

# **THE ROLE OF THE LAND ADMINISTRATION SYSTEM IN THE PROCESS OF DEVELOPING AND UPDATING THE LAND PARCEL IDENTIFICATION SYSTEM – A CASE STUDY OF HIGH NATURE VALUE FARMLAND IN NORTH-EASTERN POLAND**

**Katarzyna Kocur-Bera, Ph.D.**

*University of Warmia and Mazury in Olsztyn,  
Faculty of Geodesy, Geospatial and Civil Engineering,  
Institute of Geoinformation and Cartography,  
Olsztyn, Poland  
e-mail: katarzyna.kocur@uwm.edu.pl*

**Klaudia Piórkowska, M.Sc.**

*OPGK Olsztyn,  
Olsztyn, Poland*

## **Abstract**

This article analyzes the role of the Land Administration System in the process of developing and updating the Land Parcel Identification System. The compatibility of both systems was evaluated. The Land Parcel Identification System (LPIS) is a computerized database for identifying and monitoring eligibility for area-based subsidies. In Poland, the LPIS was developed after Poland had joined the European Union, adopted the Common Agricultural Policy and implemented the direct payment scheme for farmers. Farmers are eligible to direct payments based on the declared reference parcel. In the EU countries, the reference parcel has been defined based on various criteria (cadastral parcels, agricultural parcels, farmer's blocks or physical blocks). In Poland, the reference parcel is a cadastral parcel. The article compares the databases of the Polish cadastral system and the LPIS. The analysis covered areas with identical descriptions of land-use type in both systems. The area, length and location of boundary points of the examined parcels were compared. The comparison involved agricultural land whose specifications have been updated. The results of the analysis revealed considerable differences in the compared databases. The noted discrepancies can probably be attributed to differences in the quality of source maps and materials as well as insufficient updates based on the results of local inspections.

**Keywords:** real estate cadaster, Land Parcel Identification System, comparative analysis, land use

## **Introduction**

The Polish land and building register is a public database containing information about real estate and property rights. Real estate cadasters are kept by counties which also operate numerical databases containing information about parcel boundaries in vector or raster form. The relevant information is regularly updated, and it constitutes a source of reference data for institutions and organizations, including the Agency for the Reconstruction and Modernization of Agriculture (ARiMR). Poland implemented the Common Agricultural Policy and the direct payment scheme for farmers upon its accession to the European Union. The value of the support provided to farmers is determined based on the cadastral model. The paying agency relied on land register data to develop the Land Parcel Identification System (LPIS).

The Treaty of Accession defined the terms and conditions for implementing the Common Agricultural Policy in Poland, and it introduced the direct payment scheme for farmers. Polish farmers are entitled to financial support based on the area of farmed land. In the EU countries, direct payments for farmers are managed and monitored by paying agencies. The ARiMR is a Polish paying agency which manages financial aid under the Common Agricultural Policy and controls eligible areas and agricultural land. Direct payments complement and stabilize basic incomes in agriculture, contribute to good agricultural and environmental conditions, compensate for the costs associated with the fulfillment of EU requirements regarding product quality and production methods, contribute to environmental protection and sustainable practices in water management and the generation of energy from renewable sources. The EU operates two direct payment systems:

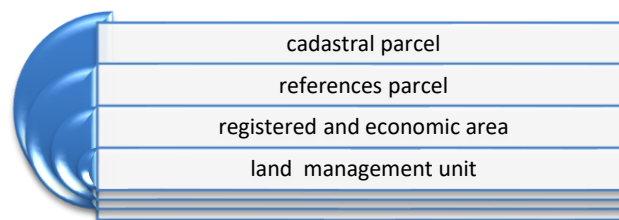
- the Single Payment Scheme (SPS) which has been introduced in the old EU-15 countries as well as in Croatia, Malta and Slovenia. Direct subsidy payments are made to owners of agricultural land based on

entitlements. Payment entitlements provide farmers with the right to a predetermined amount per hectare of land.

