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Prenamjena i održivo korištenje napuštenih vojnih prostora u Urbanoj aglomeraciji Zagreb

Conversion and sustainable use of abandoned military sites in the Zagreb Urban Agglomeration

U radu se daje pregled stanja napuštenih vojnih prostora na području Urbane aglomeracije Zagreb, temeljen na provedenom kartiranju napuštenih vojnih prostora, kojem su prethodili pregled službenih digitalnih orto-foto karata, podataka Katastra nekretnina i prostornih planova, kao i konzultacije sa zavodima za prostorno uređenje županija čiji su dijelovi uključeni u aglomeraciju. Potom se analiziraju dosadašnje prakse prenamjene vojnih *brownfielda* i optimalni načini njihova budućega korištenja u ovisnosti o njihovu specifičnom položaju u urbanoj aglomeraciji na temelju istraživanja koje je uključivalo polustrukturirane intervjue s ključnim dionicima regeneracije *brownfielda* u Urbanoj aglomeraciji Zagreb.

The paper provides an overview of the state of abandoned military sites in the territory of the Zagreb Urban Agglomeration based on mapping, which was preceded by an examination of official digital ortho-photo maps, data from the Real Estate Cadastre and spatial plans, as well as consultations with physical planning institutes. Furthermore, previous brownfield conversion practices and optimum future use of military brownfield sites have been analysed, depending on their specific position in the urban agglomeration. The analysis is based on research that included semi-structured interviews with key stakeholders in brownfield regeneration in the Zagreb Urban Agglomeration.

Key words: vojni *brownfieldi*, prenamjena lokaliteta, modeli prenamjene, Urbana aglomeracija Zagreb

Ključne riječi: military brownfield, conversion practice, conversion models, Zagreb Urban Agglomeration

Uvod

Brownfield prostori ili *brownfieldi* danas su često tema istraživanja i stručnoga rada arhitekata i urbanista, geografa, ekonomista, ekologa, sociologa i drugih profesija. Obnova *brownfielda* dobiva sve jaču političku podršku na svim političkim razinama, kroz EU, nacionalne i lokalne razvojne dokumente, a u središtu je interesa zbog doprinosu održivom razvoju, prevenciji neracionalnoga prostornog rasta gradova (engl. *urban sprawl*) i revitalizaciji gradskih središta (Hercik i dr., 2014). Ovaj rad daje pregled stanja napuštenih vojnih prostora na prostoru Urbane aglomeracije Zagreb, odnosno lokacija korištenih za potrebe Jugoslavenske narodne armije za vrijeme prethodne države te za potrebe Oružanih snaga Republike Hrvatske u razdoblju od stjecanja samostalnosti Hrvatske. Obuhvaćene su vojne lokacije u širem smislu, odnosno napuštene vojarne i ostali objekti koji su primarno služili vojsci, poput upravnih zgrada, bolnica, skladišta, poligona, radarskih postaja i drugih. Provedena je i evidencija planiranih i provedenih procesa prenamjene.

U prvom dijelu rada dan je teorijski okvir istraživanja polazeći od pregleda dostupnih domaćih i stranih relevantnih znanstvenih radova i projekata i nastojanja sistematizacije dosadašnjih istraživanja. U drugom dijelu rada dan je pregled lokacija vojnih *brownfielda* na prostoru Urbane aglomeracije Zagreb te su analizirane prakse provedenih prenamjena. Rezultati istraživanja prikupljeni su analizom relevantne prostornoplanske dokumentacije, kartiranjem lokacija te provedenim intervjuima s relevantnim dionicima prostornog razvoja. U posljednjem dijelu rada na temelju provedenih istraživanja izrađeni su modeli prenamjene vojnih *brownfield* lokacija.

Cilj istraživanja bio je provjeriti hipoteze:

- napušteni vojni prostori u Urbanoj aglomeraciji Zagreb uglavnom nisu privedeni novoj namjeni
- jedan od čimbenika uspješnosti provedbe planiranoga procesa prenamjene vojnoga *brownfielda* jest njegov položaj unutar teritorija urbane aglomeracije.

Introduction

Today, brownfield sites or brownfields are often the subject of research and professional work by architects and urban planners, geographers, economists, ecologists, sociologists, and other researchers. Brownfield regeneration is receiving increasing political support at all political levels, via EU, national and local development documents. It is of great interest in the context of sustainable development, prevention of urban sprawl, and the revitalisation of city centres (Hercik et al., 2014). This paper gives an overview of the state of abandoned military sites within the area of the Zagreb Urban Agglomeration, i.e. locations that were used by the Yugoslav People's Army in the socialist era, and by the Armed Forces of the Republic of Croatia since Croatian independence. Military locations in a broader sense are: abandoned barracks and other facilities that primarily served the army such as administrative buildings, hospitals, warehouses, training grounds, radar stations, etc. Planned and implemented conversion processes were also recorded.

The first part of the paper provides a theoretical framework for the research, starting with an overview of available relevant Croatian and foreign scientific papers and projects and a systematisation of previous research. Emphasis is placed on categorising brownfield sites according to different criteria. The second part of the paper gives an overview of the locations of military brownfield sites in the Zagreb Urban Agglomeration and analyses the practical aspects of the implemented conversions. The research results were collected by analysing relevant spatial planning documents, mapping locations, and conducting interviews with relevant spatial development stakeholders. In the last part of the paper, military brownfield site conversion models were developed on the basis of the conducted research.

The aim of the research was to test the following hypotheses:

- generally, the abandoned military sites in the Zagreb Urban Agglomeration have not been given a new purpose
- one of the success factors of the implementation of the planned military brownfield conversion process is the site's position within the urban agglomeration territory.

Teorijski okvir istraživanja: vojni *brownfield* prostori kao izazov prostornoga razvoja

Jedinstvena i jednoznačna definicija pojma *brownfield* ne postoji. Pojam se rabi u svom izvornom obliku na engleskom jeziku za označavanje napuštenih ili zapuštenih izgrađenih prostora, uz varijacije od zemlje do zemlje. U ovom se radu pojam koristi u smislu određenom tzv. CABERNET¹ definicijom koja *brownfield* određuje kao prostor koji je prethodno korišten, napušten je ili djelomično korišten, s mogućnošću stvarna ili pretpostavljena onečišćenja, uglavnom je smješten u urbanom području te zahtijeva intervenciju za privođenje namjeni. EU projekt RESCUE - *Regeneration of European Sites in Cities and Urban Environments* 2002. godine definirao je održivu regeneraciju *brownfielda* kao upravljanje, rehabilitaciju i ponovno korištenje *brownfielda* uz osiguravanje trajnoga zadovoljavanja ljudskih potreba sadašnje i budućih generacija na okolišno povoljan, ekonomski održiv, institucionalno snažan i društveno prihvatljiv način (Rizzo i dr., 2016).

Svi *brownfieldi* nisu isti i pojedina vrsta *brownfielda* zahtijeva posebno osmišljen pristup sanaciji, urbanističkom planiranju te vođenju i provedbi procesa urbane regeneracije. Prije svega *brownfieldi* se razlikuju veličinom: od pojedinačne zgrade ili građevinske čestice do velikih napuštenih industrijskih, vojnih i sličnih sklopova. Brojna prostorna i društvena istraživanja posvećena su problemu napuštenosti na razini čitavih gradova i regija (Detroit, Ruhr), nekad primarno određenih tradicionalnom industrijskom proizvodnjom, a danas u manje ili više uspješnoj potrazi za novim smislom i temeljem egzistencije (Matković i Jakovčić, 2019). Kriteriji kategorizacije i moguće kategorije *brownfielda* na temelju dostupnih relevantnih istraživanja sumarno su prikazane u tablici 1.

Vojni *brownfieldi* zapravo su najstariji oblik *brownfielda*. Kroz povijest čovječanstva, brojne su vojne strukture (utvrde, zidine, šanci) gubile svoj

Theoretical framework of research: military *brownfield* sites as a challenge to spatial development

There is no single and unambiguous definition of the term *brownfield*. The term is used in its original English form to refer to abandoned or derelict built spaces, varying in character from one country to another. In this paper, the term is used in the sense determined by the so-called CABERNET¹ definition of *brownfield* as a site affected by its former use, derelict and underused, with existing or perceived contamination problems, mainly located in urban area, which requires intervention to bring it back to beneficial use. In 2002, the EU project RESCUE - *Regeneration of European Sites in Cities and Urban Environments* defined sustainable *brownfield* regeneration as management, rehabilitation, and return to beneficial use of the *brownfield* land resource base in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations in environmentally non-degrading, economically viable, institutionally robust, and socially acceptable ways (Rizzo et al., 2016).

Not all *brownfield* sites are same, and a particular type of *brownfield* requires a specially designed approach to remediation, urban planning, and the management and implementation of the urban regeneration process. First, *brownfields* vary in size: from a single building or a building lot to large abandoned industrial, military, and similar structures. Numerous spatial and social studies are devoted to the problem of abandonment at the level of entire cities and regions (Detroit, Ruhr) that were once primarily characterised by traditional industrial production and are searching for a new meaning and basis of existence, to varying degrees of success (Matković and Jakovčić, 2019). The categorisation criteria and possible *brownfield* categories based on available relevant research are summarised in Table 1.

Military *brownfield* sites are actually the oldest form of *brownfields*. Throughout the history of mankind, numerous military structures (forts, ramparts, trench-

¹ EU projekt CABERNET – Concerted Action on Brownfield and Economic Regeneration Network proveden je u razdoblju od 2002. do 2005. godine s ciljem poticanja razvoja novih rješenja za urbane *brownfield* prostore.

¹ EU project CABERNET - Concerted Action on Brownfield and Economic Regeneration Network, implemented from 2002 to 2005 to encourage development of new solutions for urban *brownfield* sites.

Tab. 1. Pregled kriterija kategorizacije i mogućih kategorija *brownfielda*
Tab. 1 Overview of categorisation criteria and possible brownfield categories

Kriterij / Criterion	Moguće kategorije <i>brownfielda</i> / Possible brownfield categories	Izvor / Source
veličina / size	pojedinačna napuštena zgrada / individual abandoned building	Matković i Jakovčić (2019) / Matković and Jakovčić (2019)
	pojedinačna građevinska čestica / individual abandoned building lot	
	manji napušteni građevni sklop / smaller abandoned building complex	
	veliki napušteni industrijski, vojni ili prometni kompleksi / large abandoned industrial, military or traffic structures	
	napuštenost na razini gradske četvrti, čitavoga grada ili regije / abandonment at the level of a district, entire city or region	
položaj unutar nacionalnoga teritorija / position within the national territory	<i>brownfieldi</i> s dominantnim središnjim položajem i s dobrom prometnom povezanošću / brownfield sites with dominant central position and good traffic connections	Matković i Jakovčić (2019) / Matković and Jakovčić (2019)
	periferno smješteni <i>brownfieldi</i> s dobrom prometnom povezanošću i potencijalima za razvoj / brownfield sites located at the periphery, with good traffic connections and development potential	
	periferno smješteni <i>brownfieldi</i> u prostorima visoke atraktivnosti krajolika i izgrađenoga okoliša / brownfield sites located at the periphery, with attractive landscape and built environment	
	periferno smješteni <i>brownfieldi</i> u prostorima visoke atraktivnosti krajolika i izgrađenoga okoliša / brownfield sites located at the periphery, with poor traffic connections and poor development indicators and potential	
položaj unutar urbane/ruralne strukture / position within urban/rural structure	<i>brownfieldi</i> sa središnjim položajem u urbanoj/ruralnoj strukturi / brownfield sites located centrally within an urban/rural structure	Matković i Jakovčić (2019) / Matković and Jakovčić (2019)
	<i>brownfieldi</i> smješteni u kontaktnoj zoni središta urbane/ruralne strukture / brownfield sites located in an urban/rural structure centre contact zone	
	<i>brownfieldi</i> s perifernim položajem u urbanoj/ruralnoj strukturi / brownfield sites located on the periphery of an urban/rural structure	
prethodna namjena / previous use	industrijski <i>brownfieldi</i> / industrial brownfields	Perović i Kurtović Folić (2012); Kranjčević (2016); Matković i Jakovčić (2019) / Perović and Kurtović Folić (2012); Kranjčević (2016); Matković and Jakovčić (2019)
	vojni <i>brownfieldi</i> / military brownfields	
	napuštena eksploatacijska polja i rudnici / abandoned exploitation fields and mines	
	napušteni željeznički i drugi prometni kompleksi / abandoned railway and other traffic facilities	
	napuštena lučka područja / abandoned port areas	
	napuštene komunalne zgrade i površine / abandoned municipal service buildings and sites	
	stambeni <i>brownfieldi</i> / housing brownfields	
	turistički <i>brownfieldi</i> / tourist brownfields	
	<i>brownfieldi</i> bez prethodne namjene: nikad dovršene zgrade i kompleksi / brownfields with no previous use: never finished buildings and complexes	

Tab. 1. Pregled kriterija kategorizacije i mogućih kategorija *brownfielda* (nastavak)
Tab. 1 Overview of categorisation criteria and possible *brownfield* categories (continued)

