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## Identification of stagnation reasons in the field of land consolidation in Slovakia compared with the Czech Republic

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### Abstract

Causes of different evolution of land consolidation in the Czech Republic (CR) and Slovakia (SR) are documented and analyzed. Land fragmentation, methodical guidelines, legislative measures, financing and implementation of land consolidation projects are compared. Extensive, broad, complex land consolidation (LC) brings direct and indirect economic, environmental, social and landscape benefits for land owners and communities alike. It is a planning and development tool that is crucial for regional development. Authors focus on success of LC projects (measured by numbers of accepted projects relative to the country size) and their historical backgrounds in both neighbouring countries. Comprehensive land consolidation (CLC) and simple land consolidation (SLC) are examined. Approach to LC is similar in both countries. Demand for solving certain problems (e.g. land fragmentation, ownership fragmentation) is higher in Slovakia. Comprehensive land consolidation projects were initiated earlier in Slovakia than in the Czech Republic. But the current situation is significantly worse in Slovakia than in the Czech Republic. Risk of promoting particular interests resulting in an environment with disrupted dynamics of land consolidation is mentioned. Slovakia has a chance to change current dismal situation in the field of land consolidation only with the support of landowners.

**Key words:** *benefits of land consolidation, comprehensive and simple projects, land fragmentation, land ownership*

### INTRODUCTION

Statistics indicate that the average number of co-owners in Slovakia is 11.11 per one plot of agricultural land, the average number of plots per one owner is 20.59 [URBAN *et al.* 2012]. These numbers are critically high and unacceptable for a long term perspective (mainly for the economic development). This has a negative impact on rational, economic and flexible usage of agricultural land in accordance with environmental protection. Land consolidation (LC) represents an effective tool for establishing better conditions for sustainable management of plots and ad-

ressing issues in the landscape. In general, the main definitions present LC as a great tool for solving property organization (land use, ownership and other rights) and special physical planning (roads, landscape, soil erosion). Main benefit of LC is redistribution of land in order to remove fragmentation [HARTVIGSEN 2015], but modern LC goals reach far beyond these activities. Experts differentiate LC into a narrow sense (simple land consolidation, SLC) and a broader sense (comprehensive land consolidation or complex land consolidation, CLC). Both types of LC can be done in a simple or sophisticated way depending on the technical implementation standards and the

desired outcome [THOMAS 2006]. SLC is mainly focused on consolidating property rights. According to LISEC *et al.* [2014] LC's main goal is to improve the structure of plots. Additionally, LC supports owners of plots by building new roads and other infrastructure as well. Benefits of CLC can be divided into economic, environmental, social and environmental [ZHENG FENG, BAIMING 2003].

MAASIKAMÄE, JÜRGENSON [2014] state, that LC can be used for increasing competitiveness in agricultural and forest production. Land market development is a significant factor for land consolidation [SAL-LAKU *et al.* 2010]. Interesting is the statement of THOMAS [2006], that LC is one of the most important tools for solving structural problems in the field of agriculture and agricultural production. LC is important, because extreme fragmentation of landholdings has significant implications for sustainable agricultural development and for the quality of life many smallholders. LC should be also viewed as a tool to promote the primary production of food staples, improve working conditions in agriculture and the living conditions of people living in rural areas.

If LC is implemented in a comprehensive way, it could support environmental protection and natural resource management. The fragmentation of natural ecosystems has been recognized as one of the major causes of the decline of biodiversity, the others being wind and water erosion, and the lowering of the water table [LISEC, PINTAR 2005].

JÜRGENSON *et al.* [2010] state, that LC is a perfect tool for realization of rural development, based on clear ownership. LC can minimize the inequality between rural and town environment according to PAŠAKARNIS *et al.* [2013]. This may be true if LC solves questions coupled with agricultural production, housing, employment, health care, environment for life and cultural opportunities, etc.

LC offers benefits in terms of protection and creation of life environment, soil protection, water management and ecological stability of the area [PRAŽAN, DUMBROVSKÝ 2010]. LC projects are an excellent instrument to implement rural development projects with multiple purposes and goals. LC can also visually improve the value of the country. LC can support the management of existing, or addition of new, structural elements in the landscape which are significant in both the ecological and visual value [HEHL-LANGE 2001].

