SETOF Soil Erosion and TOrrential Flood Prevention: Curriculum Development at the Universities of Western Balkan Countries

UTILIZATION SUITABILITY INDEX (USI) OF TECHNOSOLS: CASE STUDY OF KAKANJ MUNICIPALITY

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Goč Srbija, Novembar 2022

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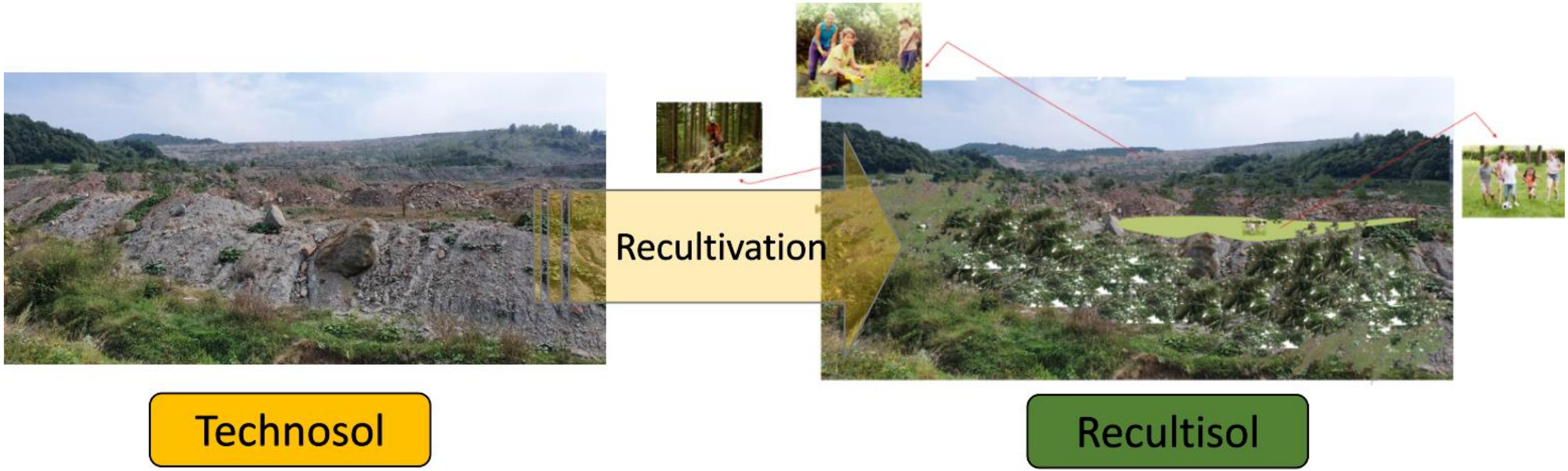
Introduction



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Definition

- According to the definition of the European Union, technogenic soil is "abandoned or underused urban or suburban soil, which is located in fully or partially developed urban areas, which may have problems caused by complete or partial contamination, and which requires intervention in order to return to useful uses".

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Object

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Object

Objective

Technosol is classified in the VII rating category (10-20 points), which enables the use of this land for construction, industrial use and recreation (Resulović et al., 2008).

Objective: Explore USI of technosol for land recultivation.

