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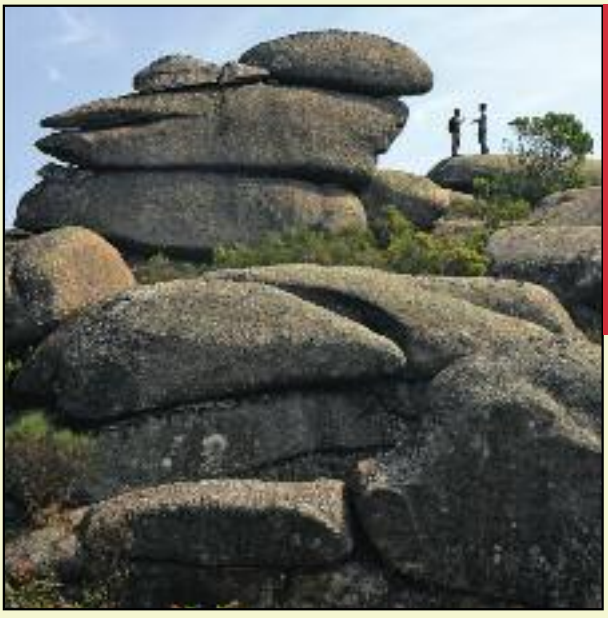

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THE MOTIVES FOR SERVICE USERS VISITING THE WELLNESS CENTRES IN SLOVENIA

MOTIVI OBISKOVALCEV WELLNESS CENTROV V SLOVENIJI

Milica Rančić, Ivana Blešić, Jasmina Đorđević, David Bole

MIRAN KAMBIČ

Olimia thermal spa.
Terme Olimia.
(Source/vir: http://www.archdaily.com/62814/orhidelia-wellness-enota/orhidelia-11)

The motives for service users visiting the wellness centres in Slovenia

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ABSTRACT: The word »wellness« is usually used to indicate a healthy balance of the mind, the body and the spirit that results in an overall feeling of the well-being. The wellness centers have become an inseparable part of the hotel facilities, at the instance of the users who come to these centers because of different motives. The purpose of this research is to examine the characteristics of a healthy-living market segment and its motivational behavior to wellness facilities in Slovenia. Hence, the objectives of this research are as follows: to identify the motivational characteristics of the tourists visiting the wellness centers and to study the relationship between the tourists' healthy-living behavioral patterns and the motivational behavior in relation to the wellness facilities in Slovenia.

KEY WORDS: geography, tourism, motives for visiting, healthy lifestyle, service users, wellness centers, Slovenia

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1 Introduction

Over the last decades the »wellness spa« industry has experienced a boom around the world. The word »wellness« has been formed by merging two words: »wellbeing« and »fitness« and it appeared in the thirties of the last century in the United States. The primary objective of this movement is an ancient philosophy, according to which there is no fulfilled life without the assent of the physical and the mental. The Wellness tourism, a term that is defined as people traveling from their place of residence for the health reasons, has gained the increasing popularity and has become one of the fastest growing types of international and domestic tourism (Wellness Tourism Worlwide 2011). Hotel guests, today more than ever, want higher quality offer for their money (Blešić et al. 2008). This means that wellness is today a very important criterion by which customers select hotels. Exploring the motives of wellness visitors is imperative for improving the tourist offer and is therefore an important part of tourism geography research (Horvat 2000). Assuming that there is a huge connection between the lifestyle of the wellness users and their motives for coming, this paper attempts to explain that the motives of the visit depends on the health and wellness habits of the users. The survey was conducted in Slovenia, which was chosen as a well-developed wellness tourism destination due to its traditional thermal baths and the modern wellness centers.

2 The wellness tourism in Slovenia

Slovenia is a country of exceptionally diverse landscapes at the intersection of four major European macroregions: the Alpine, Pannonian, Dinaric and Mediterranean regions. The great diversity of landscapes and the easy availability of the country influences the fact that this country has the opportunity to develop a different type of tourism (Ažman Momirski and Kladik 2009). One of the most developed is the spa tourism,

Figure 1: Spatial distribution of Slovenian spas (source: http://www.odeontravel.rs/katalozi/Odeon_katalog_wellness_spa.pdf; photography was edited by the authors).

a modern form of the wellness tourism. Wellness tourism is data the most important form of tourism according to statistical, totalling to 25% of all tourist arrivals and 33% of total overnight stay in 2009 (SURS 2014). The Spa tourism is especially developed in the Pannonian Slovenia, which is rich in thermal springs (Mihić 2009).

There are thermal waters with different properties and temperatures (from 32 to 73 degrees Celsius) and some mineral water (world famous »Donat Mg« and »Radenska Three Hearts«) and also the salt water, some organic and inorganic peloids. In fifteen spa centres with the motto »With the nature to the health« the latest offer is developed in the field of wellness treatments and some new programs for the health care and the disease prevention as well. The Slovenian spas have good infrastructure, good transport links and the proximity to the major tourist flows between the Alps and the Mediterranean. Support from the state in the form of systemic initiatives in the area of selecting contributions for health insurance and in the form of tax breaks and similar systemic measures, would be important for future tourism development (Gojčič 2011).

3 Literature review – previous research about the motives of the wellness tourists

Page and Connell (2006) stated that motivation as a subject was an integral part of the study of consumer behaviour in tourism. Among the most well-known tourist motivation theory is the »push-pull« concept in which activity is seen as a product of a pull-push relationship. Dann (1981) pointed out that the destination pulls in response to motivational push, which distinguishes between the motivation of the individual tourist in terms of the level of the desire (push) and the pull of the destination or attraction.

The idea of the push-pull model is the decomposition of a tourist's choice of destination into two forces, which are push and pull factors (Bansal and Eiselt 2004). The push factors are considered to be socio-psychological motivations that predispose an individual to travel, while the pull factors are those that attract an individual to a destination once the decision to travel has been made (Kim and Lee 2002).

This concept was also applied in the study of tourist motivation in the field of wellness tourism. It was concluded that there must be the factors that motivate tourists to use the spa services, but also the real attributes that attract them to come to a spa facility. Based on this concept, the research was carried out in Malaysia. Data were collected through the in-depth interviews and it is concluded that the motivation of wellness tourists largely depends on the personal needs and the lifestyle, and then on the price and quality of services (Azman and Chan 2010).

The Research on this topic was also carried out by many other methods, not only by push and pull method. Chen, Prebensen and Juan (2008) conducted a survey in a large wellness center in Taiwan, where 506 visitors were involved. The study found that the relaxation, pursing multiple activities, the recreation, and the enjoying nature are the top four motivations.

On the contrary, studies integrating healthy lifestyle into consumer behaviours by González and Bello (2002) show a strong dependency relationship between tourists' behaviours on the trip and the lifestyle. Based on that, Byung hun Kim and Adarsh Batra (2009) suggest a hypothetical model that examines and finds a relationship between the healthy lifestyle of wellness tourists and their motivations in the wellness center. This model consists of the two main parts. The first section relates to a healthy lifestyle and it consists of six variables (exercise, diet, alcohol and drugs, smoking, stress, safety) contained in 18 questions. The second section evaluated the motivational behavior and contains 13 questions. Based on this model, a study was explored by 164 questionnaires at the eight wellness centers of hotels in Bangkok from February to April in 2009. It maintains that recreation, relaxation, enhancement of the quality of life and some social activities are the top four motivational factors when visiting wellness facilities. The correlation results revealed that there were relationships between the healthy-living behavior statuses with the regard to a diet, a smoking status, and the safety and motivational behavior to visit wellness facilities.

A large study of tourist motives of wellness tourists in a large spa centre Rogaška Slatina was conducted in 2000 (Horvat 2000). For over 1300 tourists the most important motivation was health rehabilitation (48%), followed by health prevention (23%) and relaxation & recreation (25%). The study was focused on guest's motives and less on issues of living habits of visitors.

4 Methodology

4.1 The model for measuring motives of the wellness users

The model described in the previous chapter that was used in Thailand (Kim and Batra 2009) is also used for this research. The first part of the questionnaire refers to the issues of healthy living habits and it consists of the 6 variables or 18 questions. The second part refers to the importance of the guest's motives in the wellness center. This part consists of 13 motivational factors. A five-point Likert scale was used in both parts of the questionnaire.

4.2 The hypotheses

We have tested four hypotheses in order to establish the motives of visiting wellness centers in Slovenia in correlation to visitors' behaviour and lifestyle.

H1: The users of the wellness services in Slovenia are mostly females, aged between 41 and 60, if we look at the »profile of European guest in the wellness tourism«.

H2: The users of the wellness services usually come from more urban areas, as a result of a higher standard of living, but there is also a greater need for the relief from stress.

H3: The main motives for the visits of the service users in the wellness centers in Slovenia are: relaxation, recreation and effortless activity.

H4: The healthy living habits are the independent factors, but the motives of the wellness users are the dependent variables which depend on habits.

5 Findings and discussion

5.1 The data analysis

The research was carried out from April to July, 2013. The study involved service users in the wellness centers of some selected hotels in Slovenia. The research was conducted on the entire territory of Slovenia and the wellness centers were chosen on a random basis. At the beginning, the 120 questionnaires were distributed, but in the end there were 100 valid questionnaires (83%).

There are 8% men more than women in the sample, it actually goes beyond the classic »profile of a European guest in the wellness tourism« (Košić 2011). Previously, most of the wellness tourists were women. This means that the **hypothesis 1** is not confirmed but still this information is in accordance with the latest trends that show that in recent years an increasing number of male persons have become interested in this type of service. The data on the age of the respondents in this sample also do not confirm the first hypothesis, but this fact again confirms the latest trend of increasing number of young people who use the wellness services. One half of the whole number of respondents is in the age group of 21 to 40 years, while in the second place (18% less) is the following age category (41 to 60). This category, according to the most research, is the typical age group of people who visit the wellness centers. The vast majority of visitors in the wellness centers come from the largest Slovenian cities. 61% of the sample consists of people from Ljubljana, Maribor, Celje and Kranj. This means that the **hypothesis 2** is confirmed.

5.2 The results of the descriptive statistical analysis

Descriptive statistics of health and wellness habits of the respondents visiting wellness centers show that the highest value of the mean score has the factor safety, while the lowest value is assigned to the smoking factor. The standard deviation exceeds the value 1 at three factors – exercise, alcohol and drugs and smoking. The medium-high grade for the exercise factor shows that the users of the wellness centers in Slovenia quite often practice different types of physical activities. The diet factor has a similar score as a factor exercise, which is logical because usually people who care about their healthy lifestyle have a similar attitude toward the nutrition and the exercise. The third factor shows that people consume alcoholic beverages in

their daily lives much more frequently than the psychotropic medications. The score for the factor 4 shows that among the respondents there is an important number of smokers and those who are forced to the passive smoking. The stress factor was evaluated with good marks and it shows that the respondents cope relatively well with stress. The security is a factor given the highest marks. It shows that almost all the respondents care about the safety during their driving. The vast majority of them wears properly a seat belt and does not drink alcohol.

Table 1: The descriptive statistics of the respondents' healthy-living behavioural patterns.

Factors and items	Mean	Standard deviation
Exercise	3.44	1.03
I do aerobic/strength type exercise 3–4 times a week	3.33	0.99
I exercise to get energy to do the things I want to do	3.48	1.11
Diet	3.43	0.82
I take a limited amount of meat	3.28	1.07
I prefer low-fat dairy products	3.35	1.08
I like low-fat desserts	3.22	1.14
I emphasize low-fat cooking methods	3.56	1.02
I use whole grain products	3.45	1.14
A substantial amount of fruit and vegetables is part of my regular diet	3.89	0.96
I do not go for fast food	3.38	1.15
I consume less amount of salty foods	3.37	0.98
Alcohol and drugs	3.61	1.10
I take standard one to two drinks per 24 hours	3.22	1.17
I abstain from drugs or medications that affect one's mood or help one to relax or sleep	4.00	1.23
Smoking	3.25	1.35
I do not smoke	3.26	1.69
I avoid passive smoking (away from smokers)	3.24	1.24
Stress	3.39	0.82
I seldom feel stress	3.33	0.85
I cope with stress very well	3.45	0.96
Safety	4.76	0.42
I always wear seat belts	4.79	0.49
I don't drink and drive	4.74	0.48

We conclude that the users of the wellness centres in Slovenia orderly abide the patterns of a healthy lifestyle (Table 1). It is interesting to emphasize the similarity of these results with the results of the same survey conducted in Thailand (Kim and Batra 2009), especially when it comes to the exercise and the diet.

The table 2 shows the descriptive statistic of the motivational behavior of the respondents. The motivational factor of the Effortless activity had the highest mean score of 4.31 while the Affordable activity had the lowest mean score of 2.76. This is not surprising because most people visit the wellness centre to separate from everyday life and enjoy the effortless, but the similar health care products that can be found in other places, not only in the wellness centres. The relaxation had the third highest mean score of 4.13. It involves the massage, which is one of the most popular services in the wellness centres. The relaxation is one of the top three motives in the most research in this area. The recreation is in sixth place, and similarly the social activities motive was similarly rated. One of the lowest mean score had the meditation (3.33). But some wellness centers had no offer of the meditation programmes. The mental and physical therapy are the medium high rated motives, which is understandable because the research was conducted in the wellness center of hotels, but not all of them are specialized in these types of services.

When we summarize data on the importance of motives of the wellness users in Slovenia, we conclude that the three most important motives are: the Effortless activity, the Enhancement of quality of life and the Relaxation. That means that the **hypothesis 3** is not completely confirmed, but only partially. If we compare these results to the results of the same survey conducted in Bangkok, we come to the conclusion that people are led by very similar needs and motives for going to the wellness center, whether it is Thailand

or Slovenia. The results differ from previous research (Horvat 2000) where health-care services were the most important motive, probably due to the fact that this research included 10 different spa centers, while Horvat's research included only one (Rogaška Slatina).

Table 2: The descriptive statistics of the respondents' motivational behavior.

Motivational factors	Mean	Standard deviation	Ranking
Effortless activity (do nothing at all)	4,31	0,87	1
Enhancement of quality of life	4,24	0,85	2
Relaxation (tranquility enjoyment and body pampering)	4,13	0,93	3
Health consciousness (seek health-care services)	4,11	0,93	4
Social activity (be socialized with other people)	3,95	1,05	5
Recreation (be refreshed in body or mind)	3,88	1,01	6
Experiencing nature	3,65	1,11	7
Mental therapy	3,61	1,14	8
Pursuing multi-activities (learning new things)	3,49	1,04	9
Physical therapy (physical treatments)	3,34	1,20	10
Curiosity (finding thrills and excitement)	3,10	1,24	11
Meditation	3,33	1,18	12
Affordable activity (shopping health products)	2,76	1,30	13

5.3 The Correlation

The correlations between the individual factors are expressed by Pearson's coefficient of the correlation. The positive correlation coefficient of the medium strength is calculated (Cohen, 1988) at the level of significance 0.01 between the factor diet and the three motivational factors (relaxation health consciousness and effortless activity) and between the factor stress and the two motivational factors (recreation and experiencing nature). In other crosses between the factors and motives, a lot of positive but weak correlation coefficients are showed at the level of significance 0.01 and the significance level of 0.05 (Table 3).

Almost all motives are moderately and positively correlated with the exercise. It confirms that people who are daily engaged in the physical activity are also motivated to come to the wellness center. The medium strength positive correlation between the factor diet and a large number of motives shows that people who care about healthy eating, also take care of their body that needs some occasional refreshment.

Table 3: The Correlation between healthy-living status and the motivation.

	Exercise	Diet	Alcohol and drug	Smoking	Stress	Safety
Recreation	0,246*	0,208*	0,228*	0,070	0,356**	0,235*
Relaxation	0,287**	0,303**	0,118	0,101	–0,033	0,290**
Quality of life	0,217*	0,247*	0,127	–0,026	–0,027	0,155
Social activity	0,234*	–0,065	0,200*	–0,168	0,178	0,029
Curiosity	0,157	0,098	0,069	0,096	–0,112	0,026
Experiencing nature	0,269**	0,242*	0,044	0,143	0,089	0,333**
Physical therapy	0,225*	0,234*	0,017	0,127	–0,134	0,058
Health consciousness	0,202*	0,349**	0,092	0,042	–0,082	0,179
Mental therapy	0,015	0,238*	–0,062	0,158	–0,307**	–0,045
Affordable activity	0,114	0,175	–0,196	0,063	–0,301**	0,070
Pursuing multiactivities	0,003	0,010	0,001	–0,109	–0,065	0,124
Effortless activity	0,217*	0,328**	0,180	–0,118	–0,155	0,223*
Meditation	0,244*	0,092	–0,063	0,005	–0,050	0,125

** The Correlation is significant at the 0.01 level

* The Correlation is significant at the 0.05 level

The healthy-living behavior patterns in »alcohol and drugs« and »smoking« didn't affect wellness tourists' motivational behaviour. This situation can simply be explained by the fact that people who smoke or consume alcohol everyday, do not take too much care of their health, and have no clear motive for coming to the wellness centre. The factor »alcohol and drugs« shows the positive but low correlation only with the recreation motives and the social activities.

The stress factor is in the negative correlation with the most motives. This means that the people who are under stress, come to the wellness center for the relaxation and the stress relief. This is corroborated by the fact that this factor is in the maximum negative correlation with the mental therapy motive, which means that the respondents, who said that they are under a lot of stress, cite the mental therapy as an important motive for coming to the wellness center.

We can conclude that the healthy-living patterns have an influence on the motivational behavior of the tourists who visit the wellness facilities in Slovenia. This fact confirms **the hypothesis 4.**

6 Conclusion

The starting point for the definition of this topic was the theory of the tourist motivation. When it comes to the motivation of the wellness tourists, it is important to note that there is a lack of the empirical research conducted on this topic, probably because it is actually one of the newer branches, if we look at the modern vision of the wellness tourism.

Based on the previous research on the motivation of the wellness tourists, and based on some logical presumption, there are four hypotheses: the second and fourth were confirmed, the third only partially confirmed and the first is not confirmed. This shows that the people around the world have very similar needs and motives to go to the wellness center.

The results showed that the users of the wellness services in Slovenia have a reasonably good attitude towards the guidelines of a healthy lifestyle, with some minor differences in the individual factors. They mostly have positive attitudes towards the personal safety, the moderate use of alcohol, and the regular physical activity. They also respect the guidelines for healthy nutrition. Their main motives for coming to the wellness center are: the effortless activity (physical rest), the enhancement of the quality of life and the relaxation.

Summing up all these results, we conclude that the healthy lifestyle of the wellness users affects their motives for visiting. This information about the interdependence of healthy lifestyle and the motives of the wellness users should be increasingly used in the future studies of this kind, because it would be of a great importance to discover the needs of the wellness tourists in order to have a better offer and this offer accommodate to those needs.

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Motivi obiskovalcev wellness centrov v Sloveniji

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IZVLEČEK: Beseda wellness se navezuje na splošno počutje posameznika, ki priča o ravnovesju med posameznikovim umom, telesom in dušo. Wellness centri so dandanes nepogrešljiv del hotelske ponudbe za vse goste, ki obiščejo tovrstne centre z različnimi motivi. Namen te študije je raziskati značilnosti zdravega življenjskega okolja ter motivacijske faktorje obiskovalcev wellness centrov v Sloveniji. Cilji te študije so opredeliti motivacijske dejavnike turistov, ki se odločijo obiskati wellness centre, raziskati razmerje med navadami turistov, ki se dotikajo zdravega načina življenja, in motivacijskimi dejavniki za obisk wellness centrov v Sloveniji.

KLJUČNE BESEDE: geografija, turizem, motivi obiska, zdrav način življenja, koristniki storitve, wellness centri, Slovenija.

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1 Uvod

V zadnjih desetletjih je wellness turizem doživel pravi razmah po vsem svetu. Beseda »wellness« je skovanka iz angleških besed *well-being* (dobro počutje) in *fitness* (fitnes). Novo besedo so skovali v 30. letih prejšnjega stoletja v ZDA. Wellness temelji na starodavni filozofiji, ki pravi, da ni srečnega in izpopolnjenega življenja brez usklajenosti fizičnega in umskega. Wellness turizem – besedna zveza, ki dejansko označuje prihod ljudi iz zdravstvenih razlogov v wellness center/zdravilišče – je hitro pridobil pomen in postal ena izmed najhitreje rastočih in najpriljubljenejših vej mednarodnega in lokalnega turizma (Wellness tourism worldwide 2011). Dandanes hotelski gostje bolj kot kdajkoli prej zahtevajo določeno raven kakovosti za določeno ceno (Blešić s sod. 2008). To tudi pomeni, da so wellness storitve danes pomemben dejavnik pri odločitvi gostov, kateri hotel izbrati. Raziskava motivacijskih dejavnikov obiskovalcev wellness centrov je odločilna za izboljšavo turistične ponudbe in je tudi izredno pomemben člen na področju geografije turizma (Horvat 2000). Ob predpostavki povezanosti življenjskega sloga obiskovalcev in motivacijskimi dejavniki, ki so jih napeljali na obisk wellness centra, se ta študija osredotoča na razlago motivov za obisk, ki so odvisni od zdravja in navad obiskovalcev wellness centrov. Raziskavo smo opravili v Sloveniji, ki je dobro razvita turistična wellness destinacija, saj se ponaša s tradicionalnimi termalnimi zdravilišči in sodobnimi wellness centri.

2 Wellness turizem v Sloveniji

Slovenija je dežela z zelo raznoliko pokrajino na stičišču štirih velikih evropskih makroregij – alpske, panonske, dinarske in sredozemske. Velika pokrajinska raznolikost in dostopnost Sloveniji ponujata priložnost za razvoj novih oblik turizma (Ažman Momirski in Kladnik 2009). Med najbolj razvitimi je zdraviliški turizem kot sodobnejša oblika wellness turizma. Wellness turizem je statistično najpomembnejša oblika turizma, saj je leta 2009 obsegal četrtino turističnih prihodov in tretjino nočitev (SURS 2014). Zdraviliški turizem je še posebej dobro razvit v panonskem delu Slovenije, ki je bogato s termalnimi vrelci (Mihić 2009).

V Sloveniji je moč najti različne vrste termalnih vod z raznovrstnimi lastnostmi in temperaturami (med 32 in 73 stopinjami Celzija), mineralne vode (svetovno znani znamki »Donat Mg« in »Radenska tri srca«), slane vode ter organske in anorganske blatne kopeli. S sloganom »Z naravo do zdravja« v 15 zdraviliščih po Sloveniji znova in znova razvijajo novosti v ponudbi ter nove programe za izboljšanje, ohranjanje zdravja in preprečevanje bolezni. Slovenska zdravilišča se ponašajo z dobro infrastrukturo in prometnimi povezavami ter bližino večjih turističnih destinacij in mest med Alpami in Sredozemljem. Država bi k razvoju te veje turizma lahko bolj pripomogla s sistemskimi rešitvami na področju prispevkov za zdravstveno zavarovanje, z davčnimi olajšavami in podobnimi koraki (Gojčič 2011).

Slika 1: Prostorska razporeditev slovenskih zdravilišč (vir: http://www.odeontravel.rs/katalozi/Odeon_katalog_wellness_spa.pdf; fotografijo je oblikoval avtor).
Glej angleški del prispevka.

3 Pregled literature – obstoječe raziskave o motivih wellness turistov

Page in Connell (2006) sta motivacijo uporabila kot integralni del študije o vedenju potrošnikov v turizmu. Med najbolj znanimi teorijami o turistovi motivaciji je koncept privlačnih in odbojnih dejavnikov (ang. *push-pull*) koncept, kjer je dejavnost opredeljena kot rezultat »push-pull« odnosa. Dann (1981) navaja, da je destinacija tista, ki odgovarja na motivacijski faktor, tako da razlikuje med motivacijo posameznega turista glede na njegovo raven potrebe/želje (odbojnost) in privlačnostjo destinacije (privlačnost).

Ideja v ozadju tega modela je, da turistove odločitve o izbrani destinaciji razdelimo na dve sili, ki ju lahko opredelimo z odbojnimi dejavniki (željami turista) in dejavniki privlačnosti destinacije (Bansal in Eiselt 2004). Faktorji želje so sociološko-psihološki dejavniki, ki posameznika nagovarjajo k potovanju, medtem ko so dejavniki privlačnosti tisti, ki posameznika pritegnejo k obisku določene destinacije, potem ko se je že odločil za potovanje (Kim in Lee 2002).

Ta koncept je bil uporabljen tudi v študiji o motivaciji turistov na področju wellness turizma. Ugotovljeno je bilo, da določeni dejavniki turiste motivirajo h koriščenju zdraviliških storitev, drugi pa jih

prepričajo, da sploh obiščejo zdravilišča. Študija na osnovi omenjenega koncepta je bila izvedena v Maleziji, pri čemer so bili podatki zbrani z intervjuji. Motivacija turistov za obisk zdravilišč je odvisna zlasti od njihovih osebnih potreb in življenjskega sloga, kot tudi od cene in kakovosti ponujenih storitev (Azman in Chan 2010).

Druge raziskave na to temo so temeljile na drugih metodah in ne zgolj na konceptu odbojnih in privlačnih dejavnikov. Chen, Prebensen in Juan (2008) so v velikem wellness centru na Tajvanu opravili raziskavo, ki je vključevala 506 obiskovalcev. Ugotovili so, da so štirje najpomembnejši motivacijski dejavniki za obiskovalce zdravilišč oziroma wellness centrov sprostitev, številne aktivnosti, rekreacija in uživanje v naravi.

Na drugi strani pa raziskave A. M. González in L. Bella (2002), ki povezujejo zdrav življenjski slog z vedenjskimi vzorci potrošnikov, razkrivajo močno povezanost med vedenjem turistov na potovanjih in njihovim načinom življenja. Na podlagi teh izsledkov Byung Hun Kim in Adarsh Batra (2009) predlagata hipotetični model, ki odkriva povezave med zdravim življenjskim slogom turistov, ki obiščejo wellness center, in njihovo motivacijo za obisk. Model sestavljata dva dela. Prvi del se dotika zdravega načina življenja in vsebuje šest spremenljivk (rekreacija, prehrana, alkohol in droge, kajenje, stres, varnost), zajetih v 18 vprašanjih, drugi pa s 13 vprašanji ocenjuje motivacijsko vedenje. Na podlagi tega modela je bila opravljena raziskava s 164 anketami v osmih wellness centrih hotelov v Bangkoku. Med prve štiri faktorje, ki vplivajo na obisk wellness centra, so uvrstili rekreacijo, sprostitev, izboljšanje kakovosti življenja in nekatere družabne dejavnosti. Soodvisnost rezultatov je razkrila vez med vedenjskimi vzorci, ki zajemajo zdrav način življenja v smislu prehrane, kajenja in varnosti, ter motivacije za obisk wellness centra.

Obširna študija motivacije obiskovalcev wellness centra velikih term Rogaška Slatina je bila opravljena leta 2000 (Horvat 2000). Za več kot 1300 turistov je bil najpomembnejši motivacijski dejavnik zdravstvena rehabilitacija (48 %), sledile so zdravstvena preventiva (23 %) ter sprostitev in rekreacija (25 %). Študija se je osredotočila na motive gostov in manj na življenjski slog obiskovalcev.

4 Metodologija

4.1 Model za ocenjevanje motivacije obiskovalcev wellness centrov

Zgoraj opisani model, ki je bil uporabljen v raziskavi na Tajskem (Kim in Batra 2009), smo uporabili tudi v naši raziskavi. Prvi del ankete zadeva zdrave življenjske navade in vsebuje šest spremenljivk oziroma 18 vprašanj. Drugi del zadeva pomembnost motivacije obiskovalcev wellness centrov in vsebuje 13 motivacijskih faktorjev. V obeh delih ankete smo uporabili petstopenjsko Likertovo lestvico.

4.2 Hipoteze

Testirali smo štiri hipoteze s katerimi smo skušali ugotoviti motive za obisk, v odvisnosti od zdravja in navad obiskovalcev wellness centrov v Sloveniji.

H1: Po »profilu evropskega gosta v wellness turizmu« sklepamo, da wellness centre v Sloveniji v glavnem obiskujejo ženske, stare od 41 do 60 let.

H2: Obiskovalci wellness centrov povečini prihajajo iz urbanih območij, kar je posledica višjega življenjskega standarda, pa tudi večje potrebe po sprostitvi zaradi večjega stresa.

H3: Poglavitni motivi gostov za obisk wellness centrov v Sloveniji so: sprostitev, rekreacija in neobremenjujoča/nezahtevna aktivnost.

H4: Zdrave življenjske navade so neodvisni faktor, motivi obiskovalcev wellness centrov pa so spremenljivke, odvisne od življenjskih navad posameznika.

5 Rezultati in diskusija

5.1 Analiza podatkov

Raziskava, ki je potekala od aprila do julija 2013, vključuje uporabnike storitev wellness centrov v izbranih slovenskih hotelih. Raziskava je bila izvedena na območju celotne Slovenije, wellness centri pa so bili izbrani poljubno. Od 120 prvotno razdeljenih anket je bilo veljavnih 100 (83 %).

Vzorec vsebuje 8 % več moških kot žensk, v čemer presega klasičen »profil evropskega gosta v wellness turizmu« (Košić 2011). Predhodno so glavnino gostov wellness turizma namreč predstavljale ženske. To pomeni, da **hipoteza 1** ni potrjena, je pa ta podatek skladen z novejšimi težnjami, ki nakazujejo, da se v zadnjih letih vse več moških zanima za te vrste storitev. Podatki o starosti anketirancev v tem vzorcu ne potrjujejo prve hipoteze, so pa skladni z najnovejšim trendom vse večjega števila mladih uporabnikov wellness storitev. Polovica anketirancev spada v starostno skupino od 21 do 40 let. Z 18 % manj obiskovalcev ji sledi starostna skupina od 41 do 60 let, medtem ko večina raziskav trdi, da je prav ta starostna skupina tipična za obiskovalce wellness centrov. Glavnina obiskovalcev wellness centrov prihaja iz največjih slovenskih mest. 61 % vzorca predstavljajo obiskovalci iz Ljubljane, Maribora, Celja in Kranja, kar potrjuje **hipotezo 2**.

5.2 Rezultati opisne statistične analize

Opisna statistika vedenjskih vzorcev anketirancev v odnosu do zdravega načina življenja kaže, da najvišjo povprečno vrednost izkazuje dejavnik varnosti, najnižjo pa kajenje. Standardni odklon presega vrednost 1 v treh postavkah, in sicer rekreaciji, alkoholu in drogah ter kajenju. Srednje visoka ocena dejavnika rekreacije priča o tem, da so obiskovalci wellness centrov v Sloveniji pogosto fizično dejavni. Prehrano so ocenili podobno kot dejavnik rekreacije, saj imajo navadno ljudje, ki skrbijo za zdrav življenjski slog, podoben odnos do prehrane in rekreacije. Dejavnik alkohola in drog kaže na to, da anketiranci konzumirajo alkholne pijače v vsakdanjem življenju mnogo pogosteje kot psihotropne substance (droge ali zdravila). Ocenjenost četrtega dejavnika kaže, da je med anketiranci omembe vredno število kadilcev in tistih, ki so primorani v pasivno kajenje. Dejavnik stresa je prejel visoke ocene, kar pomeni, da se anketiranci razmeroma dobro soočajo s stresom. Varnost je dejavnik, ki je prejel najvišje ocene, kar pomeni, da skoraj vsi anketiranci skrbijo za varnost med vožnjo. Velika večina se v avtu pripne z varnostnim pasom in ko vozi, ne pije alkohola.

Preglednica 1: Opisna statistika vedenjskih vzorcev anketirancev v odnosu do zdravega načina življenja.

dejavniki in postavke	povprečje	standardni odklon
rekreacija	3,44	1,03
3- do 4-krat tedensko delam aerobne vaje ali vaje za moč.	3,33	0,99
Telovadim, da dobim energijo za ostale stvari, ki jih želim opraviti.	3,48	1,11
prehrana	3,43	0,82
Meso uživam v omejenih količinah.	3,28	1,07
Raje imam mlečne izdelke z manj maščobe.	3,35	1,08
Rad imam sladice z malo maščobe.	3,22	1,14
Poslužujem se metod kuhanja z malo maščobe.	3,56	1,02
Uporabljam polnozrnate proizvode.	3,45	1,14
Izdaten delež moje redne prehrane predstavljata sadje in zelenjava.	3,89	0,96
Ne poslužujem se hitre prehrane.	3,38	1,15
Zaužijem manj slane hrane.	3,37	0,98
alkohol in droge	3,61	1,10
V povprečju spijem eno do dve pijači na 24 ur.	3,22	1,17
Ne jemljem drog ali zdravil, ki vplivajo na človekovo počutje in pomagajo pri sproščanju ali spanju.	4,00	1,23
kajenje	3,25	1,35
Ne kadim.	3,26	1,69
Izogibam se pasivnemu kajenju (kadilcem).	3,24	1,24
stres	3,39	0,82
Redko čutim, da sem pod stresom.	3,33	0,85
Dobro se soočam s stresom.	3,45	0,96
varnost	4,76	0,42
V avtomobilu vedno pripnem varnostni pas.	4,79	0,49
Ne pijem, ko vozim.	4,74	0,48

Sklepamo, da obiskovalci wellness centrov v Sloveniji sovpadajo z vzorci zdravega načina življenja (preglednica 1). Kot zanimivost naj izpostavimo dejstvo, da so rezultati precej podobni rezultatom tovrstne študije, izvedene na Tajskem (Kim in Batra 2009), zlasti glede rekreacije in prehrane.

V preglednici 2 so podane opisne statistične vrednosti motivacijskih vedenjskih vzorcev anketirancev. Nezahtevna aktivnost je kot motivacijski faktor dosegla najvišjo povprečno vrednost 4,31, cenovno dostopna aktivnost pa najnižjo povprečno vrednost 2,76. Ta rezultat ni presenetljiv, saj večina ljudi obišče wellness center, da se umakne od vsakdanjega vrveža in uživa v fizično manj zahtevnih aktivnostih za vzdrževanje zdravja, ki so v podobni obliki sicer dostopne tudi drugje in ne le v wellness centrih. S tretjo najvišjo povprečno vrednostjo 4,13 se sprostitev uvršča zelo visoko, še posebej zaradi masaž, ki so med najbolj priljubljenimi storitvami wellness centrov. V večini raziskav na tem področju je sprostitev eden od treh poglavitnih motivov za obisk wellnessa, medtem ko se rekreacija uvršča na šesto mesto, podobno pa je tudi z obiskom wellnessa z motivom družbene dejavnosti. Meditacija se uvršča med najnižje na lestvici s povprečno vrednostjo 3,33, poleg tega pa nekateri wellness centri sploh ne nudijo meditativnih vsebin. Srednje do visoko ocenjena motiva za obisk wellnessa sta duševna razbremenitev in fizioterapija, kar pa je razumljivo, saj je bila raziskava izvedena v wellness centrih hotelov, čeprav vsi hoteli ne ponujajo teh storitev.

Povzetek rezultatov o pomembnosti motivov obiskovalcev wellness centrov v Sloveniji kaže na to, da so poglavitni trije razlogi za obisk nezahtevna aktivnost, izboljšanje kakovosti življenja in sprostitev, kar pomeni, da je **hipoteza 3** le delno potrjena. Če primerjamo rezultate naše raziskave z rezultati podobne raziskave v Bangkoku, ugotovimo, da imajo obiskovalci wellness centrov enake potrebe in motive ne glede na državo. Naši rezultati se razlikujejo v primerjavi z rezultati prejšnje raziskave (Horvat 2000), saj je bilo kot poglavitni motiv obiska wellnessa v njej moč zaslediti storitve za ohranjanje zdravja, kar pa je verjetno posledica dejstva, da je bilo v najnovejšo raziskavo vključenih deset različnih zdravilišč, medtem ko je Horvatova raziskava zajemala le eno (Rogaška Slatina).

Preglednica 2: Opisna statistika motivacijskih vedenjskih vzorcev anketirancev.

motivacijski faktorji	povprečje	standardni odklon	rang
nezahtevna aktivnost (brez aktivnosti)	4,31	0,87	1
izboljšanje kakovosti življenja	4,24	0,85	2
sprostitev (spokojnost in razvajanje telesa)	4,13	0,93	3
zavedanje pomembnosti zdravja (koriščenje storitev za izboljšanje/ohranjanje zdravja)	4,11	0,93	4
družbena dejavnost (druženje z ostalimi obiskovalci)	3,95	1,05	5
rekreacija (poživitev telesa ali uma)	3,88	1,01	6
doživetje narave	3,65	1,11	7
duševna razbremenitev	3,61	1,14	8
ukvarjanje z več aktivnostmi (učenje novih stvari)	3,49	1,04	9
fizioterapija (fizično zdravljenje)	3,34	1,20	10
radovednost (iskanje vznemirljivih in zabavnih stvari)	3,10	1,24	11
meditacija	3,33	1,18	12
cenovno dostopna aktivnost (nakupovanje izdelkov za zdravje)	2,76	1,30	13

5.3 Korelacija

Korelacijo med posameznimi dejavniki smo izračunali s Pearsonovim koeficientom korelacije. Pozitivni koeficient korelacije srednje vrednosti smo izračunali (Cohen 1988) ob stopnji statistične značilnosti 0,01 med dejavnikom diete in tremi motivacijskimi dejavniki (sproščanje, zavedanje o zdravju in nezahtevna aktivnost) ter med dejavnikom stresa in dvema motivacijskima dejavnikoma (rekreacija in doživetje narave). Korelacijska matrika dejavnikov in motivov prikaže veliko pozitivnih, a šibkih koeficientov korelacij ob 0,01 in 0,05 stopnji statistične značilnosti (preglednica 3).

Skoraj vsi motivi so v zmerni in pozitivni korelaciji z vadbo. To potrjuje dejstvo, da so ljudje, ki so redno fizično aktivni, motivirani za obisk wellness centrov. Pozitivna korelacija srednje vrednosti med faktorjem

Preglednica 3: Pearsonov koeficient korelacije med zdravim življenjskim slogom in motivacijo.

	vadba	dieta	alkohol in droge	kajenje	stres	varnost
rekreacija	0,246*	0,208*	0,228*	0,070	0,356**	0,235*
sprostitev	0,287**	0,303**	0,118	0,101	–0,033	0,290**
kakovost življenja	0,217*	0,247*	0,127	–0,026	–0,027	0,155
družbena dejavnost	0,234*	–0,065	0,200*	–0,168	0,178	0,029
radovednost	0,157	0,098	0,069	0,096	–0,112	0,026
doživetje narave	0,269**	0,242*	0,044	0,143	0,089	0,333**
fizioterapija	0,225*	0,234*	0,017	0,127	–0,134	0,058
zavedanje pomembnosti zdravja	0,202*	0,349**	0,092	0,042	–0,082	0,179
duševna razbremenitev	0,015	0,238*	–0,062	0,158	–0,307**	–0,045
cenovno dostopna aktivnost	0,114	0,175	–0,196	0,063	–0,301**	0,070
ukvarjanje z več aktivnostmi	0,003	0,010	0,001	–0,109	–0,065	0,124
nezahtevna aktivnost	0,217*	0,328**	0,180	–0,118	–0,155	0,223*
meditacija	0,244*	0,092	–0,063	0,005	–0,050	0,125

** Korelacija je pomembna pri 0,01 stopnji.

* Korelacija je pomembna pri 0,05 stopnji.

diete in velikim številom motivov kaže, da ljudje, ki se zavedajo pomena zdrave prehrane, tudi skrbijo za svoje telo, ki potrebuje občasno poživitev.

Vedenjski vzorci življenjskega sloga z »alkoholom in drogami« ter »kajenjem« niso vplivali na motivacijske vedenjske vzorce obiskovalcev wellness centrov. Ta pojav lahko enostavno pojasnimo z dejstvom, da se ljudje, ki vsakodnevno uživajo alkohol ali kadijo, ne posvečajo dovolj pozornosti svojemu zdravju, s tem pa nimajo pravega motiva za obisk wellness centrov. Faktor »alkohol in droge« ima pozitivno, a nizko korelacijo samo z motivoma rekreacije in družbenih dejavnosti.

Dejavnik stresa je v negativni korelaciji z večino motivov. To pomeni, da ljudje, ki so izpostavljeni stresu, obiščejo wellness center, da bi se sprostili in razbremenili. To potrjuje tudi dejstvo, da je ta dejavnik v največji negativni korelaciji z motivom duševne razbremenitve, kar pomeni, da so anketiranci, ki so izpostavljeni večjemu stresu, navedli duševno razbremenitev kot pomemben motiv za obisk wellness centrov.

Sklenemo lahko, da vzorci zdravega življenjskega sloga vplivajo na motivacijske vedenjske vzorce turistov, ki obiskujejo wellness centre v Sloveniji, kar potrjuje **hipotezo 4**.

6 Sklep

Podlaga za opredelitev te teme je bila teorija o motivaciji obiskovalcev. Ko gre za motivacijo wellness obiskovalcev, moramo upoštevati dejstvo, da je na to temo izvedenih premalo empiričnih raziskav, saj gre za drugačno in razmeroma novo obliko wellness turizma.

Glede na prejšnje raziskave motivacije obiskovalcev wellnessa in glede na nekatere logične predpostavke, smo postavili štiri hipoteze, izmed katerih sta druga in četrta potrjeni, tretja delno potrjena in prva zavrnjena. To kaže, da imajo ljudje z različnih koncev sveta zelo podobne potrebe in motive za obisk wellness centrov.

Rezultati so pokazali, da obiskovalci wellness centrov v Sloveniji menijo, da imajo zdrav življenjski slog z manjšimi odstopanji pri posameznih dejavnikih. Povečini ravnajo tako, da skrbijo za osebno varnost, zmerno uživajo alkohol, redno fizično vadijo in se zdravo prehranjujejo. Njihovi poglavitni motivi za obisk wellness centrov so nezahtevna telesna dejavnost (počitek), izboljšanje življenjskega sloga in sprostitev.

Če združimo vse pridobljene rezultate, lahko ugotovimo, da zdrav življenjski slog vpliva na motive za obisk wellness centrov. Podatki o vzajemni odvisnosti med zdravim življenjskim slogom in motivi obiskovalcev wellness centrov bi morali biti v veliki meri uporabljeni v prihodnjih tovrstnih raziskavah, saj bi bilo zanimivo ugotoviti, kakšne so potrebe obiskovalcev wellness centrov in na ta način pripraviti še boljšo ponudbo ter jo prilagoditi njihovim potrebam.

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7 Literatura

Glej angleški del prispevka.

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INDUSTRIAL RESTRUCTURING AND DOWNSIZING: CASE STUDY OF CENTRAL CROATIA

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Textile firm Kratex, from Krapina.

Industrial restructuring and downsizing: Case study of Central Croatia

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ABSTRACT: The collapse of socialist economic system in Croatia was followed by a period of economic transition during which the industry sector was affected by major changes. This study, on an example of Central Croatia, analyzes the spatial aspect of these changes between 1990 and 2011. The used data were taken from the National Bureau of Statistics and studies in which the transition period industry is researched from economic and geographical point of view. Calculations of most indicators referred to a county level while some indicators were calculated at the level of administrative cities and municipalities. It was found that, in Central Croatia, there had come to a process of deindustrialization, and in some rare cases a process of reindustrialization, an increase in importance of tertiary and quaternary activities, and calculation of some indicators such as degree of industrialization, location quotient, regional factor and index of specialization indicated on the existence of significant differences between individual parts of Central Croatia.

KEY WORDS: geography, industry, transition, deindustrialization, reindustrialization, Croatia

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1 Introduction

Industry is an economic activity that has in Croatia, over the past twenty years, gone through fundamental changes. In 2011 secondary sector (mining, industry, construction, production crafts) participated in national income of Croatia with 34 per cent (Magaš 2013). But, during the transition of the economy, industry had become virtually a marginalized activity with a significantly decreased share in Croatian GDP, decrease in a number of employees as well as a decrease in a number of industrial businesses. A little more than twenty years ago, Croatian industry employed more than 600.000 workers, while their number has been reduced to 206.823 workers by 2011. In other words, there had come to a deindustrialization process in Croatian economy followed by its tertiarization. However, in the Central Croatia area, industry still has a relatively high importance, as evidenced by data on 122.675 people employed in industry, which is more than a half of number of employees in the industry of whole Croatia. The aim of this study is to see to what extent have these changes reflected on the space of counties, municipalities and cities of Central Croatia. In doing so, the current state and the impact of recent financial (global) crisis shall not be analyzed in detail, since these issues should be processed in a separate research paper.

2 Theoretical framework

In this paper, the authors analyzed the changes that happened in industrial activity during the period from 1990 to 2011, and Central Croatia had been chosen as a case study because, when it comes to industry, it was and still is one of the most developed Croatian regions, particularly in its north-western parts. Also, the choice of this region was taken because of significant changes that have affected the selected activity in this area-from deindustrialization to restructuring, but also a complete collapse of certain industries. Unfortunately, as some data of Croatian population census from 2011 are not yet available, they could not be included into this analysis.

The purpose of this study is to determine the extent to which changes have affected industry in Central Croatia during the period of last twenty years, and according to this, two hypotheses were made: 1. Economic transition, as well as restructuring of the industry have led to even greater economic and development differences among individual parts of Central Croatia than it was before 1990, i.e. economic disparities among different regions (counties) which were equally economically developed before transition; 2. The north-western part of Croatia has restructured industry better and has overcome transitional problems more successfully than southern and eastern parts of Central Croatia. Although some economy authors believe that transition ended in 2004, when GDP reached its pre-transitional level, other authors also consider that it is interesting to observe the period after 2004 due to unfinished privatization of some (big) companies in Croatia as well as transitional problems that still largely reflect on activities in industry as a whole.

3 Research methodology

This study is based on the analysis of several statistical models which were used, namely: models which analyze spatial distribution of certain phenomena (degree of industrialization, location quotients) and models that indicate specialization or diversification (index of specialization).

The degree of industrialization was calculated by the following formula:

$$D_{ind} = A : B \pm 1000$$

(where Dind is – degree of industrialization, A – number of employees in industry, a B – total population). Together with the degree of industrialization, another used indicator was location quotient. The location quotient is one of the scales for spatial distribution of industry, i.e. the degree of concentration of industry in a smaller compared to a larger spatial area. It was calculated according to:

$$LQ = b_2 : a_2 / B_1 : A_1$$

where LQ is the location quotient, b_2 is a number of industrial workers in the smaller area (county), a_2 is a number of industrial workers in the larger area (Central and Croatia in general), B1 is a number of residents in the smaller area, and B_2 is a number of residents in the larger area. The following term was used to calculate the index of specialization:

$$Ispec = A_1 : A_2 / B_1 : B_2$$

where A_1 – a number of employees in the smaller area in a certain activity, A_2 – a total number of employees in the smaller area, B_1 – a number of employees in the larger area in a certain activity, B_2 – a total number of

employees in the larger area. If the resulting index is greater than 1.00, then the particular area (county) is considered specialized in a certain area of economy, i.e. in the economic activity. All data and information were analyzed in detail and compared to each other in order to identify actual trends and bring appropriate conclusions.

When analyzing this problem, when it comes to geographers, a certain number of studies considering Croatia, were conducted by Feletar and Stiperski (1992; 1997) and later Lončar and Braičić (2011, 2012) who analyzed problems especially of Sisak-Moslavina county.

4 Analysis of changes in industrial activities in Central Croatia

The transformation from a socialist country and country-planned economy towards a western-style democracy and market based economy has caused dramatic changes in economic, social, ecological and spatial development in post-socialist countries (Miljanović et al. 2010). Also, with the fall of the socialist system, new states were faced with challenges that were unpredictable in many aspects (Lorber 1999). One of the major challenges in these new terms was industry. Industry is still one of the main growth drivers in every economy. Industry in the EU is no longer based on labor-intensive activities, and the cost of these changes has affected employment, i.e. in increase of unemployment, while the low-skilled work force seems to be a permanent loser. This especially applies to textile and clothing industry (Teodorović and Buturac 2006). When it comes to industry, privatization was aimed at accelerating restructuring of industrial companies and profitable placement of product and services on competitive and international markets (Kalogjera 1993). This fact also refers to industrial companies that are particularly significant for the Central Croatia region which is the subject of this study.

The attractiveness of an area for development of industry is based on interdependence among various groups of economic, demographic and other factors and industrial development in municipalities and cities in Croatia (Stiperski 1995). The most important industrial areas are connected to leading urban centers and their urbanized regions. Several industrial areas can be highlighted in Central Croatia, primarily the wider area of Zagreb, Međimurje-upper Podravina area including Varaždin, Čakovec and Koprivnica (Magaš 1998). Industry in these areas employed 24.137 workers in 2011, which is 20% of the total number of employees in industry of Central Croatia. This is also the largest industrial region in Croatia. Due to war and deindustrialization process, industrial production and the number of industrial companies in certain counties decreased significantly compared to pre-war period. The rapid process of deindustrialization reduced the degree of utilization of national resources, both natural and labor, which has lead to major regional differences in development. During this process, smaller counties and cities were visibly lagging behind (Lokin, Mlinarević and Živković 2007). This particularly applies to Sisak-Moslavina County in which the number of mentioned companies almost halved in 1996 compared to 1990 and which has never fully succeeded in bringing industry to its pre-war state. This is a consequence of direct and indirect damages caused by direct attacks on objects, inability to supply raw materials due to roads hindrance, decrease in realization because of economic blockade, inability to pay, during the Homeland war. It should be noted that analysis included all data on the number of industrial companies for the whole period 1990–2007 (the last year data is publicly available for), but because of the extent and large amount of data, this study includes data for only every five years starting from 1991.