Kriterij / Criterion	Moguće kategorije <i>brownfielda</i> / Possible <i>brownfield</i> categories	Izvor / Source
ekonomski uzrok nastanka / economic causes	<i>brownfieldi</i> u tradicionalnim industrijskim područjima kao rezultat velikoga gubitka radnih mjesta u rudarstvu, proizvodnji čelika i tekstilnoj industriji / <i>brownfields</i> in traditional industrial zones caused by massive decline in industrial jobs in the coal, steel and textile industries	Ferber i Grimski (2001); Matković i Jakovčić (2019) / Ferber and Grimski (2001); Matković and Jakovčić (2019)
	<i>brownfieldi</i> u urbanim područjima nastali kao posljedica procesa suburbanizacije i izmještanja aktivnosti na periferiju / <i>brownfields</i> in urban areas caused by suburbanisation process and displacement of industrial activities to the periphery	
	<i>brownfieldi</i> u ruralnim područjima koji su rezultat gubitka radnih mjesta u primarnom sektoru / <i>brownfields</i> in rural areas mainly connected with loss of jobs in primary economic activities	
	<i>brownfieldi</i> kao rezultat neekonomskoga uzroka / <i>brownfields</i> as a result of a non-economic cause	
ekonomski status / economic status	tržišno atraktivni <i>brownfieldi</i> koji su obično smješteni na kvalitetnim i atraktivnim gradskim lokacijama, a njihova je regeneracija obično rezultat ulaganja privatnoga sektora / <i>brownfields</i> in traditional industrial zones caused by massive decline in industrial jobs in the coal, steel and textile industries	prema Đokić i Sumpor (2010): EU projekt CABERNET / According to Đokić and Sumpor (2010): EU projekt CABERNET
	<i>brownfieldi</i> na rubu profitabilnosti kao potencijalna žarišta razvoja, za koje se teži regeneraciji prema principu javno-privatnoga partnerstva / <i>brownfields</i> with marginal profitability which are potential focal points of development where regeneration aims at public-private partnership	
	<i>brownfieldi</i> na kojima regeneracija ne može biti profitabilna te se oslanja na javni sektor i poticajne instrumente / <i>brownfields</i> regeneration of which cannot be profitable thus it relies on public sector and incentive instruments	
onečišćenje / contamination	<i>brownfieldi</i> s prisutnim onečišćenjem / contaminated <i>brownfields</i>	Matković i Jakovčić (2019) / Matković and Jakovčić (2019)
	<i>brownfieldi</i> s percipiranim onečišćenjem / <i>brownfields</i> with perceived contamination	
	<i>brownfieldi</i> bez prisutnosti onečišćenja / contamination-free <i>brownfields</i>	
povijesna i kulturna vrijednost / historical and cultural values	<i>brownfieldi</i> u cijelosti ili dijelom zaštićeni kao kulturno dobro / <i>brownfields</i> fully or partly protected as cultural heritage	Matković i Jakovčić (2019) / Matković and Jakovčić (2019)
	<i>brownfieldi</i> s prisutnom povijesnom i kulturnom vrijednošću i potencijalom za zaštitu kulturnoga dobra, ali bez formalne konzervatorske zaštite / <i>brownfields</i> with historical and cultural value and potential to become protected cultural heritage, but without formal protection	
	<i>brownfieldi</i> bez struktura povijesne i kulturne vrijednosti / <i>brownfields</i> with no structures of historical and cultural value	

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značaj i namjenu (Hercik i Szczyrba, 2012). Specifičnost je vojnih *brownfielda* u tome što njihovo napuštanje nije uzrokovano ekonomskim, već političkim razlozima (Kádár, 2014.) Tranzicijski procesi u postsocijalističkim zemljama središnje i istočne Europe obuhvatili su i proces demilitarizacije, a vojni *brownfieldi* pojavili su se na mjestu velikoga broja nekadašnjih vojnih sadržaja (Morar i dr., 2016). Naravno, vojni *brownfieldi* nisu specifičan izazov prostornoga razvoja samo u postsocijalističkim zemljama Europe, ali su brzina promjena uvjetovanih tranzicijskim procesima i dinamika nastanka *brownfielda* bile izraženije u ovim zemljama u usporedbi s drugim regijama (Hercik i dr., 2014).

Više autora upozorava na nepostojanje evidencija vojnih *brownfielda* te na relativno malen broj istraživanja koja se bave njihovom prenamjenom. U većini zemalja pitanje vojnih prostora prožeto je sigurnosnim ograničenjima zbog kojih podatci u pravilu ostaju nedostupni i znanstvena istraživanja nemoguća (Kardov i Tabak, 2014.). Autori iz postsocijalističkih zemalja ističu i drugi mogući razlog slabije istraženosti vojnih *brownfielda* koji proizlazi iz činjenice da su površinom najzastupljeniji industrijski *brownfieldi* dugo bili u fokusu istraživanja, što je ostale vrste *brownfielda* stavilo u drugi plan (Hercik i dr., 2014; Kádár, 2014).

Vojni *brownfieldi*, kao i *brownfieldi* općenito, bili su predmetom istraživanja različitih polja znanosti – geografije, ekonomije, arhitekture i urbanizma, ekologije, sociologije, povijesti i političkih znanosti te drugih. S obzirom na stvarno prisutno ili pretpostavljeno onečišćenje tla i voda značajan je dio istraživanja posvećen upravo aspektu ekološke sanacije vojnih *brownfielda*. U podjednakoj su mjeri zastupljena istraživanja ekonomskih modela upravljanja i vođenja procesa prenamjene i regeneracije *brownfielda* te modela participacije javnosti i poslovnoga sektora u tim procesima. Dio literature bavi se aspektom kulturne i povijesne vrijednosti vojnih *brownfielda* i potencijalom budućega korištenja u funkciji turističke infrastrukture.

Niz je radova koji istražuju genezu, rasprostranjenost i potencijale prenamjene vojnih *brownfielda*, među kojima se posebno izdvajaju istraživanja u postsocijalističkim zemljama Srednje i Istočne Europe.

es) have lost their significance and purpose (Hercik and Szczyrba, 2012). Military brownfield sites are special for the fact that they are abandoned for political, rather than economic, reasons (Kádár, 2014). Transition processes in the post-socialist countries of Central and Eastern Europe have also included the process of demilitarisation, and military brownfields have emerged in sites of many former military installations (Morar et al., 2016). Of course, military brownfield sites do not only pose a challenge to spatial development in European post-socialist countries, but the speed of change caused by transition processes and the dynamics of brownfield emergence were more pronounced in these countries compared to other regions (Hercik et al., 2014).

Several authors point out the lack of military brownfield site records, as well as the relatively small number of studies that address their conversion. In most countries, the issue of military sites is directly related to security constraints that make data generally unavailable and scientific research impossible (Kardov and Tabak, 2014). Authors from post-socialist countries also draw attention to another possible reason for the poor state of research into military brownfield sites. The industrial brownfields occupying the largest areas have long been the focus of research, while other types of brownfield sites are of secondary importance (Hercik et al., 2014; Kádár, 2014).

Military brownfields, as well as brownfield sites in general, have been the subject of research in various scientific fields—geography, economics, architecture and urbanism, ecology, sociology, history, political science, etc. Given the actual or perceived contamination of soil and water, the research has focused on military brownfield environmental remediation to a large degree. Research into economic models of management and conduction of brownfield conversion and regeneration processes and models of public and business sector participation in these processes are equally represented. Part of the literature also deals with the aspect of the cultural and historical value of military brownfield sites and their potential for future use as tourism infrastructure.

There are a number of papers studying the genesis, distribution, and potential of conversion of military brownfield sites, among which research conducted in the post-socialist countries of Central and Eastern Europe are particularly noteworthy.

Razmjeri napuštanja i orijentacijske površine vojnih *brownfielda* mogu se ilustrirati podacima iz radova koji su se bavili ovom temom u pojedinim državama odnosno regijama:

- Mađarska: Evidentirano je ukupno 379 vojnih *brownfielda* (razvrstanih prema tipu nekadašnjega sadržaja), ukupne površine preko 27 000 hektara. Lokacije su raspršene po čitavom teritoriju države, sa zamjetnom koncentracijom u zapadnom dijelu zemlje, odnosno prema nekadašnjoj „željeznoj zavjesi”. Istraživanje je pokazalo da lokalne vlasti nisu imale nikakvih spoznaja o 24 % napuštenih vojnih lokacija smještenih unutar njihova administrativnoga područja, što se posebno odnosi na tajne lokacije poput nekadašnjih skladišta bombi (Kádár, 2014).
- Italija – pogranična regija Friuli Venezia Giulia: Regija Friuli Venezia Giulia do kraja 80-tih godina prošloga stoljeća predstavljala je granicu „zapadnoga svijeta” i bila je jedna od najmilitariziranijih regija u Europi, s naslijeđem obrambenoga sustava iz Prvoga i Drugoga svjetskog rata te iz razdoblja Hladnoga rata. Padom Berlinskoga zida čitav je složeni sustav izgubio svoju svrhu i važnost. Podatci talijanskoga Ministarstva obrane govore o 103 vojne lokacije koje su zauzimale 1,3 % cjelokupnoga područja regije, dok je na oko 50 % područja bio uspostavljen poseban režim korištenja – „pravo služnosti” vojske (Santarossa, 2013).
- Njemačka – Savezna država Brandenburg: U saveznoj državi koja prstenasto okružuje Berlin i danas je njegova metropolitanska regija u doba Hladnoga rata izgrađena je gusta mreža sovjetskih vojnih baza pa vojni *brownfieldi* zauzimaju oko 5 % teritorija savezne države (CONVER-NET, 2006).
- Sjedinjene Američke Države: Od 1988. godine Ministarstvo obrane SAD-a zatvorilo je oko 400 vojnih baza. Više od 20 vojnih baza na preko 400 000 ha prenamijenjeno je u „prirodne rezervate” i priključeno nacionalnoj mreži zemljišta primarno namijenjenih očuvanju staništa i biološke raznolikosti (Havlick, 2007).

Reorganizacijom obrambenoga sustava Republike Hrvatske prestao je interes i potreba oružanih snaga Hrvatske vojske za korištenje dijela vojnih

The extent of abandonment and provisional area of military brownfield sites can be illustrated by data from papers dealing with this topic in individual countries or regions:

- Hungary: A total of 379 military brownfield sites (classified by type of former use), with a total area of over 27,000 hectares, have been recorded. The locations are scattered throughout the country, with a noticeable concentration in the western part, that is, towards the former Iron Curtain border. The research found that local authorities were unaware of 24% of abandoned military sites located within their administrative territory, which is especially true of secret locations such as former bomb depots (Kádár, 2014).
- Italy, the border region of Friuli Venezia Giulia: Until the late 1980s, the region of Friuli Venezia Giulia was a border region of the western world, and was one of the most militarised regions in Europe, with a heritage of World War I and World War II defence systems. With the collapse of the Berlin Wall, the entire complex system lost its purpose and significance. The data of the Italian Ministry of Defence indicate 103 military sites occupying 1.3% of the entire territory of the region, while nearly 50% of the region was subject to subsequent easement for military purposes. (Santarossa, 2013).
- Germany, State of Brandenburg: A dense network of Soviet military bases was built during the Cold War forming a ring around Berlin, which today represents its logical metropolitan region, thus military brownfield sites occupy about 5% of the State’s territory (CONVER-NET, 2006).
- United States: Since 1988, the U.S. Department of Defence has closed approximately 400 military bases. More than 20 military bases occupying over 400,000 ha have been transformed into nature reserves and added to the national network of land primarily intended for habitat and biodiversity conservation (Havlick, 2007).

With the reorganisation of the defence system of the Republic of Croatia, the interest and need of the Croatian Armed Forces to use certain mil-

kompleksa i lokacija. Napuštene vojne lokacije tako su postale, osobito u većim gradovima, značajan prostorni resurs za budući razvoj. Zakonska regulativa omogućuje davanje ovakvih područja na raspolaganje jedinicama lokalne samouprave uz prethodno precizno obrazloženje razvojnih potreba i buduće namjene područja. Za razliku od površinom najzastupljenijih industrijskih *brownfield* prostora koji su često opterećeni neriješenim imovinskim i pravnim pitanjima, zbog uglavnom jasne vlasničke strukture vojnih *brownfielda* niz je primjera na nacionalnoj razini u kojima su oni prepušteni na raspolaganje jedinicama lokalne samouprave ili nadležnim resorima države u svrhu ostvarenja znanstvenih, kulturnih, sportskih, stambenih i poslovnih sadržaja.

Metodologija istraživanja

Rad se temelji na istraživanju provedenom u Zagrebu tijekom 2019. i 2020. godine koje je uključivalo polustrukturirane intervjue s ključnim dionicima regeneracije *brownfielda* u Urbanoj aglomeraciji Zagreb.

