Planned Villages as Rural Heritage in the Function of Sustainable Development: Case Study of Gornji Vrhovci in Slavonia, Croatia

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Abstract. Although cultural values are the subject of an increasing number of officially adopted documents, at international as well as on European level, elaborations of planned villages’ values are rare. In 1990, the term cultural landscape was confirmed in several international texts as a concept related to the protection and heritage (World Heritage Convention, 1992; Recommendation on the Integrated Conservation of Cultural Landscapes Areas as Part of Landscape Policies, 1995). From the beginning of the 21st century, the concept is dispersed into several disciplines and the focus shifts to the side of natural values, visual values of the landscape, built structure, heritage values, elaborating the concept of the cultural landscape more widely and at the same time clarifying its components more in depth. The paper analyses the values of planned rural settlements in the context of the cultural landscape and the values of the rural heritage. The importance of planned rural heritage as a tourist attraction and potential destination is examined through a spatial multi-level research of the regional area on the example of the area of Western Slavonia, Croatia. Since the middle of the 18th century, in the area of Slavonia, there is the largest number of planned and regulated villages that have been integrated into the landscape, contributing to the spatial diversity and consequently the spatial identity. Therefore, the question arises whether their planned spatial structure can be recognized as a heritage and whether this part of heritage can be used in the function of rural tourism development. This paper explores the historical urban-architectural reconstruction of the village Gornji Vrhovci (1945-1948) after its damage during World War II, and reconstruction (1995-1998) after the damage during the Homeland War. Since the architects led both reconstructions of the village, the paper explores whether the recognizable spatial structure of the village can serve as a contribution to the development of a model for the development of rural tourism. The paper concludes that, despite the need for the development of rural tourism in Croatia, the identity of spatial structures of the village are neglected by the development plans both in the sense of heritage and resource sustainable development.

1. Introduction

The dichotomous values of natural and cultural heritage are confirmed in the documents of the World Heritage Convention (1972, Articles 1 and 2) [1]. This dichotomy was examined and discussed in the research and theoretical texts from the 1960s to the end of the century through the discussion on the urban-rural continuum, the urban-rural dichotomy, and the definition of rural space. Since then we can find academic discussions on the concepts of cultural landscape, cultural heritage and landscape.
heritage [2-5]. 1990, the construct of the cultural landscape was confirmed in several international texts as a concept within protection and heritage (World Heritage Convention, 1992; Recommendation on Integrated Preservation of Cultural Landscapes as Part of Landscape Policy, 1995) [6, 7]. Since the beginning of the 21st century, the phenomenon has spread into several disciplines and the concept dissolved to natural values, visual values of the landscape, built structure, heritage values, elaborating the meaning of cultural landscape while carefully elaborating its detailed components [5].

The adaptation of heritage in a modern way through the activation of the responsibility of all stakeholders in society is the subject of the Conclusions of the Council of the European Union [8, 9]. Although heritage is the subject of an increasing number of officially adopted documents, especially at the European level [10-12] there has been only few research specifically focused on planned villages as heritage. In this area, the definition of the value of the built environment can be found in the Charter on the Built Vernacular Heritage [13]. The definition precisely outlines the values that provide the unity of built structures and cultural landscape and states “The built vernacular heritage is an integral part of the cultural landscape and this relationship must be taken into consideration in the development of conservation approaches” [13]. Changes occur in the cultural landscape shifts top down changes to the rural area, rural settlements and rural heritage. Changes have brought new characteristics of rural spaces and two most emphasized are local unevenness and diversification [14]. The research area brought several insights for the new rural situation: rural areas that are more resilient and adaptive are going through the diversification of functions, population growth, and weekend migrations. On the other hand, decreasing of the activity and depopulation leaves a negative trend with the consequences of the disappearing settlements, ageing, the decline of social networks, changes in supply and services in the village, as well as the decline of the physical structure [14].

The aim of this paper is to discuss values of a specifically built structure in a rural area, rural planned settlements or its parts that create unique cultural landscapes with the environment. The paper analyses the values of planned rural settlements in the context of rural heritage and the values of the cultural landscape. The importance of planned rural heritage as a tourist attraction and potential destination is examined through a multi-level overview [15] of the regional area on the example of Western Slavonia, Croatia. Our research questions were:

1. Can we identify values of planned rural settlements as regional countryside capital?
2. What kind of values could be promoted for planned rural settlements?