Table 1: Number of industrial companies by counties of Central Croatia in five-year periods, 1990–2007.

County	1991	1996	2001	2006	2007
Zagreb	57	118	107	283	287
Krapina-Zagorje	67	69	62	133	141
Sisak-Moslavina	107	61	51	92	104
Karlovac	71	88	71	124	134
Varaždin	99	102	88	176	182
Koprivnica-Križevci	40	52	51	81	89
Bjelovar-Bilogora	67	76	71	101	110
Međimurje	51	70	75	163	174
City of Zagreb	303	358	376	770	792
Central Croatia	*862*	*1.033*	*952*	*1.923*	*2.013*

Source: Croatian Bureau of Statistic, 2002; 2007a; 2007b; 2008a; 2008b

From data we can see that there are more industrial companies in north-western part of Central Croatia, including the Zagreb County, while their number is lower in eastern and southern regions. This leads to a conclusion that the north-western part of Central Croatia has been and still remains its industrial core. Industrial development has an important role in employment because it provides great opportunities for employing the work force, not only in industry, but in many other sectors, including services (Obadić 2004). In order to better understand changes that occurred during transition, it is necessary to analyze changes in the number and proportion of workers employed in industry by counties (Table 2).

Table 2: The number of employees in industry by counties of Central Croatia 1991–2011 and the per cent of industry employees in total number of employees

County	1991*	1996	2001	2006	2011
Zagreb	10.819	14.951	10.346	14.068	12.324
%	–	40,7	8,6	24,0	22,2
Krapina-Zagorje	17.946	12.257	8.619	9.459	8.566
%	–	44,8	14,3	35,7	33,8
Sisak-Moslavina	29.444	13.466	10.386	10.570	9.954
%	–	39,4	18,2	28,9	29,5
Karlovac	19.862	11.480	8.055	8.868	6.998
%	–	41,3	16,9	29,3	24,8
Varaždin	26.754	19.095	17.087	20.056	18.876
%	–	45,1	24,9	41,0	40,3
Koprivnica-Križevci	15.650	13.067	11.697	11.662	8.539
%	–	48,2	24,3	43,6	35,7
Bjelovar-Bilogora	12.734	8.552	6.415	7.496	6.798
%	–	34,1	11,9	30,0	29,7
Međimurje	13.499	10.691	10.514	12.570	12.055
%	–	44,4	19,5	43,4	46,5
City of Zagreb	104.777	66.287	80.716	78.945	38.565
%	–	30,2	27,2	23,2	11,7
Central Croatia	*251.485*	*169.846*	*163.835*	*173.694*	*122.675*
%	–	*34,9*	*20,3*	*27,9*	*20,8*

*No data available. Counties as territorial units were formed in 1993, so for all previous periods there is no data by certain activities on that level.
Source: Croatian Bureau of Statistic, 1993; 1994b, 1996a; 1997; 2002; 2007a; 2007b; 2008b; 2012a

A partial recovery, as an increase in the number of industrial workers in most counties, started in 2002/2003 when Croatia began moving significantly towards the European Union (Stabilization and association agreement was signed in 2001 and put to force in 2005). In the following years, from 2004 to 2007, the number of industrial workers increased slightly in all counties. In the last observed period, until 2011, the number of industry workers decreased in all counties, especially in the City of Zagreb. That is an indication of Zagreb transforming from an industrial city into a city of tertiary and quaternary characteristics, as well as a further deindustrialization process. The number of employees in this county in secondary sector decreased by more than 50%. At the level of Central Croatia, the number of employees in industry in the 2006–2011 period declined by more than 50.000. When it comes to industrial productivity, in the first decade of 21st century, it was two times higher than in the eighties. Low productivity during the eighties had become even lower in the nineties. The reason for this is a more rapid decrease in industrial production than in industrial employment. The lowest productivity was in 1991, when the index was 61 (2000 = 100). In the eighties, productivity ranged from 71 to 76, but since 1991 it has grown continuously (Stiperski 2007).

5 Spatial distribution of industry in Central Croatia

In order to determine changes in the number of employees in industry, one of the simplest and most frequent quantitative models of industrial geography was used-the degree of industrialization. Depending on

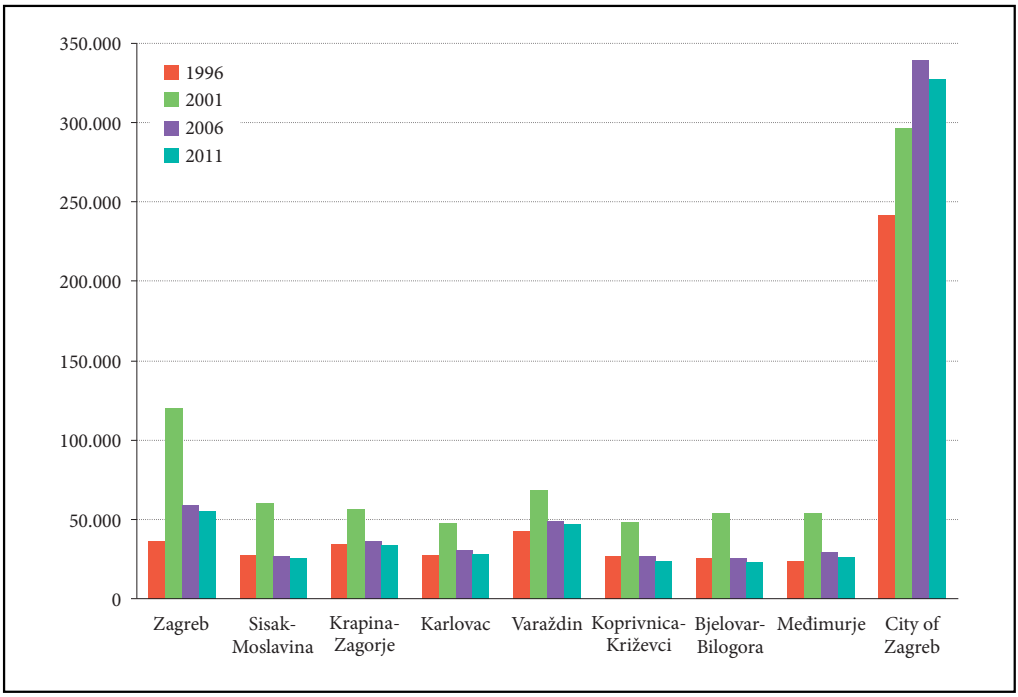

Figure 1: Total number of employees in all activities, by counties, 1996–2011 (Croatian Bureau of Statistics 1997a; 1997b; 2012a; 2012b)

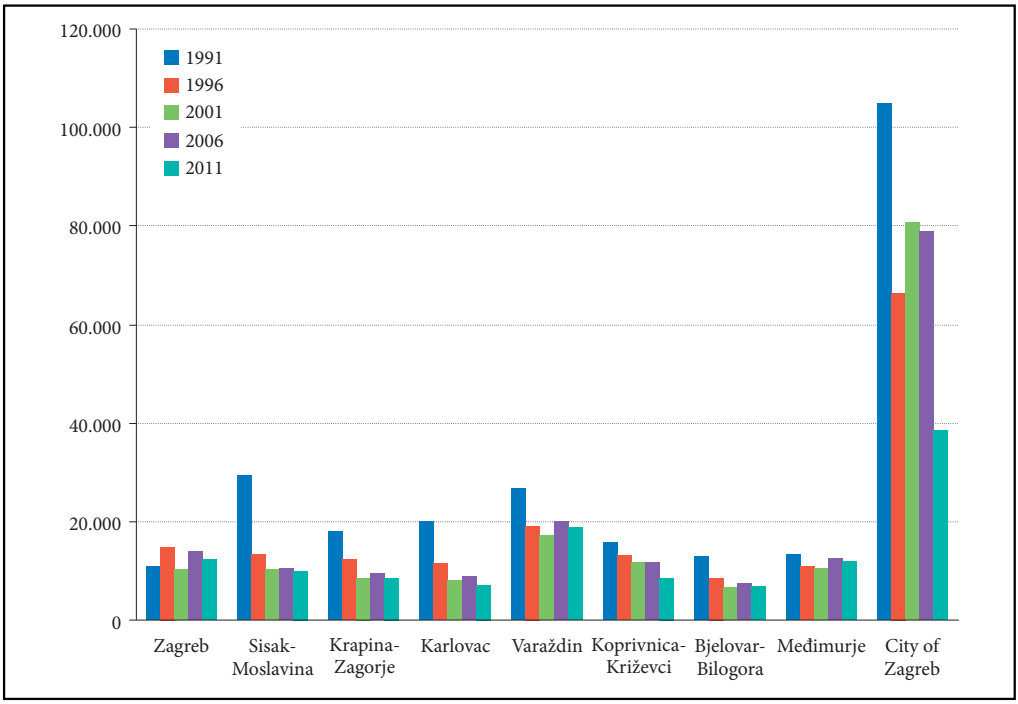

Figure 2: Employed in industry, by counties, 1991–2011 (Croatian Bureau of Statistics 1992a; 1992b; 2012a; 2012b)

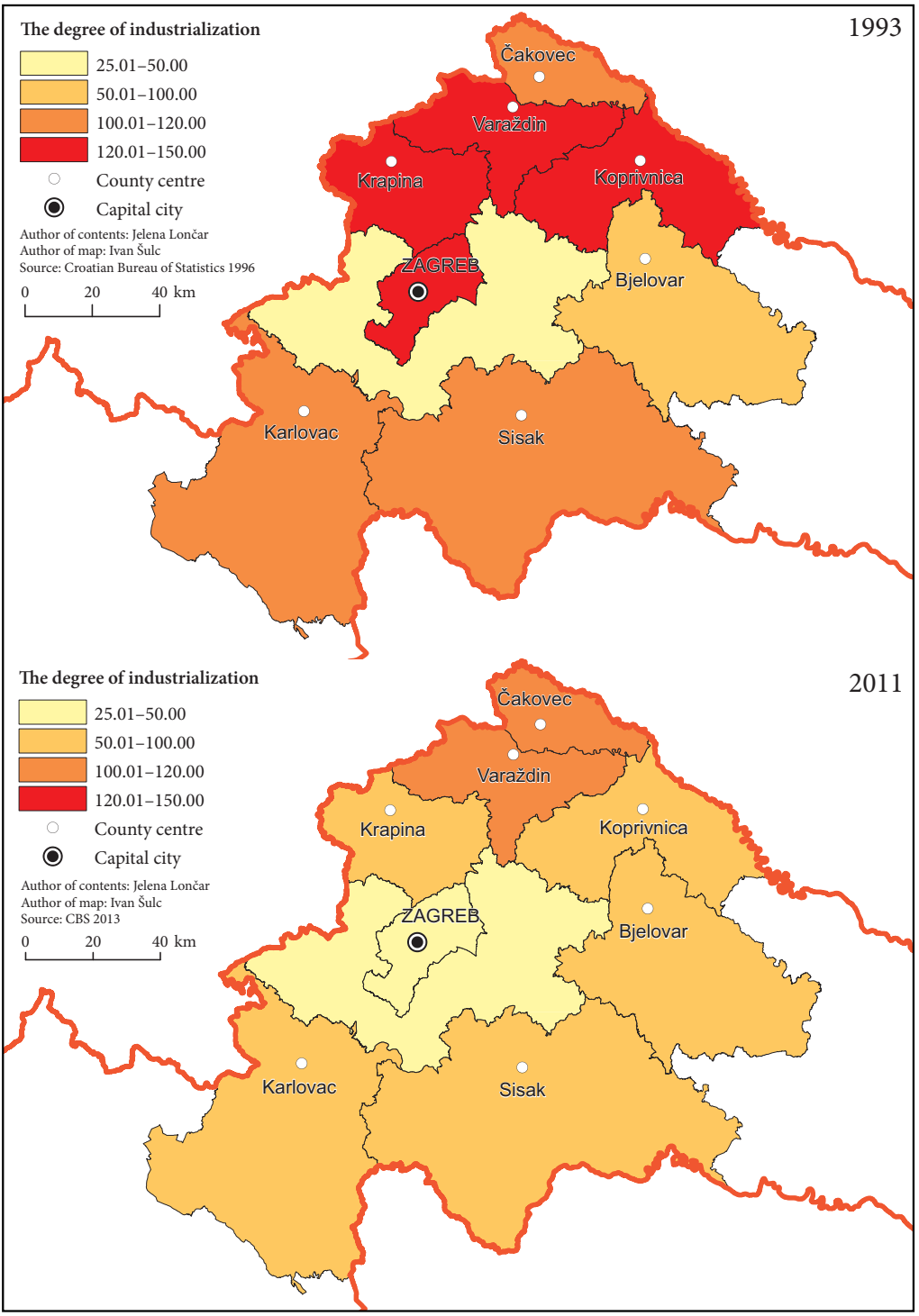

Figure 3: The degree of industrialization by counties of Central Croatia in 1991 and 2011 (Croatian Bureau for Statistics 2001; 2013; calculated by authors).

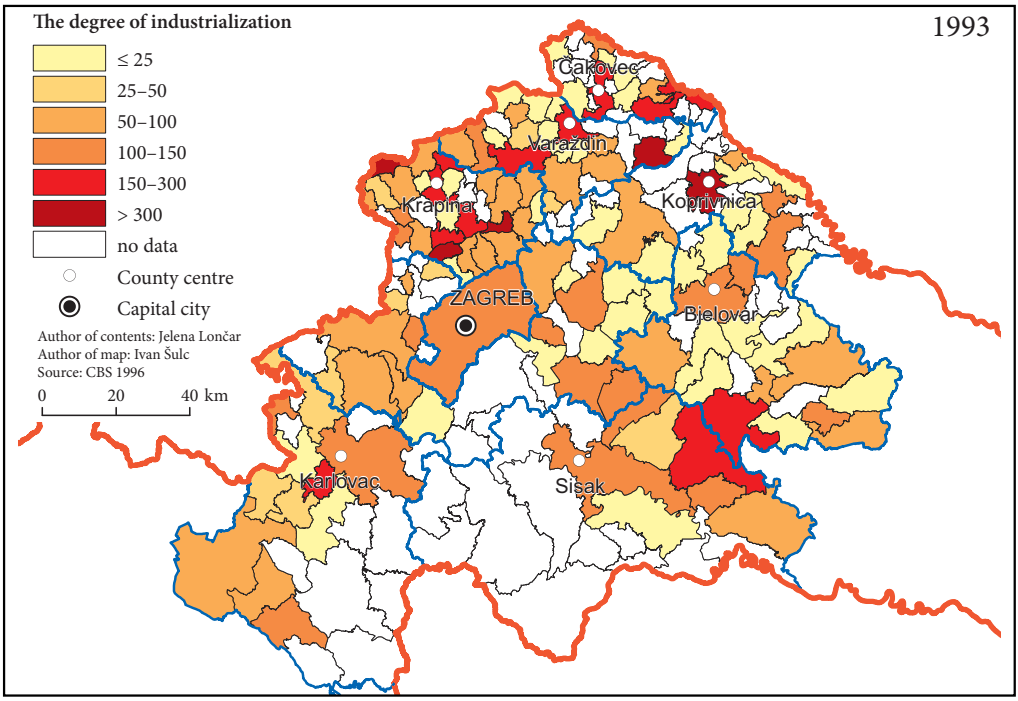

Figure 4: The degree of industrialization by municipalities and cities of central Croatia in 1993 (Croatian Bureau of Statistics, 1996b).

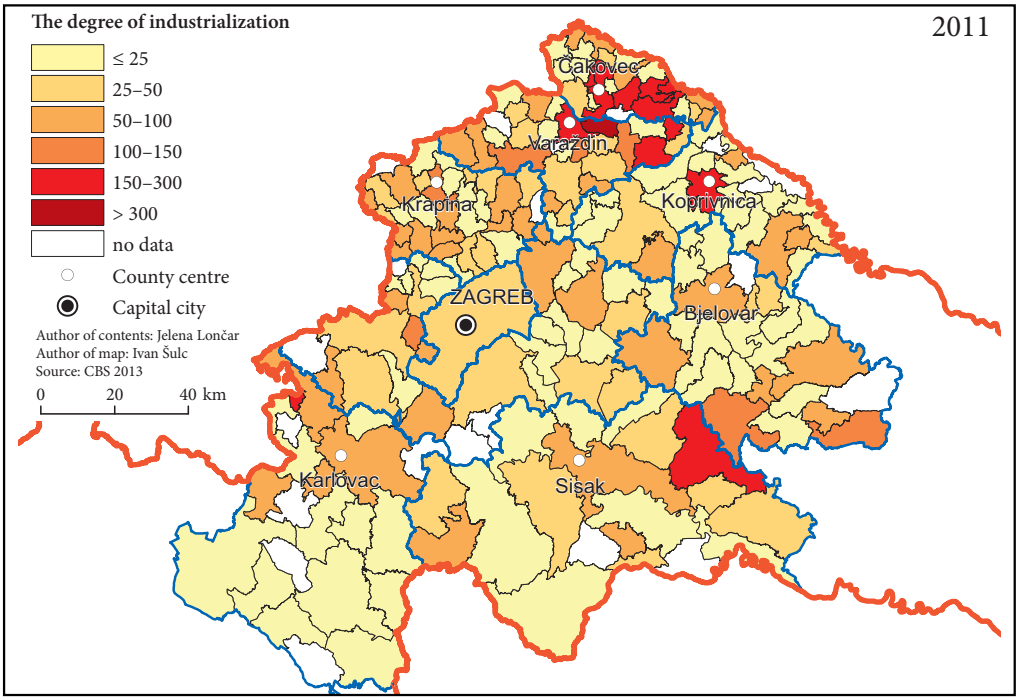

Figure 5: The degree of industrialization by municipalities and cities of central Croatia in 2011.

the level of the degree of industrialization, certain counties (cities or municipalities) can be classified: if there is more than 150 industrial workers per 1000 residents, we are talking about a highly industrialized area (that in which industry dominates in economical structure and is a factor of transformation), if the number is 100–149, it is medium industrialized, 60–99 – poorly industrialized, less than 60 – the area is at the beginning of the process of industrialization (Feletar and Stiperski 1992).

Degree of industrialization was also calculated and analyzed by municipalities and cities for 1993 and 2011 (Figures 4 and 5), in order to gain a more detailed picture of changes that have happened in industry over the past twenty years. It should be noted that in 1993, because of the war situation, it was not possible to obtain data for many cities and municipalities. It is also important to outline that many industrial manufacturers, in order to survive in the new market, abandoned their traditional production and were forced to extend the range or reorient the production of other products, which lead to a change in the identity of industrial production in some areas. In 2011, the degree of industrialization was lower than in 1993, which is to be expected given that the number of employees in the industry had significantly declined. As for the previous period, data on the number of employees in the industry do not exist and have not been calculated, because in the specified year, there were no workers employed in industry in those municipalities and cities.

Also, it is justified to say that on whole industry as well as the degree of industrialization, domestic and foreign investments has great impact. The accumulation (or lack) of investment activities in selected environments in the consequence of a number of factors where social economic differentiation in a region is reflected in changed location factors and where its advantages or disadvantages also contribute to the occurrence of new social and regional inequalities (Ravbar 2009).

6 Location quotients as indicators of trend in development of industry in (Central) Croatia

In order to get the most reliable picture of spatial distribution of industry, supported by specific data, as well as its changes over time, there are quantitative measures for this important indicator. For analyzing the spatial distribution and certain classification of counties in Central Croatia in relation to the distribution of industry, the location quotient was selected. As a basis, it requires two relatively safe and comparable data: the number of employees in the industry (of the county) and the number of employees in relation to a larger spatial unit. This indicator, thus, considers safe elements and can be compared over a longer period of time. What is particularly important, location quotient gives a much more realistic picture of the distribution of industry in space, because it puts its level of development in a relation to a number of residents of the smaller unit. In addition, this indicator also puts a smaller unit in a specific location in relation to average level of development of industry in a larger unit-this average is typically marked with 1000 (Feletar 1984). Also, this indicator allows us to perform a certain classification (typology) of the counties according to relative industrial development. Classification from D. Feletar (1984) is slightly modify and

Table 3: Location quotients by counties of Central Croatia compared to Central Croatia and Croatia in general, 1993 and 2011.

	Central Croatia				Republic of Croatia			
County	1993	type	2011	type	1993	type	2011	type
Zagreb	0,41	b	0,66	B	0,6	b	0,71	c
Krapina-Zagorje	1,33	B	1,00	A	1,33	B	1,33	B
Sisak-Moslavina	1,09	A	1,00	A	1,4	B	1,00	A
Karlovac	0,87	c	0,83	c	1,33	B	1,00	A
Varaždin	1,5	B	1,87	C	2,0	C	2,25	D
Koprivnica-Križevci	1,4	B	1,2	A	2,0	C	2,00	C
Bjelovar-Bilogora	0,83	c	1,00	A	1,0	A	1,5	B
Međimurje	1,0	A	1,8	C	1,5	B	2,5	D
City of Zagreb	1,1	A	0,81	c	1,37	B	1,00	A

Source: Croatian Bureau of Statistics, 1994b; 2013; calculated by authors.

therefore, developed as follows: a – counties with undeveloped industry (up to 0,399); b – counties with partially developed industry (0,400–0,699); c – counties with average industrial development (0,700–0,999); A – counties with industry development slightly above average (1,000–1,300); B – counties with medium developed industry (1,301–1,600); C – counties with industry being their dominant activity (1,601–2,000); D – counties extremely focused on industry (more than 2,000). Based on this set of criteria, values of the location quotients for all counties of Central Croatia in 1993 and 2011, compared to Central Croatia and Croatia in general were calculated.

Most counties in Central Croatia in 1993 can be categorized as type A and B, i.e. most countries were in the category with industry developed slightly above average (Sisak–Moslavina, Međimurje, City of Zagreb) and counties with medium developed industry (Krapina–Zagorje, Varaždin, Koprivnica–Križevci). Twenty years later, location quotient indicates that type A was dominant, meaning that the industry as an activity in space had »decreased« and been replaced by some other economic activities. Counties where industry was more prominent than in other parts of Central Croatia are Varaždin and Međimurje, with industry being their dominant sector in 2011. This is another indicator that the north-western part of Central Croatia region is an area of larger industrial employment and development. But, from the national viewpoint, it is important for balanced regional development that economic development increases the attractiveness of an entire region and with it improves the quality of life (Ravbar 2004).

7 Indices of specialization

Another indicator of the economic structure of an area are indices of specialization of the employees structure that show the development of a smaller economic area in comparison to a larger one (Turčić and Hunjet 2002; Braičić et al. 2009). In this case, it is again industry in counties of Central Croatia compared to industry in Croatia in general.

Table 4: Indices of specialization by counties of Central Croatia in 1990 and 2011.

County	1990	2011
Zagreb	0,51	1,1
Krapina-Zagorje	1,68	1,65
Sisak-Moslavina	1,22	1,45
Karlovac	1,31	1,2
Varaždin	1,40	2,00
Koprivnica-Križevci	1,50	1,75
Bjelovar-Bilogora	1,11	1,45
Međimurje	1,35	2,3
City of Zagreb	0,82	0,55

Source: Croatian Bureau of Statistics, 1992c; 2012; calculated by authors.

Analysis showed that in 1990 all counties except Zagreb County and the City of Zagreb, were specialized in the field of industry with respect to Croatia as a whole, which is to be expected, given that the industry is the most important activity in Central Croatia when talking about the number of employees. Indices of specialization are, however, relatively small, because the total number of employees in Croatia, which is divided by the number of employees in counties, includes other activities such as tourism (which is especially developed on the coast) which gives a relatively low index of specialization in industry at the level of Central Croatia. In 2011, index of specialization increased in most counties, except in the City of Zagreb, Karlovac and Krapina–Zagorje. A particularly significant increase was recorded in Varaždin and Međimurje County which suggest that the observed counties focused on industry as a leading activity of the central part of Croatia and that it has even greater significance for this area than in 1990.

8 Conclusion

Changes that happened in industry in both Central Croatia and Croatia as a whole are a result of deindustrialization of the economy and poor processes of transformation and privatization. Although the number

of industry employees declined almost everywhere in Central Croatia, great regional differences in terms of changes in the industrial sector have reflected on the importance of industry in spatial structures of certain parts of Central Croatia. Changes referring to the distribution of industry and its volume changed the spatial picture of Central Croatia, which can be seen in the results of calculations applied in this study. These results confirm both hypothesis laid out in Theoretical framework. Judging by the most indicators, the significance of industry as a spatial transformation factor is particularly reduced in southern and eastern parts of Central Croatia. This is partly a consequence of war in the nineties, but also other factors, such as different and less favorable industrial structure based on heavy industry that was created here in the last decades, and which was less adaptable to the new market system. Having analyzed the data, it should be outlined that in order to revive industry and production, Croatia as a whole needs a good industrial policy, i.e. a strategy of industrial development that would serve as a basis for a complete reindustrialization and knowledge and innovation-based industry.

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INTERCHANGE NODES BETWEEN SUBURBAN AND URBAN PUBLIC TRANSPORT: A CASE STUDY OF THE CZECH REPUBLIC

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IGOR IVAN

Reconstructed train station Ostrava-Svinov.

Interchange nodes between suburban and urban public transport: A case study of the Czech Republic

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ABSTRACT: This paper presents a methodology for localizing theoretical interchange nodes used for interchange between suburban and urban public transport in thirteen regional capitals in the Czech Republic. This methodology is based on the use of current timetables and simulation of more than 2,500 public transport connections between selected surrounding municipalities with significant commuter flows and randomly selected urban public transport stops within the regional capitals. The second part of the paper focuses on particular interchange nodes. Regional capitals are divided into groups according to the level of centrality of interchange nodes and the prevailing orientation of the transport mode. The article also analyzes the time stability of localized interchange nodes.

KEY WORDS: geography, urban transport, suburban transport, public transport, commuting, interchange, stop, Czech Republic

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1 Introduction

The decision of mode choice remains a crucial issue in studying transport geography. Although some cities or even countries have been successful in shifting car users onto public transport, others are struggling despite their efforts to make public transport more attractive. Many relevant factors influencing the final decision have been identified, but two of them are the most important: the travel time and the level of variability of travel time (van Vugt, van Lange and Meertens 1996). Unlike price and other factors, time spent traveling is an absolute constraint that cannot be increased infinitely (Vande Walle and Steenberghen 2006). Travel time is not uniform, but consists of several phases: preparation time for a journey, walking and waiting time, time needed for interchanges, and in-vehicle time. All of these times are perceived differently by individual passengers. In addition, passengers are more sensitive to out-of-vehicle time than in-vehicle time (1.5 to 2.3 times more; Vande Walle and Steenberghen 2006). The phases of out-vehicle time are quite variable. The time needed for preparing varies according to the length, purpose, and frequency of the journey. Walking and waiting time are mostly perceived negatively (except for very long journeys), and in the case of commuting using suburban public transport (SPT) walking time can make up 24 to 30% of the time of the entire journey in the Czech Republic (Ivan 2010). Changes of transport vehicles or transport modes are generally perceived negatively. Only a few empirical studies have tried to quantify the weights for particular out-vehicle times. Vande Walle and Steenberghen (2006) provided a general overview of these studies, and the Flemish multimodal transport model is considered to be the most complex one. This model provides weights for each out-vehicle time; one minute of waiting time is weighted by 165%, each minute of walking time by 150%, and for each change of vehicle an extra factor is added between 2 and 15 minutes, depending on the characteristics of the interchange.

Vehicle or transport mode interchange is a fundamental issue. On the one hand, passengers in multimodal transport systems often have to change their transport mode to reach their destinations, and the interchange can significantly expand the accessible area. On the other hand, this has a significant impact on the demand for the public transport and reduces its competitiveness because interchange has a cost, which can often be quite considerable. The process of urban sprawl and reorganization of public transport planning in most cities makes interchange one of the crucial problems of public transport. Based on a study by Guo and Wilson (2011) comparing the situation in several cities, about 70% of underground trips and 30% of bus trips involve at least one interchange in London, and 70% and 40% of all public transport trips include one or more interchanges in Munich and Paris. Bole et al. (2012) also noted that the role of train and bus transport should be increased and connected to urban public transport (UPT) at primary interchange nodes in the case of Ljubljana.

The interchange nodes can be developed in places where two or more public transport links or transport modes cross or approach. The most important requirement for the interchange nodes from the public transport operators' point of view is securing passengers' maximum safety and comfort. The most important requirement from the passengers' point of view is the time needed to carry out the interchange; they prefer a short, one-level transfer. It is important to minimize the distance and time connected changing between transport vehicles; quick and easy interchange is essential. Based on the results from thirty-two in-depth interviews conducted with public transport users in Scotland, several factors associated with poor quality of interchanges have been selected (Hine and Scott 2000). Common complains relate to poor quality of the waiting environment, paying for toilet facilities and their poor standards, poor timetables, personal security, poor signage within the interchange node, and long distances between different interchange nodes. Similar results have also been reported by Wardman et al. (2001). Nevertheless, for passengers an interchange is mainly considered a potential cause of delay (Stokes 1994). In general, participants in the in-depth interview study sought to avoid interchanges (especially during commuting and similar time-sensitive trips).

The issue of interchange is often overlooked by public transport planning agencies, although they are often aware of the importance of convenient interchanges. Based on the results of a survey conducted in twenty European cities by the European Commission, many operators did not know the volume of interchanges taking place in their systems. They have explained this disinterest by the impact of several factors: organizational barriers, the fact that interchanges cannot be completely eliminated by transfer planning improvements towards seamless travel, and lack of analytical tools to understand interchange behaviour (GUIDE 1999).

This paper reports the findings of an analysis of interchange nodes in thirteen regional capitals (NUTS3) in the Czech Republic. The goal of this paper is to select several main interchange nodes (stops, stations)

from current stops within these cities based on current timetables and proposed methodology to determine whether they play the role of interchange node during the entire day, and to determine the main public transport mode orientation of regional capitals. For this paper, an interchange node is defined as a public transport stop used for changing between SPT and UPT.

2 Methodology of interchange node localization

The approach for localizing interchange nodes used in this study was based on real transport connections offered by current timetables. This study does not calculate real flows of passengers. This methodology involves searching hundreds of public transport connections between defined places of origin and destination in thirteen regional capitals. The hypothesis is that a public transport stop is considered an interchange node if it is suggested by timetables several times as the stop to change the transport vehicle (mode) from SPT to UPT.

2.1 Origins: surrounding municipalities

The municipalities of origin for commuting by public transport were defined by a set of ten municipalities surrounding each of the regional capital within 100 kilometers (as the crow flies). Two important factors

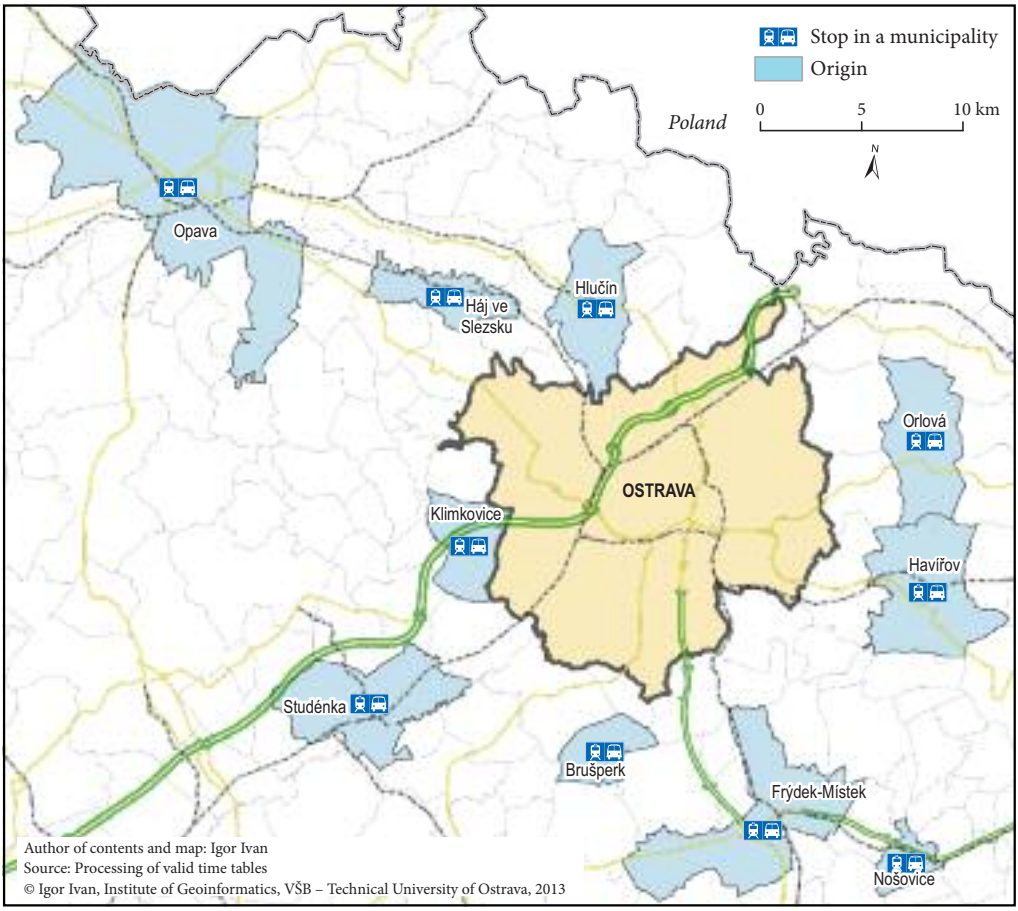


Figure 1: Surrounding municipalities of the origin: the case of Ostrava.

were considered for selecting these 130 municipalities. Significant and stable commuting flows between each municipality and the capital must exist according to the results of the 1980, 1991, and 2001 censuses. The second condition ensures the spatial distribution of these municipalities around the regional capital to include possible commuting flows from all directions (Figure 1).

2.2 Destinations: randomly selected stops in regional capitals

Randomly selected UPT stops played the role of destinations. The count of these stops differs from city to city because of their sizes. The maximum number of UPT stops was selected in Prague, where one randomly selected UPT stop defines each part of the city, and so destinations in Prague are ultimately defined by fifty-seven UPT stops. The second- and third-largest cities (Brno and Ostrava) are each defined by fifty UPT stops, even though the number of city districts is halved and each city district contains at least one UPT stop. In the case of the other ten smaller regional capitals, 1% of all UPT stops within the city were selected, but at least ten UPT stops. Altogether, 268 UPT stops were randomly selected in all thirteen regional capitals.

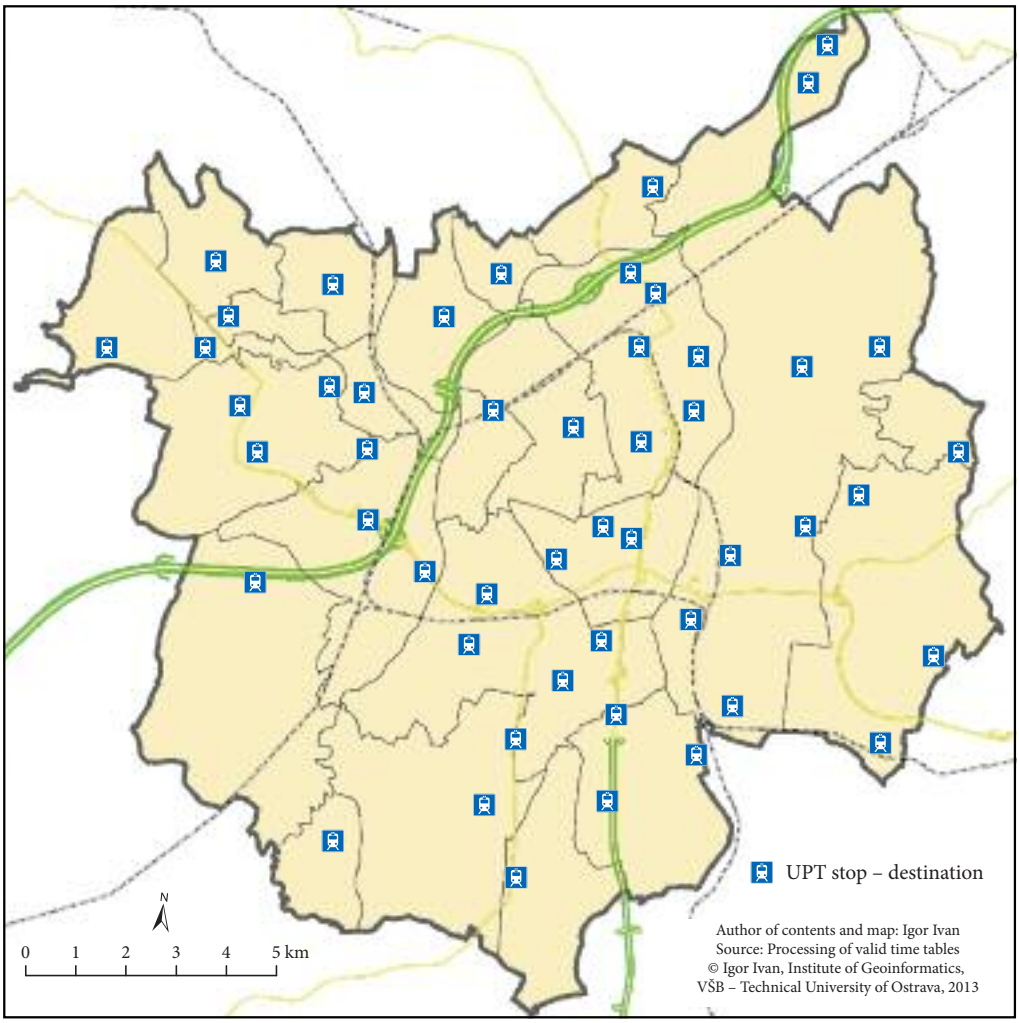


Figure 2: Randomly selected UPT stops as destinations: the case of Ostrava.

2.3 Interchanges: localization of interchange nodes

After the selection of places of origin and destination, public transport connections between all combinations were searched using current timetables with arrival at 8 am. This time corresponds to the beginning of the morning shift (Mudrych 1998). All connections were searched for June 22, 2010. Overall, more than 2,500 connections (for one commuting time) were searched in timetables. These connections had to meet specific criteria used for public transport connections in the database of Public Transport Connections. This database has been developed every year since 2006 for the Integrated Information Portal of the Ministry of Labor and Social Affairs in the Czech Republic. The total duration of the journey is limited to ninety minutes, the arrival at the destination cannot be earlier than sixty minutes before the shift, the departure of the journey cannot be earlier than two hours before the shift, and total number of interchanges must be fewer than five (Ivan et al. 2013). The most suitable among all the connections meeting the criteria was selected and several attributes were recorded, including the name of the stop used for the interchange between SPT and UPT, the total travel time, and the travel time in SPT and UPT vehicles. The final list of inter-

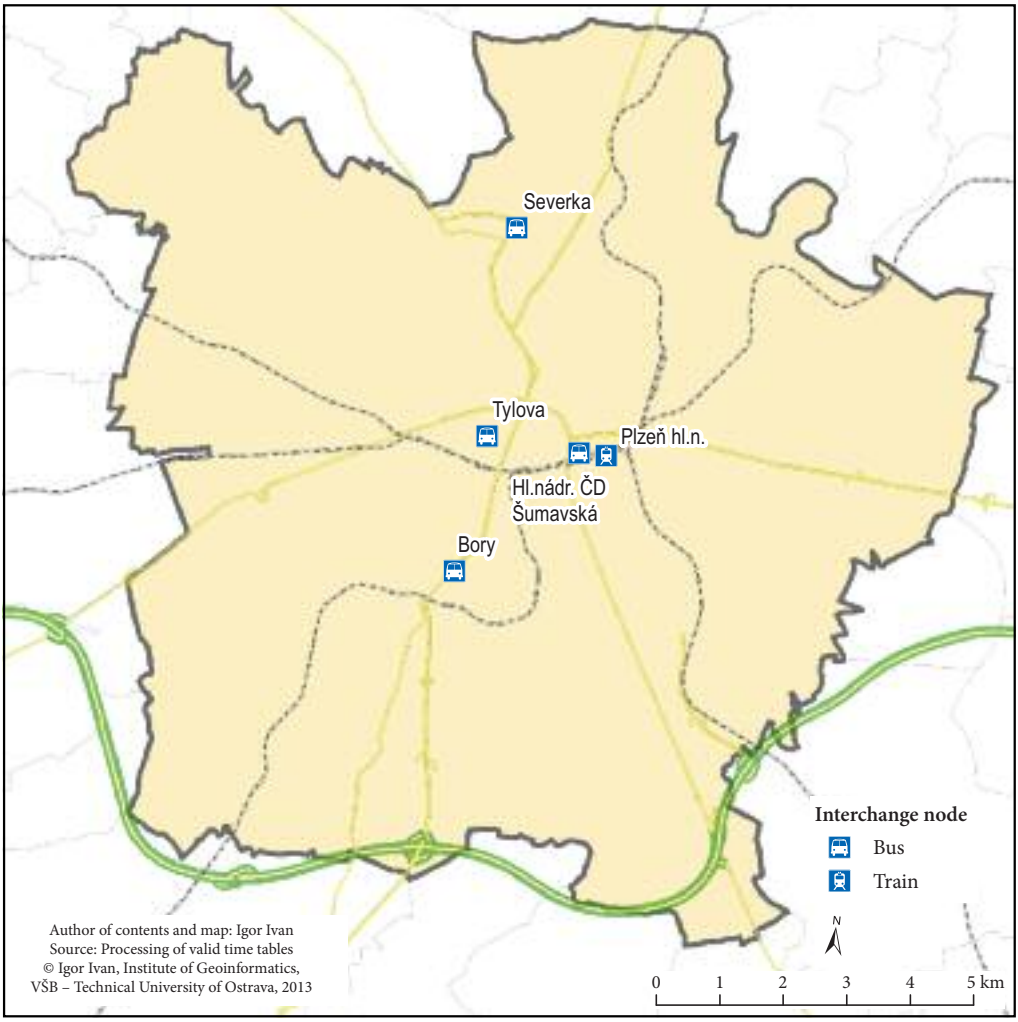


Figure 3: Final interchange nodes: the case of Pilsen.

change nodes is based on the frequency of use. In the case of Prague, Brno, and Ostrava, each public transport stop used more than ten times is considered the interchange node. In the case of other cities, the selection of resulting interchange nodes is more individually based on local conditions without any specific limit. Altogether, seventy-seven interchange nodes were selected in these thirteen regional capitals for commuting at 8 am.

3 Results and discussion

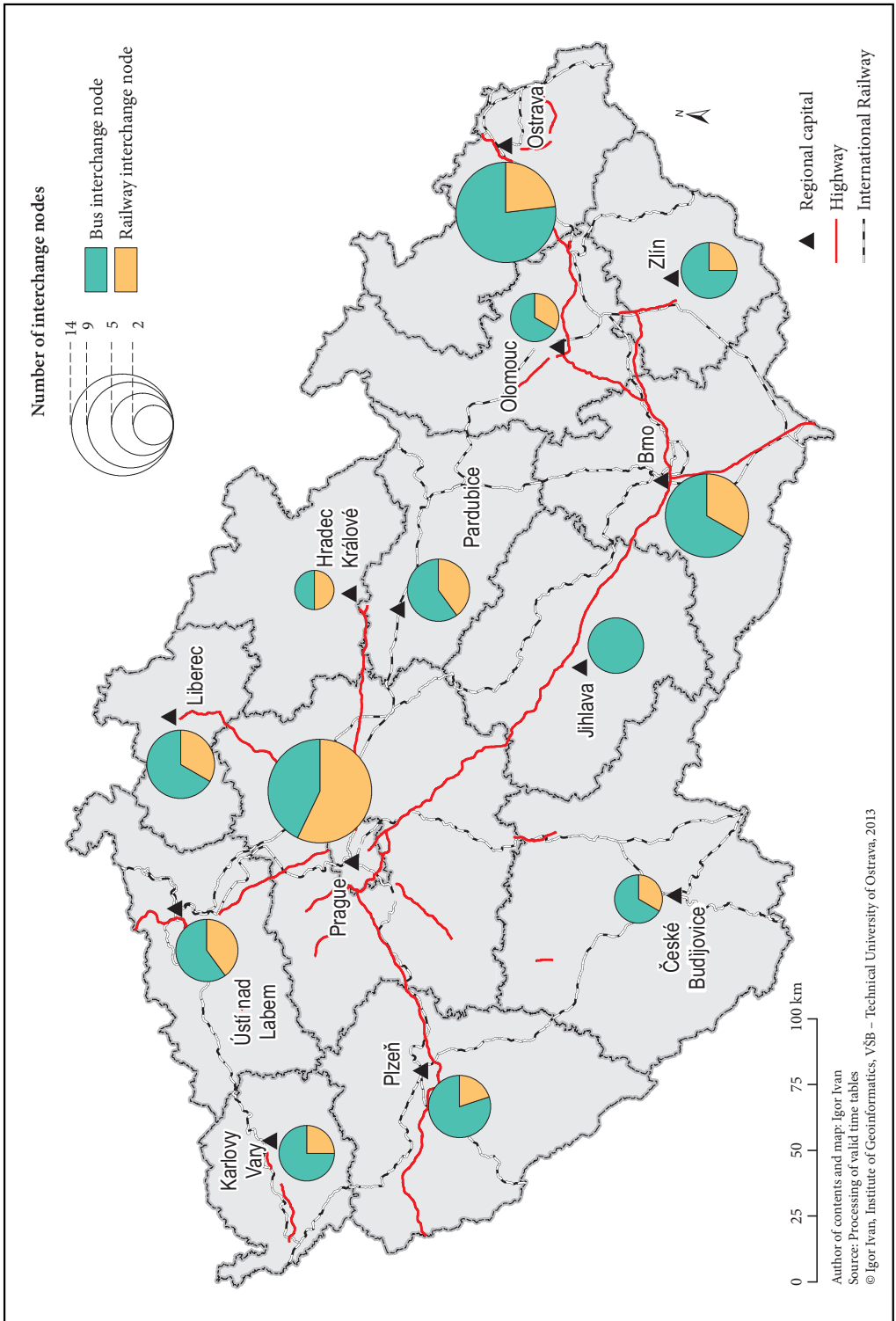
Altogether, there are almost 2,500 SPT stops in these thirteen regional capitals (about 95% of them are bus stops). The biggest number of interchange nodes is in Prague (fourteen), Ostrava (thirteen), and Brno (nine), which reflect the population of these cities. The slightly larger number of interchange nodes in Ostrava is caused by the polycentricity of this industrial city (for more, see Hruška-Tvrdý et al. 2012) compared to historical cities such as Brno and Prague. Considering the modal split, among all seventy-seven localized interchange nodes, fifty-one nodes are serviced by buses and twenty-six by trains, which makes trains more important considering the general share of bus stops among all SPT stops. The interchange nodes serviced by buses usually make up 60 to 80% of all interchange nodes in the city. Nevertheless, there are three exceptions: Prague is the only city with a prevalence of interchange nodes serviced by trains; only two interchange nodes (equally serviced by bus and train) were localized in Hradec Králové, and, finally, all four localized interchange nodes in Jihlava are serviced by buses, mainly because of the lack of a connection to the railway corridors (see Figure 4).

3.1 Centrality of interchange nodes in regional capitals

The centrality of the interchange node is defined as the number of interchanges per interchange node. The centrality for 8 am commuting varies from 13.2 in Pardubice and Liberec to 41.3 in Brno. The extreme situation in Brno is caused by 153 interchanges available at the main train station connected to the first railway corridor. This station is located close to the city center and services the entire region (about 60,000 travellers daily). The close UPT stop ensures accessibility to the entire city by several tram, trolleybus, and bus links, which further increases its importance. Hradec Králové is also a city with high centrality, with an average of forty interchanges per interchange node. The most used interchange node (newly developed in 2008) is serviced by bus transport and plays an important role in the regional public transport system. This new transport terminal ensures the centralization of all bus links (urban, suburban, and national) at one location (Internet). The second interchange node is in front of the main train station (a five-minute walk from Terminal HD) and ensures interconnection of the railway and urban transport system.

The situation is different in Pardubice, Liberec, and Zlín, with centrality ranging from 13 to 15. In Liberec, the most important interchange nodes are the bus and train main stations. The official terminal (Fügnerova) was not selected by the methodology because of the small number of proposed interchanges. The results were also confirmed in 2013. This UPT stop is far from the main bus or train SPT stops. If timetables suggested using it, the walking time to the Fügnerova stop is fifteen minutes and, together with waiting times, the total out-vehicle time is about nineteen minutes (compared to ten minutes using other interchange nodes). The most often used interchange node in Pardubice according to timetables is the main train station, which provides the connection to the first and third railway corridors (twenty-three interchanges). The situation in Pardubice may change during 2014 or 2015 and the centrality of this station will increase. The surrounding area will be rebuilt and a new transport terminal will make it possible to change all modes of public transport at one location. Thus, it is possible that the future situation will be very close to the current situation in Hradec Králové. Zlín is also a city with low centrality and must rely more on bus transport. The impact of railway transport is very low, which is caused by the lack of a fast connection to the railway corridor (similar to Liberec). Zlín is connected to the corridor using the railway station in the nearby city of Otrokovice by a non-electrified single-track railway with low capacity and a frequent trolleybus line.

