The patrimony of wooden churches, built between 1531 and 2015, in the Land of Maramureș, Romania

Alexandru Ilieș\textsuperscript{a}, Jan A. Wendt\textsuperscript{b}, Dorina Camelia Ilieș\textsuperscript{a}, Grigore Vasile Herman\textsuperscript{a}, Marin Ilieș\textsuperscript{c} and Anca Luminița Deac\textsuperscript{d}

\textsuperscript{a}Department of Geography, Tourism and Territorial Planning, University of Oradea, Oradea, Romania; \textsuperscript{b}Department of Regional Development Geography, University of Gdansk, Gdansk, Poland; \textsuperscript{c}Faculty of Geography, Babeș-Bolyai University of Cluj-Napoca, Napoca, Romania; \textsuperscript{d}Doctoral School in Geography, University of Oradea, Oradea, Romania

ABSTRACT

The map and temporal scale of the territory known as ‘The Land of Maramureș’ outlines a real heritage treasure, built in historical time and formed of 74 wooden churches. Varying in terms of architecture, dimensions and cult, the wooden churches are indeed heritage objects, 33 of them being on the list of historical monuments in Romania, while 5 are included in the UNESCO world heritage list. An impressive database, which includes the edifices built during 1531–2015 period, is processed, analyzed, synthesized and mapped in this project. By using cartographic methods and specific programs (ArcGIS, CorelDRAW), suggestive pictograms are generated, expressing relevant elements for the proposed purpose: spatiality, a series of technical details (height, architectural style, etc.), monument type and oldness. Such a complex material is useful in the process of territorial planning and organization from the point of view of those concerned with issues of urban development and tourism as well as for the general public as well.

1. Introduction

The Land of Maramureș is a historical province of the Romanian political space, with a history which is strongly reflected through its multicultural particularities and the material evidence of its inhabitants.

In time, heterogeneity, both ethnical (Romanians, Ukrainians, Hungarians, Germans, Jewish, etc.) and confessional (Orthodox, Catholics, Protestants, Neo-protestants, etc.) materialized into religious edifices. The 74 wooden churches (Main Map) belong entirely to the Orthodox and Greek-Catholic confessions; 71 built by Romanians communities and 3 built by Ukrainians communities (Poienile de sub Munte, Ruscova and Rona de Sus villages). Being hundreds of years old, most of them are identified with a certain mental space (Cocean, 1997; Ilieș, 2006) reflecting especially through their architectural particularities a specific cultural space (Dâncuș, 1986; Dâncuș & Cristea, 2000; Ilieș, Iliță, Josan, Iliță, & Hotea, 2013; LMI, 2015) built of wood, they continue to exist today thanks due to the skill of the craftsmen and to the historical monument status enjoyed by 33 of the edifices (LMI, 2015). Amongst these, there are five remarkable churches included into the UNESCO world heritage list: in the villages of Bărsana, Budești, Desești, Ieud and Poienile Izei (Main Map). Later on, during the nineteenth century, a single wooden church was built in the village of Valea Stejarului (1806), one during the inter-war period in the village of Bogdan Vodă (1935) and five more during the communist period in the second half of the twentieth century. No less than 35 new wooden churches were built during the post-socialist period, 1990–2015.

The database was created by using information from representative bibliographic sources (Baias et al., 2014; Godea, 1972; Ilieș, Iliță, & Hotea, 2013; LMI, 2015; Man, 2005), verified and completed by means of field activities. By processing the database using as tools the ArcGis and Arc Map programs, we accomplished a synthetic, expressive cartographic material, with quantitative and qualitative elements, very useful in the territorial organization and planning policies and strategies.

The practical usefulness of the resulting cartographic material is also based on a user’s target group formed of: public authorities at all levels; public and private institutional structures focused on monument protection; local communities, especially schools; specialists in territorial planning and organization etc.

There is also the possibility to apply the methodology support to other areas (e.g. the entire territory of Transylvania) or for the representation of other types of elements (attractions).

Taking into consideration the fragility of these tourist attractions (age, lack of protection), a major risk in mapping them could occur from the lack of correlation...
of the information gathered from literature and media with the territorial realities. For example, the church from Bocicoel is presented in the bibliographic sources as being made of wood, while, in reality, it has been wrapped and covered in sheet metal. Such modifications, without information and with the authorities’ agreement, have become a common practice lately. Other risks that may occur are: moving the edifice in another place; ‘reconstruction’ by changing the architectural style; natural or human destruction caused by the lack of protection etc.