Istraživanje je bilo usmjereno na dva problema i podijeljeno u dvije tematske cjeline. U prvoj cjelini cilj je bio upoznati se s iskustvima i stavovima ispitanika povezanih s tematikom obnove *brownfield* prostora, ocjenom važnosti čimbenika uspješnosti regeneracije *brownfielda*, ocjenom kvalitete i uspješnosti provedbe politika regeneracije *brownfielda* na nacionalnoj, regionalnoj i lokalnoj razini, mogućim usmjerenjima za istraživanje i praktičnim preporukama.

Druga cjelina istraživanja posvećena je isključivo vojnim *brownfieldima* Urbane aglomeracije Zagreb, poznavanju njihovih lokacija, ocjeni uspješnosti dosadašnjih praksi prenamjene, kao i utvrđivanju stavova o optimalnim novim namjenama vojnih *brownfielda* u odnosu na njihov specifičan položaj u aglomeraciji.

Ispitanici su odabrani dijelom na osnovi spoznaje o njihovu sudjelovanju u dosadašnjim istraživanjima, kreiranju politika i projektima urbane regeneracije *brownfielda*, a dijelom pomoću metode snježne grude. Prosječno trajanje intervjua (obje cjeline) bilo je 32 minute.

itary complexes and locations ceased. Abandoned military sites, especially in major cities, have thus become a significant spatial resource for future development. Legislation allows for making such areas available to local self-government units, with a precise elaboration of the development needs and future uses of the area. Industrial brownfield sites, which are the largest by area, are often burdened with unresolved property rights and legal issues. However, due to the largely transparent ownership structure of military brownfields, there are a number of examples on the national level in which such sites are made available to local self-government units or relevant state sectors for scientific, cultural, sports, residential, and business amenities.

Research methodology

this paper is based on the research conducted in Zagreb during 2019 and 2020 that included semi-structured interviews with key stakeholders in brownfield regeneration in the Zagreb Urban Agglomeration.

The research focused on two issues and was divided into two thematic units. The first was to get acquainted with the experiences and attitudes of the respondents related to the theme of brownfield restoration, evaluate the importance of brownfield regeneration success factors, evaluate the quality and success of implementing brownfield regeneration policies at national, regional and local levels, identify possible research directions, and provide practical recommendations.

The second part of the research was devoted solely to military brownfield sites in the Zagreb Urban Agglomeration—ascertaining their locations, evaluating the success of previous conversion practices, and establishing attitudes regarding optimum uses of military brownfield sites in relation to their specific position in the agglomeration.

The respondents were selected partly on the basis of their participation in brownfield urban regeneration research, policy making and projects carried out to date, and partly using the snowball method. The average interview duration (both parts) was 32 minutes.

U ovom se radu predstavljaju rezultati druge cjeline istraživanja, odnosno stavovi ukupno 13 ispitanika iz triju skupina dionika relevantnih za temu prenamjene vojnih *brownfielda*:

- 6 upravljačkih dionika (UD) – predstavnika tijela regionalne uprave i lokalne samouprave iz upravnih područja prostornoga uređenja, regionalnoga razvoja i upravljanja javnom imovinom
- 4 znanstvena i stručna dionika (ZSD) – predstavnika znanstvene i stručne zajednice koji su se bavili tematikom regeneracije *brownfield* prostora
- 4 politička dionika (PD) – člana predstavničkih i izvršnih tijela vlasti nacionalne, regionalne i lokalne razine.²

Usporedno s provedbom intervjua provedeno je kartiranje napuštenih vojnih prostora na području Urbane aglomeracije Zagreb, kojem su prethodili pregled službenih digitalnih ortofoto karata, podataka Katastra nekretnina i prostornih planova, uz konzultacije sa zavodima za prostorno uređenje županija.

Vojni brownfieldi na prostoru Urbane aglomeracije Zagreb i ocjena uspješnosti dosadašnjih praksi prenamjene

Urbana aglomeracija Zagreb ustrojena je 2016. godine i obuhvaća Grad Zagreb kao središte aglomeracije te još 29 gradova i općina: 7 s područja Krapinsko-zagorske i 22 s područja Zagrebačke županije (sl. 1). Površina aglomeracije je 2 911,3 km², a na njezinu području živi 1 086 528 stanovnika, što je neznatno više od četvrtine (25,35 %) ukupnoga stanovništva Republike Hrvatske (podatci Popis stanovništva, kućanstava i stanova iz 2011.). Strategija razvoja Urbane aglomeracije Zagreb za razdoblje do 2020. godine usvojena je krajem 2017. godine, čime je započeo proces provedbe Strategije te su stvoreni uvjeti za korištenje gotovo 1 milijarde kuna EU sredstava namijenjenih urbanom razvoju putem mehanizma integriranih teritorijalnih ulaganja.

This paper presents the results of the second part of the research, i.e. the attitudes of 13 respondents from three stakeholder groups relevant to the topic of military brownfield conversion:

- 6 managing stakeholders (MS)—representatives of regional and local government bodies in the administrative areas of spatial planning, regional development, and land management;
- 4 scientific and professional stakeholders (SPS)—representatives of the scientific and professional community who deal with the topic of brownfield space regeneration; and
- 4 political stakeholders (PS)—members of the representative and executive bodies at the national, regional, and local levels².

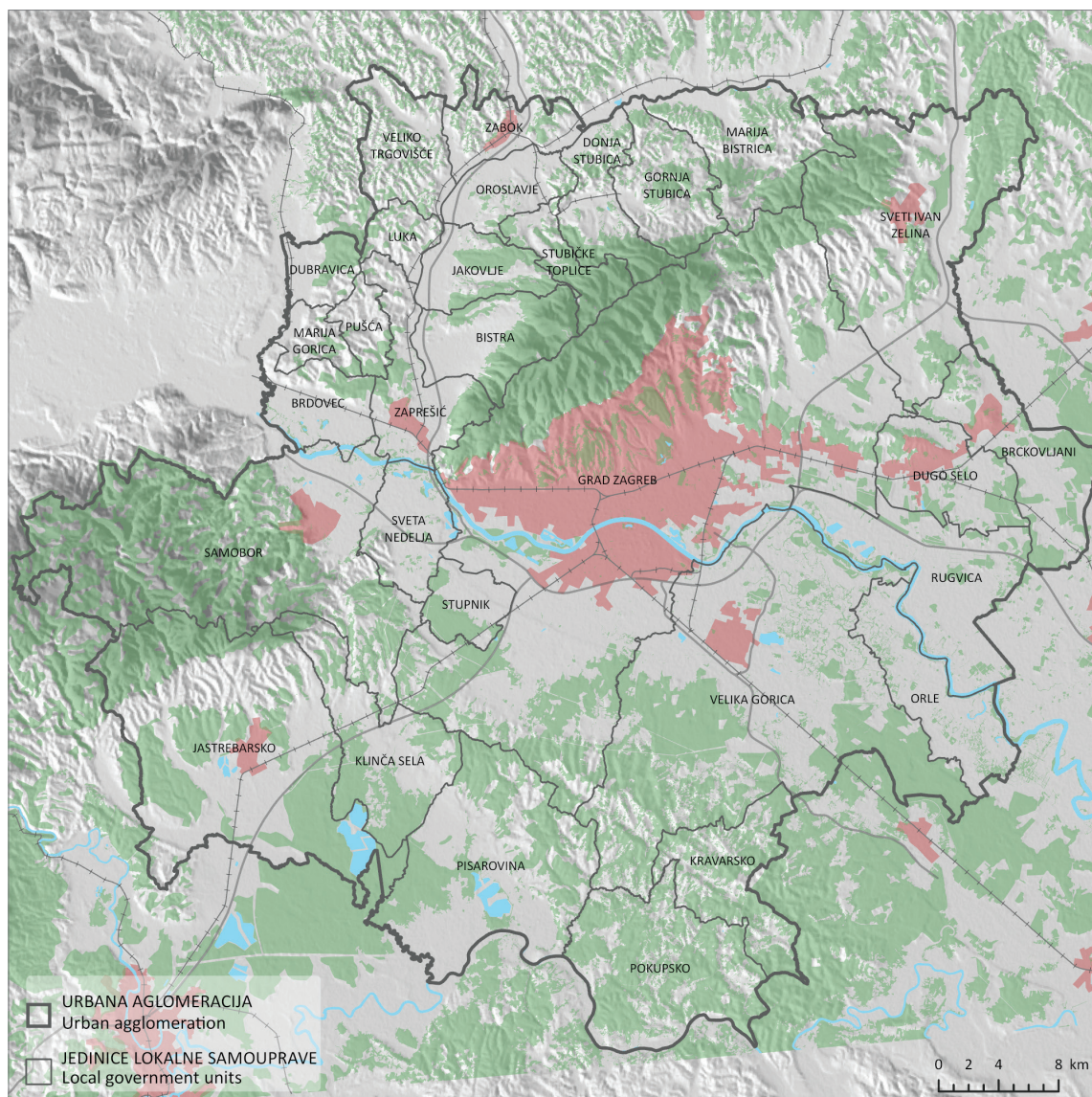
Mapping of abandoned military sites in the Zagreb Urban Agglomeration was conducted in parallel with the interviews. The mapping was preceded by verification of official digital ortho-photo maps, Real Estate Cadastre data, and spatial plans, with the consultation of county planning institutes.

Military brownfield sites in the Zagreb urban agglomeration and evaluation of results of previous conversion practices

The Zagreb Urban Agglomeration was established in 2016. It encompasses the City of Zagreb as the centre of the agglomeration and 29 other cities, towns, and municipalities: 7 from Krapina-Zagorje County and 22 from Zagreb County (Fig. 1). The area of the agglomeration is 2,911.3 km² with 1,086,528 inhabitants, which is slightly more than a quarter (25.35%) of the total population of the Republic of Croatia (Census of population, households and dwellings, 2011). The Zagreb Urban Agglomeration Development Strategy for the Period to 2020 was adopted late in 2017. This was the starting date of the Strategy's implementation, thus the conditions were met for the use of almost HRK 1 billion of EU funds for urban development by implementation of the Integrated Territorial Investment (ITI) mechanism.

² Navođenje položaja, administrativnih jedinica i institucija izostavljeno je radi zadržavanja anonimnosti ispitanika.

² Mention of positions, administrative units, and institutions is omitted in order to maintain the anonymity of the respondents.



Sl. 1. Urbana aglomeracija Zagreb
Fig. 1 Zagreb Urban Agglomeration

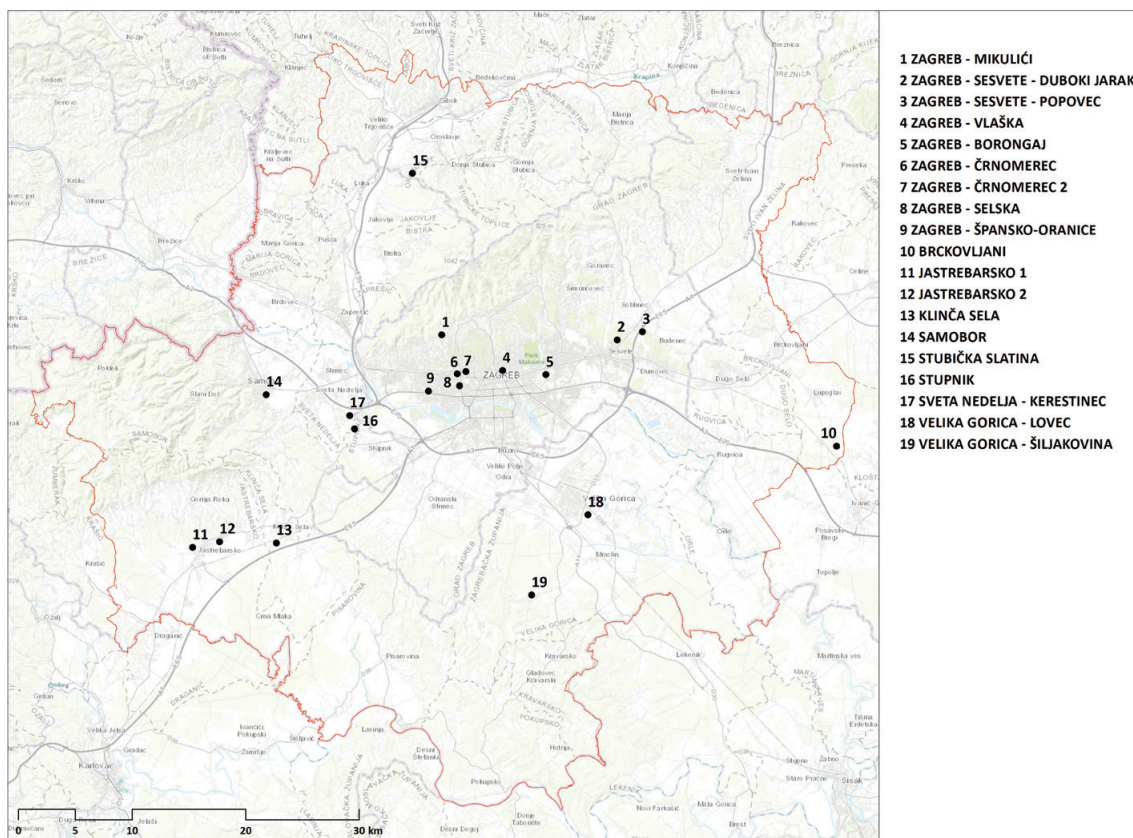
Izvor: Grad Zagreb – Gradski ured za stratejsko planiranje i razvoj Grada (2019)
Source: City of Zagreb – City Office for Strategic Planning and Development of the City (2019)

