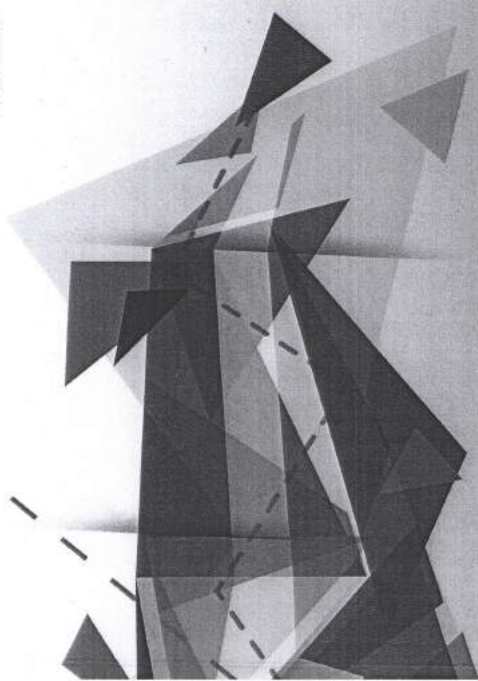


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ECOLOGY AND
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ECOLOGY AND ENVIRONMENTAL PROTECTION

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THE DESCRIPTION OF BENEFITS AND PROCEDURES OF LAND CONSOLIDATION WITH EMPHASIS ON LANDSCAPING ACTIVITIES ON THE EXAMPLE OF THE CADASTRAL TERRITORY OF MELEK, SLOVAKIA

Ing. Jakub Pagač
Ing. Monika Čubišáková, PhD.
Ing. Jozef Halva, PhD.

Slovak University of Agriculture in Nitra, Slovakia

ABSTRACT

The analysis of the land consolidation benefits for the country is an important part of the study of theory and practice. Land consolidation is one of the tools for the complex arrangement of ownership relations to land and also to the development of rural areas. In the definition of land consolidation we can imagine the arrangement of the parcels, allotment, deployment of types of the land, roads, water management, erosion control, environmental, terrain, and other measures. The analysis of the individual procedures that were used in the planning of the land consolidation and the benefits of carrying out of land consolidation we made on the example of the cadastral territory of Melek. The municipality of Melek is located in western Slovakia, in the Nitra district with area of 620 ha. Land consolidation was started in 2003 and finished in 2010 with entry in the cadastre of real estates. The number of C register plots of the cadastre before the start of the land consolidation was 613. The number of the E register plots of the cadastre was 1 828 and the number of property relations of the original condition was 25 095. The number of new plots was reduced to 1 281, which represents a decrease of 47.5% and the number of ownerships is decreased by 88.8% to 2 802. The aim of this contribution is to point out the benefits of the land consolidation and to describe the procedures of land consolidation with emphasis on landscaping activities.

Keywords: land consolidation, evaluation, the benefits of land consolidation, Slovakia

INTRODUCTION

Land consolidation (LC) are the main instrument for the complex arrangement of ownership relations to land and also to rural development. Under the concept of LC, we can imagine the layout of the land, parcels, consolidation, disposition of types of land, communication, water management, anti-erosion, environmental, terrain, and other measures. The task of the LC is to improve the living conditions of the rural population, the removal of the large fragmentation and to create a rational arrangement of the ownership of the forestry assets and other agricultural assets to improve the production and operating environment in the country [1]. Land consolidation is a planned readjustment and rearrangement of land parcels and their ownership according to developing agricultural technology. Land consolidation is the most favourable land management approach for solving land fragmentation and has been applied in many countries around the world [2]. Land consolidation is related more generally to social and economic reforms. Therefore, Land consolidation in rural areas not only aims at

combining disparate land areas but also at better management of all related areas such as agricultural, technical, social and cultural areas to improve standards of land ownership [3]. In many countries, it is a major tool in the development of rural areas, lagging behind or with major adjustment problems [4].

