricultural land through land consolidation procedure significant land areas are being identified the use of which was not registered in the records, namely that which was occupied by persons not paying any compensation for the use of such land.
6. Construction of irrigation system through land consolidation, in addition to effects on agricultural land productivity, significantly reduces costs for farmers who now do not have to dig wells, but instead connect to the so called manholes. On the other hand, connecting to such manholes enables the appropriate fee to be paid for the use of water, which is practically not applied in the case of well water use.
7. Avoiding costs incurred by machinery trespassing other people's fields due to lacking access to public road.

8. Increased revenues of agricultural households at risk from poverty owing to reduced production costs, increased soil productivity and time savings that can be used to generate additional income affects mitigating pressure on the social welfare system.
9. Increased free time resulting from reduced time of transport from the farmstead to the estate.
10. Environmental benefits resulting from mitigated pollution owing to lesser fuel consumption and formation of windbreaks providing habitat to a number of animal and plant species and thus positively affecting biodiversity.
11. Benefit for the public sector stemming from the updated real estate cadastre is multiple. Harmonisation of data in the real estate cadastre facilitates public authorities to maintain larger number of procedures delivered based on the cadastre data. Expropriation procedures and assessment of property tax liabilities are just some of such examples.
12. Land consolidation implementation represents an excellent basis for development of detailed urban development plans for the part of the land consolidation area where the land was designated as construction land, inter alia, due to development of geodetic records in digital form, thus significantly facilitating urban planning.
13. Benefit for the development of local democracy due to the effect of land consolidation as a catalyst for civic participation in the decision-making processes at the local government unit level.

What has been identified, but not calculated in terms of land consolidation costs

1. Losses based on the land area reduction for common needs;
2. Unimplemented investments in agricultural land due to excessively long duration of the land consolidation process since its launch to vesting participants into property, i.e. registration of corresponding rights in the real estate cadastre;
3. Missed public sector revenues based on exemption of land consolidation participants from paying fees, compensations and assessed taxes on property transfer in relation to registration of rights over real estates in the land consolidation area.
4. The cost of time to inform land consolidation participants on the plans underlying land consolidation implementation, provision of information to authorities participating in the land consolidation implementation and contractors, same as providing proposals for decision-making and participation in disputes arising based on the decisions passed in scope of land consolidation process delivery.
5. The cost of time on the side of authorities engaged in the land consolidation implementation.

9. CONCLUSION AND RECOMMENDATIONS

Should the public sector invest more into land consolidation?

We deem that the findings of this analysis demonstrate that **public sector investments into land consolidation implementation are necessary and justified**. They are needed given that the fragmentation level and structure of agriculture land based on the size of parcels and estates, as such representing a barrier to more efficient agricultural production and competitiveness of Serbian agriculture in international market. As for the justification, our position is that the land consolidation effect on the reduced costs of land consolidation participants and increased public sector revenues justify typical levels of public sector investments into land consolidation. Particularly important is that land consolidation is especially producing benefits for the segments of our population at risk of poverty- these are rural, and quite often elderly, households. In that respect, land consolidation costs encompass an important social component. Development component of land consolidation is especially visible in benefits enjoyed by large agricultural systems, which particularly benefit from the canal network development, but also from irrigation, and extension of field roads allowing access to parcels to larger and modern machinery.

However, the **evaluation of justification of investments in the land consolidation implementation is not unconditional**. Situations in which land consolidation lasts longer than 10 years without any prospects of its successful completion any time soon, with the well-exceeded budget and pronounced dissatisfaction of the participants, are not rare. This does not mean that funds earmarked for the land consolidation implementation need to be reduced. Just the contrary: public sector should ensure, even before the launch of land consolidation, sources for its full implementation, otherwise land consolidation process should not be initiated at all.

Division of shares in financing land consolidation between different government levels (the Republic, autonomous province and local government) should be the subject of agreement to be reached at least in the mid-term. In doing so, both the Republic and the autonomous province should consider the possibility of participating with an even larger share in the land consolidation financing, however such funding would need to include setting standard costs of individual works in scope of land consolidation, and conditioned by compliance with deadlines and efficient implementation of land consolidation by the local government unit as investor. In the follow-up an overview of potential measures is provided, to be considered so as to implement land consolidation processes faster, with lower costs and more visible effect.