- the Single Area Payment Scheme (SAPS) which is a simplified system offered to the Member States that joined the EU in 2004 and later. The amount of the payment is calculated by dividing the country's annual financial envelope by the respective agriculturally utilized area (reference area). The annual financial envelope is determined based on reference cereal yields, area of agricultural land and livestock population.

The direct support scheme covers more than 1.4 million of Polish farmers, and it is the largest and the most important support mechanism for Polish rural areas.

Agricultural producers have to meet the following eligibility criteria for direct payments: (a) the total area of reference parcels in a farm is minimum 1 ha (minimum 0.1 ha per land management unit), (b) land must be kept in good agricultural and environmental condition throughout the calendar year, (c) the farmer has been allocated an identification number in the national register of producers (UOPRSWB, 2015). Direct payments are granted based on the declared reference parcels. In Poland, a reference parcel is a cadastral parcel. The eligible area within a cadastral parcel is composed of land management units which may or may not be eligible for payments. A diagram of LPIS objects localized within a cadastral parcel is presented in Figure 1.



**Fig. 1.** Diagram of LPIS objects localized within a cadastral parcel.

*Source: Own elaboration.*

The EU Member States are under obligation to develop a system for managing and controlling the utilization of EU financial aid. The Integrated Administration and Control System (IACS) is a computerized tool for implementing the provisions of the Common Agricultural Policy and monitoring the distribution and utilization of the financial support for farmers (ARMiR, 2016). According to Regulation (EU) No. 1306/2013 of the European Parliament and of the Council, the IACS is a computerized database, an identification system for agricultural parcels, aid applications or payment claims and a system for the identification and recording of payment entitlements.

The Land Parcel Identification System (LPIS) is part of the IACS. Pursuant to the provisions of Art. 70 of Regulation (EU) No. 1306/2013, the EU Member States are under obligation to establish an identification system for agricultural parcels based on maps, land registry documents and other cartographic references with the use of aerial and spatial orthoimagery and GIS techniques. In Poland, LPIS resources are developed based on digital orthophotomaps and the information found in land and building registers (UOKSEP, 2003).

The purpose of the LPIS is to guarantee non-ambiguous identification of agricultural parcels declared for financial support and to determine their location in agricultural and geographic space. Parcels are identified based on the assigned territorial codes (TERYT) and parcel numbers in the land and building register. The LPIS is also used to verify the declared parcel area and the farmers' payment entitlements. As of 2005, LPIS resources are developed with the use of GIS tools. The database consists of: (1) digital orthophotomaps covering the entire country, (2) boundaries of reference parcels in the form of vector maps, (2) land management units not eligible for payments in the form of vector maps. The LPIS resources are used for administrative control and explanatory proceedings after local inspections (SZDARIMR, 2015). In Poland, the LPIS is developed based on data from the land and building register concerning cadastral parcels, including agricultural land and soil classification data. In many cases, the boundaries of cadastral parcels constitute property/tenancy boundaries, they are easy to identify based on boundary points and field margins, their area is strictly defined, and the relevant data are released at no charge for IACS needs. In the early stages of development, LPIS was based on descriptive data from the land and building register (registered parcels of agricultural land with specified land-use type), and the relevant information was used to classify every parcel into one of the two categories: parcels intended for agricultural production and parcels not used for agricultural purposes (eligible or not eligible for payments). At present, the area of agricultural parcels in the LPIS is defined based on intersections between vector layers containing the boundaries of cadastral parcels and the boundaries of land management units. The area of parcels not

eligible for payments is subtracted from the area of cadastral parcels based on orthophotomap data. The graphical part of the LPIS database was developed with the use of cartographic materials from the land and building register with minimum horizontal accuracy corresponding to a topographic map in the 1:10 000 scale. Digital orthophotomaps were used when the eligibility of declared parcels could not be validated based on the existing data or maps. In Poland, agricultural land is highly fragmented; therefore, orthophotomaps are developed based on two standards: orthophotomaps with a resolution of 0.50 m (standard I) and orthophotomaps with a resolution of 0.25 m (standard II). Standard II covers approximately 25% of Poland's territory, mainly its south-eastern regions which are characterized by high fragmentation of agricultural parcels. New aerial photographs covering most of Poland's territory have been taken to meet the EU standards for orthophotomaps. In the remaining parts of the country, orthophotomaps have been developed based on archive resources (aerial photographs taken as part of the Phare 1997 project) and Ikonos satellite images (border zones, estimated resolution of 1 m).