Pregledom službenih digitalnih ortofoto karata i podataka Katastra nekretnina te pregledom prostornih planova uz konzultacije sa zavodima za prostorno uređenje županija i Grada Zagreba evidentirano je ukupno 19 napuštenih vojnih prostora na području urbane aglomeracije (sl. 2). Istraživanje je usredotočeno na napuštene vojne komplekse, odnosno lokacije kojima se koristila Jugoslavenska narodna armija za vrijeme prethodne države od-

Examination of the official digital ortho-photo maps, and data of the Real Estate Cadastre and spatial plans, in consultation with the physical planning institutes of the counties and the City of Zagreb, resulted in a total of 19 abandoned military sites in the area of urban agglomeration being recorded (Fig. 2). The research focused on abandoned military installations or locations used by the former Yugoslav People's Army and the Armed Forces of the Republic of Croatia. Nine

**Prenamjena i
održivo korištenje
napuštenih vojnih
prostora u Urbanoj
aglomeraciji Zagreb**

Conversion and
sustainable use
of abandoned
military sites in
the Zagreb Urban
Agglomeration



Sl. 2. Napuštene vojne lokacije u Urbanoj aglomeraciji Zagreb
Fig. 2 Abandoned military sites in the Zagreb Urban Agglomeration

nosno poslije Oružane snage Republike Hrvatske. Ukupno devet napuštenih vojnih područja nalazi se na području Grada Zagreba, devet na području gradova i općina Zagrebačke županije koji su u sastavu Urbane aglomeracije Zagreb, a jedna se lokacija nalazi u Krapinsko-zagorskoj županiji (Grad Oroslavje koji je u sastavu aglomeracije).

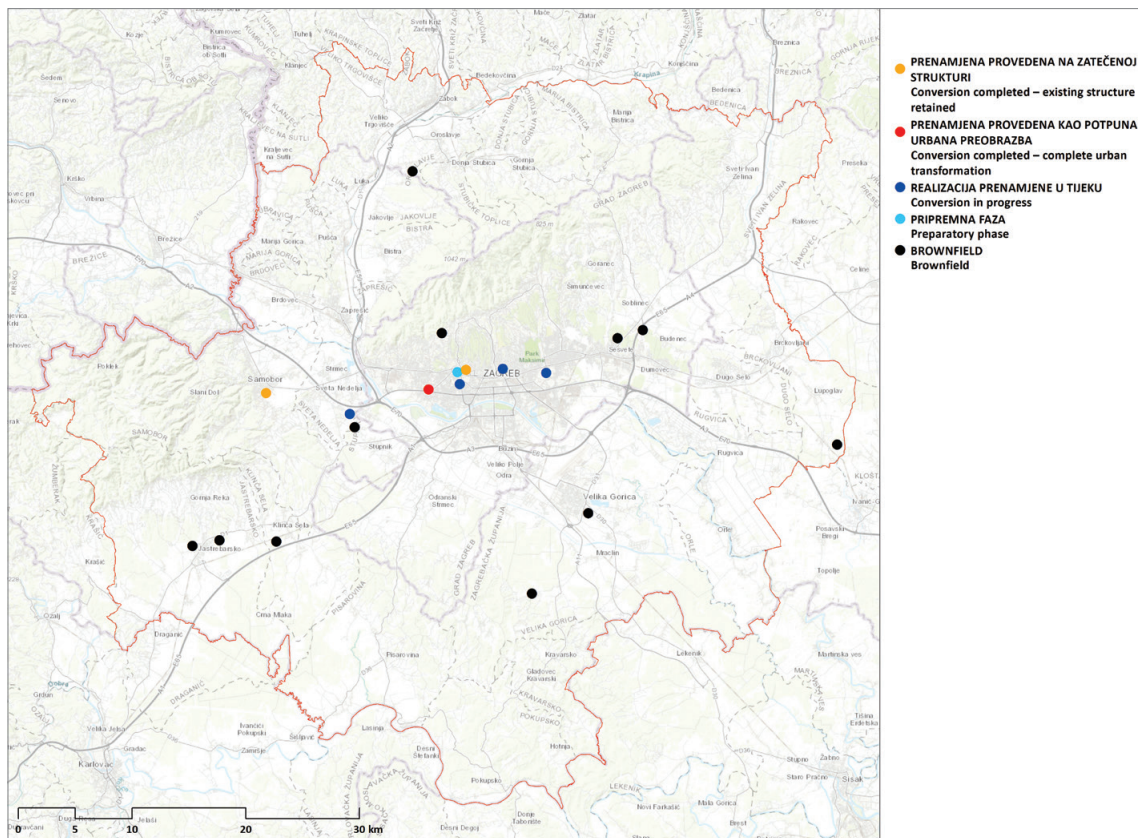
Ukupna površina evidentiranih napuštenih vojnih prostora iznosi 328,4 ha. Tri prostora ukupne površine 37,3 ha (11 %) u potpunosti su privedena novoj namjeni, na četiri prostora ukupne površine 121,3 ha (37 %) započete su aktivnosti urbane regeneracije i privođenja novoj namjeni, dok je 12 prostora ukupne površine 169,8 ha (52 %) i dalje vojni *brownfield*.

Prostorna distribucija vojnih *brownfielda* na kojima je provedena prenamjena, odnosno pokrenuti su određeni procesi urbane regeneracije, upućuje na ulogu geografskoga čimbenika specifičnog položaja

abandoned military sites are located in the City of Zagreb, nine in the cities and municipalities in Zagreb County, and one in Krapina-Zagorje County (the City of Oroslavje).

The total area of the recorded abandoned military sites is 328.4 ha. Three sites with a total area of 37.3 ha (11%) have been completely redeveloped, activities related to urban regeneration and redevelopment are underway in four sites with a total area of 121.3 ha (37%), while 12 sites totalling 169.8 ha (52%) in area are still military brownfield sites.

The spatial distribution of military brownfield sites undergoing conversion or those in which certain processes of urban regeneration have already been initiated, reveals the role that the geographical factor of a specific position in the local spatial and functional structure plays in successful conversion: all former military sites that have undergone or are undergoing conversion, or for which conversion is in preparation,



Sl. 3. Napuštene vojne lokacije u Urbanoj aglomeraciji Zagreb – stadij prenamjene
Fig. 3. Abandoned military sites in the Zagreb Urban Agglomeration – conversion phase

ja u lokalnoj prostorno-funkcionalnoj strukturi u uspješnosti provedbe prenamjene: sve nekadašnje vojne lokacije na kojima je prenamjena provedena ili je u pripremi ili u tijeku nalaze se u urbanom području Grada Zagreba, u Gradu Samoboru kao značajnijem urbanom središtu u zapadnom dijelu urbane aglomeracije te na razvojnoj osi Zagreb – Samobor (sl. 3). To potvrđuje istraživanja (Frantál i dr., 2015) koja su utvrdila da je većina uspješno regeneriranih lokacija smještena u blizini središta velikih gradova, odnosno istaknula važnost položaja *brownfielda* u urbanom području za provedbu prenamjene i urbane regeneracije.

S obzirom na to da su svi ispitanici uključeni u istraživanje provedeno 2019. i 2020. godine stručnjaci s dugogodišnjim angažmanom u pitanjima vezanim za urbani razvoj, ne iznenađuje dobro poznavanje pojma *brownfield*, problematike napuštenih i neodgovarajuće korištenih prostora te geneze njihova nastanka. Zadovoljavajuće je i poznavanje

are situated in the urban area of the City of Zagreb, the City of Samobor (a major urban centre in the western part of the urban agglomeration), and along the Zagreb-Samobor development axis (Fig. 3). This confirms the research (Frantál et al., 2015) that determined that most of the successfully-regenerated sites are located near the centres of major cities, and emphasised the importance of brownfield site location in the urban area for conversion implementation and urban regeneration.

Given that all respondents included in the research conducted in 2019 and 2020 are experts with long-standing involvement in the field of urban development, it is not surprising that they have a good understanding of the notion of brownfields, as well as the issues of abandoned and inappropriately-used spaces and the genesis of their emergence. Their knowledge of military brownfield sites in the City of Zagreb is also satisfactory-almost all respondents were able to give several examples, the most frequently mentioned

vojnih *brownfielda* u Gradu Zagrebu – gotovo svi ispitanici mogli su navesti nekoliko primjera, a među najčešće spominjanima su: vojarne na Črnomercu i Borongaju, vojarna zapadno od Selske ulice, vojarna uz naselje Špansko, vojna bolnica u Vlaškoj ulici i vojno skladište Duboki jarak u Sesvetama. Poznavanje vojnih *brownfielda* u drugim jedinicama lokalne samouprave koje čine Urbanu aglomeraciju Zagreb znatno je slabije. Izuzetak su nekadašnje vojarne u Samoboru i Jastrebarskom, koje su poznate većini ispitanika.

Prenamjena napuštenih vojnih prostora na području Črnomerca među najbolje je ocijenjenima, pri čemu se ponovo ističe važnost smještaja i dostupnosti lokacije:

Črnomerec treba spomenuti, jedan je dio sveučilišni pa neka privatna učilišta..., i sve to je dobro smješteno, u centru grada, uz tramvaj. (ZSD 3)

Cijeli kompleks na Črnomercu - to više ni ne doživljavam kao vojno... (PD 1)

Prenamjena nekadašnjih vojarna u zapadnom dijelu Zagreba u nova stambena naselja također je visoko ocijenjena, što je moguće povezano s činjenicom da su ostvareni i prateći sadržaji stambene funkcije (javni i društveni sadržaji, javne zelene površine):

Kod ovih vojarni na zapadnom dijelu grada u vrijeme realizacije projekata nije ni bilo govora o brownfield projektima. Radilo se o objektima koji nisu imali povijesni i arhitektonski značaj pa je najisplativije bilo porušiti kako bi se dobilo zemljište za izgradnju i to je uspješno napravljeno. (UD 1)

Vojarna na Selskoj gdje su sada stambene zgrade. To mi je dobar primjer, stanovanje usred grada je prikladno. (ZSD 2)

Određeni procesi prenamjene u tijeku također su prepoznati kao primjeri dobre prakse:

Vojna bolnica u Vlaškoj i vojarna Taborec u Samoboru su dobri primjeri jer funkcioniraju ili je jasno da će funkcionirati, osigurani su javni sadržaji, zatvorena je financijska konstrukcija. (UD 5)

Samoborska vojarna je dobar primjer. Na tom se prostoru dogodila nova policijska stanica koja je izmještena iz centra grada. Centar za mlade koji je

being: the barracks at Črnomerec and Borongaj; the barracks west of Selska Street; the barracks adjacent to Špansko in the western part of the City of Zagreb; the Military Hospital on Vlaška Street; and the Duboki Jarak military warehouse in Sesvete. Their knowledge of military brownfield sites in other local government units that make up the Zagreb Urban Agglomeration was much poorer. The exceptions were the former barracks in Samobor and Jastrebarsko, which were known to most respondents.

The conversion of abandoned military sites in the Črnomerec area is among the best rated, which again emphasises the importance of the location and its accessibility:

‘Črnomerec is worth mentioning—one part is used by University and some private colleges . . . the location is good, in the city centre, and it is connected by tram.’ (SPS 3)

‘The whole complex at Črnomerec—I don’t even see it as military site anymore . . .’ (PS 1)

Conversion of the former barracks in western Zagreb to new housing developments is also highly rated, which may be due to the fact that the amenities accompanying the housing function (public and community facilities, public green spaces) have been provided:

‘Regarding these barracks in the western part of the city, there was no mention of brownfield projects at the time the projects were implemented. These were buildings that had no historical or architectural significance, so the most cost-effective way was to demolish them in order to obtain land for construction and this was done successfully.’ (MS 1)

‘The barracks on Selska Street once occupied a site where residential buildings are today. This is a good example for me, housing in the middle of the city is appropriate.’ (SPS 2)

Certain ongoing or just finished conversion processes are also recognised as examples of good practice:

‘The Military Hospital on Vlaška Street and the Taborec Barracks in Samobor are good examples because they are functional or it is clear that they will become functional, public amenities are provided, the financial framework has been achieved.’ (MS 5)

‘The Samobor Barracks are a good example. A new police station was set up to the area, which was moved from the

jedinstven u Hrvatskoj smješten je u prostoru bivšeg vojnog restorana. Izgrađen je i dječji vrtić. (PD 3)

Primjeri manje uspješne prakse uglavnom se ne ističu zbog neprimjerene namjene ili lošega urbanističko-arhitektonskog rješenja, nego zbog trajnoga stanja nedovršenosti ili nedosljedno provedene koncepcije regeneracije. Najviše prigovora upućeno je najambicioznijem projektu urbane regeneracije vojnog *brownfielda* – Sveučilišnom kampusu na lokaciji nekadašnje vojarne na Borongaju.