Legal framework for land consolidation implementation

As demonstrated by the previous analysis, legal framework for land consolidation implementation in Serbia is characterised by extreme sub-norming. This leads to land consolidation stakeholders being quite often feeling as left on their own, without legal security for their actions, but just the contrary- that sub-norming is actually the source of high risk in actions of state authorities and other actors in the land consolidation process. **This is why much more detailed regulation of land consolidation by law should be considered- by elaborating the existing provisions of the Law on Agricultural Land or by adopting a new law to regulate this area more completely**. It is especially important to develop procedural norms, including the procedure of vesting land participants into property, then actions of the commission in passing the decisions on the land consolidation mass reallocation with encumbrances on real estates, the manner of presenting interests of the participants (which can be done by

setting forth compulsory establishment of the Board of Land Consolidation Participants), and consider introducing a mechanism to ensure accountability of the commission for the results of the land consolidation implementation. In parallel with a more detailed regulation of land consolidation by legal norms, work should be launched on drafting of innovated bylaws to regulate with the sufficient level of detail and by referring to adequate technological standards, actions in different segments of land consolidation implementation. Increasing reliance on the specialised applicative software in implementing land consolidation, primarily by contractors for geodetic and technical works, significantly facilitates certain activities, but it also opens the need to systemically regulate this area. Especially notable is lagging of the bylaws content behind the progress made in the use of information technologies. This leads to the situation that some of the softwares being used generate output documents in different formats, and their content is not standardised. This is why regulatory framework at the bylaw level needs to be modernised so as to define the form and content of documents included in the land consolidation survey study. It is especially important to enable all participants in the land consolidation procedure (both on the side of public and private sector) having such need, to access appropriate software tools allowing them to work with documents created in scope of land consolidation.

Strategic management of the land consolidation implementation

It is not easy to reach key data on the land consolidation procedure implementation in Serbia. This comes as no surprise, having in mind fragmentation of competences for the land consolidation process implementation, based on the different levels of government (local government, territorial autonomy and the Republic), and different authorities (Ministry of Agriculture, Forestry and Water Management, Republic Geodetic Authority). A positive circumstance is that each of these authorities do have certain data available. **What needs to be improved is availability of such data and the manner of its use.** In the situation where it is hard to say how far did the implementation of certain land consolidation procedures get, and even harder to say what the effects of implemented procedures are, it is practically impossible to evaluate the success of individual land consolidation procedures and the role of implementers of such procedures.

All authorities participating in the land consolidation costs funding have, or should have, interest to almost in real time have the following information available:

- Implementation status of the land consolidation procedure they are supporting, and which is ongoing, including data on deployment of financial resources,
- Effects of the land consolidation procedure implementation.

First step in this direction would be to establish **a competent body for collection and processing of data on the effects of land consolidation procedures.** This body could be the State Land Consolidation Commission, and hereby we propose to consider its introduction, or the ministry in charge of agriculture. All participants in the land consolidation process would be obliged to forward the data set in advance to this body. Apart from this, such commission could be competent for the following:

- To compile a proposed mid-term plan for the land consolidation implementation;
- To make proposal of the bylaws to be passed;
- To draft annual report on the land consolidation implementation;

- To monitor efficiency of the stakeholder work in the land consolidation procedures, and especially of municipal land consolidation commissions, to indicate to founders of such bodies when the work of individual land consolidation commissions needs to be improved and to make proposals to competent authorities for delivery of measures aimed at improvement of the land consolidation implementation;
- To answer the questions of municipal land consolidation commissions;
- To ensure training of the commission members and other actors in the land consolidation process;
- To inform the public about the relevance of the land consolidation procedure implementation.

Second, equally important step, implies **definition of indicators and objectives in the land consolidation programme preparation phase**. The role of such indicators is twofold at least: on one side, performance indicators represent one more source of information for deciding on which land consolidation programmes and to what extent are to be supported by budget funds; on the other, these indicators make irreplaceable instrument for monitoring and evaluation of land consolidation effects, or performance of each individual programme.

Enhancing monitoring of the land consolidation results would be significantly improved if certain **applicative software as support in the land consolidation process management** would be used, and its introduction has already been proposed earlier. Its use would be obligatory for all participants in the land consolidation process. This software could enable access to relevant data on the land consolidation implementation updated almost in real time.

