

Comparison of the Thematic Data on the Use of Land in Urbanized Areas in Selected European Countries

Olga MATUK, Elżbieta BIELECKA, Poland

Key words: cadastre, land use

SUMMARY

The real estate cadastre is certainly one of the most important sources of information on land use, i.e. the division of land into types by actual use or development. The land use classification depends on many geographical factors, including climate, relief, soil, geology, water relations, as well as historical and economic conditions. The purpose of this study was to compare the classification of information on land use in urban areas collected in the cadastre of eight European countries: Austrian, Bulgarian, Czech Republic, Estonian, German, Poland, Portugal, Slovenian. The research focused on determining similarities and differences in the number of registered levels of classification and subgroups of object classes at individual levels of land use classification. The analysis was conducted on documentation, including legal acts regulating land use issues, made available in national languages by the relevant authorities. The mentioned problem is extremely important due to many initiatives aimed at harmonizing the land use classification. The conducted research showed discrepancies in the number of registered levels of classification and differences in the number of subgroups of utilized areas in urban areas. The presented results are the first stage of the analysis of land use, which is registered in cadastral systems.

Comparison of the Thematic Data on the Use of Land in Urbanized Areas in Selected European Countries

Olga MATUK, Elżbieta BIELECKA, Poland

1. INTRODUCTION

The real estate cadastre is one of the most important sources of information on land use. The content of real estate cadastres functioning in various European countries depends on i.e. climate, relief, soil. Land information is of great importance. They are a tool for implementing specific policies, primarily agriculture and environmental protection. Land information plays a large role in the economic development of each country. There is a significant increase in initiatives to improve access to and exchange of cadastral information to support the implementation of pan-European information services (Permanent Committee on Cadastre in the European Union from 2008 and 2009).

The purpose of this study was to compare the number of distinguished levels of classification and subgroups of land use object classes at individual levels of detail. The research concerns the registration of land use in eight European countries, namely: Austria, Bulgaria, the Czech Republic, Estonia, Germany, Poland, Portugal and Slovenia.

Each country has its own land cover classification (Parsova V, Celms A, Gurskiene V, Jurgenson E, 2018). The diversity of land use classification requires a systematic review of the scope of content and how to group individual land use. The purpose of this study is to analyze methods of land use classification. In particular, the following research issues were raised:

1. How detailed is the land use classification in urban areas with a distinction between the number of classification levels?
2. Are the analyzed countries characterized by a similar land use registration method in terms of the number of subgroups of land use classes at individual levels of detail?

2. DATA AND METHODS

The study of the range of the number of classification levels and the number of subgroups of land use class classes located in urban areas was carried out for eight European countries.

To achieve the assumed goals were used:

- a statistical method based on the separation of classification levels of subgroups of object classes of registered land use;
- an analytical method consisting in the analysis of legal acts and materials obtained from government institutions.

The comparative analysis was made on the basis of legal acts and materials related to running cadastral systems. Research materials were made available by the competent authorities. These documents are prepared in national languages and are characterized by different structure and detail.

The analysis of various materials necessitates the adoption of certain work patterns. These diagrams refer primarily to the search for objects that are definitionally and functionally similar. The analysis involved determining the number of thematically related objects to indicate the number of levels of land use registration classification. In addition, the purpose of the study was to indicate the number of subgroups of classes of land use objects registered at individual levels of detail.

3. RESEARCH AND RESULTS

The study revealed that the highest number of levels of land use classification related to urbanized areas is in Portugal. The smallest is in Bulgaria. The largest similarity in the number of classification levels is in Austria, the Czech Republic and Estonia (2 levels each) as well as Slovenia, Germany and Poland (3 levels each).

Order nr	Country	Number of classification levels	Number of classes at the 1st level of detail	Number of classes at the 2nd level of detail	Number of classes at the 3rd level of detail	Number of classes at the 4th level of detail	Number of classes at the 5th level of detail	Number of classes at the 6th level of detail