Figure 4: Number of interchange nodes in regional capitals. ► p. 42
Figure 5: The centrality of interchange nodes in regional capitals ► p. 43


Number of interchange nodes
14
9
5
2
Bus interchange node
Railway interchange node
Karlovy Vary
Ústí nad Labem
Liberec
Hradec Králové
Pardubice
Prague
Plzeň
Jihlava
České Budějovice
Olomouc
Brno
Zlín
Ostrava
N
Regional capital
Highway
International Railway
0
25
50
75
100 km
Author of contents and map: Igor Ivan
Source: Processing of valid time tables
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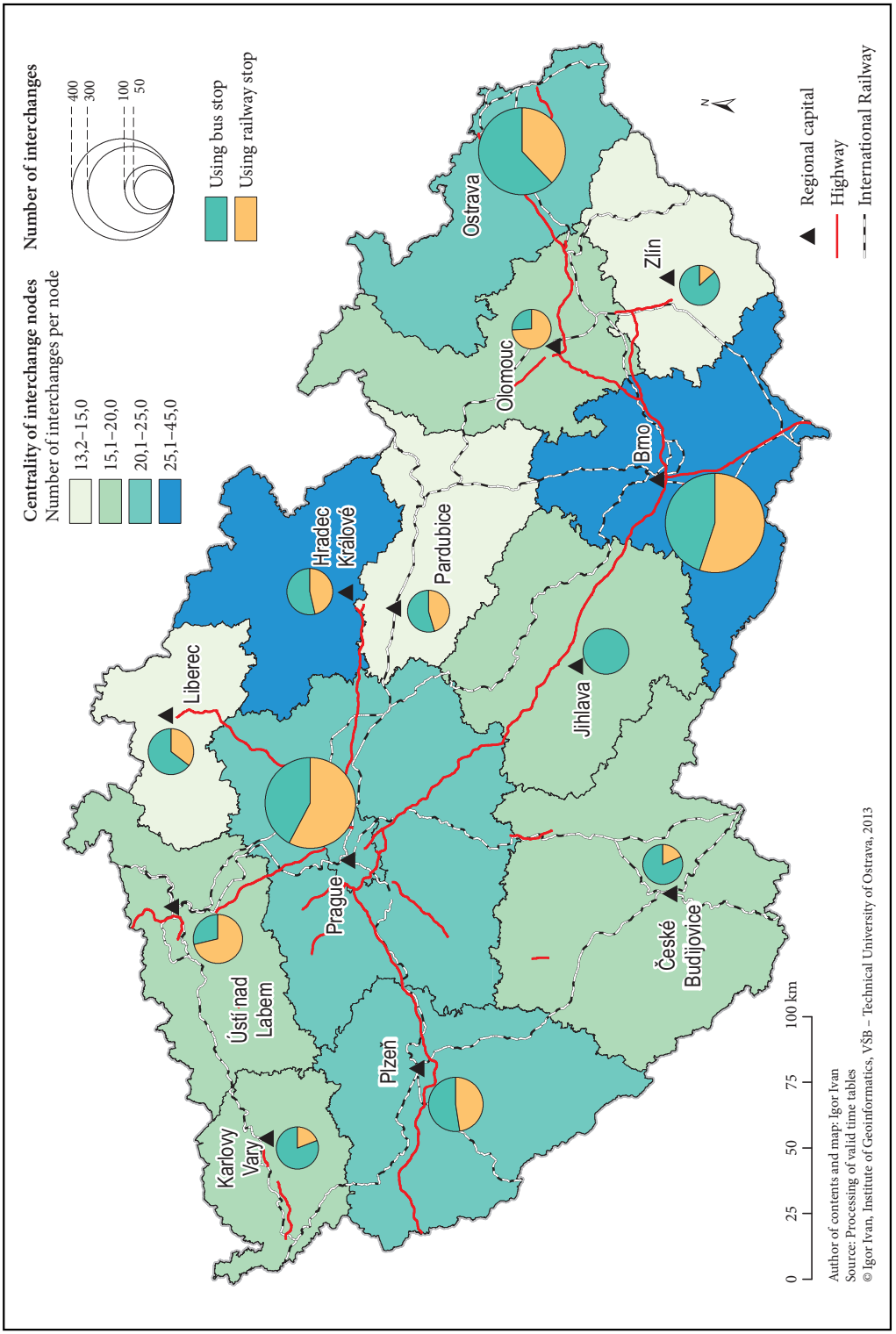
Centrality of interchange nodes
Number of interchanges per node
13,2–15,0
15,1–20,0
20,1–25,0
25,1–45,0
Number of interchanges
400
300
100
50
Using bus stop
Using railway stop
Regional capital
Highway
International Railway
Liberec
Hradec Králové
Pardubice
Ostrava
Olomouc
Zlín
Brno
Jihlava
Prague
Ústí nad Labem
Plzeň
Karlovy Vary
České Budějovice
0 25 50 75 100 km
Author of contents and map: Igor Ivan
Source: Processing of valid time tables
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The city council of Zlín is aware of this limitation and has already approved the new Zlín 2020 strategy, in which the development of a new transport terminal and connection to main railway network are among the main aims.

3.1 Orientation of regional cities to transport modes

Cities can also be classified according to their orientation to railway or bus modes. The orientation is defined as the difference between the average number of interchanges at bus interchange nodes and average number of interchanges at railway interchange nodes. If the final ratio is –10 or less, the interchange node is considered railway-oriented and, analogously, if the final ratio is above 9 the interchange node is bus-oriented. Brno, Pilsen, Olomouc, Ústí nad Labem, and Ostrava are the cities with the highest dependence on trains (in descending order). This is mainly due to the connection to the railway corridor and the dominant role of main railway station close to UPT stops. The city absolutely most dependent on railway transport is Brno, where 55% of all interchanges are made at three localized railway interchange nodes (33% of all nodes) and the average number of interchanges at railway stations is almost 2.5 times higher than in case of bus nodes. On the other hand, Jihlava, České Budějovice, and Zlín are dependent mainly on bus transport. This is mainly due to their peripheral position in the railway network hierarchy (although České Budějovice is connected to the fourth railway corridor) and the dominant role of the bus station. The situation in Jihlava may change during the coming years, when the new transport terminal will be developed next to the existing railway station. The third group consists of five cities with a similar average number of interchanges at the interchange node of both modes.

3.2 Time stability of interchange nodes

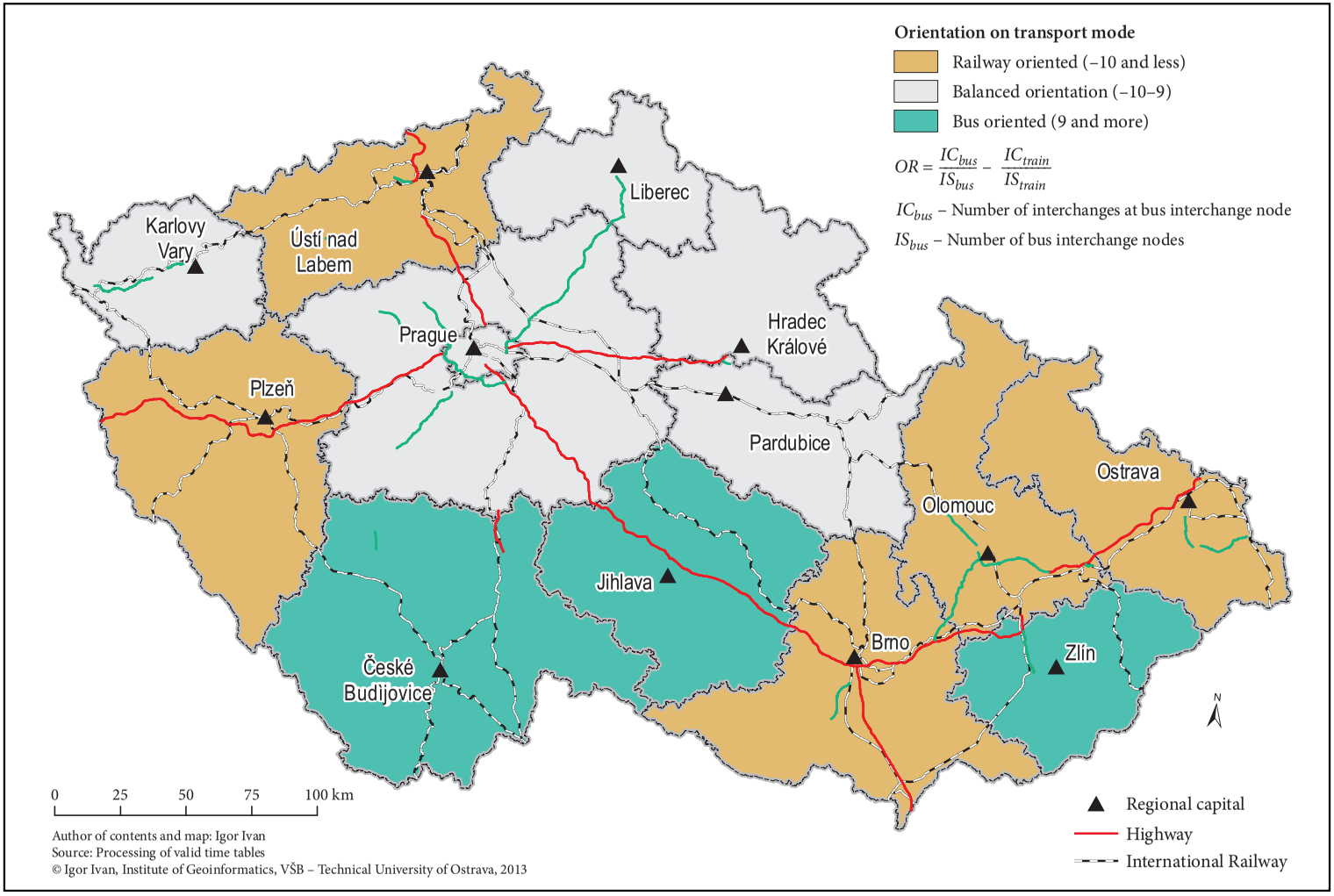
The results presented above describe the 8 am commuting situation, but the selected interchange nodes may vary for different times. To analyze the spatio-temporal stability of interchange nodes, the interchange nodes have also been localized for 2 pm and 10 pm as the beginnings of the afternoon and night shifts. The three largest cities (Prague, Brno, and Ostrava) were selected for the case study.

Generally, the number of significant interchange nodes decreased and the use of the most important nodes increased, reflecting the principle of elitism and increase of centrality. Based on 570 connections searched, fourteen interchange nodes were selected in Prague for 8 am commuting. This number decreased to eleven for commuting to the afternoon shift or twelve for commuting to the night shift. This development is quite unique among the cities analyzed. The railway station (Masaryk station) remained the most important for all commuting times. In case of all times analyzed, one bus stop (Černý Most or Opatov) reached a similar frequency of use as the Masaryk station. Prague is a typical city with a large number of interchange nodes with similar use without one or two significant central interchange nodes. No interchange node is as central as in the case of Brno or Ostrava, with a share above 20% of all changes made at one stop.

In Brno, nine and six interchange nodes were localized for commuting to the afternoon and night shift. The main role of the central railway station also remains unchanged for other commuting times and the frequency of its use increased to 44.2% for 10 pm commuting. This increasing centrality causes a decreasing use of all other important interchange nodes, mainly bus stops. Three bus interchange nodes provide 25% frequency of use for 8 am commuting, but only one of these stops plays the role of an interchange node with a frequency of about 3% for 10 pm commuting.

The Svinov railway station and Svinov Mosty bus stop remain the most important interchange nodes in Ostrava, but they switch positions for night shift commuting. They service the connections from the western and southern parts of the region. In the case of 8 am commuting, more than 25% of interchanges are made at these two nodes and this share increases to 33% of all interchanges for 10 pm commuting. The other important interchange node is the main bus station in the city center, with an increasing frequency of use from 6% to almost 10%. This stop serves the heavily populated eastern part of the region. However, the situation may change during the coming years because the city council plans to develop four main interchange nodes. This analysis has located two of them so far.

Figure 6: The orientation of regional capitals to transport modes. ►


Orientation on transport mode
Railway oriented (–10 and less)
Balanced orientation (–10–9)
Bus oriented (9 and more)
$OR = \frac{IC_{bus}}{IS_{bus}} - \frac{IC_{train}}{IS_{train}}$
IC_{bus} – Number of interchanges at bus interchange node
IS_{bus} – Number of bus interchange nodes
Karlovy Vary
Ústí nad Labem
Liberec
Prague
Hradec Králové
Plzeň
Pardubice
Ostrava
Olomouc
Jihlava
Brno
Zlín
České Budějovice
N
0 25 50 75 100 km
Regional capital
Highway
International Railway
Author of contents and map: Igor Ivan
Source: Processing of valid time tables
© Igor Ivan, Institute of Geoinformatics, VŠB – Technical University of Ostrava, 2013

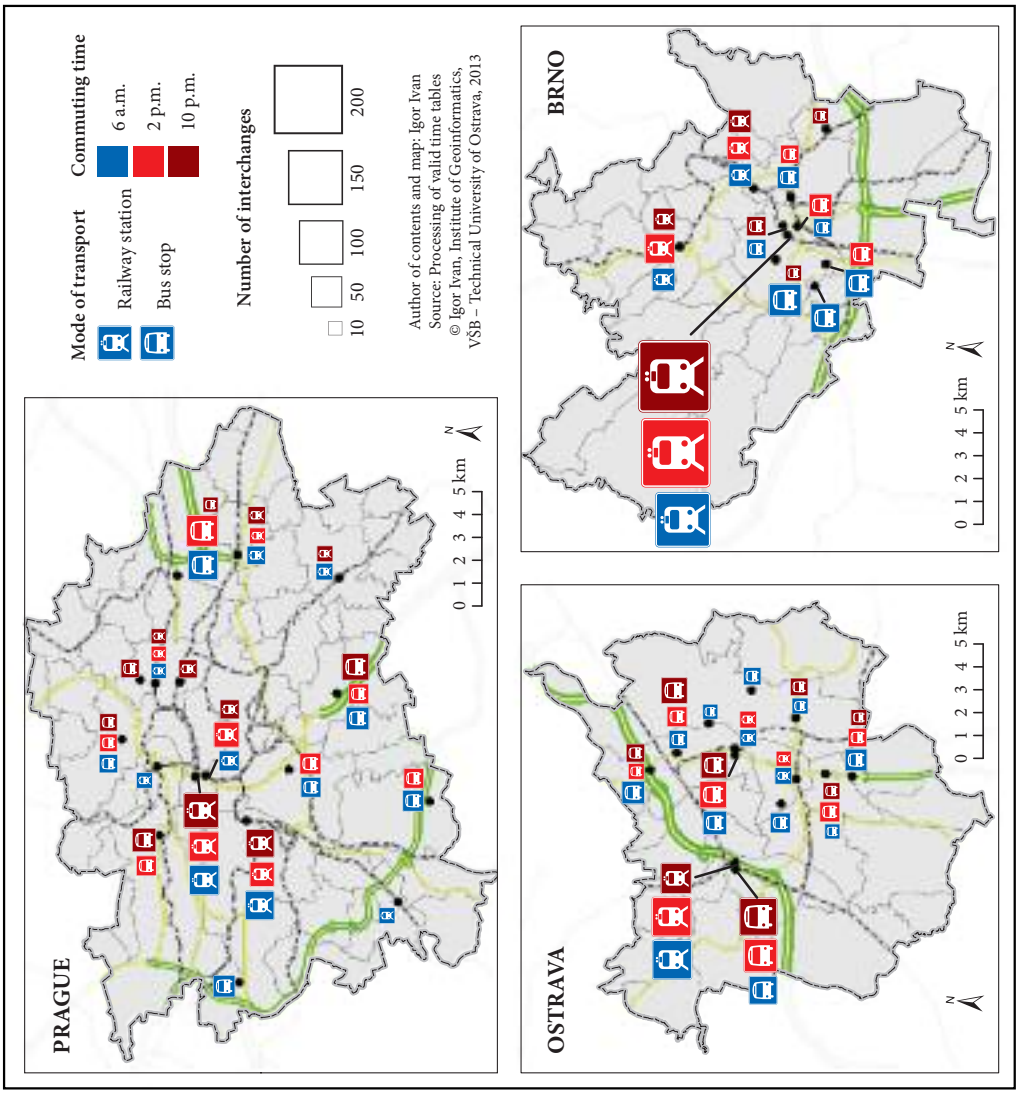


Figure 7: Time stability of interchange nodes in Prague, Brno, and Ostrava.

4 Conclusion

Changing vehicles or transport modes is a very current topic mainly due to budget cuts in support for public transport. This is why city councils, regional government, and the national government in the Czech Republic must economize public transport connections. This leads to decreasing the number of parallel links and to increasing the number of interchanges to reach final destinations. This paper introduced a methodology for localizing theoretical interchange nodes in thirteen regional capitals in the Czech Republic. Based on current timetables, over 2,500 public transport connections were evaluated and seventy-seven interchange nodes for 8 am commuting were localized. Generally, it is possible to divide regional capitals into three categories according to dominance of railway stops (five regional capitals) or bus stops (three regional capitals) for interchange from SPT to UPT. The third group consists of capitals with a similar use of both types

of transport (five capitals). Similarly, the centrality of interchanges within these cities can be evaluated. Many cities have their own specific features, and two main factors influencing interchanges in the city can be selected. First, the existence of a connection to the railway corridor increases the importance of the main railway station. Second, cities with already existing or recently developed transport terminals interconnecting SPT and UPT are unique in the centrality of their interchanges (the cases of Hradec Králové and Brno). The situation could change in the future because in several capitals there are projects to develop new modern transport terminals (the cases of Zlín, Jihlava and Pardubice).

The time stability of these interchange nodes for 2 pm and 10 pm commuting was investigated based on the example of three regional capitals (Prague, Brno, and Ostrava). The results tend to show similar figures related to principle of elitism. The number of significant interchange nodes decreased, whereas the frequency of use of some of the most significant interchange nodes increased. There is also a tendency for an increasing number of connections that did not meet the criteria of the methodology presented. New interchange nodes (less important due to their frequency of use) appeared rarely and with only a small frequency of use.

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QUANTITATIVE ANALYSIS OF MARGINALIZATION INDICATORS – EXAMPLE OF THE PELJEŠAC PENINSULA, CROATIA

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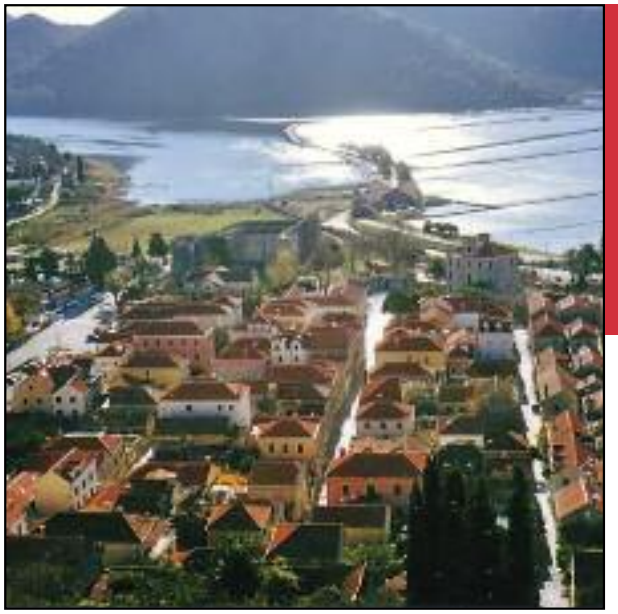

NIKOLA GLAMUZINA

Town of Ston and Salt pans in the background.

Quantitative analysis of marginalization indicators – example of the Pelješac peninsula, Croatia

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ABSTRACT: Besides marginalization on the international, national and regional levels, it is possible to speak about marginalization on the local level. It is especially important since its consequences and various aspects are felt in everyday life. This paper presents the results of quantitative analysis of the process of marginalization on the local level on the example of the peninsula of Pelješac in Croatian Littoral. The main aim of the research is to contribute to propose a quantitative approach in the research of marginalization. The authors have defined four indicators which form the basis of the GIS analysis: demographic, socio-economic, educational and an indicator of physical marginalization. In order to see relationship between the indicators, the peninsula has been divided into zones which differ according to the marginalization process. Such differences are expressed quantitatively in form of an index of marginalization.

KEY WORDS: geography, marginalization, Pelješac, Croatia, indicators, GIS

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1 Introduction

The issues of marginality and marginalization first appeared in scientific research in the first half of the 20th century (Park 1928; Stonequist 1937). Geographers did not significantly get involved in investigating the issue until the end of the century (De Koninck 1980; Vant 1986). Marginality and marginalization are closely related to economic development of regions. This is why the majority of geographical studies are primarily focused on economic marginality, observed from temporal and spatial points of view. More recently, other dimensions of marginalization, such as social, cultural, political and environmental, have been analyzed by geographers (Jussila, Leimgruber and Majoral 1998; Jussila, Majoral and Cullen 2002; Jussila, Majoral and Delgado Cravidão 2001). The processes of globalization and deregulation at the turn of the century have increased the rift between prosperous »central« regions and less prosperous »peripheral« regions. Although marginality is not the result of globalization and deregulation, it has been significantly reinforced by these two processes. Usually, the terms *peripherality* and *marginality* are considered synonyms. However, a geographical understanding of these two notions makes a clear distinction between them since marginality is a broader term which does not exist only in a spatial (geographical) context (Cullen and Pretes 2000; Leimgruber 2004).

The peninsula of Pelješac, in the southern Croatian region of Dalmatia, represents a typical peripheral area. It measures 348 km^2 and has 7789 inhabitants. The population is concentrated in 40 settlements, of which only Orebić can be considered urban. The peninsula is thinly populated (the average population density is 23.7 inhabitants per square kilometer) and it has no significantly developed economic activities except tourism and Mediterranean agriculture (Glamuzina 2009, 148).

The main purpose of the research is the quantitative and spatial analysis of the process of geographic marginalization.

1.1 Survey of previous research

In recent years marginalization has been thoroughly presented in geographical research (Déry, Leimgruber and Zsilincsar 2012; Leimgruber 2004). Part of the credit belongs to the International Geography Union (IGU) Commission on »Globalization, marginalization and regional and local response», which has popularized such research (Jones, Leimgruber and Nel 2007; Leimgruber 2010; Leimgruber, Majoral and Lee 2003; Majoral, Jussilaand Delgado Cravidão 2000; Valença, Nel and Leimgruber 2008).

Effects of marginalization in peripheral areas during the contemporary process of globalization have recently been studied in small towns in New Zealand. When the national government focuses on international macroeconomics and on larger population hubs inside the country, the only response is in local initiatives and entrepreneurship. The development problems were studied in Canada (Nel and Stevenson 2009; Conradson and Pawson 2009; Huskey and Morehouse 1992) where agrarian abandonment as a widespread problem of marginalized regions is an easily recognizable landscape feature (Sancho-Reinoso 2011).

Marginalization can be measured by qualitative or quantitative analyses. Qualitative analysis has been widely applied since such an approach emphasizes the individuality and specificity of a research area. Quantitative analysis reliy on statistical data and are still debatable (Déry, Leimgruber and Zsilincsar 2012).

This research starts from the need of operationalizing the theoretical approaches concerning spatial problems on a local level and translating them to implementable models. In general, aggregate spatial data are characterized by two spatial effects: dependence and heterogeneity which require development of specific methodological approaches. Since such issues are overlooked by traditional econometrics they are covered by a special field of spatial econometrics (Anselin 1988). The introduction of geographic information system in data analysis has created a need for new techniques which focus on spatial aspects of statistic data. In this sense, local indicators of spatial association, such as Moran's I, have been applied (Anselin 1995) and compared with other methodological approaches (Getis and Ord 1992). The relevance of the application of the same method, often called the Moran Coefficient (MC) in geographic research, just in other research which deals with spatial analysis, has been confirmed and even recommended (Griffith 2009). At the same time, spatial autocorrelation is becoming more widely used in economic geography (Getis 2010; Haining 2004, 89). Therefore, improvement of analytical techniques is necessary for better understanding of spatial processes. On the other hand, the application of GIS to spatial analysis is well documented in the scientific research (Worboys and Duckham 2004).

2 Methodology

The methodological approach of this research is based on an analysis of the official data published by the Croatian Statistical Bureau. Some data (distance to roads, the relation between air and surface distance, travelling time between a settlement and a regional centre) were derived from a digital elevation model and by the Via Michelin and Routes websites (Internet 1). The digital elevation model 25 × 25 m was made by vectorization of contour lines from topographic maps at a scale of 1 : 25,000. 16 relevant statistical data were grouped into four indicators. The analysis of the problem (Figure 1) starts with defining the major socio-geographic processes and issues in the marginalized area: long-term population loss, low population density, population ageing, emigration, underdeveloped labour contingent, stagnant economic structure (with high proportion of the agricultural population), significant geographic distance from the principal regional urban centres and poor educational population structure (low share of educated population, especially university-educated).

For the purpose of systematic analysis 16 relevant statistical data have been classified into four indicators:

- demographic,
- socio-economic,
- educational and
- physical marginalization indicator.

The demographic indicator (DI) contains four statistical data: number of inhabitants, population density, index of ageing and percentage of the young population age group (up to 18 years).

The socio-economic indicator (SEI) consists of: labour contingent, percentage of agricultural population, absent population (local residents which temporarily live outside of the their settlements) and transport cost to the regional centres.

The physical marginalization indicator (PMI) comprises of: elevation, distance to the principal regional centre, relation between air and surface distances, and travelling time between a settlement and the regional centre.

The educational indicator (EI) includes: illiteracy rate, percentage of the population which is highly educated, share of the population with the lowest level of education (with only an elementary school degree or without it) and percentage of the population currently enrolled in higher education.

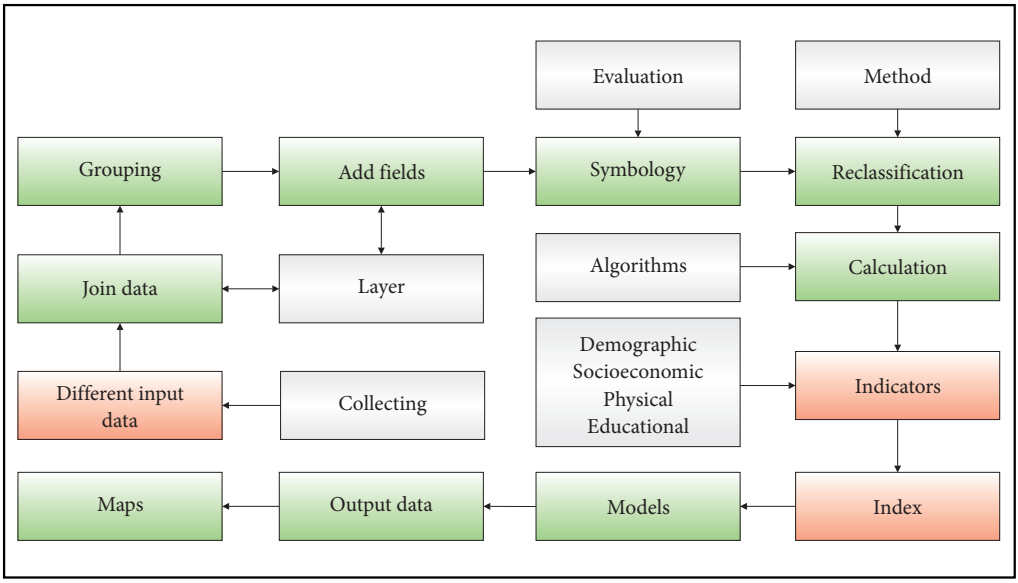

Figure 1: Scheme of the analysis of geographic marginalization applied in the paper.

For each of the 16 statistical data the range of values has been defined and analyzed. Applying the Jenks' optimization method which identifies natural breaks in the data set (Jenks 1967) the values have been grouped in five classes. Each class was given a prudential value from 1 (insufficient) to 5 (excellent).

Since the principal goal of this research is to contribute to methodology the authors have devised four models for calculating the index.

- In the first model all four indicators have been given equal importance: $M_I = (0.25 \times PMI) + (0.25 \times EI) + (0.25 \times DI) + (0.25 \times SEI)$.
- The second model emphasizes the importance of the indicator of physical marginalization (PMI) and the demographic indicator (DI): $M_I = (0.40 \times PMI) + (0.15 \times EI) + (0.30 \times DI) + (0.15 \times SEI)$.
- In the third model the PMI and the DI have switched places with the other two indicators: $M_I = (0.30 \times PMI) + (0.15 \times EI) + (0.40 \times DI) + (0.15 \times SEI)$.
- In the fourth model the PMI and the DI have been given larger but still equal importance: $M_I = (0.40 \times PMI) + (0.10 \times EI) + (0.40 \times DI) + (0.10 \times SEI)$.

The further procedure can be explained by the example of calculating the demographic indicator (DI). It comprises four statistic data: population number (P_n), population density (P_d), index of population ageing (I_{pa}) and share of the young (0–19 year olds) population (P_{0-19}). The demographic indicator was calculated using the following formula:

$$DI = \left[\frac{(P_n \times 0.25) + (P_d \times 0.25) + (I_{pa} \times 0.25) + (P_{0-19} \times 0.25)}{4} \right] - 0.25)$$

In the worst case model the prudential value for a certain settlement is 1 and in the best case model 5. The range is 0.25 to 1.25. For the purposes of easier manipulation, but also to enable an easier and clearer understanding of the output data, the sum was subtracted by 0.25, correcting the range of values from 0 (instead of 0.25) to 1 (instead of 1.25). Therefore, the value of 0 means total marginalization while 1 indicates that there is no marginalization at all. These values have been furthermore analyzed by applying Moran's I – a measure of spatial autocorrelation for examining the correlation among nearby locations or geographic units in space (Barković 2009). Negative values show no spatial autocorrelation, a zero value shows a random spatial pattern, while positive values confirm spatial autocorrelation. The values range from –1 (no spatial correlation or perfect dispersion) to + 1 (complete or perfect correlation).

3 Results

Applying the described methodology the values for all the 40 settlements of the peninsula were calculated just as the index of marginalization (Table 1).

In the case of demographic indicator there are no clear differences regarding the areas of the peninsula (Figure 2). The settlements with the highest values are isolated from each other and the distances between them are pronounced. The settlements with the highest values are mutually divided by extended areas with

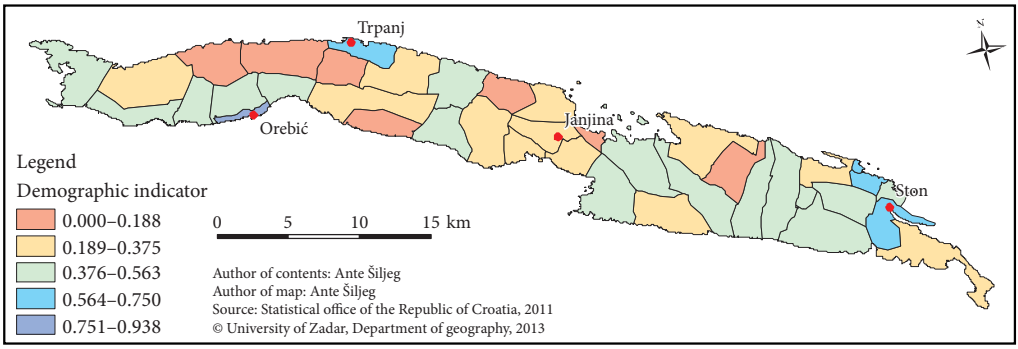

Figure 2: Demographic indicator on Pelješac.

Table 1: Values of the four indicators and the index of marginalization for each of the 40 settlements on Pelješac in 2001.

SETTLEMENT	Indicators				Index of marginalization			
	Demo-graphic	Socio-economic	Physical margin-alization	Educational	Model 1	Model 2	Model 3	Model 4
Boljenovići	0.500	0.438	0.375	0.438	0.438	0.431	0.444	0.438
Brijesta	0.313	0.500	0.563	0.563	0.484	0.478	0.453	0.456
Broce	0.313	0.250	0.438	0.313	0.328	0.353	0.341	0.356
Česvinica	0.500	0.250	0.250	0.375	0.344	0.344	0.369	0.363
Dančanje	0.063	0.563	0.313	0.500	0.359	0.303	0.278	0.256
Donja Banda	0.375	0.563	0.563	0.438	0.484	0.488	0.469	0.475
Donja Vrućica	0.000	0.500	0.438	0.375	0.328	0.306	0.263	0.263
Drače	0.188	0.500	0.688	0.688	0.516	0.509	0.459	0.469
Duba Pelješka	0.000	0.375	0.438	0.750	0.391	0.344	0.300	0.288
Duba Stonska	0.250	0.250	0.375	0.375	0.313	0.319	0.306	0.313
Dubrava	0.563	0.563	0.438	0.625	0.547	0.522	0.534	0.519
Gornja Vrućica	0.188	0.438	0.563	0.250	0.359	0.384	0.347	0.369
Hodilje	0.625	0.313	0.375	0.500	0.453	0.459	0.484	0.481
Janjina	0.375	0.625	0.563	0.563	0.531	0.516	0.497	0.494
Kučište	0.500	0.563	0.813	0.625	0.625	0.653	0.622	0.644
Kuna Pelješka	0.563	0.500	0.563	0.625	0.563	0.563	0.563	0.563
Lovište	0.563	0.563	0.750	0.500	0.594	0.628	0.609	0.631
Luka	0.625	0.438	0.375	0.313	0.438	0.450	0.475	0.475
Mali Ston	0.563	0.313	0.438	0.563	0.469	0.475	0.488	0.488
Metohija	0.563	0.500	0.375	0.500	0.484	0.469	0.488	0.475
Nakovanj	0.250	0.563	0.438	0.750	0.500	0.447	0.428	0.406
Orebić	0.938	0.500	1.000	0.500	0.734	0.831	0.825	0.875
Oskorušno	0.375	0.625	0.563	0.500	0.516	0.506	0.488	0.488
Osobjava	0.125	0.500	0.438	0.250	0.328	0.325	0.294	0.300
Pijavičino	0.313	0.500	0.563	0.500	0.469	0.469	0.444	0.450
Podgorje	0.438	0.500	0.625	0.438	0.500	0.522	0.503	0.519
Podobuče	0.188	0.563	0.813	0.563	0.531	0.550	0.488	0.513
Popova Luka	0.250	0.500	0.563	0.438	0.438	0.441	0.409	0.419
Potomje	0.563	0.625	0.563	0.625	0.594	0.581	0.581	0.575
Putniković	0.438	0.438	0.375	0.625	0.469	0.441	0.447	0.431
Sparagovići	0.438	0.500	0.375	0.313	0.406	0.403	0.409	0.406
Sreser	0.313	0.375	0.625	0.500	0.453	0.475	0.444	0.463
Stanković	0.563	0.563	0.875	0.500	0.625	0.678	0.647	0.681
Ston	0.750	0.313	0.438	0.500	0.500	0.522	0.553	0.556
Tomislavovac	0.313	0.438	0.375	0.500	0.406	0.384	0.378	0.369
Trpanj	0.625	0.438	0.688	0.500	0.563	0.603	0.597	0.619
Trstenik	0.250	0.500	0.625	0.438	0.453	0.466	0.428	0.444
Viganj	0.500	0.500	0.938	0.438	0.594	0.666	0.622	0.669
Zabrđe	0.500	0.500	0.375	0.500	0.469	0.450	0.463	0.450
Žuljana	0.500	0.438	0.688	0.500	0.531	0.566	0.547	0.569

Source: Statistical Office of the Republic of Croatia, 2001a; 2001b; 2001c; 2001d; 2001e; Internet 1

moderate and low values. Such distribution suggests population concentration in Orebić. In the northwestern part of the peninsula the settlement of Trpanj, a traffic junction (a ferry port connecting to the mainland), may be singled out. In the eastern part of the peninsula three settlements stand out.

Regarding the socio-economic indicator Pelješac shows more regular geographic distribution (Figure 3). An almost completely continuous zone of settlements with the highest and high values of the indicator stretches from the northwestern to the southeastern part. However, the southeastern part still differs significantly since it comprises of two zones with lower values especially in the area of Ston.

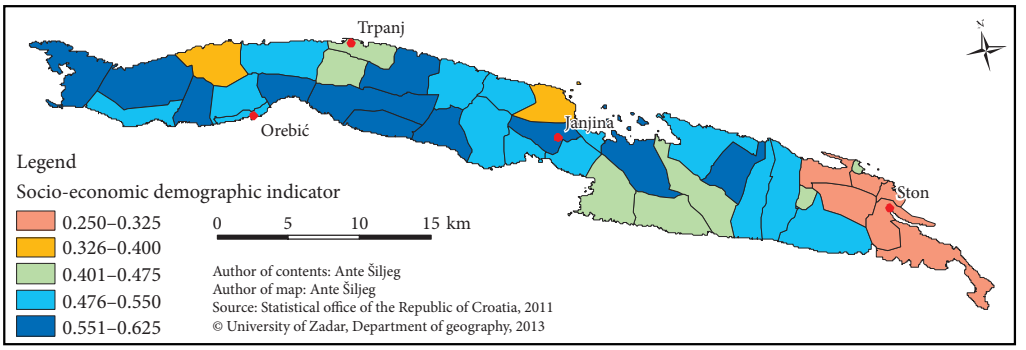

Figure 3: Socio-economic demographic indicator on Pelješac.

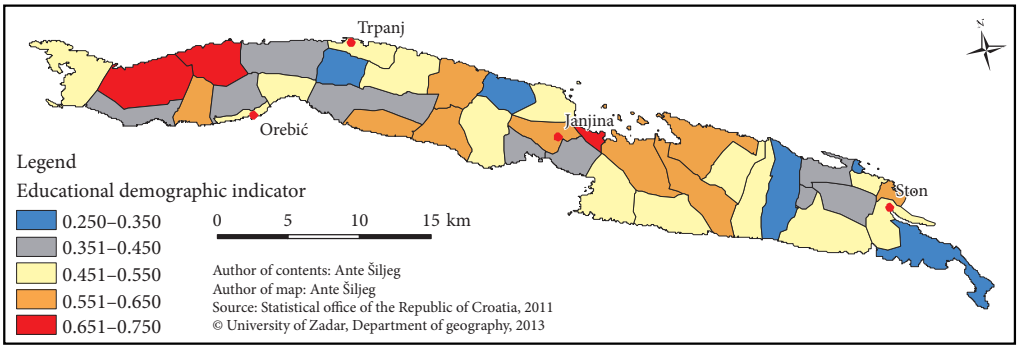

Figure 4: Educational demographic indicator on Pelješac.

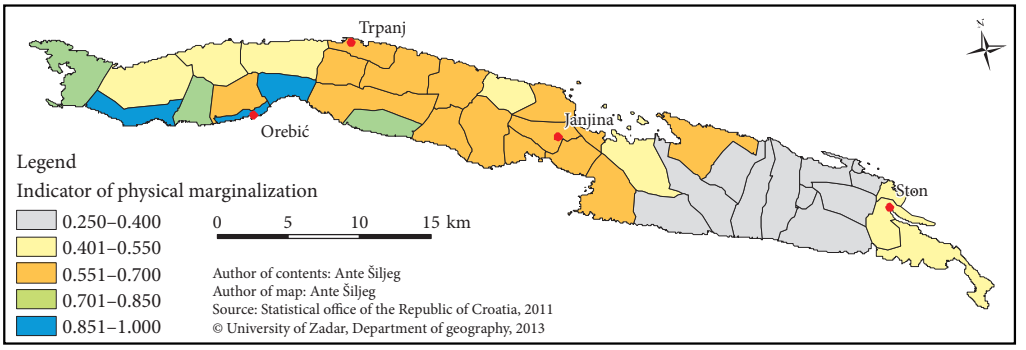

Figure 5: Physical marginalization indicator on Pelješac.

The educational indicator shows random geographic distribution (Figure 4) and does not provide information for drawing any conclusions regarding its spatial characteristics.

Although it seemed that in the case of the indicator of physical marginalization the distribution of values should be geographically equal while moving away from the northwestern part of the peninsula, where the principal settlement of Orebić is situated, this is only partly true (Figure 5). The reason for such situation is distance that influence the cost of daily commuting. Furthermore, reducing of jobs in Dubrovnik and Ploče during the last 25 years and developement of Orebić have also contributed to such a process. The spatial distribution of the indicator is not even due to steep mountainous terrain.

The values of the Moran coefficient range from 0.0711 (Model 3) to 0.1777 (Model 2). All four values (0.1106 Model 4; 0.1677 Model 1) are positive and are slightly beyond zero (Figure 6). The very fact that the four values are not grouped or dispersed shows that the chosen four indicators (demographic, socio-economic, educational and the indicator of physical marginalization) are relevant just as are the statistical data from which they were calculated. On the other hand, the same values show that there is no spatial autocorrelation among the 40 settlements of the peninsula.

4 Discussion

Marginalization is related to peripherality on national or international levels. Peripheral areas (just as the core areas) are not homogeneous. Although the sense of marginalization can be very subjective certain processes can be measured using statistical data.

The indicator of physical marginalization is important since physical limitations in everyday life are strongly felt by the local population (Glamuzina 2009). Therefore, various physical obstacles and mere geographic distances represent an issue in daily human interactions. Due to dispersed population of the Pelješac peninsula and rudimentary developed traffic system the sense of marginality in some settlements

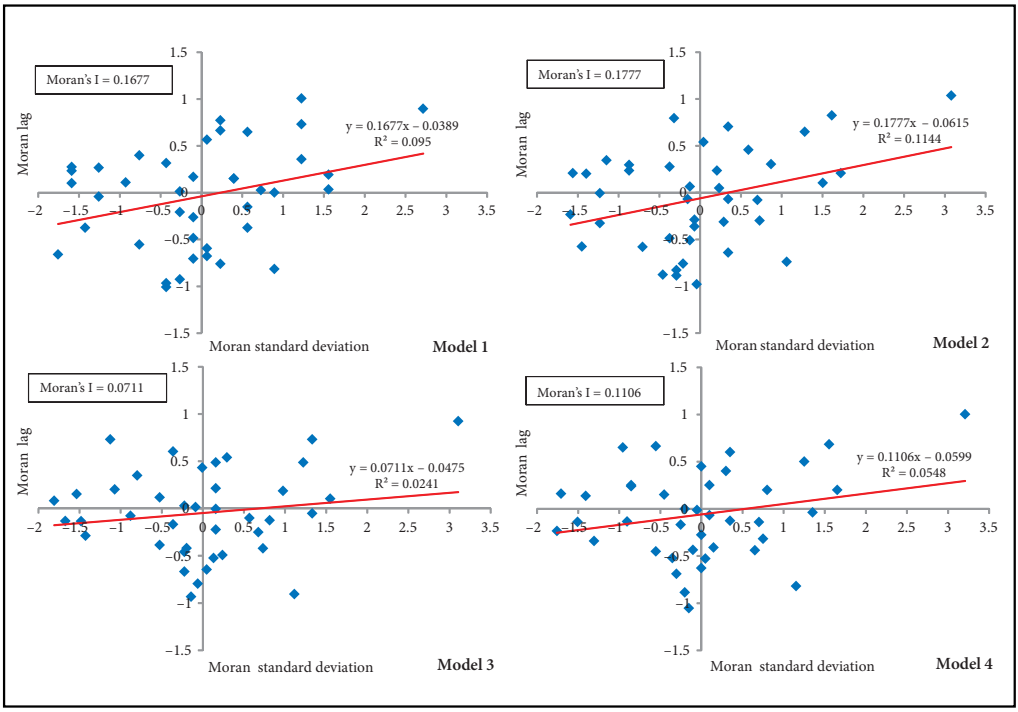

Figure 6: The Moran Coefficient in four scenarios on Pelješac.

is very present. Local population often highlights the problem of their physical limitations in everyday life (Glamuzina 2009).

Education and schooling are often referred as prerequisites for economic, social and overall development. But the role of education is different in the peripheral and underdeveloped areas with impoverished job opportunities. With only 7789 inhabitants dispersed throughout 40 settlements over a relatively small area, the peninsula itself represents a tiny segmented market. Such a situation does not stimulate further development. Pelješac depends on traditional Mediterranean agriculture, primarily the cultivation of grapes and olives. Littoral settlements have developed tourism which is of a seasonal character. Because of this the opportunity for jobs for a highly educated population is small and employment opportunities are much better in urban areas outside of the peninsula. However, a considerable distance from large urban centres of regional or subregional hubs disables daily migrations. That is why the share of highly educated population is very low in the majority of local settlements. The share of the population of the peninsula which is currently enrolled in higher education (22.65%) is twice that of the share of the highly educated population (11.48%). These data cast a light on the problem of the emigration of the highly educated population. In addition, 24 settlements have one-half or more inhabitants with or without an elementary education. Because of this a higher share of educated population does not represent an advantage for any settlement because highly educated population must fit into the existing socio-economic structure. Therefore, socio-economic indicator has been given the same (low) significance as the educational indicator. The pronounced population ageing of some settlements, together with the low proportion of young population, are signs of the process of gentrification. It puts certain settlements in an even more marginal position in comparison with others (Figure 7).

The index of marginalization shows the more subtle differences among the peninsula's settlements. The very range of values – from 0.263 (minimal) to 0.875 (maximal) – shows pronounced differences among the settlements confirming marginalization. Certain settlements constantly show low index values (meaning the extreme marginalization). Such settlements are much easier to find in the central and southeastern areas of Pelješac far from Orebić.

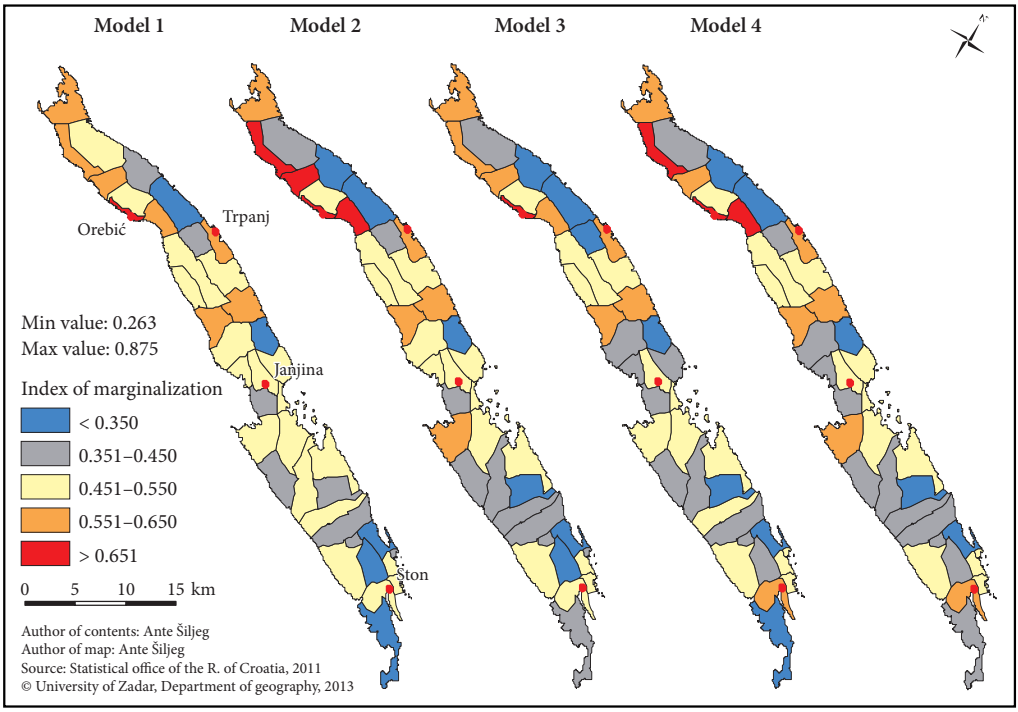

Figure 7: Index of marginalization in the four scenarios on Pelješac.

How to diminish marginalization in case of Pelješac? Can local initiative and entrepreneurship be the solution or a part of the solution? Is economic development the answer to the issues which burden the peninsula? Although the present economic base of Pelješac is narrow (vineyards, olives, tourism, catering, mariculture, a wind farm, a few small construction companies and one salt works) there are possibilities for their expansion. The development of new activities is possible in the case of cattle breeding, beekeeping and mining (construction stone) and investments in certain small industrial enterprises. However, there is a question of positive effects in sense of diminishing or even a reversal of problems of marginalization and peripherality. Distance from the population and economic core of Croatia, situated in the Zagreb region, at the same time represents a distance from the majority of the national market puts Pelješac in an unfavourable position regarding the placement of local products. Tourism can only be a partial solution since it exists during the summer. Therefore, the expansion of the local (and regional) market is temporary with very limited positive effects.

5 Conclusion

A quantitative approach was applied to analyze marginalization and geographic peripherality. This research shows the possibility to obtain relevant conclusions concerning marginalization using relevant statistic data and indicators of the quantitative approach. Quantification of the process of marginalization helps in the comparison of the processes and it offers more objective analysis.