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Case study location

Municipality of Kaknaj

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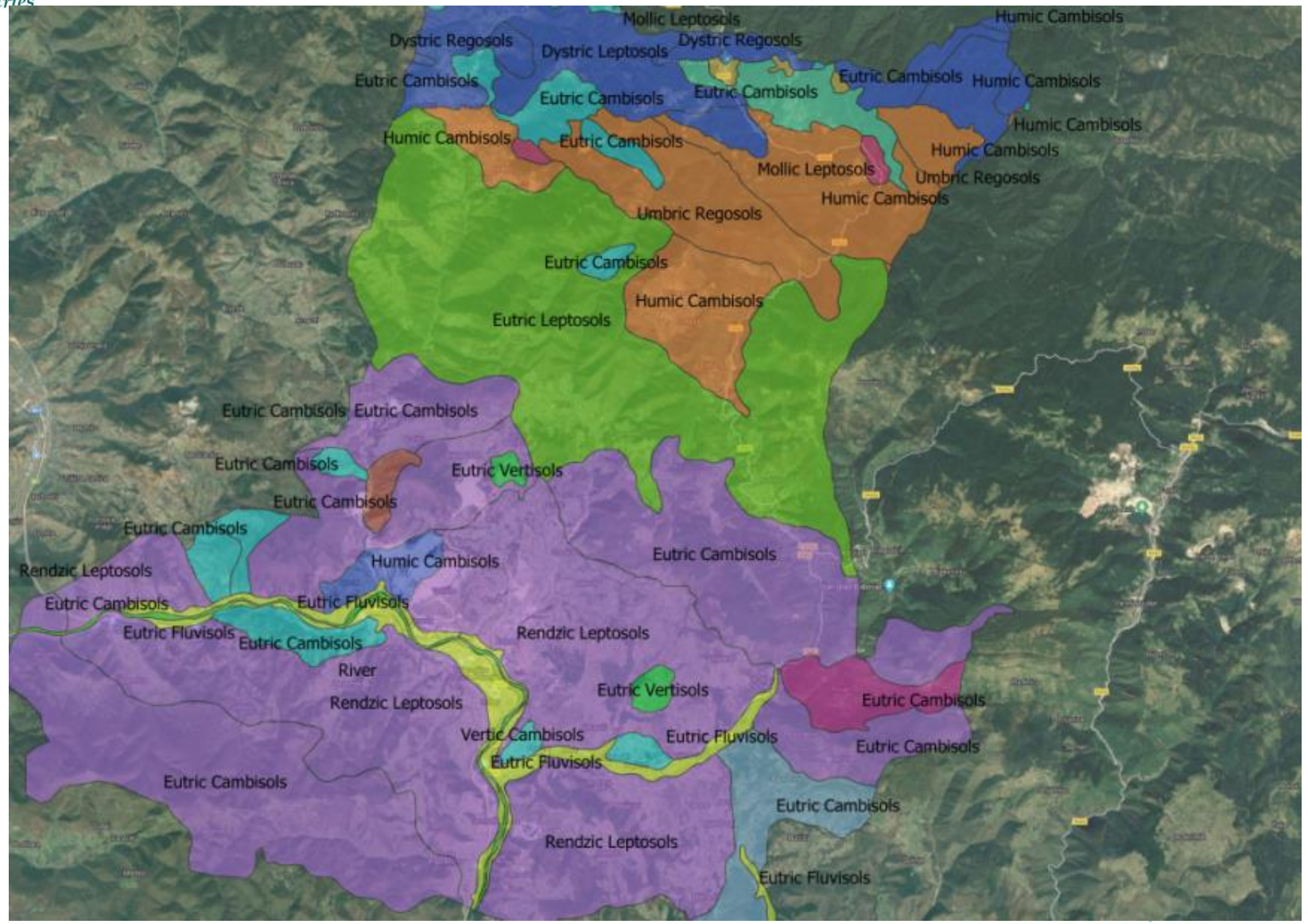
Soil map

- Eutric Cambisol
- Rendzic Leptosol



Methods

FAO land evaluation concept (FAO 2007)