Multifunctional (comprehensive) LC projects are currently preferred in both countries, the Slovak Republic (SR) and in the Czech Republic (CR) [DUMBROVSKÝ 2004; MUCHOVÁ, ANTAL 2013].

## RESEARCH QUESTION

Statistical values for fragmentation of land ownership are compared in this paper. Differences in historical evolution of Slovak Republic (SR) and in the Czech Republic (CR) are highlighted. Numbers of pending and completed LC are presented for the years

from 1991 to 2015. Values are compared and the success (measured by numbers of accepted projects relative to the country size) of LC projects is evaluated in both countries. What are the causes of different evolution of land consolidation in CR and SR when the approach to LC is similar in both countries?

## HISTORICAL CONTEXT

A milestone in the common history of the two countries SR and CR occurred in the second half of the nineteenth century. Serfdom in the Austrian Empire was abolished in 1848. The so called "Urbar" patent was declared in 1853 [ŠTEFANOVIČ 2010], "Urbar" relationship to lords was completely cancelled. Former serfs have become the owners of self-used plots. Ownership brought also severe financial difficulties. Indebtedness of farmers arose and there was a widespread division of parcels. Different ownership rights in Austria/CR (inheritance by single heir, mostly the eldest male sibling, the Austrian Civil Code from the year 1811) and in Hungary/SR (usually equal inheritance by all siblings, Hungarian Customary law) [HUDECOVÁ 2014] led to different fragmentation. Land fragmentation in Slovakia, due to inheritance, is significantly higher than in the CR (Tab. 1).

**Table 1.** Comparison of ownership state in Slovak Republic (SR) and Czech Republic (CR)

Object of comparison	SR	CR
Number of ownership relations	97.95 mil.	10.15 mil.
Average number of co-owners per plot	11.11	1.59
Average area of each plot	0.56 ha	0.34 ha
Number of plots	8.82 mil.	22.95 mil.
Number of plot owners	4.18 mil.	6.69 mil.
Number of property rights	4.40 mil.	6.09 mil.
Number of cadastral territories	3 559	13 026
Area of the country	49 036 km <sup>2</sup>	78 867 km <sup>2</sup>

Source: own elaboration based on data of Geodesy, Cartography and Cadastre Authority of Slovak Republic, Czech Office for Surveying, Mapping and Cadastre.

Political regime change and the onset of collectivization in the fifties of the 20th century, gave LC a completely different meaning, namely to be a tool for fast introduction of large-scale production agriculture in the former Czechoslovakia (CR and SR). Agricultural cooperatives have been created, landowners' rights restricted, private farming and family farms abolished [HUDECOVÁ 2014]. Barriers (plot boundaries) were ploughed as dictated by the new organization of territory in the form of economic and technical land adjustments. Transitions and roads between fields were removed and new conditions for large scale land management created [URBAN *et al.* 2012].

Figure 1 shows a typical current land registry map with big agricultural land blocks covering many small plots. The individual plots are at present predominantly inaccessible, water and wind erosion is increasing, and the ecological stability of landscape and biodiversity is deteriorating.