In Slovakia, for the execution of the project, the LC binding act no. 330/1991 Coll. on land consolidation, arrangement of land property, land offices, consolidation fund and on land communities. LC according to this act may be carried out in two forms. The first way is simple land consolidation, which have one or several objectives and address the wider land-use relationships and public interests [5]. Shall be borne by their investors or the municipality and are used mainly for blending of land designated for investment construction. The second form, which is also the closer we will be to deal with complex land adjustments. Their goal is a new arrangement of ownership relations to land in the perimeter of the LC, the spatial and functional layout, ensuring the accessibility of land and the settlement of the boundaries of the land, so they created the best conditions for cultivation. To the circuit LC are included land as a rule, one of the cadastral territory, except for land built-up part of the village [6]. Stages of the project, LC will begin with the so-called preparatory proceedings. It is done before the project, LC after assessing the results of the preparatory proceedings, an administrative authority shall decide about the authorisation or regulation of the LC.

The objective of this contribution is to highlight the contribution of the land consolidation and describe the procedures of land consolidation with emphasis on landscaping activities.

MATERIAL AND METHODS

Case study

The decisive fact in the selection of a model territory Meleek were already completed LC. Realize started from 1. July 2003, when the decision was issued on the regulation of the LC. Continued up to 18. January 2011, when the project was LC registered in the cadastre of real estates. Materials and documents of the project, with whom we are working we have obtained from the District office in Nitra land and forestry department (tab. 1).

Tab. 1 Basic information about the project, the LC in the model area

Start project	Completed project	Running time [years]	Area [ha]	The number of ownership relations
Meleek 01.07.2003	18.01.2011	7,5	561,35	13 823

The village of Meleek is located in western Slovakia, in the Nitra district, 21 km south-east from the district of the city of Nitra. To 31.12.2018 village has 472 population, density of population is 76.13 population/km². The village is part of the Danubian upland, with the total area of the cadastral territory of 620 hectares.

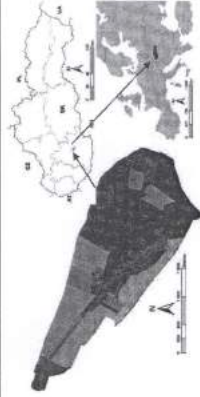


Figure. 1 Localization of the solved area

The relief of the solved area passes gradually from a plane in the Žitava into the typical hilly relief with mild slope to 2.5 with a predominantly western and north-west-oriented exposure of the slopes. Designed territory is included into the warm climatic area, the west of the warm, slightly dry or slightly humid with mild winter. The average annual temperature is 9.7°C, the average temperature for the growing period is 15.5°C, the maximum temperatures rise up to 37°C and the minimum temperature falls to -37°C. The long-time average of the atmospheric precipitation varies around 657 mm, of which the growing season falls 238 mm. An important role in the territory plays a wind, with the prevailing east and northeast winds. The main flow, which flows through the addressed area is Meleek creek with like a water tank Meleek and with a Homeland. All surface water in the other hand the territory have their water contaminated, in particular erosion soil of agricultural land, in rivers passing through the built-up area of the municipality is added and pollution from drains cesspools family farms. Loss of soil agricultural soil causes a clogging of the water courses, due to which leads to flood water on the surrounding land and water leakage into the bedrock in several phases of his flow. Underground waters are bound at the bedrock gravel and sand around the basin of the river Žitava and morava Meleek stream. In terms of resources and protection of groundwater is dealt with territory is not located in any protected area of natural accumulation of groundwater and sources of surface water intended for the supply of drinking water to the population. The underground water level varies in the range of 5.2 – 7.5 m below the surface. In the other hand the territory is primarily haplic luvisols in practically all subtype and on the tiny area we find a fluviosol. According to phytogeographical regions division of Slovakia belongs to the dealt with territory within the area of pannonian flora (Pannonicum), of the district of the Danubian plain, which occupies the entire part of the Danubian Hills and the Danubian lowland.

Project of the phases land consolidation in Slovakia

The LC is governed by the act no. 330/1991 Coll. on land consolidation, arrangement of land ownership, land offices, land fund and on land communities as amended. For the complex legal and engineering-project planning process we have divided the phases of the LC into two basic activities, geodetic-cadastral (light grey in the diagram) and landscape (dark grey colour in the diagram). All of these activities themselves are closely interconnected and together form a complete set LC [7].