In this paper, we present the results of an architectural historical overview of a case study of Gornji Vrhovci village in the western part of rural Croatia. Such an analysis offers insights into the processes of identity construction and image management of Croatian parts that are going through a decline, as well as patterns of change in the meanings and uses of rural space.

2. Planned Rural Settlements as Countryside Capital

Under the influence of modernisation processes in the world, including Croatia, there is a trend of devastation and deterioration of rural settlements. Croatia, as a part of common European area and society, cannot be excluded from current global social and economic processes (globalisation, deagrarisation, market-based agriculture etc.), so further deterioration and devastation of villages is to be expected [16]. Garrod et al. (2004) reconceptualised a wider concept of rural resources as ‘countryside capital’ consisting out of natural, physical and social capital [17]. The definition of countryside capital presently adopted by the Countryside Agency is ‘the fabric of the countryside, its villages and its market towns’ [in 17]. Therefore, the question arises whether the planned spatial structure can be recognized as countryside capital, i.e. as a special physical feature in a usual organic and spontaneous rural system. Cano et al (2013) propose that research of rural potentials or countryside capitals should include not only an examination of documentation and reuse potential but also intangible
aspects involved in the restoration of a building and the quality of the landscape where the building is located [18].

The analysis of indicators as a subgroup of a more complex construct is a proper tool for elaborating diffused term. In Table 1, there is an overview of different value concepts for identification of built heritage as rural development potential. Concepts on the higher level are countryside capital, cultural tourism, sustainability of rural development and sustainability of built heritage attractions. Some common ideas promoting village heritage can be found in presented complex concepts in a hierarchical subdivision from the countryside to the built heritage.

Table 1. Comparison of different value concepts for identification of built heritage as a rural development potential

| Countryside Capital [17] | Sustainability set of Indicators for rural development [19] | Rural Buildings as a Subject of Cultural Tourism [18] | Indicators for Assessing the Sustainability of Built Heritage Attractions [20] |
|--------------------------|-------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------|
| Agricultural buildings   | Environmental Linear landscape elements                      | Constructive elements of interest                    | Social Support from attraction to local communities                      |
| Rural settlements, from isolated dwellings to market towns | Economic Farmhouses                                      | State of conservation                                | Local residents' satisfaction with the operation of the attraction        |
| Historical features, such as historic buildings, industrial remnants | Organic farms                                             | Distance to urban core                                | Traffic congestion during peak tourism periods                          |
| Tracks, trails, bridleways, lanes and roads | E-commerce Inactive farms | Facility of access | Governance                                                              |
| Streams, rivers, ponds and lakes | Water quality | Water supply | Other spaces Covered                                                    |
| Water quality            | Woods, forests and plantations                             | Disinfection                                        | Covered                                                                 |
|                       | Distinctive local customs, languages, costumes, foods, crafts, festivals, traditions, ways of life | Electric installation                               |                                                                         |

3. Croatian rural space and rural heritage

According to the urban - rural typology of Eurostat [21], 79.1% of the Croatian territory is predominantly rural area. Village sites, with their regional identity, represent heritage that is insufficiently used but could be used for the purpose of sustainable development and development of tourism [16]. Croatian rural region, Slavonia, can be characterized as the area with the largest number of planned and regulated villages during the 18th century. They are now integrated into the landscape and contribute to the diversity of space as well as to spatial identity. Rural area heritage has long been considered with less attention than urban heritage. Hence, this paper presents two research questions, the first with the focus on planned village heritage values and the second examining planned village heritage contribution to spatial diversity and spatial identity.
The subject of this research was the reconstruction of the Gornji Vrhovci village in the period after the Second World War when it was devastated. The aim of the research is to recognize the planned spatial structure as heritage, to point out that heritage (the spatial structure of village) could be observed as a resource for sustainable development and thus also as the resource for the sustainable development of tourism. The paper seeks to highlight the tradition of planning villages in Croatia which is insufficiently recognized and used in development planning.