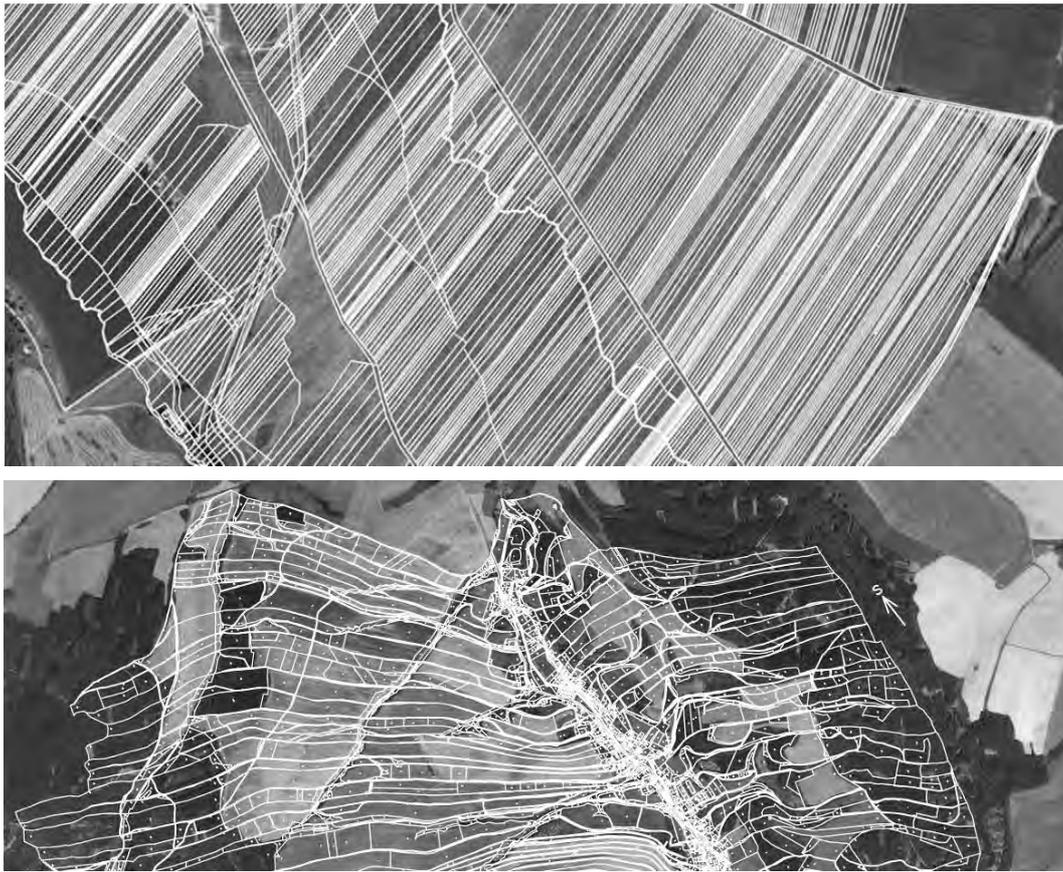


Fig. 1. Samples of ownership relations (plot boundaries) on orthophoto maps (1:10 000) for Slovakia (top panel) and Czech Republic (bottom panel); source: own graphical elaboration based on data of Geodesy, Cartography and Cadastre Authority of Slovak Republic, Czech Office for Surveying, Mapping and Cadastre

After 1991, historical land ownership distortions began to be rectified by new land consolidations, in accordance with legislation (Act. No. 330/1991 Coll. in Slovakia and Act. No. 139/2002 Coll. in the Czech Republic).

## MATERIAL AND METHODS

Statistical data on land ownership/fragmentation/LC came from the Ministry of agriculture and rural development of Slovakia and the Czech cadastral and geodetic office.

Compensations due to different size of both countries can be calculated by two methods with the de facto same result.

1. Weighting coefficient for SR can be defined as the ratio of areas occupied by agricultural land in the CR and Slovakia ( $42156 \text{ km}^2/23970 \text{ km}^2$ ). Numbers of projects in Slovakia are to be multiplied by the calculated coefficient (1.76).
2. Average area of cadastral territory in Slovakia and the CR is a ratio of the country size to the number of cadastral territories. Average cadastral area (c.a.) in Slovakia has 1377 ha and 604 ha in the CR. Sums of areas of average c. a. in hectares are displayed on the Y-axis in Fig. 2, 3, 4 and 5. These numbers represent values for complete or initiated LC in a particular year. This correction of

the calculation takes into account the fact that the average area of c. a. in Slovakia is more than double than in the CR. In other words, two projects of LC in CR correspond to the size of approximately one LC project in Slovakia.

Comprehensive (CLC) and simple (SLC) land consolidations are evaluated separately as mentioned above.

## RESULTS

Table 1 shows that both countries are similar, but for the number of ownerships and the average number of co-owners per plot. These numbers clearly illustrate the difference in the concept of Austrian and Hungarian inheritance law. For Slovakia this means an enormous fragmentation of land ownership that is still growing. On average, 65% more plots in Slovakia have about ten times more co-ownership relations. One plot in Slovakia has on average seven times greater numbers of co-owners.

## COMPREHENSIVE LAND CONSOLIDATION

Statistical summaries of completed and started CLC projects from 1991 until 2015 are shown in Fig. 2 and 3.

