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FORTIFICATIONS OF THE RAPALLO BORDER AND THEIR ROLE AS CO-CREATORS OF SPACE

Janez Peter GROM[1,*], Alenka FIKFAK[2], Luka SKANSI[3]

[1, 2] *Fakulteta za arhitekturo, Univerza v Ljubljani, Ljubljana, Slovenia*
[3] *Istituto universitario di Architettura di Venezia, Venice, Italy*

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Abstract. In the period between the two world wars, the latent tensions between the European nations resulted in the construction of defensive positions on the borderlines of major European countries. Under the same conditions, the Italian Kingdom built an extensive fortification line, i.e. the Alpine Wall. The Kingdom of Serbs, Croats, and Slovenes (SHS) replied to it with the Rupnik Line. On the base of the Treaty of Rapallo, a 289-km long demarcation line was built with an exceptional defence infrastructure, which interfered with vast natural areas of exceptional quality that are protected by various nature conservation regimes today. The research presented in this paper is focused on a specific land expropriation. The goal is to understand the historical perspectives and assess the current significance of this fortification system with its impact on the natural environment. The system of spatial assessment of the architectural, urban, regional and spatial planning aspects and landscape interpretation has been developed with the use of spatial planning mapping and other methods. It was tested on the case study of the Žiri Municipality to establish a possible systemic base on which the entirety of the Rapallo border with its defence infrastructures could be mapped and their contemporary role assessed.

Keywords: Rapallo border, Treaty of Rapallo, Alpine Wall, Rupnik Line, fortification infrastructure and landscape, heritage interpretation, cartography as a method, Žiri municipality, heritage development potentials.

Introduction

The absence of objective consideration, analytical system, assessment criteria, and maintenance and promotion schemes of fortification heritage is evident and the question of its utilization and sustainability is hence gaining significant importance. Armed conflicts that occurred in European territories after World War I have pushed away, both in the physical context and in cultural memory, the role and importance of the heritage. Cultural heritage is a significant force for the 21st-century Europe. "Not only is it at the heart of what it means to be European, it is being discovered by both governments and citizens as a means of improving economic performance, people's lives and living environments. Evidence demonstrates that relatively modest investment in cultural heritage can pay substantial dividends. These can be taken economically but also in terms of improving environmental sustainability and social cohesion." (European Commission, 2014). The European Green Belt Association (Riecken, Ullrich, & Lang, 2007) is a good example of an ongoing initiative based on an exceptional symbol of European history. The association focuses on a route that was for a long time one of the most divisive barriers in Europe and promotes it as an opportunity, a bonding legacy of history, on which a new network connecting high-value natural and cultural landscapes was created. The Walk of Peace (Kravanja, 2014) is a well-established example of a cross-border tourist promotion that is based on an invisible line that connects places, people, cultures and nations and which contributes to smart development of the area and region. The Cultural Routes programme (Council of Europe, 2015) was launched by the Council of Europe in 1987 with the objective to demonstrate, by means of a journey through space and time, how the heritage of the different countries and cultures of Europe contributes to a shared and living cultural heritage. Individual studies on the heritage of the defense architecture of the Rapallo border on today's Slovenian territory has been made, yet none of them addressed defense lines of both bordering nations at the same time (Bizjak, 2016), none of them took into

*Corresponding author. E-mail: *janez.grom@fa.uni-lj.si*

perspective the entire stretch of the Rapallo border from the Alpine region to the Adriatic sea (Jankovič Potočnik & Tonič, 2012) and none of them discussed the spatial implications of the siting of such infrastructure systems in the respective landscapes, furthering the question of heritage protection through modern technologies, thus granting general accessibility to information.

1. Regional historical context

Slovenian territory lies at a historical crossroads between European nations, it is a melting pot of cultures, and thus also a place of tensions and conflicts. Ever since Antiquity, this territory, tucked between the Gulf of Trieste, North-Eastern Alpine Space, and the Ljubljana Basin, saw cultural exchange, and was intersected by the main migration and trade routes of Central and South-Eastern Europe. It connected the Balkans region with Central Europe, and initially nomadic nations and later Slavic populated lands in the East with the Romance cultures at the Apennine Peninsula and the Adriatic Sea. The tensions between the Byzantine Empire, also referred to as the Eastern Roman Empire, and the Western Roman Empire had their epilogue in September 394 in one of the most important battles of the Late Roman period, which took place in the Vipava Valley area, i.e. the Battle of the Frigidus or the Battle of the Frigid (Cold) River (Springer, 1996). This conflict was of exceptional importance as its outcome consolidated Christianity in the Western Roman Empire and thus decided the entire future identity of the European continent.