Finally, we consider it justified to submit on each ongoing land consolidation procedure **annual report to the body responsible for the land consolidation monitoring, same as to submit a final report following the completion of the land consolidation procedure**. Such reports should be publicly published, so as to allow all stakeholders and the general public, participating through budget funds in financing of land consolidation projects, to get familiar with the course of the project implementation and their results.

The decision-making calendar on ensuring support to local government units for land consolidation implementation

One of the major problems in regard to land consolidation implementation pertains to non-harmonisation between the decision-making calendar on the support to local government units for the land consolidation implementation, which is why local government units, as investors in the land consolidation process, fail to conclude contracts with the contractors in due time. This creates significant waste of time and dissipation of energy at the very onset of the land consolidation implementation. However, overcoming this problem should only be the first step on the way to redefine the system of support provision to municipalities in these procedures. Our position is that the **possibility of introducing the mid-term land consolidation programmes should be considered, based on which local government units would know in advance the extent of funds they would have available during the entire land consolidation process delivery**. In addition, also to be considered is introduction of the criteria for deciding on the award of funds so as to ensure support for those activities in scope of land consolidation providing best results, given the level of invested funds. Moreover, **it should be considered to give advantage in provision of funds of the Republic and autonomous province to those projects where the readiness of the land consolidation participants to contribute with their own funds to its implementation was proven**.

Composition and role of the Land Consolidation Commission

As previously stated, municipal Land Consolidation Commission is a key body for the implementation of land consolidation. Stakeholders in land consolidation look up to these commissions when the success in implementing land consolidation needs to be explained, but also when they seek causes to major unjustified delays and other significant problems in the land consolidation implementation. Commitment of the commission members to the tasks related to land consolidation given that many of them have other working assignments, is a red thread cross-cutting almost all considerations on the efficiency of the land consolidation implementation in concrete cases. Land consolidation stakeholders indicate the need for certain level of professionalisation of municipal land consolidation commissions. Although we consider that such professionalisation can hardly be made possible, we still reckon that the **professionalisation concept sets forth several potential directions for potential improvement of the municipal land consolidation commissions' operation:**

- Greater reliance on the land consolidation commission members to whom such work is the only or basic work engagement;
- Engagement of the commission members in different land consolidation projects, but in a way which will not lead to them being overburdened by workload which would negatively affect the commission efficiency;
- Obligatory delivery of adequate training of appointed commission members, they should be prevented from joining the work of the commission without it.

Although the said measures would not principally lead to professionalisation of the commission, we think they would bring about certain specialisation, namely, raising the level of competence of the commission members, which would by all means affect success of projects implemented by the so trained commission members.

A separate issue in relation to the members of municipal land consolidation commissions concerns the potential implied conflict of interest inherent in the commission members, or negative motivation implied in the system of compensations for the membership with the commission. Namely, keeping the compensation for the commission work was in certain cases recognised as motive underlying significantly longer duration of procedures than objectively needed. In relation to this, a possibility should be considered to differently contractually agree on the compensation for the commission work, by disbursing the defined portion agreed in advance after the land consolidation procedure has been successfully completed.

Preparation for the land consolidation procedure implementation

With the purpose to identify participants in the land consolidation process, it is of great importance **to resolve as a priority all second-instance proceedings in the real estate cadastre maintenance.** The same reason underlies the need for **priority resolution of all requests before the Restitution Agency, concerning the land consolidation area, but also all property related disputes.** All court decisions and all decisions on restitution are enforceable after land consolidation, however its subsequent enforcement diminishes the relevance of land consolidation in regard to enlargement of estates. It would be optimal to finalise all these tasks in the phase of factual situation determination.

Land consolidation procedure implementation

Twofold competence of the Land Consolidation Commission and real estate cadastre service in the land consolidation area and their parallel work during the land consolidation implementation has, in practice to date, proved to be an approach which should be changed so as to simplify the procedure. The proposal is to, **with the onset of the Land Consolidation Commission work, assign all competences for the changes over the real estates to the Land Consolidation Commission until the effective decisions on the land consolidation mass reallocation had been passed.** The Minutes of the Land Consolidation Commission on determination of factual situation should be recognised before other authorities as a proof of ownership over the real estate. After adoption of the decision on the real estate mass reallocation and acceptance of the land consolidation study, the proposal is to simultaneously receive the database of cadastral records and pass the decision on the real estate cadastre update based on the commission data, when further competence for the maintenance of the survey and real estate cadastre is transferred to the Republic Geodetic Authority- local real estate cadastre service.