climate relief soil

soil quality-SQ

$$USI = SQRT(SQ * KPdeg/Purb * KPdeg/Pforest * K\,Pdeg/Pagric * KGN)$$

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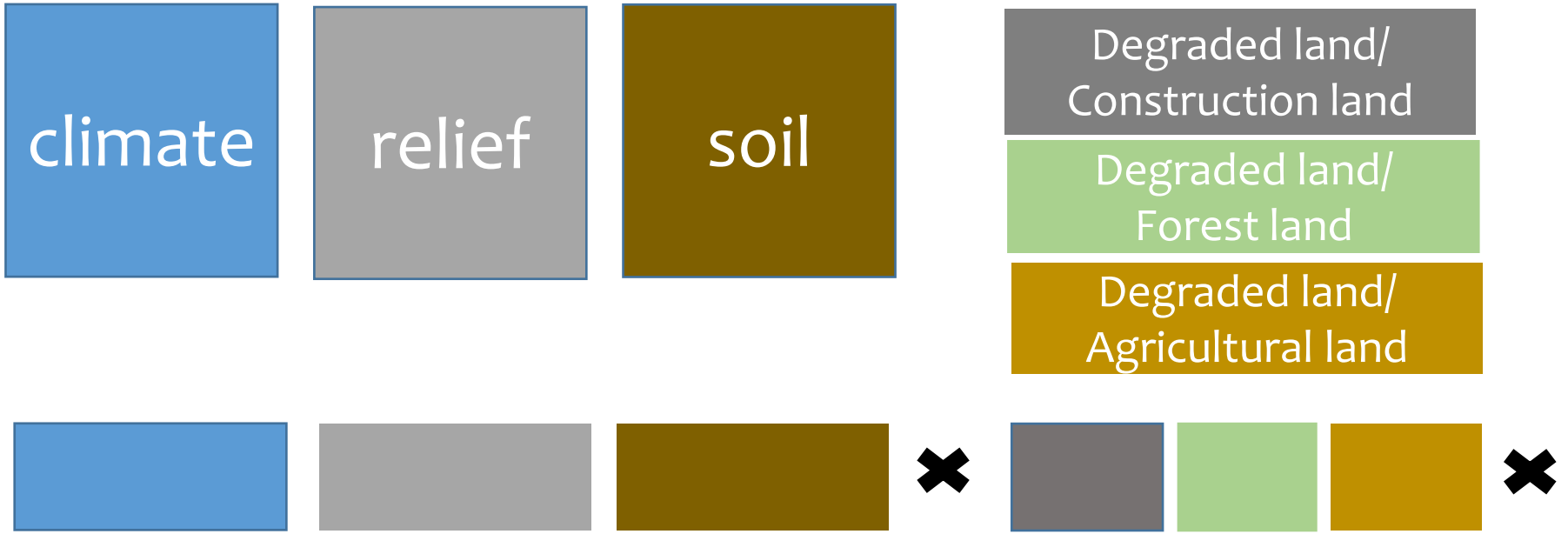
Methods



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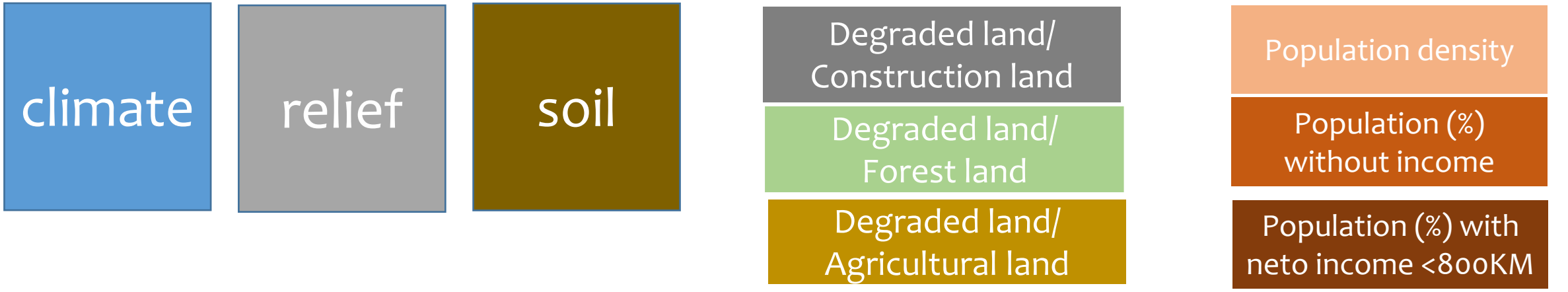