The index of marginalization method as applied in this research shows a high degree of relevancy. Quantitative analysis offers geographers wide possibilities for spatial analysis, especially combined with qualitative approach.

Marginalization is primarily influenced by the position of the settlements in relation to the regional centre, while the position of settlements in relation to the coast is of secondary importance. That is why the models which emphasize the importance of the indicator of physical marginalization may be considered the most relevant for the purpose of this research.

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MEASURING THE IMPACT OF THE RECESSION ON SLOVENIAN STATISTICAL REGIONS AND THEIR ABILITY TO RECOVER

MERJENJE VPLIVA RECESIJE IN SPOSOBNOSTI OKREVANJA SLOVENSKIH STATISTIČNIH REGIJ

Lucija Lapuh

The crisis also reflected in marketing (published with permission).
Kriza je odsevala tudi v oglaševanju (objavljeno z dovoljenjem).

Measuring the impact of the recession on Slovenian statistical regions and their ability to recover

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ABSTRACT: The 2009 global economic crisis also affected the economic development of Slovenia's statistical regions. Its impact can be measured in terms of the intensity of stress, and post-shock development can be measured in terms of the intensity of recovery. The study of regional economic resilience belongs to the concept of evolutionary economic geography and is based on an analysis of selected indicators that define the socioeconomic composition of the regions. In terms of shock impact and intensity of recovery, the regions are divided into four types with ascribed socioeconomic characteristics.

KEY WORDS: economic geography, regional planning, resilience, recession, recovery, statistical regions, Slovenia

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1 Introduction

The recession first affected the economies of developed countries and their regions in 2007 and gradually spread around the entire globe (Lorber 2010), causing researchers and other actors of economic and regional development to focus even more intensely on how the negative impacts of the economic recession can be mitigated or even avoided. The expression »resilience« has become established in international literature, which according to Christopherson, Michie and Tyler (2010) describes a response to a threat by seeking adaptation. Resilience after natural disasters and negative economic impacts (such as recessions) is studied in order to reduce vulnerability and improve society's response to these changes.

Martin (2012) believes that a regional economy's adaptive capacity during a recession depends on what this economy was like before that recession. Some economies subject to disturbances can recover faster than others.

This article establishes how the shock caused by the recession has affected Slovenia's statistical regions, how they are recovering, and how their socioeconomic structure influences both of these aspects.

The goal is to theoretically define regional resilience during the recession using selected statistical indicators and to present a methodology for measuring the impact of shock and the ability to recover. Based on the findings of the study of Slovenia's statistical regions, it is possible to determine which regions are more resilient in responding to external shocks.

The onset of a crisis anywhere around the globe can threaten the entire world's financial system and economy. The adoption of the euro was crucial to the development of financial markets in Europe because it created the world's second-largest financial market (Fettich 2009). The crisis moved from the U.S. to Europe, and shifted from the financial sector to the global economy. The economy does not grow evenly and is characterized by rises and falls. The Slovenian economy is strongly attached to the EU, and consequently its cyclicity positively correlates with EU economic cycles (Lavrač 2008). The period between joining the EU and the onset of the global financial crisis was the most successful for Slovenia in terms of annual economic growth and exports (Lorber 2010). The GDP of the most-developed Central Slovenia Statistical Region was 2.18 times higher than the GDP of the least-developed Mura Statistical Region (Lorber 2011).

2 Regional resilience

According to Swanstrom (2008), the number of published papers on resilience in the Social Science Citation Index (SSCI) saw an annual increase of 400% from 1997 to 2007. Between 1969 and 2007, ecological articles on resilience predominated, whereas after 2007 psychological and psychiatric articles have prevailed (Janseen 2007); articles on recessions and natural disasters are also increasing. According to Christopherson, Michie and Tyler (2010), the concept of resilience has become popular due to an increased sense of (economic, political, and environmental) risk and the perception that globalization has made places and regions more permeable to the effects of what were once believed to be external processes. Economic and environmental crises gradually increase the perceived sense of vulnerability and stimulate the search for new paths to resilience.

This study is closely linked to evolutionary economic geography, which highlights the developmental dimension of the economy. According to the evolutionary approach, resilience is a dynamic process (Martin 2012). Regional economic resilience is defined as the ability of a regional economy to withstand, absorb, or overcome an external economic shock (Economic crisis … 2012; Raco and Street 2012) and to recover from it relatively quickly (Augustine et al. 2013). Regions whose economic growth does not change during recessions are shock-resistant, and regions that do not reach the same level of development as before the shock are non-resilient (Hill, Wial and Wolman 2008). According to Augustine et al. (2013), the majority of regions recover along with the national economy. Effective resilience planning can be observed with communities that are organized in such a way that they suffer minimal consequences in the event of shock (Tobin 1999) and can recover as quickly as possible.

The economic recession of an individual region can be caused by a downturn in the national economy, a downturn in industries that made up an important part of the region's export base, and local events that disrupt economic growth (Augustine et al. 2013). Why do certain regions manage to maintain a high quality of life for their residents whereas others fail (Christopherson, Michie and Tyler 2010)? How does socioeconomic structure influence regions' ability to respond to change and recover from shock?

3 Measuring the impact of the recession on regions

3.1 Bases for measuring regional resilience

Resilience measurements focus on the socioeconomic conditions in the region, the impact of shock, vulnerability, response to shock, adaptive capacity, recovery, and resilience. Maru (2010) claims that it is not easy to measure regional resilience and agrees with Brand and Jax (2007) that resilience is primarily a descriptive concept. Literature analysis shows that related methodology has been developed in parallel with resilience theory.

Outside Slovenia, not only economists but also geographers responded quickly to the economic changes caused by the recession by carrying out research. They conducted studies for various spatial units (international, regional, and local comparisons), and hence these studies differed in terms of research questions, methodology, and indicators included. They calculated a vulnerability intervention index (Naude, McGukkuvray and Russouw 2008), sensitivity index (Martin 2012), and regional resilience (Economic crisis … 2012; Hill, Wial and Wolman 2008; The index … 2011; Briguglio et al. 2008; Graziano 2013; Rizzi and Dallara 2011; Resilience capacity … 2013; Foster 2010). To date, no one has measured resilience in Slovenia, but there have been some geographical studies on the recession and natural hazards (e.g., Lorber 2010, 2011; Kušar 2012; Komac et al. 2013).

Various quantitative methods (e.g., regression, correlation, and discriminant analyses, descriptive statistics, factor analysis, principal component analysis, and cluster analysis) and qualitative methods (e.g., interviews for individual case studies) were used to calculate vulnerability and resilience, and to explain differences in the regional development before, during, and after the recession.

3.2 Measuring the intensity of shock and ability to recover

Based on a literature overview (Naudé, Gillivray and Rossouw 2008; Briguglio et al. 2008; Economic crisis … 2013; The index of economic … 2011), three indicators were selected to measure the intensity of shock and the ability of regions to recover. These three indicators show that the impact of the recession differs in terms of intensity and timeframe. The GDP per capita shows changes in the economy, whereas the registered unemployment rate and the gross income tax base show changes in society caused by the recession. The main indicator of an economic downturn is the GDP, which is the sum of gross value added on the basic prices of all industries and the net tax on products (SI-STAT 2013). The impact of the recession on the gross income tax base, which is an indicator that shows economic development, can be observed in 2009. It provides information on purchasing power because it shows the extent of funds that are actually available to people (Pečar 2008). The delays in publishing these data are also worth mentioning in this regard. The impact on the registered unemployment rate (measured by the statistical region of one's place of residence), which is the percentage of registered unemployed people among employed people recorded by the place of residence of both (SI-STAT 2013), is the one that is most delayed; after the recession, Slovenia has not yet experienced a drop in the registered unemployment rate, which was the highest in 2013. Recovery or a reduction in the number of employees during extraordinary events such as recessions takes place later than the recovery of the GDP. A typical delay can be observed in both the increase in the number of the unemployed and the return to a lower rate. It has been shown that an area that preserves the initial GDP rate and simultaneously experiences a rapid decrease in the employment rate cannot be perceived as resilient by the local population (Economic Crisis … 2013).

Shock can be calculated for each of the three indicators described above (data available on the SI-STAT web portal of the Slovenian Statistical Office or at the Slovenian Institute for Macroeconomic Analyses and Development, UMAR) using the following formula (Foster 2010):

$$\text{Shock} = \frac{(T_0 - T_{-1})}{(T_{-1} \times 100)}$$

where T_0 is the year in which the greatest downturn due to shock was recorded, and T_{-1} is the year before signs of the recession began to show. Slovenian data are used to check when the impact of the recession was the greatest for each indicator separately. The lower the calculated value of the intensity of shock, the more the region is subjected to shock.

Recovery can be calculated using the following formula:

$$\text{Recovery} = \frac{(T_0 - T_{+2})}{(T_{+2} \times 100)}$$

where T_0 is the year when the greatest downturn due to shock was recorded, and T_{+2} is the year of recovery or the year that the last data available refer to. The lower the value of the calculated intensity of recovery, the better the region has recovered.

For all of the indicators above, the year before the changes occurred is 2008 (T_{-1}), and the year of shock/recession is 2009 (T_0). The year of recovery varies (e.g., T_{+2} = 2011, T_{+4} = 2013). It is evident from the quarterly GDP per capita data that Slovenian GDP peaked in 2008, which is why this year was used as the base year (T_{-1}); Slovenia hit the bottom the following year, and so 2009 was used as T_0. According to the Slovenian Statistical Office (Podnar 2014), after eight consecutive drops in the GDP, growth was again recorded in the last quarter of 2013. Based on the data available, 2011 was used as the year of recovery in terms of GDP per capita (intermediate phase) because after that it again fell by € 437.8 in 2012 (SI-STAT … 2013). This is a case when there is some recovery, but that is again followed by an economic downturn, and one cannot yet speak of the end of the recession (Podnar 2014).

With the indicator registered unemployment rate, a minus sign is added in the calculation because this indicator, unlike the other two, shows the opposite value (the greater the unemployment, the worse the region): it represents a negative phenomenon because lower unemployment is more favorable for the region. There has been no recovery in unemployment yet and therefore only the shock can be calculated. The highest unemployment rate after the recession was recorded in 2013. In calculating the recovery for the gross income tax base, the last available data (i.e., for 2011) are used.

The value of shock was calculated for the GDP per capita, registered unemployment rate, and gross income tax base. Based on these values, regions are divided into four equally large classes through the calculation of quartiles (Sagadin 2003), and every class is assigned scores (Nared 2002) ranging from –2 to + 2. Three regions with the lowest values (i.e., the strongest impact of shock) are scored + 2, three regions with strong shock are scored 1, regions with moderate shock are scored –1, and regions with the highest values (i.e., the weakest shock) are scored –2. The sum of the scores of all the variables for an individual statistical region represents the total value of shock. The maximum value for an individual region is twice the number of indicators: if three indicators are used, the region can achieve a maximum score of 6. The higher the value calculated, the greater impact of shock on the region.

The same procedure was used to calculate recovery, in which a higher value of the sum implies that the region has recovered better.

In terms of the intensity of shock and ability to recover, the statistical regions were then divided into four groups according to the number of scores achieved.

Table 1: Regions divided by the intensity of shock and recovery for individual indicator

Quartile	Shock	Recovery	Score
Quartile 1	Strongest	Best	2
Quartile 2	Strong	Good	1
Quartile 3	Moderate	Poor	–1
Quartile 4	Weakest	Poorest	–2

In order to determine the characteristics of all four types of regions, the following indicators – which best define the rate of economic development, specialization, export orientation, and social structure of regions – were selected based on the overview of literature on resilience (The Index … 2011; Economic crisis … 2013; Resilience capacity … 2013; Naudé, Gillivray and Rossouw 2008; Marrocu and Paci 2012; Vaarst Andersen and Lorenzen 2005; Boschma and Fritsch 2009; Creative Industries … 2011; Hill, Wial and Wolman 2008).

The values of individual indicators were obtained directly from the statistical data and were adjusted to 1,000 inhabitants. This makes the data comparable between statistical regions. The data were also used to calculate the share or ratio of specialization (Vrišer 1997), which shows the extent of homogeneous or heterogeneous structure of industry in a specific place in relation to the national average. It is estimated

Table 2: Indicators defining the socioeconomic structure of regions (SI-STAT . . . 2013; Statistični register . . . 2012; Pečar 2014.).

- Number of businesses per 1,000 inhabitants
- Number of workers per business
- Gross investment per capita [EUR]
- Specialization ratio [%]
- Regional gross value added on basic prices by industry (processing industries, construction, trade, accommodation and food service activities, and transport) [Mio EUR]
- Number of R&D employees among all employees
- Share of construction employees among all employees [%]
- Share of inhabitants with a creative profession among all employees by place of residence [%]
- Number of employees in creative activities by place of residence among all employees by place of residence [employed]
- Share of net revenues from sales on international markets in total revenues [%]
- Aging index
- Share of job vacancies [%]
- Share of employed people in the entire population by place of residence [%]
- Labor migration index
- University graduates (undergraduate) by statistical region of one's place of residence per 1,000 inhabitants
- Natural change of population: rate of natural increase per 1,000 inhabitants
- Net migration rate per 1,000 inhabitants
- Net internal migration rate (between statistical regions) per 1,000 inhabitants
- Number of people over 15 years old with no education or that did not finish primary school per 1,000 inhabitants
- Number of people over 15 years old with a university degree (first, second, or third cycle) per 1,000 inhabitants

by individual industries, in which a regional and national employee structure by industry is first worked out and then the positive differences of the regional industry shares that exceed the national (Slovenian) average are added up. The sum of positive surpluses is then divided by 100 (Müller 1976).

An average of every indicator described above was calculated for all four groups of regions (divided by shock and recovery). This makes it possible to determine what kind of socioeconomic structure a region should have in order for the shock to have a smaller impact on it and for the region to be able to recover faster and more intensely.

Data for 2011 are included in the study due to accessibility; the only exception is the gross value added on basic prices by industry, for which data for 2008 (the state before the impact of the recession) are used for comparison.

4 Results and discussion

Based on the GDP per capita data, Table 3 shows that the Mura Statistical Region was the most resilient to shock. Its GDP was affected the least by the recession (it recorded the smallest shock) compared to other statistical regions, which was also the result of the fact that it already had the lowest GDP per capita before the recession. It was followed by the Lower Sava and Coastal–Karst statistical regions. In terms of the GDP per capita, the shock was the strongest in the Upper Carniola, Carinthia, and Southeast Slovenia statistical regions. This is shown in figure 1, which demonstrates how strongly the recession affected individual statistical regions and how they recovered. Based on the calculated values of the intensity of shock and recovery of the GDP shown, it can be concluded that during the period studied only the Mura Statistical Region returned to the (already low) state before the recession. Other regions are lagging behind in their recovery.

Recovery has not yet been observed in relation to registered unemployment rate as an indicator; it continues to be extremely high and therefore only the shock can be calculated. Unemployment data show that the rate was the highest in 2013, which is why this year was used to calculate the shock in relation to unemployment.

In terms of the registered unemployment rate (2008–2013), the recession had the strongest impact on the Central Slovenia, Inner Carniola–Karst, and Gorizia statistical regions, whereas the weakest shock was recorded in the Mura, Drava, and Savinja statistical regions. In the Mura Statistical Region, the unemployment rate was the highest even before the financial crisis and so the reduction was not that substantial (the lowest value of shock); however, the absolute unemployment rate is still higher than in other statistical regions. Regions and countries deal with the consequences of recessions long after they are officially over.

Table 3: Calculated shock and recovery for gross GDP per capita (SI-STAT . . . 2013).

		T_{-1}	T_0	T_{+2}				
	Statistical region	GDP 2008	GDP 2009	GDP 2011	Shock (08–09)	Shock, GDP scores	Recovery (09–11)	Recovery, GDP scores
	SLOVENIA	18420	17415	17620	–5.4560261		–1.16	
1	Mura	11909	11463	11929	–3.7450668	–2	–3.91	2
2	Drava	15473	14574	14696	–5.8101209	1	–0.83	–1
3	Carinthia	14288	13085	13640	–8.4196529	2	–4.07	2
4	Savinja	16479	15513	16156	–5.8620062	1	–3.98	2
5	Sava	12291	11614	11800	–5.5080954	–1	–1.58	1
6	Lower Sava	15579	14940	15061	–4.1016753	–2	–0.80	–1
7	Southeast Slovenia	17478	16091	16294	–7.9356906	2	–1.25	1
8	Central Slovenia	25942	24780	24695	–4.4792229	–1	0.34	–1
9	Upper Carniola	15733	14317	14764	–9.0001907	2	–3.03	1
10	Inner Carniola–Karst	13277	12635	12498	–4.8354297	–1	1.10	–2
11	Gorizia	17633	16480	16354	–6.538876	1	0.77	–2
12	Coastal–Karst	19842	18964	18838	–4.4249572	–2	0.67	–2

The higher the GDP score, the greater the intensity of shock (column 7) and the intensity of the region's recovery (last column).

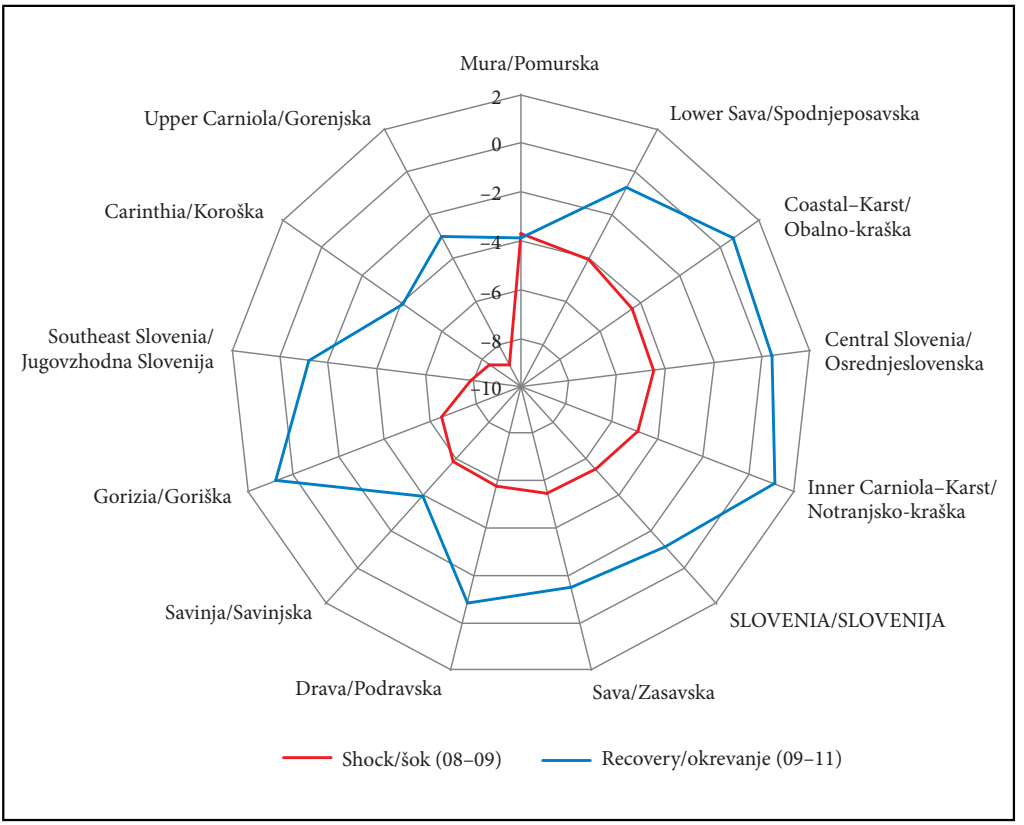

Figure 1: Value of shock and intensity of recovery of the gross value added calculated for Slovenian statistical regions (SI-STAT . . . 2013).

The gross income tax base (EUR) experienced the greatest decrease in the Central Slovenia, Upper Carniola, and Drava statistical regions, and the smallest in the Mura, Lower Sava, and Inner Carniola–Karst statistical regions.

Table 4 shows that based on the shock and recovery calculated, the highest scores were achieved by the Mura and Lower Sava statistical regions. This means that they were the least affected by the recession. They are followed by the Coastal–Karst Statistical Region. The shock affected the Upper Carniola, Gorizia, and Southeast Slovenia statistical regions the most.

Standing somewhere in the middle are the remaining regions: the Carinthia, Savinja, and Central Slovenia statistical regions.

Table 4: Shock calculated for Slovenian statistical regions.

Statistical region	Shock, GDP scores	Shock, unemployment scores	Shock, income tax scores	Shock, total scores
SLOVENIA				
Mura	–2	–2	–2	–6
Drava	1	–2	2	1
Carinthia	2	–1	–1	0
Savinja	1	–2	1	0
Sava	–1	–1	–1	–3
Lower Sava	–2	–1	–2	–5
Southeast Slovenia	2	1	1	4
Central Slovenia	–1	2	2	3
Upper Carniola	2	1	2	5
Inner Carniola–Karst	–1	2	–2	–1
Gorizia	1	2	1	4
Coastal–Karst	–2	1	–1	–2

The higher the score, the greater the intensity of shock. The sum of scores of the three indicators selected is provided in the last column.

Recovery can only be calculated for two indicators: GDP per capita (EUR) and gross income tax base per capita (EUR) because there has not yet been any recovery in relation to the (annual) registered unemployment rate by statistical region of one's place of residence. The maximum score is 4 (because two variables are included). The results show that the Mura and Carnithia statistical regions recovered the best, followed by the Savinja and Southeast Slovenia statistical regions. The Inner Carniola–Karst and Coastal–Karst statistical regions recovered the least, followed by the Gorizia and Central Slovenia statistical regions.

Table 5: Recovery calculated for Slovenian statistical regions

Statistical region	Recovery, GDP scores	Recovery, income tax scores	Recovery, total scores
SLOVENIA			
Mura	2	2	4
Drava	–1	–1	–2
Carinthia	2	2	4
Savinja	2	1	3
Sava	1	1	2
Lower Sava	–1	–1	–2
Southeast Slovenia	1	2	3
Central Slovenia	–1	–2	–3
Upper Carniola	1	1	2
Inner Carniola–Karst	–2	–2	–4
Gorizia	–2	–1	–3
Coastal–Karst	–2	–2	–4

The higher the score, the greater the intensity of recovery. The sum of the scores of the indicators selected is provided in the last column.

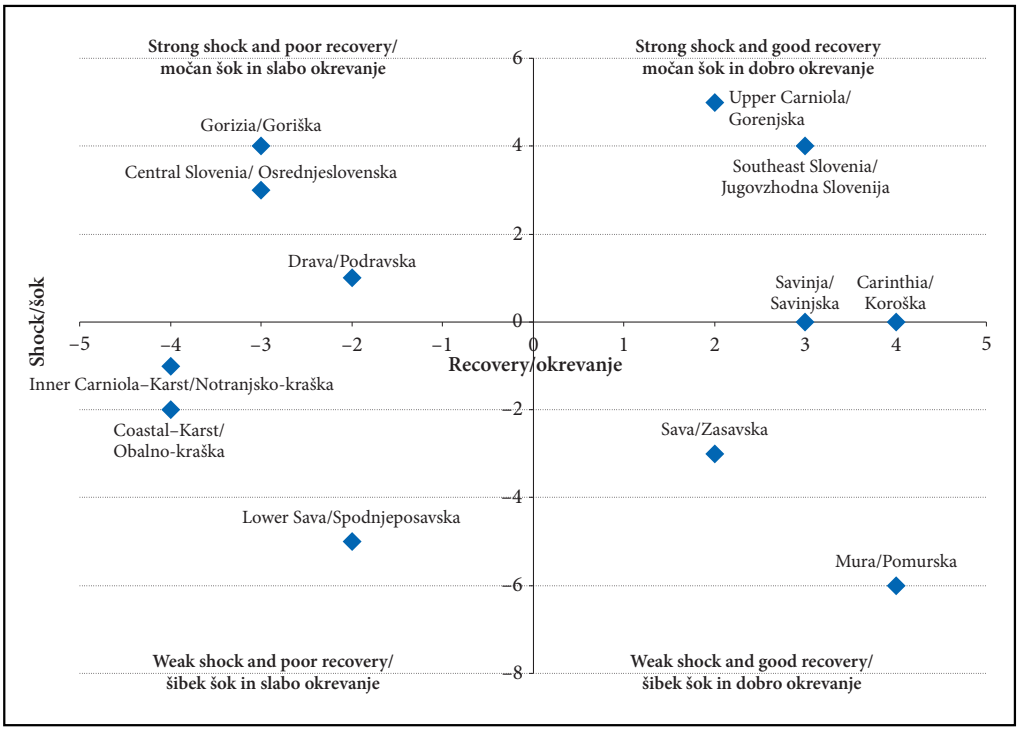

Figure 2: Slovenian statistical regions by intensity of shock and intensity of recovery.

Resilience depends on the shock suffered by an individual region and on the level of recovery that this region has achieved. Figure 2 shows that the Mura Statistical Region experienced a weak impact of shock (low total score) and good recovery, which means that this region is the most resilient. The Gorizia and Central Slovenia statistical regions are the least resilient.

Regions that experienced a strong impact of shock and good recovery typically have the highest export rate, a high rate of natural increase, and a high rate of inhabitants moving to other statistical regions because they have a negative internal migration rate per 1,000 people. In 2008, more than half of the gross added value of regions that experienced a strong shock was created in activities that experienced the greatest downturn due to the recession: construction, processing activities, and trade, accommodation and food service activities, and transport. Because these activities experienced the greatest decline (35% in the Central Slovenia Statistical Region by 2011), the regions that depended the most on them also experienced the greatest economic downturn and no recovery has yet been recorded. In this type of region, the share of construction employees among all employees was the lowest in 2011, when many employees were made redundant.

Compared to other types of regions, regions with a strong impact of shock and poor recovery typically have the largest number of businesses per 1,000 inhabitants, the largest number of job vacancies, the highest share of R&D employees, the highest share of people with a university degree and at the same time the lowest share of people with no education or that did not finish primary school, the highest share of inhabitants with a creative profession, and at the same time the smallest number of employees in creative activities by place of residence. More than half of economic activities in the Central Slovenian Statistical Region, which belongs to this group of regions, is based on activities that experienced the greatest downturn during the recession.

Compared to the other three groups of regions, regions with a weak impact of shock and good recovery typically have the smallest number of businesses per 1,000 inhabitants, the smallest share of gross investment per capita, the smallest share of employed people, a low share of R&D employees, and an above-average

number of employees in creative activities by place of residence. Population aging and moving to other statistical regions and other countries (a negative rate on natural increase and a negative net migration rate) are also typical. The population's educational structure is not very promising (a lower number of college graduates than elsewhere).

Regions with a weak impact of shock but poor recovery typically have a fairly high specialization ratio (with predominantly small enterprises), a high export rate, high shares of gross investment per capita, and a low share of R&D employees. This group of regions has an above-average share of inhabitants that did not finish primary school. Employed people typically work in the region where they reside, and the net migration rate and the internal migration rate (between statistical regions) are above average, meaning that people move into these regions.

5 Conclusion

This study discussed resilience and presented a methodology for calculating the intensity of shock and intensity of recovery. Three indicators were selected based on a literature overview that best define the impact of the recession (i.e., gross domestic product per capita, registered unemployment rate, and gross income tax base) and were used to calculate the impact of shock and the intensity of partial recovery of Slovenian statistical regions (full recovery has not been achieved yet). Based on these results, the regions were divided into four types. The Upper Carniola and Southeast Slovenia statistical regions experienced a strong shock and recovered well, whereas the Gorizia, Central Slovenia, and Drava statistical regions also experienced a strong shock, but their recovery was poor. The Mura and Sava statistical regions managed to recover well after experiencing a weak shock, whereas the Lower Sava, Coastal–Karst, and Inner Carniola–Karst statistical regions recovered poorly. The recession had a smaller impact on regions that already had low economic growth and a high unemployment rate prior to the financial crisis.

The pre-crisis socioeconomic characteristics of regions influence the intensity of shock and intensity of recovery of individual types of regions. Based on an analysis of the socioeconomic indicators defined, it was determined that a heterogeneous economic structure is more favorable during recessions because in this case the economy depends not only on individual activities. The situation was also more favorable in regions where small enterprises predominate. In contrast to the findings in literature published to date, regions with a weak shock impact have a poorly educated workforce and the smallest share of R&D employees. The highest shares of inhabitants working in a creative profession are typical of regions that experienced a weak shock and recovered well, which also corresponds with the finding by Kozina (2013), who reports that a large concentration of creative individuals contributes to greater economic growth.

Based on a calculation of the impact of shock and the intensity of recovery, a methodology for calculating resilience should be developed and policy recommendations for providing this methodology should be prepared. More detailed analyses of how the economic structure affects regional resilience will be needed in the future because it is only by knowing all the facts connected with regional resilience to recessions that regions can appropriately respond to them and avoid them or survive their impact to the best possible extent.

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Merjenje vpliva recesije in sposobnosti okrevanja slovenskih statističnih regij

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IZVLEČEK: Svetovna gospodarska kriza je leta 2009 vplivala na gospodarski razvoj slovenskih statističnih regij. Njen vpliv merimo z jakostjo šoka, razvoj po šoku pa z jakostjo okrevanja. Raziskava gospodarske prožnosti regij sodi pod koncept evolucijske ekonomske geografije in temelji na analizi izbranih kazalnikov, ki opredeljujejo družbeno-gospodarsko sestavo regij. Glede na vpliv šoka in jakost okrevanja so regije razdeljene na štiri tipe, ki so jim pripisane družbeno-gospodarske lastnosti.

KLJUČNE BESEDE: ekonomska geografija, regionalno planiranje, prožnost, recesija, okrevanje, statistične regije, Slovenija

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1 Uvod

Recesija, ki je leta 2007 oziroma leto kasneje sprva vplivala na gospodarstva razvitih držav in njihovih regij, se je nato razširila po celem svetu (Lorber 2010) in povzročila, da so se raziskovalci in ostali akterji gospodarskega in regionalnega razvoja še intenzivneje začeli ukvarjati z vprašanjem, kako te negativne vplive gospodarskega nazadovanja ublažiti oziroma se jim celo izogniti. V svetovni literaturi se je uveljavil termin prožnosti, ki po mnenju Christophersona, Michie in Tylerja (2010) opisuje odgovor na povzročeno nevarnost z iskanjem prilagoditve. Prožnost po naravnih nesrečah in negativnih gospodarskih vplivih (kot je recesija) raziskujemo z namenom zmanjšanja ranljivosti in izboljšanja odziva družbe na te spremembe.

Martin (2012) meni, da je sposobnost prilagajanja regionalnega gospodarstva v času recesije odvisna od lastnosti gospodarstva pred recesijo. Nekatera gospodarstva, ki so podvržena motnjam, so sposobna okrevati hitreje kot druga.

Namen tega članka je ugotoviti, kako je šok zaradi recesije vplival na slovenske statistične regije, kako okrevajo in kako družbeno-gospodarska sestava regij na oboje vpliva.

Cilj prispevka je poleg teoretične opredelitve prožnosti regij v času recesije s pomočjo izbranih statističnih kazalnikov predstaviti metodologijo, s katero lahko merimo vpliv šoka in sposobnost okrevanja.

Na podlagi rezultatov raziskave za slovenske statistične regije smo ugotovili, katere regije so prožnejše na zunanji šok.

Izbruh krize kjerkoli na svetu lahko ogrozi finančni sistem in gospodarstvo celega sveta.

Kriza se je iz ZDA preselila v Evropo in iz finančnega sektorja v svetovno gospodarstvo. Za razvoj finančnih trgov v Evropi je bil izrednega pomena sprejem evra, ki je ustvaril drugi največji finančni trg na svetu (Fettich 2009). Gospodarstvo ne raste enakomerno, saj je zaznamovano z vzponi in padci. Slovensko gospodarstvo je močno navezano na EU, posledično je cikličnost slovenskega gospodarstva v pozitivni korelaciji z gospodarskimi cikli Evropske unije (Lavrač 2008). Za Slovenijo je bilo najbolj uspešno obdobje po priključitvi v Evropsko unijo do začetka svetovne finančne krize glede na letno gospodarsko rast in izvoz (Lorber 2010). BDP najrazvitejše Osrednjeslovenske statistične regije je bil 2,18 krat višji kot BDP najmanj razvite Pomurske statistične regije (Lorber 2011).

2 Prožnost regij

Swanstrom (2008) je ugotovil, da je število člankov o prožnosti v Social science citation index (SSCI) od 1997 do 2007 naraščalo za 400 odstotkov letno. Med leti 1969 in 2007 so prevladovali ekološki članki o prožnosti, po letu 2007 pa prevladujejo psihološki in psihiatrični članki (Janseen 2007), v porastu pa so tudi članki s področja recesije in naravnih nesreč. Christopherson, Michie in Tyler (2010) ugotavljajo, da je koncept prožnosti postal priljubljen zaradi povišane občutljivosti na zaznavanje tveganja (tako gospodarskega kot političnega in okoljskega) ter prepričanja, da globalizacija vpliva na večjo prepustnost vplivov, ki so nekoč veljali za zunanje. Gospodarska in okoljska kriza stopnjujeta zaznan občutek ranljivosti in spodbujata k iskanju novih poti, ki vodijo do prožnosti.

Raziskava je tesno povezana z evolucijsko ekonomsko geografijo, ki poudarja razvojno razsežnost gospodarstva. Evolucijski pristop zagovarja, da je prožnost dinamičen proces (Martin 2012). Regionalna gospodarska prožnost je sposobnost gospodarstev regij, da se uprejo recesiji oziroma jo premagajo ali absorbirajo šok (Economic crisis … 2012; Raco in Street 2012) ter da v relativno kratkem času okrevajo po recesiji (Augustine s sod. 2013). Regije, katerih gospodarska rast se ob recesiji ne spremeni, so odporne na gospodarski šok *(shock-resistant*). Regije, ki po šoku ne dosežejo stopnje razvoja pred šokom, pa so neprožne (ang. *non-resilient*; Hill, Wial, Wolman 2008). Augustine s sodelavci (2013) ugotavlja, da ko okreva nacionalno gospodarstvo, okreva tudi večina regij. Učinkovito načrtovanje prožnosti imajo skupnosti, ki so organizirane tako, da so ob šoku posledice minimalne (Tobin 1999) in da so v čim krajšem času sposobne okrevati.

Do gospodarskega nazadovanja posamezne regije lahko pride zaradi nazadovanja nacionalnega gospodarstva, nazadovanja v dejavnostih, ki so za regijo predstavljale pomemben del izvoza in zaradi krajevnih dogodkov, ki so prekinili gospodarsko rast (Augustine s sod. 2013). Christopherson, Michie in Tyler (2010) so se spraševali zakaj so nekatere regije sposobne ohraniti visoko kakovost življenja za svoje prebivalce, medtem ko druge niso? V članku bomo ugotovili, kakšna družbeno-gospodarska sestava vpliva na sposobnost regij, da se odzovejo na spremembo in se opomorejo od nje.

3 Merjenje vpliva recesije na regije

3.1 Izhodišča merjenja prožnosti regij

Pri merjenju prožnosti nas zanimajo: družbeno-gospodarske razmere v regiji, vpliv šoka, ranljivost (ang. *vulnerability*), odgovor na šok (ang. *response*), prilagoditvena sposobnost (ang. *adaptive capacity*), okrevanje (ang. *recovery*) in prožnost (ang. *resilience*). Maru (2010) ugotavlja, da merjenje prožnosti regij ni enostavna naloga in se strinja z Brandom in Jaxem (2007), da je prožnost predvsem opisni koncept, čeprav so poleg teorije prožnosti običajno razvijali tudi s tem povezano metodologijo.

V tujini so se poleg ekonomistov tudi geografi z raziskavami hitro odzvali na gospodarske spremembe, ki jih je prinesla recesija. Raziskave so bile narejene za različne prostorske enote: meddržavna, regionalna in lokalna; zato se med njimi posledično razlikujejo tudi raziskovalno vprašanje, metodologija proučevanja in vključeni kazalniki. Računali so indeks ranljivosti (ang. *vulnerability intervention index*) (Naude, McGukkuvray in Russouw 2008), odpornost in občutljivost (ang. *sensitivity index*) (Martin 2012) ter prožnost regij (Economic crisis … 2012; Hill, Wial in Wolman 2008; The indeks … 2011; Briguglio s sod. 2008; Graziano 2013; Rizzi in Dallara 2011; Resilience capacity index 2013; Foster 2010). V Sloveniji še ni nihče računal prožnosti, na področju geografije so o recesiji in naravnih nesrečah pisali Lorberjeva (2010, 2011), Kušar (2012) in Komac s sodelavci (2013).

Pri izračunu ranljivosti, odpornosti in prožnosti so za pojasnjevanje razlik v regionalnem razvoju pred, med in po recesiji uporabljali naslednje kvantitativne (regresijsko, korelacijsko, diskriminančno analizo, opisne statistike, faktorsko analizo, metodo glavnih komponent, metodo razvrščanja v skupine) in kvalitativne metode (npr. intervju za študije primera).

3.2 Merjenje jakosti šoka in sposobnosti okrevanja

Na podlagi analize literature (Naudé, Gillivray in Rossouw 2008; Briguglio s sod. 2008; Economic crisis … 2013; The Index of Economic Resilience 2011) smo opredelili tri kazalnike, ki merijo jakost šoka in sposobnost okrevanja regij. Vpliv recesije se na teh treh izbranih kazalnikih kaže v različni intenziteti in časovnem zamiku. Medtem ko bruto družbeni proizvod (BDP) na prebivalca kaže spremembe zaradi recesije v gospodarstvu, kažeta stopnja registrirane brezposelnosti in bruto osnova za dohodnino spremembe v družbi. Pokazatelj gospodarskega nazadovanja je BDP, ki je enak vsoti bruto dodane vrednosti v osnovnih cenah vseh dejavnosti in neto davkov na proizvode (SI-STAT 2013). Vpliv recesije na bruto osnovo za dohodnino na prebivalca je viden leta 2009. S tem kazalnikom ugotavljamo ekonomsko razvitost, saj podaja informacijo o kupni moči prebivalstva in prikazuje, s kolikšnimi finančnimi sredstvi prebivalstvo dejansko razpolaga (Pečar 2008). Omembe vreden je tudi zaostanek pri objavljanju tega podatka. Stopnja registrirane brezposelnosti merjena po statističnih regijah prebivališča in prikazana glede na stalno prebivališče delovno aktivnih prebivalcev in registriranih brezposelnih oseb (SI-STAT 2013), je vidna najkasneje. Tako Slovenija po recesiji še ni doživela znižanja. Območje, kjer se je ohranila prvotna stopnja BDP-ja in ki je hkrati imelo hitro znižanje zaposlenosti, z vidika lokalnega prebivalstva ne moremo oceniti kot prožno (Economic Crisis … 2013).

Za vsakega od treh zgoraj omenjenih kazalnikov (SI-STAT … 2013; Pečar 2014) izračunamo šok z enačbo:

$$\text{šok} = \frac{(T_0 - T_{-1})}{(T_{-1} \times 100)}$$

kjer je T_0 leto, ko je bilo zaradi šoka zaznano največje nazadovanje, T_{-1} pa leto, preden so se začeli kazati znaki recesije. Za vsak kazalnik posebej smo na ravni podatkov za Slovenijo preverili, kdaj je bil vpliv recesije največji. Nižja kot je izračunana jakost šoka, bolj je regija podvržena šoku. Okrevanje smo izračunali z enačbo:

$$\text{okrevanje} = \frac{(T_0 - T_{+2})}{(T_{+2} \times 100)}$$

kjer je T_0 leto, ko je zaradi šoka prišlo do največjega nazadovanja, T_{+2} pa leto okrevanja oziroma zadnji dostopni podatek. Za vse zgoraj opisane kazalnike smo vzeli za izhodišče leto 2008 (T_{-1}), leto šoka/recesije 2009 (T_0), leto okrevanja od recesije (npr: $T_{+2} = 2011$, $T_{+4} = 2013$) pa se razlikuje od kazalnika do kazalnika.

Tako je bil na ravni Slovenije BDP na prebivalca najvišji leta 2008, zato smo to leto vzeli za izhodišče (T_{-1}), naslednje leto 2009 pa je bil najnižji (v indeksu označeno s T_0). BDP je po osmih zaporednih padcih ponovno narasel v zadnjem četrtletju leta 2013 (Podnar 2014). Glede na kazalnik BDP na prebivalca smo vzeli 2011 kot leto okrevanja (vmesna faza), saj je BDP na prebivalca leta 2012 ponovno padel za 437,8 € (SI-STAT … 2013) in še ne moremo govoriti o koncu recesije (Podnar 2014).

Pri kazalniku stopnja registrirane brezposelnosti smo dodali negativen predznak, saj je obraten od ostalih (nižja brezposelnost je za regijo ugodnejša). Stopnja brezposelnosti je bila po recesiji najvišja leta 2013. Do okrevanja brezposelnosti še ni prišlo, zato smo izračunali le šok.

Pri izračunu okrevanja za bruto osnovo za dohodnino smo uporabili zadnji dostopni podatek, ki je za leto 2011.

Regije smo razdelili glede na kvartile izračunanih vrednosti (Sagadin 2003), razredom pa smo pripisali vrednost od –2 do 2 (Nared 2002). Regijam z najnižjimi vrednostmi, ki pomenijo najmočnejši vpliv šoka, smo pripisali 2 točki (preglednica 1). Seštevek vseh spremenljivk za posamezno statistično regijo pa je skupna vrednost šoka. Najvišja vrednost za posamezno regijo je dvakratnik števila kazalnikov, višja skupna vrednost odseva večji vpliv šoka na regijo. Enako smo izračunali tudi okrevanje, pri čemer višja vrednost skupnega seštevka pove, da je regije bolj okrevala. Regije smo nato glede na jakost šoka in sposobnost okrevanja razdelili v štiri skupine.

Preglednica 1: Regije glede na jakost šoka in intenzivnost okrevanja za posamezen kazalnik

kvartil	šok	okrevanje	točke
1 kvartil	najmočnejši šok	najboljše okrevanje	2
2 kvartil	močan šok	dobro okrevanje	1
3 kvartil	blag šok	slabo okrevanje	–1
4 kvartil	najblažji šok	najslabše okrevanje	–2

Družbeno-gospodarske lastnosti štirih tipov regij smo opredelili z naslednjimi kazalniki, ki opredeljujejo stopnjo gospodarske razvitosti, usmerjenost specializacije, izvozno usmerjenost in družbeno sestavo regij (The index … 2011; Economic crisis … 2013; Resilience capacity … 2013; Naudé, Gillivray in Rossouw 2008; Marrocu in Paci 2012; Vaarst Andersen in Lorenzen 2005; Boschma in Fritsch 2009; Creative industries … 2011; Hill, Wial in Wolman 2008).

Preglednica 2: Kazalniki, ki opredeljujejo družbeno-gospodarsko sestavo regij (SI-STAT … 2013; Statistični register … 2012; Pečar 2014).

- število podjetij na 1000 prebivalcev [‰]
- število oseb, ki delajo na podjetje [osebe/podjetje]
- bruto investicije na prebivalca [EUR]
- koeficient specializacije [%]
- bruto dodana vrednost v osnovnih cenah po dejavnostih (predelovalne dejavnosti, gradbeništvo in trgovina, gostinstvo, promet) [Mio EUR]
- vsi zaposleni v raziskovalno-razvojnih dejavnosti med delovno aktivnim prebivalstvom [zaposleni]
- delež zaposlenih v gradbeništvu med delovno aktivnim prebivalstvom [%]
- delež prebivalcev z ustvarjalnim poklicem med delovno aktivnim prebivalstvom po kraju bivanja [%]
- zaposleni v ustvarjalnih dejavnostih po kraju bivanja glede na delovno aktivno prebivalstvo po kraju bivanja [zaposleni]
- delež čistih prihodkov od prodaje na tujih trgih v prihodkih skupaj [%]
- indeks staranja [%]
- stopnja prostih delovnih mest [%]
- delež delovno aktivnih prebivalcev med prebivalci po kraju bivanja [%]
- indeks delovne migracije [%]
- diplomanti visokošolskega dodiplomskega izobraževanja po statistični regiji stalnega prebivališča na 1000 prebivalcev [‰]
- naravno gibanje prebivalstva – naravni prirast na 1000 prebivalcev [‰]
- selitveni prirast s tujino na 1000 prebivalcev [‰]
- selitveni prirast med statističnimi regijami na 1000 prebivalcev [‰]
- prebivalstvo staro 15 ali več let brez izobrazbe, z nepopolno osnovnošolsko na 1000 prebivalcev [‰]
- prebivalstvo staro 15 ali več let z visokošolsko izobrazbo (1., 2. in 3., stopnja) na 1000 prebivalcev [‰]

Izračunali smo tudi koeficient specializacije (Vrišer 1997), ki pokaže heterogenost panožne sestave industrije glede na državno povprečje (Müller 1976).

Povprečje vsakega zgoraj zapisanega kazalnika smo izračunali za vsako od štirih skupin regij. Posledično smo ugotovili kakšna mora biti družbeno-gospodarska sestava regije, da ima šok na določeno regijo manjši vpliv in da je zmožna hitrejšega in intenzivnejšega okrevanja.

V raziskavo so zaradi dostopnosti vključeni podatki za leto 2011, le za bruto dodano vrednost v osnovnih cenah po dejavnostih so za primerjavo uporabljeni podatki za leto 2008 (stanje pred recesijo).

4 Rezultati in razprava

Na podlagi podatkov za BDP na prebivalca je bila najbolj prožna Pomurska statistična regija, kar je posledica najnižjega BDP-ja na prebivalca pred recesijo. Sledita ji Spodnjeposavska in Obalno-kraška statistična regija (preglednica 3). Glede na BDP na prebivalca je bil šok najmočnejši v Gorenjski in Koroški statistični regiji ter v statistični regiji Jugovzhodna Slovenija. Le to je grafično prikazano na sliki 1, ki prikazuje kako močno je recesija vplivala na posamezne statistične regije in kako so okrevale. Na podlagi jakosti šoka in okrevanja BDP-ja se je le Pomurska statistična regija vrnila na (že tako nizko) stanje pred recesijo. Ostale regije pri okrevanju relativno zaostajajo.

Preglednica 3: Šok in okrevanje glede na bruto družbeni proizvod (BDP) na prebivalca (SI-STAT . . . 2013).

		T_{-1}	T_0	T_{+2}				
	statistična regija	BDP na prebivalca 2008	BDP na prebivalca 2009	BDP na prebivalca 2011	šok (2008–2009)	šok točke BDP	okrevanje (2009–2011)	okrevanje – točke BDP
	SLOVENIJA	18420	17415	17620	–5,4560261		–1,16	
1	Pomurska	11909	11463	11929	–3,7450668	–2	–3,91	2
2	Podravska	15473	14574	14696	–5,8101209	1	–0,83	–1
3	Koroška	14288	13085	13640	–8,4196529	2	–4,07	2
4	Savinjska	16479	15513	16156	–5,8620062	1	–3,98	2
5	Zasavska	12291	11614	11800	–5,5080954	–1	–1,58	1
6	Spodnjeposavska	15579	14940	15061	–4,1016753	–2	–0,80	–1
7	Jugovzhodna Slovenija	17478	16091	16294	–7,9356906	2	–1,25	1
8	Osrednjeslovenska	25942	24780	24695	–4,4792229	–1	0,34	–1
9	Gorenjska	15733	14317	14764	–9,0001907	2	–3,03	1
10	Notranjsko–kraška	13277	12635	12498	–4,8354297	–1	1,10	–2
11	Goriška	17633	16480	16354	–6,538876	1	0,77	–2
12	Obalno-kraška	19842	18964	18838	–4,4249572	–2	0,67	–2

Višja vrednost točk BDP-ja pomeni večji šok (7. stolpec) in hitrejše okrevanje (9. stolpec).

Slika 1: Vrednost izračunanega šoka in jakost okrevanja bruto dodane vrednosti za slovenske statistične regije (SI-STAT . . . 2013).
Glej angleški del prispevka.

Do okrevanja kazalnika stopnja registrirane brezposelnosti sploh še ni prišlo, zato smo izračunali le šok. Iz podatkov brezposelnosti je razvidno, da je bila najvišja leta 2013, zato smo za računanje šoka upoštevali to leto.

Glede na registrirano stopnjo brezposelnosti (2008–2013) je recesija imela največji vpliv na Osrednjeslovensko, Notranjsko-kraško in Goriško statistično regijo, najmanj pa na Pomursko, Podravsko in Savinjsko statistično regijo. Pri Pomurski statistični regiji je bila brezposelnost že pred krizo najvišja, zato ni prišlo do tolikšnega znižanja, absolutna vrednost brezposelnosti pa je še vedno višja kot v ostalih statističnih regijah. S posledicami recesije se regije in države soočajo še potem, ko je recesija uradno že mimo.

Bruto osnova za dohodnino na prebivalca (EUR) je doživela največji upad v Osrednjeslovenski, Gorenjski in Podravski statistični regiji, najmanjši pa v Pomurski, Spodnjeposavski in Notranjsko-kraški statistični regiji.