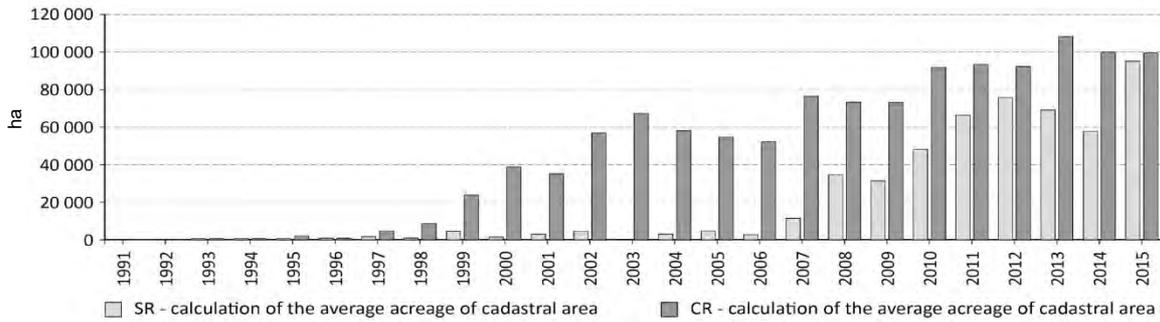


Fig. 2. Representation of comprehensive land consolidation (CLC) completion related to the average area of cadastral area; source: on elaboration based on raw data: Geodesy, Cartography and Cadastre Authority of Slovak Republic; Czech Office for Surveying, Mapping and Cadastre

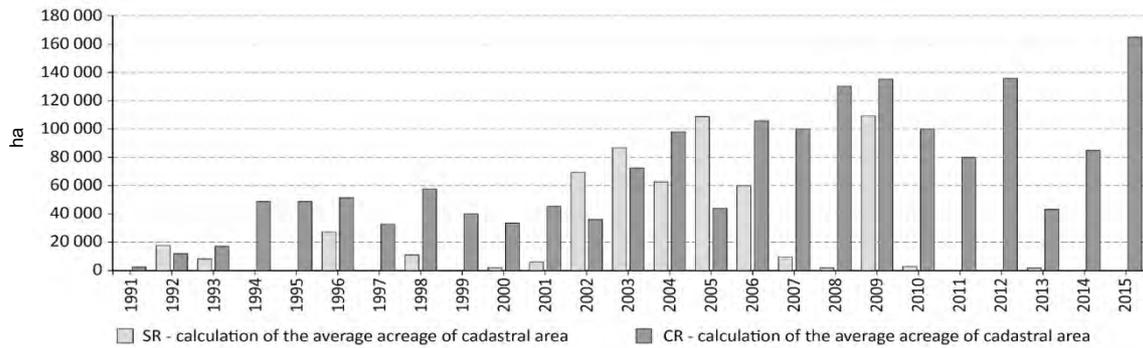


Fig. 3. Representation of comprehensive land consolidation (CLC) initiation related to the average area of cadastral area; source: on elaboration based on raw data: Geodesy, Cartography and Cadastre Authority of Slovak Republic; Czech Office for Surveying, Mapping and Cadastre

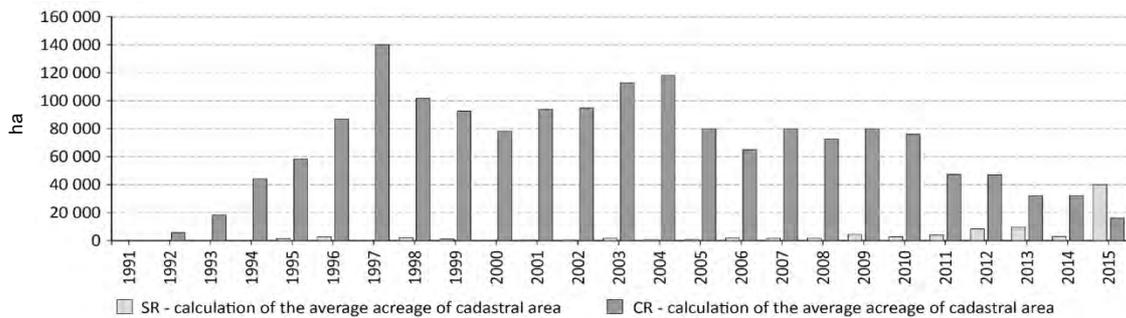


Fig. 4. Representation of simple land consolidation (SLC) completion related to the average area of cadastral area; source: on elaboration based on raw data: Geodesy, Cartography and Cadastre Authority of Slovak Republic; Czech Office for Surveying, Mapping and Cadastre