The Roman port city of Tergeste was the eastern entry point to the Apennine Peninsula. As a consequence, the entire region was under constant pressure of Eastern nations. Emona, now Ljubljana – the capital city of Slovenia, was torn down by the Huns, led by Attila, in 452, and Aquileia (Slovene: Oglej) was destroyed the same year (Hriberšek, 2013).

Much later, for several centuries, this territory fell into geopolitical and economic interest sphere of the Habsburgs, who turned Trieste into the central commercial centre of the Austrian empire and continuously prevented the intrusion of Ottoman interests into continental Europe. To this day, some built elements remain, either architectural or comprehensive urban designs of settlements, which testify to these historical moments. The territory of present-day Slovenia and the territory populated by the Slovenian ethnic community in Italy is crisscrossed by a network of connected settlements, formed into fortified villages (Slovene: tabor), whose main purpose was, by using fortification elements, to protect the population and the communication network as a system of warning fires lit on top of hills from South Balkans to Vienna. During the industrial revolution, the 577.2-km Vienna–Trieste Southern Railway was built as one of the key infrastructural projects of the Austro-Hungarian Monarchy (Dietrich, 1994), which strengthened the East–West connections. Its course ran directly across the territory that was later intersected by the Rapallo Border. A critical turn of events with continuously shifting political orientation and the physical border between the two empires once again occurred in this territory. The early 20th century saw the fall of Austria, yet another great European empire. The armed conflict that resulted from the fall to the fall again took place in the Alps and their surrounding valleys. At the crossroads of three European groups of nations – Germanic, Romance, and Slavic – this area became the point of collision and one of the largest World War I battlefields. In this period, the territory became a bloody battleground, with torn down cities and changed morphology of vast slopes of the Alps. The consolidation of Italian army's positions on the one hand, and those of the allied German and Austrian forces on the other hand meant, due to the specific geology, that the trenches were carved into the bedrock of the mountains. The kilometres of tunnels, trenches, concrete bunkers, fortified machine-gun nests are both tangible architectural heritage and a silent witness of the turbulent past. On the other hand, this gross interference with nature and its changed image needs to be assessed; today, most areas with former fortification infrastructure are under rigorous natural protection regimes. An outstanding case is the battle at Mount Batognica, where due to several years of stalemate Italian forces dug trenches below Austrian positions and filled them with explosives (Piekalkiewicz, 1996). After discovering this, the Austrian side did the same. The ensuing explosion permanently transformed the entire hilltop and thus the appearance of the devastated hillside.

Historical tensions between European nations in the period during both wars resulted in the construction of extensive fortification systems on border territories. Similarly, between 1930 and 1942 the Kingdom of Italy built an extensive, 1851-km fortification infrastructure called Vallo Alpino (the Alpine Wall) along the entire alpine arc, at its northern land borders with France, Switzerland, Austria and the Kingdom of Serbs, Croats, and Slovenes (SHS), from the Gulf of Genoa in Italy to the Rijeka Bay in present-day Croatia. In the then territory of the Kingdom of Serbs, Croats and Slovenes, as a counter measure to the Alpina Wall, the construction of the 289-km Rupnik Line commenced in 1937, stretching from Jalovec to Rijeka (Figure 1), throughout the length of the border with the Kingdom of Italy (this section of the Alpine Wall was called Vallo Littorio).

It is the aim of this research to determine how the landscape was transformed by the construction of the defence infrastructures of the Rapallo Border and understand the mutual relations between the now tangible and intangible heritage, i.e. heritage that, in its time, rather than defining the political border, it divided nations, ethnicities and local socio-economic streams. It is our intention to assess the actual status in spatial information systems and databases of the infrastructure elements of both defence infrastructures, as until now they have not been recorded and their cultural significance and spatial implications could not be assessed.

2. Rapallo border

Under the Treaty of Rapallo of 1920, which delineated the border between the two kingdoms (Gombac, 2007), contractual provisions were put in place as consolidation of positions, which were finally connected into a systematic defence infrastructure on both sides. The Italians built the Alpine Wall defence infrastructure and the SHS Kingdom built the Rupnik line defence infrastructure.