The experience from the past years has shown that during the execution of geodetic and technical works there are critical points when the contractor is in need of expert support of supervision. One of the problems is harmonisation of the cadastral municipality borders with the neighbouring cadastral municipalities where survey in stereographic projection is in force. Likewise, problems arise in determining construction area borders and in harmonisation with municipal decisions not implemented in the cadastral records. It also happens that during the execution of works municipality adopts the decision changing the borders of the construction area to be recorded through the survey study.

In practice supervision over the execution of geodetic and technical works is demonstrated as a need for harmonisation of the supervision positions, especially in situations when expert supervision in different phases of works execution is performed by different representatives of the Republic Geodetic Authority. Due to these reasons, **ongoing consultation mechanisms should be established between the land consolidation commission, geodetic and technical works contractors and RGA so as to identify potential problems in the land consolidation implementation in due time and address them with the participation of all stakeholders.**

Appellate procedure and land consolidation

The number of appeals lodged to the decisions on vesting into property is considered to be moderate and it shows that the land consolidation participants are generally satisfied with the outcome of these processes, same as that through communication between the land communication actors (municipal commissions and contractors of geodetic and technical works on one side, and land owners on the other) large number of administrative disputes and potential later court proceedings is being successfully avoided. However, appeals filed to the municipal commission decisions significantly delay successful completion of the land consolidation procedure. In order to additionally improve situation in this respect, it is needed to:

- **Pay additional attention to communication with participants in the land consolidation process,** starting from the initial phases of the procedure, so as to constructively manage their expectations and detect potential resistance as early as possible, while they still can be taken into account;

- Present as clearly as possible the reasons underlying making decisions presented to the participants, with a focus on the retained or increased value of the estate, compromises other participants were obliged to accept, while pointing out usual outcomes of the proceedings initiated at the request of dissatisfied land consolidation participants, that are most often not favourable for the complainants;
- **Strengthen capacities of the Ministry of Agriculture, Water Management and Forestry to decide upon appeals in the shortest possible period of time.**

Registration of rights over real estates

Registration of ownership rights following the adoption of the decisions on the land consolidation mass reallocation, i.e. update of the real estate cadastre based on the land consolidation data marks the final phase of the land consolidation survey, requiring engagement of professional staff, technical equipment, financial resources and patience of the right holder in relation to the official time period for preparation and implementation of the data presentation procedure on the real estates and related rights.

A special challenge in implementing land consolidation is that land consolidation participants often consider land consolidation completed by passing of the decision on the land consolidation mass reallocation, and not by registration in the real estate cadastre records, when the entire procedure actually finishes. This challenge is even more pronounced when similar position is shared by the local government, especially keeping in mind the role of municipalities in the final stage of land consolidation. Namely, financing of land consolidation is entirely borne by the local government, including financing of the work of the Commission for presentation of real estate data. On the other hand, decision on the establishment of the commission is passed by the Republic Geodetic Authority. Such a relationship between the local government unit and cadastre has proven to be one of the bottlenecks in implementing land consolidation- in terms of human resources, finance and duration of these procedures. This is yet another reason why the results of municipalities in implementing land consolidation, including this final phase, should be one of the criteria in deciding on allocating funds as support to land consolidation implementation.

The practice has shown that following completion of land consolidation, the real estate data presentation procedure lasts unjustifiably long, despite the fact that decisions on land consolidation mass reallocation lay grounds for registration in the real estate cadastre and automatic take-over of the commission data in the real estate cadastre is acceptable. In reality, in the real estate cadastre certain number of changes is introduced after the launch of land consolidation, and it also happens that different changes are introduced over the same real estates, one in the real estate cadastre and a different one before the Land Consolidation Commission. This parallel work of the two institutions opens space for abuse and error, that needs to be legally regulated. A long process of the real estate cadastre establishment after land consolidation disables parcel owners to freely dispose with their property and exercise their rights, they are entitled to, before other authorities, with the title deed being necessary for such procedure, like excerpt from the real estate cadastre database. Apart from time, financial moment should also be of relevance when thinking about land consolidation and real estate cadastre. It is desirable to exclude the unnecessary financing of the Commission for real estate cadastre data presentation and related rights following the work of the Land Consolidation Commission. Since the decisions on the land consolidation mass reallocation make the grounds for registration in the real estate cadastre, i.e. that the real estate cadastre is being updated based real estate cadastre data, practically same data is being presented twice, first time by means of decision on the land consolidation mass reallocation, and second by means of the real estate cadastre data presentation.