4. Methodology

The aim of the research was to identify the potential of planned villages in the function of sustainable development. The research is based on two methods: i) a data based inductive-deductive method and ii) by analysing historical written and graphical sources. Time frame analysis of available graphical materials was also used. The starting point of the research on the spatial structure of the Gornji Vrhovci village is its historical, economic, social, cultural, political and ecological context. The overall context influences the shaping of the spatial structure of the village as well as putting heritage to use for development. If the spatial structure of the village is considered as heritage, it should be recognized and understood and could be stimulating for the needs of sustainable development. Considering the spatial structure of the village as heritage, without understanding its past, can lead to a lack of recognition of its spatial characteristics, and in the development planning process to the loss of its spatial value.

The research on the reconstruction of the Gornji Vrhovci village after WWII relied mostly on the archives of the Croatian Ministry of Culture in Zagreb. To reconstruct the steps of reconstruction, daily press from the time was used, such as Vjesnik. The book by Alexandar Freudenreich [22] was used to gain insight into the building condition of demolished village structures. The book Neglected Heritage - Spatial Structures of Villages in Croatia [Zanemarena baština – prostorne strukture sela u Hrvatskoj] [23] was used to get insight into the architectural and building reconstruction of villages in Croatia.

5. Gornji Vrhovci

5.1. General information about the village Gornji Vrhovci

Gornji Vrhovci is the village in the Požega-Slavonia County, part of the municipality of Velika. The village is located on southern slopes of Papuk Mountain and has often been referred to as “Papučki” (of Papuk) through history. From the geographic point of view, the village is located in the micro-region of Ravnogorsko-papučko-krndijsko prigorje of Slavonia area between the Drava River and the Sava River, but more importantly, it is settled in the core of the area between three regional towns (Figure 1).

Figure 1. The regional position of the village Gornji Vrhovci (authors interpretation)
According to the Central Bureau of Statistics data, only ten people lived in the village in 2011 (www.dzs.hr) (Table 2). The village of Gornji Vrhovci lies at about 520 meters above the sea which makes it a mountain village. The village lies at the outer edge of the Papuk Nature Park but is in the Papuk UNESCO Global Geopark [24].

Table 2. Number of inhabitants in the village Gornji Vrhovci 1857–2011

| Year | 1857 | 1880 | 1890 | 1900 | 1921 | 1931 | 1948 | 1953 | 1971 | 1991 | 2001 | 2011 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Gornji Vrhovci | 251 | 263 | 293 | 304 | 260 | 282 | 190 | 204 | 140 | 72 | 12 | 10 |

Source: Central Bureau of Statistics, [25]

5.2. Village of Gornji Vrhovci before the Second World War
According to the cartographic presentation of the First Military Survey of Slavonia 1781–1783, the village Gornji Vrhovci consisted of only a few houses located along the Vrhovci creek [26]. Almost a century later, according to the map of the Second Military Survey 1865–1869, the village of Gornji Vrhovci appeared to consist of several grouped hamlets. By WWI, the number of inhabitants in the village was on the rise at the turn of the 20th century slightly more than 300 people lived in the village (Table 2).

Before WWII there were more than 250 inhabitants in the village. The cadastral plan shows that houses in the village were not arranged along the road but rather grouped in several hamlets outside the main road. There were roads leading to these grouped hamlets, but there were no internal paths. Houses were built of local stone while roofs were made of wood. It is safe to assume that the village had poor hygienic and sanitary conditions, and because the distance between houses was small, there was a great danger of rapid-fire spread.

6. Brief Overview of the Reconstruction of the Village Gornji Vrhovci
The village of Gornji Vrhovci was completely burnt down during WWII. After the end of the war, the new government – the People's Republic of Croatia - organized the reconstruction of the village. The reconstruction implied the construction of a new village on the same location. The reconstruction had the aim to be the model of the reconstruction of the hill-mountain village at the same location, respecting the standards of modern village construction (water supply, firefighting and hygienic and sanitary conditions) for further similar reconstructions.