The LPIS relies on information from various registers and databases kept by government institutions:

1. National Center for Geodetic and Cartographic Documentation – data relating to administrative boundaries from the State Register of Borders (PRG), Database of Topographical Objects (BDOT) and databases of aerial and satellite images (ORTO),
2. County Centers for Geodetic and Cartographic Documentation – descriptive data and maps from the land and building register, maps of conservation areas,
3. Central Statistical Office – TERYT identifiers,
4. Ministry of the Environment – data relating to Natura 2000 areas, National Parks, landscape parks with boundary zones, nature reserves, protection task plans, environmental protection plans, nature and landscape conservation areas, geologically valuable areas, natural monuments, protected landscape areas, ecological corridors,
5. National Water Management Authority – hydrographic survey maps, areas with high risk of nitrate pollution, water intake protection zones,
6. General Directorate for National Roads and Motorways – vector data describing national roads and motorways (BRARMIR, 2015).

Pursuant to the provisions of Regulation (EU) No. 1307/2013 of the European Parliament and of the Council, LPIS data have to be regularly updated. Digital orthophotomaps depicting land use types at the time the aerial image was captured are updated every 3 years, and they are highly reliable tools for determining the area of agricultural land eligible for financial aid. The anaglyph method (3D orthophotomap) has been recently introduced to improve the quality of the LPIS database. This 3D imaging technique supports spatial visualization and facilitates interpretation of the analyzed images (UOPRSWB, 2015). The LPIS database is also updated to account for changes in land use. The relevant information is supplied by farmers in the form of a graphic annex to a payment application. Pursuant to the provisions of Art. 17 point 5 of the Commission Implementing Regulation (EU) No. 809/2014, the beneficiary is required to unambiguously identify and declare the area, use and location of each agricultural parcel. If the information provided in the application is not valid or incomplete, the beneficiary has to make the relevant changes in the pre-established form. If necessary, the beneficiary should correct the reference data and indicate the valid boundaries of reference parcels on a map. The relevant changes are processed and entered into the LPIS system by the paying agency (PB.zs.058.1.2017). Eligible areas can also be controlled during local inspections. Local inspections are conducted to gather information about an agricultural parcel and its immediate vicinity within the boundaries of the declared reference parcels. Any discrepancies between GIS data and field data gathered during a local inspection are marked on parcel sketches with the use of post-control codes. The LPIS database is also updated to account for changes in source data, including in the land and building register where new data are introduced by county administrators (division and consolidation of cadastral parcels, system upgrades, changes in the name, number and registration number of cadastral districts). The relevant data are imported to the LPIS reference database in the cadastral data exchange standard (SWDE) (UOPRSWB, 2015).

The aim of this study was to analyze the compatibility of LPIS and LAS data relating to a selected area in north-eastern Poland (in this part of the country, LAS resources are based on historical data from the Prussian cadaster). This is an important consideration since LPIS and LAS data constitute a basis for the payment of subsidies to farmers under the Common Agricultural Policy.

## Materials and Methods

The analysis was performed based on the data obtained from the County Center for Geodetic and Cartographic Documentation in Olsztyn (vector boundaries of cadastral parcels and agricultural land, descriptive data with identifiers, area of cadastral parcels, land-use type and area of agricultural land) and the corresponding LPIS data obtained from the Olsztyn Branch of the Agency for the Restructuring and Modernization of Agriculture (vector reference boundaries, identifiers and area of reference parcels, maximum eligible area, vector boundaries of land management units, digital orthophotomap for 2016). The compatibility of land-use types in the evaluated cadastral parcels (and reference parcels) and agricultural land (land management units) was analyzed, and the boundaries of the studied objects were determined. The compatibility of LPIS and LAS data was analyzed in randomly selected objects. This approach was possible because the Polish LPIS/IACS system contains the "land management unit" category which corresponds to different land-use types in the LAS. The definitions of the land management units in the LPIS and the corresponding land-use types in the LAS are presented in Table 1.