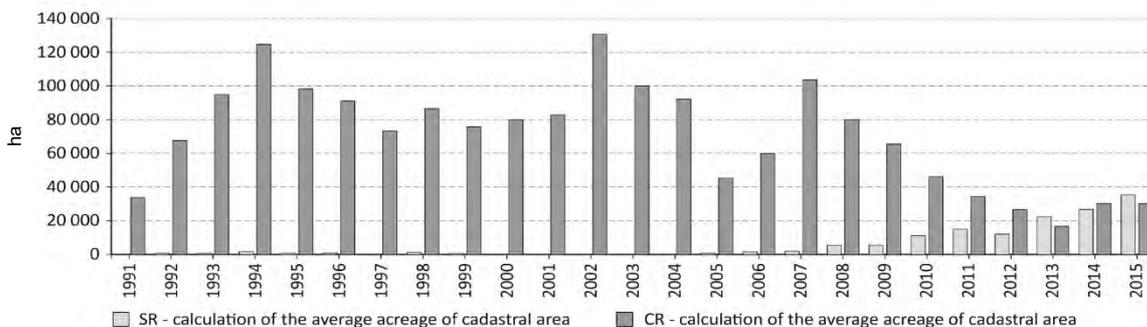


Fig. 5. Representation of simple land consolidation (SLC) initiation related to the average area of cadastral area; source: on elaboration based on raw data: Geodesy, Cartography and Cadastre Authority of Slovak Republic; Czech Office for Surveying, Mapping and Cadastre

From Fig. 2 and Tab. 2, it can be seen that in Slovakia there is more or less gradual increase of projects registration in the Land Register. This is a result of initiating projects especially in the early years of the SAPARD (Special Assistance Programme for Agriculture and Rural Development) funds until 2008. Project duration is about 6–7 years. Long-term stagnation of LC projects until 2007 was caused by difficulties in the early stages of projects (high ownership fragmentation as shown in Tab. 1) and also by the gradual creation of LC methodologies. Procedures related to the geodetic activities (surveying and cadastral works) were issued in 2000 (KEMÉNY *et al.* [2000], updated VANEK *et al.* [2008]) and procedures for projecting activities (water management, erosion control, communications and environmental analysis and proposals) in 2001 (GEISSE *et al.* [2001], updated MUCHOVÁ *et al.* [2009]). LC projects in the CR have been started in much larger quantities since 1998. This is presumably caused by financial reinsurance activities associated with LC and related creation of methodologies. The first, “Provisional methodological guidelines for comprehensive land consolidation“, was issued in 1995 (DUMBROVSKÝ [1995], updated DUMBROVSKÝ, MEZERA [2000]; DUMBROVSKÝ *et al.* 2004]). Figure 3 shows the detailed statistics for started LC. Data for the SR is modified by area coefficient.

**Table 2.** Success of comprehensive land consolidation (CLC) projects in Slovak Republic (SR) and Czech Republic (CR) – until 31.12.2015

Slovak Republic – state of LC			Czech Republic – state of CLC		
completed (number)	initiated (number)	% of the SR area covered by approved projects	completed (number)	initiated (number)	% of the CR area covered by approved projects
370	156	12	2001	586	20
426			2587		

Source: own elaboration based on data of Geodesy, Cartography and Cadastre Authority of Slovak Republic, Czech Office for Surveying, Mapping and Cadastre.

Fig. 3 indicates that numbers of started CLC in the CR do not vary much. Projects were initiated regularly with the notable exception of the year 2013 (creation of State Land Office). On the contrary, projects in Slovakia were initiated very unevenly by public tenders. The main reasons can be seen in the EU funding cycles, political priorities, deformed business environment (enormous predominance of demand over supply), distortion of prices, obstructions at tender evaluations etc.

In the early years from the 1992 in Slovakia (Fig. 3), projects were initiated with the hope of a successful completion on the basis of a new law on LC. Around two projects were started for each district. In 1993, based on the concept of land ownership arrangements, the majority of projects reached the stage of the initial state registry (ISR). In the period of 1991–1995, ISR methodology was abandoned due to

the huge fragmentation of ownership (Tab. 1 and Fig. 2) by a political decision of the government. Based on the Slovak Act no. 180/1995 Coll. as amended, in each cadastral area, registry of renewed land registration (RRLR) must be implemented prior to an LC project. RRLR documents the registration of ownership relations and ensures that all parcels are registered on ownership titles (section C or E).