Na podlagi izračuna šoka in okrevanja sta največ točk dosegli Pomurska in Spodnjeposavska statistična regija (preglednica 4), ki ju je recesija najmanj prizadela, sledi jima Obalnokraška statistična regija. Šok je najbolj prizadel Gorenjsko statistično regijo in Goriško statistično regijo ter statistično regijo Jugovzhodna Slovenija.

Preglednica 4: Izračun šoka za slovenske statistične regije.

statistična regija	šok točke BDP	šok točke brezposelnost	šok točke dohodnina	šok točke skupaj
Pomurska	−2	−2	−2	−6
Podravska	1	−2	2	1
Koroška	2	−1	−1	0
Savinjska	1	−2	1	0
Zasavska	−1	−1	−1	−3
Spodnjeposavska	−2	−1	−2	−5
Jugovzhodna Slovenija	2	1	1	4
Osrednjeslovenska	−1	2	2	3
Gorenjska	2	1	2	5
Notranjsko-kraška	−1	2	−2	−1
Goriška	1	2	1	4
Obalno-kraška	−2	1	−1	−2

Višja kot vrednost točk pomeni večji vpliv recesije. Zadnji stolpec prikazuje seštevek točk izbranih kazalnikov.

Okrevanje smo izračunali le za BDP na prebivalca (EUR) in bruto osnovo za dohodnino na prebivalca (EUR), zato je najvišja vrednost štiri. Najbolj sta okrevali Pomurska in Koroška statistična regija, sledita jim Savinjska statistična regija in statistična regija Jugovzhodna Slovenija. Najslabše sta okrevali Notranjsko-kraška statistična regija in Obalno-kraška statistična regija, sledita jima Goriška in Osrednjeslovenska statistična regija.

Preglednica 5: Okrevanje slovenskih statističnih regij glede na bruto domači proizvod na prebivalca (EUR) (BDP) in bruto osnovo za dohodnino na prebivalca (EUR).

statistična regija	okrevanje točke BDP	okrevanje točke dohodnina	okrevanje točke skupaj
Pomurska	2	2	4
Podravska	−1	−1	−2
Koroška	2	2	4
Savinjska	2	1	3
Zasavska	1	1	2
Spodnjeposavska	−1	−1	−2
Jugovzhodna Slovenija	1	2	3
Osrednjeslovenska	−1	−2	−3
Gorenjska	1	1	2
Notranjsko-kraška	−2	−2	−4
Goriška	−2	−1	−3
Obalno-kraška	−2	−2	−4

Višja kot vrednost točk pomeni večjo intenzivnost okrevanja. Zadnji stolpec prikazuje seštevek točk izbranih kazalnikov.

Slika 2: Slovenske statistične regije glede na jakost šoka in intenzivnost okrevanja.
Glej angleški del prispevka.

Prožnost je odvisna od intenzivnosti šoka, ki ga je regija utrpela, in od jakosti in hitrosti okrevanja. S slike 2 je razvidno, da je bil vpliv recesije na gospodarsko nazadovanje in porast brezposelnosti pri Pomurski statistični regiji nizek, okrevanje pa hitro. Ta regija je najbolj prožna, najmanj pa sta prožni Goriška in Osrednjeslovenska statistična regija.

Za regije, na katere je šok močno vplival in so dobro okrevale, je značilno, da imajo najvišji izvoz in visok naravni prirast. Zanje je značilno odseljevanje v druge statistične regije. Več kot polovica bruto dodane vrednosti

regij, ki so doživele močan šok, je bila leta 2008 proizvedena v dejavnostih, ki so zaradi recesije najbolj nazadovale: gradbeništvo, predelovalne dejavnosti s trgovino ter gostinstvo in promet. Ker je prišlo pri teh dejavnostih do največjega upada (tudi v Osrednjeslovenski statistični regiji za 35 % do leta 2011), so najbolj nazadovale regije, ki so bile od nje najbolj odvisne, v njih pa še ni prišlo do okrevanja. V tem tipu regij je bil najnižji delež zaposlenih v gradbeništvu leta 2011, saj je prišlo do odpuščanja zaposlenih.

Za regije, na katere je šok močno vplival in so slabše okrevale, je glede na ostale tipe regij značilno največje število podjetij na 1000 prebivalcev. Imajo tudi največ prostih delovnih mest, najvišji delež zaposlenih v raziskovalno-razvojnih dejavnosti, najvišji delež prebivalcev z visokošolsko izobrazbo in hkrati najnižji delež prebivalcev brez izobrazbe oziroma z nepopolno osnovnošolsko izobrazbo ter najvišji delež prebivalcev z ustvarjalnim poklicem, a hkrati najnižje število zaposlenih v ustvarjalnih dejavnostih po kraju bivanja. Več kot polovica gospodarske dejavnosti Osrednjeslovenske statistične regije, ki sodi v to skupino, temelji na dejavnostih, ki so v času recesije doživele največje nazadovanje.

Za regije, na katere je šok malo vplival in so okrevale, je značilno, da imajo glede na ostale tri skupine najmanjše število podjetij na 1000 prebivalcev, najnižje bruto investicije na prebivalca, najnižji delež delovno aktivnih prebivalcev in nizek delež zaposlenih v R-R dejavnosti ter nadpovprečno število zaposlenih v ustvarjalnih dejavnostih (po kraju bivanja). Značilna sta tudi staranje prebivalstva in odseljevanje v druge statistične regije ter tujino. Izobrazbena sestava prebivalstva je neugodna (nižje število diplomantov kot drugje).

Za regije, na katere je šok malo vplival, a so počasi okrevale, so značilni specializacija podjetij (prevladujejo manjša podjetja), velik izvoz, visoke bruto investicije na prebivalca in nizek delež zaposlenih v raziskovalno-razvojnih dejavnosti. V tej skupini je nadpovprečen delež prebivalcev z nepopolno osnovnošolsko izobrazbo. Za delovno aktivne prebivalce je značilno, da so v večji meri zaposleni v regiji bivanja, selitveni prirast s tujino in med statističnimi regijami pa je nadpovprečen, kar pomeni, da se ljudje priseljujejo v te regije.

5 Sklep

V raziskavi je predstavljena prožnost regij in metodologija izračuna jakosti vpliva recesije in intenzivnosti okrevanja po njej. S pomočjo treh na podlagi literature opredeljenih kazalnikov, ki najbolje opredeljujejo vpliv recesije (BDP na prebivalca, stopnje registrirane brezposelnosti in bruto osnove za dohodnino), sta bila izračunana vpliv šoka in jakost delnega okrevanja slovenskih statističnih regij. Regije smo uvrstili v štiri tipe. Statistični regiji Gorenjska in Jugovzhodna Slovenija sta doživeli močan šok in dobro okrevali, medtem ko je bilo ob močnem šoku okrevanje slabše pri Goriški, Osrednjeslovenski in Podravski statistični regiji. Pomurski in Zasavski statistični regiji je uspelo po šibkem šoku dobro okrevati, Spodnjeposavski, Obalno-kraški in Notranjsko kraški statistični regiji pa slabo. Recesija je manj vplivala na regije, ki so že pred krizo imele nižjo gospodarsko rast in visoko brezposelnost.

Na jakost šoka in intenzivnost odziva posameznega tipa regij vplivajo družbeno-gospodarske značilnosti regije pred recesijo. Na podlagi analize opredeljenih družbeno-gospodarskih kazalnikov smo ugotovili, da je heterogena gospodarska sestava v času recesije bolj prožna, saj gospodarstvo ni odvisno le od posameznih dejavnosti. Bolj prožne so tudi regije, kjer prevladujejo manjša podjetja. V nasprotju z do sedaj objavljeno literaturo je spoznanje, da imajo regije, na katere je šok šibko vplival, slabše izobraženo delovno silo in najnižji delež zaposlenih raziskovalno-razvojnih dejavnostih. Največji delež prebivalcev z ustvarjalnim poklicem imajo regije, ki so doživele šibek šok in dobro okrevanje, kar potrjuje ugotovitev Kozine (2013), da večja koncentracija ustvarjalcev pripomore k večji gospodarski rasti.

Na podlagi izračuna vpliva šoka in jakosti odziva je treba razviti metodologijo izračuna prožnosti ter pripraviti priporočila odločevalcem za zagotavljanje le te. V prihodnje bodo dobrodošle podrobnejše analize, kako gospodarska sestava regij vpliva na prožnost regij. Regije se lahko primerno odzovejo in prenesejo vplive recesije, če poznamo dejavnike in ukrepe, ki vplivajo k njihovi prožnosti.

6 Viri in literatura

Glej angleški del prispevka.

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SPATIAL DIVERSITY OF TOURIST FUNCTION DEVELOPMENT: THE MUNICIPALITIES OF POLAND'S WEST POMERANIA PROVINCE

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PATRYCJUSZ ZARĘBSKI

Seaside in Sarbinowo, West Pomerania Province.

Spatial diversity of tourist function development: the municipalities of Poland's West Pomerania province

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ABSTRACT: This article examines the spatial diversity of tourist function development using the example of one of Poland's sixteen main administrative regions: the West Pomerania Province (Polish: *Województwo zachodniopomorskie*). The analysis was carried out based on the values of the Defert tourist function index, which is one of the basic indexes used in tourism geography. The analysis demonstrated significant differences between the individual municipalities in the region examined. This confirms the assumption that seaside municipalities have the highest tourist function development.

KEY WORDS: tourist function, municipality, province, lodging places, population, Poland

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1 Introduction

At present, a number of various methods (Crouch and Ritchie 1995; Dwyer et al. 2000; Heath 2002) can be indicated which define the competitiveness of a destination. This is possible among others trough a determination of the development degree of the tourist function of a given destination. Literature provides a number of different methods (e.g. Aubert et al. 2013; Defert 1972; Kowalczyk 2002; Warszyşska 1985) that allow a fairly precise determination of the fact whether a given region possesses a properly developed tourist function.

The use of appropriate indexes is one of the ways to determine this level. In the geography of tourism and tourism economics, there is a whole spectrum of this type of measures including tourist comfort index, the concentration index, attractiveness index (Coccossis and Parpairis 2000), overall tourism intensity index, foreign tourism intensity index (Soybali 2005). The advantage being the result of the use of appropriate indexes follows the fact that they are actually reliable on one hand and they are objective on the other hand. However, it needs to be emphasized that the expression »index« may have different meanings. According to Smith (2010, 132), the »*index refers to the combination of two or more variables into a single measure to provide a succinct indication of some phenomenon*«.

The chief purpose of this article is an attempt to assess the development level of the tourist function of the individual communes in West Pomerania Province (*in Polish Województwo zachodniopomorskie*), which is one of the 16 main administrative regions in Poland. The analysis carried out was based on one of those indexes that are most frequently used in the geography of tourism, i.e. the Defert tourist function index (DTFI). The intention of the authors was also to indicate spatial differences in the development level of the tourist function in the individual areas of the province, i.e. seaside, lakeland and the remaining areas. It is worth noting that other natural values (e.g. geodiversity, landscape, zoological and botanical values) and cultural values are very important in analysis of the spatial diversity of development of the tourist function. However, it can be accepted that natural values analyzed (hydrological natural features) are one of the important factor in tourist function diversity (Szwichtenberg 1995).

2 Literature review

Tourist function is understood as a socioeconomic activity pursued by a given area and its inhabitants, aimed at tourist services (Kowalczyk 2002). The scale and nature of the tourist function can be presented by means of various measures and numerous qualitative features (Durydiwka 2013).

In the literature, the development of tourist function is usually determined by measures based on the size of accommodation, tourist traffic, the number of employees in tourist services or income from tourism (Durydiwka 2013). Some of those refer to simple formulae (ones that often include two variables), while others present more extended components that are based e.g. on accepted weights (e.g. the municipal tourist index, which is related to 5 quantities i.e. attractions: 20%; dominant tourist products: 25%; tourist information office: 5%; turnover of accomodations: 45% and tourism tax: 5% (Aubert et al. 2013).

As Jreat (2004, 161) states, »*among the several methods proposed by scholars to measure the relative importance of tourism, the one that has gained most acceptance is Defert's tourist function index*«. Defert's tourist function index (DTFI) compares the number of tourist beds available in a destination to the total number of residents, or hosts in the region' (Boniface and Cooper 1987) and is expressed as (Defert 1972, 10):

$$\text{DTFI} - \text{T(f)} = \frac{\text{Bed capacity} \times 100}{\text{Resident population}}$$

The abovementioned index is one of the most frequently used ones when determining the development degree of the tourist function of a given destination (Lasanta et al. 2007; Smith 1995). It is also worth to indicate the purpose which was pursued when Defert created the index analyzed. His goal in creation this function was to develop a single measure that reflects the relative magnitude of tourism in a local economy (Smith 2010).

The index presented above possesses a fairly wide application. While initially applied to towns and cities, the index has also been used at national and regional level (Jreat 2004).

The index is characterized by a fundamental advantage, i.e. an ease of obtaining data which required for its calculation. In the majority of countries, information concerning the bed capacity and resident population can be obtained among others from statistical yearbooks or other studies of this type. On the other hand, it is advisable to indicate a number of imperfections. Firstly, the index does not take into account certain values which are not usually presented in tourist statistics (the so-called »the second homes« or »lodging places offered by »acquaintances and friends«) (Zelenka and Pásková 2012). On the other hand, studies concerning the Defert index for individual towns and regions occur in literature taking into consideration »second homes« (Opačić and Mikačić 2009). What is more, its application is definitely more useful and proper when determining the level of the tourist function of spatial units with a relatively small number of permanent residents or ones which are small in terms of the number of the residents that live in localities (communes). The index is focused on localities (communes) with lower values of the denominator, i.e. the number of permanent residents (Szwichtenberg and Borzyszkowski 2000). This is confirmed by Soybali (2005, 88), according to whom »*number of resident population plays an important role and while the DTFI value of densely populated larger regions or provinces could indicate smaller values despite the large number of beds, regions or provinces where the number of resident population lesser and more polarised may indicate significantly higher DTFI values despite smaller bed capacity*«. The author emphasizes that the value of the index is clearly dependent on the number of residents, and hence it may accept relatively low values in regions with high population. He mentions regions in Turkey as an example, where in the majority of cases the values were below 1.0 (apart from the following regions: Mediterranean and Aegean) (Soybali 2005). There is a similar situation in the case of large cities, which possess a significant number of lodging facilities and places. This is confirmed by Muska and Bite (2011, 225) among others, according to whom »*as Riga region concentrates one third of the permanent residents of the country and more than 40% beds of tourist accommodation establishments, the value of Defert's function is not significantly different (1,8 in 2009) from the average indicators of Latvia (1,4 in 2009)*«.

A review of scientific literature in the scope of the index analysed clearly confirms its wide application. Individual researchers provide not so much a theoretical DTFI analysis but they primarily indicate its practical applications in various destinations. Hence, the results obtained allow a proper and objective assessment concerning the development level of the tourist function of individual destinations. For example Jreat (2004) provides the values of the Defert index for individual 12 districts in India. The average value was almost 5.12. It appears that only two districts (Chamba and Kullu) achieved a value that was above the average: 6.88 and 43.79 respectively. Jreat (2004) also analyzed the value for 29 selected Indian towns. In this case, these values fluctuated from 0.2 (Baddi) to 180.17 (Manali). Lundgren (2006) examined the values of the index for Baltic ports and demonstrated huge disproportions between individual cases. The highest value was observed for Visby (358.94) and the lowest one for St. Petersburg (3.40). A number of ports (those significant ones) possessed relatively low values, e.g. Copenhagen (10.9) or Helsinki (10.8). The research carried out by Bănică and Camară (2011) on a group of 215 small towns in Romania (below 20.000 residents) indicate that a significant majority of them have a relatively poorly developed tourist function (based on the value of the Defert index). Nevertheless there can be identified 30 localities including or overlapping officially recognized tourist resorts (23 of national and 7 of local importance). This status is reflected by the tourist function index which varies between 0% (many of these towns have no lodging capacities or tourist activities) and 260%. Generally speaking, relatively high values (or higher than average ones) are observed in strictly tourist regions. The example of three administrative units that are included in the »Tirol-Südtirol-Trentino« Euroregion serves to confirm this assumption. In the year 2009, the value for Trentino was 31.6; for the South Tyrol: 43.7; and for Tyrol: 38.5; for the whole of Italy, it was 7.6; and for Austria: 11.5 (Brida and Giuliani 2012).

In the majority of cases the analyses carried out concern clearly defined spatial units, e.g. administrative units (towns and communes). Furthermore, literature includes studies that refer to specified parts of individual administrative units. For example, the value for the Florence municipality is 6.37; for the historical center of this town: 15.30 (for Venice, 7.30 and 15.00 respectively) (van der Borg et al. 1996).

3 Methodology

3.1 Description of study area

West Pomerania Province is one of the major tourist regions in Poland. Taking into consideration the basic data connected with tourist movement, an essential role is to be observed of the area examined in national tourism, i.e.:

- the number of foreign tourists in the year 2012: 1.53 m (4th position in the country) (Bartoszewicz and Skalska 2013, 35),
- the number of home tourists in the year 2012: 3.1 m (6th position in the state) (Krajowe i zagraniczne … 2013, 6),
- the number of tourist lodging facilities in the year 2012: 1,219 (3rd position in the state) (Turystyka … 2013, 84 and 86),
- the number of lodging places in the year 2012: 119,967 (1st position in the state) (Turystyka … 2013, 84 and 86).

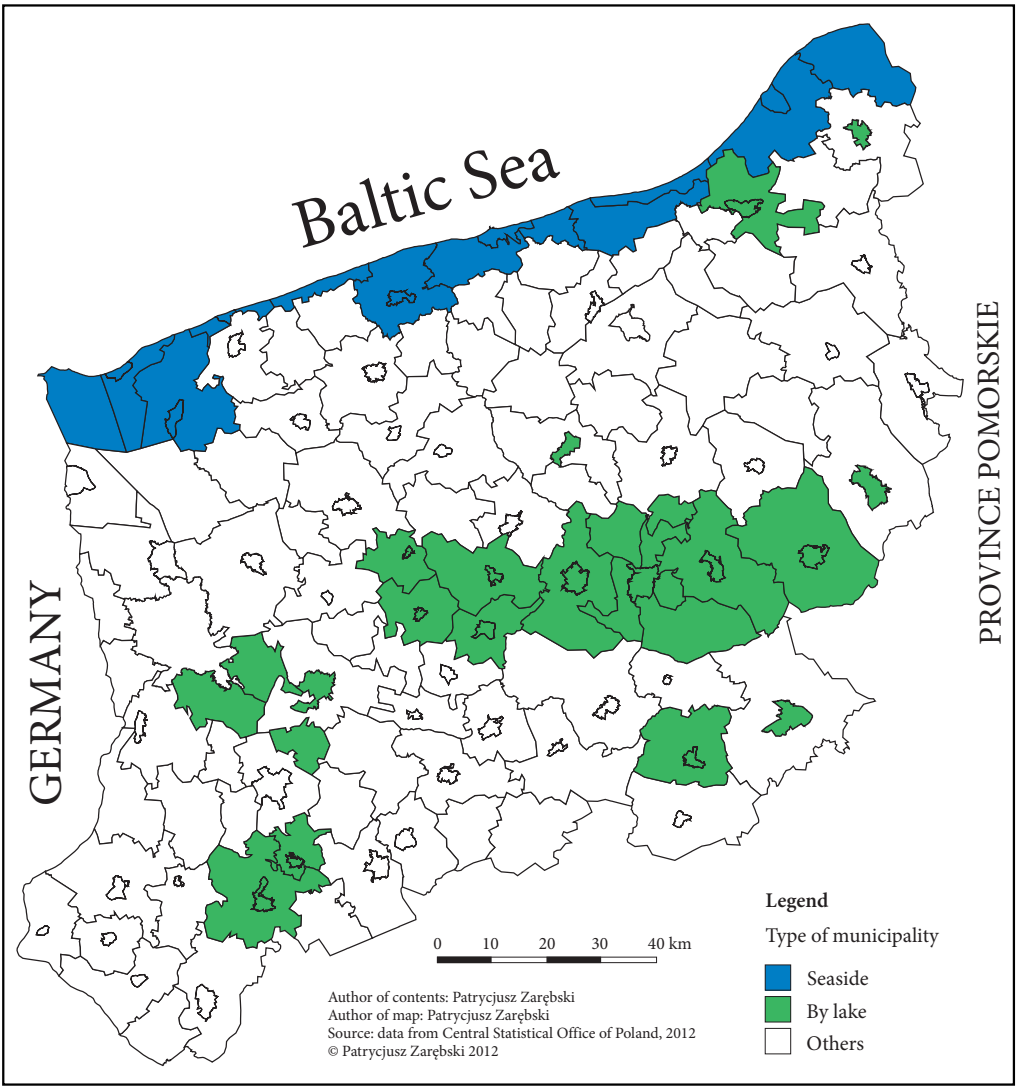

Figure 1: The nature of communities due to natural values.

The communes of West Pomerania Province can be classified among others considering basic natural values, which often constitute the base of the development of tourism. In the article, the following criteria were accepted of the delimitation of communes, and the following units were distinguished:

- seaside units: those that with an access to the shoreline of the Baltic Sea,
- lakeland units: those that possess the index of lake area on a level greater than 5% (Instytut Turystyki 2014),
- other units which do not meet the abovementioned criteria.

Taking into consideration the possession of natural values, which constitute the base for the development of the tourist function, the communes of the province examined are characterized by a fairly high diversification (Figure 1). 14 communes possess an access to the Baltic Sea (12% of all the communes), ones that are situated in the north part of the province. A high percentage of the lake area occurs in 22 communes (19% of all the communes), ones which are situated mainly on the area of lake districts. In a general listing, communes with natural values that are over the average and that are favourable for the development of tourism constitute 31% of all the communes.

To sum up the current discussion, it is to be stated that the information and data obtained (Figure 1) confirm the fact that the region analysed is characterized by a significant natural diversity. As a consequence, this results in a diversification of tourist attraction. It can be assumed a priori that there are similar differences in the scope of the development level of the tourist function of individual administrative units (communes).

3.2 Methods

In the present study, the analysis makes use of a division of the values of the index examined accepted by Boyer (1972) and Pearce (1995). Authors grouped tourism regions in six categories according to their DTFI values as follows:

- > 500 recent 'hypertouristic' resort,
- 100–500 large tourist resort,
- 40–100 predominantly tourist commune,
- 10–40 communes with an important but not predominant tourist activity,
- 4–10 little tourist activity or tourist function 'submerged' in other urban functions,
- < 4 practically no tourist activity.

As stated by Pearce (1995, 84) »*value of 100 indicates that the number of tourists would equal the number of local residents, assuming all beds available were being used*«. The literature includes various interpretations of the values provided above. According to some researchers, the value of the index over 100 demonstrates a well developed tourist function (Kowalczyk 2002; Szromek 2007), while other researchers reduce this value (e.g. for Poland) to 50 (Warszyşska 1985; Żek 2008).

The data concerning the number of lodging places and the number of population was obtained from the Central Statistical Office (Główny Urząd Statystyczny 2014). The percentage of the area of lakes in the communes was determined based on the data obtained from the »Commune database« from the Institute of tourism in Warsaw. A spatial visualization of the results obtained in the form of maps was prepared based on standard graphical tools which are available in the Windows environment and the geostatistics portal of the Central statistical office.

In the study, the following research hypothesis was accepted: the development level of the tourist function is clearly diversified depending on the nature of communes (and thereby the type of natural values that occur on their area). In the study, a division of the communes into seaside, lakeland and other was accepted.

4 Results and discussion

The region examined is quite strongly spatially diversified with regard to the development of the tourist function (Table 1, Figure 2). 83% of all the lodging places in the province with 11% of population potential are concentrated in the seaside strip. This gives the values of the tourist function index for these communes on the level of DTFI = 52.4. This causes significant disproportions in the development of tourism in the area examined. For comparison, in the lakeland communes with a high index of the lake area, there are only 5% of the lodging places of the province with relatively low values of the DTFI index = 2.

The highest values of the DTFI index (100–500) were observed in some seaside communes (e.g. Mielno, Rewal). This proves a very high share of tourism in the economic system of the commune (cf. Table 1). In the case of these units, tourism is the main factor in the formation of the local economy. A slightly lower significance of tourism in the economy (DTFI index 40–100) was observed in such communes as Darłowo and Międzyzdroje. A coexistence of tourism with other important sectors of economy was observed in the following towns: Kołobrzeg, Darłowo, Świnoujście and the following communes: Złocieniec, Trzebiatów and Nowe Warpno. In this case, tourism is developing alongside with activities connected with fishery, food processing or the development of industry. Hence, these communes did not obtain any high values of the index examined. Moreover, in some seaside communes, a relatively low DTFI value resulted from a fairly high number of residents (this situation occurs in Kołobrzeg town, which is resided by ca. 50 thousand of residents; nota bene, this town is the largest health-resort in Poland!).

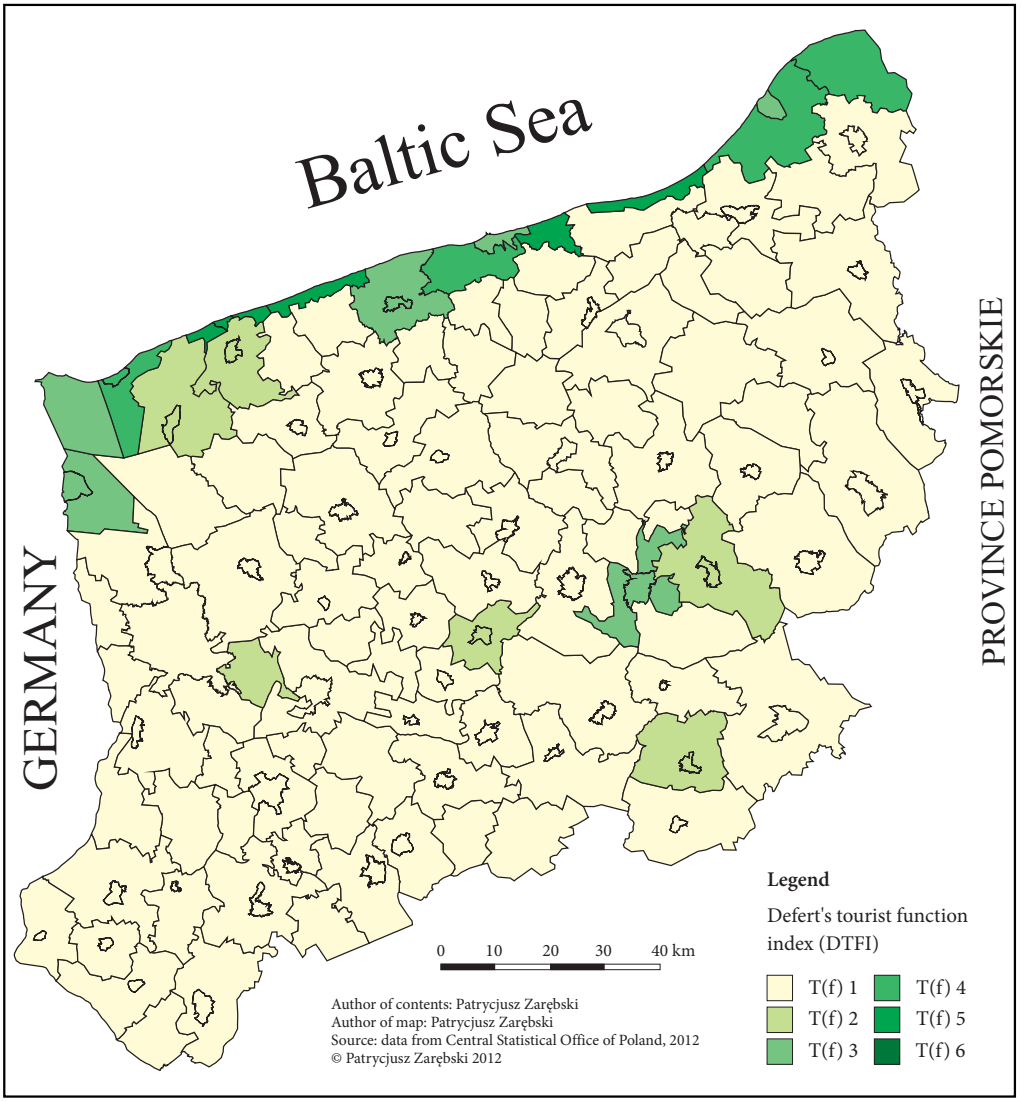

Figure 2: Spatial differentiation of Defert's tourist function index (DTFI).

Table 1: Value of the Defert index for communes in West Pomerania Province (N = 114).

Number	Value of the Defert index		Seaside communes		Lakeland communes		Other communes	
	Range	Group	Number	(in %)	Number	(in %)	Number	(in %)
1.	> 500	T(f) 6	–	–	–	–	–	–
2.	100–-500	T(f) 5	4	28,6	–	–	–	–
3.	40–100	T(f) 4	4	28,6	–	–	–	–
4.	10–40	T(f) 3	4	28,6	1	4,5	1	1,3
5.	4–10	T(f) 2	1	7,1	4	18,2	1	1,3
6.	< 4	T(f) 1	1	7,1	17	77,3	76	97,4
7.	Total		14	100	22	100	78	100

The analysis carried out demonstrated a spatial diversity of the area examined with respect to the index analysed. Thereby, the research hypothesis accepted in the article was confirmed. The seaside communes can be recognized as units with definitely the highest development degree of the tourist function. It is worth to mention that their advantage over the lake district units and other units is quite high.

The phenomenon above is confirmed among others by the research carried out by Mikačić (2007), from which it results that seaside regions in Croatia accept definitely the highest values of the Defert index: the average value was 94.0 (taking into consideration »second homes«). As many as 80% of accommodation places of the whole state are situated on the Croatian coast. The values for the inland part averaged 11.0 (Mikačić 2007). The example of the inland part of the Istria country demonstrates that the values for individual municipalities and towns fluctuated from 3.32 to 53.76 (Vojnovic and Knezevic 2013, 219). Papapavlou-Ioakeimidou et al. (2006) accept a similar opinion. They demonstrated on the example of the Greek coast that communities with the highest value of the index examined are mainly located along coastal zones, particularly in the small peninsulas of Kassandra and Sithonia, in western and southern Chalkidiki. Quite diversified values were obtained in the individual provinces of the Italian Sicily: extreme values amounted to 6.40 (Caltanissetta) and 54.88 (Messina). The average value for the whole island was 28.74 (Giacalone et al. 2005, 160).

The analysis of the spatial diversity carried out in this article confirms the results of the research and assumptions by Mikačić (2007), Vojnovic and Knezevic (2013), Papapavlou-Ioakeimidou et al. (2006) and Giacalone et al. (2005). However, they are so essential and important that an analysis was carried out of units located outside of the main tourist regions of Europe. This means that no regions or other administrative units situated in the basin of the Mediterranean Sea were covered by the research. The analysis was related to a region situated in the direct neighbourhood of the Baltic Sea, which is characterized by a definitely smaller attractiveness (for instance considering the climate) than that of the Mediterranean Sea. Nonetheless, it became evident that even in this case the seaside units are characterized by a definitely higher level of the development of the tourist function than the other units.

5 Conclusion

The analysis of the spatial diversity of the development degree of the tourist function carried in the article demonstrated significant disproportions in the range of the values of the Defert index in the area examined. This is among others the result of the diversity of the region examined, chiefly as regards the possession of natural values. The division accepted in the article of 114 communes into individual types of units, i.e. seaside, lakeland and others as well as the analysis carried out of these units regarding the development degree of the tourist function allowed the author to propose several essential conclusions, i.e.:

- West Pomerania Province is diversified owing to its natural values (the Baltic Sea, lakes) and so is the character of the individual administrative units (seaside, lakeland, other). The main areas of the concentration of these values occur in the northern communes of the province and also in those communes that are situated in the area of lake districts in the southern and eastern parts of the province.
- The character of the natural values analysed determines the development of the tourist function in the province. As a result of the analysis, the highest development of the tourist function measured with the Defert index was observed in the seaside communes. The lakeland communes possess a relatively lower level of development.

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A METHODOLOGICAL BASIS FOR LANDSCAPE INTERPRETATION: THE CASE OF THE LJUBLJANA MARSH

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The Ljubljana Marsh is a valuable protected area for Slovenia.

A methodological basis for landscape interpretation: the case of the Ljubljana Marsh

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ABSTRACT: Landscape interpretation is one of the best-suited and established forms of informing and raising the awareness of visitors and local residents. The literature contains only rare examples of useful methodology that could help managers with the initial steps of interpretation. A methodological basis for landscape interpretation is presented, using the case of the Ljubljana Marsh. The form consisting of eight thematic categories is a useful tool for identifying suitable topics and selecting the right interpretation tools. Using this form, managers will reach their final interpretation goal more easily: to make people recognize the landscape and protect it against inappropriate changes.

KEY WORDS: geography, interpretation, protected area, heritage, cultural landscape, management, Ljubljana Marsh, Slovenia

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1 Introduction

People have always wanted to understand and explain the world around them. Various cultures have explained and admired their local landscapes, their products, and their people's stories (Colquhoun 2005). Interpreting nature, heritage, the environment, or landscape is a more recent phenomenon and is one of the best-suited and established forms of informing and raising the awareness of visitors and local residents.

Within this context, the term »interpretation« was first used by John Muir in 1871. He wrote the following in his notebook: »I'll interpret the rocks …,« in which he was referring more to understanding than communicating (Mackintosh 2013). The American naturalist Enos Mills held professional discussions on the natural surroundings and led excursions into the wilderness as early as the beginning of the twentieth century (Internet 1). Later on, his methods became the basis for modern interpretation in the National Park Service (Internet 2). A few decades later, the term interpretation was defined by Freeman Tilden (1957), who laid the foundations for the profession of heritage interpretation as it is understood today (Kye 2005). Tilden (1957) defined interpretation as an educational activity that aims to reveal meanings and relationships using original objects, first-hand experience, and illustrative media, rather than to merely communicate factual information. Based on one of the shorter definitions, interpretation involves »translating« a technical language into a language that nonscientists can readily understand (Ham 1992; Ogorelec 2004; Veverka et al. 2014). The purpose of modern and comprehensive landscape interpretation that exceeds the interpretation of natural and cultural heritage is to bring a specific topic closer to people in a comprehensible way in order to help them understand the landscape. This encourages them to explore further and think critically. The ultimate goal of landscape interpretation is for visitors to get to know the landscape and subsequently protect it against inappropriate changes. There is a proven link between interpretation and increased knowledge of the landscape and changed attitudes towards it (Wearing et al. 2008).

The mission for protected areas is not only to protect them, but also to make it possible for visitors to experience the nature, cultural heritage, and intangible values of a specific place. Arranging and presenting protected areas to visitors are among the important goals, operational aims, and hence relevant tasks of protected area managers. However, the presence of visitors in these usually sensitive ecosystems causes frequent disturbances that are not in line with the desired goal of protecting unique and diverse natural or cultural landscapes; therefore, visits to such areas must be carefully planned, guided, and supervised (Baldauf et al. 2011).

Designing an interpretation plan is one of the first steps in arranging protected areas for visitors, in which one needs to ensure that the best possible link is established between the landscape and the visitor. Planning the interpretation entails developing effective tools that are based on the mission and goals of the manager, the interests and needs of the visitors, and unique and important features of the landscape one wishes to present and thus encourage visitors to think. Effective tools are developed by answering the following three basic questions: What? Who? Why? (Gross, Zimmerman and Buchholz 2006). This article provides answers to »What?« and thus helps explain how the understanding of landscape and its components should be developed. The key question is which parts of the landscape and which events that happened in a specific area are worth explaining (Gross, Zimmerman and Buchholz 2006).

Literature on interpretation contains no methodology that could help interpreters with the initial stages of planning the interpretation of a selected landscape. The aim of this article is to present an approach to developing the bases for landscape interpretation using the case of the Ljubljana Marsh. This area was selected because it is one of the most radically transformed Slovenian landscapes. During the nineteenth century in particular, enormous amounts of peat were removed from the marsh, lowering its surface by several meters. Over the past 250 years, several thousand kilometers of drainage canals have been cut into it (Vidmar 2013), thereby drying out the majority of the land there. Its cultural landscape differs greatly from the original one, but it is still (or even precisely because of this) very interesting for interpretation. The study of the marsh proceeded from its natural geographical characteristics and the key human changes introduced over a thousand years of its development. The design of the landscape interpretation plan relied on the knowledge of its natural and cultural heritage, which provides deeper insight into the interconnection of people and nature.

2 The Ljubljana Marsh

The Ljubljana Marsh is a large wet plain measuring just over 150 km^2 in the southern part of the Ljubljana Basin interspersed with 15 to 100 m tall isolated, largely wooded hills (Pavšič 2008). The marsh basin is filled by fluvial deposits that cover its bedrock. At the end of the Pleistocene over ten thousand years ago, the Ljubljana Marsh is believed to have been covered by a large lake (Verbič and Horvat 2009), even though no general agreement has been reached about this among researchers. Thus, for example, Šifrer (1984) believes that there was no major lake formation in the marsh, but this does not mean there were no intermittent lakes there. In any case, floods are an important characteristic of the Ljubljana Marsh. Frequent or regular floods especially affect its central part, where approximately 15% of the terrain is under water.

The Ljubljana Marsh has been strongly influenced by the several thousand years of human presence, which is proved by numerous archeological finds, especially those from the Ljubljanica River. The first traces of settlement reach back to the early Mesolithic, when the marsh was populated by Mesolithic hunters (Gaspari 2009). The next important settlement era extends to the late Neolithic, when the inhabitants lived in pile dwellings. Major human interventions that significantly changed the marsh landscape began in the second half of the eighteenth century, when the marsh began to be systematically drained (Melik 1927; Melik 1946). The once extensive lowland raised bog, the southernmost and lowest in Central Europe, has now only been preserved in the form of small peat beds. Hence the typical bog characteristics are only preserved in the choronym *Barje* (literally, 'peatland, bog') or *Ljubljansko barje* (literally, 'Ljubljana peatland, bog').

After 150 years of human intervention in the marsh landscape, at the beginning of the twentieth century the first realizations appeared about the need to protect it (Spomenica … 1920). Efforts to protect the Ljubljana Marsh intensified during the 1980s, until the marsh was protected as a landscape park in 2008 with the goal »to protect the natural values, preserve the biodiversity, and maintain and enhance the landscape diversity« (Uredba o Krajinskem … 2008).

Despite being protected, the Ljubljana Marsh continues to face many pressures and threats that may endanger its future sustainable development. Recently, leisure activities have become increasingly important in the marsh in addition to agriculture and will have a strong impact on the future of this landscape. Because one of the main goals of protecting the Ljubljana Marsh is also »to enable research, education, relaxation, and spiritual enrichment of people« (Uredba o Krajinskem … 2008), the interest of visitors is expected to increase, as are the need and care for preserving this exceptionally valuable area.

3 The basis for interpreting the Ljubljana Marsh landscape

An interpretation infrastructure plan was already made for the Ljubljana Marsh Nature Park at the time when it was established (Thaler et al. 2007). Potentially suitable locations were defined based on various criteria, with an emphasis on the physical setup. This article focuses on preserving and understanding the cultural landscape and especially its heritage using various interpretation tools, such as e-lessons and field assignments, which are not necessarily visible out in the field.

The prepared material is intended to help the manager select the areas for interpretation and develop the interpretation bases. One of the basic guidelines for managing protected areas was taken into account: the visitors and local communities must discover and understand the value and importance of heritage, which promotes attachment to the local environment and enhances the care for it.

Records, such as the registers of natural and cultural heritage (Pravilnik o določitvi … 2004; Register nepremične kulturne … 2015; Register žive kulturne … 2015), Digital Encyclopedia of natural and cultural heritage – DEDI (2015), protected area management plans, and municipal and other material, were reviewed through desk research, and based on an expert assessment the potential areas for landscape interpretation were defined. The next step involved expanding the materials prepared in the office by including findings obtained in the field (by inspecting the area and conducting interviews with the key stakeholders).

The areas were not selected based on quantitative criteria, which would have made it possible to rank topics and areas by relevance. For example, such criteria are used with established geomorphological evaluation methodologies (e.g., Erhartič 2012; Ciglič and Perko 2013; Erhartič, Zorn and Komac 2013). Primary

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Figure 1: The Ljubljana Marsh is crisscrossed by numerous drainage channels.

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Figure 2: Aerial view of the mosaic-like landscape of the Ljubljana Marsh.

interest was placed on the lists of topics and suitable areas, which covered the diversity of the cultural landscape to the greatest possible extent. Based on this, the manager of the area or any other interested party will be able to prepare the interpretation. The following principles were taken into account in selecting the areas:

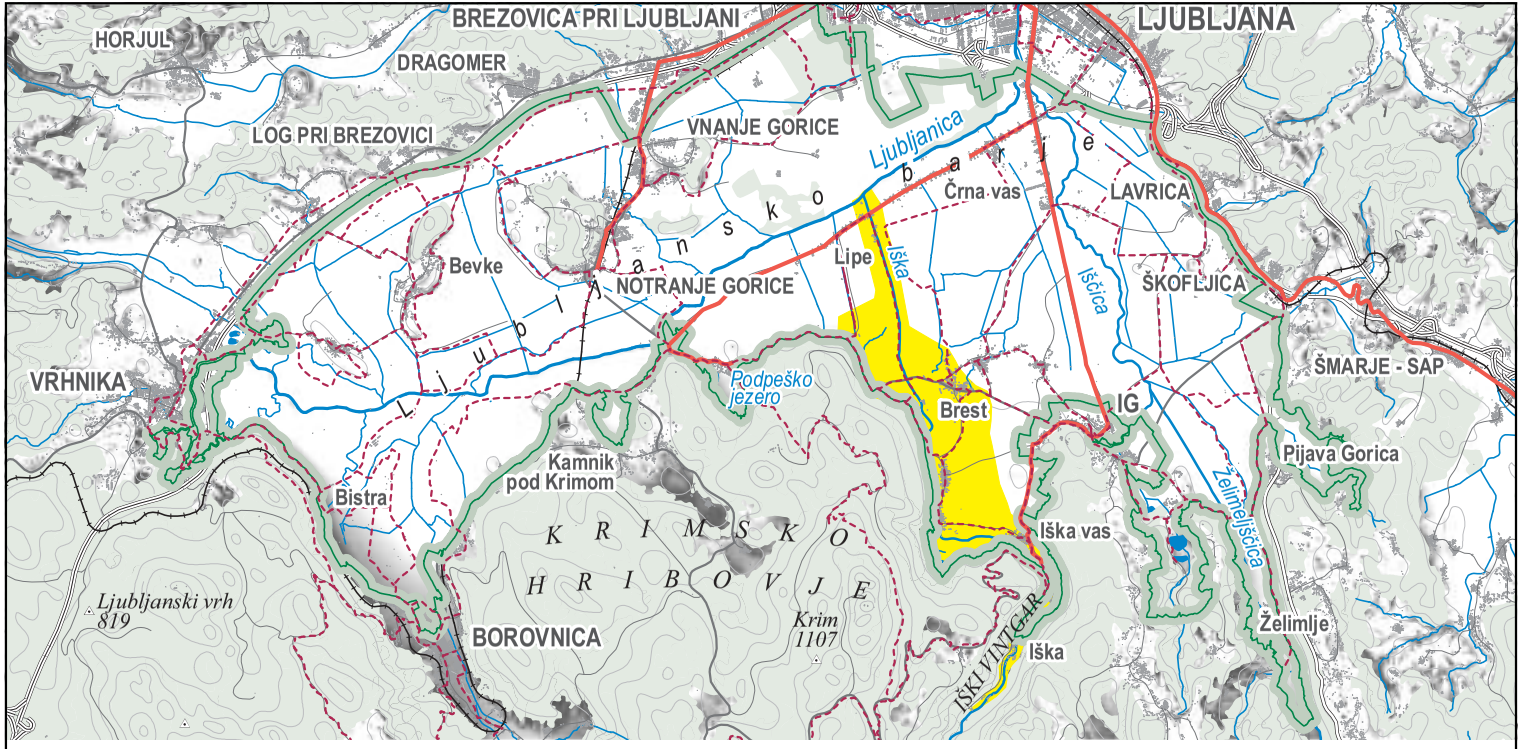
- Visitors should be directed to less vulnerable areas and away from more vulnerable ones,
- Visitors should be directed to areas with existing or planned infrastructure;
- Density of natural and cultural heritage units from official records;
- Additional values with interesting topics pointed out by the locals;
- Experiential diversity of the area and its educational potential.

Based on the case study of the Ljubljana Marsh Landscape Park, fifteen areas most suitable for interpretation were defined (Table 1).

Table 1: Proposed interpretation areas in the Ljubljana Marsh.

Number	Name	Brief description
1	Ljubljanica springs	This area is characterized by the high-volume springs of the Ljubljanica River where the karst and marsh landscapes meet.
2	Ethnological heritage of Bevke and its surroundings	This area is characterized by people's long-term coexistence with nature, demonstrated in rich archeological and ethnological heritage.
3	Old orientation points	Churches on the hilly southern rims of the Ljubljana Marsh still serve as important orientation and vantage points, and an important part of religious heritage.
4	Iška River	In its lower reaches, after exiting the Iška Gorge, the Iška River (a formerly meandering river that has been trained) deposited a gravel fan with rich supplies of drinking water.
5	Recent colonization of Črna Vas	The Črna Vas area, crisscrossed by numerous drainage channels, was one of the last planned colonization areas in Slovenia in 1830.
6	Iška Moor	The Iška Moor is one of the most extensive contiguous areas of wet meadows and herbaceous plants in the Ljubljana Marsh.
7	Ljubljanica River	The Ljubljanica River is the central watercourse of the Ljubljana Marsh. In the past it was of exceptional importance to people, which is confirmed by the numerous archeological artefacts from various archeological periods found in it.
8	Mali Plac	The Mali Plac Nature Reserve is a former raised bog, which turned into a marsh because of human intervention.
9	Pile-dwellers at Ig	This area is characterized by the remnants of the pile-dwelling culture, a UNESCO World Heritage site since 2011.
10	Substitute habitat near Mestni Log	Because of the planned expansion of the nearby landfill, a substitute habitat is planned to be set up in this area.
11	Quarries in Podpeč and Notranje Gorice	This area is known for the abandoned limestone quarry in Podpeč and the abandoned dolomite quarry in Notranje Gorice.
12	Habitats around Pijava Gorica	This area is characterized by extremely diverse land use. It is largely covered by tilled fields and meadows, and wet meadows can be found on its eastern edge.
13	Nearby Karst area	Karst features are typical of the southern rims of the Ljubljana Marsh. An interesting example of this is Podpeč Lake, a karst lake with springs in and around it fed by the nearby karst area.
14	Draga Valley and nearby area	The Draga Valley has seven ponds created in the eighteenth century due to harvesting clay. A fish hatchery was later set up in them.
15	Technical heritage	This area boasts rich technical heritage, among which the Southern Railroad with its accompanying structures, and small hydroelectric plants are the most important.

Figure 3: Proposed interpretation areas in the Ljubljana Marsh. ►



Legend

- Area of interpretation
- Park boundaries
- Bicycle trail
- City bus line

0 1 2 4 6 km

Authors of contents: Aleš Smrekar, Jernej Tiran, Mateja Šmid Hribar, Bojan Erhartič
Author of map: Manca Volk Bahun
Source: Geodetska uprava RS, 2014
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3.1 Interpretation form

A structured landscape interpretation basis was developed for every area using the form presented here. The form was designed and completed by taking into account the perspective of managers, who will be able to use the selected topics as a starting point for developing the landscape interpretation in a selected area. The form is transferrable to other environments, is easy to complete, and can be used by the specialist services of managers of various types of protected areas and by local communities. It consists of the following eight thematic categories:

- Location;
- Area outline;
- Natural and cultural heritage;
- Cultural value;
- Infrastructure;
- Landscape interpretation;
- Protection and potential vulnerability;
- Map.

The categories of the **interpretation area location and outline** provide a thorough presentation of the selected area: its location in the immediate and wider surroundings, a brief description of its relief features, bodies of water, predominant flora, land use, and key social geographical properties, such as the predominant type of settlement, population by settlement, and the socioeconomic structure of individual settlements.

I. LOCATION	
Address	*Description*
Wider area in question	*Potential protected area, region*
Immediate area in question	*Established name of the part of the region*
Municipality(ies)	*The municipality(ies) that the interpretation area belongs to.*
Settlement(s)	*The settlement(s) whose parts extend to the area of interpretation.*
Map	*The area of interpretation marked on the map of the wider region.*

II. AREA OUTLINE	
Brief outline	*Geographic location, relief properties, bodies of water, flora, predominant land use, settlement: population, type of settlement (urban, suburban, rural, compact, scattered), economic activities*
Protected areas	*Legislation that protects parts of the area or individual heritage units*

The natural and cultural heritage category provides an inventory of the heritage sites in individual areas and is key for developing the themes, goals, and topics of the landscape interpretation. A desk inventory of the heritage sites is carried out for each area selected, in which both the units protected through legal acts and those that are only included in the official records are taken into account.