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Methods

Soil quality

Na osnovu člana 24. stav 6. Zakona o poljoprivrednom zemljištu ("Službene novine Federacije BiH", broj 52/09), federalni ministar poljoprivrede, vodoprivrede i šumarstva donosi

PRAVILNIK

O JEDINSTVENOJ METODOLOGIJI ZA RAZVRSTAVANJE POLJOPRIVREDNOG ZEMLJIŠTA U KATEGORIJE POGODNOSTI

climate

relief

soil

Sarajevo, Zenica, Ilijaš, Breza, Visoko, Zepče, Maglaj Kakanj	Srednje bosansko područje - Sarajevsko - zenički rajon	400-1300	187	877	9,6	400-500	5-8

Nagib (inklinacija) zemljišta u		Oznaka reljefa	Naziv reljefa	Bonitetni bodovi
stepenima	procentima			
0 - 2	0 - 3	a	ravan	10
0 - 2	0 - 3	b	ravan s mikro ili mezouvalama	8 - 9
2 - 6	3 - 11	c	valovit ili vrlo blage padine	8 - 9
6 - 9	11 - 16	d	umjereno blage padine	7 - 8
9 - 12	16 - 21	e	umjereno strme padine	6 - 7
12 - 17	21 - 31	f	strme padine	4 - 5
17 - 24	31 - 45	g	jako strme padine	2 - 5
24 - 33	45 - 65	h	vrlo jako strme padine	1 - 2
preko 33	preko 65	i	vrletne padine	1

geologic origin
texture
effective depth
groundwater
pH value
drainage

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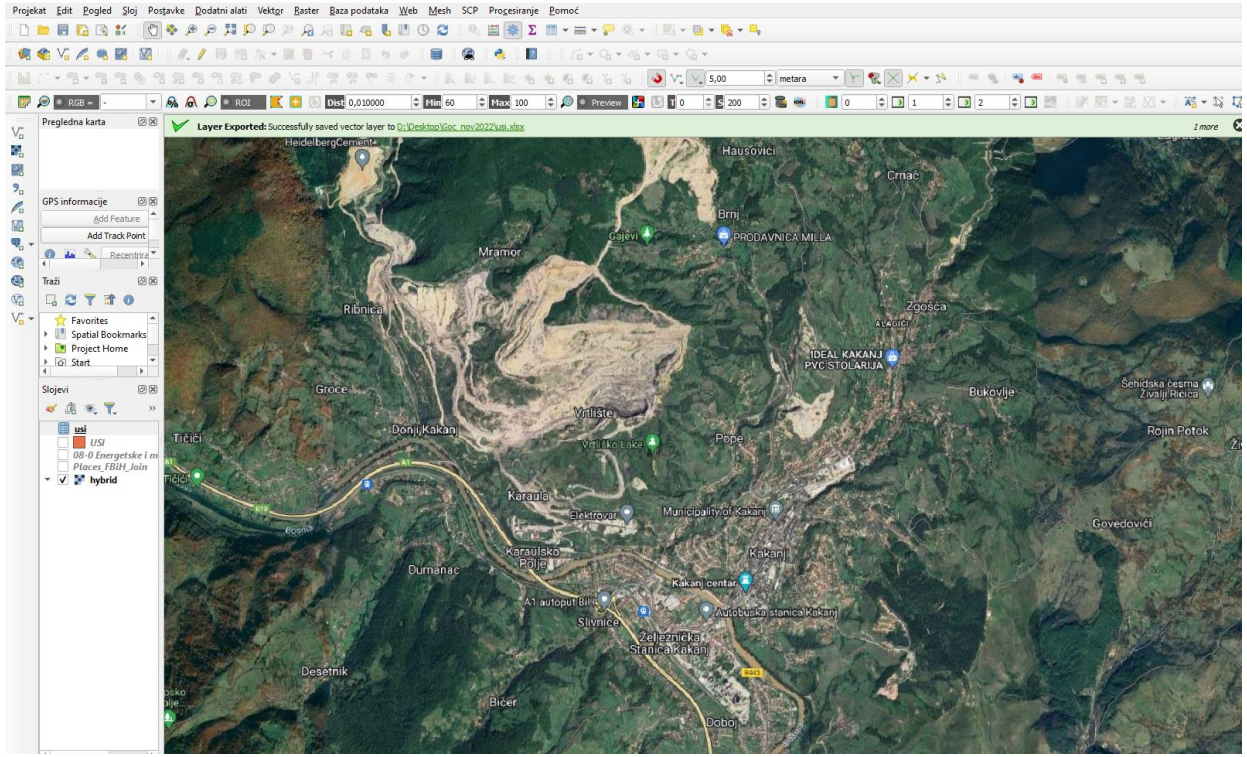
Identification of area