The studied area was the municipality of Dobre Miasto in north-eastern Poland. In the analyzed location, the predominant types of agricultural land are arable land, permanent meadows and permanent pastures. In the studied objects, 86% (Object 1), 85.2% (Object 2) and 71.6% (Object 3) of the area was eligible for payments. The land-use structure in the analyzed objects is presented in Table 2.

**Table 1.** List of the studied objects from the LPIS and LAS.

Classification in the Land Parcel Identification System	Classification in the Land Administration System
<p><b>GR – arable land</b> Land under crops; temporarily fallow land in good agricultural and environmental condition; land under greenhouses with permanent or portable structure; land occupied by agricultural machinery for farming operations.</p>	<p><b>R – arable land</b> Land subjected to permanent mechanical cultivation for the purpose of agricultural or horticultural production; land used for the cultivation of hops, wicker and ornamental trees, including coniferous trees, tree and shrub nurseries; land occupied by agricultural and horticultural machines and equipment outside farmstead parcels; fallow land and temporarily fallow land;</p>
<p><b>P – potential agricultural land</b> Areas with a non-permanent structure, not eligible for direct payments, situated in the vicinity of or inside an agricultural parcel, can be used for agricultural production without incurring substantial costs;</p>	
<p><b>T – permanent grasslands</b> Permanent meadows – land covered with dense perennial vegetation composed on various species of grasses, leguminous and herbaceous plants that form the meadow sward, regularly mowed, including mountain pastures and meadows that are mostly mowed; Permanent pastures – land covered with vegetation similar to that found in meadows, used mostly for livestock grazing, including mountain pastures and meadows that are generally not mowed and are used for livestock grazing;</p>	<p><b>Ł – permanent meadows</b> Permanent meadows – land covered with dense perennial vegetation composed on various species of grasses, leguminous and herbaceous plants that form the meadow sward, regularly mowed, including mountain pastures and meadows that are mostly mowed;</p>
<p><b>C – protected permanent grasslands</b> Permanent grasslands which are Natura 2000 sites and meet protection criteria;</p>	<p><b>Ps – permanent pastures</b> Permanent pastures – land covered with vegetation similar to that found in meadows, used mostly for livestock grazing, including mountain pastures and meadows that are generally not mowed and are used for livestock grazing, including land occupied by livestock rearing facilities such as canopies and barns, situated outside farmstead parcels;</p>
<p><b>S – orchards</b> Land under trees, shrubs and perennial berry plants for fruit production, including continuous land with minimum clearance between trees or non-continuous land with large clearances, excluding land under other crops; the minimum area of agricultural parcels eligible for orchard payments is 0.1000 ha;</p>	<p><b>S – orchards</b> Land with a minimum area of 0.1000 ha, densely planted with fruit trees or shrubs (minimum 600 trees or 2000 shrubs per ha), including land under fruit tree and shrub nurseries and vineyards;</p>
<p><b>Z – wooded land</b> Land with tree and shrub cover with an area smaller than 0.10 ha, including: 1. midfield clusters of trees and shrubs that are not classified as forests; 2. peatlands partially covered with clusters of shrubs and dwarf trees; 3. land naturally overgrown with wicker and willow shrubs in river valleys and depression basins; 4. land adjacent to bodies of water, covered with trees or shrubs, which constitutes a biological protective zone around water courses and bodies of water;</p>	<p><b>Lzr – wooded agricultural land</b> Enclaves or semi-enclaves on agricultural land with clusters of midfield trees and shrubs or only trees older than 10 years, not classified as forests or orchards;</p> <p><b>Lz – wooded land</b> Land with tree and shrub cover with an area smaller than 0.10 ha, including: 1. peatlands partially covered with clusters of shrubs and dwarf trees; 2. land naturally overgrown with wicker and willow shrubs in river valleys and depression basins;</p>