Only 12 of the 52 early projects have been completed after a considerable time delay. More complex projects were initiated in the years 1996–2003 mainly in ecologically disturbed areas (High Tatras and Žiar-ska basin) [VAŠEK 2014]. From 2002 (on the basis of the EU SAPARD programme, followed by the Sectoral Operational Programme and the Rural Development Plan) many projects have been started, even more than in the CR. (Please, note that the data is modified with weighting coefficients, in respect to the area of both countries.)

Unfortunately, there are also some years when no projects were initiated in Slovakia. Land consolidations have been moved into the background due to high-level decisions about their political (un)importance. There were also other problems with the transparency and effectiveness of implementing proposed measures, public tenders etc. This resulted in simplification activities and cost reduction proposals for the sake of “accelerating” the processes since 2010. New processing technologies and price list were proposed. However, even these activities have not brought recovery to LC in Slovakia.

High numbers of started and completed SLC can be documented for the CR since 1991, Fig. 4 and 5 since 1991. This trend begins to change towards the end of the observed period (since about 2010), with a continuous increase in initiating of CLC. SLC in the CR dealt mostly with accuracy and reconstruction of land registry and other specific needs of a small area (access to plots, erosion or flood protection). Considerable experience from a high number of completed SLC shows that the Czech rural country needs complex solutions. SLC subsequently requires CLC. Thus, over the years, numbers of started and completed CLC increase (Fig. 2 and 3). Act no. 139/2002 Coll., bases LC projects on CLC with SLC as their simplification/precursor. It can be stated that the CR managed to maintain an increasing trend of LC since 1991 (Fig. 2 and 3), which is not visibly affected by significant methodological and political turbulence.

### SIMPLE LAND CONSOLIDATION

The overall status of completed and initiated SLC in the CR and Slovakia are illustrated in Figures 4 and 5. High numbers of started and finished SLC projects can be documented in the CR (Fig. 4 and 5). Over the years, there were observable fluctuations and the numbers show gradual decline (roughly from 2010). CLC projects have been gaining support in the CR since. Fig. 4 and 5 show an upward trend for started

(since about 2005) and completed SLC projects (around 2008) in Slovakia. Legislation in the SR from 2014 (amendment to Act no. 330/1991 Coll.) provides greater scope for the application of SLC and it is expected that in the coming years, initiating of SLC will grow. The Fig. 4 and 5 document gradual growth of SLC in Slovakia. Investors, developers and businesses related to land management realize that LC is currently the only way, within the framework of the current legislation (besides the expropriation), to acquire/manage land property and open an area for investment activities. SLC projects in Slovakia do not have methodological cover, yet. The truth is that CLC represents a better, general solution to the problems of the country. Main benefit of SLC is higher speed due to smaller scale. SLC in Slovakia are financed by the investor, thus less dependent on public funding (and politics, partially), but a warning against oversimplification at the expense of the landscape and purposeless “solutions” has to be issued.

**Table 3.** Success of simple land consolidation (SLC) projects in Slovak Republic (SR) and Czech Republic (CR) – until 31.12.2015

Slovak Republic – state of SLC			Czech Republic – state of SLC		
com- pleted	initiat- ed	% of the SR area covered by approved projects	com- pleted	initiat- ed	% of the CR area covered by approved projects
number			number		
63	46	3	2 773	141	22
109			2 914		

Source: own elaboration based on data of Geodesy, Cartography and Cadastre Authority of Slovak Republic, Czech Office for Surveying, Mapping and Cadastre.

## DISCUSSION

One would expect that in Slovakia, with a much greater fragmentation of land ownership, efforts to address it using LC would be increasing. Unfortunately, it is the opposite, while in the CR it is a gradual, continuous process. LC takes place irregularly in Slovakia, probably due to the changes in political priorities/interests. LC projects and their implementation are influenced, co-managed and in the case of CLC dependent on public administration and government so the unfortunate situation could have been addressed given an adequate political will.