III. NATURAL AND CULTURAL HERITAGE				
List of natural heritage sites used for interpretation				
Number	Type *(e.g., hydrological, geomorphological, zoological, ecosystem etc.)*	Name	Location (x, y coordinates)	Description
…	…	…	…	…
…	…	…	…	…
List of cultural heritage sites used for interpretation				
Number	Type *(e.g., cultural landscape, buildings, archeological sites, settlements and their parts etc.)*	Name	Location (x, y coordinates)	Description
…	…	…	…	…
…	…	…	…	…
Predominant types of heritage:		*The predominant type of heritage in the lists of cultural and natural heritage sites is highlighted (e.g., hydrological and archeological heritage).*		

The cultural value category lists various values that have not yet been recognized by the heritage protection profession and evaluates the interpretation areas in terms of cultural service provision. It takes into account the relaxation, aesthetic, inspirational, identification, spiritual, and educational values that the area offers to locals and visitors (e.g., Šmid Hribar 2014). The greater the number of types of cultural services provided by the area, the more important its cultural value.

IV. CULTURAL VALUE					
Relaxation values	Aesthetic values	Inspirational values	Identification values	Spiritual/religious values	Educational values
. . .	. . .	. . .	. . .	. . .	. . .

The infrastructure category first focuses on the transport accessibility of the area by analyzing the traffic connections, with a special emphasis on sustainable modes of transport. Bus and railroad timetables are studied in detail, especially from the nearby local and regional centers and transportation hubs. This makes it possible to determine whether the existing conditions are suitable or what should be done in the future to improve accessibility (e.g., changing bus routes, building a bridge across a stream, build more hiking trails and cycle paths, and so on).

An inventory is made of the structures intended for supply, service, and leisure activities, such as restrooms, grocery stores, restaurants, ATMs, museums, places for equipment rental, accommodation, and so on. These activities are important for satisfying the general needs of visitors and, in terms of the hierarchy of needs, they are a precondition for attracting their attention (Ogorelec 2004). Interpretational arrangements, such as nature trail entry and exit points, are placed in areas with existing infrastructure.

V. INFRASTRUCTURE	
Accessibility	Bus, train, car, bicycle, cable car, on foot; (describe and provide suitable information, such as distance from a given place, timetables, parking, etc.)
Supply and service activities	Portable toilets, grocery store, snack bar, restaurant, accommodation, vacation farm, information point, post office, bank, ATM, gas station, cell phone coverage, Wi-Fi access (list available activities)
Leisure activities	Existing interpretation tools; hiking trails, cycle paths, riding trails, waterways, and similar; playground, sports fields, and picnic areas; equipment rentals; museum.

The form's main focus is on **landscape interpretation**; specifically, its theme, goal, and topics. The theme is selected based on the predominant type of heritage in a specific area and is used as the central interpretation theme, such as the pile-dwelling culture in the Ljubljana Marsh. In this, recommendations for the theme to include a central idea, reflect the purpose of the interpretation, and be presented in an attractive and simple way are taken into account (Tilden 1957; Lewis 1981; Veverka 2011). After this, the goals of the interpretation are defined for the specific area. In line with the latest studies on working memory capacity (Cowan 2005), a maximum of three goals are defined, making sure they relate to the theme and follow one of the main purposes of landscape interpretation: to stimulate visitors to think (Tilden 1957). In the case of the pile-dwelling culture, these goals include the following: to get to know the settlements and lifestyle of pile-dwellers and how they adapted to their living conditions, and how lower groundwater levels endanger the in situ conservation of pile-dwelling sites. Then suitable material or topics are developed in order to reach the goals set. In the case of the pile-dwelling culture, the possible topics include the following: the presumed lake, swamp, peatland, piles, pile-dwelling settlement, material remnants, threat to the conservation of sites, and a typical pile-dweller's day.

In line with the selected theme, goals, and topics, the most suitable interpretation tools are suggested, such as e-lessons, information boards, mobile apps, private tours, reconstructions, field assignments, printed materials, outdoor classrooms, and nature trails. Various types of interpretation tools targeted at different groups of (both real and online) visitors make it possible to attract a wide variety of potential visitors of various ages, interests, and background knowledge.

VI. LANDSCAPE INTERPRETATION	
Interpretation theme	Central theme or motif of interpretation
Interpretation goals	A maximum three goals are highlighted
Interpretation topics	Selection of topics
Interpretation tools	Selection of tools: • Low-cost (e.g., brochures, online descriptions, field assignments, private tours) • Medium price range (e.g., e-lessons and mobile apps) • Expensive (e.g., visitors' center, reconstructions, and outdoor classrooms)

If, based on the criteria described above, a selected area is identified as worthy of interpretation, **the protection and potential vulnerability category** is used to check the environmental carrying capacity and assess the area's potential vulnerability in terms of natural and cultural heritage conservation. The fundamental question is how many people can visit the selected area within a specific time range and in what way without degrading its environment. For example, visits are controlled by making visitors walk to the edge of the nature reserve and letting them see the reserve only in small, preferably guided, groups. Before making any changes or interventions, the manager must arrange a zonation of the interpretation area based on the legal bases, assessment of the environmental carrying capacity, the topics of interpretation, and proposed tools. In this, the manager defines where various visitor groups can spend time, what areas they can reach with various means of transport, and so on. Based on this assessment, it can be decided what additional infrastructure should be installed in the area, if at all. Only the legal bases for protecting the heritage in the selected area are entered in the form.

VII. PROTECTION AND POTENTIAL VULNERABILITY	
Protected areas	The type of protection in place (e.g., Strict Nature Reserve, Nature Reserve, Natural Monument, Natura 2000 site, Monument)

VIII. MAP	
Thematic map	The location of the interpretation area is marked on a map, including the natural and cultural heritage units and infrastructure

4 Conclusion

Landscape interpretation is one of the most suitable, effective, and also demanding and complex processes of informing and raising the awareness of visitors and local residents in protected and other areas of interest. From its conceptual to implementing stage, this process demands a comprehensive and interdisciplinary approach. The relevant literature does not include any established guidelines on appropriate methodology for identifying the elements that are worth interpreting within a specific landscape.

A special methodology was designed that managers and interpreters can use to identify the areas for interpretation and their key potentials, and develop an interpretation basis by including various interpretation tools. The most useful part of this methodology is the interpretation form, which can be transferred to other landscapes and is simple to use. Using this form, managers will identify the key natural and cultural heritage sites, cultural values, infrastructure, and legal bases for protecting heritage in a specific area. The form serves primarily as a tool and the conceptual interpretation differs by individual case.

Fifteen areas were identified and evaluated as part of the case study of the Ljubljana Marsh Nature Park. The identification was based on the expert assessment, which subsequently allowed for a broader understanding of the landscape complexity. Quantitative evaluation would have only limited this process, and individual seemingly marginal (but exceptionally important) landscape components would have been lost.

In a cultural landscape it is difficult to draw a clear dividing line between nature and society. Similarly, despite Slovenia's administrative division, natural and cultural heritage are interconnected, which requires a comprehensive presentation in terms of landscape interpretation. The process of identifying topics of

interest can be enriched by including an area's cultural values. Special attention must be paid to the most vulnerable areas in terms of natural and cultural heritage conservation when the manager wishes to present them to a selected audience. The most appropriate methods of interpreting heritage in the vulnerable areas include private in situ guided tours, interpretation centers, and the internet.

The selection of interpretation tools (e.g., field assignment database, e-lessons with teaching instructions, information boards, private guided tours, printed materials, outdoor classrooms, and nature trails) depends on the topics selected and target groups. The selected tools are targeted at various groups of people to convince them to come visit a specific landscape and try to understand the landscape they are visiting or even living in. This agrees with Cvahte's claim that quality interpretation not only influences people's knowledge, but also changes their behavior (Cvahte 2013).

Using the form presented, the manager will more easily achieve the ultimate goal of interpretation: for people to get to know the landscape and protect it against inappropriate changes by spreading knowledge about it and positive attitudes towards it.

An expert-based landscape interpretation does not result in commercialization of the area; on the contrary, it helps direct visitors and raise their awareness.

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THE IMPORTANCE OF MOUNTAIN GEOMORPHOSITES FOR ENVIRONMENTAL EDUCATION: EXAMPLES FROM THE ITALIAN DOLOMITES AND THE SWISS ALPS

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Tsanfleuron glacio-karstic area, Switzerland.

The importance of mountain geomorphosites for environmental education

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ABSTRACT: Because of their specific physical characteristics (altitude, slope, orientation, climate), mountain environments have an important natural diversity. In particular, their geodiversity is generally much larger than in the lowlands, and because mountain geosites are often very aesthetic, mountain areas present a great potential for geoheritage, geoconservation and geotourism studies. This paper reviews six reasons why this potential is high and concludes that mountain areas are particularly interesting to develop educational programs on three current environmental issues: climate change; natural hazards; and human impacts on particularly sensitive geomorphological environments. Then, the paper reviews the principal research in the field of geoheritage currently carried out on these three topics and presents two case studies in the Italian Dolomites and the Swiss Alps.

KEY WORDS: geomorphological heritage, geomorphosites, geotourism, mountain geomorphology, Alps

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1 Introduction: mountains as open-air laboratories for environment education

Heritage is a complex concept, both contested and culturally constructed, depending on personal and collective backgrounds and experiences. The perception and the definition of what constitutes heritage, its significance and the way it should be preserved and used may vary deeply from person to person or at least from groups of people or communities to others (Aplin 2002).

Frequently heritage is artificially divided into natural and cultural components (e.g. World heritage), even if this kind of distinction is often meaningless and almost always blurred. The artificiality of such division is clearly witnessed by geomorphosites (Panizza 2001; Reynard et al. 2009) and more in general by the concept of geological or geomorphological landscape (Reynard 2005). We observe and admire many landscapes, which have been altered by human activities – the so-called »cultural landscapes« – and which represent the relationships between physical and anthropogenic components that interacted, are conditioned and still condition the landscape, in space and in time.

Referring to what is stated in the Declaration of the rights of the international memory of the Earth, »*our history and the history of the Earth cannot be separated. Its origins are our origins, its history is our history and its future will be our future*« and »*as an ancient tree retains the record of its life and growth, the Earth retains memories of the past inscribed both in its depths and on its surface, in the rocks and in the landscape, a record which can be read and translated*« (Actes … 1994, 273). Since the geological landscapes have recorded the whole history of the Earth – the geohistory (see Pralong 2006) –, landforms are the visible symbols and the perceptible evidence of this continuous evolution. For this reason the landscape should be perceived and offered as a value, as a heritage.

Recent decades have witnessed an exponential growth of scientific research in mountain environments (e.g. Beniston 2003; Gruber et al. 2012) and in this context the value of geoheritage in mountain areas has been re-discovered in various parts of the Alps (Reynard et al. 2011) and other mountain ranges.

Several characteristics make the mountain environments areas with a great potential for geoheritage, geoconservation and geotourism studies (Giusti et al. 2013):

- Mountain areas are internally diverse, variable and dynamic, due to their elevation, relief, and exposure. They are, therefore, recognized as natural areas with a very high geodiversity, especially the Alpine collisional orogens (Benito-Calvo et al. 2009) in contrast with Tertiary foreland sedimentary basins. This high landform diversity (Thomas 2012, Zwolişski and Stachoviak 2012), often over very short distances, provides open-air laboratories where processes and landscape evolution can be studied and transmitted to a non-specialized public.
- Mountain areas often combine active landforms and processes (active geomorphosites) and inherited landforms (passive geomorphosites) (Thomas 2012; Pelfini and Bollati 2014), as well as evolving passive geomorphosites (Pelfini and Bollati 2014), that is inherited landforms that are reactivated by current active processes. In particular, many mountain areas show clear evidence of late-Pleistocene glaciations and, more in general, evidence of processes that have occurred in different morphoclimatic systems. The active geomorphosites have a high educational value because they allow us to: understand and visualize geomorphological processes in action; envisage the landscape evolution; highlight their relationship with present societies and their future development. Passive geomorphosites, which bring us to the past, have a particular heritage value as records and symbols of Earth's history and evolution.
- Many mountain environments, especially the glacial ones, are very sensitive areas, particularly vulnerable to disturbance and prone to change, where climate change impacts are very acute (e.g. Ravanel (2011) on rockfalls, Stoffel and Huggel (2012) on mass movements, and Haeberli and Beniston (1998) on the cryosphere). Changes are visible at very short time scales and may generate active processes, very evident to observe, such as landslides, thermokarstic landforms or rockfalls due to permafrost melting.
- Mountain areas are also sensitive to natural hazards related to snow processes (avalanches), fluvial and torrential processes (Wohl 2000), as well as processes related to the melting of the cryosphere (Haeberli 1992).
- Mountain landscapes have often a central aesthetic character, which was at the basis of the tourism development in the Alps in the 18th century (Nicolson 1959) and which confers a great potential for the development of geotourism (Cayla 2010). In fact, one could start from aesthetic and landscape perceptions in order to stimulate the knowledge of geological-geomorphological components of the landscape in the general public.

- Finally, mountain ranges, in particular the Alps, have been at the core of important discoveries in the Earth sciences, such as the concept of nappes by M. A. Bertrand (Dal Piaz 2001), the pluri-glacialism (Penck and Bruckner 1909) or the origin of erratic blocks (e.g. Reynard 2004).

These characteristics make mountain areas particularly suitable for educational and tourist purposes. This paper focuses on the importance of mountain geomorphosites for environmental education. It is based on the idea that, because of the characteristics listed above, mountain environments are sites particularly interesting for communicating and educating people (e.g. tourists, scholars) on three main current environmental issues:

- climate change and its impacts on societies, and related adaptation measures;
- natural hazards related to climate forcing and human pressure on the environment;
- human impacts on particularly sensitive geomorphological environments.

After having briefly reviewed the current research carried out on these three topics, we propose two case studies, in the Italian Dolomites and in the Swiss Alps, before a discussion on the interest of mountain geomorphosites for environmental education.

2 Current research on mountain geomorphosites

We have already reviewed the main improvements concerning research on geomorphosites during the last twelve years (Reynard and Coratza 2013). Here we focus on the three thematic issues presented above.

Several scholars have dealt with climate change impacts on specific types of geomorphosites. Diolaiuti and Smiraglia (2010) discussed the issue of glacial geomorphosites that are melting in a context of climate warming; they consider glaciers as a vanishing resource. The glacier recession provokes the formation of new landforms and landscape features, in particular an increase of debris-covered glaciers and thermokarst features (kettles, supraglacial lakes) or the generation of debris flows initiating in recently deglaciated glacier forefields. In this sense, glacier forefields are particularly well-suited areas for observing climate change impacts on the cryosphere and related landforms (Barboux et al. 2014). In particular, the Forni glacier, in the Lombardy Alps, where a geotourist trail was equipped in the early 2000s, is becoming an »*open air environmental museum of deglaciation*« (Diolaiuti and Smiraglia 2010, 148). Similar experiences (in-depth geomorphological survey associated with geotourism development) are carried out on the Miage Glacier, in the Italian Mont-Blanc massif (e.g. Bollati et al. 2013). Garavaglia et al. (2010) demonstrated the interest of dendrochronological methods for studying glacier geomorphosites. Ravanel et al. (2014) also showed recently the great potential of using specific techniques (laser scanning) for measuring landform evolution in high-mountain active and sensitive geomorphosites. Bosson and Reynard (2010) combined several cartographic approaches (geomorphological mapping, geosystemic mapping, reconstruction of glacial stages) for communicating the dynamics of mountain environments to the managers of the Contamines-Montjoie natural reserve managers, in the Mont-Blanc massif. Nevertheless, research on the sensitivity of mountain geomorphosites to climate change still remains undeveloped. In particular, periglacial contexts are poorly addressed in a geotourist and geoconservation point of view, even if their sensitivity to climate change is actively studied. That is also the case of particularly active processes related to climate warming and extreme events, in particular debris flows. Educational programs in these kinds of sites (e.g. torrential systems) should be developed for specific publics such as tourists or scholars, as it was proposed by Garavaglia and Pelfini (2011).

The relationships between natural hazards and geomorphological heritage has also been poorly addressed until now. Alcántara Ayala (2009) proposed a general discussion on these relationships, and Italian scholars developed a methodology to assess risk and geomorphological heritage along (geo)tourist trails (Piccazzo et al. 2007, Coratza et al. 2008, Pelfini et al. 2009). Several case studies focused on the importance of active geosites for explaining the dynamics of geomorphological processes in mountain environments (e.g. Pelfini et al. 2009; Garavaglia and Pelfini 2011; Pelfini and Bollati 2014). Research on passive geomorphosites and past catastrophes are less developed. Recently, Coratza and De Waele (2012) discussed the importance of sites that were prone to natural hazards in the past for environmental education. They stressed that »*important landmarks produced by past hazards, especially if they have an aesthetical appeal, may be important geomorphosites ideal to promote geological education*« (Coratza and De Waele 2012, 195). Nevertheless, they noted that only in very few cases (e.g. Vajont in Northern Italy) past

catastrophes are included in large educational programs aimed at demonstrating the importance of the relationships between geology and society. Especially in tourist areas, authorities may be reluctant to communicate on past disasters as this could scare tourists. All these studies demonstrate that both active and inactive geomorphosites may be of interest for educating people (scholars, tourists, hikers) to the dynamics of mountain geomorphological processes, to the relationships between geology and society (in particular to the impacts of human infrastructures on the triggering of some catastrophes), and to the evolution of mountain risks through time. In this sense, several sites in the Alps could become hotspots for the education to natural hazards, even if at the moment this kind of educational and geotourist product is poorly developed.

Finally, one should stress the fact that human development has great impacts on the particularly sensitive mountain ecosystems. Some of these impacts are linked to the geological and geomorphological contexts. This is, in particular, the case of karstic environments, where pollution issues are related to the specificities of the karstic geomorphological features (Hobléa 2009). French and Slovenian scholars have been particularly active on these issues. Gauchon et al. (2006) and Hobléa et al. (2008) addressed questions concerning the protection of underground karst by using the concept of heritage resource. They stressed the fact that the protection of the endokarstic heritage needs to address territorial planning issues, involving people and communities living in areas quite distant to the areas to protect. In order to involve local populations in the management of their geomorphological heritage, Hobléa et al. (2011) developed the concept of »hybrid research«, that is a research protocol including scholars and local population in the experimentation. In particular, they tested this approach in tracing experiments to better understand underground water circulations. In this context, Erhartič (2010) addressed the issue of karstic features protection through a cartographic approach. In another paper (Komac et al. 2012), the geomorphologists of the Anton Melik Geographical Institute stressed the importance of managing geomorphosites in a dynamic way: the objective should be more to conserve (i.e. to allow the sites to evolve in the future) than to preserve them (i.e. to fix the sites in their present state).

This brief literature review shows how specific mountain geomorphosites could be equipped for developing education programs dealing with current environmental issues such as impacts of climate change on environmental processes, natural hazards management and mitigation, and environmental impacts of human activities (e.g. water pollution). Nevertheless, even if there is a great potential for this kind of educational activities, the Alps, and mountain ranges in general, lack at the moment of articulated programs for environmental education based on specific geomorphosites. In the next section, we develop the case of two sites – one at the regional scale (Dolomites), and one at the local scale (Tsanfleuron geomorphosite), where this kind of program could be developed.

3 Case studies

3.1 The Sassolungo Group, Gardena Valley, Dolomites (Italy)

The Dolomites – universally known for their scenic beauty and scientific interest and proclaimed in 2009 as a UNESCO »Word Heritage« site – make up a unique natural environment on our planet. The long and complex geological and geomorphological history of this region has created typical and spectacular landforms with huge vertical cliffs, whitish, silver or pink rock pinnacles and towers rising from green slopes made up of darker and brittle rocks, with woods, pastures and scattered hamlets. Due to their high geomorphodiversity (Panizza 2009), the Dolomites can be considered as a high-altitude field laboratory for research, development of geomorphological theories and understanding, as well as for the development of effective educational and dissemination strategies and activities (Bruschi et al. 2009).

The area, considered in the present study, is located in the southeastern portion of Gardena Valley, in particular in the upper part of the valley, mainly occupied by the Sassolungo Group (more than 3000 m). The area has a strong hiking-tourism vocation thanks to its spectacular high-mountain landscape and a dense network of hiking tracks. The well-developed network of hiking paths and slopes for many different climbing skills offer a lot of possibilities for high-mountain excursions. Permanent dwelling-places are absent with the exceptions of a few tourist structures nearby opened during certain periods of the year.

From a geological viewpoint, the Sassolungo Group is formed by limestone and dolomite formations referable to the Sciiliar Group (Upper Anisian-Lower Carnian). These correspond to dolomites and dolomitic

Figure 1: Examples of glacial landforms present in the Gardena Valley: worthy of note are the well preserved glacial cirques located in the northern slope of Sassolungo Group, at the Sasso Levante (a) and near Punta Dantersas at about 2740 m A.S.L. (b), as well as *roches moutonnées* located in the eastern slope of Sassopiatto (c).

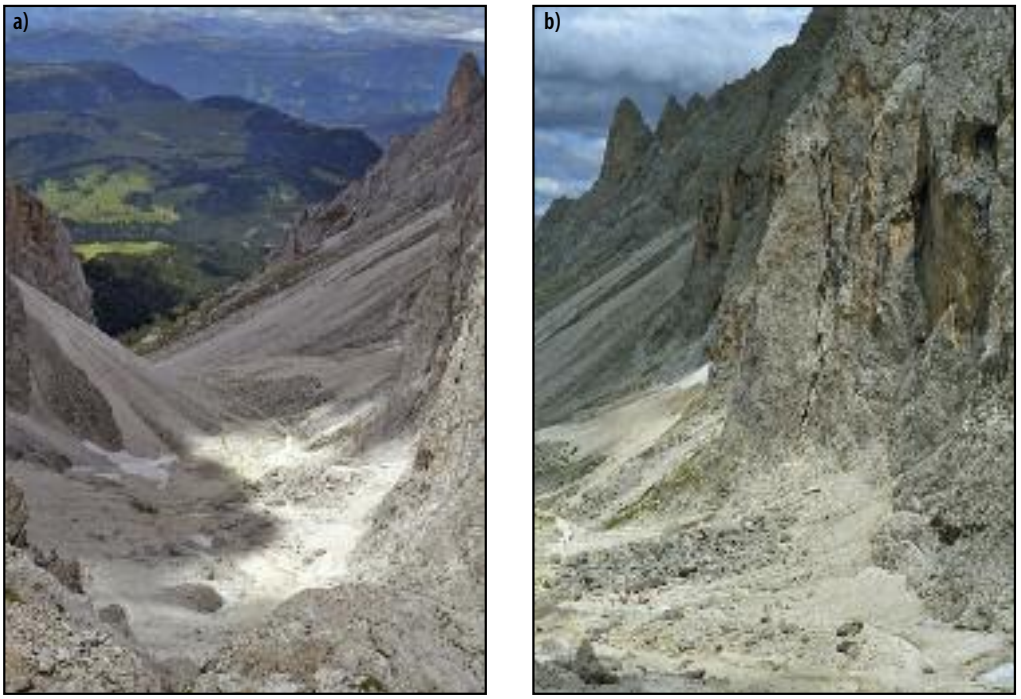

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Figure 2: Examples of landforms and processes active in the current morphoclimatic conditions: partially active talus cones (a) and rock-fall accumulation in the narrow Sassolungo valley (b). Both landforms and the related processes are responsible for hazards, which might threaten the safety of visitors and tourists.

limestones, very light pearl pink or whitish, in some rare cases reddish or greyish, in color, usually not stratified. The group is characterized by subvertical cliffs (up to 700 meters high) which make up the source of the thick scree deposits that are accumulated at the foot of the walls and join the cliffs to the more gentle slopes made up of darker and softer terrain, mainly consisting of Wengen Formation (Upper Ladinian).

This area, as with all the Dolomites, represents landscape mosaics, which express the summation of landscape histories and processes (Thomas 2001), offering an almost complete educational open-air laboratory due to the variety and complexity of phenomena and processes taking place during present climate conditions and during recent geological periods. These mountains, due to the aggregation of relict, recent and active landforms constitute an outstanding geoheritage, suitable for educational and tourist purposes. Landforms typical of past morphoclimatic conditions (passive geomorphosites) share the stage with forms and processes active in the current morphoclimatic conditions (active geomorphosites); their spatial and geometrical relationships may be sufficient to trace a relative time-line of the geomorphological history of the area. That history represents an important piece of information: as cities are visited by tourists thanks to their historical heritage (monuments etc.), the landscape also has its own historical heritage (geosites and geomorphosites) to be discovered, understood and therefore appreciated (Coratza et al. 2008). As in all the Dolomites, structural and geological characteristics represent the main factors controlling the landscape of the area (Coratza et al. 2005). Depending on the lithology, different litho-structural forms have developed: dolomitic outcrops have been highly fractured under tectonic pressure, developing large and deep channels that cut through the massifs and a dense network of several fracture systems that amplify cryogenic processes. Several glacial landforms are present in the valley, showing the presence and the activity of ancient glaciers (Figure 1). Worthy of note are the well preserved glacial cirques located in the northern slope of Sassolungo Group, at the Sasso Levante and near Punta Dantersas at about 2740 m, as well as *roches moutonnées* located in the eastern slope of Sassopiatto.

The gravity-induced slope landforms and processes are the most recurrent geomorphological features active since the end of the Lateglacial within the area (Figure 2). The water of snow melting and heavy rain-

fall, occurring mainly between June and September, together with the wide availability of frost shattering material, cause concentrated runoff ditches, debris flows and active talus and scree slopes, partially covering traces of palaeforms related to periglacial and glacial processes. Moreover, several spectacular falls and topples detaching from over 2000 m high peaks of Sassolungo Group are clearly visible and witness the dynamicity of processes in the area. Among the most evident rock-fall accumulations and talus cones, worthy of notice are those located on slopes at the base of the dolomite massif of Sassolungo Group, crossed by a well-frequented hiking track.

The landforms and processes active in the current morphoclimatic conditions may be responsible for hazards, which might threaten the safety of visitors and tourists (Brandolini et al. 2006; Pelfini et al. 2009; Bollati et al. 2013; Pelfini and Bollati 2014). In particular, fast-occurring processes might directly involve tourists in proximity to the sites of interest or along access roads and footpaths. By examining the chronicles of accidents that occurred in Alpine areas during the past few years, it results that debris flows and falls are the processes, which should be taken into account more than any other. This is true essentially for three reasons: the first is the very close link between these natural phenomena and extreme meteoric events, which now take place with extremely irregular recurrence and higher frequency than in the past; the second reason is linked to the considerable velocities that a mass of debris can attain, thus also threatening people moving fast in the surroundings; the third reason concerns the difficulty of identifying the source areas of these disarray phenomena.

Therefore, this area constitutes an outstanding open-air laboratory suitable for developing new ways and strategies to educate hikers to the dynamicity of mountains environments and to natural geomorphological risks, favoring an easy understanding of the landscape and of its hazards and a responsible and safe fruition of high-mountain tourist areas.

3.2 The Tsanfleuron glacio-karst, Western Swiss Alps

The Tsanfleuron glacio-karstic geomorphosite is one of the largest karstic areas of the Swiss Alps. It is characterized by a complex combination of karstic and glacial processes, unique at the country scale, which

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Figure 3: (a) A view of the glacio-karst of Tsanfleuron. (b) The part of the karren field deglaciated since the beginning of the Holocene. (c) A detail of karren fields.

makes it a rare and unique geosite in the Swiss Alps (Reynard 2008). These specificities have attracted Swiss and foreign researchers for the last 40 years, which makes the site one of the most studied and documented karstic sites in the Western Swiss Alps. This is one of the reasons why in 2006, the French Association of Karstology visited the area during its annual field trip (Hobléa et al. 2008). The karst is inscribed in the list of Swiss geosites for the unique combination of karstic and glacial landforms.

The Tsanfleuron karren field belongs to the Helvetic nappes and consists of Jurassic to Palaeogene sedimentary rocks (Gremaud et al. 2009). The nappe forms a vast anticlinorium, with Tertiary limestones outcropping in the downstream part and Cretaceous Urgonian limestones outcropping in the upper part. The latter is characterized by the presence of a glacier that is retreating very quickly, and allows a large set of glaciokarstic landforms (Nye channels, glaciokarstic depressions, carbonate precipitation microforms, etc.) to be visible. The combination of limestone outcrops and a network of pro- and subglacial streams creates complex underground water circulations (Gremaud et al. 2009; Gremaud and Goldscheider 2009) and impacts on the protection of springs captured for drinking water supply (Savoy et al. 2008).

The diversity of karstic and glacial landforms (Figure 3), the fast retreat of the Tsanfleuron glacier (Reynard 2006; Martin 2013), and the complexity of water circulations have induced the University of Lausanne to select this site as a hotspot for mountain geomorphology research, but also for the development of an educational program (Reynard 2008) on the mountain geomorphology and its sensitivity to climate change and to human impacts on the karstic environment (in particular water circulations). An educational brochure was produced, as well as a geotourist map (Martin and Reynard 2009) and an educational product – called »Rocks and Water« – was specifically dedicated to school children of the middle schools in the region. An interactive application – showing, in particular, the fast retreat of the glacier and also some glacial processes such as glacial erosion – was also created.

All these geotourist and educational products aim at developing a better understanding of current geomorphological processes in a high-mountain changing environment. A survey among the users (Martin 2013) shows that even if they are well illustrated with good-quality figures and maps, the message of such products remains still a little bit too difficult for users without specific knowledge in geosciences. This kind of realization should, therefore, be developed taking better into account the knowledge of the potential public (Martin 2013).

4 Conclusion

Mountain geomorphological features are often very impressive and aesthetic, and geomorphological processes are active and very visible in the landscapes. For all these reasons mountain geomorphosites seem to be particularly interesting sites for developing educational activities on environmental issues such as fast changing environments due to climate warming, natural hazards or human impacts on sensitive environmental sites. Nevertheless, at the moment, few sites have clearly been used for developing these kinds of activity. This is one of the objectives of the Working group on geomorphosites of the International Association of Geomorphologists (IAG) for the period 2013–2017.

ACKNOWLEDGEMENTS: This paper is dedicated to our colleague Bojan Erhartič, who disappeared too early in a plane crash in 2013 when he was returning home after fieldwork in the Slovenian mountains. Bojan took part for many years in the activities of the Working group on geomorphosites of the International Association of Geomorphologists (IAG) that we have had the honor of chairing since 2001 (Reynard and Coratza 2013). Bojan Erhartič was particularly active and took part, among other events, in the workshop on mapping issues organized in Lausanne in 2008 (Erhartič 2010), in the conference organized by our colleague Christian Giusti in Paris in 2009 (Erhartič et al. 2012, Komac et al. 2012), and more recently in the session on geomorphosites during the International Geomorphology Conference in Paris, in August 2013, a few weeks before he passed away. Bojan has played a central role in the development of geomorphosite studies in Slovenia (see for example his papers on geomorphosite assessment (Erhartič 2010) and on geodiversity and geomorphosite studies in Slovenia (Erhartič and Zorn 2012). We hope that his colleagues will continue his legacy and develop further research on the geomorphological heritage of Slovenia. The English proofreading by Meredith Blake is much appreciated.

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STAKEHOLDER CONFLICTS IN THE TIVOLI, ROŽNIK HILL, AND ŠIŠKA HILL PROTECTED LANDSCAPE AREA

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Forest forms the central part of the park.

Stakeholder conflicts in the Tivoli, Rožnik Hill, and Šiška Hill Protected Landscape Area

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ABSTRACT: Green areas and especially their distribution and composition are the key factor that makes urban people's lives more comfortable and healthier. Even though Ljubljana residents also have many other green areas at their disposal in their immediate vicinity, the area of Rožnik Hill and Tivoli Park as an urban forest with dispersed park features continues to be the most popular recreational destination, with roughly 1,750,000 visits per year. In 1984 it was designated a protected landscape area through an ordinance. In the past decades, a number of conflicts have arisen in this area between various stakeholders, such as landowners, park users, and specialist services, which is why these types of areas require careful and prudent management.

KEY WORDS: geography, protected area, protected landscape area, management, green areas, urban forest, Ljubljana

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1 Introduction

Cities are areas of large concentrations of people and economic activities, serving as transportation hubs, centers of a creative environment, and drivers of development for the surrounding countryside, as well as centers of economic, social, and cultural life (Ravbar, Bole and Nared 2005; Kozina 2010). All of these activities, which typically shape urban areas, influence the quality of the urban living environment. Outdoor recreation largely takes place in interconnected natural and manmade green areas. They are ascribed the role of identity bearers, which is ensured through planning spatial development and setting up and maintaining the urban green areas. In addition to important ecosystem services such as air and water purification, wind and noise filtering, or microclimate stabilization, natural areas provide social and psychological services, which are of crucial significance for the livability of modern cities and the wellbeing of urban dwellers (Chiesura 2004). There is strong evidence that parks have the positive impacts on : 1) biodiversity; 2) property prices; 3) physical activity and reduced obesity; and 4) local cooling (Konijnendijk et al. 2013). A park experience may reduce stress (Ulrich 1981), enhance contemplativeness, rejuvenate city dwellers, and provide a sense of peacefulness and tranquility (Kaplan 1983). Local communities often overlook green areas or only become aware of their significance when they are insufficient because their primary role is recreational rather than economic.

In the City of Ljubljana, which has an area of 275 km^2 and a population of approximately 280,000 (Internet 1), residents have relatively convenient access to green areas, including urban forest. The bases of Ljubljana's green system are formed by the green areas that extend into the city center and are complemented by marked circular and transverse connections and a point network of public parks. Many people use them every day and hence it is vital to include this area in the framework of the long-term vision of harmonizing the needs and demands of visitors, city dwellers, and owners (Žižek 2010). A forest is a meeting place of various interests that serves several purposes. Human needs and demands in relation to a forest change faster than the forest. A forest can be merely a recreational area, or first and foremost the main element of a recreational experience (Anko 1990). Recreation in forest does not include a single activity and is not uniform; it is a series of activities, the goal of which is to replenish people's physical and mental strength by enabling them to escape an overburdened environment, and seek a primal state and contact with nature. People usually make brief visits to the forest, but the frequency of their visits is relatively high; most importantly, Slovenian forests can be visited practically for free throughout the year (Anko 1990). A study of urban forests in various European cities highlighted four types, in which Ljubljana was mentioned as a good example in connection with two of them (Pauleit et al. 2005):

- Closed woodland surrounding the city (Oslo – Norway, Ljubljana – Slovenia);
- Woodland islands and belts within the city (Ljubljana – Slovenia, Munich – Germany);
- Dispersed woodland within an urban matrix (Black Country, United Kingdom);
- Small woodland areas in parks and gardens within the city; dispersed woodland in an agricultural matrix around the city (Florence – Italy).

As an urban forest with dispersed park features west of Ljubljana's center, the Tivoli, Rožnik Hill, and Šiška Hill area occupies a special place among the city's green areas. This article evaluates this area from the viewpoint of key stakeholders and features, and it outlines guidelines for future development.

2 Methods

The following methods were used in the study, which was conducted from July 2009 to September 2010:

- studying and analyzing literature, secondary sources, and legislation, collecting available databases, and preparing materials for fieldwork;
- fieldwork: counting visitors (on three Sundays and three weekdays at various times of the year);
- surveying visitors and residents about the park and parking (150 surveys; half among visitors and the rest on Prešeren Square in downtown Ljubljana among random residents that had lived in Ljubljana for at least one year);
- structured interviews for various target audiences: twenty interviews with experts in various fields (forestry, geography, architecture, sociology, and ethnology), representatives of various institutions (the Slovenian Forest Service, the Institute of the Republic of Slovenia for Nature Conservation, the Slovenian Institute for the Protection of Cultural Heritage, the Ljubljana Zoo, the University of Ljubljana's Botanical Gardens, the Tivoli Sports Recreational Center, and the City of Ljubljana), landowners, park residents, and representatives of civil society initiatives;
- data analysis and spatial display in the geographic information system.

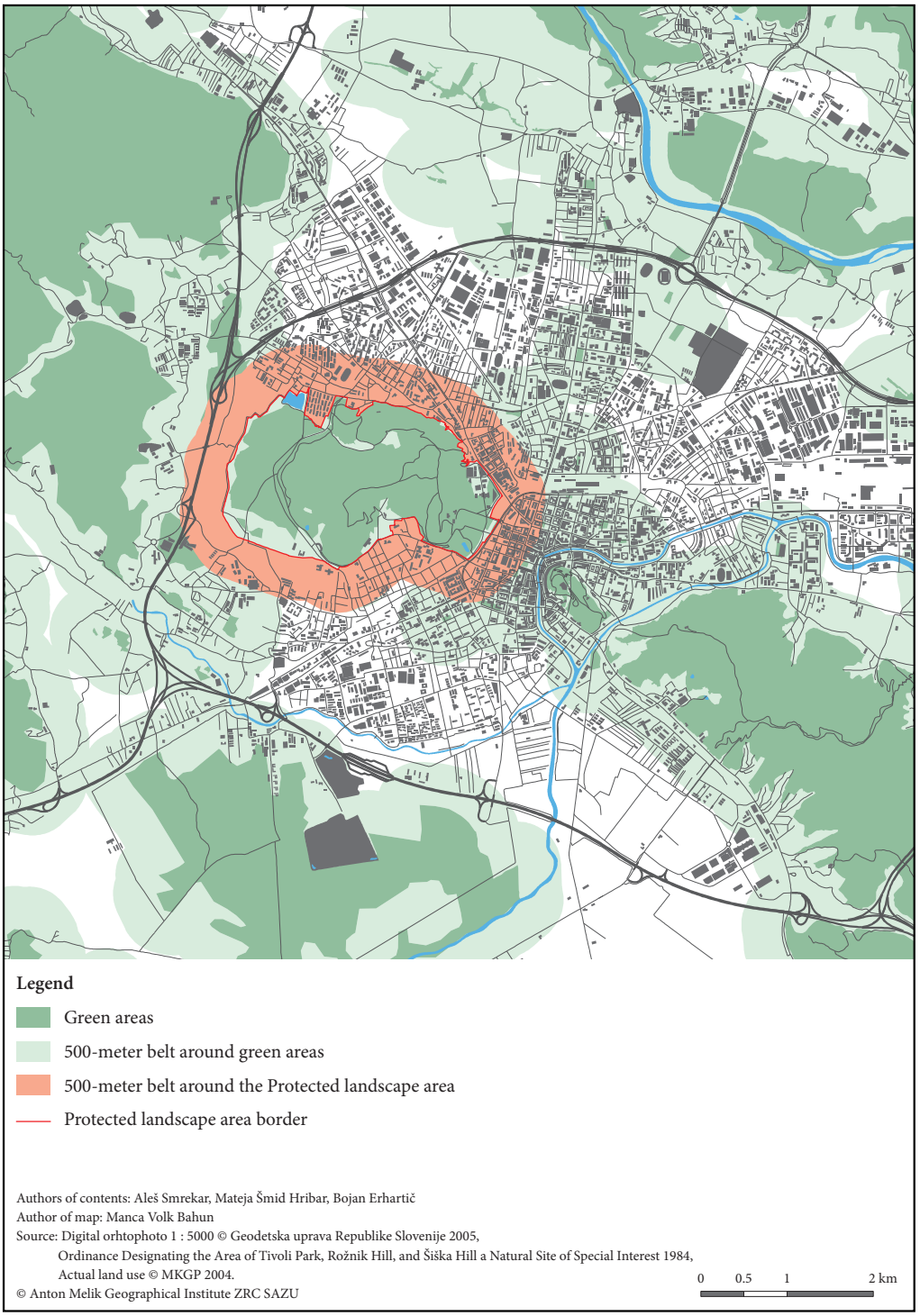

Figure 1: Green area accessibility in Ljubljana.

3 Outline of the park and its main stakeholders

With a total area of 459 hectares, the Tivoli, Rožnik Hill, and Šiška Hill Protected Landscape Area extends across the northwestern edges of Ljubljana. The eastern part of this large park is covered by Tivoli Park, which is a good example of a designed natural area. Tivoli Park rises gently 130 m above the surrounding landscape to the top of forested Rožnik Hill and is the central part of the larger park area. Its western part is flat and lower, mostly wooded, with scattered open spaces. The western border of the park mostly runs along the thirty-kilometer long recreational trail around Ljubljana known as the »Path of Remembrance and Comradeship«, which has strong cultural and historical associations (Kranjc, Simoneti and Vidic 2006).

In 1984, the Ordinance Designating the Area of Tivoli Park, Rožnik Hill, and Šiška Hill a Natural Site of Special Interest proclaimed this area a protected landscape area »that represents the unique identity of the city of Ljubljana, where natural and cultural elements are combined into a uniform cultural and landscape area« (Odlok o razglasitvi Tivolija … 1984). Judging from Article 2 of this ordinance, the area was designated as such for both natural and cultural reasons. In addition, the protected landscape area also includes other types of protected areas.

Despite the vicinity of the city center, its densely built-up surroundings, and a large number of visitors, the park has great biodiversity. Its hilly part is mostly covered in wild forest flora composed of acidophilous sessile oak and chestnut forests, beech forest with hard-fern, and pine forest with blueberries (Jogan 2003). An aerial photo analysis showed that forest covers 341 hectares or 74% of the park. In its central part its share is significantly higher than that (i.e., 92%). Over four hundred plant species have been identified across the entire park (Jogan 2003). The diverse mix of bird species is another important element of this area (DOPPS 2005, cited in Načrt upravljanja … 2008). The main reasons for such great diversity are the diverse habitat types: forest with various combinations of deciduous and coniferous trees and a large share of old trees, a park, water areas, and an urban environment.

The park does not contain any major densely built-up settlements or business organizations whose operation would depend on exploiting natural resources. A considerable portion of its southern part is taken up by the dispersed complex of research and educational institutions belonging to the emerging Biological Center (Butina 2009).

Several facilities can be found in its central wooded area at Mostec, where there are ski-jumping hills, jogging trails, and places for socializing as part of the Mostec Sports and Recreation Center. There is a catchwater on nearby peak.

The majority of trails can be found in Tivoli Park and in the wooded part of the larger park area above it. The central park in the protected landscape area has a total of approximately 85km of trails, which corresponds to nearly 300 meters per hectare. The central area has no asphalted or other paved trails.

During the twentieth century, various sports and leisure facilities were introduced to Tivoli Park, which contains over eighty tree species. Tivoli Hall, built in 1965, is the largest recreation complex in the park (Internet 2). Other facilities include the tower of the former ski jumping hill on Galle Hill (*Galetovo*), the military installation at the top of Šiška Hill, numerous air-raid shelters, and the catchwater on Tivoli Peak (*Tivolski vrh*; Načrt upravljanja … 2008).

There are approximately thirty cultural heritage sites in the park. The Register of Immovable Cultural Heritage treats the wooded part of this area as a cultural landscape and Tivoli Park as a garden-architecture heritage site. In addition, the status of a cultural heritage site has been conferred on Cekin Castle and its park, Tivoli Castle, Tivoli Hotel (also known as 'the Swiss House' (*Švicarija)*), the former open-air theater behind Tivoli Castle, and approximately fifteen statues, monuments, and memorial plaques (Register nepremične … 2010).

Ten information boards with a map of the park can be found at highly frequented locations, informing visitors about the special features, characteristics, and values of the protected landscape area.

3.1 Landowners

According to Zadravec (2004), 56% of the forested land on Rožnik Hill is privately owned. It is divided between approximately 340 owners, a full half of whom do not manage the forest. Based on the surveys conducted among them, Zadravec established that only a tenth of respondents receive some kind of income from the forest. Half of the owners are over sixty years old and almost all of them (i.e., 97%) inherited wooded land

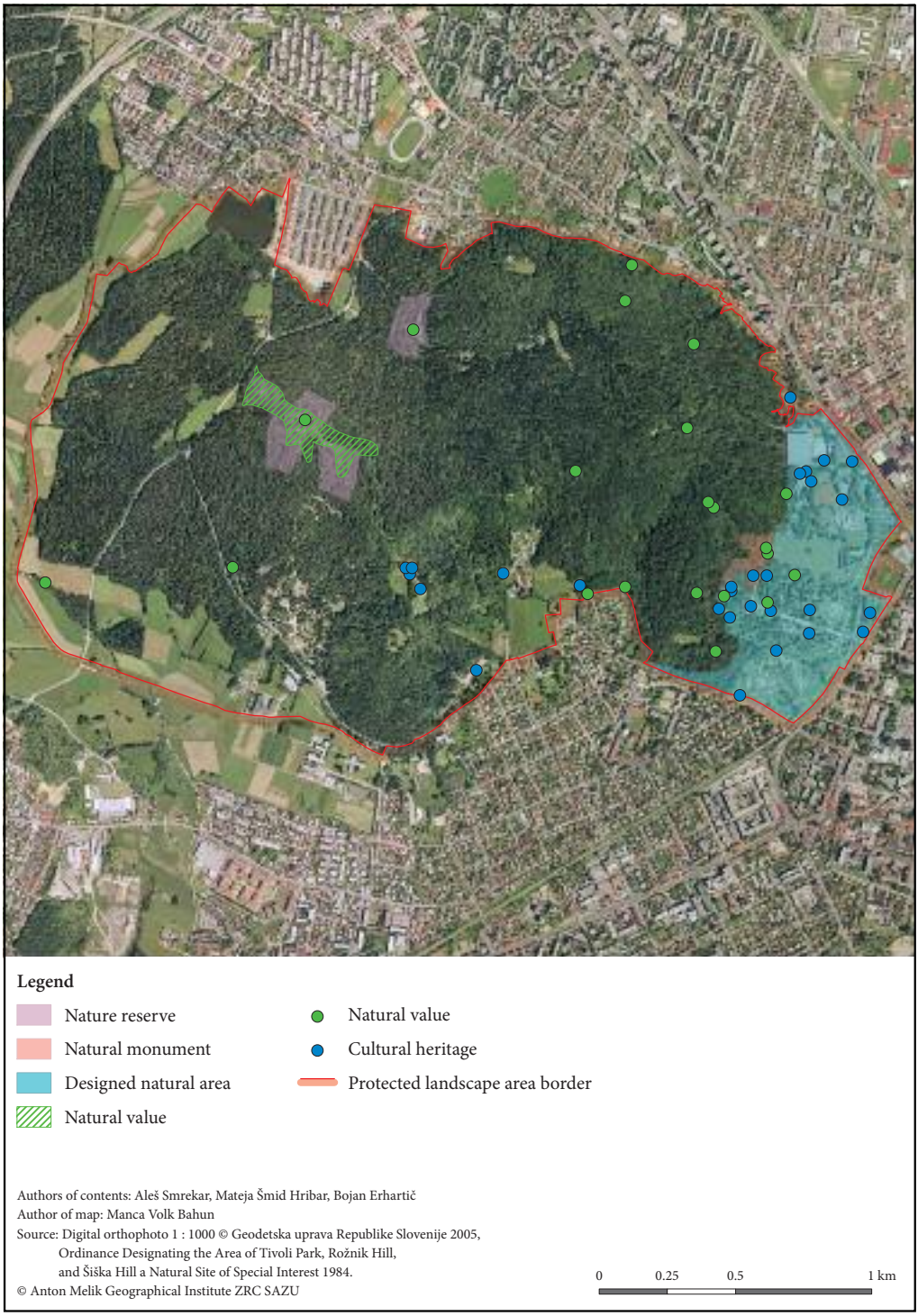

Figure 2: Main parts of the protected landscape area.

Legend

- Publically owned
- Privately owned
- Protected landscape area border

Authors of contents: Aleš Smrekar, Mateja Šmid Hribar, Bojan Erhartič
Author of map: Manca Volk Bahun
Source: Digital orthophoto 1 : 1000, Digital land cadaster © Geodetska uprava Republike Slovenije 2005,
Ordinance Designating the Area of Tivoli Park, Rožnik Hill,
and Šiška Hill a Natural Site of Special Interest 1984.
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0 0.25 0.5 1 km

Figure 3: Land ownership in the park

on Rožnik Hill. The wooded lots are small and very fragmented: two-thirds of owners own less than one hectare of forest, just under a third own one to five hectares, and just under a fifth of them own more than five hectares. Just under half of the owners live in the immediate vicinity of the park, and two-fifths visit the woods at Rožnik very rarely (i.e., only a couple of times a year or never). Logging is carried out by 16% of the owners, and clean-up logging by 29%. Their most frequent reasons for not logging are not being qualified for it (37%), not being physically able to do it (24%), and the fact that logging is not economically attractive to them (22%; Zadravec 2004).

Recently several major owners have performed clean-up logging in their forested land in line with a decree from the Ljubljana Unit of the Slovenian Forest Service (Čad 2010). The owners of smaller patches of forest usually do not take care of them and accordingly also do not carry out maintenance work and clean-up logging. The owners are very displeased with the current situation, as shown by their comments: »Ljubljana residents think everything belongs to the city and are unaware that this is private property; as the owner I'm paying for other people's recreation« (Babnik 2010); »… we owners are protecting our interests, which means we're restricting movement and use« (Čad 2010). According to Zadravec's findings (2004), forest owners highlight the improper behavior by visitors. Čampa (1993) established that vandalism, recreation, disrespect for property, and motor vehicles are the most problematic.

3.2 Visitors

Compared to landowners, visitors are a larger group of the park users. Because there are no official data on or estimates of how many people visit the Tivoli, Rožnik Hill, and Šiška Hill Protected Landscape Area on a daily or annual basis, this information was obtained by counting visitors in 2009 and 2010.

Table 1: Visits to the park area at individual counting points.