<p>5. ravines and gullies covered with naturally growing or planted trees and shrubs which prevent erosion, not classified as forests; 6. mounds of rock and rubble overgrown with trees and shrubs; 7. defunct cemeteries overgrown with trees and shrubs, excluding dense forest complexes; 8. clusters of trees and shrubs used as parks, but not equipped with recreational facilities and structures, other types of land covered with shrubs, excluding long-term plantations;</p>	<p>3. land adjacent to bodies of water, covered with trees or shrubs, which constitutes a biological protective zone around water courses and bodies of water; 4. ravines and gullies covered with naturally growing or planted trees and shrubs which prevent erosion, not classified as forests; 5. mounds of rock and rubble overgrown with trees and shrubs; 6. clusters and shrubs used as parks, but not equipped with recreational facilities and structures; 7. defunct cemeteries overgrown with trees and shrubs;</p>
<p><b>O – land afforested under Rural Development Programs</b> Land afforested after 2008 under Rural Development Programs.</p>	
<p><b>R – short-term tree plantations</b> Eligible areas planted with selected tree species.</p>	
<p><b>L – forests</b> Land with compact surface and a minimum area of 0.1000 ha, covered with trees, shrubs and sward or temporarily without cover, including forest roads;</p>	<p><b>Ls – forests</b> Land: 1) with compact surface and a minimum area of 0.1000 ha, covered with trees, shrubs and sward or temporarily without cover, including forest roads; 2) used for forestry and forest management, occupied by buildings and structures, drainage systems, forest district boundaries, forest roads, power lines, tree nurseries, timber storage yards, forest parking lots and tourist facilities;</p>
<p><b>W - water bodies</b> Land under water courses and inland bodies of standing water, excluding inland bodies of salt water, including rivers, lakes, canals, drainage ditches, ponds, basins and lagoons;</p>	<p><b>Wm – inland bodies of salt water</b> <b>Wp – land under water courses</b> <b>Ws – land under bodies of standing water</b> <b>W - ditches</b></p>
<p><b>K - roadways</b> Land delimited by public and private roadways pursuant to the provisions of the Act of 21 March 1985 on public roads;</p>	<p><b>Dr - roads</b> Land under roads; <b>Tk – railway lines and structures</b> Land under railway lines and structures; <b>Ti – other transport facilities</b> Airports, sea and inland ports, tram lines, bus stations, car parks, cable cars, flood embankments;</p>
<p><b>U – industrial areas</b> 1. Industrial areas, including land occupied by industrial buildings and equipment, water intakes, wastewater treatment plants, transformer stations, spoil piles, landfills, storage yards, warehouses, transportation centers, overhaul plants, etc. 2. residential areas, including land not used for agricultural production or forestry, occupied by residential buildings and facilities (yards, driveways, passages, playgrounds, etc.); 3. other developed areas, including land occupied by buildings and facilities related to administration, health care, commerce, religious worship, crafts, services, education, culture, art, recreation, communications, human and animal cemeteries; 4. recreational areas not occupied by buildings; 5. mines, including land occupied by active strip mines;</p>	<p><b>Ba – industrial areas</b> Land occupied by industrial and storage buildings, structures and devices, transportation centers, overhaul plants, transformer stations, above-ground pipelines, collectors and water mains, spoil piles, landfills, water intakes and wastewater treatment plants; <b>B – residential areas</b> Land occupied by residential buildings, utility buildings and technical facilities (yards, driveways, passages, playgrounds, recreational areas, water wells, water reservoirs, above-ground cable lines) excluding outside farmstead parcels; <b>Bi – other developed areas</b> Land occupied by non-residential buildings and structures, cemeteries and defunct cemeteries not classified as wooded land, and animal cemeteries; <b>Bz – recreational areas</b> Land not occupied by buildings and related structures; <b>K - mines</b> Active strip mines;</p>
<p><b>D - farmsteads</b> Developed agricultural land occupied by residential buildings and other buildings and structures for agricultural production (garages, utility buildings, boiler houses, silos, barns, etc.);</p>	<p><b>Br – developed agricultural land</b> Developed agricultural land occupied by residential buildings and other buildings and structures for agricultural production (garages, utility buildings, boiler plants, silos, barns, etc.), household gardens and flower beds in rural areas;</p>
<p><b>I – other non-agricultural land</b> Land not suitable for agricultural production</p>	<p><b>N – fallow land</b> Marshes (swamps, bogs, quagmires, fens, moors), sands (quicksand, wild beaches, coastal sands, dunes), natural geological formations (cliffs, steep slopes, precipices, rocks, rubble), excluding reclaimed mine lands; <b>Tr – other land</b> Land not suitable for the above types of use.</p>