Degraded land/
Construction land

Degraded land/
Forest land

Degraded land/
Agricultural land



Naziv Hybrid

URL http://mt0.google.com/vt/lyrs=y&hl=en&x={x}&y={y}&z={z}

Izvor type=xyz&url=http://mt0.google.com/vt/lyrs%3Dy%26hl%3Den%26x%3D%7Bx%7D%26y%3D%7By%7D%26z%3D%7Bz%7D&zmax=18&zmin=0

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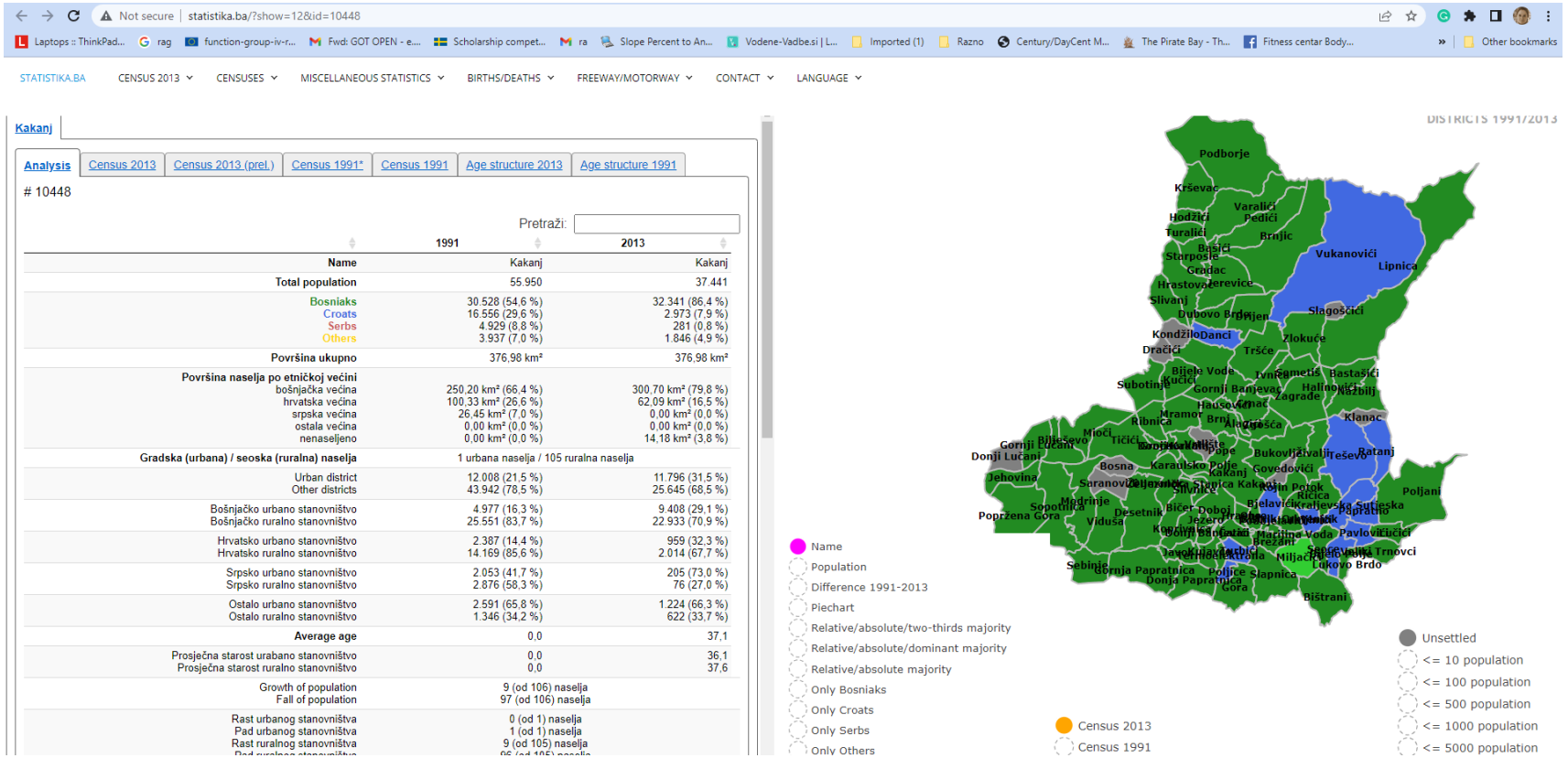
Gathering demographic data