This indiscriminately interfered with natural areas of exceptional quality and cut in a very concrete and physical way into the existing settlement structure and impact areas – in the same ways as the treaty in theory. In the first half of the 20th century and in the aftermath of World War II, the discussions on land use and the transformation of the natural environment into the built environment usually addressed post-war reconstruction and urbanisation with expansion of cities, the demographic boom, and general infrastructure building in Europe. The studies dealing with these topics mostly focused on applications of contemporary sustainable and resilient systems for developing urban areas. Italian institute ISPRA defines the "exploitation of terrain as a change from the natural terrain (unused terrain) to artificial terrain (used terrain)" (Munafò, 2016). As part of this comprehensive definition, questions remain completely unexplored as to the spatial intrusions of the military fortification infrastructure, which was extensively built between the two Wars across Europe; The Metaxas Line in Greece, the Maginot Line (Ligne Maginot) in France, the Hindenburg Line (Siegfriedstellung) in Germany, the Fortified Position of Namur (Position Fortifiée de Namur – PFN) and Fortified Position of Liège (Position Fortifiée de Liège – PFL) in Belgium, the defence system Reduit in Switzerland, the Mannerheim Line in Finland, Italian Alpine Wall (Vallo Alpino) and Rupnik Line (Rupnikova linija) in the SHS Kingdom, in a total length exceeding 4000 km, considering only the most extensive ones (Kauffmann & Jurga, 2014).

When talking about this past we first need to understand its scope. The Alpine Wall itself was partially used until 1991–1992, i.e. until the end of Cold War. Without doubt, the impacts of this infrastructure on space are still relevant today. The French sociologist Henri Lefebvre stresses that, rather than limited to economic and ideological aspects, changes are socially overwhelming. According to Lefebvre (1974), social transformation must be understood as an opportunity rather than a restricting fact. Lefebvre (1974) claims that space is a social product or a complex social construct affecting spatial practices and perception.

The entire stretch of the Rapallo Border, with the Alpine Wall on the one side and the Rupnik Line on the other, was thus authoritatively and uncritically sited. It divided the territory and cultures, it cut into the natural and social fibre, tore apart social lives and the existing built tissue, following the goal mentioned. As such it never fulfilled its supposed function and was never entirely