*Kampus Borongaj nema relacije unutar grada, teško je doći do tamo, sadržaji su skromni. Nekako ništa ne završavamo. Taj kampus je u dijelu zaživio, ali to je sve kao naša tradicija nedovršavanja kuća koju svi kritiziramo kad se vozimo izvan grada, pola kuća nema fasadu ili ogradu ili krov. Mi to prenosimo izvan privatne u javnu sferu, nešto se napravi i čim na minimumu može funkcionirati, tu se staje. Kod kampusa je glavno pitanje na koji način ga povezati s gradom. Za *brownfield* je karakteristično da je to područje unutar grada koje je napušteno i to se može prepoznati već na vizualnoj razini, pogledamo fotografije grada i kažemo: ovo je *brownfield*. E, sad, kod obnove nije pitanje samo obnova unutar te cjeline, nego se postavlja pitanje kako ga povezati s ostalim dijelovima grada. Kako ga integrirati, da komunicira. Recimo, na Borongaju čak ni na toj minimalnoj razini funkcioniranja u kojoj danas postoje predavaonice i menza, nema kioska ili tako nekih osnovnih stvari, a da ne govorimo o npr. igralištima, za koja je sve potrebno već gotovo tamo... Ni na koji način ne komunicira ni s tom svojom neposrednom okolicom, naseljem. Kod obnove *brownfielda* trebao bi se dogoditi neki povratni efekt na okolna naselja, substandardna što se tiče kvalitete života. Efekt nove namjene u kampusu trebao se preliti na naselja, a onda i na cijeli grad. To se nije dogodilo. Kampus je zamišljen u konceptu logora, s ulaskom kroz ona vrata, predavala sam tamo i prestala jer nisam mogla tamo više odlaziti. Kao prvo, trebalo mi je sat do tamo i sat natrag. Da je bio ugodan prostor, sa sadržajima, knjižnicom, ostala bih pola dana između predavanja... I uvijek je to pitanje nadležnosti, na koga adresirati problem, na državu, grad, sveučilište. (ZSD 3)*

Vojarina na Borongaju, tu imamo jednu djelomičnu prenamjenu radi smještaja visokoškolskih ustanova,

city centre. A youth centre unique in Croatia is housed in a former military restaurant. A nursery was also built'. (PS 3)

Examples of less successful practices do not generally stand out for their inappropriate purpose or poor urban planning and architectural solution, rather for the fact that they remain persistently unfinished or due to an inconsistently implemented concept of regeneration. Most objections were addressed to the most ambitious urban *brownfield* regeneration project—the University Campus at the site of the former Borongaj Barracks.

*'The Borongaj campus has no inner city links, it's hard to get there, the amenities are modest. We somehow never finish anything. That campus has come to life in part, but it's all like our tradition of not finishing homes that we all criticise when we drive out of town, half the houses don't have a facade or fence or roof. We transfer this beyond the private into the public sphere, something is built and as soon as it has minimum functioning capacity we stop. The main issue with this campus is how to connect it to the city. *Brownfield* is characterised by the fact that it is an abandoned area within the city and can be recognised visually—we look at the photographs of the city and say: "This is *brownfield*". Now, the reconstruction is not only a matter of reconstruction within that site, but the question is how to connect it with other parts of the city. How to integrate it to communicate. For example, in Borongaj, not even the minimum level of functionality is offered; lecture halls and the cafeteria are available today, but there are no kiosks or any similar essential things, not to mention playgrounds, for which everything needed is already practically available there The barracks in no way communicates with its immediate surroundings, the settlement it is located in. *Brownfield* regeneration projects should have some reverse effect on their neighbourhoods—substandard in terms of quality of life. The effect of the new activity on campus was expected to spill over into the neighbourhoods and then into the entire city. That didn't happen. The campus was conceived as a camp, with the entry through that gate, I was a lecturer there and left because I couldn't go there anymore. First, it took me an hour to get there and an hour back. If it was a comfortable space, with facilities, a library, I would not mind staying there half a day between lectures And it is always a question of responsibility, to whom to address the problem . . . the state? The City? The University?' (SPS 3)*

'Regarding Borongaj Barracks, we have a partial conversion to accommodate higher education institutions; ba-

u osnovi je ideja dobra jer nudi aktiviranje napuštene kompleksa i rješavanje javnih potreba. Međutim, prostor nije u cijelosti riješen, nije uspostavljena kvalitetnija veza iz ostalih dijelova grada. Željeznička stanica Borongaj nije vezana za promet naselja uz Borongajsku cestu i studentski kampus, a nije dobro smještena niti u odnosu na okretište u Borongaju. (UD 3)

Dobar primjer bio bi Borongaj, lijepa javna namjena. Ali on je nedovršen i pitanje je kada će biti realiziran. (PD 1)

Selska-Ilica – nije do kraja riješeno. Jastrebarsko isto nije do kraja riješeno. Problem je kad se da zemljište gradu, a grad ne zna što s tim. Dugo nisam bila u Samoboru pa ne znam u kojem je stanju točno. Kampus Borongaj – šteta što nije bolje uređen. (ZSD 4)

Nove namjene vojnih brownfielda Urbane aglomeracije Zagreb

Analizom teorijskih istraživanja i istraživanja primjera utvrđeni su osnovni modeli prenamjene vojnih *brownfielda* kao specifične kategorije *brownfielda*. Modeli se prvenstveno razlikuju po funkcionalnoj prenamjeni, odnosno novom načinu korištenja, uz moguće varijacije povezane s različitim smještajem u prostoru i različitim načinima financiranja aktivnosti prenamjene te s različitim oblicima prostorne intervencije.

Prvi model prenamjene u urbanim područjima odnosi se na osnovnu funkciju grada – stanovanje. Rezultati dosadašnjih istraživanja upućuju na to da privlačnost ostvarenih stambenih sadržaja na nekadašnjim vojnim prostorima ovisi o planiranoj tipologiji stanovanja i o lokaciji vojnoga *brownfielda* unutar urbanoga područja, pri čemu se najuspješniji primjeri nalaze na malim udaljenostima od središta gradova. Za model rezidencijalne namjene vojnih *brownfielda* karakteristično je da mu u pravilu prethodi uklanjanje postojećih izgrađenih struktura i plansko uređivanje novoga naselja, pri čemu se kvalitetni ozelenjeni prostori nastoje očuvati kao novi parkovi naselja. Primjeri prenamjene vojnih *brownfielda* u stambenu namjenu su novija zagrebačka naselja na lokacijama nekadašnjih vojarna u Španskom i u Selskoj (sl. 4).

sically, the idea is good, because it offers the revival of an abandoned complex and addresses public needs. However, the space is not fully designed, no better connections have been established from other parts of the city. The Borongaj railway station is not linked to the traffic in the settlement along Borongaj Road and the student campus, nor is it well located in relation to the final Borongaj tram stop'. (MS 3)

'A good example would be Borongaj, a nice public service facility. But it is unfinished and no one knows when it will be'. (PS 1)

'Selska-Ilica streets—not fully resolved. Jastrebarsko has not been fully resolved as well. The problem arises when the land is given to the city and the city does not know what to do with it. I have not been to Samobor in a long time so I do not know in what condition it is in. Borongaj Campus—it's a shame it's not better organised'. (SPS 4)

New uses for military brownfields in the Zagreb urban agglomeration

The analysis of theoretical and case studies identified the basic models for redeveloping military brownfield sites as a specific brownfield category. Models are primarily differentiated by functional conversion or new usage, with possible variations associated with differences in spatial placement, methods of funding of conversion activities, and type of spatial intervention.

The first conversion model for urban areas relates to the basic function of the city: housing. The results of the research conducted so far indicated that the attractiveness of housing in former military areas depended on the planned typology of housing and the location of the military brownfield within the urban area; the most successful examples being those located a short distance from the city centre. The military brownfield conversion model for residential use is typically preceded by the removal of the existing structures and the planning of a new settlement, while attempting to preserve quality green spaces as new parks. Examples of the conversion of military brownfields for residential use are the more recently built settlements at the locations of former barracks at Špansko and on Selska Street (in Zagreb) (Fig. 4).

Drugi model prenamjene odnosi se na prenamjenu u javnu i društvenu namjenu, odnosno poslovnu i inovacijsku infrastrukturu. S obzirom na javnost korištenja i društveni značaj ulaganja u prenamjenu u nove javne sadržaje i potpurnu poslovno-inovacijsku infrastrukturu u najvećoj mjeri provodi javni sektor, uz mogućnost sklapanja i provedbe javno-privatnoga partnerstva. Model javne namjene i poslovno-inovacijske infrastrukture može podrazumijevati potpunu fizičku transformaciju zatečene izgrađene strukture s gradnjom novih građevina, ali vrlo često se novi sadržaji smještaju u postojeće zgrade prilagođene novom načinu korištenja. S jedne strane, kulturni sadržaji poput muzeja i galerija nalaze u vojnoj arhitekturi, često velikih dimenzija, savršen ambijent za prezentaciju postava, dok s druge strane, edukacijski i poslovno-inovacijski sadržaji, unatoč tomu što su prethodna i nova namjena u bitnome različite u svojim ciljevima odlično funkcioniraju u nekadašnjim vojnim kompleksima zbog sličnosti strukture i načina funkcioniranja. I vojna i edukacijska i poslovno-inovacijska namjena zahtijevaju prostorni razmještaj organiziran po odjelima, sa zajedničkim zatvorenim i otvorenim prostorima. Upravo stoga novu je edukacijsku i poslovno-inovacijsku namjenu najlakše smjestiti u paviljonski koncipiranim kompleksima nekadašnjih vojarna. Među značajnijim primjerima ovakve prenamjene u Urbanoj aglomeraciji Zagreb ističe se prenamjena vojarnu u Borongaju u Sveučilišni kampus, prenamjena nekadašnje Vojne bolnice u Vlaškoj ulici u glazbeno učilište Elly Bašić, kao i djelomično realizirana prenamjena s novim javnim sadržajima u nekadašnjoj vojarni Taborec u Samoboru (sl. 4).

Relativno velike površine i bogati otvoreni prostori nekadašnjih vojarna u urbanim područjima omogućuju prenamjenu u sportsko-rekreacijsku namjenu. Obično se radi o prostorima smještenim u urbanim područjima, ali ne u njihovim središnjim dijelovima, te o ulaganjima javnoga sektora. Model sportsko-rekreacijske namjene najčešće u potpunosti preobražava vojni *brownfield* uslijed specifičnih programskih zahtjeva i prostornih i arhitektonskih standarda za gradnju sportskih građevina, uz mogućnost zadržavanja i ponovnoga korištenja nekadašnjih vojnih vježbališta. Prostor nekadašnje vojarnu Taborec u Samoboru dijelom je

The second model of conversion relates to conversion for the public and social use, namely for business innovation infrastructure. Considering the public character of use and social importance, investments in conversion to new public amenities and supporting business innovation infrastructure mostly come from the public sector, with the possibility of entering into and implementing a public-private partnership. The model of public use and business innovation infrastructure may entail complete physical transformation of the existing structures and construction of new buildings, but very often new facilities are placed in existing buildings that have been adapted. Cultural facilities, such as museums and galleries find military architecture, which is often large in size, a perfect setting for exhibitions. Furthermore, educational and business innovation facilities, despite the fact that previous and new uses are substantially different in their goals, function very well in former military installations because of the similarity of structure and manner of function. Military, educational, and business innovation facilities require a departmentalised spatial arrangement, with shared indoor and outdoor spaces. For this reason, it is easiest to place a new educational or business innovation service into a pavilion-type complex like a former military barracks. Among the more significant examples of such conversions in the Zagreb Urban Agglomeration are the conversion of the barracks in Borongaj into a university campus, the conversion of the former Vlaška Street Military Hospital into the Elly Bašić Music School, as well as the partial conversion of the former Taborec Barracks in Samobor to accommodate new public amenities (Fig. 4).

The relatively large areas and abundant open spaces of the former barracks in urban areas make them convertible for sport and recreational use. Usually, these are places located in urban areas but not in their central parts, and the investment comes from the public sector. The sports and recreational use model most often completely transforms the military brownfield, due to specific program requirements and spatial and architectural standards for the construction of sports buildings, with an option to retain and reuse former military training facilities. The area of the former Taborec Barracks

rezerviran i za ovaj model prenamjene te je uređeno nogometno igralište s atletskom stazom i tribinama kao i teren za *inline* hokej neposredno uz Centar za mlade (sl. 4).