Conducting a survey



Name	1991 Kakanj	2013 Kakanj
Total population	55.950	37.441
Bosniaks	30.528 (54,6 %)	32.341 (86,4 %)
Croats	16.556 (29,6 %)	2.973 (7,9 %)
Serbs	4.929 (8,8 %)	281 (0,8 %)
Others	3.937 (7,0 %)	1.846 (4,9 %)
Površina ukupno	376,98 km²	376,98 km²
Površina naselja po etničkoj većini		
bošnjačka većina	250,20 km² (66,4 %)	300,70 km² (79,8 %)
hrvatska većina	100,33 km² (26,6 %)	62,09 km² (16,5 %)
srpska većina	26,45 km² (7,0 %)	0,00 km² (0,0 %)
ostala većina	0,00 km² (0,0 %)	0,00 km² (0,0 %)
nenaseljeno	0,00 km² (0,0 %)	14,18 km² (3,8 %)
Gradska (urbana) / seoska (ruralna) naselja	1 urbana naselja / 105 ruralna naselja	
Urban district	12.008 (21,5 %)	11.796 (31,5 %)
Other districts	43.942 (78,5 %)	25.645 (68,5 %)
Bošnjačko urbano stanovništvo	4.977 (16,3 %)	9.408 (29,1 %)
Bošnjačko ruralno stanovništvo	25.551 (83,7 %)	22.933 (70,9 %)
Hrvatsko urbano stanovništvo	2.387 (14,4 %)	959 (32,3 %)
Hrvatsko ruralno stanovništvo	14.169 (85,6 %)	2.014 (67,7 %)
Srpsko urbano stanovništvo	2.053 (41,7 %)	205 (73,0 %)
Srpsko ruralno stanovništvo	2.876 (58,3 %)	76 (27,0 %)
Ostalo urbano stanovništvo	2.591 (65,8 %)	1.224 (66,3 %)
Ostalo ruralno stanovništvo	1.346 (34,2 %)	622 (33,7 %)
Average age	0,0	37,1
Prosječna starost urabano stanovništvo	0,0	36,1
Prosječna starost ruralno stanovništvo	0,0	37,6
Growth of population	9 (od 106) naselja	
Fall of population	97 (od 106) naselja	
Rast urbanog stanovništva	0 (od 1) naselja	
Pad urbanog stanovništva	1 (od 1) naselja	
Rast ruralnog stanovništva	9 (od 105) naselja	