As local population did not have either housing or food, the Municipal Committee of the People's Front of Osijek organized in 1945 collecting of material and financial resources for the locals (food, wardrobe, money). The project was managed by the Ministry of Buildings which appointed architect Alexandar Freudenreich, Croatian architect and writer (Zagreb, 21 November 1892 – Zagreb, 22 June 1974) to lead the process. He surveyed and documented the existing situation and, by August 1945, made a proposal and a report "for the terrestrial (regulatory) plan and the reconstruction of the destroyed and burned village of Gornji Vrhovci (Papučki)". Freudenreich made two versions of the spatial regulation plan for the new village and architectural projects for the reconstruction of houses [23], [27]. By December 1945, the Ministry of Buildings established the principles for the reconstruction, which determined "the size of the rowhouse, the construction of housing units, the construction of farm buildings, hygiene conditions, the construction of common buildings and the construction of common buildings for cultural and administrative purposes". Besides Freudenreich, the projects were designed by architect Boris Devide (also employee of the Ministry of Buildings) and surveyor Fedor Zaharjin [27]. Gornji Vrhovci represents the reconstruction of the village after WWII in which legal property relationships were resolved on the location.

Local sandstone was used as a building material. This was the way to integrate the village visually and materially to the landscape. The house layout was part of developed typology (one or more bedrooms) depending on the number of family members. Houses were single-story with a basement and an attic [26-
Since the village consisted of several groups of hamlets, Freudenreich proposed two versions of the reconstruction. In the first version of the reconstruction, the village was completely removed from the regional road. Three smaller squares (cemetery, home of culture, school and a source of water) were planned. The new village was planned to have parallel streets which would have been very difficult to construct due to the configuration of the terrain (Figure 2). This new village regulation proposal has not been implemented.

In the second version of the reconstruction, one part of the village is located along the main road while two other parts are grouped into hamlets. The existing spatial structure was respected while following firefighting sanitary-technical and hygienic conditions. There are three squares in this plan version (two along the main road - on the left and right of the road) and one that connects new hamlets. In the central part of the settlement, along the main road, the zone of central and public functions is planned (school, home of culture, agricultural cooperative, etc.). Freudenreich devoted great attention to the planning of the farmyard, i.e. the layout of residential and agricultural buildings. Residential buildings were located along the road, while agricultural ones were located in the second part of the yard.

The second version of the proposal for the village reconstruction was selected and the reconstruction of the village began in the spring of 1946. As reported by the Vjesnik newspaper, "the works on the construction of Gornji Vrhovci will be performed by the Youth Brigade on a voluntary basis" [29]. By the end of 1946, sixteen very beautiful and spacious stone houses were constructed, while in 1947 a further 38 new houses and 54 farm buildings were planned to be built [30]. Along with residential buildings, a school, a home of culture, a local people’s committee building, a local agricultural cooperative and a social hall were planned to be built. In total, the plan envisaged the construction of 78 residential houses (in nine types), while about fifty were constructed. Thanks to good management and the realistic plan, most of the planned settlement was built. The building site was run by Ivan Smojvir,
and the construction was carried out by the peasants and the youth work brigade of the national hero Nikola Demonja from Osijek and by youth working brigade Branko Bjegović from Slavonski Brod [30]. Unlike some other village renovation plans, the Gornji Vrhovci regulation plan was conceived realistically, taking into consideration the number of residents and the necessary functions. Most of the settlement is located along the street that follows the terrain configuration. Residential houses line the street on both sides.

Figure 3. Situation of village Gornji Vrhovci in 1968 and 2017 [31]

During the reconstruction of the village, Freudenreich introduced the concept of zoning (housing, central functions - school, home of culture, agricultural cooperative, cemetery - source of water) and modern living conditions in the village (organization of the farmyard and the water supply network). A significant part of the project is preserved in the legacy of Architect Freudenreich, which is kept at the Ministry of Culture of the Republic of Croatia, but it lacks a significant part - in particular, the nine variants of residential buildings.