Since local government is competent for financing of the entire land consolidation (ending by registration in the real estate cadastre), it means that financing of the Commission for the real estate cadastre data presentation is also borne by the local government.

After the decision on the land consolidation mass reallocation, life goes on in the land consolidation area, land is being sold or bought, inheritance proceedings are being resolved, etc. The longer the period from the moment of adoption of effective decisions on the land consolidation mass reallocation to the onset of the real estate cadastre data presentation and the real estate cadastre update procedure, the greater the number of changes on the real estates in the land consolidation area, therefore the Commission for the real estate cadastre presentation data enters the survey maintenance procedure, which additionally delays the moment for the real estate cadastre update.

The experience has shown that there is a need to, after adoption of effective decisions on the land consolidation mass reallocation, in parallel with the receipt of the land consolidation study, receive cadastral records of the real estate cadastre, meaning that the registration of rights could be done automatically, without additional presentation of real estate data and related rights, given that the decisions on the land consolidation mass reallocation do create basis for registration in the real estate cadastre. Such a change in the real estate update methodology requires certain preconditions.

First, it is necessary to abolish parallel competence in the land consolidation area: **of the local real estate cadastre on the real estate cadastre maintenance and Land Consolidation Commission on the implementation of the land consolidation process. The entire competence for the implementation of changes in the land consolidation area, up until adoption of effective decisions on the land consolidation mass reallocation should be assigned to the Land Consolidation Commission, while after the acceptance of the land consolidation study and real estate cadastre update, competence for the real estate cadastre maintenance would be resumed by the local cadastre.**

Second, **it is necessary for the Land Consolidation Commission to define registration of encumbrances taken from the real estate cadastre (situation before the land consolidation), in relation to real estates after land consolidation, meaning that the decision on the land consolidation mass reallocation needs to contain all necessary data for registration in the real estate cadastre, including the data on the type of land, type of ownership and encumbrances.**

The most used possibility is to pass a decision implying that land consolidation area includes the entire cadastral municipality, and conduct the survey of the construction area through survey of factual situation in the land consolidation area included in the decisions on the land consolidation mass reallocation. If it were adopted for the real estate cadastre update to be performed by automatic take-over of data from the decision on the land consolidation mass reallocation, without additional presentation of the real estate data, and if the decisions on the land consolidation mass reallocation would include the entire construction area, this would mean significant acceleration of the procedure.

To that end, it should be considered that **by the launch of land consolidation all competences in terms of real estates in the land consolidation area are assigned to the Land Consolidation Commission up until adoption of effective decisions on the land consolidation mass reallocation.** By simultaneous adoption of the decision on the land consolidation mass reallocation, the data is entered in the cadastral records of the real estate cadastre, coming into force simultaneously with the land consolidation study reception.

As of this date, further competence for the maintenance of survey and real estate cadastre is transferred to the Republic Geodetic Authority-Real Estate Cadastre Service. Since the Republic Geodetic Authority is competent for the receipt of the study and real estate cadastre, and that according to the Rulebook on the Job Classification at the Republic Geodetic Authority both are under the competence of organisational unit responsible for supervision, there are no obstacles to shorten this procedure, however it would require harmonisation of legislation with such a proposal.

Popularisation of land consolidation as a measure with multiple positive impacts on the territory and the society

Taking into account the importance of land consolidation as an instrument for development of rural areas and agriculture, with effects on the land owners as participants in the land consolidation process, local government and society as a whole, **it is needed to invest more energy and resources in popularisation of this agrarian policy measure.** Ministry of Agriculture, Forestry and Water Management- Directorate of Agricultural Land, Provincial Secretariat for Agriculture, Water Management and Forestry and Republic Geodetic Authority, as institutions in charge of monitoring of the land consolidation implementation as the state survey area whose implementation is in the interest of the state, measures aimed at development of rural areas and agriculture should not be the only ones to promote the relevance of land consolidation. Land consolidation should be redefined as a task of national importance, and then raise necessary resources so as to treat it as such. This includes focus on informing and education, and then provision of expert support to local government and contractors in the land consolidation process. Only after that shall we obtain a system capable to absorb additional financial resources that need to be allocated for land consolidation as use them in an optimal manner.

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