2. Study site

The Land of Maramureș, both a historical (Ilieș & Wendt, 2014) and a mental space (Cocean, 2011; Ilieș & Ilieș, 1999), with a medieval documentary attestation (Filipașcu, 1940) is currently part of Maramureș County from the administrative point of view (Figure 1). It is situated on an area of 3351 square kilometers on Romania’s northern border with Ukraine (Main Map). The morphologic variety and the layout of the relief provide to the studied area a natural fortress-like aspect, also emphasized by the convergent character of the Tisa River’s tributaries. The landscape variety is also the result of its layout with a 2101 m altitude range, this value representing the difference between the lowest point, 202 m (in the north-west on the Tisa) and the highest point, 2303 m (Pietrosul Rodnei Peak) in the Rodnei Mountains (in the southwest). In latitude its extension is 21°58” or 55 km around the 48° parallel (northern latitude) and in longitude its extension is 1°12’51” or 105 km around the 24° meridian (eastern longitude) (Ilieș et al., 2013).

Administratively, there are 36 territorial-administrative units: Sighetu Marmației municipality, 4 towns and 31 communes with a total of 60 settlements. Through the 55 villages situated mostly on the valleys of the main rivers (Tisa, Iza, Vișeu, Mara and Cosău), the landmark of the rural space is well reflected by the presence of the monumental wooden churches, a fact which means that this type of heritage element is still representative for the analyzed space. The number of monument churches of centennial age is sensitively equal to the number of new churches built during the post-socialist period. Out of the 35 new churches, 12 were built in the urban area and 23 in the rural area.

Out of the 60 localities, 22 do not have wooden edifices and 18 villages have more than 2 wooden churches. In this area, the oldest wooden churches are in: Breb (1531–1622), Moisei (monastery; 1600) and Sarasău (1600) villages, built in the sixteenth century according to the list of historical monuments designated by the Romanian Cultural Ministry (2015). The highest wooden church in the world (75 m) was built during the period 1996–2003 within the Săpânța-Peri monastery. The smallest wooden church, built in inter-World Wars period (unclear year), is situated in the area of the Bărsana commune, its name is Nuțu’s Chapel and it is 5 m high. With an average of more than a wooden church per locality, with its typical architectural style, the Land of Maramureș is a unique space in the European cultural assembly and the map resulted from processing the database fully reflects this patrimonial wealth.

3. Map compilation

3.1. Map structure

By analysis through comparison with other specialty paper works having resembling topics (Baiaș, 2013; Baiaș et al., 2014; Beconytė, Eismontaitė, & Žemaitytienė, 2014; Buterez, 2016; Ilieș et al., 2009; Ilieș, Wendt, Ilieș, Josan, & Herman, 2011; Ilieș et al., 2013; Patterson, 2001), we consider that our endeavor is new by structure, design and represented elements.

The basic structure of the map is in the form of a digital elevation model (DEM), as a result of combining the natural environment with technical (roads and railroads) and administrative (Administrative Territorial Units limits) infrastructure elements generated by Environmental Systems Research Institute. On this, the material cultural heritage elements formed by the wooden churches are represented, emphasizing the followings: spatial distribution, architectural style, age, monument type, building material and some technical parameters (height, etc.). Besides the basic map, the overall design included five pieces:

- The geographic position of the Land of Maramureș in Romania’s political-territorial ensemble.
- The temporal scale for the period 1531–2015 with pictograms representing all the 74 churches to scale.
- The first three highest churches.
- The five churches included in the UNESCO world heritage list.
- A brief description of the material.

The basic map scale with georeferencing accomplished in GIS and processed in CorelDRAW is 1:208,000 in STEREO 1970 projection.

3.2. Mapping methods

The final cartographic material resulted from combining the DEM, photographs taken by the authors and processed under the form of pictograms, information and methods gathered from scientific paper-based bibliographic resources (Beconyte & Viliuviene, 2009; Ilieș, 2003; Irimuș, Vescan, & Man, 2005; Wendt, 2013) and maps (Baiaș et al., 2014; Beconytė et al., 2014; Buterez, 2016; Ilieș et al., 2013; Zupan & Franges, 2014), all supported and completed by rich
information obtained from field mapping and documentation activity. The images gathered in the field, processed and shown under the form of pictograms, representing each and every church, were georeferenced by points and transposed in the system of known coordinates, establishing tie-points with geographical information system (GIS) data as well as a 20 m DEM.