Apart from Gornji Vrhovci, Freudenreich also wrote reports on the existing state and proposals for the reconstruction of villages: Šumetica, Šagovina, Golobrde, Trnava Gornja and Škrabutnik. Visibly shaken by living conditions of village inhabitants in the region of Slavonia, in November 1945 Freudenreich wrote the text "Po garištima" [On the sites of fire] which was published only in 1972 as part of the “Kako narod gradi” book [How the people build] [22]. Unfortunately, the village of Gornji Vrhovci was damaged again during the Homeland War (1991-1995). The reconstruction of the village after this last war was not planned, which has resulted in the appearance of today's abandoned village (Figure 3). Houses are not standardized and typified. Local stone was not used as the building material, but brick. It can be concluded that the village lost its spatial identity. The reconstruction of the village of Gornji Vrhovci is by all means a unique example of the reconstruction of the village after war destruction where consideration was given
to satisfying the needs of the inhabitants, the integration into the landscape and the introduction of modern sanitary and technical conditions. Apart from the fact that renewal had a political significance (during socialism reconstruction had an aim to show the care for the workers and rural inhabitants), it certainly respected the social, cultural and ecological principles of construction.

7. Conclusion

Each geographic region of Croatia has specific spatial forms and village features (compact, linear, dispersed) so in order to put the preserved spatial structures into the function of development, their spatial features must be known. The area of Slavonia has a tradition of planning villages for more than two and a half centuries and it must be recognized and brought to awareness as a heritage and put into the function of sustainable tourism development. Although the spatial structure of village Gornji Vrhovci is presented here as a cultural heritage (historical and spatial), this type of heritage is insufficiently recognized as a sustainable tourism development resource.

In the Požega-Slavonia County, one of the most interesting planned villages is the village of Gornji Vrhovci due to its specific spatial structure. The heritage of the spatial structure of the village represents only one segment of heritage, which can be put into the function of development planning. Until today, there are slightly more than 230 planned villages built in the past 250 years identified in Croatia. A field trip and research of historical maps showed that planned villages contribute to the spatial identity and spatial diversity of the rural area but are not recognized either as heritage or as a cultural tourism attraction [5]. Despite the need for the development of rural tourism in Croatia, the identity of spatial structures of the village are neglected by new development plans both in the sense of heritage and in the sense of potential for the development of rural tourism and spatial regeneration. Planned villages as part of the heritage can certainly be put into the function of tourism either through inclusion in tourist thematic trails (e.g. trails of planned village settlements) or as an additional content of other thematic trails like cycling trails and wine roads.

References

[1] Convention Concerning the Protection of the World Cultural and Natural Heritage, Adopted by the General Conference at its seventeenth session Paris, [Online] 1972 [Accessed 10th January 2020] Available at: https://whc.unesco.org/archive/convention-en.pdf.
[2] R.E. Pahl, “The Rural-Urban Continuum”, Working Session 3, Sociologia Ruralis, 6, pp. 299-329, 1966.
[3] S. Harper, “The British Rural Community:an Overview of Perspectives,” Journal of Rural Studies, vol. 5, no. 2, pp. 161–184, 1989.
[4] P. Cloke, “Counterurbanisation – a rural perspective”, Geography, 70, pp. 13-23, 1985.
[5] M. Jones, “The Concept of Cultural Landscape: Discourse and Narratives”, in Landscape Interfaces Cultural Heritage in Changing Landscapes, Editors: Palang, Hannes, Fry, G. (Eds.), pp. 30-50, 2003.
[6] Convention Concerning the Protection of the World Cultural and Natural Heritage, Adopted by the World Heritage Committee at its sixteenth session Santa Fe, United States of America, [Online] 1992 [Accessed on January 2020] Available at: https://whc.unesco.org/archive/1992/whc-92-conf002-12e.pdf.
[7] Recommendation No. R (95) 9 on the integrated conservation of cultural landscape areas as part of landscape policies, Council of Europe (Adopted by the Committee of Ministers on 11 September 1995) and the Appendix to Recommendation No. R (95) 9
[8] Council of the European Union 2014: Conclusions on cultural heritage as a strategic resource for a sustainable Europe, 20. May 2014, [Online] No. 216/2013, [Accessed 2nd March 2020] Available at: https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/educ/142705.pdf.
[9] European Parliament 2015: Towards an integrated approach to cultural heritage for Europe,
P8 TA (2015)0293. http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+TA+P8-TA-2015-0293+0+DOC+XML+V0//HR (accessed 2nd March 2020)

[10] European Cultural Convention, ETS No.018, Paris, [Online] 19/12/1954 [Accessed 10th January 2020] Available at: https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/018

[11] Convention for the Protection of the Architectural Heritage of Europe, Reference ETS No.121, [Online] [Accessed 10th January 2020] Available at: https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/121

[12] Council of Europe Framework Convention on the Value of Cultural Heritage for Society, Reference, CETS No.199, [Online] [accessed 10th January 2020] Available at: https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/199.

