

Management of the agricultural landscape in land consolidation projects in Poland

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Abstract: A characteristic feature of Polish rural areas is a high biodiversity. Its existence is caused by extensive agriculture and agrarian structure fragmentation. This fact puts a huge responsibility on surveyors and other professionals responsible for the land consolidation process in Poland, as they are to improve farming conditions with respect for the sensitive environmental structures.

In contemporary land consolidation works rules of sustainable development are considered. Following those rules, new non-agricultural functions are introduced in the rural space. A concept of post-consolidation area management is developed within the land consolidation project; this concept includes: protection of the natural environment, management of rural landscapes, delineation of lands to be used for the needs of technical and social infrastructure, and water management.

The paper presents the land consolidation project that is in place in southeastern Poland. The project is located in an area with special landscape values, which could be threatened by the land consolidation process. The recent pro-environmental changes in land consolidation procedure are presented and discussed.

Key words: *environmental aspects, land consolidation*

Introduction

Biodiversity in Poland is one of the richest in Europe. It is caused by convenient natural conditions, as well as by specific anthropogenic pressure (irregular industrialization and urbanization of the countryside, traditional extensive agriculture, and the sustainable spread over the country's historical forests). Especially eastern and southeastern parts of the country characterize a well-preserved rural environment related to the fragmented agricultural structure. The maintenance of the traditional farm structure and extensive agriculture enabled the preservation of genetic resources. But from the year 2000, the farmland bird index indicates slow disadvantageous changes in the farmland bird population. Marginal habitat abandonment, rural landscape structure simplification and intensification of agricultural production are the main threats. Research results have shown that economically inconvenient scattered parcels forming the existing land use pattern create favorable conditions for high biodiversity. It forms habitats for farmland birds and mammals.

After the political system changed, Polish rural areas were affected by economic crises. It results from the low profitability of agricultural production (caused by rural land fragmentation and small farm areas) and high unemployment. The long-term solution for rural areas should be non-agricultural job creation through rural development policy as well as the transformation of the spatial structure of rural areas (Pulecka, 2008).

The main instrument for shaping the spatial structure of rural areas is a land consolidation process. About two million hectares of arable land in Poland diligently require land consolidation. Financial funds (coming from European and national funds) for the period 2007–2013 will only cover the costs for 210 thousand hectares. Pressure for economically grounded land consolidation has been the chance for involving new law regulations concerning the preservation of landscape structures in the land consolidation procedure. New regulations complying with UE requirements related to environment aspects have been introduced.

A land consolidation plan should refer to the instruments performing the principles of local spatial policy: local development plans and, precedent to adoption thereof, local studies of conditions and directions of spatial planning. Local development plans, which are local normative acts, are drafted solely for certain areas designated in previous studies, which are usually built-up areas. With respect to agricultural areas, only very general recommendations are usually presented in local studies of conditions and directions of spatial planning, which do not set forth the principles of rural landscape shaping.

The consolidation process is regulated by the Act of March 26, 1982 on consolidation and exchange of lands. Consolidation and exchange proceedings are conducted by *starost* (head of second level of local government administration in Poland) as a task within the scope of government administration. Consolidation plans are drafted by specialized geodetic units. Land consolidation processes, conducted on a large scale after World War II, and the related liquidation of sites of no capacity for agricultural production (forestations, shrubs, waste lands), resulted in the significant simplification of rural landscape structure and consequent deterioration of biodiversity. However, the influence of the sustainable development concept, which constitutes the basis for the majority of policies and programs that have been introduced in recent years, affected the approach to issues connected with transformation, by way of consolidation-exchange processes, of rural areas structure.

Land consolidation process as a tool for rural landscape management

At present, the concept of the multifunctional development of rural areas, as accepted in Europe, results in significant spatial transformations. Multifunctional development consists of skilful integration into the rural space of new, non-agricultural functions. Consolidation and exchange of lands are supposed to be of great importance for contemplated concepts for the multifunctional development of Polish countryside. Much attention has recently been paid to the influence of land consolidation processes on the natural environment. A list of actions that are taken during a land consolidation process and their potential impact on natural environment is presented by Woch (2006). New regulations complying with UE requirements related to environment aspects have been introduced. The Act of October 3, 2008 on providing access to information on natural environment and its protection, on society's participation in the protection of the natural environment and on the assessment of the impact on the natural environment, lists land consolidation among undertakings that may have a significant impact on natural environment and provides for the obligation to obtain an administrative decision on environmental factors prior to issuing a decision on approval of land consolidation or land exchange plan (Art. 72 Section 1 item 8). The Ministry of Agriculture

and Rural Development edited guidelines completing existing land consolidation procedure. According to the guidelines, an environmental pre-study should be prepared in every case where the land consolidation area exceeds 300 hectares. The environmental pre-study consists of two parts: graphic and descriptive. The graphic part should be prepared to the scale of 5000 or 10000 with marked borders of occurring zones:

- wet and waterlogged zones,
- coastal zones,
- mountainous or sylvan zones,
- protected zones, including water intake zones and protected zones of water reservoirs,
- protected habitat zones, including Natura 2000,
- zones with exceeded environmental standards,
- populated zones,
- zones with significant historical, cultural and archeological landscapes.

The environmental pre-study is carried out by proper administrative bodies elaborating the land consolidation project at the time of preparing the preliminary land consolidation project. The environmental pre-study with the preliminary land consolidation project are verified by the environmental office of the proper administrative district. Then, the environmental impact assessment procedure can be imposed by that office.

Consolidation works, which change the ownership structure, provide an exceptional possibility to take actions aimed at shaping countryside landscape. The shaping of landscape during the land consolidation process is effected mainly by creating spatial and legal conditions for desired forms of land use.

The issue of landscape shaping during a land consolidation process may be understood very broadly (Thomas, 1998, 2006, Helle, 2006). It will not pertain solely to natural aspects of landscape functioning, as a natural system, but also to aesthetic, cultural, social and economical aspects of the space, connected with implementation of the sustainable development concept. The scope of issues covered by land consolidation plans, which constitute elements of rural development plans, includes *inter alia*:

- conservation of existing landscapes of special natural values and setting out of rules for their exploitation for tourist and recreation purposes,
- improvement of water conditions and water management in areas subject to consolidation (e.g. creation of small retention reservoirs),
- adjustment of the manner of land use to natural conditions,
- introduction of plots and fields structure, which enables cross-slope cultivation in areas threatened by water erosion,
- forestation of lands that are barely useful for agricultural production,
- introduction of forestations and shrubs into the agricultural production environment in order to prevent wind erosion of soil and to protect biological diversity,
- introduction of strip turfings and shrubs as biogeochemical barriers preventing eutrophication of waters,
- creation of road networks for the purpose of agricultural transport, taking into consideration soil erosion prevention.

Study area

This paper discusses the results of the analyses of the guidelines for a land consolidation plan, as drafted by the Zamojski Department of the Regional Bureau of Geodesy and Agricultural Lands in Lublin (*Zamojski Oddział Wojewódzkiego Biura Geodezji i Terenów Rolnych w Lublinie*). The study

area includes the villages of Drowniki, Majdan Skierbieszowski, Marcinówka, and Podwysokie, located in the north-eastern part of the Skierbieszów commune. The area under consideration covers 1351.21 hectares.

The analyzed area is located in the region of Działy Grabowieckie, which constitutes a part of the Lubelska Upland. The whole consolidated area is located within the borders of Skierbieszowski Landscape Park. The area is of rich landscape variety. The most characteristic features thereof are numerous ravines and dry valleys carved in loess formations (fig. 1–2). Due to their numerous branches they constitute an important landscape attraction.



Fig. 1–2. Land consolidation area with characteristic landscape features: numerous ravines and dry valleys carved in loess formations

The main field of activity in the consolidated area is agriculture, which constitutes the main source of income for local people. Lands owned by individuals, which form agricultural farms and constitute 81.19% of the total area of the cadastral unit, prevail in the land ownership structure. The main problems facing agriculture in the consolidated area include:

- plots' fragmentation,
- hindered access to fields and farmsteads,
- soil erosion.

Improvement in the structure of agricultural farms, as well as in the existing impractical inner and inter-village “chequered” pattern of plots are the main goals of the consolidation that is to be carried out. Protection and shaping of natural and landscape conditions, as well as the promotion of eco-farming, the introduction of which is an important goal, are also listed among the aims of the discussed process.

Development limitations

The study area is located within the borders of Skierbieszowski Landscape Park. The provisions of Lubelski Voievod's Ordinance No. 29 of August 10, 2005 on Skierbieszowski Landscape Park (Lubelski Voievodship's Official Journal No. 2005.182.3154) apply to the said area.