The map is produced in ArcMap 10.2 and finalized in CorelDRAW X7. In the first stage a GIS database was created, including information about the existing wooden churches and their particularities. On a cartographic background, the localities which have monumental churches and those which did not were identified, digitalized and converted into dots and pictograms. For pictograms, the most representative images were taken from the photographic database created on the field and they were processed in Corel PHOTO-PAINT X7. In content, we sometimes deviated from the generalized scheme in order to emphasize more details with carefully selected images, suggestively represented for the temporal component on one hand and for the spatial component on the other. Finally, the map unfolds on an A2 format (420 mm x 594 mm), it used the National Grid with GCS Dealul_Piscului_1970, 1:208.000 scale reference, exported in TIFF format and edited in CorelDRAW X7 and Corel PHOTO-PAINT X7. The final version from CorelDRAW was exported in A2 TIFF format, RGB mode, at 600 dpi.

4. Map production

Based on methods and tools tested in the speciality literature (Baias et al., 2014; Beconyte et al., 2011; Beconyte et al., 2014; Buterez, 2016; Cataudella, 2004; Di Gregorie, Frongia, Piras, & Forresu, 2014; Ilieș et al., 2013; Ilieș, Ilieș, & Deac, 2015; Le Fur, 2007; Zupan & Franges, 2014), the structure was created and the working stages were defined. The creation of a database was the first step of this endeavor. The existence of numerous hardcopy sources referring from various points of view to wooden churches in Maramureș (Baias et al., 2014; Godea, 2012; Patterson, 2001; Porumb, 2005) allowed the creation of a motivated starting point in our endeavor. This database was completed by the authors’ field investigations, materialized by the identification and localization of each old and new objective (until 2015). Each objective’s card was updated and completed with new, precise information such as the height of these edifices (a particularity which is not unitarily mentioned in any of the consulted documents).

In carrying out the map, two stages can be distinguished:
4.1. Field activity and consultation with bibliographic sources

With activities such as:

- Identifying all wooden churches known from existent bibliographic references and cartographic materials.
- Using the information from printed and on-line sources referring to new edifices built after 1990. Special attention was paid to ecclesiastical sources, respectively to regional organizations for the data reliability.
- Field activity at the level of each of 60 localities when the GPS (2–5 m of accuracy after calibration) localization was carried out and completed with technical details of the card of each edifice which was registered, photographed, measured, mapped and included into the database;
- For each edifice photographs were taken, as complete and relevant as possible. The attempt was to make a unitary set of photographs for all churches, taken from the same angle and position and showing two sides. Such an approach facilitates a comparative, highly useful, study in order to emphasize the differences and resemblances between them. For some churches, because of the vegetation, the endeavor was not carried out as intended and the images present only the most accessible facets of the church. In these cases, we suggested to the local authorities’ solutions to better emphasize these heritage elements and to protect them from the negative effects of the lush vegetation (humidity, lack of light, fungi etc).

4.2. Laboratory activity

This implies processing the database and actually creating the map.

Ever since the creation of the database, differentiating criteria were taken into consideration, thus facilitating the creation of a typology according to: architectural type (Bârcă & Dinescu, 1997; Dâncuș, 2010; Goda, 2012; Ilieș et al., 2011; Stahl & Petrescu, 1958), monument type (according to a list of monuments elaborated by the Romanian Cultural Ministry, 2015), age, confession and partially the height of the edifice.

The basic map (based on the DEM) with technical infrastructure elements and administrative limits was created in ArcGIS. The DEM’s hypsometric scale was used and symbols were taken from ArcGIS. These symbols were derived from other existing legends however, most of them being created under the form of pictograms and introduced in order to obtain a representation as correct and suggestive as possible of the mapped phenomenon. The pictograms were created by using processed images (and adjusted to the map scale) in CorelDRAW and Corel PHOTO-PAINT.