Figure. 2 The course of the process, the LC segregated geodetic-cadastral activities (grey label) and landscape activity (dark grey marking).

Tab. 2 Time schedule of the project, the LC in cadastral area Melk

Name project LC	Completed project LC
The decision on the regulation LC	30.07.2003
The point field	31.08.2003
Labelling on the area LC	30.11.2003
Planimetric mapping	31.08.2004
Elevation mapping	31.08.2004
The valuation of land	31.05.2005
Initial state registry	31.08.2005
Territorial system of ecologic stability	30.05.2006
General principles of functional organization of the territory	23.12.2005
The principles of the placement of new plots	16.06.2006
Plan shared facilities and measures and plan public facilities and measures	31.08.2008
Partitioning plan in the form of placement and marking plan	30.10.2007
Implementation of LC project	25.03.2009
Partitioning plan in the form of reconstruction of the cadastral operate by new mapping	01.04.2009
Registration in the cadastre of evidence of real estates	13.07.2009

RESULTS

The analysis of the geodetic action Work in the points field include reconnaissance ground, stabilize, and signaling of the detailed points of the detailed field. Demarcation, focus and permanent marking of the boundaries of the circuit LC are divided into four basic units, preparatory work, measuring work, data processing and final documentation. When the ring-mapping topography in the circuit LC, it was necessary to field investigate and geodetic methods focus course, the boundaries between the various new objects, so that the current situation in the field was shown and described in the documentation [8]. The subject of the measurements were the borders of the interface types of land, the using of land-use of the same type, constructions, engineering networks, water flows and areas, roads and other. The largest representation in the studied territory is stable land with a share of up

to 79 %, and a grassland area with a share of 8 %. Purpose of terrain mapping in the circuit LC focused network of detailed points in sufficient density in places. The subject of the measurements were unfenced large blocks of arable land with a density of points 20 to 40 m distant from each other, the required edges with an altitude difference of over 1 m, longitudinal and transverse profiles of small water courses, existing roads.



Figure. 3 a) Outline of the measurement of detailed points topography, b) A map topographic and elevation

Analysis of the cadastral activities The aim creation of price maps for the needs of the project, the LC was to provide the basis for the valuation of the land or their parts in the district project LC. Determine the value of any of the premises in the perimeter of the project, the LC is based on the status of the under layer of the updated boundaries and codes of the soil-ecological units, verification kind of land in the field and the existence of forests in the individual campuses types of land.

The Initial state registry with the honour of the land is to list and display all the parcels or their parts in the district project LC, with acreage and types of land commissioning verification and in willful mapping topographic focused and updated. The purpose of compilation of the ISR was to get in the place LC an overview of land and property relations to them as well as familiarising of the individual participants LC on the state, with the entering into of the project LC.

In the framework of the phases of the separation plan, each owner was held to discuss the proposal of placing the new land and the requirements of the owner to the location of the new land. In tab. 2 are listed the basic ownership characteristics before and after the project decision-making after the analysis of the registered project LC.



Figure. 4 a) ISR, b) The valuation of land, c) register the new state

Tab. 3 Basic information about the ownership before and after the project LC

	Before started project LC	After completed project LC
The number of ownership relations	36 876	13 823
The number of parcels	2928	1782
The average number of co-owners on one parcel	11.87	7.76
The average number of parcels for one owner	11.54	0.62
The average area the plots [ha]	0.51	0.89

Analysis of the landscape activities:

General principles of functional organization of the territory (GPFO) are the significant phases of the project, the LC, which represents the long-term the starting state of the optimal use of the area for all the activities that the area creates the conditions for their implementation. Basis for processing GPFO in the perimeter of the project, the LC for the cadastral land Melek was the analysis of the input information, the categorization of transportation systems, assessment of the condition of the functionality of water management and amelioration drainage facilities, assessment of erosion and interpretation of the suitability and biodiversity of landscape using limits. To increase the ecological stability and biodiversity of the country is part of the LC and the processing of local territorial system of ecological stability (LTSES). Processing LTSES in the framework of the project, the LC design elements biocorridor and interactive elements created in the perimeter of the LC network, relatively ecologically stable territory, which beneficially affect the ecologically little stable, or unstable intensive agricultural used landscape. The aim of the assessment area is identification environmental problem areas – areas, which reflected the degree of the clashes of interests of positive and negative phenomena – limits and may create a threat to the elements of the LTSES. The territory was thus identified and classified to 335-46 ha which is more than 86 % of the area of the cadastral territory. The skeleton of the proposal GPFO consists of public and shared facilities and measures. Public facilities and measures to serve the population of the village of the area and includes facilities for recreation, sports equipment, equipment for the supply of drinking water, wastewater treatment, landfills, municipal solid waste or other public facilities and measures. Shared facilities and measures to serve the owner of the land in the perimeter of the LC, and this includes roads, erosion control measures, environmental protection measures, water management measures and the shared facilities and measures (SFM).



Figure. 5 examples a) GPFO, b) LTSES, c) Plan SFM

For the improvement of the overall ecological spatial stability of the landscape, its retention ability, protection against erosion, including the composition and scenery of the country have been designed by the new eco stabilisation elements of TSES in to cadastral land the village of Melek as the planting of a liner of the vegetation along the current and proposed agricultural field roads. The planting of a liner of vegetation on agricultural land without the field trip, planting in groups and solitary trees. A draft rural roads formed the core of the GPFO with connections to the local roads and the state path of the third class. Total proposed 18 field roads with a total length of 22 km.

The realisation of shared facilities and measures

Implementation works started the first phases, which included construction of the main field road U01, U02, U03 and secondary field roads U03a, U15. Built, the roads had a total length of 4,288,44 m with an area of 17,694 m². When selecting the construction of the first part of the communication actions played mainly the role of the need for disclosure of the land. Field trip U03 and U03/U03a were existing roads that inconvenient its purpose and to link the village with the wine-area to the east of the area. Field road U01 was attached next to the local agricultural cooperatives and ensuring continuous passage of agricultural equipment to rural area of the municipality without the necessary pass by the village.

Of the environmental measures have been built accompanying the greenery of the 3-ZE3, 3-ZE2 f to the field roads U01, U14 and wind barrier 9-ZE5, 5-ZE3, 2-ZE3. Built environmental measures should be along the length of the 2,573.8 m with an area of 11,944 m². The importance of accompanying greenery are in the country irreplaceable, and form the landscape ecology, microclimate, hygienic and aesthetic function. Function wind barrier is to reduce the speed of the wind, and at some distance before and behind the wind barrier. The criterion of selection wind barrier was the area which was most affected by wind erosion.



Figure. 6 The realisation of shared facilities and measures

CONCLUSION

To the undisputed benefit and benefits of LC after their registration in the cadastre of real estate include the reduction of fragmentation in land ownership, creating a better user units of agricultural land, the new vector cadastral map in the perimeter of the project, the creation of territorial reserves for the municipality for investment activities, creation of settlement of land for the construction of shared facilities and measures [9]. In this study, we analysed the contribution of LC to the cadastral territory of Melek. From the point of view of owner relations with the number of the parcel register C register 613 and the parcel register E cadastral 1.828, which after the LC completely perished, was a total of 2,241 parcel. After the LC this number decreased to 1,281 from

a decline of 47.5%. The number of ownership relations before the start of the LC was 2.095, which is after LC decreased by 89% to 2.802 in ownership relations. The average area of the plots increased from 0.271 ha to 0.44 ha and the average number of co-owners per parcel decreased 11.88 to 2.19. In addition to the significant benefits for the population from the point of view of ownership relations, should LC a positive contribution also to the landscape ecology part of the country. Together were built 4.588 m of the roads with an area of 17.694 m² and ecological measures with the length of 1.2573.8 m with an area of 11.944 m². These measures form the skeleton of ecological stability of the landscape.