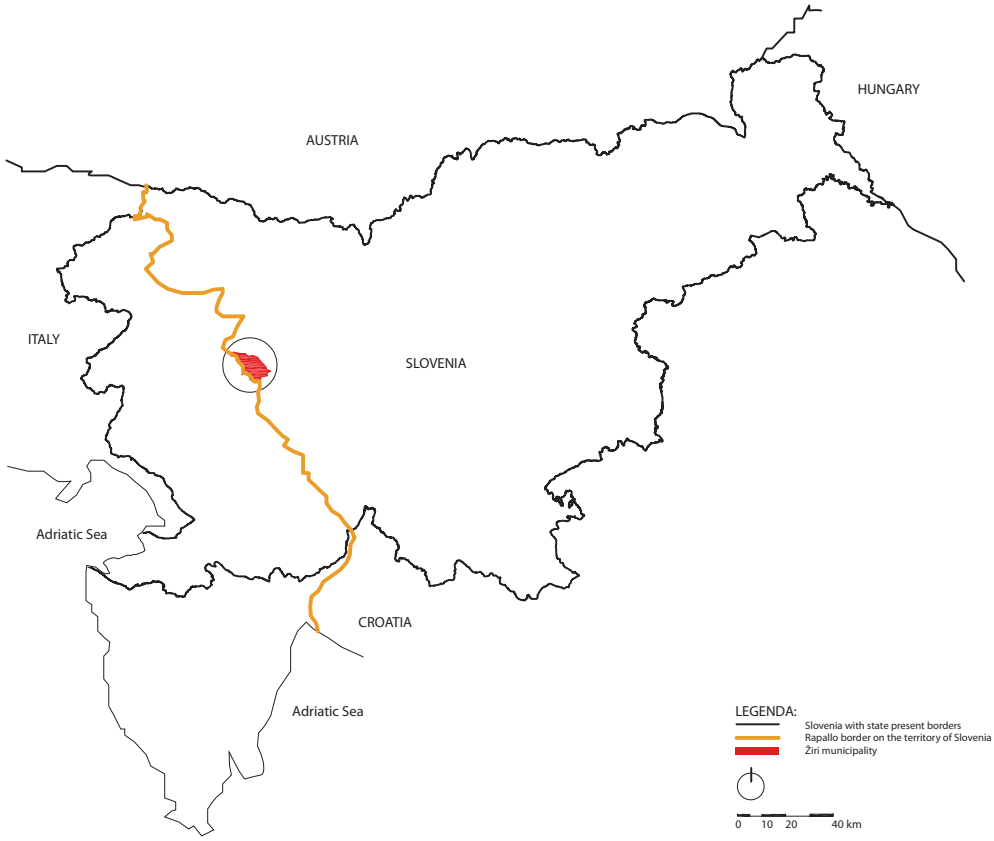

Figure 1. Rapallo border in Slovenian territory

completed. It protected only "seemingly", fell instantly and thus remained an "unused border". However, its impacts are permanent; this initially reinforced concrete infrastructure has remained abandoned. Nowadays it is treated as heritage, but currently it is only informally recognised as such. At the same time, its impacts are overreaching, as the defence lines followed the politically determined Rapallo Border, while other parameters on the ground were not considered: national structure, cultural structure, settlement, infrastructure connections, and natural assets. The question of its contemporary significance remains open and its future potentials are mostly not considered, as currently the structures both of the Rupnik Line and the Alpine Wall are not protected by the Institute for the Protection of Cultural Heritage (ZVKD), i.e. neither as architectural heritage nor as a spatial phenomenon. These structures are largely situated in areas under natural protection schemes (Triglav National Park and protection regimes, Natura 2000, water protection, etc.), with deteriorated and disorganised infrastructure, so they are all the more difficult to deal with.

3. Methodology and tools

Cultural heritage can be represented by buildings, artwork and monuments, but also non-material manifestations like language, dance, song, cuisine, custom, religion, landscape, literature, art, philosophy and, even television programs (Ogleby & Rivett, 1995). Naglič (2005) finds that the heritage of Rapallo Border territories is extensive and diverse, covering both tangible heritage (Figure 2a) in the form of many material remains in space, as well as intangible heritage (Figure 2b) in the form of the so-called "living heritage of places, people, and the many life stories connected with the border" (Lah, 2010).

The case of the fortification systems that materialized from the Treaty of Rapallo is a unique feature in space. As stated, it physically divided three major European groups of people; Germanic, Romance, and Slavic. As such it established a specific and artificial situation in the societies that inhabited the affected regions. Furthermore, it strongly impacted various terrain morphologies, all the way from the Alpine region, across the Karst plains to the Adriatic coastline. The Italian military interpreted the features of the landscape with their own logic as did the military of the SHS Kingdom in its own unique way. Studying original archival materials is mandatory to understand these different logics that resulted in different approaches of the erection of the defence infrastructures within the same microlocation. The larger scale subdivision based on landscape typologies was complemented by taking advantage of a wide array of natural features on the microlocation; the individual fortification and defensive structures that are still present today are part of the tangible heritage. All these interventions drew inspiration from the landscape and helped to form a new landscape that we recognize in space still today and can be seen as a contemporary added significance in the landscape as intangible heritage.

The study of the question and spatial phenomenon of Rapallo fortification lines and related territories requires, as an element with a wide range of impacts, the treatment of historical content, understanding of spatial implications, both through a concrete spatial dimension as well as the temporal aspect, and the understanding of the development and education potential with the help of modern technologies.

The significance of subject matter as cultural heritage, through the elements listed by Ogleby and Rivett (1995), and their connectivity, is essential for understanding the impact on landmarks in space.

Given the exploration of the significance of spatial landmarks, cartography was used as a method of studying the physical form of quantifiable and legible content. This also involves the studying of historical maps and other archival documents. These revealed the unique perspectives on landscape interpretation prioritizing the military exigences yet the same logics can be put to other purposes in landscape interpretation today.