Counting Point	Fall (September 2009)			Winter (January 2010)			Spring (May 2010)		
	Entry	Crossing	Total	Entry	Crossing	Total	Entry	Crossing	Total
1	833	–	833	935	–	935	1,199	–	1,199
2	–	925	925	–	471	471	–	1,352	1,352
3	1,196	–	1,196	875	–	875	1,370	–	1,370
4	548	–	548	634	–	634	634	–	634
5	2,144	–	2,144	1,064	–	1,064	2,586	–	2,586
6	882	–	882	719	–	719	918	–	918
7	–	1,414	1,414	–	1,207	1,207	–	2,010	2,010
8	–	2,027	2,027	–	1,283	1,283	–	2,934	2,934
9	–	2,114	2,114	–	1,868	1,868	–	2,278	2,278
10	–	–	–	–	–	–	2,289	–	2,289
11	–	–	–	–	–	–	1,461	–	1,461
12	–	–	–	–	–	–	389	–	389
13	–	–	–	–	–	–	329	–	329
14	–	–	–	–	–	–	1,033	–	1,033
15	–	–	–	–	–	–	1,616	–	1,616
16	–	–	–	–	–	–	396	–	396
17	–	–	–	–	–	–	135	–	135
18	–	–	–	–	–	–	502	–	502
Total	5,603	6,480	12,083	4,227	4,829	9,056	14,857	8,574	23,431

The majority of visitors (44%) were fifteen to thirty-five years old, followed by those thirty-six to sixty-five years old (36%), and people over sixty-five (6%).

Like the majority of outdoor recreational activities, visits to the park also have two annual peaks, one in the spring and one in the fall. The number of visits is smaller in the summer because of the heat and summer vacations, and in the winter because of the low temperatures and short days. The number of people visiting the area during the week is three times smaller than on Sundays, which can be ascribed to work and other obligations. Based on the counts, it can be estimated that during weekdays the park is visited

Figure 4: Points for counting visitors in the park.

by an average of 3,500 people, on Sundays in winter by 6,000 people, on Sundays at other times of the year by approximately 9,500 people, and on the most pleasant days off work by approximately as many as 20,000. A field inspection showed that the number of Saturday visits is approximately 25% less than the number of Sunday visits. Based on multiple counts, observations, and calculations, we estimate that approximately 1,750,000 people visit the Tivoli, Rožnik Hill, and Šiška Hill Protected Landscape Area annually. However, this number does not include special events (i.e., the May Day celebration on Rožnik Hill, a large number of gatherings at the Mostec area, and the large sports and entertainment events held at Tivoli Hall), visitors to the ZOO and Tivoli Hall, and parking area users (Smrekar, Erhartič and Šmid Hribar 2011). The daily rhythm of weekend visits shows that visitors come in two waves: in the morning between 10:30 and 12:30, and in the afternoon between 3:30 and 5:00 (in the spring even as late as 6 pm). During the week, people tend to visit the area mainly in the afternoons.

The majority of visitors enter the area from the city center. They enter the central, wooded part of the park through Tivoli Park and the Mostec area. Many of them also use part of the Path of Remembrance and Comradeship. The main type of recreation in the area is hiking (73%), followed by cycling (13%) and jogging (7%). A smaller share of respondents also use the forest to walk their dogs and other pets, date, attend large-scale events, feed the birds, gather berries and nuts, visit exhibitions or museums, and to visit the local restaurants.

The inventory also showed the most common forms of socializing. This depends on the dynamics, behavioral characteristics, infrastructure needs, and (in)compatibility of different recreation (Anko 1987). The inventory of visitors revealed that a quarter of visitors come to the park alone, a quarter come with their partner, a quarter with their families, 18% with a friend, and 7% as part of a large group.

The survey showed that Tivoli Park and the wooded area are similar in terms of the average time visitors spend there; visitors tend to linger only slightly longer in the central wooded area. The majority of those visiting these two areas (i.e., 37%) stay there just under an hour (41 to 60 minutes), followed by those that visit the area for 21 to 40 minutes, and finally, those that leave the area in less than twenty minutes. Only a few people stay in the park for more than two hours, which confirms the assumption that the area is mostly a recreational place where visitors go for a quick rest.

Even though the visitors live fairly close to the area, a full 45% of the respondents go there by car or motorcycle, 27% walk, 18% come by bike, and only 10% use public transport. Regardless of the means of transport used, the majority of visitors surveyed need sixteen to thirty minutes to get to the park from their homes, 36% get there in six to fifteen minutes, and 5% live less than six minutes away. Sixteen percent of the respondents need more than half an hour to reach the area.

4 The park as a value

One of the starting points of our research was to examine whether the Tivoli, Rožnik Hill, and Šiška Hill Protected Landscape Area is considered a value and, if so, what kind of value. The park is definitely very important for Ljubljana residents because it offers them diverse ways of experiencing the natural environment and an opportunity to relax psychologically and exercise outdoors. Judging from the opinions expressed in the interviews, we can conclude that the area is a value that needs to be protected.

The key value of the area studied is the immediate vicinity of the natural environment (341 hectares of forest and 43 hectares of Tivoli Park as an example of a planned natural area), which is freely accessible to numerous Ljubljana residents and visitors. According to Torelli (2010), this kind of harmony between the city and the forest, in which the city changes into a conserved forest via a designed park, is difficult to find in other comparable European cities. In Ljubljana, one can walk in less than fifteen minutes from one edge of the forest to another through the city center (Rožič 2010).

This fact places the recreational and social aspects that contribute significantly to the wellbeing in the city at the forefront (Pirnat 2010; Pergovnik Cotič 2010). In 1860, when Ljubljana Mayor Etbin Henrik Costa bought Tivoli Castle, Tivoli Park was described in the newspapers as »the most beautiful place in Ljubljana.« This certainly attests that the area studied, and especially Tivoli Castle and its surroundings, was once considered an aesthetic value among the city's residents (Ovsec 1994). In addition, ecological and ecosystem aspects also stand out in the park. It is completely understandable that in this type of environment economic aspects are pushed into the background. The multifaceted nature of the urban forest,

MILAN OROŽEN ADAMIČ

Figure 5: The city extending into the park.

BOJAN ERHARTIČ

Figure 6: The Little Rožnik Hill Nature Reserve.

which is simultaneously a natural and cultural heritage site, should also be taken into account in the management of the park.

Another value, which may not seem as obvious at first glance, is the area's natural endowment with water (Jerman 2010; Rožič 2010). Rožnik and Šiška hills have a number of springs. It is no coincidence that the path from Bellevue Hotel to Tivoli Hotel is referred to as the »Trail of Seven Footbridges« (Jerman 2010; Rožič 2010), and that a kneipp-spa operated near the Čad Inn at the beginning of the twentieth century (Ovsec 1994; Torelli 2010).

Torelli (2010) also drew attention to the museological and educational value of the area, which makes it possible to experience the forest as a live museum. This also includes the unmaintained section of the forest or the »urban wild,« and thus not only the designed park, but also the forest, where one can see wild animals. Parks are usually a common feature in capital cities, whereas a wild forest in the direct vicinity of the city center is more of a rarity (Kurinčič Mikuž 2010; Kranjec Menaše 2010).

5 Discussion

The analysis shows that the entire park is divided into three distinct parts: the smaller designed park (Tivoli), the wooded part (Rožnik and Šiška hills), and the green areas between the Koseze and Brdo neighborhoods. Each of them has its own typical features and offers a different way of experiencing the natural environment and spending free time. All three parts must be viewed as a complementary whole because the interconnection of various places are important not only for people, but also for plants and animals, presents a unique added value for them. This is what distinguishes this area significantly from other green areas found in other major European cities.

Hiking is the most frequent type of recreation. Because of the large number of people visiting the park (up to 20,000 visitors a day and roughly 1,750,000 visitors a year), conflicts arise between landowners, visitors, and the objectives of natural and cultural heritage conservation (Odlok o razglasitvi Tivolija … 1984). In order to prevent conflicts, activities that are in line with the conservation objectives of the park must be clearly highlighted, and land ownership must be regulated to avoid dissatisfaction among both owners and visitors. Because of unregulated ownership, the forest represents a burden to the owners or, as highlighted by Anko (2010), »*Rožnik Hill is utterly useless for an owner, but an ideal thing for the city dweller*.« The best solution would be to purchase the private land in the park. A step in this direction has already been made with the adoption of the Ordinance Designating Special-Purpose Forests (2010). According to this ordinance, the owners of wooded plots are entitled to tax relief or compensation and, if an owner so requests, the City of Ljubljana is obligated to purchase his wooded land.

Without a common long-term vision combining development and protection, the vested interests of the landowners, the municipality, and visitors result in spontaneous development, which usually increases the dissatisfaction among all stakeholders. The area is currently quite neglected and in many places also degraded. The municipality must assume the key role in seeking joint solutions. Overall development should proceed from the assumption that the area is a green oasis in the middle of an urban environment, in which residents can relax and experience the natural environment (Pergovnik Cotič 2010).

However, after nearly twenty-five years the park still does not have a manager to take care of the numerous aspects of the protected area. In addition, zoning of the area is vital, with a suitable distribution of activities. The forest covers a full 74% of the protected area. Because this is an urban forest, its management should focus on seeking a balance between ecological and social functions.

The area has various categories of trails. The most problematic are the muddy unmaintained tracks, crisscrossing one another and subject to erosion (Verlič et al. 2015). Therefore, some of these tracks should be closed to visitors and some should be converted into trails, to which visitors (who now walk wherever they want) could be diverted. This would move people away from some areas to areas intended for recreation.

6 Conclusion

A high-quality living environment is an exceptionally important life value of modern urban life, and green areas are one of its key factors. One of the largest and most popular green areas in Ljubljana is the Tivoli, Rožnik Hill, and Šiška Hill Protected Landscape Area.

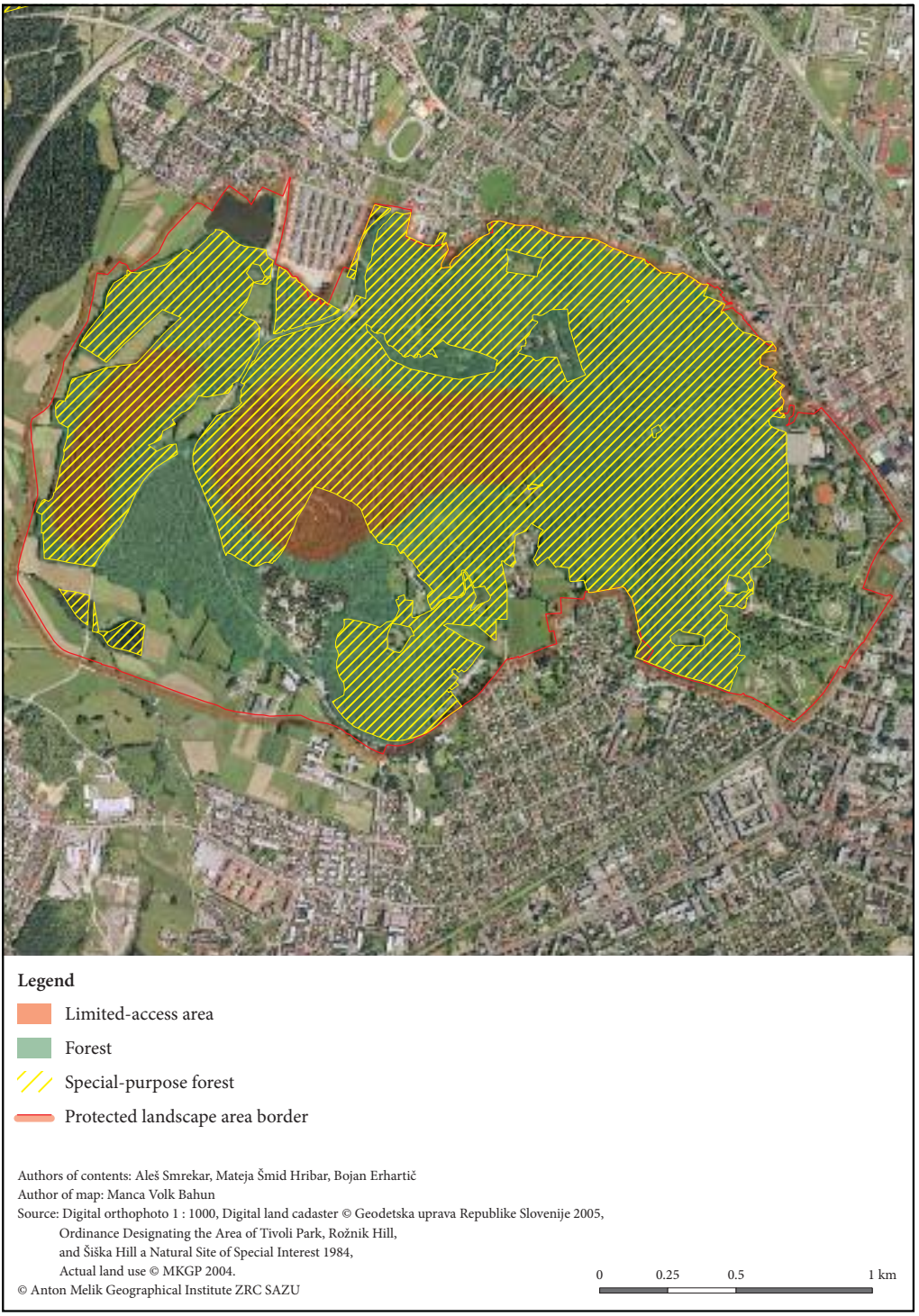

Figure 7: Redirecting visitors in the park.

It is estimated that this protected area is annually visited by approximately 1,750,000 people, not even counting the visitors to the ZOO and Tivoli Hall, and the users of the parking areas in Tivoli Park. The largest number of people visit the park on Sundays (i.e., up to 20,000). Visitors are usually seeking a brief break from their daily work. Such a large number of visitors to this area proves that it has very important value to visitors.

A number of interests of various stakeholders are present in this type of urban protected area, which demands comprehensive management that includes nature protection, preservation of the cultural landscape, and understanding human activities within the area, on the part of both landowners and visitors. In the case of improper management, forest owners face the most problems among the stakeholders because satisfying the interests of the general public may threaten their economic management of the forest. In addition to landowners, visitors are also affected because they are expected to use the existing trails in the urban forest. It would be most prudent for the municipality to purchase the forest land. Managing a protected landscape area urgently demands zoning with an optimal distribution of activities. In an urban forest that attracts many visitors, one must precisely define the trails for hikers, joggers, and cyclists. In conclusion, attention is drawn to the following thought by Hildebert de la Chevallerie: »*it is vital for the further development of Tivoli Park to evaluate the entire area of the City of Ljubljana without delay and include [*the park] as a 'green belt' in spatial planning. This task, which every generation will fulfill as its duty piece by piece, will decide on the quality of life in Ljubljana« (1994, 15).

ACKNOWLEDGEMENTS: This article is the result of the project »Assessing the Visitor Burden and Capacity of the Wooded Section of the Tivoli, Rožnik Hill, and Šiška Hill Protected Landscape Area« financed by the City of Ljubljana. Detailed results are presented in the volume *Krajinski park Tivoli, Rožnik in Šišenski hrib* (The Tivoli, Rožnik Hill, and Šiška Hill Protected Landscape Area; Smrekar, Erhartič and Šmid Hribar 2011).

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THE BEAUTY OF LANDFORMS

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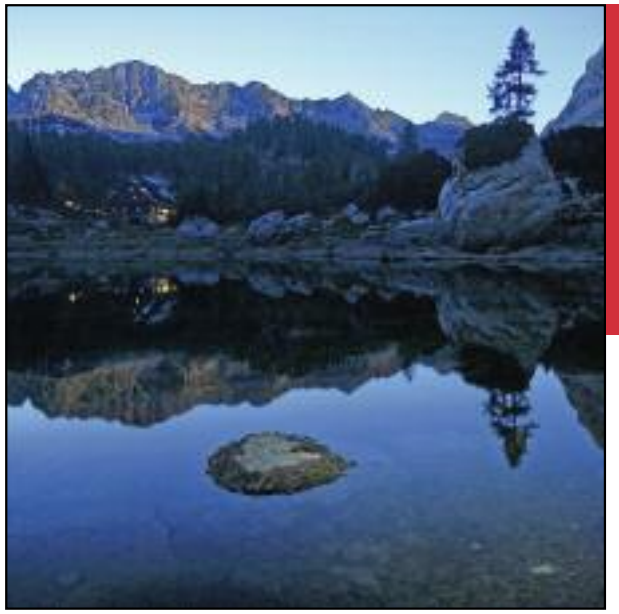

BOJAN ERHARTIČ

Dvojno jezero Lake is the symbol of beauty.

The beauty of landforms

DOI: http://dx.doi.org/10.3986/AGS.3039
UDK: 911.52:111.852(497.4DolinaTriglavskih jezer)
COBISS: 1.01

ABSTRACT:
This article determines which landforms attract people the most and whether one can speak of collective patterns in the aesthetic evaluation of a landscape. It therefore concerns enjoying the beauty offered by a more or less reshaped natural environment. This study is based on the Triglav Lakes Valley (Dolina Triglavskih jezer) in Slovenia which, due to the few man-made changes introduced there, includes hardly any anthropogenic »unnecessary noise.« The online survey included more than six hundred people and used photos of various landforms. Lakes were found to be the most attractive to the respondents, and fractured rock areas were the least attractive.

KEY WORDS: geography, aesthetics, photography, nature, landscape online survey, Dolina Triglavskih jezer, Triglav National Park, Slovenia

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1 Introduction

The word *aesthetics*, coined in 1735 by the German philosopher Baumgarten, is derived from the Greek verb *aisthanomai* 'to sense, perceive'. To an observer, aesthetics is the feeling of or the ability to experience beauty that develops as part of his or her subjective feeling (Šmid Hribar 2011). Hence, this is about enjoying the beauty offered by both the natural environment and human creations. Aesthetics is usually limited to the beautiful/ugly dichotomy. This dichotomy has stimulated philosophical debate, and hence the object of aestheticism is a logical consequence of manipulating the topic at hand (Barett et al. 2009).

The question of what is beautiful offers as many answers as there are philosophers (Lothian 1999). The main change in the past two millennia has been the shift from conceiving beauty as an object's feature (objective aesthetics) to the subjective feeling of an object in the eyes of the observer (subjective aesthetics). From the Greek philosophers to the Renaissance, beauty was recognized merely as an objective physical feature. In the seventeenth century, Locke was the first to understand beauty as an objective and subjective feature (Lothian 1999). The greatest leap in understanding beauty can be found in Kant's theory of aesthetics, where he did not address the dilemma of the objective and subjective, but defined aesthetic judgment as a reflexive judgment. According to Kant, the beauty of an object is judged in terms of the feelings that this object arouses in an individual and not the object directly (Elden and Mendieta 2011). Proceeding from Kant's theory, philosophers developed many views on aesthetics. Thus in a large number of modern theories of aesthetics one can find close parallels with Kant's theory (Lothian 1999).

The important question is whether the need to feel the beautiful is a fundamental human need. The psychologist Maslow (1943) ranked human needs by importance, from basic biological needs to higher psychological needs. Physiological needs, which must be fulfilled in order to stay alive, are ranked the lowest, and aesthetic needs – for instance, reflected in the interest in various art products or the landscape – are ranked the highest, right below the top of the pyramid. Postrel (2003) disagrees with Maslow's theory, arguing that aesthetics is something that people (as a species) have reacted to since time immemorial, regardless of economic development, income, or cultural context.

Everything is connected in a landscape and has its value and importance. This refers not only to physical reality, but also to the organization and conception of the social elements of human existence (Urbanc 2008). When individuals observe a landscape through their own perception and understanding, there must be hundreds of reasons why they believe a specific landscape is exceptional to them (Staut, Kovačič and Ogrin 2007). This evaluation is personal and depends on the level of awareness and knowledge of an individual and society as a whole (Hlad 2002). The majority of people have their own opinion about the beauty of a specific landscape, but differences occur according to age, education, and cultural environment (Kaplan and Herbert 1987).

The effect of landscape beauty on people's wellbeing is gaining increasing importance in modern life (Kaplan, Kaplan and Ryan 1998; Hartig et al. 2003). Hence, it is not surprising that the ten criteria for defining UNESCO World Heritage sites (Internet 1) also include aesthetic value, which refers to »superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.« Empirical studies of the influence of beauty on various economic and social outcomes carried out over the past decades show that aesthetics is not an end in itself (Florida, Mellander and Stolarick 2011).

The majority of studies of landscape beauty are based on extremely limited conceptual issues that rely on landscape photos. These are used as substitutes for actual views of the landscape (Daniel 2001). Studies in which researchers examined the expressed subjective beauty of selected landscapes show that there are no statistically significant differences between assessments of landscape beauty in photos and the assessments of the beauty expressed while perceiving these same landscapes directly on site (e.g., Stamps 1990; Hull and Stewart 1992). The criticism raised against these types of studies is primarily based on potential subjectivity, deficient standardization of methods, and repeatability of results (Bruns and Green 2001; Daniel 2001). Research results are increasingly applicable in planning, managing, and even monitoring changes in the landscape (Tress et al. 2001; Tahvanainen et al. 2002). In Europe, the applicability of these results became even more topical with the ratification of the European Landscape Convention (European Landscape Convention … 2000; Dramstad et al. 2006).

Despite many methodological challenges, there is also increasing interest in the visual evaluation of the landscape among geographers because the link between visual evaluation and geography is the strongest in the case of the landscape in particular (Urbanc, Gašperič and Kozina 2015). Even though many studies of this type have been conducted in cultural landscapes (Farina 2006), where there have been instances

of land development, some have also been carried out in landscapes that were only slightly reshaped, such as in semi-natural and close-to-natural landscapes.

This article uses an online survey to determine which landforms in a natural environment where there is not much human influence are the most attractive to people and whether one can speak of collective patterns of perceiving beauty. The problem that this study focuses on proceeds from Kant's claim that the evaluation of an object's beauty is not based on interest – that is, its applicability or utility is irrelevant (Elden and Mendieta 2011) because one is only interested in the beauty itself. In a landscape as a complex system, it is of course extremely difficult to isolate such »pure« aesthetic judgment. In order to reduce »unnecessary noise,« this study is limited to landforms in which man-made changes can hardly be perceived. Slovenia has few landscapes left in which the effects of man-made changes are as minute as in the Triglav Lakes Valley (Dolina Triglavskih jezer), which this study focuses on.

2 Methods

2.1 Study area

This study used the example of the Triglav Lakes Valley, which lies in the central part of Slovenia's only national park, the Triglav National Park. The lakes give the main character to this nearly ten-kilometer-long mountain valley between the Bohinj and Trenta valleys, which lies at an elevation between 1,300 and 2,000 m. Its karst surface was reshaped by glaciers during the Pleistocene. Large karst surface features include high-mountain closed depressions, dolines, solution pans, grikes, and shaft entrances, and smaller ones mostly include rills and solution pans. The effects of glacial erosion can be seen in the rock surfaces polished by glaciers. Typical features include cirques, rock drumlins, roches moutonnées, glacier crevasses, and alvars. Accumulation glacial features include moraines. Many taluses can be observed below rock walls (Hrvatin et al. 2015). Due to its karst landscape, the lakes in the Triglav Lakes Valley are exceptional features, home to a diverse and unique community of flora and fauna (Brancelj 2015). Various human activities (forestry, mountain pasturing, and charcoal burning) created a cultural landscape. Before the Triglav Lakes region was designated a protected area, it included three mountain pastures: Dvojno jezero Lake, Pri Utah Pasture, and Lopučnica Pasture. After their abandonment due to nature conservation demands, this area is being overgrown with forest (Zorn et al. 2015). The protection regime in place in the valley only allows hiking. Two mountain lodges are currently operating in the area, and the valley is one of the most popular hiking destinations in the Slovenian Alps (Peršolja 2015).

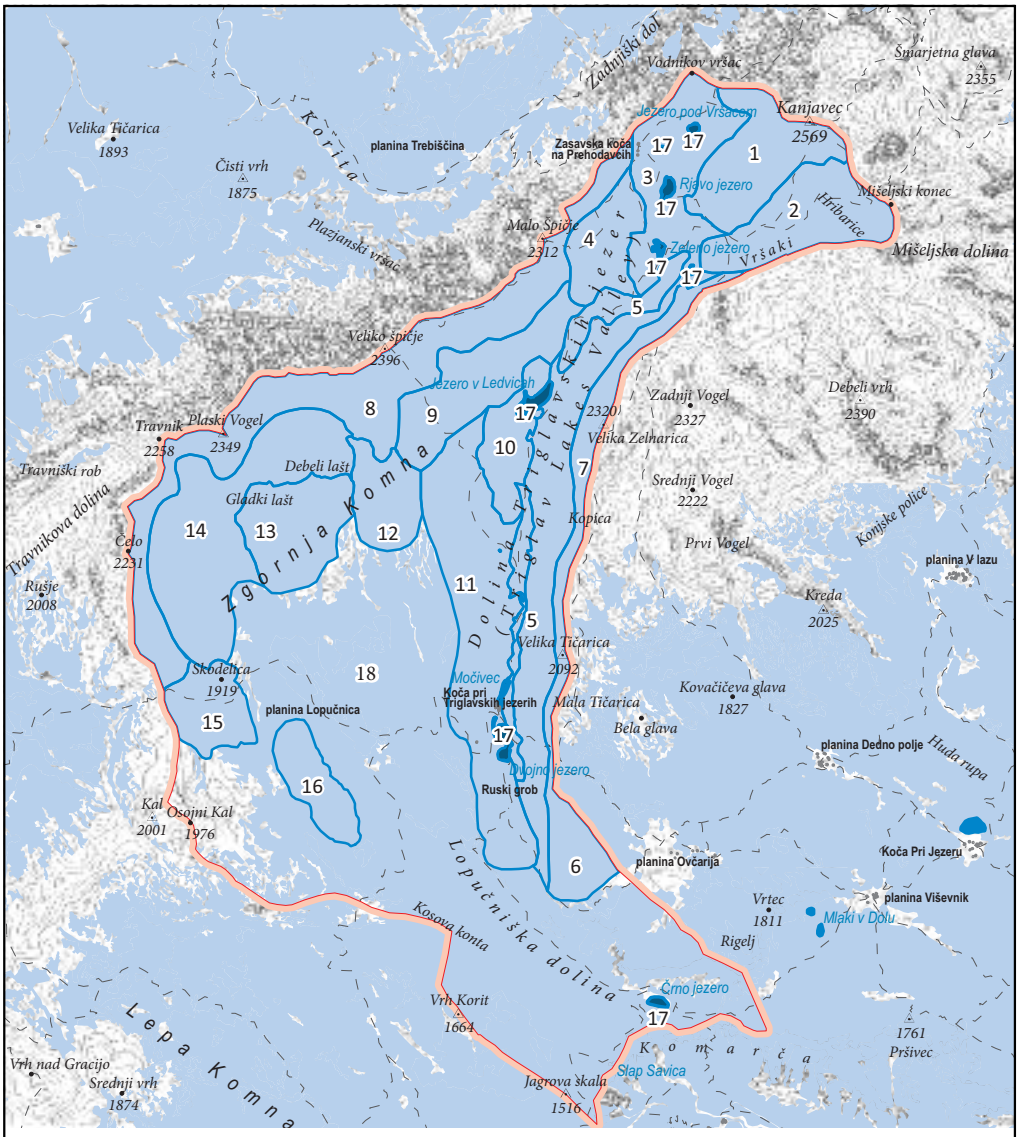
The exceptionality of the Triglav Lakes Valley already fascinated visitors more than two centuries ago. In 1795, Hochenwart wrote the following while taking in the surrounding rock faces and taluses: »it looks so peaceful that it strongly stirs the heart … of the observer because in all the Carniolan mountains one cannot find more beautiful and charming views« (1838: 52). Something similar is true of the lakes (Hacquet 1778). Hochenwart (1838: 52) wrote that »in all of the Carniolan mountains [Carniola was part of Austria-Hungary at that time] one cannot find more beautiful and charming views« than the ones opening up from the Štapce Saddle onto the Triglav Lakes Valley. The number of visitors to the valley increased after 1880, when the Austrian Tourism Club built a mountain lodge at Dvojno jezero Lake in the central part of the valley. The awareness that this was a natural gem that needed to be preserved gradually became stronger (Šmid Hribar and Lisec 2011). In 1924, the idea of protecting the valley finally became a reality; this was the first case of any region being designated a nature protection area in the then Yugoslavia. Later on this led to the establishment of Triglav National Park as it is known today.

2.2 Selecting the landforms studied

The Triglav Lakes Valley was divided into four types in terms of landforms (Erhartič 2012):

- Peaks and ridges with appertaining taluses;
- Plains, rocky plateaus, and alvars;
- The valley bottom;
- Forest and mountain pine belt.

Figure 1: Landforms in the Triglav Lakes Valley (adapted from Erhartič 2012). ►



1 Mount Kanjavec
2 Hribarice Pass
3 Upper Triglav Lakes Valley
4 Rocky plateaus south of Prehodavci
5 Moraines on east side of Triglav Lakes Valley
6 Lake Ridge
7 Taluses below Lake Ridge
8 Ridge along Veliko Špičje, Mount Plaski Vogel and Mount Čelo
9 Tectonically fractured area below Veliko Špičje Ridge
10 Alvars and roches moutonnées between Jezero v Ledvicah Lake and Pri utah Pasture
11 Alvars below forest with interspersed karst depressions
12 Debeli lašt Alvar
13 Gladki lašt Alvar
14 Za Dolino and Pri Bajti plateaus
15 Velika vrata Pass
16 Kosmata lašta Alvar
17 Lakes
18 Forest and mountain pine belt

0 0.5 1 2 km

Authors of contents: Bojan Erhartič, Aleš Smrekar
Author of map: Manca Volk Bahun
Source: GURS, 2015
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Within these types, typical examples of landforms were defined (e.g., taluses or lakes) and photographed. All of the photos were in color, taken in nice weather. Thirteen photos of various landforms in the valley were prepared in addition to three control photos of similar landforms in other Slovenian regions. Among other things, the photos of the Triglav Lakes Valley feature Mount Kanjavec, Hribarice Pass, Veliko Špičje Ridge, fractured surface, roches moutonnées, forest, and lakes.

2.3 Survey

In the spring of 2013, an online survey was conducted to determine which landforms attract respondents the most (Smrekar and Erhartič 2013). The questionnaire was HTML-based. The respondents viewed the questionnaire and completed it using a web browser, and their replies were then sent directly to the research institute's server (Vehovar et al. 2002). The invitation to complete the questionnaire was sent to several Slovenian nature-related interest groups, using their e-mailing lists: for example, to hikers (e-news of the

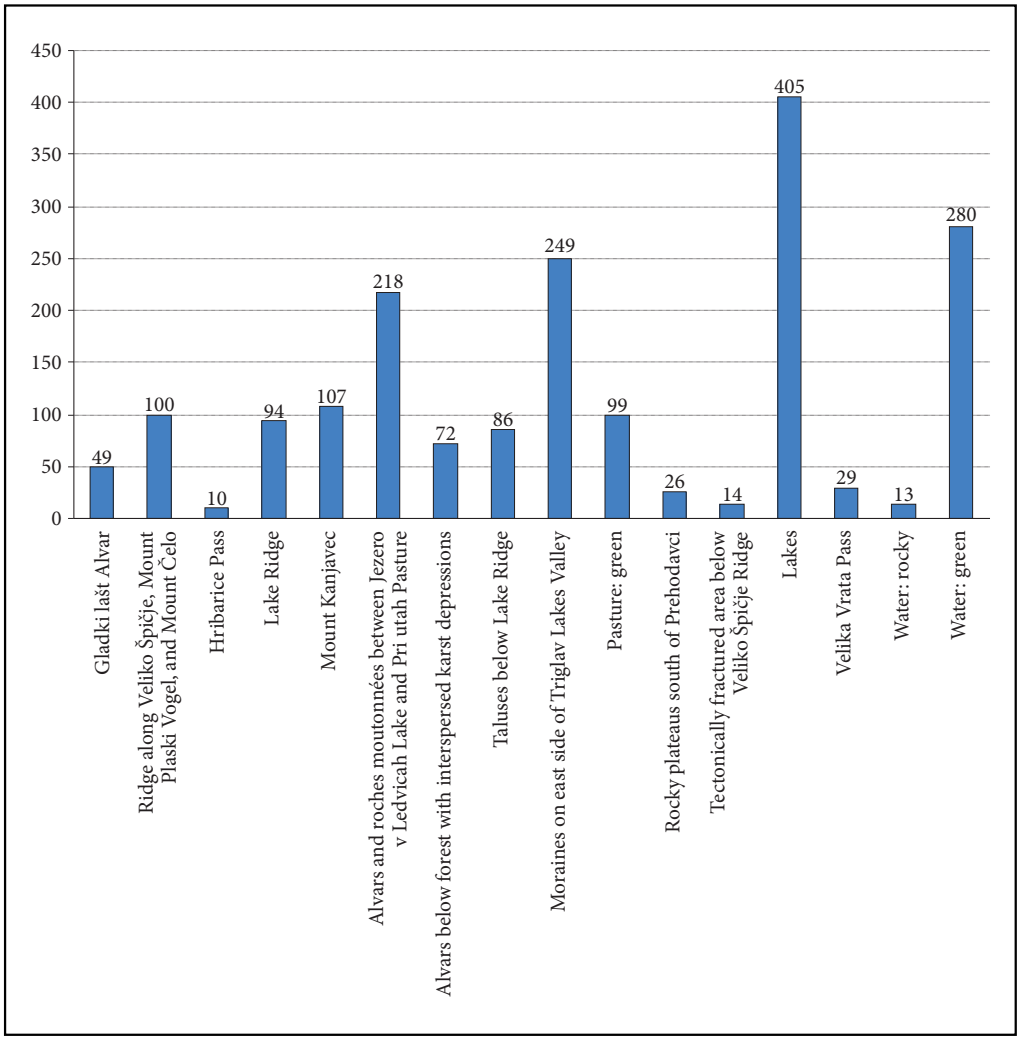

Figure 2: Aesthetic evaluation of the Triglav Lakes Valley according to respondents' opinions (Smrekar and Erhartič 2013).

Slovenian Alpine Association) and geographers (Geolista). The invitation was sent to a total of over eight thousand e-mail addresses. Employing the snowball sampling method, the recipients were invited to forward the invitation letter to others.

In the online survey, the respondents first selected three photos from a total of sixteen in terms of how attractive they found the landforms displayed. The photos were displayed in random order. In addition to the target landform, other landforms were also partly visible in some photos; these were blurred out to focus the respondents' attention on the target landforms. In photos in which the target landform was not visible in sufficient detail, insets were added to create a photo within a photo.

The respondents then ranked the three photos selected according to the subjective criterion (beauty) and added a maximum of three keywords to each photo that, in their opinion, best described the landform depicted.

Then three previously selected photos were shown to the respondents one after the other; these differed significantly from one another and featured the following: a lake with large rocks, the forested Triglav Lakes Valley, and a »rough« high-mountain rock surface. It was only at this stage of the survey that the respondents learned that the photos were from the Triglav Lakes Valley.

Respondents that had already been to the Triglav Lakes Valley had to select three landscape elements (not landforms) among the fifteen listed (and not shown on photos) that they found the most attractive. These included a rock face, forest, dynamic terrain, animals, alpine flowers, mountain pines, a lake, a green alpine meadow, a moraine, rills and grikes, a talus, a mountain ridge, an alvar, a boulder, and the sky.

Finally, the respondents were shown the same photo of Jezero v Ledvicah Lake as in the first step of the survey, only that now the photo showed a little bit more of the surroundings (i.e., more landforms). The respondents were asked to rank six landforms in the photo in order of preference. The area was divided into the following six parts (landforms): lake, sparse forest, taluses, high-mountain peak, bare rocks, and alpine meadow. Respondents were asked to rank each one of these from most to least beautiful on a six-point scale, whereby they could only assign individual values from 1 to 6 once.

2.4 Survey sample

The online survey carried out in the spring of 2013 yielded 606 answers, provided by 60% women and 40% men. In terms of sex structure, the sample obtained significantly deviates from a representative sample, considering that the share of women living in Slovenia is 50.5% (Število prebivalcev … 2013). In terms of age structure, the sample also deviates considerably from a representative sample because it includes an above-average share of young people: the questionnaire was completed by only 2.0% of people over 65, whereas their share in the total population is 18.7%. In addition, in the questionnaire just over half (52.0%) of the respondents were under 35, whereas their share in the total population is just under a third (30.7%). The biggest gap between the sample obtained and the actual population characteristics is evident from the education structure. Just over three-quarters (74.0%) of the participants in the survey were university graduates, whereas their share in the total population is just under a fifth (19.4%); the share of secondary-school graduates amounted to just above one-fifth (23%), which approaches the 30.6% in the total population, but only 3% of participants had a vocational school certificate or lower (whereas their share in the total population is 50.2%).

3 Results

Among the thirteen landforms photographed in the Triglav Lakes Valley, the respondents unambiguously selected Jezero v Ledvicah Lake as the most attractive (Figures 3 and 4), followed by the slightly undulating and partly grassed-over moraines on the east side of the Triglav Lakes Valley (Figures 5 and 6). Third place went to the exposed bare rocky landscape comprised of alvars and roches moutonnées between Jezero v Ledvicah Lake and Pri Utah Pasture (Figures 7 and 8). Views of water and vegetation proved to be considerably more attractive than views of exposed bedrock. Hence it is not surprising that respondents least often selected the tectonically fractured rocky area below the Veliko Špičje Ridge and the rocky slopes of the Hribarice Pass (Figures 9 and 10).

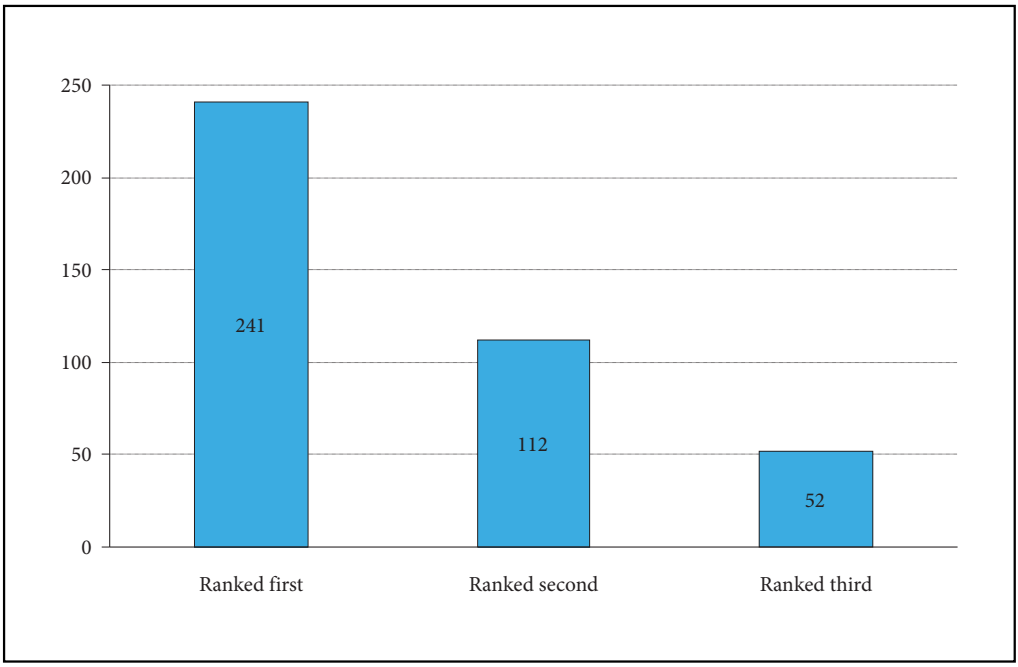

Figure 3: Respondents found the lakes by far the most attractive landforms (ranked first, second, or third; Smrekar and Erhartič 2013).

BOJAN ERHARTIČ

Figure 4: Jezero v Ledvicah Lake as shown in the survey.

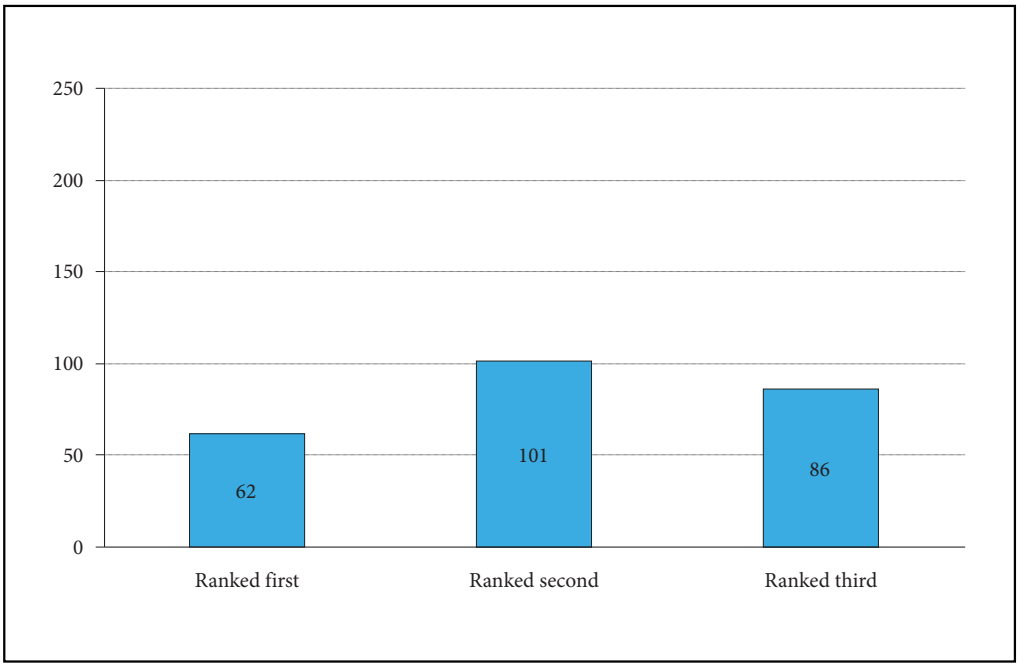

Figure 5: Moraines were the second most attractive landform (ranked first, second, or third; Smrekar and Erhartič 2013).

BOJAN ERHARTIČ

Figure 6: Glacial moraines as shown in the survey.

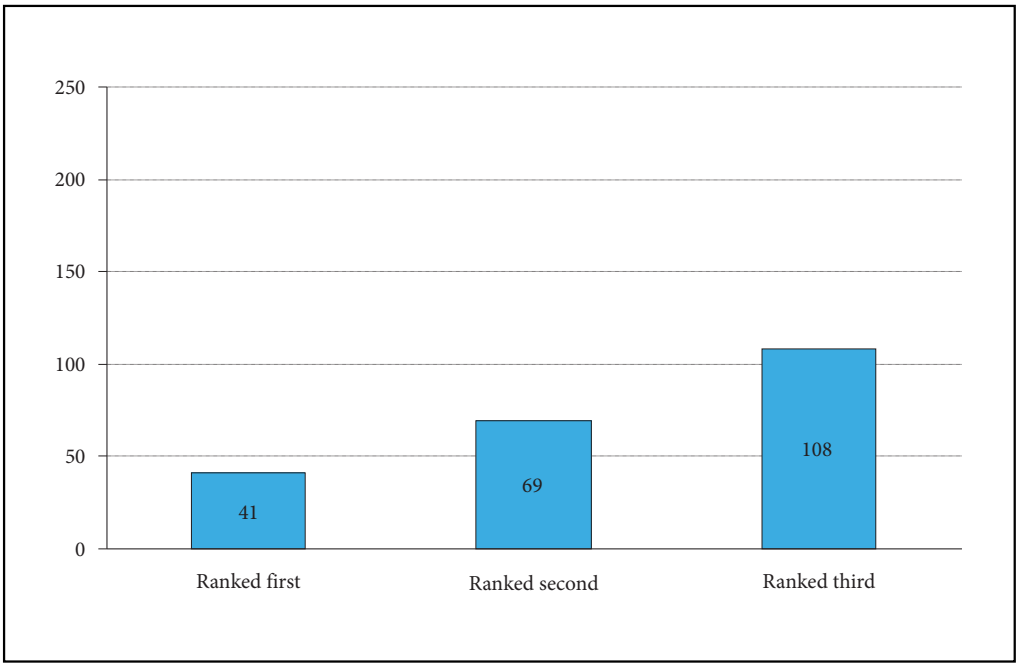

Figure 7: The third most beautiful landform according to the respondents was the alvars and roches moutonnées (ranked first, second, or third; Smrekar and Erhartič 2013).

Figure 8: Roches moutonnées between Jezero v Ledvicah Lake and Shed Pasture as shown in the survey.

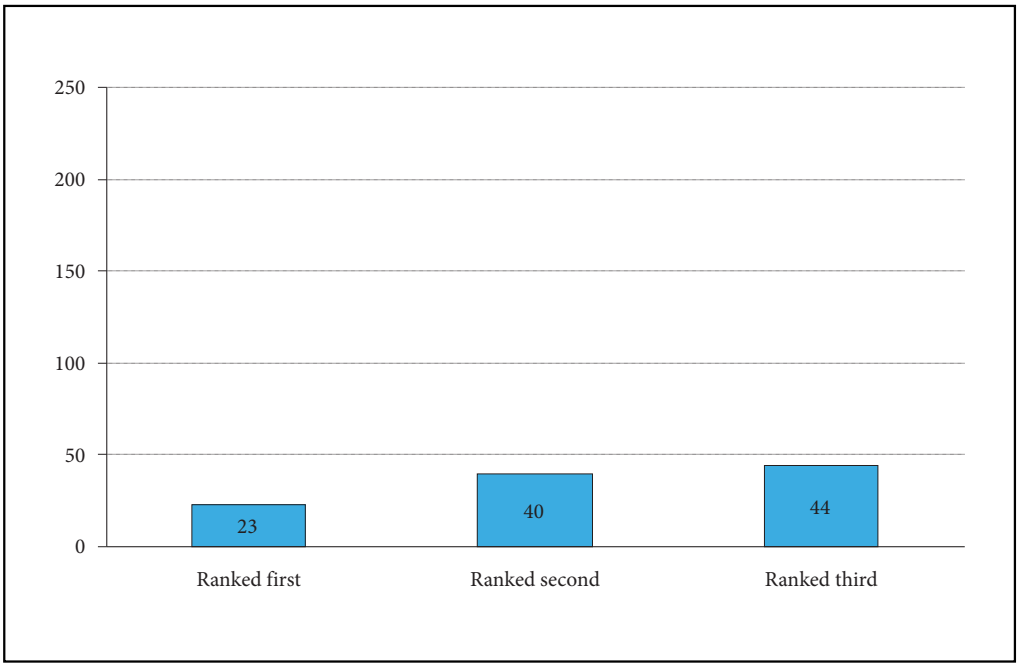

Figure 9: Rock slopes were found least attractive by respondents (ranked first, second, or third; Smrekar and Erhartič 2013).

BOJAN ERHARTIČ

Figure 10: The Hribarice Pass as shown in the survey.

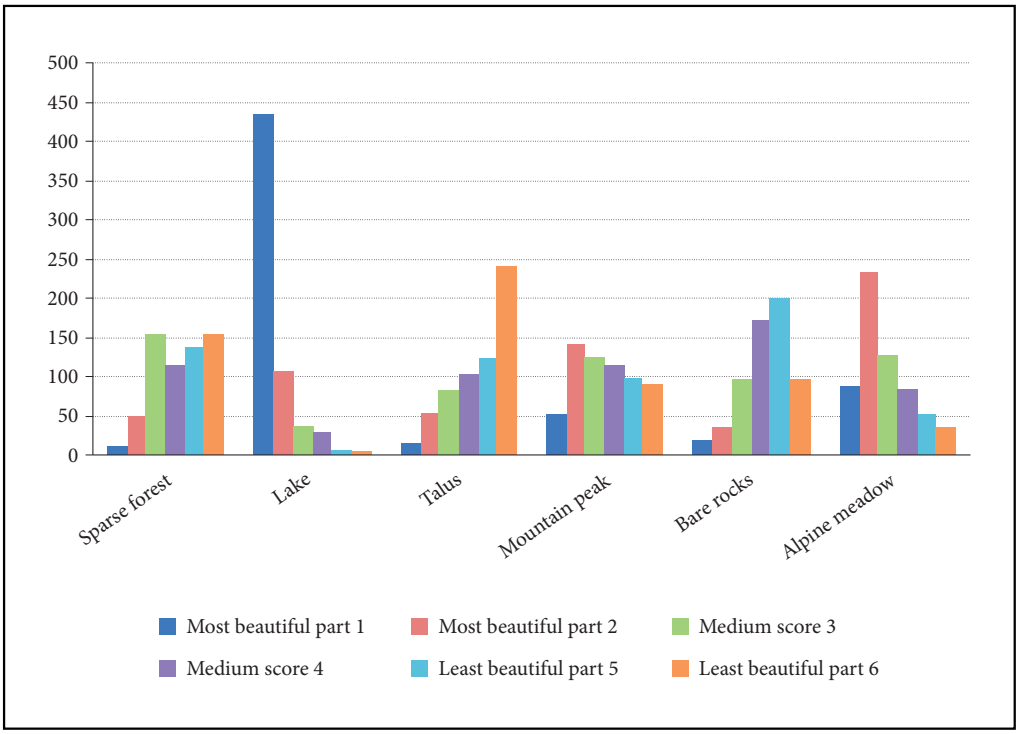

Figure 11: Ranking landforms from most to least beautiful (Smrekar and Erhartič 2013).