Prenamjena vojnih *brownfielda* u prometnu i infrastrukturnu namjenu predstavlja racionalan pristup ovom pitanju jer podrazumijeva ponovno korištenje napuštene vojne infrastrukture (poletno-sletne staze, cestovni i željeznički koridori i druge prometne i infrastrukturne građevine). Cidell (2003) je istražio modele korištenja napuštenih vojnih baza u Sjedinjenim Američkim Državama za civilno zrakoplovstvo, prepoznajući četiri glavna podmodela prenamjene: komercijalne zračne luke, zračne luke za teretni promet, zračne luke za manje letjelice te aeropleksi, odnosno manje zračne luke u funkciji industrijskih parkova. Santarossa (2013) predlaže prenamjenu dijela vojnih *brownfielda* regije Friuli Venezia Giulia u solarne parkove na temelju kartiranja lokacija i istraživanja pogodnosti ekspozicije pojedinoga *brownfielda*. U Urbanoj aglomeraciji Zagreb prostorno-planskom dokumentacijom nije predviđen ovakav model prenamjene vojnih *brownfielda*.

Poseban slučaj prenamjene velikih, većinom izvangradskih vojnih *brownfielda* njihova je renaturalizacija. Važan je europski primjer renaturalizacija vojnih *brownfielda* unutar „Estonskoga zelenog pojasa”. Zadnje trupe Vojske SSSR-a napustile su Estoniju u rujnu 1995. godine. Slijedom okolnosti da je na velikim površinama estonske obale do tada bila zabranjena bilo kakva aktivnost, osim onih u funkciji vojske, ribolova i eksploatacije mineralnih sirovina, očuvane su prirodne vrijednosti i obala predstavlja paradoksalnu mješavinu vrijednih područja prirode i područja s napuštenim vojnim i industrijskim građevinama, dijelom kontaminiranim opasnim otpadom.³ Ukupno je u području „Estonskoga zelenog pojasa” proglašeno 40 novih zaštićenih područja prirode (Järv i dr., 2013). Nakon zatvaranja oko 400 vojnih baza u SAD-u 1998.

in Samobor is partly reserved for this model of conversion, thus a football field with track and stands has been arranged, as well as a inline hockey rink next to the Youth Centre (Fig. 4).

The conversion of military brownfield sites for traffic and infrastructure uses is a rational approach to this issue, as it involves the reuse of abandoned relevant military infrastructure (runways, road and rail corridors, and other transport and infrastructure facilities). Cidell, 2003, investigated patterns of deployment of abandoned military bases in the United States for civil aviation, identifying four major sub-models of conversion: commercial airports; freight airports; smaller aircraft airports; and “aeroplexes”, i.e. an airport or airfield in a rural area that is combined with an industrial park. Santarossa, 2013, proposed to convert a portion of Friuli Venezia Giulia military brownfield sites to solar parks, based on mapping of locations and exploring the benefits of solar exposure of individual brownfield sites. In the Zagreb Urban Agglomeration, spatial planning documentation does not envisage such a model for the conversion of military brownfield sites.

One particular case of conversion of large, mostly non-urban military brownfield sites is their renaturalisation. A significant European example is renaturalisation of military brownfield sites within the “Estonian Green Belt”. The last USSR Army troops left Estonia in September 1995. Since large areas of the Estonian coast had been banned from any activity other than military, fishing, and mineral exploration, natural values were preserved and the coast is a paradoxical mix of valuable nature areas and areas with abandoned military and industrial structures, partly contaminated with hazardous waste³. In total, 40 new nature protected areas have been declared in the Estonian Green Belt area (Järv et al., 2013). After the closure of about 400 military bases in the US in 1998, over 400,000 ha were added to the national ecological network. Much of

³ Poslije Drugoga svjetskog rata Estonija je bila jedan od najvećih proizvođača urana u Europi. Godine 1959. osnovano je odlagalište radioaktivnoga otpada Sillamäe, koje je po osamostaljenju Estonije klasificirano kao prijetnja cijeloj Baltičkoj regiji i provedena je njegova sanacija. Na poluotoku Pakri nalazila se najgušća mreža sovjetskih vojnih objekata koja je uključivala i poligon za trening nuklearnih podmornica. Zagađenje prisutno na poluotoku Pakri daleko je od konačnoga rješenja.

³ After World War II, Estonia was one of the largest uranium producers in Europe. In 1959, the Sillamäe radioactive waste storage facility was established which, after Estonia gained its independence, was classified as a threat to the whole Baltic region and its rehabilitation was carried out. The Pakri Peninsula housed the densest network of Soviet military facilities, which included a nuclear submarine training centre. The contamination present in the Pakri Peninsula is far from definitive resolution.

godine preko 400 000 ha priključeno je nacionalnoj ekološkoj mreži. Velik dio ovih područja kontaminiran je kemijskim i eksplozivnim sredstvima i drugim ostatcima vojnih aktivnosti pa je renaturalizacija bila rješenje koje ne zahtijeva velika financijska sredstva za sanaciju, koja bi bila nužna u slučaju bilo kojega drugog novog načina korištenja (Havlick, 2007). Proučavanje prostornoplanske dokumentacije pokazalo je da je ovaj model prenamjene zastupljen u Urbanoj aglomeraciji Zagreb te da se gotovo trećina vojnih lokacija planira renaturalizirati (kao dio šumskoga kompleksa), urediti kao parkovna površina ili koristiti u poljoprivredne svrhe. Ovi vojni *brownfieldi* smješteni su izvan naselja i u perifernom dijelu urbane aglomeracije. Nekadašnji vojni lokaliteti Brckovljani – Prečec i Jastrebarsko 2, kao i nekadašnja radarska postaja Šiljakovina na području Grada Velike Gorice prostornoplanskom dokumentacijom planirani su kao šumsko zemljište, dok je nekadašnja vojna streljana u zagrebačkim Mikulićima planirana za javne parkove i zelene površine. Nekadašnji zrakoplovno-tehnički zavod na lokalitetu Lovec u Velikoj Gorici i vojno skladište u naselju Popovec u sklopu Grada Zagreba planirani su za poljoprivrednu namjenu (sl. 4).

U prenamjeni vojnih *brownfielda* za novo korištenje u funkciji uslužno-smještajne sastavnice turizma ključnu ulogu ima atraktivnost lokacije *brownfielda*, odnosno smještaj u području ili krajoliku koji je sam po sebi atrakcija i posjeduje iznimne prirodne, kulturne, povijesne i druge vrijednosti. Brojni vojni *brownfieldi* u turističkim gradovima na hrvatskoj obali prostornoplanskom dokumentacijom predviđeni su za preobrazbu u buduće turističke zone. Realizacija ovakvih planskih postavaka nerijetko dovodi do sukoba na relaciji lokalna uprava – ulagači – lokalna zajednica jer stanovništvo vojne *brownfielde* percipira kao prostore koji još uvijek nisu zahvaćeni intenzivnom gradnjom, u kojima treba osigurati javne i druge sadržaje bitne za lokalnu zajednicu te u najvećoj mogućoj mjeri očuvati neizgrađeni prostor i prirodne predjele. Model turističke namjene najčešće u potpunosti preobražava vojni *brownfield*, a nažalost, često teži formiranju izoliranih enklava zadržavajući zatvoreni karakter prostora i selektivno profilirane korisnike, što su bile temeljne značajke

these areas are contaminated with chemical and explosive ordnance and other remnants of military activities. Renaturalisation is a solution that does not require significant financial resources for remediation, which would be necessary in the case of any other new use (Havlick, 2007). An examination of the spatial planning documentation showed that this conversion model is envisaged for the Zagreb Urban Agglomeration and that almost one third of the military sites are planned to be renaturalised (as part of the forest complex), developed into park areas, or used for agriculture. These military brownfield sites are located outside of settlements and in the periphery of the urban agglomeration. The former military sites of Brckovljani-Prečec and Jastrebarsko 2, as well as the former Šiljakovina radar station near the City of Velika Gorica are designated as forest land in spatial planning documentation, while the former military shooting range in the Zagreb settlement Mikulići is designated for public parks and green spaces. The former Aeronautical Technical Institute at Lovec in Velika Gorica and a military warehouse in the settlement of Popovec within the City of Zagreb are designated for agricultural use (Fig. 4).

In the conversion of military brownfield sites for new use in the accommodation service component of tourism, a key role is played by the attractiveness of the brownfield location, i.e. accommodation in an area or landscape that is attractive and possesses exceptional natural, cultural, historical, and other values. Numerous military brownfield sites in tourist towns on the Croatian coast are foreseen for transformation into future tourist zones in spatial planning documentation. Implementation of such plans often leads to conflicts between local government, investors, and the local community. The local population perceives brownfields as spaces that have not yet been consumed by intensive construction, in which public and other amenities relevant to the local community should be provided, and wants to preserve undeveloped space and natural landscapes to the greatest extent possible. The model envisaging use in tourism most often completely transforms the military brownfield and, unfortunately, often tends to form isolated enclaves while maintaining the closed character of the space and presence of se-

i prijašnje vojne namjene. U Urbanoj aglomeraciji Zagreb prostorno-planskom dokumentacijom nije predviđen ovakav model novoga turističkog korištenja vojnih *brownfielda*.

Posebnu skupinu vojnih *brownfielda* čine oni koji se, zbog svoga povijesnog značaja, arhitektonske i inženjerske vrijednosti, zadržavaju u zatečenom stanju i postaju dijelom turističke infrastrukture, uz moguću obzirnu interpolaciju novih interpretacijskih i posjetiteljskih sadržaja. Među vojnim *brownfieldima* s baštinskim i turističkim potencijalom posebno se ističu mornaričke luke, brodogradilišta i baze u kojima su tijekom dugoga razdoblja postojanja akumulirane specifične strukture – spomenici arhitekture i urbanoga planiranja te inženjersva. Mornaričke su luke bile nacionalni i kraljevski ponos u Francuskoj, Nizozemskoj, Ujedinjenom Kraljevstvu i Švedskoj, u njih su ulagana značajna državna sredstva, a zgrade su gradili najpoznatiji arhitekti (Clark, 2005). Istaknuti primjer turističke valorizacije vojne baštine u Hrvatskoj jest turistička valorizacije tvrđave sv. Nikole u kanalu sv. Ante (Šibenik).⁴ Zanimljiv je prijedlog projekt arhitekture Anete Mudronja Pletenac u kojem predlaže prenamjenu napuštenoga vojnog aerodromskog kompleksa Željjava, u podnožju planine Plješevice, u Europski centar za kulturu leta „Mali princ”.⁵ Unatoč napuštenosti Željjava i danas ima svoje stalne posjetitelje: zaljubljenike u tehnologiju i avijaciju i turiste koji istražuju skrivene i napuštene prostore (*ruin tourism*). Provedena analiza pokazala je da samo jedan vojni *brownfield* urbane aglomeracije ima status zaštićenoga kulturnog dobra, ali predviđeno je njegovo javno korištenje u funkciji edukacije (nekadašnja Vojna bolnica u Vlaškoj ulici čija je obnova nedavno završena).

Jedan od ciljeva intervjuja provedenih 2019. i 2020. godine bio je doznati i usporediti stavove ispitanika o optimalnim novim namjenama vojnih *brownfielda*, u ovisnosti o njihovu specifičnom smještaju u Urbanoj aglomeraciji Zagreb.

lectively profiled occupants, which resembles characteristics of earlier military use. The Zagreb Urban Agglomeration does not envisage such a model of new tourist use of military brownfield sites.

A special group of military brownfield sites are those which, due to their historical significance, and architectural and engineering value, remain in their existing condition and are slated to become part of the tourism infrastructure, with the possible careful infill of new interpretive and visitor content. Among the military brownfield sites with heritage and tourism potential, naval ports, shipyards, and bases are particularly interesting with specific structures that had been accumulated over a long period of time—monuments of architecture, urban planning, and engineering. Naval ports were the national and royal pride in France, the Netherlands, the United Kingdom, and Sweden; significant national funds were invested in them, and buildings were built by the most famous architects. (Clark, 2005). A prominent example of the military heritage valorisation in tourism in Croatia is that of the St. Nicholas Fortress in the St. Anthony Channel (Šibenik)⁴. An architect named Aneta Mudronja Pletenac gave an interesting project proposal: to convert the abandoned Željjava military airport complex at the foot of Plješevica Mountain into the Little Prince European Centre for the Culture of Flight⁵. Despite being abandoned, Željjava still has regular visitors: technology and aviation enthusiasts and tourists participating in ruin tourism. The analysis showed that only one brownfield in Zagreb urban agglomeration has the status of a protected cultural heritage, but its public use is envisaged to be for educational purposes (the former Military Hospital on Vlaška Street).