It is necessary to renew land market to allocate purchased shares of land in Slovakia [URBAN *et al.* 2012]. In the first place, it is necessary to consolidate land ownership for simplification and clarification of rights. Especially the situation in Slovakia requires CLC projects with meaningful and transparent solutions for implementation of proposed measures. The fact that proposed measures are not implemented after the registration of LC project into the Land Registry undermines the credibility of the entire process.

The Czech Republic does not have such a numerous and complicated ownership relations as Slovakia,

but property rights and land fragmentation must be dealt with also. Long term experience gained from the considerable amount of completed SLC (covering specific areas) is further used in CLC. The number of initiated and completed CLC is increasing and the dynamics is gaining momentum. Construction activities are addressed within CLC. It is interesting that after large scale SLC activities in the CR, they have begun to prefer complex solutions and the number of CLC starts to exceed the SLC. Early stage of “great enthusiasm” for SLC can be observed in Slovakia, although it is clear that it is only a workaround for an emergency with the notion rather something than nothing at all.

Right choice of the future projects for LC in both states is very important in terms of social needs/regional development, market requirements, investment demand and gaining support for resolving (ecological) issues in the landscape [MUCHOVÁ, PETROVIČ 2010].

Ultimate beneficiaries of fully implemented LC projects are communities and inhabitants (many of them landowners) of the particular area. Informed landowners could exert enough pressure to decouple LC dynamics from the political one in Slovakia in particular.

## CONCLUSIONS

Plight in the design and implementation of land consolidation (LC) in Slovakia may result in attempts to overcome stagnation at the expense of landscape. Call for greater efficiency (simplification/“cheapening” and speeding up) can result in oversimplification (purposeless “solutions”), dissipation of opportunities (regional development, dealing with environmental problems, landscape conservation and restoration, prevention of adverse events) and resources. There is no need to go far for the lessons. Extensive experience from the Czech Republic (CR) is available. They identified, after a great numbers of simple LC projects, need for comprehensive projects that currently dominate in the CR. After overcoming organizational and methodological issues in Slovakia, comprehensive LC (CLC) projects have been stopped (2010) by a political decision with a pressure for the simple ones. State and public administration controls LC projects on both sides of the common border including commissioning and acceptance of projects, i.e. also has the responsibility. Significant methodological and political turbulence is also common for both countries but the CR managed to maintain an increasing trend of LC (since 1991). Based on the available data, unfortunately, it must be concluded that the disrupted dynamics of LC in Slovakia is probably caused by promoting particular interests (political priorities) that influence funding, distort prices, deform business environment, and obstruct public tenders and projects.

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### Przyczyny stagnacji konsolidacji gruntów w Słowacji i Republice Czeskiej

#### STRESZCZENIE

W pracy udokumentowano i przeanalizowano przyczyny odmiennego rozwoju konsolidacji gruntów w Republice Czeskiej i Słowacji. Porównano fragmentację ziemi, wskazania metodyczne, środki prawne, finansowanie i wdrażanie projektów konsolidacji gruntów. Ekstensywna, szeroka i złożona konsolidacja gruntów przynosi bezpośrednie i pośrednie korzyści ekonomiczne, środowiskowe, społeczne i krajobrazowe, zarówno właścicielom ziemi, jak i społecznościom. Jest narzędziem planowania i rozwoju istotnym dla rozwoju regionalnego. Autorzy skupili się na sukcesie projektów konsolidacji gruntów (mierzonym liczbą zaakceptowanych projektów w stosunku do powierzchni kraju) i na ich historycznym tle w obu sąsiadujących państwach. Badano całościową i prostą konsolidację gruntów. Podejście do konsolidacji jest podobne w obu krajach. W Słowacji istnieje większa potrzeba rozwiązywania pewnych problemów (np. fragmentacja ziemi, rozdrobnienie własnościowe). Projekty całościowej konsolidacji gruntów powstały wcześniej w Słowacji niż w Republice Czeskiej, ale obecna sytuacja jest znacząco gorsza w Słowacji. Wymienia się ryzyko realizacji partykularnych interesów, które skutkują przerwaniem dynamicznej konsolidacji gruntów. Słowacja ma szansę na zmianę obecnej fatalnej sytuacji jedynie w warunkach wsparcia ze strony właścicieli ziemskich.

**Słowa kluczowe:** *całościowe i proste projekty, fragmentacja gruntów, korzyści z konsolidacji gruntów, własność ziemi*