5. Map legend and representation through pictograms

In order to represent the wooden churches pictograms were used, edited in Corel PHOTO-PAINT X7. The basic principle was to accurately represent the technical and architectural particularities of each mapped edifice, without substituting it for typical symbols. This fact facilitates ‘the reading’ of the entire material and implicitly provides a synthetic and overall image of the whole cultural space defined by the wooden churches. At the same time, the particularities of each and every edifice are accurately presented, becoming thus easier to identify homogenous areas defined by the characteristics of the wooden churches determined after one or several criteria (tower, height, age, entrance position, etc).

For each wooden church there were taken sets of photographs at very high resolutions (4608×3456 dpi) and from at least four different positions, using Nikon Coolpix S9300 and Canon EOS600D digital cameras. For each objective there were obtained images containing two sides (lateral and front). Each photograph was edited in CorelDRAW X7 and Corel PHOTO-PAINT X7, obtaining the profile of each element without background. After editing, each new image (RGB format) was saved at a good resolution (600 dpi) and imported in ArcGIS for georeferencing. The final form was exported in bmp (600 dpi) format and finalized in CorelDRAW, where the correct position of each pictogram (georeferenced) was identified in the territorial assembly. To a large extent, at map level and on the age scale, the proportions between edifices were maintained. Actually, the wooden churches symbols represented on the map faithfully show the morphometric and architectural particularities of each edifice.

For the representation of their age, the map was associated at base level with a temporal multiscale where all churches were represented by pictograms in real form (Main Map). Grouped on age categories with a separation of 100 years/category, the scale reflects the periods of maximum interest in which they were built, corroborated with the architectural style specific to the period. According to official documents, two churches were built in the sixteenth century. After the seventeenth and eighteenth centuries when 31 churches were built, the nineteenth century followed with only one edifice built in 1806, then the twentieth century with one church built in 1935 and another five churches built during the socialist period. The scale is completed by the 25 post-socialist years passing from the second into the third millennium (twentieth and twenty-first centuries), when 35 new
churches were built. On this scale, each church was positioned so as to faithfully show the construction year and the confession it presently belongs to 2015. On this scale, the pictograms were dimensioned to comparatively show as faithfully as possible the edifices height.

6. Conclusions

By accomplishing this map at the level of the analyzed area, it created an image of the spatial distribution of this type of objectives and their grouping according to the previously mentioned particularities. The usefulness of this cartographic construction is emphasized in the regional and local strategies and policies of territorial planning and organization, having as objective the localization, preservation and promotion, from a tourist objective and as protected monuments, of an important element belonging to mankind’s wooden built heritage, the wooden churches. Almost equally, the new edifices from the post-communist period are represented which, by number (35), construction material (combined) and architectural style, can support or deform the traditional architectural style represented by the 33 monument churches.

This type of cartographic representation also combines the morphological features of the landscape (i.e. depressions, valleys, hills and mountains) with the location of the wooden churches. The construction material, wood, comes from the respective space, oak wood for the old ones and coniferous wood for the newer ones, as identified with the vegetation levels specific to the localization areas of each wooden church.

This study also highlights the value of mapping patrimony elements as a useful tool in emphasizing these types of elements, differentiated spatially and temporally on one hand, and morphologically and culturally on the other. Equally, the target group is highly diversified, from schools and the general public, to specialists in territorial planning and organization, each category having easy access to the ‘reading’ and understanding the role played by the wooden churches in defining the cultural space of the Land of Maramureș.

Software

Mapping was carried out using ArcMap 10.2. In addition to the editor, we used both georeferencing and spatial analyst toolbars. The resulting map was edited using CorelDRAW X7 and Corel PHOTOPAINT X7.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

Baias, Ş. (2013). Identificarea, evaluarea și valorificarea patrimoniului cultural de lemn din județul Bihor [Identification, evaluation and valorising of the wooden cultural patrimony from Bihor county]. Oradea: Editura Universității din Oradea.

Baias, Ş, Baias, I., Blaga, L., Buhaș, S., Chiriac, A., Ciocan, J., … Wendt, J. A. (2014). Crisana-Maramures. Geographical atlas of tourism heritage. Oradea: Editura Universității din Oradea.

Bârcă, A., & Dinescu, D. (1997). The wooden architecture of Maramureș. București: Humanitas.

Beconyte, G., Alekna, V., Rociute, I., Adomaityte, A., Baikauskas, M., & Ranonis, A. (2011). A map of 21st century conflicts in Europe. Journal of Maps, 7(1), 1–8. doi:10.4113/jom.2011.1166

Beconyte, G., Eismontaité, A., & Žemaitiienë, J. (2014). Mythical creatures of Europe. Journal of Maps, 10(1), 53–60. doi:10.1080/17445647.2013.867544

Beconyte, G., & Villeviene, R. (2009). The concept and importance of style in cartography. Geodesy and Cartography, 35, 82–91.