Figure 2. A bunker with camouflage above the Žiri Basin – tangible heritage (figure 2a – left; source: author's own archives). The interplay of natural and man-made elements in the landscape – intangible heritage (figure 2b – right; source: Roberto Ferrari)

Using state-of-the-art mapping methods, allowing for affixing spatial data with a wide set of accompanying information, such as the geographic information system (GIS), opens new opportunities for work concerning heritage. The GIS system can always include comprehensive and highly detailed documentation information on the physical characteristics of heritage and settings through textual descriptions, drawings, and photos (Riveiro, Arias, Armesto, & Ordóñez, 2011), and 3D scanned or virtual models (Tsirliganis et al., 2004; Styliadis et al., 2009; Remondino, 2011). Through comprehension of cartography, synthesis, and by understanding the specific spatial developments, it becomes clear that the landscape or the entire impact area is part of heritage as well (Lowenthal, 1993) – the landscape that the Rapallo Border is embedded into and permanently defines it, while, on the other hand, the terrain morphology itself defined and prejudiced the strategy of siting the fortified system. In this context, the verification of cartography on several levels is an efficient method to understand the impacts of siting the fortification systems, from the viewpoint of understanding the implications related to infrastructure, settlement, and landscape image. Through the study of archival data and verification with modern mapping technologies and terrain surveys we established the first step to assess how the inclusion of defence lines of the Rapallo Border influenced the landscape and spatial development.

To that end, the following has been studied and interpreted:

- historical cartography – Slovenia on military survey maps 1763–1787 (1804) – 3rd volume; Josephinische Landesaufnahme 1763–1787 (1804) für das Gebiet der Republik Slowenien, scale 1:28,880; Franciscan Cadastre, 1819–1950 (source: Archivio di Stato di Trieste); Topographical map of the area (*Italian map*) made around 1930; scale: 1:25,000;
- surveying data (Surveying and Mapping Authority of the Republic of Slovenia) and digital orthophoto maps, 2014; scale 1:5000;
- statistical data Statistical Office of the RS – SI-Stat;
- and interpretation of the collected data using various tools: CAD, Esri, DigitalGlobe, GeoEye, Getmapping, Aerogrid, GIS User Community.

Treating data using mapping is of key significance when integrating the collected information from individual periods into the spatial context to correctly assess and interpret the mutual effect between landscape and infrastructure. We can recognise three main criteria for treating heritage in the context to space. A systematic understanding of space in relation to scale simplifies the legibility and compilation of data. The research team studying the case of military industrial compounds, Dagu Dock of Beiyang Navy, China, proposed a continuous scale composed of regional, site, and building scales as a framework to organize information, technologies and methodologies in GIS-based cultural heritage conservation studies (Mao, Liu, Zhou, Huang, & Li, 2008). In this manner, based on the general guidelines defined in the authentic defence strategies of both bordering nation's military doctrine, the following scales were determined to facilitate the systematisation of the study:

1. Regional scale. In the regional scale, the historical performance of the heritage site on politics, economy, cultural and social development is tested though GIS spatial analysis.
2. Site scale. In the site scale, the interaction of space and infrastructure is studied, in the sense of understanding and interpreting logics of site selection and the impact of infrastructure in terms of further development of the site. Historical contexts of sites, towns, or landscapes, reconstructed in a GIS-based model, are key concerns of the spatial and historical interpretation of the heritage investigated.
3. Building scale. From a contextual perspective, heritage properties or assertions can be understood though inherited historical spatial phenomena on its landscape and site scales. This finer-scale analysis allows for studying the individual relations between the individual elements of fortification systems with their setting and checking their impacts on the micro location.

4. Case study, municipality of Žiri

After the gathering of relevant archival information concerning the placement and installation of the Rapallo Border demarcation line, the Alpine wall defence on the Italian side and the Rupnik line defence system on the SHS side, the data were set to be verified through information available in modern cartography and GIS databases. An absolute lack of information was discovered as none of the structures evidenced in the historical data was available in these systems.

The research was set to carry out terrain surveys in the location of the municipality of Žiri, since it was recognized as a possible site of interest due to its rich terrain morphology, the close proximity of the defence systems to each other and their closeness to the border line set in the middle of the settlement of Žiri.

The settlement of Žiri lies in the centre of the Žiri Basin in the Gorenjska statistical region, in the extended upper part of Poljanska Sora at an altitude of 478 m above sea level. It is placed in the junction of tree Slovenian regions: Gorenjska (Upper Carniola region), Primorska (Littoral region) and Notranjska (Inner Carniola). The settlement of Žiri is the administrative centre of the Municipality of Žiri, founded in 1994.

The settlement was placed to the right of the heavily fortified border between the Kingdom of Italy and the Yugoslavian kingdom before World War II. During the postwar development, the prewar heritage lost its importance and impact on daily lives and as such it was slowly erased from living memory (Figure 1).