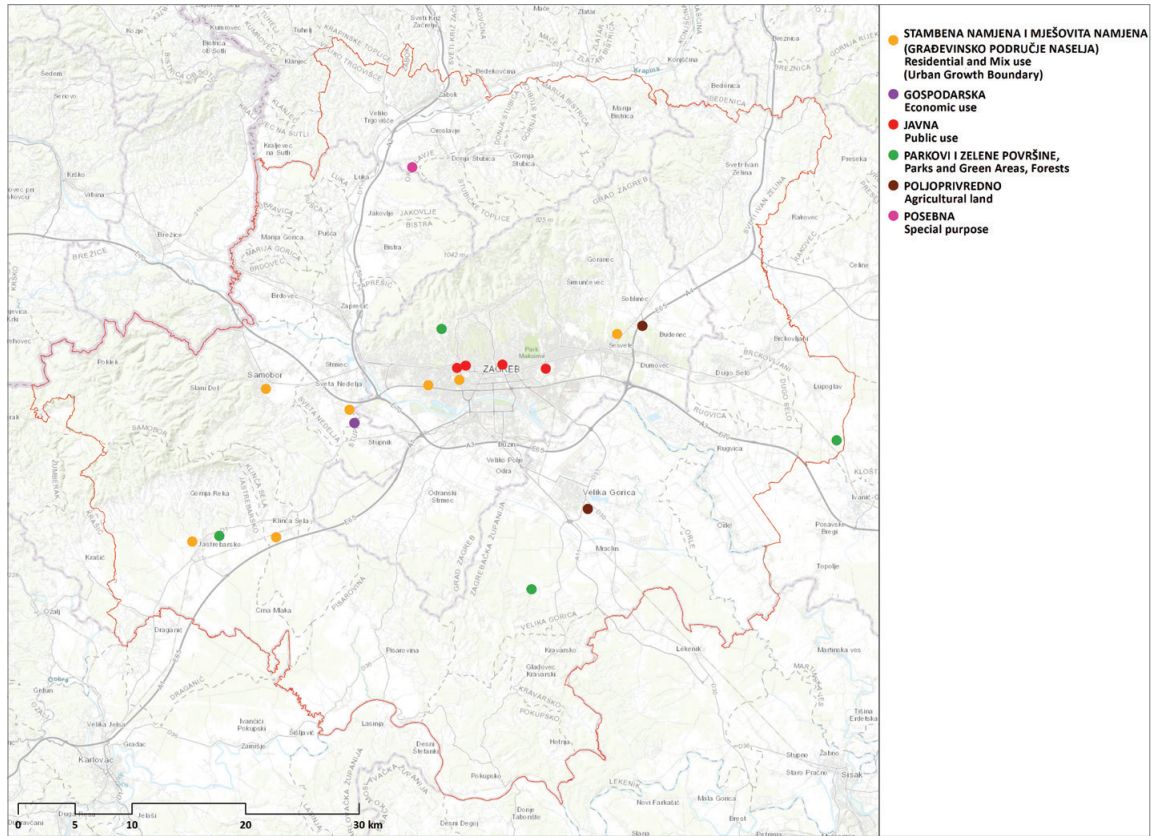
One of the goals of the interviews conducted in 2019 and 2020 was to ascertain and compare attitudes of the respondents regarding optimum new uses of military brownfield sites, depending on their specific location in the Zagreb Urban Agglomeration.

⁴ Tvrđava sv. Nikole je 6. srpnja 2017. službeno upisana na UNESCO-ovu listu svjetske baštine u sklopu nominacije „Obrambeni sustavi Republike Venecije u razdoblju od 15. do 17. stoljeća”. Na popisu su još Bergamo, Peschiera del Garda i Palmanova u Italiji, Kotor u Crnoj Gori te Zadar u Hrvatskoj.

⁵ Prijedlog je nagrađen nagradom 50. Zagrebačkoga salona arhitekture.

⁴ St. Nicholas fortress was officially entered into the UNESCO List of World Heritage Sites on July 6th, 2017, within the nomination of the Venetian Works of Defence from the 16th and 17th Centuries. The list also includes Bergamo, Peschiera del Garda and Palmanova in Italy, Kotor in Montenegro and Zadar in Croatia.

⁵ The proposal awarded at the 50th Zagreb Architecture Salon.



Sl. 4. Napuštene vojne lokacije u Urbanoj aglomeraciji Zagreb – planirana namjena prostora
Fig. 4 Abandoned military sites in the Zagreb Urban Agglomeration—planned site use

U urbanom području Grada Zagreba, odnosno u naselju Zagreb kao središnjem naselju jedinice lokalne samouprave, ispitanici su na prvom mjestu popisa najpoželjnih novih namjena istaknuli javnu i društvenu namjenu:

Javna namjena. (ZSD 2)

Javna namjena, to treba iskoristiti za smještaj javnih sadržaja koji imaju prostorne poteškoće i ostvariti pozitivan utjecaj na kvalitetu života u gradu. (PD 2)

Za Grad bi svakako bilo dobro nešto od društvene namjene: vrtići, škole, kultura, umjetnost, knjižnice... pa čak i u neku funkciju turizma. (ZSD 4)

Javna i društvena namjena, znači kultura, obrazovanje, znanost, sportsko-rekreacijska namjena. (UD 2)

Definitivno društvena namjena, prostori za mlade, prostori za inovacije gdje se puno mozгова može družiti i raditi i kroz druženje dolaziti do novih ideja.

The respondents emphasised the public and social use as the first on the list of the most desirable new uses **in the urban area of the City of Zagreb, namely in the settlement of Zagreb as the central settlement of the local self-government unit:**

'Public use'. (SPS 2)

'Public use; this should be used to accommodate public facilities that have difficulties with space and thus achieve a positive impact on the quality of life in the city'. (PS 2)

'Some social use would certainly be good for the City: kindergartens; schools; culture; art; libraries . . . and even some function in tourism'. (SPS 4)

'Public and social use; therefore culture, education, science, sports and recreational purpose'. (MS 2)

'Definitely some social use, spaces for young people, spaces for innovation and brainstorming and socialisation, new ideas through socialising. Certainly not any

Sigurno ne nekakva proizvodnja, tome u gradu nije mjesto. (PD 3)

Neki ispitanici upozorili su i na moguće opasnosti budućega jednonamjenskog korištenja i predložili buduću mješovitu namjenu:

Društvena namjena, poslovni prostori, otvorene javne površine, sport i rekreacija, eventualno društveno poticana stanogradnja - POS. (UD 3)

Ako smo unutar GUP-a grada Zagreba, to je mješovita namjena. Nerijetko gradovi u takve veće brownfield zone prvo stave neki reprezentativni javni objekt, npr. nova opera u Oslu, koji daje pečat novom razvoju. Znači javna namjena, stanovanje, sport – pretvaranje brownfielda u ono što čini grad. Ne neki jednonamjenski prostor pod ogradom, koji je mrtav pola dana. Vojni i industrijski brownfieldi su nekadašnje zone pod ogradom, jednonamjenske i izolirane od grada. (PD 1)

Javna i društvena namjena, proizvodna namjena, poslovna namjena, ugostiteljsko-turistička namjena, sportsko-rekreacijska namjena, stambena namjena. (UD 5)

Mislim da centar grada nije ekskluzivno za jednu namjenu. Za centar je karakteristična mješovitost. Znači, te uvjete treba prenijeti i na brownfield u centru, jedna diversifikacija funkcija, vodeći računa da što više različitih socijalnih grupa, identiteta koristi taj prostor. Neka vrsta agore, mjesto susreta različitih aktivnosti gdje će svatko naći nešto za sebe. (ZSD 3)

Mješovita, znači stambeno i poslovno, kultura, ono što čini grad. (UD 4)

Zanimljiv je i stav o mogućem korištenju vojnih brownfielda u urbanom području Zagreba za stambenu namjenu, ali s izrazitim naglaskom na ekološkoj i energetskej održivosti i primjeni najsuvremenijih tehnologija kojima se dostiže koncept samodostatnosti.

Definitivno gradu treba stambenog prostora, ali ne treba više razmišljati o klasičnom stambenom prostoru, nego na krilima ekologije, zelenih politika, energije, stvoriti potpuno novi koncept naselja koja su samoodrživa. Možemo vojni brownfield promatrati kao otok koji sa svih strana ima neku postojeću infrastrukturu, a može i sam proizvesti neku infrastrukturu i ponuditi je

kind of production, there is no place for that in the city'. (PS 3)

Some respondents also pointed out to the potential dangers of single use and suggested mixed use in the future:

'Social use, commercial premises, open public spaces, sports and recreation, possibly subsidised housing construction'. (MS 3)

'If we are to remain within the framework of the City of Zagreb Master Plan, we are talking about mixed use. Cities often first put up some representative public facility in such larger brownfield areas, such as the new Oslo Opera, which promotes new development. So public use, housing, sports—turning brownfield into what makes a city. Not some single-purpose fenced space that is lifeless for half the day. Military and industrial brownfield sites are formerly fenced-in, single-purpose zones isolated from the city'. (PS 1)

'Public and social use, production, commercial, use for catering and tourism, sports and recreation, and housing'. (MS 5)

'I don't think downtown is meant exclusively for single use. The city centre is characterised by its blend. So these conditions should also be transferred to the brownfield in the centre, a diversification of functions, taking into account that as many different social groups and identities use this space. A kind of agora, a meeting place for different activities where everyone will find something for themselves'. (SPS 3)

'Mixed use, meaning residential and commercial use, culture, that which is typical of a city'. (MS 4)

There is an interesting view regarding the possible use of military brownfield in the urban area of Zagreb for residential use, emphasising environmental and energy sustainability and the application of cutting-edge technology that attains the concept of self-sufficiency:

'Definitely, the city needs housing, but we should no longer think about classic housing. On the wings of ecology, green policies, energy we should create a completely new concept of self-sustaining housing. We can view the military brownfield as an island that has some existing infrastructure on the perimeter, but can also produce some new infrastructure and offer it to the city. That

sebi, a i dalje. Svakako taj novi tip stanovanja. (PD 4)

Ispitanici su upozorili i da donošenje odluke o budućoj namjeni treba biti rezultat istraživanja potreba i potencijala mikrolokacije, ali i studija izvodljivosti i isplativosti:

Nema univerzalnog odgovora, to je stvarno „case by case”. Skupe lokacije u centru traže investicije s brzim povratom, najčešće stanovanje. (ZSD 1)

Javna namjena, smještajni kapaciteti hotelskog tipa... Precizno utvrđivanje stvarno ovisi o kontekstu. Primjerice, u blizini fakulteta dobro je planirati studentski dom. Na periferiji, ali u zoni javnog prijevoza, moguće je planirati neki hotel za samce... Znači, javna namjena, ali konkretan program u ovisnosti o potrebama i ponudi u bližem okruženju. Općenito, mislim da vojnoj namjeni nije mjesto u zoni tramvaja, preskupo je i nepotrebno u toj zoni držati tenkove i kamione. (UD 6)

Odgovori na pitanje o optimalnim novim namjenama vojnih *brownfielda* u drugim gradovima **Urbane aglomeracije Zagreb** ponovno su istaknuli javnu i društvenu namjenu, ali u nešto većoj se mjeri predlažu i druge namjene: poslovna, stambena i mješovita namjena:

Dobro bi bilo posvetiti takve lokacije umjetnosti i da se na takvim lokacijama planira neki muzej, park skulptura. Javni sadržaj definitivno. (UD 6)

Najčešće se vojni objekti prenamjenjuju u obrazovne i to nije slučajno, to je zbog same strukture i načina funkcioniranja. Te dvije namjene koliko god su različite po ciljevima, bliske su po načinu rada i organizacije prostora na odjele, zajedničke prostore i slično. Ako se zadržava postojeća struktura, edukaciju je najlakše smjestiti. I to je možda bolje za prsten, nego za centar velikog grada. (ZSD 3)

U središtima mjesta neka vrsta poduzetničkih inkubatora, prostori za udruge. (PD 2)

Javna i društvena namjena, proizvodna namjena, poslovna namjena, ugostiteljsko-turistička namjena, sportsko-rekreacijska namjena. (UD 5)

Mješovita namjena, ali da ima i društvene namjene, edukacije, obrazovanja. (ZSD 4)

Stambena namjena. (ZSD 2)

new type of housing, certainly’. (PS 4)

The respondents also stated that any decisions regarding the future use should be a result of research into the needs and potentials of a site, as well as of results of feasibility and cost-effectiveness studies:

‘There is no universal answer, this really calls for a case-by-case approach. Expensive downtown locations seek quick return on investments, most often in housing’. (SPS 1)

‘Public use, hotel accommodation Accurate determination really depends on the context. For example, it is a good idea to plan a dorm near the college. A singles hotel could be planned on the outskirts, but also in the area of public transportation So, public use, but a specific program depending on the needs and offer in the surrounding area. Generally, I think that military use has no place within the tram zone, it is too expensive and unnecessary to keep tanks and trucks in that zone’. (MS 6)

The answers to the question about the optimum new uses of military brownfield sites **in other cities of the Zagreb Urban Agglomeration** reiterated public and social use, but other uses are also frequently proposed—commercial, residential, and mixed use:

‘It would be good to dedicate such sites to art and to plan a museum or a sculpture park at such sites. Public amenities definitely’. (MS 6)

‘Military facilities are most often transformed for educational purposes, and this is not accidental, because of the structure and the way they function. These two purposes, however different in aim, are closely related as regards the manner and organisation of the space into departments, common areas, and the like. If the existing structure is maintained, an education facility is easiest to accommodate. And such a solution could be better for the city ring than for the centre of the big city’. (SPS 3)

‘In the centres of the towns we can envisage some kind of entrepreneurial incubators, spaces for NGOs’. (PS 2)

‘Public and social use, production, commercial, use in catering and tourism, sports and recreation’. (MS 5)