[13] P. Lowe, J. Murdoch, A. Flynn, and P. Lowe, “Regulating the New Rural Spaces : the Uneven Development of Land,” Journal of Rural Studies, vol. 9, no. 3, pp. 205–222, 1993.

[14] T. Lasanta, J. Arnáez, N. Pascual, P. Ruiz-flaño, M. P. Errea, and N. Lana-renault, Space – time process and drivers of land abandonment in Europe,” Catena, vol. 149, p. 3, pp. 810-823, 2017.

[15] V. Van Eetvelde and M. Antrop, “A stepwise multi-scaled landscape typology and characterisation for trans-regional integration , applied on the federal state of Belgium,” Landscape and Urban Planning, vol. 91, pp. 160–170, 2009.

[16] A. I. García, F. Ayuga, “Reuse of Abandoned Buildings and the Rural Landscape: the Situation in Spain “, American Society of Agricultural and Biological Engineers, vol. 50, no. 4, pp. 1383–1394, 2007.

[17] B. Garrod, R. Wornell, and R. Youell, “Re-conceptualising rural resources as countryside capital : The case of rural tourism,”, Journal of Rural Studies, vol. 22, pp. 117–128, 2006.

[18] M. Cano, “Preservation and Conservation of Rural Buildings as a Subject of Cultural Tourism : A Review Concerning the Application of New Technologies and Methodologie”, Tourism & Hospitality, vol. 2, 2:215, 2013.

[19] G. Ottomano, K. Govindan, A. Boggia, R. Viviana, A. De Boni, and R. Roma, “Land Use Policy Local Action Groups and Rural Sustainable Development . A spatial multiple criteria approach for efficient territorial planning,” Land use policy, vol. 59, pp. 12–26, 2016.

[20] W. Ren and F. Han, “Indicators for Assessing the Sustainability of Built Heritage Attractions : An Anglo-Chinese Study,”, Sustainability, vol.10, 7, 2504, 2018.

[21] Degree of Urbanisation (DEGURBA) - Local Administrative Units, Eurostat, [Online] 2020 [Accessed 23th April 2020] Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Territorial_typologies_manual_-_urban-rural_typology#Results.

[22] A. Freudenreich, “Kako narod gradi na prostoru Hrvatske”, [Vernacular architecture on the Croatian territory] Republički zavod za zaštitu spomenika kulture, Zagreb, pp. 344, 1972.

[23] J. Kranjčević, “Zanemarena baština – prostorne strukture sela u Hrvatskoj”, [Neglected Heritage - Spatial Structures of Villages in Croatia], Srednja Europa, Zagreb, pp. 202, 2018.

[24] Park prirode Papuk, [The Natural Park Papuk], [Online] 2020 [Accessed 2nd March 2020] Available at: http://pp-papuk.hr/1.

[25] Državni zavod za statistiku, [Central Bureau of Statistics], [Online] 2020 [Accessed 10th January 2020]

[26] Z. Živković, “Aleksandar Freudenreich (arhitekt i graditelj)”, Monumenta Croatica, Zagreb, pp.78, 1992.

[27] K. Galović, “Prosvjetna ognjišta i domovi kulture, Arhitektura u Nezavisnoj Državi Hrvatskoj (1941-1945)”, Vijenac, vol. 4, 10 (229), 2002.

[28] Ministarstvo kulture Republike Hrvatske, [Ministry of culture, Republic of Croatia] (MK UZKB), inheritance Aleksander Freudenreich, archive.
[29] Osiječani izgrađuju Gornje Vrhovce, prvoboračko selo na obroncima Papuka, *Vjesnik*, 6 (480), pp. 4, 15th November 1946.

[30] Za izgradnju popaljenog sela Gornji Vrhovci dat će ove godine građanstvo Osijeka 8.000.000 dinara, *Vjesnik*, 7 (556), pp 5, 15th February 1947.

[31] Državna geodetska uprava, Geoportal, 1:5.000 [Online] 2020 [Accessed 2nd March 2020] Available at: www.dgu.hr.