As the Italian border was pushed much further west, the new state of Yugoslavia did not have a real need for this defence infrastructure as well as no institutions to take care or even notice these built elements in space. As the

role of the infrastructure became marginal the surveys that treated the mapping of the space completely ignored the built structures forming this formidable defence system.

During the phase that followed studies of the archival material the work in the research constituted of terrain surveys. It became evident that the built structures were left to dereliction and oblivion by neglect. The research was carried out on two levels.

On the *site-level* scale we tried to identify the structures still present and verify the correctness of the historical data. As found in the historical documentation both the Alpine Wall and the Rupnik line consisted of a wide selection of fortification typologies that each served to a specific purpose and task. According to their function they were sited on a selected ground following military necessities, both in the sense of their defensive role or as a support to an offensive strategy. Some were mere observation posts taking advantage of vantage points that today offer the most amazing views of the landscape as it was discovered in the field survey.

The survey mostly dealt with elements constituting the Rupnik defence positions and only the relationship to the Rapallo border line and some major positions of the Italian Alpine Wall was established. The examination of the site showed that all the positions of the Rupnik defence infrastructure in the municipality of Žiri revealed an intricate system hidden for almost 70 years.

On the second level, i.e. the level of the *building scale*, the discovered structures were identified by comparing historical data; as a result, typologies were determined (Figure 3).

A serious obstacle discovered in the identification of the individual structures of both defence lines is the question of ownership. The structures were originally built at the discretion of the military body and no real consideration of the ownership of land plots where the infrastructure was placed was given any weight. The result in today's reality is that the elements of these infrastructures are scattered in the landscape. Mostly they are hidden and hard to identify, yet some of them occupy prominent positions across the landscape as their original role was to control specific sections of this landscape. They are immovable giants of a bygone era still marking the territory today – once important and affecting everyone, while known only to few today. The ownership of the land where the elements are placed meant that access to them is sometimes accompanied by difficulties when trying to map them.

The discovered relationships of individual structures within the system showed a unique way of interpreting the "micro landscape" based on the period military logic.

Moreover the dialogue among the Rupnik line, the Rapallo border in between and the Alpine Wall well defined the entire landscape in a larger scale. It is evident that the placement of these systems affected greatly both the natural landscape and also the built structure of the settlement of Žiri that is squeezed between these two lines, crossed by the Rappallo border and, in fact, positioned in the "space in between".

It is only by carefully mapping the locations of individual structures today that we can assess their relation to historical data. Only adequate field surveys carried out in the entire stretch of the Rapallo border, from the Alps

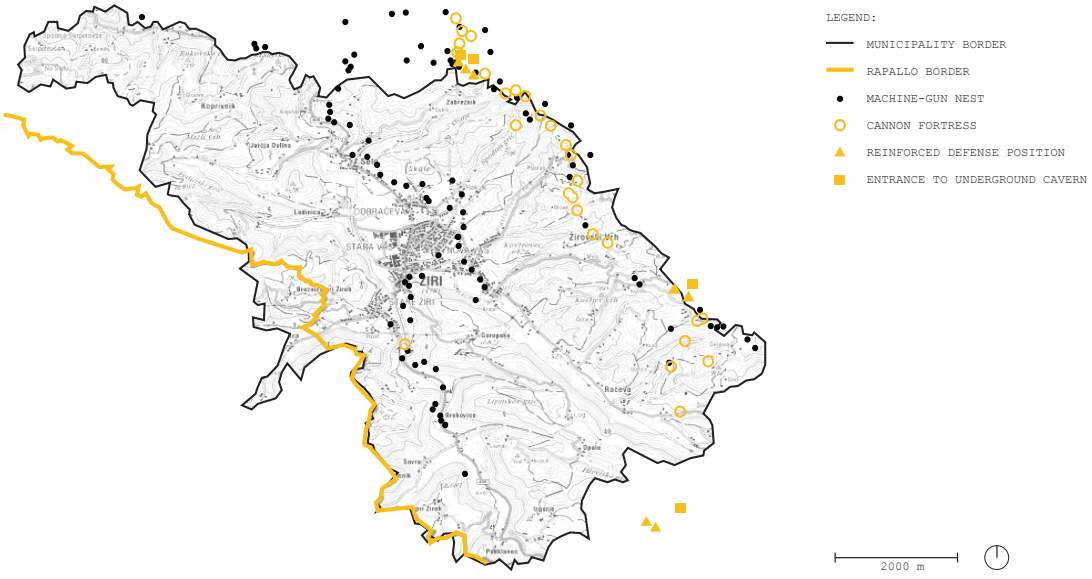

Figure 3. Municipality of Žiri – discovered elements of the Rupnik fortification system with defined typologies and the Rapallo border

to the Adriatic Sea, will allow the full understanding of the impact of these systems on the landscape and other quantifiable elements of space on the *regional scale*. At this point we have some data accessible publicly but the majority is left to be discovered. An appropriate way to do this is shown on the case of Žiri.