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THE EVALUATION OF THE IMPACT OF SOIL POLLUTION ON HUMAN HEALTH

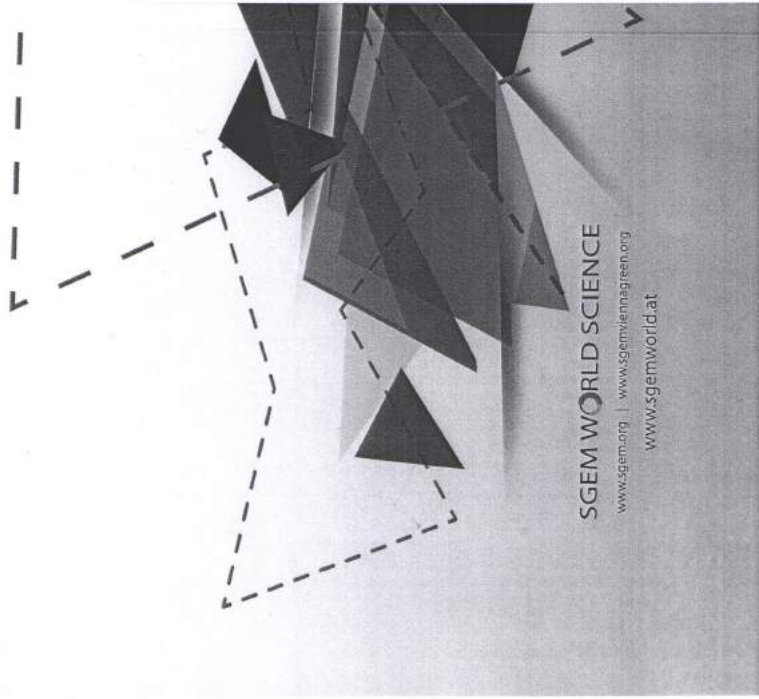
Professor, Doctor of Agricultural Sciences, Stepanova LP¹
Associate Professor, Candidate Of Biological Sciences, Pshareva AV²
Associate Professor, Candidate Of Pedagogics, Nechushkin Yu V³
Associate Professor, Candidate Of Agricultural Sciences, Myshkin AI¹
¹Orel State Agrarian University, Orel, Russia
²Bauman Moscow State Technical University, Moscow, Russia
³OSU named after Turgenev, Orel, Russia

ABSTRACT

Our field of scientific research is part of the Central Federal District of Russia. The population is 754,816 people; the share of urban population is 66.72%. On the territory of the Oryol region, there is 24,652 km². Oryol is the administrative center, the whole region is divided into 24 districts, the region is located in the central part of the Central Russian Upland in the forest-steppe zone in the south-west of the European part of Russia. The climate of the Oryol region is moderately continental. In the area of the Oka River and its tributaries. In the eastern part of the region flows the river Sosna with tributaries. To the west of the city of Orel flows the river Nerussa and Nalva.

The region is located in the zone of soil movement from sod-podzolic to predominantly leached and podzolized chernozemic soil [9]. In addition, there are various soil types from light gray forestic in the West and in the East and southeast to leached and typical black soil [12]. The industrial sectors of the region: mechanical engineering and this part of the industry branch makes up 30% of the total production, the food industry in the Oryol region is more than 25%, and the share of the construction industry is only 13% [1]. In addition to the city of Orel, where most of the enterprises are concentrated, there are separate factories that are located in the city of Livny and the city of Mtsensk, as well as in other small cities of the Oryol region [3]. The region's ferrous metallurgy is only 7%, which began to develop in the region in the second half of the 20th century. The city is the Oryol Joint-Stock Company "Oryol Steel Rolling Plant", and in the city of Mtsensk there is an aluminum plant and a factory for the production of fasteners "Parallel".

Experimental sites that were subjected to prolonged exposure to the slagheap of the Mtsensk Aluminum Casting Plant (MZAL) were selected as the object of study. The Zone of Continuous Observation (PPN) was published in the village of Bolshoye Luchino at different distances from the object of land pollution, which is within a radius of 30 meters, 150 meters, 300 meters and 450 meters from the mountain with slag waste [6], [8], [11]. Landfills, samples of soil genetic horizons and mixed samples of humus horizons of experimental plots were laid on the studied sites. Soil: light gray forest, medium-loamy soil on loess-like loams [4].



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