‘Mixed use, including social and education facilities’. (SPS 4)

‘Residential use’. (SPS 2)

To opet zavisi o položaju u strukturi grada. Ne znam gdje je vojarna u Dugom Selu, u Jaski je na ulazu u grad i tamo se može smjestiti i gospodarstvo jer neće ometati drugo funkcioniranje. Može biti i neki sportski sadržaj. (PD 3)

Za dio ispitanika potrebe Donje Stubice, Dugog Sela, Jastrebarskog, Oroslavja, Samobora, Svete Nedelje, Svetog Ivana Zeline, Velike Gorice, Zaboka i Zaprešića ne razlikuju se od potreba Zagreba:

Isto kao i kod Zagreba, kombinacija mješovitih sadržaja. (UD 4)

Sve kao i kod urbanog područja Grada Zagreba. (UD 3)

Kao i kod prethodnih, javna i društvena namjena: kultura, obrazovanje, znanost, sportsko-rekreacijska, s tim da u tim drugim središtima bi odgovarala i poslovna namjena. (UD 2)

Dio ispitanika prepoznao je ulogu građana u odlučivanju o budućoj namjeni prostora te ulogu strateškoga planiranja razvoja:

Trebalo bi imati i javne namjene, ponuditi građanima ankete i varijante. (ZSD 1)

Odlična lokacija za nešto što konkretni grad svojom strategijom želi razvijati. Vojne barake uglavnom nemaju neku vrijednost, znači mogu se i porušiti. (PD 1)

Odgovori na pitanje o optimalnim novim namjenama vojnih **brownfielda u sjedištima općina i ostalim manjim naseljima Urbane aglomeracije Zagreb** pokazali su svijest ispitanika o razvojnim izazovima malih naselja:

E, tu je problem. Ti veliki vojni brownfieldi nikad nisu pripadali tim općinama, nego nekom nacionalnom sustavu. To su za male općine često preveliki prostori, za kojima one nemaju ni dovoljno vlastitih potreba ni kapaciteta za obnovu. To za jednu općinu predstavlja veliki teret, ali kad bi se pet općina ujedinilo i reklo što će tu razvijati, onda bi moglo proći. Ali to nećemo vidjeti tako skoro, usitnjenost samouprave je veliki problem. (PD 1)

Nema tu generalnog stava, to ovisi o specifičnom kontekstu, što im je potrebno razvojno, identitetski, kakav je odnos zajednice prema tom objektu. Tu bih

'This again depends on the position within the structure of the city. I do not know where the barracks in Dugo Selo are located, the barracks in Jaska are at the entrance into the town where commercial facilities could be placed, as they will not interfere with other functions. There may also be some sports amenities'. (PS 3)

For some respondents, the needs of Donja Stubica, Dugo Selo, Jastrebarsko, Oroslavlje, Samobor, Sveta Nedelja, Sveti Ivan Zelina, Velika Gorica, Zabok, and Zaprešić are not different from the needs of Zagreb:

'Same as for Zagreb, a combination of mixed uses'. (MS 4)

'All the same as in the urban area of the City of Zagreb'. (MS 3)

'Same as with the previous ones, public and social use—culture, education, science, sports and recreation, with commercial use in these other centres as well'. (MS 2)

Some respondents recognised the role of citizens in decision-making on the future use of space, as well as the role of strategic development planning:

'It should also have public uses, polls, and alternatives to be offered to the citizens'. (SPS 1)

'Great location for something a particular city wants to develop according to its strategy. Military barracks generally have no value, so they can even be demolished'. (PS 1)

The answers to the question about optimum new uses of military brownfield sites **in municipal centres and other smaller settlements in the Zagreb Urban Agglomeration** showed the awareness of the respondents about the development challenges facing small settlements:

'Well, here's the problem. These large military brownfield sites never belonged to these municipalities, rather to some national system. These are often too large for small municipalities, for which they have neither need nor the capacity to regenerate. This is a huge burden for one municipality, but if five municipalities unite and say what they will join in development then it could work. But we won't see it that soon, the fragmentation of self-government units is a big problem'. (PS 1)

'There is no general attitude, it depends on the specific context, what they need in terms of development, identity,

stvarno krenula odozdo, vidjeti značenje koje ima, tradiciju, sadašnje korištenje. U malom mjestu morate znati tko će biti korisnik, u velikom gradu je lakše, uvijek se netko nađe. (ZSD 3)

Tu nema recepta, treba istražiti koji je nedostajući sadržaj u tom naselju koji bi popravio kvalitetu života, koji odgovara karakteru naselja. (UD 4)

Dobro bi bilo osvježiti i manja mjesta nekim kulturnim sadržajem, postoje takve potrebe i puno to znači za život mjesta. (UD 6)

Uz uvjet dobre prometne povezanosti, stanovanja. Možda bi mladi bili spremni živjeti u manjem mjestu i putovati ako je dobro prometno povezano. (ZSD 4)

Ako je u naseljenom dijelu, gospodarstvo nije prihvatljivo jer bi gabaritima nagrdilo šarm maloga mjesta. I u centru malog mjesta treba planirati društvenu namjenu, škole, vrtiće. Na taj način se potiče ostanak ljudi i doseljavanje. Izvan centra mjesta apsolutno gospodarska namjena, moguće i proizvodna jer je to opet preduvjet ostanka ljudi u malim mjestima. (PD 3)

I odgovori na pitanje o optimalnim novim namjenama vojnih *brownfielda* u **pretežito neizgrađenom, ruralnom prostoru Urbane aglomeracije Zagreb** upućuju da ovakve lokacije traže sagledavanje na višoj upravljačkoj razini:

Teško je za takve ikakvu namjenu naći u koju bi netko investirao. (ZSD 1)

To treba gledati u širem kontekstu, što fali širem prostoru. Potrebno je sagledavanje na razini županije, na primjer. (UD 4)

Tu jedino ako država prepozna neku potrebu. Za općinu je to samo teret. (PD 1)

Možda neki mali centar, potporna institucija za poljoprivredu, neki LAG... (ZSD 3)

Proizvodnja. (ZSD 2)

Ako je u blizini nekih termi ili druge atrakcije, možda smještajni kapaciteti, turizam. (UD 6)

Isto stanovanje, prostori za sport i rekreaciju, pa čak i edukaciju. Može i turizam, to se sve može vezati jedno uz drugo. (ZSD 4)

what the relationship of the community to that structure is. I would really start with a bottom-up approach, to see the significance of a specific facility, tradition, present use. In a small town, you need to know who the user will be, it's easier in the big city, it's always easy to find someone'. (SPS 3)

'There is no recipe, it is necessary to investigate what such a settlement lacks, what would improve the quality of life, which corresponds to the character of the settlement'. (MS 4)

'It would be good to revitalise smaller towns with some cultural amenities, there are such needs, and it means a lot for the life in such place'. (MS 6)

'Provided good traffic connection, housing. Perhaps young people would be willing to live in a smaller town and travel, if there is good traffic connection'. (SPS 4)

'If the site is in a populated area, the commercial activities are not acceptable, as the facility dimensions would endanger the charm of a small town. Social use, schools, kindergartens should also be planned in the centre of a small town. This encourages people to stay and move in. Commercial use is absolutely acceptable outside the city centre, possibly even production, as this is again a prerequisite for people to remain in small towns'. (PS 3)

The answers to the question about the optimum new uses of military brownfield sites in the **largely undeveloped, rural area of the Zagreb Urban Agglomeration** also indicate that these locations require to be considered at the higher governance level:

'It is difficult to find any use for such sites that is interesting for an investor'. (SPS 1)

'This should be considered in a broader context, what is the greater area lacking. County-level analysis is needed, for example'. (MS 4)

'Only if the state recognises a need. The municipality sees it only as a burden'. (PS 1)

'Maybe a small centre, a support institution for agriculture, some LAG...'. (SPS 3)

'Production'. (SPS 2)

'If in a vicinity of a spa or other attraction, the site could be used for accommodation, tourism'. (MS 6)

'For housing, sports and recreation areas, even education. Also tourism, it can all be intermingled'. (SPS 4)

Najgore je da nešto zjapi prazno i izvan funkcije. Neki planinarski dom, izletnički turizam. Gospodarstvo, opet kao preduvjet ostanka. Naravno, ne nešto što će upropastiti neki prekrasan krajolik. (PD 3)

Može to preuzeti natrag priroda i gotovo. Ali, ako je u blizini neka poslovna zona, uz malo modifikacija može se prenamijeniti u neki rekreacijski centar pridružen toj poslovnoj zoni. Jednostavno treba promatrati lokaciju u njenom kontekstu. (PD 4)

Zaključak

Iz provedenoga istraživanja može se izvesti zaključak da stavovi ispitanika o optimalnoj budućoj namjeni vojnih *brownfield* prostora u Urbanoj aglomeraciji Zagreb u bitnome ovise o njihovoj specifičnom smještaju u aglomeraciji. Vojni *brownfieldi* u urbanom području Zagreba te u nešto manjoj mjeri oni u drugim gradskim središtima aglomeracije percipirani su kao prostorni rezervati u gusto izgrađenom urbanom tkivu koje treba očuvati za razvoj funkcija i usluga koje će udovoljavati potrebama što širega kruga građana. Najčešće su predlagane javna i društvena te sportsko-rekreacijska namjena, a dio ispitanika prepoznaje mješovitu namjenu kao optimalnu buduću namjenu regeneriranoga prostora zbog toga što mješovitost funkcija i diversifikacija društvenih skupina koje koriste prostor daju „gradskost” napuštenoj lokaciji.

Kako se smanjuju stupanj centraliteta i urbanitet naselja u kojem je smješten vojni *brownfield*, tako se stavovi ispitanika mijenjaju i smanjuje se želja za čuvanjem ograničenoga prostornog resursa za javnu i društvenu namjenu. Ispitanici ističu nedostatne upravljačko-financijske kapacitete za provedbu značajnih projekata prenamjene *brownfielda* u manjim naseljima, potrebu sagledavanja tematike na višoj upravljačkoj razini i nužnost učinkovita strateškoga planiranja. Među predloženim namjenama dominiraju one koje bi mogle donijeti nova radna mjesta i novo stanovništvo pa se vojni *brownfieldi* u manjim mjestima percipiraju i kao mogući prostorni spremnik za buduće priuštivo stanovanje u Urbanoj aglomeraciji Zagreb, uz preduvjet dobre prometne povezanosti.

‘The worst thing is to have something that is unused and out of function. A hiking lodge, excursion tourism maybe. Commercial activities, again, as a prerequisite for people to stay. Of course, not something that will ruin a beautiful scenery’. (PS 3)

‘Nature can take it back. But if there is a business zone nearby, with a few modifications it can be converted into a recreation centre associated with that business zone. One simply needs to look at the location in its context’. (PS 4)

Conclusion

The conclusion based on the results of the conducted research is that attitudes of the respondents about the optimum future use of the military brownfield sites in the Zagreb Urban Agglomeration largely depend on the specific location of the site in the agglomeration. Military brownfield sites in the urban area of Zagreb, and to a lesser extent those in other urban centres in the agglomeration, are perceived as spatial reserves in the densely built urban tissue, which should be preserved for development of functions and services that would meet the needs of as many citizens as possible. Public, social, and sports and recreational uses were most often proposed, while some respondents recognised mixed use as the optimum future use of regenerated space, because the mix of functions and diversification of social groups using the space give urbanity to an abandoned location.

As the degree of centrality and urbanity of the settlement in which the military brownfield is located decreases, the attitudes of the respondents change and the desire to conserve limited spatial resources for public and social uses becomes less pronounced. Respondents emphasised the lack of managerial and financial capacity to carry out significant brownfield conversion projects in smaller settlements, the need to consider the topic at a higher governance level, and the need for effective strategic planning. The proposed uses were dominated by those that could create new jobs and attract new population, so military brownfield sites in smaller towns were also perceived as possible spatial reservoirs for future affordable housing in the Zagreb Urban Agglomeration, provided that there would be good traffic connections.

Zanimljivost je istraživanja da značajne razlike u stavovima i suprotstavljena stajališta između triju skupina dionika (upravljačkih, znanstveno-stručnih i političkih) nisu istaknute.

Samo je jedan ispitanik predložio mogućnost provedbe procesa renaturalizacije vojnih *brownfielda* u neizgrađenom, ruralnom prostoru aglomeracije premda je istraživanje prostorno-planske dokumentacije pokazalo da je takav model u aglomeraciji zastupljen u zamjetnoj mjeri. To se vjerojatno može pripisati činjenici slabijega poznavanja broja i lokacija vojnih *brownfielda* smještenih izvan gradova.

It is interesting to note that significant differences in attitudes and opposing views between the three groups of stakeholders (managerial, scientific and professional, political) were not expressed.

Only one respondent suggested the possibility of the implementation of the process of renaturalisation of military brownfield sites in undeveloped, rural agglomeration space, although the spatial planning documentation shows that such a model is foreseen to a significant extent. This can probably be attributed to the fact that there is not much knowledge regarding the number and locations of military brownfield sites located outside cities.

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