Buterez, C. (2016). Monasteries of Buzău County (fifteenth-twenty-first centuries). Journal of Maps, doi:10.1080/17445647.2016.1152919

Cataudella, M. (2004). Cartografia tematica, Atlante dei tipi geografici [Thematic cartography, Atlas of geographic types]. Firenze: Instituto Geografico Militare.

Cocean, P. (1997). The land – a typical geographical region of Romania. Revue Roumaine de Geographie, Tome 41, 41–50. București: Editura Academiei.

Cocean, P. (2011). Tările. Regiuni geografice şi spaţii mentale [The lands. Geographical regions and mental spaces]. Cluj-Napoca: Presa Universitară clujeană.

Dâncuș, M. (1986). Zona etnografică Maramureș [The ethnographic area of Maramureș]. București: Editura Sport-Turism.

Dâncuș, M. (2010). Vernacular architecture and other values of folk culture to be found in the collections of the Maramureș Ethnographic Museum. Cluj-Napoca: Editura Dacia XXI.

Dâncuș, M., & Cristea, G. (2000). Maramureșul un muzeu viu în centru Europei [Maramureș a living museum in the centre of Europe]. București: Editura Fundației Cultural Române.

Di Gregorie, F., Frongia, P., Piras, G., & Forresu, R. (2014). Map of the natural and cultural heritage in the landscape of the Carignano wine district of the Sulcis region (SW Sardinia). GeoJournal of Tourism and Geosites, 13(1), 66–80.

Filipușcu, A. (1940). Istoria Maramureșului [The history of Maramureș]. București: Editura Universul.

Godea, I. (1972). Monumente de arhitectură populară din nord-vestul României, bisericile de lemn [Popular architectural monuments from the north-west of Romania, wooden churches] (Vol. 1). Oradea: Editura Muzeului Țării Crișurilor, Oradea.

Godea, I. (2012). Arhitectura românească în epoca modernă 1700–1900 [Romanian architecture in modern period 1700–1900]. Oradea: Editura Primus.

Ilieș, A., Ilieș, D. C., & Deac, A. L. (2015). Selective, subjective or exclusive tourist map. GeoJournal of Tourism and Geosites, 16(2), 217–226.

Ilieș, A., Ilieș, D. C., Josan, I., Grama, V., Herman, G., Gozner, M., … Stașac, M. (2009). Coșiu Valley (Maramureș) – Evaluation of Antrophic Patrimony (I). GeoJournal of Tourism and Geosites, 4(2), 203–216. year II.
Le Fur, A. (2007). *Pratiques de la cartographie* [The practice of mapping]. Paris: Armand Colin.

LMI. (2015). *Lista monumentelor istorice, anexă la Ordinul Ministerului Culturii din România, nr.2,361/2010, publicat în Monitorul Oficial al României, anul 178 (XXII), nr. 670bis, vineri, 1 octombrie 2010* [List of historical monuments, Annex to the Order of Ministry of Culture in Romania, no 2,361/2010, published in Official Monitor of Romania, year 178 (XXII), no 670bis, Friday, 1 October, 2010]. Retrieved from www.patrimoniu.gov.ro/ro/monumente-istorice

Man, G. (2005). *Biserici de lemn din Maramureș* [Wooden churches from Maramureș]. Baia Mare: Editura Proema.

Patterson, J. (2001). *Wooden churches of the Carpathians, a comparative study*. New York, NY: East European Monographs.

Porumb, M. (2005). *Biserici de lemn din Maramureș* [Wooden churches from Maramureș]. București: Editura Academiei Române.

Stahl, P. H., & Petrescu, P. (1958). *Arhitectura de lemn a Maramureșului* [Wooden architecture of Maramureș]. București: Arhitectura RPR.

Wendt, J. A. (2013). *Skarby kartografii* [Treasures cartography]. Warszawa: Wydawnictwo Arkady.

Zupan, R., & Franges, S. (2014). Map of the Diocese of Pozega (Dioecesis Posegana). *Journal of Maps*, 11(3), 496–505. doi:10.1080/17445647.2014.978908