The respondents that had already been to the Triglav Lakes Valley most frequently selected the photos of the lake (407), the green alpine meadow (245), and alpine flowers (170) as the most beautiful among the fifteen landscape elements listed. Taluses were found the least attractive (8).

At the end, the respondents were once again shown the photo of Jezero v Ledvicah Lake and asked to rank six landscape elements in the photo from most to least beautiful. Respondents most often ranked the lake (541), the alpine meadow (320), and the mountain peak (191) in the top two classes according to attractiveness; the last two are perhaps surprising given the results of the first step of the survey, in which the rocky high-mountain landscape (zoomed in on) was found the least attractive by the respondents. In line with this finding, the respondents ranked bare rocks among the two least attractive classes (53).

4 Discussion

The results show the complexity of evaluating what is beautiful or what attracts people in a landscape. In the area studied, people were most attracted to landforms filled with water and covered with vegetation. In contrast, bare rocks were less interesting from the aesthetic point of view, even though they include exceptionally interesting relief forms, such as alvars, moraines, rock faces, ridges, and so on. The question is whether one can at least speak about collective, if not even universal, patterns of perceiving the beauty of the natural environment or landforms.

The results of the analysis of the online survey that used a non-random sample showed considerable deviations from the total population characteristics. These primarily involve differences in the demographic and education structure. One of the reasons for the unrepresentative sample may be the fact that the elderly, less-educated population groups, and hence most likely the lower socioeconomic classes, do not use the internet. This means they do not have the opportunity to participate in this type of survey. Regardless

of all of this, it can be concluded that the respondents included interested individuals that are active in this region, considering that nearly three-quarters had already visited the valley studied.

The aesthetic value of the Triglav Lakes Valley is among the most apparent or visible values, which, on the other hand, is exceptionally difficult to measure because the evaluations simply refer to the looks or the visual effect created by the natural environment. The findings of this research revealed which part of (non-living) nature in the Triglav Lakes Valley can be evaluated as having high aesthetic value. The authors were stimulated to explore this issue by a previous study conducted in the same region, in which they comprehensively evaluated surface landforms (Erhartič 2012) using a method developed by Reynard et al. (2007). The criteria for the comprehensive evaluation of surface landforms (Erhartič 2012) also include the aesthetic value, which, in turn, is comprised of two simple criteria: the object's visibility and landscape perception; greater value is ascribed to more diverse and dynamic locations with greater relief energy.

The results obtained by using the method that Erhartič (2012) applied to the Triglav Lakes Valley and the method presented in this article show that lakes are ascribed the highest value. This is not surprising because it is a well-known fact that even in different cultural environments people have similarly high agreement scores with regard to the aesthetic value of water (Scholte et al. 2015). In terms of an object's visibility, units covered with forest are usually ascribed lower values because surface landforms without vegetation are less visible (Reynard et al. 2007) and hence the surface itself is given a lower aesthetic value. In addition, respondents were not found to be enthusiastic about the forest. The similarity of the results using both methods is also shown in the evaluation of mountain ridges, which were ranked high both times.

It is interesting that the respondents selected Jezero v Ledvicah Lake as the most attractive landform and that the authors previously decided the same for the same feature, except that it also included the surrounding area. It was displayed with several landforms included, which the respondents had to rank into six classes. In the authors' opinion, this is a very attractive landscape that includes extremely diverse landforms, such as lakes, alpine meadows, sparse forests, taluses, bare rocks, and mountain peaks, in a relatively small area.

The non-uniformity of answers regarding the fifteen landscape elements listed was surprising, excluding the lake as clearly the most attractive element (chosen 407 times) among the three most attractive. It is interesting that living nature is not grouped together, considering that »green alpine meadows« were ranked second (chosen 245 times) and »alpine flowers« were ranked third (chosen 170 times) – that is, just below the top – whereas »forest« (placed tenth, chosen 56 times) and »mountain pines« (placed twelfth, chosen 30 times) were ranked just at the beginning of the last third of a total of fifteen places. Only »animals« placed close to the two-thirds out of fifteen (ranked ninth, chosen 60 times). At first glance, this contradicts the claim that one sees an »it« in the flora and a »thou« in the fauna (Rolston 1987), according to which one would expect higher values for fauna than flora. As a rule, people establish more direct contact with animals, which is supposed to increase the value of landscapes rich in fauna. Knowing the fauna in the Triglav Lakes Valley, visitors do not encounter many animals, except for a few species, such as the marmot and chamois.

5 Conclusion

In professional circles, the aesthetic importance of landforms is often an unjustly and intentionally ignored criterion in defining the importance of landforms. This has especially been the case over the past decades due to the increasing objectification of science, research, and perception. This survey evaluated the landforms in the protected area of Triglav National Park using various cases and proved that people are the most attracted to water features; hence, it can be concluded that collective patterns exist in connection with the perception of the beauty of the natural environment. It can be confirmed with considerable certainty that green areas (e.g., meadows and forests) are more attractive than bare, rocky landscapes. Parallels with this finding can be found in the fairytale about the chamois Goldenhorn (Baumbach 1886), which tells about miraculous gardens in the Triglav Lakes Valley. The cinquefoil species known as the »Triglav flower« (*Potentilla nitida*) was said to be a plant that gave living creatures a special life force. Thus it is not surprising that the respondents appreciated a landscape with water and greenery more. Of course, it is important to once again emphasize the finding above about the representativeness of the respondent sample.

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Guidelines for Contributing Authors in Acta Geographica Slovenica – Geografski Zbornik

1 Aims and scopes

Acta geographica Slovenica – *Geografski zbornik* is the main Slovenian geographical scientific journal published by the Anton Melik Geographical Institute of the Research Centre of the Slovenian Academy of Sciences and Arts.

The journal is aimed at presentation of scientific articles from the fields of physical, human and regional geography. Review scientific articles are published, e.g. review and synthesis of already published articles on specific topic, and original research articles, e.g. first publication of original scientific results that allows repetition of the study and examination of results.

The journal was first published in 1952, and fourteen issues appeared periodically until 1976. Granted more permanent government funding, it has been published annually since 1976. From 2003, it is published twice a year. The journal is subsequently published in print and on the Internet in both Slovenian and English since 1994 (http://ags.zrc-sazu.si/). Each year, it is distributed in exchange for 200 scientific journals from around the world. The articles on the internet are read in more than 100 countries.

Acta geographica Slovenica – *Geografski zbornik* welcomes articles from all geographers in Slovenia, South-Eastern and Central Europe, as well as articles from those in related fields whose scientific and research work can enrich the overall view of the geographical environment.

Acta geographica Slovenica publishes articles in Slovenian and English. If one of the authors is from Slovenia the article has to be in English and Slovenian. The articles of the authors from abroad and the articles of special issues are only published in English. The articles in Slovenian have to be translated to English after a positive peer-review. If the article is translated by the editorial board the cost for authors is 500 €. If the authors provide a professional translation of the article it has to be lectored; the cost of lectoring for authors is 200 €. Slovenian articles are lectored by the editorial board. The articles that are submitted for publication in English need to be lectored after a positive peer-review. Lectoring is organized by the editorial board; the cost for authors is 200 €.

2 Article components

The articles published in the scientific journal *Acta geographica Slovenica* – Geografski zbornik should be arranged according to the IMRAD scheme: Introduction, Method, Results and Discussion. The articles must contain the following elements:

- article's main title in both English and Slovenian;
- abstract (up to 800 characters including spaces);
- up to eight key words;
- article in English (up to 20,000 characters including spaces) and identical article in Slovenian;
- reference list.

Text of the article should be equal in Slovenian and English.

The titles of chapters and subchapters in the article should be marked with ordinal numbers (for example, 1 Introduction, 1.1 Methodology, 1.2 Terminology). The division of an article into chapters is obligatory, but authors should use subchapters sparingly. It is recommended that the article includes Introduction, Conclusion and References chapters. The titles should be short and comprehensible. Authors should avoid using footnotes and endnotes.

3 Quoting

When quoting from source material, authors should state the author's last name and the year, separate individual sources with semicolons, order the quotes according to year, and separate the page information from

the author's name and year information with a comma, for example »(Melik 1955, 11)« or »(Melik, Ilešič and Vrišer 1963; Kokole 1974, 7 and 8)«.If the source material has more than three authors only the first one should be listed (Melik et al. 1956).

The References' units should be listed according to the alphabetical order of the authors' second names. If there are more units from the same author in the same year, letters should be added to the citation (for example 1999a in 1999b).

Every unit consists of three sentences. In the first Author's name, publishing year and article's title are listed in front of the colon while the title is listed after it. The surnames of the authors and the initials of their names are separated by commas. The subtitle is separated from the title by a comma.

If the unit is an article, the name and number of the journal is indicated in the second sentence. If the unit is a monograph, there is no second sentence. The name of the publisher and number of pages are not listed. If the unit is not printed the type (e.g. diploma thesis) should be listed in the second sentence, separated from information of the institution by a comma. Laws should be qouted by a title, publication name and its number (e.g. Official gazette 56-2), separated from the publication year in the last part of the quotation.

In the third sentence the place of publishing or the place where the publication is kept are stated.

The Digital object identifier (DOI) has to be included to the quotes if available. For more details please visit webpage of the *Crossref* company (www.crossref.org; http://www.crossref.org/guestquery; http://dx.doi.org/).

Few examples:

1) for articles in journals:
   - Melik, A. 1955a: Kraška polja Slovenije v pleistocenu. Dela Inštituta za geografijo 3.
   - Melik, A. 1955b: Nekaj glacioloških opažanj iz Zgornje Doline. Geografski zbornik 5.
   - Perko, D. 2002: Določanje vodoravne in navpične razgibanosti površja z digitalnim modelom višin. Geografski vestnik 74-2.
   - Fridl, J., Urbanc, M., Pipan, P. 2009: The importance of teachers' perception of space in education. Acta geographica Slovenica 49-2. DOI: http://dx.doi.org/10.3986/AGS49205
2) for chapters in monographs or articles in proceedings:
   - Lovrenčak, F. 1996: Pedogeografska regionalizacija Spodnjega Podravja s Prlekijo. Spodnje Podravje s Prlekijo, 17. zborovanje slovenskih geografov. Ljubljana.
   - Mihevc, B. 1998: Slovenija na starejših zemljevidih. Geografski atlas Slovenije. Ljubljana.
   - Komac, B., Zorn, M. 2010: Statistično modeliranje plazovitosti v državnem merilu. Od razumevanja do upravljanja, Naravne nesreče 1. Ljubljana.
3) for monographs:
   - Natek, K., Natek, M. 1998: Slovenija, Geografska, zgodovinska, pravna, politična, ekonomska in kulturna podoba Slovenije. Ljubljana.
   - Fridl, J., Kladnik, D., Perko, D., Orožen Adamič, M. 1998: Geografski atlas Slovenije. Ljubljana.
   - Perko, D., Orožen Adamič, M. 1998: Slovenija – pokrajine in ljudje. Ljubljana.
   - Oštir, K. 2006: Daljinsko zaznavanje. Ljubljana.
4) for expert's reports, diploma, master and doctoral thesis:
   - Richter, D. 1998: Metamorfne kamnine v okolici Velikega Tinja. Diplomsko delo, Pedagoška fakulteta Univerze v Mariboru. Maribor.
   - Šifrer, M. 1997: Površje v Sloveniji. Elaborat, Geografski inštitut Antona Melika ZRC SAZU. Ljubljana.
5) for sources with unkwnown authors and cartographic sources:
   - Popis prebivalstva, gospodinjstev, stanovanj in kmečkih gospodarstev v Republiki Sloveniji, 1991 – končni podatki. Zavod Republike Slovenije za statistiko. Ljubljana, 1993.
   - Digitalni model višin 12,5. Geodetska uprava Republike Slovenije. Ljubljana, 2005.
   - Državna topografska karta Republike Slovenije 1 : 25.000, list Brežice. Geodetska uprava Republike Slovenije. Ljubljana, 1998.
   - Franciscejski kataster za Kranjsko, k. o. Sv. Agata, list A02. 1823–1869. Arhiv Republike Slovenije. Ljubljana.
   - Buser, S. 1986a: Osnovna geološka karta SFRJ 1 : 100.000, list Tolmin in Videm (Udine). Zvezni geološki zavod. Beograd.
   - Buser, S. 1986b: Osnovna geološka karta SFRJ 1 : 100.000, tolmač lista Tolmin in Videm (Udine). Zvezni geološki zavod. Beograd.

6) for internet sources with known authors and/or titles:
- Vilhar, U. 2010: Fenološka opazovanja v okviru Intenzivnega spremljanja stanja gozdnih ekosistemov. Internet: http://www.gozdis.si/impsi/delavnice/Fenoloska%20opazovanja_Vilhar.pdf (19. 2. 2012).
- eGradiva, 2010. Internet: http://www.egradiva.si/ (11. 2. 2012).

7) for internet sources with unknown authors, titles or institutions:
- Internet: http://giam.zrc-sazu.si/ (22. 7. 2012).

8) for more internet sources with unknown authors
- Internet 1: http://giam.zrc-sazu.si/ (22. 7. 2012).
- Internet 2: http://ags.zrc-sazu.si/ (22. 7. 2012).

In case 7) the author is quoted in the text, for example (Vilhar 2010), while in case 8) only internet is quoted, for example (Internet 2).

The laws are cited as follows (name of the law, number of the official gazzette, place of publishing), for example:
- Zakon o kmetijskih zemljiščih. Uradni list Republike Slovenije 59/1996. Ljubljana.
- Zakon o varstvu pred naravnimi in drugimi nesrečami. Uradni list Republike Slovenije 64/1994, 33/2000, 87/2001, 41/2004, 28/2006 in 51/2006. Ljubljana.

If amemdments were proposed to the law they have to be quoted. In the text whole title of the law has to be quoted or its first few words if the title is a long one, for example (Zakon o kmetijskih zemljiščih 1996) ali (Zakon o varstvu … 1994).

All the quoted contributions have to be listed in the chapter References.

The authors should consider copyright rules of data owners, for example: the rules of the Geodetic survey of the Republic of Slovenia are available at http://e-prostor.gov.si/fileadmin/narocanje/pogoji_uporabe_podpisani.pdf.

4 Tables and figures

Authors should submit photographs and other graphic materials in a form suitable for scanning or in digital raster form with a resolution of 300 dpi, preferably in TIFF or JPG format formats in the printing size. If authors cannot deliver articles or graphic supplements prepared using the specified programs, they should consult the editorial board in advance: rok.ciglic@zrc-sazu.si.

All ***tables*** in the article should be numbered uniformly and have their own titles. The number and the text are separated by a colon, the caption is ended by a full stop. Example:
Table 1: Number of inhabitants of Ljubljana.
Table 2: Spreminjanje povprečne temperature zraka v Ljubljani (Velkavrh 2009).

The tables should contain no formatting and should not be too large – one-page tables are appreciated.

All ***illustrative material*** – Figures (photographs, maps, graphs, etc.) in the article should also be numbered uniformly and have their own titles. Example:

Figure 1: Location of measurement points along the glacier.

The journal has an established 16.5 cm × 23.5 cm format to which all graphic materials must be adapted. In the case of graphic illustrations for which the authors do not have the copyright, the authors must acquire permission to publish from the copyright owner. Authors must include the author's name with the title of the illustration.

Illustrative material should be precisely 134 mm wide (one page) or 64 mm wide (half page, one coloumn), height should not exceed 200 mm. If the figure is to be the size of the page, its size should be 134 × 192,3 mm (the subtitle is written in one line) or 134 × 200 mm (the subtitle is on the facing page).

Maps should be done in digital vector form using the Corel Draw program, and charts done using *Corel Draw* or *Adobe Illustrator* programs, especially if they contain text. They can also be done in digital raster form with resolution at least 300 dpi, preferably in TIFF or JPG formats in the printing size.

For maps made using CorelDraw or Adobe Illustrator programs,two separate files should be prepared; the original file (format .cdr or .ai) and the file with representation of the image (format .jpg).

For maps made using ArcGIS where raster layers were used next to vector layers (for example .tif of relief, airborne or satellite image), three files should be submitted: a file with vector image with not transparency used together with a legend and colophone (export in format.ai), the second file with raster image (export

in .tif format), and the third one with vector and raster image together showing the final version of the map (export in format .jpg). Please use template files from the journal internet page.

No title should be printed on maps as they are written below them.

The colors should be saved in CMYK and not in RGB or other formats.

The *Times new roman* font, size 8, should be used to write the legend, as well as for colophon (size 6). In the colophon author, scale, source and copyright should be listed. The colophone should be written in both, English (and Slovenian), if space is available on the map. Example:
Scale/merilo: (grafično, tekstovno)
Author of contents/avtor vsebine: Drago Perko
Author of map/avtorica zemljevida: Jerneja Fridl
Source/vir: Statistical office of the Republic of Slovenia, 2002
© Anton Melik geographical institute ZRC SAZU, 2005

Graphs should be done in digital form using *Excel* program. Graphs should be done on separated sheets and accompanied by data.

Photographs have to be in raster format and in resolution 240 dots per cm or 600 dots per inch, preferably in.tif or .jpg formats, that is about 3200 dots per page width of the journal.

Figures showing **computer screen** should be prepared at the highest possible screen resolution (Nadzorna plošča\Vsi elementi nadzorne plošče\Zaslon\Ločljivost zaslona oziroma Control Panel\All Control Panel Items\Display\Screen Resolution). The figure is done by *print screen*, the data are pasted prilepi to the selected graphic programme (e.g. Paint) and saved as .tif. The size of the image or its resolution should not be changed.You can find templates of maps in cdr and mxd files for a whole page map in landscape view and an example of correct structure of files for a submission of a map made with ESRI ArcGIS on the journal webpage.

5 Article admission

Only original and new articles will be accepted for publication. Upon acceptance of your chapter, you will be required to sign a warranty that your article is original (contents–wording and formatting) and has not been submitted for publication or published elsewhere.

Authors must submit their contributions in digital form written in *Word* format using the template.

Supplementary files (figures) can be submitted packed in one zip file.

The text file should be unformatted, except for text written in bold and italic form. As the article is subject to changes during the review process it should first be submitted in either English or Slovenian language, and translated to the other language only after the acceptance for publication. The translation is an expense of the author.

The entire text should be written in lowercase (except for uppercase initial letters, of course) without unnecessary abbreviations and contractions. The text should be plain and only bold and italic formatting is allowed. Please use no other formatting, such as chapter or page numbering. Use sentence case in titles.

If a text is unsatisfactorily written, the editorial board can return it to the author to arrange to have the text proofread professionally or reject the publication of the article.

Date of acceptance of the article for publication is published after the abstract and key words. Authors should send articles using the editorial sistem of the journal at: ags.zrc-sazu.si.

6 Review process

All articles are examinated by one of the editors upon receipt. Afterwards the authors are usually asked to correct or change the article. After the articles have been corrected they are sent to two anonymous reviewers. The reviewers receive an article without the author's name, and the author receives the review(s) without the reviewer's names. If the reviews do not require the article to be corrected or augmented, the review will not be sent to the author.

If the size of the text fails to comply with the provisions for publication, the author shall allow the text to be appropriately modified according to the judgment of the publisher. The article may be rejected for publication by the reviewers or by the editors until it is finally accepted for publication.

7 Copyright

For articles sent for publication to *Acta geographica* Slovenica – *Geografski zbornik*, all the author's moral rights remain with the author, while the author's material rights to reproduction and distribution in the Republic of Slovenia and other states, are for no fee, for all time, for all cases, for unlimited editions, and for all media shall be unexclusively ceded to the publisher. The authors allow publication of the article or its components on the internet.

Author has to provide a professional translation. The name of the translator should be quoted. Authors should cooperate in the reviewing and editorial process.

Author gives permission to the publisher to change the article in order to be in accordance with the Guidelines, including the length of the article.

The publisher shall see to it that all accepted articles are published in *Acta geographica Slovenica – Geografski zbornik* and on the internet in accordance with the submission time and with the arrangement according to the themes discussed. Ordered contributions can be published regardless of the submission time.

No honoraria are paid for articles appearing in *Acta geographica* Slovenica – *Geografski zbornik* nor for the reviews.

The author shall receive one (1) free copy of the publication.

8 Submission preparation checklist

As part of the submission process, authors are required to check off their submission's compliance with all of the following items, and submissions may be returned to authors that do not adhere to these guidelines.

1. The submission has not been previously published, nor is it before another journal for consideration (or an explanation has been provided in Comments to the Editor).
2. The submission file is in Microsoft Word document file format.
3. Where available, URLs for the references have been provided.
4. The text is single-spaced; uses a 12-point font; employs italics, rather than underlining (except with URL addresses). All illustrations' and figures' locations within text are marked (illustrations and figures are not inside text!). Illustrations and figures are provided as supplementary files (cdr, ai for maps and illustrations; tif for photographs). Tables are placed within the text at the appropriate points. Supplementary files must not excess 50 MB.
5. The text adheres to the stylistic and bibliographic requirements outlined in the Author Guidelines, which is found in About the Journal.
6. **If submitting to a peer-reviewed section of the journal, the instructions in Ensuring a Blind Review have been followed.**
7. Supplementary files do not exceed 50 MB.
8. I agree for this article to be translated into English / Slovenian (if at least one of the authors is from Slovenia) or for the English grammar and spelling to be copyedited at my expense (see Guidelines for details) AFTER the article is accepted for publication.

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11 Acta geographica Slovenica Editorial review form

Acta geographica Slovenica editorial review form

1 The paper is an original scientific one – the paper follows the standard IMRAD scheme and is original and the first presentation of research results with the focus on methods, theoretical aspects or case study.)
Yes
No

2 The paper's content is suitable for publishing in the AGS journal – the paper is from the field of geography or related fields of interest, the presented topic is interesting and well presented. In case of negative answer add comments below.)
Yes
No

3 Editorial notes regarding the paper's content.

4 Length of the paper is acceptable for further processing (20.000 characters including space). If longer, the paper has to be shortened by the author and resubmitted.
- The paper has less than 20.000 characters.
- The paper has more than 20.000 characters, but less than 25.000.
- The paper has more than 25.000 characters.

5 The style and formatting of the paper is according to the AGS guidelines – the paper is prepared in plain text, no other text formatting is used than bold and italic. See the Guidelines of AGS journal for details.)
Yes
No

6 Notes regarding style and formatting.

7 Citing in the paper is according to the AGS guidelines and style, including DOI identificators.
Yes
No

8 The reference list is suitable (the author cites previously published papers with similar topic from other relevant scientific journal).
Yes, the author cited previously published papers on similar topic.
No, the author did not cite previously published papers on similar topic.

9 Scientific language of the paper is appropriate and understandable.
Yes
No

10 Supplementary files (ai, cdr, pdf, tif, jpg, xlsx etc.) that were added to the paper are in proper format and resolution (including the introductory photo), maps are prepared according to the AGS Guidelines. (In this step contact the technical editor Ærok.ciglicAzrc-sazu.siÁ for assistance if needed).*
- Supplementary files are correct.
- Supplementary files are not appropriate and need a major correction.
- Some supplementary files need corrections.

11 Describe the possible deficiencies of the supplementary files:

12 DECISION OF THE RESPONSIBLE EDITOR*
The paper is accepted for further processing and may be sent to the reviewer.
The paper is accepted for further processing but needs technical improvements (see notes).
The paper is accepted for further processing but its content needs additional improvements (see notes).
The paper is not accepted for publication because:
- It is more suitable for a specialized journal.
- Does not fit the aims and scopes of the AGS journal.
- Is not an original scientific paper.
- The presentation of the results is poor.
- The paper is of very low quality.
- The paper has already been published elsewhere.
- Other (see comments below).
- Other reasons for rejection of the paper.

12 Acta geographica Slovenica review form

1 RELEVANCE

1a) Are the findings original and the paper is therefore a significant one?*
yes
no
partly

1b) Is the paper suitable for the subject focus of the AGS journal?*
yes
no

2 SIGNIFICANCE

2a Does the paper discuss an important problem in geography or related fields?*
yes
no
partly

2b Does it bring relevant results for contemporary geography?*
yes
no
partly

2c What is the level of the novelty of research presented in the paper?*
high
middle
low

3 ORIGINALITY

3a Has the paper been already published or is too similar to work already published?*
yes
no

3b Does the paper discuss a new issue?*
yes
no

3c Are the methods presented sound and adequate?*
yes
no
partly

3d Do the presented data support the conclusions?*
yes
no
partly

4 CLARITY

4a Is the paper clear, logical and understandable?*
yes
no

4b If necessary, add comments and recommendations to improve the clarity of the title, abstract, keywords, introduction, methods or conclusion:*

5 QUALITY

5a Is the paper technically sound? (If no, the author should discuss technical editor [rok.ciglic@zrc-sazu.si] for assistance.)*
yes
no

5b Does the paper take into account relevant current and past research on the topic?*
yes
no
Propose amendments, if no is selected:

5d Is the references list the end of the paper adequate?*
yes
no
Propose amendments, if no is selected:

5e Is the quoting in the text appropriate?*
yes
no
partly
Propose amendments, if no is selected:

5f Which tables are not necessary?

5g Which figures are not necessary?

6 COMMENTS OF THE REVIEWER

Comments of the reviewer on the contents of the paper:
Comments of the reviewer on the methods used in the paper:

7 RECOMMENDATION OF THE REVIEWER TO THE EDITOR-IN-CHIEF

My recommendation is:
Please rate the paper from 1 [low] to 100 [high]:
Personal notes of the reviewer to editor-in-chief.

Navodila avtorjem za pripravo člankov v *Acti geographici Slovenici* – Geografskem zborniku

1 Uvod

Acta geographica Slovenica – Geografski zbornik je osrednja slovenska znanstvena revija za geografijo, ki jo izdaja Geografski inštitut Antona Melika Znanstvenoraziskovalnega centra Slovenske akademije znanosti in umetnosti.

Revija je namenjena predstavitvi znanstvenih dosežkov s področja fizične, družbene in regionalne geografije ter sorodnih ved. Objavlja pregledna znanstvena besedila, to je pregled in sintezo že objavljenih najnovejših del o določeni temi, ter izvirna znanstvena besedila, to je prvo objavo originalnih raziskovalnih rezultatov v takšni obliki, da se raziskava lahko ponovi, ugotovitve pa preverijo.

Revija je prvič izšla leta 1952 in je do leta 1976, ko je bila natisnjena štirinajsta številka, izhajala občasno. Leta 1976 je zaradi trajnejše finančne pomoči države začela izhajati redno, od leta 2003 pa izhaja dvakrat letno v tiskani in elektronski obliki na medmrežju. Od leta 1994 izhaja enakovredno v slovenskem in angleškem jeziku (http://ags.zrc-sazu.si). Vsako leto jo razpošljemo v izmenjavo na več kot 200 naslovov po celem svetu. Članke na medmrežju berejo v več kot 100 državah sveta.

Acta geographica Slovenica – Geografski zbornik v objavo sprejema geografske članke iz Slovenije ter Jugovzhodne in Srednje Evrope. Objavljamo tudi članke geografiji sorodnih ved, katerih znanstveno in raziskovalno delo lahko obogati geografske poglede na pokrajino.

Acta geographica Slovenica objavlja članke v slovenskem in angleškem jeziku. Članki, pri katerih je vsaj eden od avtorjev iz Slovenije, morajo imeti tudi slovenski prevod. Članki avtorjev iz tujine in članki posebnih izdaj so objavljeni samo v angleškem jeziku. Članke, ki prispejo v slovenskem jeziku, je po pozitivni recenziji treba prevesti v angleščino. Če za prevod poskrbi uredništvo, je strošek prevoda za avtorje 500 €. Če avtorji sami poskrbijo za profesionalni prevod članka, je treba članek lektorirati, strošek lekture v višini 200 € pa nosijo avtorji. Za lekturo slovenskega dela članka poskrbi uredništvo. Članke, ki prispejo v angleškem jeziku, je po pozitivni recenziji treba nujno lektorirati. Za lekturo poskrbi uredništvo, strošek v višini 200 € pa nosijo avtorji.

2 Sestavine članka

Članki, objavljeni v znanstveni reviji *Acta geographica Slovenica* – Geografski zbornik so urejeni po shemi IMRAD (uvod, metoda, rezultati in razprava; angl.: *Introduction, Method, Results And Discussion*).

Članki, poslani v objavo, morajo imeti naslednje sestavine:

- glavni naslov v slovenskem in angleškem jeziku;
- izvleček dolžine do 800 znakov skupaj s presledki;
- do osem ključnih besed;
- članek v angleškem ali slovenskem jeziku, ki naj skupaj s presledki obsega do 20.000 znakov.
- seznam uporabljenih virov in literature, urejen skladno z navodili.

Besedilo člankov mora biti enakovredno v angleškem in slovenskem jeziku.

Članek naj ima naslove poglavij in naslove podpoglavij označene z vrstilnimi števniki (na primer: 1 Uvod, 1.1 Metodologija, 1.2 Terminologija). Razdelitev članka na poglavja je obvezna, podpoglavja pa naj avtor uporabi le izjemoma. Zaželeno je, da ima članek poglavja Uvod, Sklep in Literatura. Naslovi člankov naj bodo jasni in čim krajši. Avtorji naj se izognejo pisanju opomb pod črto na koncu strani in naj bodo zmerni pri uporabi tujk.

3 Citiranje v članku

Avtor naj pri citiranju med besedilom navede priimek avtorja, letnico ter po potrebi številko strani. Več citatov se loči s podpičjem in razvrsti po letnicah, navedbo strani pa se od priimka avtorja in letnice loči z vejico, na primer: (Melik 1955, 11) ali (Melik, Ilešič in Vrišer 1963, 12; Kokole 1974, 7 in 8). Če ima citirano delo več kot tri avtorje, se citira le prvega avtorja, na primer (Melik s sod. 1956, 217).

Enote v poglavju Viri in literatura naj bodo navedene po abecednem redu priimkov avtorjev, enote istega avtorja pa razvrščene po letnicah. Če je v seznamu več enot istega avtorja iz istega leta, se letnicam dodajo črke (na primer 1999a in 1999b). Zapis vsake citirane enote skladno s slovenskim pravopisom sestavljajo tri je stavki. V prvem stavku sta navedena avtor in letnica izida (če je avtorjev več, so ločeni z vejico, z vejico sta ločena tudi priimek avtorja in začetnica njegovega imena, med začetnico avtorja in letnico ni vejice), sledi dvopičje, za njim pa naslov in morebitni podnaslov, ki sta ločena z vejico. Če je citirana enota članek, se v drugem stavku navede publikacija, v kateri je članek natisnjen, če pa je enota samostojna knjiga, drugega stavka ni. Izdajatelja, založnika in strani se ne navaja. Če enota ni tiskana, se v drugem stavku navede vrsta enote (na primer elaborat, diplomsko, magistrsko ali doktorsko delo), za vejico pa še ustanova, ki hrani to enoto. V tretjem stavku se za tiskane enote navede kraj izdaje, za netiskane pa kraj hranjenja. Pri navajanju literature, ki je vključena v sistem DOI (Digital Object Identifier), je treba na koncu navedbe dodati tudi številko DOI. Številke DOI so dodeljene posameznim člankom serijskih publikacij, prispevkom v monografijah in knjigam. Številko DOI najdete v samih člankih in knjigah, oziroma na spletni strani http://www.crossref.org/guestquery.

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   - Melik, A. 1955b: Nekaj glacioloških opažanj iz Zgornje Doline. Geografski zbornik 5. Ljubljana.
   - Perko, D. 2002: Določanje vodoravne in navpične razgibanosti površja z digitalnim modelom višin. Geografski vestnik 74-2. Ljubljana.
   - Fridl, J., Urbanc, M., Pipan, P. 2009: The importance of teachers' perception of space in education. Acta geographica Slovenica 49-2. Ljubljana. DOI: 10.3986/AGS49205
2) za poglavja v monografijah ali članke v zbornikih:
   - Lovrenčak, F. 1996: Pedogeografska regionalizacija Spodnjega Podravja s Prlekijo. Spodnje Podravje s Prlekijo, 17. zborovanje slovenskih geografov. Ljubljana.
   - Mihevc, B. 1998: Slovenija na starejših zemljevidih. Geografski atlas Slovenije. Ljubljana.
   - Komac, B., Zorn, M. 2010: Statistično modeliranje plazovitosti v državnem merilu. Od razumevanja do upravljanja, Naravne nesreče 1. Ljubljana.
3) za monografije:
   - Natek, K., Natek, M. 1998: Slovenija, Geografska, zgodovinska, pravna, politična, ekonomska in kulturna podoba Slovenije. Ljubljana.
   - Fridl, J., Kladnik, D., Perko, D., Orožen Adamič, M. (ur.) 1998: Geografski atlas Slovenije. Ljubljana.
   - Perko, D., Orožen Adamič, M. (ur.) 1998: Slovenija – pokrajine in ljudje. Ljubljana.
   - Oštir, K. 2006: Daljinsko zaznavanje. Ljubljana.
4) za elaborate, diplomska, magistrska, doktorska dela ipd.:
   - Richter, D. 1998: Metamorfne kamnine v okolici Velikega Tinja. Diplomsko delo, Pedagoška fakulteta Univerze v Mariboru. Maribor.
   - Šifrer, M. 1997: Površje v Sloveniji. Elaborat, Geografski inštitut Antona Melika ZRC SAZU. Ljubljana.
5) za vire brez avtorjev in kartografske vire:
   - Popis prebivalstva, gospodinjstev, stanovanj in kmečkih gospodarstev v Republiki Sloveniji, 1991 – končni podatki. Zavod Republike Slovenije za statistiko. Ljubljana, 1993.
   - Digitalni model višin 12,5. Geodetska uprava Republike Slovenije. Ljubljana, 2005.
   - Državna topografska karta Republike Slovenije 1 : 25.000, list Brežice. Geodetska uprava Republike Slovenije. Ljubljana, 1998.
   - Franciscejski kataster za Kranjsko, k. o. Sv. Agata, list A02. 1823–1869. Arhiv Republike Slovenije. Ljubljana.
   - Buser, S. 1986a: Osnovna geološka karta SFRJ 1 : 100.000, list Tolmin in Videm (Udine). Zvezni geološki zavod. Beograd.
   - Buser, S. 1986b: Osnovna geološka karta SFRJ 1 : 100.000, tolmač lista Tolmin in Videm (Udine). Zvezni geološki zavod. Beograd.

Avtorji vse pogosteje citirajo vire z medmrežja. Če sta znana avtor in/ali naslov citirane enote, potem se jo navede takole (datum v oklepaju pomeni čas ogleda medmrežne strani):

- Vilhar, U. 2010: Fenološka opazovanja v okviru Intenzivnega spremljanja stanja gozdnih ekosistemov. Medmrežje: http://www.gozdis.si/impsi/delavnice/Fenoloska%20opazovanja_Vilhar.pdf (19. 2. 2010).
- eGradiva, 2010. Medmrežje: http://www.egradiva.si/ (11. 2. 2010).

Če avtor, naslov ali ustanova niso poznani, se navede le:

- Internet: http://giam.zrc-sazu.si/ (22. 7. 2011).

Če se navaja več enot z medmrežja, se doda še številko:

- Internet 1: http://giam.zrc-sazu.si/ (22. 7. 2011).
- Internet 2: http://zgs.zrc-sazu.si/ (22. 7. 2011).

Med besedilom se v prvem primeru navede avtorja, na primer (Vilhar 2010), v drugem primeru pa le medmrežje, na primer (Internet 2).

Zakone se citira v naslednji obliki (ime zakona, številka uradnega lista, kraj izida), na primer:

- Zakon o kmetijskih zemljiščih. Uradni list Republike Slovenije 59/1996. Ljubljana.
- Zakon o varstvu pred naravnimi in drugimi nesrečami. Uradni list Republike Slovenije 64/1994, 33/2000, 87/2001, 41/2004, 28/2006 in 51/2006. Ljubljana.

Če ima zakon dopolnitve, je treba navesti tudi te. Med besedilom se zakon navaja s celim imenom, če gre za krajše ime, ali pa z nekaj prvimi besedami in tremi pikami, če gre za daljše ime. Na primer (Zakon o kmetijskih zemljiščih 1996) ali (Zakon o varstvu … 1994).

V poglavju *Viri in literatura* morajo biti navedena vsa dela, citirana v prispevku, ostalih, necitiranih del pa naj avtor ne navaja.

Avtorji naj upoštevajo tudi navodila za navajanje virov lastnika podatkov ali posrednika, če jih le-ta določa. Primer: Geodetska uprava Republike Slovenije ima navodila za navajanje virov določena v dokumentu »Pogoji uporabe geodetskih podatkov« (http://e-prostor.gov.si/fileadmin/narocanje/pogoji_uporabe_podpisani.pdf).

4 Preglednice in grafične priloge v članku

Priloge morajo prav tako oddati natisnjene v digitalni obliki v ustreznem formatu. Fotografije in druge grafične priloge morajo avtorji, če je le mogoče, oddati v obliki, primerni za skeniranje, sicer pa v digitalni rastrski obliki z ločljivostjo vsaj 300 pik na palec ali 120 pik na cm, najbolje v formatu TIFF ali JPG in končni velikosti slike. Če avtorji ne morejo oddati prispevkov in grafičnih prilog, pripravljenih v omenjenih programih, naj se predhodno posvetujejo z uredništvom (rok.ciglic@zrc-sazu.si).

Vse ***preglednice*** v članku so oštevilčene in imajo svoje naslove. Med številko in naslovom je dvopičje. Naslov konča pika. Primer:
Preglednica 1: Število prebivalcev Ljubljane po posameznih popisih.
Preglednica 2: Spreminjanje povprečne temperature zraka v Ljubljani (Velkavrh 2009).

Vse ***grafične priloge*** – slike (fotografije, zemljevidi, grafi in podobno) v članku so oštevilčene enotno in imajo svoje naslove. Med številko in naslovom je dvopičje. Naslov konča pika. Primera:
Slika 1: Rast števila prebivalcev Ljubljane po posameznih popisih.
Slika 2: Izsek topografske karte v merilu 1 : 25.000, list Kranj.

Avtorji morajo za grafične priloge, za katere nimajo avtorskih pravic, priložiti fotokopijo dovoljenja za objavo, ki so ga pridobili od lastnika avtorskih pravic.

Grafične priloge naj bodo široke točno 134 mm (cela širina strani) ali 64 mm (pol širine, 1 stolpec), visoke pa največ 200 mm. V primeru, da želimo imeti celostransko sliko ali zemljevid, mora biti njuna velikost 134 × 192,3 mm (podnapis h grafični prilogi je enovrsticen) ali 134 × 200 mm (podnapis h grafični prilogi je naveden na sosednji strani).

Slikovno gradivo (zemljevidi, sheme in podobno) naj bo v formatih .ai ali .cdr, fotografije pa v formatih .tif ali .jpg.

Zemljevidi naj bodo izdelani v digitalni obliki. Zaželeno je, da so oddani v vektorski obliki, pripravljeni s programom *Corel Draw* ali *Adobe Illustrator*, zlasti če vsebujejo besedilo. Možno jih je oddati tudi v rastrski obliki z ločljivostjo vsaj 300 pik na palec ali 120 pik na cm, najbolje v formatu TIFF ali JPG in končni velikosti slike.

Pri tistih zemljevidih in shemah, izdelanih s programom ArcGIS, kjer so poleg vektorskih slojev kot podlaga uporabljeni tudi rastrski sloji (na primer .tif reliefa, letalskega ali satelitskega posnetka in podobno), oddajte tri ločene datoteke. V prvi naj bodo samo vektorski sloji z izključeno morebitno prosojnostjo poligonov skupaj z legendo in kolofonom (izvoz v formatu .ai), v drugi samo rastrska podlaga (izvoz v formatu .tif), v tretji, kontrolni datoteki pa vektorski in rastrski sloji skupaj, tako kot naj bi bil videti končni zemljevid v knjigi (izvoz v formatu .jpg). To je nujno, da tudi natisnjeni zemljevid ohrani ustrezno kakovost.

Zemljevidi naj bodo brez naslova, ker je naveden v podnapisu. Za izdelavo zemljevidov uporabite predloge s spletne strani revije.

Pri izbiri in določanju barv za slikovne priloge uporabite zapis CMYK in ne RGB oziroma drugih.

Za legendo zemljevida je potrebno uporabiti tip pisave *Times new roman* velikosti 8 pik, za kolofon pa isto vrsto pisave velikosti 6 pik. V kolofonu naj so po vrsti od zgoraj navzdol v angleškem in slovenskem jeziku navedeni: merilo (grafično ali besedilno), avtor vsebine, avtor zemljevida, vir in ustanova oziroma nosilec avtorskih pravic. Kolofon mora biti v angleškem in slovenskem jeziku razen kjer to zaradi prostorskih omejitev ni možno. Primer:

Scale/merilo: (grafično, besedilno)
Author of contents/avtor vsebine: Drago Perko
Author of map/avtorica zemljevida: Jerneja Fridl
Source/vir: Statistični urad RS, 2002
© Geografski inštitut Antona Melika ZRC SAZU, 2005

Pri zemljevidih in shemah, izdelanih v programih CorelDraw ali Adobe Illustrator, oddajte dve ločeni datoteki; poleg originalnega zapisa (format .cdr ali .ai) dodajte še datoteko, ki prikazuje, kako naj bo videti slika (format .jpg).

Grafikoni naj bodo izdelani s programom *Excel*. Na posameznem listu naj bodo skupaj z grafom tudi podatki, na podlagi katerih je bil izdelan.

Fotografije mora avtor oddati v digitalni rastrski obliki z ločljivostjo vsaj 240 pik na cm oziroma 600 pik na palec, najbolje v formatu .tif ali .jpg, kar pomeni približno 3200 pik na celo širino strani v reviji.

Slike, ki prikazujejo računalniški zaslon, morajo biti narejene pri največji možni ločljivosti zaslona (ločljivost uredimo v: Nadzorna plošča\Vsi elementi nadzorne plošče\Zaslon\Ločljivost zaslona oziroma Control Panel\All Control Panel Items\Display\Screen Resolution). Sliko se nato preprosto naredi s pritiskom tipke print screen, prilepi v izbran grafični program (na primer Slikar, Paint) in shrani kot .tif. Pri tem se slike ne sme povečati ali pomanjšati oziroma ji spremeniti ločljivost. Po želji lahko uporabite tudi ustrezne programe za zajem zaslona in shranite sliko v zapisu .tif.

5 Sprejemanje prispevkov

Za objavo v reviji *Acta geographica Slovenica* sprejemamo le izvirne oziroma nove znanstvne članke. Avtor s podpisom potrdi izjavo o izvirnosti vsebine in podobe članka ter dejstvo, da članek še ni bil posredovan v objavo drugam oziroma drugje še ni bil objavljen.

Avtorji morajo besedilo prispevkov oddati v digitalni obliki prek spletne strani ags.zrc-sazu.si. Prispevki morajo biti izdelani v programu Word.

Zaradi morebitnih sprememb v postopku recenzije in urejanja naj članek najprej oddajo v slovenskem jeziku, po sprejemu za objavo pa še v angleškem. Prevod je strošek avtorja.

Digitalni zapis besedila naj bo povsem enostaven, brez zapletenega oblikovanja, samodejnih naslovov, poravnave desnega roba, deljenja besed, podčrtavanja in podobnega. Avtorji naj označijo le mastni (krepki) in ležeči tisk. Besedilo naj bo v celoti izpisano z malimi črkami (razen velikih začetnic, seveda), brez nepotrebnih krajšav, okrajšav in kratic.

Če besedilo slovnično ali vsebinsko ni ustrezno napisano, ga uredniški odbor avtorju lahko vrne v popravek, zahteva lektoriranje ali članek zavrne. Datum prejetja članka je objavljen za angleškim prevodom izvlečka in ključnih besed.

Avtorji naj prispevke pošiljajo prek sistema OJS na naslovu ags.zrc-sazu.si.

6 Recenziranje člankov

Članke najprej pregleda eden od področnih urednikov. Avtorji člankov so potem običajno pozvani, da članek ustrezno dopolnijo ali popravijo. Sledi recenzentski postopek, ki je praviloma anonimen. Recenzenta prejmeta članek brez navedbe avtorja članka, avtor članka pa prejme recenzijo brez navedbe recenzenta. Če recenzija ne zahteva popravka ali dopolnitve članka, se avtorju članka recenzij ne pošlje. Avtor dovoljuje, da uredništvo prispevek krajša ali drugače prilagodi, da bo primeren za objavo. Na predlog uredništva ali recenzenta se lahko zavrne objavo prispevka.

7 Avtorske pravice

Za avtorsko delo, poslano za objavo v *Acti geographici Slovenici* – Geografskem zborniku, vse moralne avtorske pravice pripadajo avtorju, materialne avtorske pravice reproduciranja in distribuiranja v Republiki Sloveniji in v drugih državah pa avtor brezplačno, enkrat za vselej, za vse primere, za neomejene naklade in za vse medije neizključno prenese na izdajateljico. Avtor dovoljuje objavo članka ali njegovih delov na medmrežju.

Avtor sam poskrbi za profesionalni prevod članka ter obvezno navede ime in priimek prevajalca. Avtorji so dolžni sodelovati v procesu lektoriranja besedila in urejanja članka.

Če obseg avtorskega dela ni skladen z navodili za objavo, avtor dovoljuje izdajatelju, da avtorsko delo po svoji presoji ustrezno prilagodi.

Izdajatelj poskrbi, da se vsi prispevki s pozitivno recenzijo, če so zagotovljena sredstva za tisk, objavijo v *Acti geographici Slovenici* – Geografskem zborniku in na medmrežju, praviloma skladno z vrstnim redom prispetja prispevkov in skladno z enakomerno razporeditvijo prispevkov po temah. Naročeni prispevki se lahko objavijo ne glede na datum prispetja.

Prispevki v reviji *Acta geographica Slovenica* – Geografski zbornik niso honorirani niti niso honorirani recenzenti.

Avtorju pripada 1 brezplačen izvod publikacije.

8 Priprava kontrolnega seznama v sistemu OJS

Kot del postopka oddaje članka morajo avtorji preveriti skladnost članka in navodil. Uredništvo si pridržuje pravico, da avtorjem vrne članek v popravek, če ta ni pripravljen skladno s temi navodili. Avtorji morajo upoštevati naslednja navodila:

1. Članek ni bil predhodno objavljen niti ni v postopku objave v drugi reviji oziroma je to razloženo v komentarju uredniku).
2. Datoteka je shranjena v formatu Microsoft Word.
3. Če so na voljo, so predloženi URL-ji in DOI referenc.
4. Besedilo ima enojne razmike s pisavo velikosti 12 točk; za poudarjanje vsebine uporablja ležeč ali krepki format brez podčrtovanja (razen URL naslovov). V besedilu je s podnapisi označena lega slik, ilustracije in slike pa niso vnesene v besedilo, temveč so oddane v posebnih datotekah (.cdr, .ai za zemljevide in ilustracije; .tif za fotografije). Preglednice so na ustreznih mestih besedilu. Velikost posamezne dodatne datoteke ne sme preseči 50 MB.
5. Besedilo je pripravljeno skladno z oblikovnimi in bibliografskimi merili za pripravo člankov za objavo v reviji *Acta geographica Slovenica*, ki so objavljene v poglavju *About* na spletni strani http://ojs.zrc-sazu.si/ags.
6. Pri oddaji članka so bila upoštevana navodila za zagotavljanje anonimne recenzije članka.
7. Velikost dodatnih datotek ne presega 50 MB.
8. Če je vsaj eden od avtorjev iz Slovenije, se strinjamo, da bomo dali članek na naše stroške prevesti v angleški / slovenski jezik oziroma dali lektorirat angleški del članka (za podrobnosti glej navodila), POTEM ko bo sprejet za objavo.

9 Izjava o zasebnosti

Imena in e-poštni naslovi, vneseni v tej reviji mestu se bodo uporabljali izključno za navedene namene te revije in ne bodo na voljo za kakršne koli druge namene ali za katero koli drugo stranko.

10 Naročanje

Acto geographico Slovenico – Geografski zbornik lahko naročite na naslovu založnika:
Založba ZRC
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SI – 1001 Ljubljana, Slovenija

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Revijo je mogoče tudi kupiti v knjigarni Azil na Novem trgu 2 v Ljubljani ali si jo sposoditi v knjižnicah (www.cobiss.si).

11 Obrazec za uredniški pregled člankov

Obrazec za uredniški pregled člankov v reviji Acta geographica Slovenica – Geografskem zborniku je zaradi uporabe uredniškega sistema *Open journal system* (OJS) zaenkrat dostopen samo v angleškem jeziku. Glej angleški del navodil.

12 Obrazec za recenzijo člankov

Obrazec za recenzijo člankov v reviji Acta geographica Slovenica – Geografskem zborniku je zaradi uporabe uredniškega sistema *Open journal system* (OJS) zaenkrat dostopen samo v angleškem jeziku. Glej angleški del navodil.

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