Source: Own elaboration based on the Instructions for inspecting eligible areas.

## Results and Discussion

Differences in the area of cadastral and reference parcels were determined by comparing the corresponding areas in the LPIS and LAS, and ineligible areas were subtracted from the area of cadastral parcels. The results are presented in Table 3. The average difference for 100 objects was 0.03 ha, and the maximum difference was 0.35 ha.

**Table 2.** Land-use structure in the analyzed villages.

No	Land-use structure in the analyzed objects	Object 1 (%)	Object 2 (%)	Object 3 (%)
1	Arable land	59.7	50.0	42.7
2	Permanent pastures	14.8	26.0	22.9
3	Permanent meadows	11.6	9.2	12.5
4	Fallow land	5.9	6.4	6.0
5	Roadways	4.2	3.0	4.3
6	Developed agricultural land	1.4	2.4	4.0
7	Forests, land covered by trees and shrubs	1.3	1.5	3.3
8	Water bodies	0.7	1.1	2.2
9	Developed and urbanized land	0.4	0.4	2.0
10	Orchards	0.1	0.1	0.1

Source: own elaboration based on the data from the County Center for Geodetic and Cartographic Documentation.

**Table 3.** Differences in the area of cadastral and reference parcels.

Statistics	Value [ha]
arithmetic average	0.03
median	0.02
dominant	0.00
maximum value	0.35
minimum value	0.00

Source: Own elaboration.

In the next step, differences between the position of boundary points of parcels in the LAS and the LPIS were determined. The position of boundary points differed in 95% of the analyzed parcels, and linear differences exceeded 0.1 m in 89% of the cases. The maximum linear difference between boundary points was 17.4 m, and the minimum difference (greater than 0.10 m) was 0.15 m. In the evaluated objects, the average maximum linear difference in the position of boundary points was determined at 4.50 m with a median of 3.57 m. The presence of maximum linear differences was also analyzed along river and road boundaries. In 80% of parcels where the linear difference in the position of boundary points exceeded 0.10 m, the greatest differences were noted along road boundaries. The above difference was noted in 78% of parcels bordering rivers. The average differences were determined in parcels where the linear difference in the position of boundary points exceeded 0.10 m. The average maximum difference was 8.6 m and the average minimum difference was 0.15 m.

**Table 4.** Differences in the position of boundary points in the compared parcels.

Statistics	Value [m]
arithmetic average	4.50
median	3.57
dominant	null
maximum value	17.40
minimum value	0.15

Source: Own elaboration.

In the last step, differences in the area of the most prevalent land management units (and arable land) with various land-use types were analyzed. The average difference in the area of the corresponding land management units in the compared systems ranged from 0.04 ha to 1.52 ha (Table 5). The greatest maximum differences in area were determined at 9.79 ha for arable land, 9.36 ha for permanent grasslands

and 4.48 ha for other types of non-agricultural land. The smallest maximum difference in area was determined at 0.10 ha for roadways. The mode value of the analyzed datasets ranged from 0.00 ha to 0.03 ha. Forests and areas covered by trees and shrubs did not have a mode value. The median ranged from 0.04 ha to 0.96 ha. The greatest discrepancies in area resulted from different interpretations of land use, in particular in permanent meadows and pastures which were identified as arable land in the LPIS or, if confirmed by an orthophotomap, as other non-agricultural land. Such differences were also observed in relation to fallow land which was identified as water bodies or land covered by trees and shrubs in the LPIS.