The current state of this massive systems remains formally undiscovered and they serve to no purpose at all although they have a clear presence in the landscape; they were built to comply with specific agendas and they influenced the culture of the nations involved. Their specificity in the logic of siting follows some of the common rules of urban design (orientation, views, climate, and terrain morphology), yet they are almost completely uncharted today and as such have no real impact on adjacent realities. These structures represent a mammoth infrastructure with interconnected inner relationships forming two unified systems that are not available to study today ‑ as they are undiscovered.

Furthermore it is possible to define the position of these structures that we define as heritage, their role within the system, and their effects on the space where they were sited, so that a formal recognition of this heritage can be made. This formal recognition would allow us to further the assessment of this heritage and assess it in the sense of discovering its contemporary potentials in a wide array of fields of socio-political and socio-economic interests.

Conclusions

Military infrastructure heritage and related territorial development have development potential. This overview presents considerations about the significance of the Rapallo Border fortification systems and the impacted border areas, i.e. the contested areas. Understanding spatial content and relations therein, as a consequence of infrastructure siting, is of key significance for understanding all accompanying impacts that the development had on the natural landscape, the built infrastructure with the development of settlements. To allow the testing of different historical roles in different periods the defence infrastructure had on the landscape and, vice versa, adoption of data interpretation and presentation through virtual and augmented reality is a necessity. Along with theoretical considerations, this is why a wide discussion about the topic is important, while the general accessibility of data is a prerequisite. The interpretation of the Rapallo Border as a former separation area differently influencing both sides of the border and the landscape in unique ways, as a consequence of the logics implemented in the positioning of the infrastructure, adds to the significance of this type of heritage. In this sense it can become the engine of development of a region and, particularly, the tool allowing the heritage with the possibilities offered by virtual and augmented reality technologies to acquire financial means necessary for maintenance, accessibility and education development (Graham, Ashworth, & Tunbridge, 2000).

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RAPALLO SIENOS ĮTVIRTINIMAI IR JŲ VAIDMUO KURIANT ERDVĘ

J. Grom

Santrauka

Tarpukario laikotarpiu užslėpta įtampa tarp Europos tautų lėmė gynybinių įtvirtinimų statybas tarp didžiųjų Europos šalių teritorijų. Tokiomis aplinkybėmis Italijos karalystė statė ilgą įtvirtinimų liniją, pavadintą Alpių siena. Jugoslavijos karalystė į tai atsakė Rupniko linijos statyba. Ji atsirado remiantis Rappallo sutartimi. Tai 289 km ilgio demarkacinė linija, nužymėta išskirtine gynybine struktūra, įsiterpusia į didžiulius natūralius ypatingos vertės plotus, šiuo metu saugomus įvairiais gamtos apsaugos reglamentais. Straipsnyje pateikiamas specifinio gamtos nusavinimo tyrimas. Pristačius istorinę raidą, siekiama nustatyti gynybinių įtvirtinimų dabartinę vertę ir jų poveikį gamtinei aplinkai. Aplinkos vertinimas architektūriniu, urbanistiniu, regioniniu ir erdvės planavimo aspektais ir kraštovaizdžio interpretavimas yra atliekamas taikant erdvės planavimo analizės žemėlapiuose ir kitus metodus. Tyrimas patikrintas Žiri savivaldybės atveju, sukūrus siūlomą sisteminę bazę, kurioje galima nužymėti Rappalo sieną su jos įtvirtinimais ir įvertinti jos šiuolaikinį vaidmenį.

Reikšminiai žodžiai: Rappalo siena, Rappalo sutartis, Alpių siena, Rupniko linija, gynybiniai įtvirtinimai ir kraštovaizdis, paveldo interpretavimas, kartografijos metodas, Žiri savivaldybė, kultūros paveldo potencialas.