As a result, numerous guidelines with respect to space management had to be taken into account by the consolidation plan, for example bans on:

- liquidation and/or destruction of forestations in the fields,
- conducting earth works that permanently deform the lie of the land,

- changes in the water relations,
- erection of new buildings within a strip of 100 m around the edges of lakes, rivers and other water tanks, with the exception of facilities that serve water tourism, water management and fishing;
- liquidation and filling-in of old river beds and water-muddy areas.

It is stated in Zamojski Starost's decision on environmental impact, which has been issued for the purposes of the consent to carry out the land consolidation, that the land consolidation process must not result in any changes to the present agricultural character of the area subject to consolidation. Moreover, it is stated that the land consolidation plan has to protect and preserve the existing forestations in the fields or provide for new forestations, as well as locate plots after the consolidation in such a manner that agricultural activities will prevent soil erosion and movements of masses of earth. The existing springs and streams, as well as the directions of natural flow of rainwater also have to be preserved by the consolidation plan.

Landscape management issues in the land consolidation plan

The analyzed guidelines for the land consolidation plan include directives with respect to terrain designation, shaping of spatial order and land development, principles of providing and operating technical and public utility infrastructure, principles of natural environment protection and communication network shaping.

The following suggestions are made in the analyzed guidelines for the land consolidation plan:

- increase in afforestation rate by designating some lands for forestation,
- limitation of water and wind erosion by applying various anti-erosion safeguards,
- increase in the quality of agricultural production that will result from:
 - liquidation of the impractical “chequered” pattern of lands,
 - creation of larger, more practically shaped plots,
 - creation of a network of roads of appropriate parameters that will provide access to fields.

Protection and preservation of high environmental and landscape values is emphasized in the plan. The said values provide opportunities for creating agro-touristic farms and eco-farms, as well as for developing foot and bike tourism. This may improve farms' income in the future (which is presently relatively low).

Among the actions aimed at preventing erosion the following, *inter alia*, are suggested: cross-slope layout of plots and, consequently, cross-slope cultivation, introduction of forestations and turfings on the slopes most exposed to erosion, securing mouths of ravines in order to prevent their moving backwards, paving of roads, leaving some of the “high baulks” as natural anti-erosion safeguards, and the introduction of fruit farming and perennial plantations on the eroded slopes.

In order to organize the agricultural production environment in conformity with soil, natural and landscape conditions, the rural-forest boundary is delineated, which is one of the elements of the local development plan for Skierbieszów commune.

The following lands in the area subject to consolidation are designated for forestation: lands located in the immediate vicinity of forest complexes, enclaves and semi-enclaves in forests, lands located on slopes of significant inclination and subject to water erosion, lands in the immediate vicinity of ravines, and of the total area of approx. 105.30 hectares. The planned forestations are adjusted to the newly planned layout of roads designated for the purposes of agricultural transport.

A significant impediment to the creation of a new concept of organizing agricultural production environment, which prevents efficient laying out of fields and hinders communications, are the branched ravines,

which are numerous in the analyzed area. Due to their landscape values the plan does not provide for liquidation thereof or any changes in their layout. Legal borders and the new layout of fields will be adjusted to field shrubs and turfings that occur in the area subject to consolidation.

Conclusions

In the analyzed consolidation plan some instruments of landscape shaping are applied. In the guidelines for the land consolidation plan for villages Drewniki, Majdan Skierbieszowski, Marcinówka and Podwysokie the following actions aimed at landscape shaping are suggested:

- protection of the existing natural, landscape and cultural values and their exploitation for tourist and recreation purposes,
- forestation of lands that are barely useful for agricultural production,
- adjustment of the manner of land use to natural conditions,
- preservation of high baulks and field shrubs and forestations,
- preservation of the existing communications layout of the roads designated for agricultural transport.

The consolidation procedure provides for legal and spatial conditions for introducing diverse forms of land use – e.g. linear and surface forestations – into the space that comprises lands owned by many individuals. Broadly understood consolidation efforts are successfully made in many European Union member states.

Due to amendments to legal provisions, which have been enacted over recent years, land consolidation has been listed among the activities that have an impact on the natural environment. In Poland, consolidation plans are drafted by specialized units where surveyors play leading role. A surveyor may ask for the assistance of experts when drafting a plan. It appears that the involvement of landscape ecology specialists in the drafting process is of vital importance. A broadly understood land consolidation process together with post-consolidation organization of a given area is an instrument that allows for active rural landscape shaping.

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