**Table 5.** Differences in the area of farmland with various land-use types.

Name of land use	Statistics	Value [ha]
arable land	arithmetic average	1.25
	median	0.45
	dominant	0.01
	maximum value	9.79
	minimum value	0.00
permanent pastures/meadows	arithmetic average	1.52
	median	0.96
	dominant	0.00
	maximum value	9.36
	minimum value	0.00
land covered by trees and shrubs	arithmetic average	0.34
	median	0.28
	dominant	null
	maximum value	1.15
	minimum value	0.02
forests	arithmetic average	0.33
	median	0.30
	dominant	null
	maximum value	0.48
	minimum value	0.22
water bodies	arithmetic average	0.13
	median	0.04
	dominant	0.01
	maximum value	0.89
	minimum value	0.00
roadways	arithmetic average	0.04
	median	0.04
	dominant	0.02
	maximum value	0.10
	minimum value	0.01
farmsteads	arithmetic average	0.11
	median	0.05
	dominant	0.03
	maximum value	0.37
	minimum value	0.01
other land	arithmetic average	0.31
	median	0.13
	dominant	0.03
	maximum value	4.48
	minimum value	0.00

Source: Own elaboration.

The tolerance limit in measurements of agricultural parcels is an important parameter in field inspections which determines the allowable margin of error in the declared eligible area. Regardless of the applied measurement method, tolerance is calculated as the product of an agricultural parcel's perimeter and the width of the buffer zone surrounding the parcel. The buffer zone is determined by the applied

measurement method. Tolerance is expressed in hectares to the nearest 100 m<sup>2</sup>. The maximum tolerance may not exceed 1.00 ha, and minimum tolerance is 0.01 ha.

## Conclusions

The Land Parcel Identification System is developed based on data from the land and building register, and it is a part of the Polish Integrated Administration and Control System. In the first years of LPIS operation, financial support for farmers was granted based on information relating to the boundaries, area and location of cadastral parcels and agricultural land (eligible and ineligible areas). With time, the ARiMR developed new LPIS system layers known as reference boundaries (reference parcels) and land management units. The reference boundaries were determined based on cadastral parcels, and land management units were identified based on definitions of agricultural land. The new layers have been developed to meet the EU requirements relating to system updates, and to eliminate discrepancies between cadastral data and actual land use. Most discrepancies relating to cadastral parcels, such as the location of drainage ditches or rivers, result from shifts in the shoreline of water bodies. The analysis also revealed that databases of agricultural parcels often contain outdated information which cannot be used in the process of applying for subsidies. Each year, the ARiMR uses the data imported from county centers for geodetic and cartographic information to update the reference database. The cadastral data in payment applications constitutes a basis for the identification and localization of agricultural parcels.

The analysis of compatibility between LAS and LPIS data revealed considerable discrepancies. The maximum difference in the area of cadastral and reference parcels was determined at 0.35 ha. The maximum difference in the location of boundary points exceeded 17 m, and it was noted in a parcel bordering a river. With regard to agricultural land, discrepancies in land-use type were observed in 66% of the analyzed parcels, and the greatest difference exceeded 9 ha. In most cases, the noted discrepancies resulted from different interpretations of land use, in particular in permanent meadows and pastures which were identified in the LPIS as arable land, land covered by trees and shrubs or other non-agricultural land. Differences in land-use type were observed in 55% of the analyzed parcels.

The analyzed area is covered by a project entitled "e-map – supplementation and digitalization of data for comprehensive access to the geodetic and cartographic resources of Olsztyn county", co-financed by the European Regional Development Fund under the Regional Operational Program for Warmia and Mazury 2007-2013. As part of the project, the boundaries of developed and urbanized farmland were verified based on orthophotomaps and the results of local inspections. The portion of land occupied by internal roadways, technical devices and household gardens was zoned as non-agricultural land.

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