1	Slovenia	3	1	15	40	-	-	-
In Slovenia, 16 classes are registered at the 2nd level of detail, of which 1 class is not associated with urbanized areas. Therefore, 15 classes were taken for analysis. In addition, 43 classes are registered at the 3rd level of detail, of which 3 are not associated with urbanized areas. The authors adopted 40 land use classes for analysis.								
2	Germany	3	5	25	35	-	-	-
3	Austria	2	3	12	-	-	-	-
In Austria, 13 classes are registered at the 2nd level of detail, of which 1 class is not associated with urbanized areas.								
4	Czech Rep.	2	3	19	-	-	-	-
5	Poland	3	3	7	4	-	-	-
6	Estonia	2	11	2	-	-	-	-
In Estonia, the current existing division is related to the purpose for which the area and purpose subtype was intended								
7	Bulgaria	1	4	-	-	-	-	-
8	Portugal	6	1	4	11	29	32	16
In Portugal, 30 classes are registered at the 4th level of detail, of which 1 class is not associated with urbanized areas. Therefore, 29 classes were taken for analysis. In addition, 33 classes are registered at the 5th level of detail, of which 1 is not associated with urbanized areas. The authors adopted 32 land use classes for analysis.								

Table No. 1. The number of classification levels and the number of classes at each classification level

Source: Own studies

The results of examining the number of registered subgroups of classes of land use objects at individual levels of detail are presented in Table No. 2.

Level	The minimum number	Country	The maximum number	Country
Level I	1	Slovenia Portugal	11	Estonia
Level II	2	Estonia	25	Germany
Level III	4	Poland	40	Slovenia

Level IV (29 land use subgroups), level V (32 land use subgroups) and level VI (16 land use subgroups) only occurs in Portugal
--

Table No. 2. Number of subgroups at particular levels of detail

Source: Own studies

The study showed that taking into account the number of registered classes of land use objects at the studied levels of classification, there are two countries, Slovenia and Portugal, which at the first level of detail have one class of objects related to urbanized areas. For the other countries, a large variety was noticed in the way land use was registered.

The analyzes carried out show very large differences in the degree of detail and the number of subgroups of registered object classes.

4. CONCLUSIONS

The study provided relevant information regarding the diversity of the scope of land use information collected in the real estate cadastre in the countries analyzed. The land use classification currently functioning in European countries is not extensive. The exception is Portugal, which has six levels of land use. In addition, the registration of subgroups of feature classes at different levels of detail shows little similarity.

The tests showed:

- a) discrepancy in the number of distinguished levels of classification;
- b) discrepancy in the number of distinguished subgroups of object classes registered at particular levels of detail.

REFERENCES

1. Declaration by the Czech Office of Geodesy and Cadastre (2013). on the real estate cadastre (cadastral decree), Czech Republic
2. National Land Use Database (2006). Land Use and Land Cover Classification, England, United Kingdom
3. Parsova V., Gurskiene V., Kaing M., Real Property Cadastre in Baltic Countries, Jelgava 2012;
4. Parsova V, Celms A, Gurskiene V, Jurgenson E, Application of remote-sensing technologies for determination of types of land use, Engineering for Rural, Development, Jelava, 23-25.05.2018
5. Permanent Committee on Cadastre in the European Union (Austria, Belgium, Czech Republic, Germany, Italy, Spain, Slovakia, Sweden), Cadastral Information System, 2008

Comparison of the Thematic Scope on the Use of Land in Urbanized Areas in Selected European Countries (10437)
Olga Matuk and Elzbieta Bielecka (Poland)

6. Permanent Committee on Cadastre in the European Union (Cyprus, Finland, Greece, Poland, Hungary, Slovenia) and (Estonia, Lithuania, Luxembourg, Denmark, Romania, Portugal), Cadastral Information System, 2009
7. Regulation of the Minister of Regional Development and Construction of 29 March 2001. on the records of land and buildings, Poland
8. Regulation on the actual / actual use of land, Slovenia
9. Regulation on the types of intended use of the cadastral unit and the procedure for their designation
10. Ordinance of the Federal Minister of Economy, Family and Youth on the specification and definition of land use types and how to show it in the border register, Austria
11. Spatial Development Act, Bulgaria
12. Technical specifications of the land use plan (COS) in mainland Portugal in 1995, 2007, 2010 and 2015, Portugal
13. Real Estate Registration Act, Slovenian
14. Federal Act on measurements and border records / Geodetic law, Austria

Olga Matuk
 Military University of Technology
 Faculty of Civil Engineering and Geodesy
 2 gen. Sylwestra Kaliskiego St., Warsaw
 POLAND
 Tel. (+48) 261 83 94 51
 Email: olga.matuk@wat.edu.pl

Elżbieta Bielecka
 Military University of Technology
 Faculty of Civil Engineering and Geodesy
 2 gen. Sylwestra Kaliskiego St., Warsaw
 POLAND
 Tel. (+48) 261 83 90 76
 Email: elzbieta.bielecka@wat.edu.pl