Pitanja:		Ponuđeni odgovori
1.	Vaš spol	Muško/ Žensko
2.	Godine starosti	
3.	Koja je Vaša stručna sprema?	1. Osnovna škola i niže 2. Srednja stručna sprema 3. Univerzitetsko obrazovanje
4.	Koji je Vaš status zaposlenja?	1.Zaposlen u vlastitoj firmi 2. Zaposlen kod poslodavca 3. Nezaposlen/a 4. Penzioner 5.Student 6.Učenik 7. Ostalo
5.	VisinaVaših mjesečnih primanja u KM?	
6.	Ukoliko na prethodno pitanje niste odgovorili, molimo Vas da odaberete trenutni mjesečni nivo primanja	1. Nema primanja 2. <299KM/mj 3. 300-499KM/mj 4. 500-799KM/mj 5.800-1500KM/mj 6.> 1500KM/mj
7.	U kojem dijelu općine Kakanj živite?	1. U gradu Kaknju 2. U ruralnom dijelu općine Kakanj 3. U neposrednoj blizini odlagališta Bare 4. U neposrednoj blizini Kamenoloma Greben 5. U neposrednoj blizini Površinskog kopa Vrtlište 6. U blizini deponije šljake i pepela Turbići 7. Ostalo
8.	Stambeni objekat u kojem živite	1. objekat kolektivnog stanovanja (stan) 2. objekat individualnog stanovanja (kuća)
9.	Kako bi ste ocijenili svoje zdravstveno stanje u protekla tri mjeseca?	1-loše 5-odlično
10.	Da li netko u Vašoj porodici pati od bolesti respiratornog sistema? Ukoliko je Vaš odgovor Da, možete li navesti koje vrste i koliko dugo?	
11.	U kojoj mjeri ste upoznati sa uticajem tehnogenog tla na okoliš?	1- nisam upoznat/a 5- potpuno upoznat/a
12.	Da li ste posjetili jednu od degradiranih površina na području općine Kakanj? (Lokacije kao što su: Bare, Vrtlište, Kamenolom Greben, Deponija Turbići)	1. Da 2. Ne
13.	Ocijenite uticaj na kvalitet življenja i kvalitet okoliša koji se uzrokuju odlaganjem šljake, pepela, jalovine i otpada u blizini naselja?	1- nema problema 5- veliki problem
14.	Koliko često posjećujete neke od navedenih degradiranih površina?	1. Svakodnevno jer živim u blizini 2. Jednom tokom sedmice 3. Jednom u mjesecu 4. Do tri puta godišnje 5. Jednom godišnje 6. Nikada
15.	Kako ocjenjujete trenutni izgled napuštenih prikazanih degradiranih površina?(Bare)	1- loše 5- izvrsno
16.	Kako ocjenjujete trenutni izgled napuštenih prikazanih degradiranih površina?(Vrtlište)	1- loše 5- izvrsno
17.	Kako ocjenjujete trenutni izgled napuštenih prikazanih degradiranih površina?(Greben)	1- loše 5- izvrsno
18.	Kako ocjenjujete trenutni izgled napuštenih prikazanih degradiranih površina?(Turbići)	1- loše 5- izvrsno

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Methods

Bonitet	SQ class
0-20	1
20-30	2
30-40	3
40-60	4

KU-K Pdeg/Pconstruction	KS Pdeg/ Pforest	KP Pdeg/Pagric	Degradation class
< 1	<0.3	< 0.5	1
1 - 2	0.3 - 0.6	0.5 - 1.5	2
2 - 3	0.6 - 0.9	1.5 - 2.5	3
>3	>0.9	>2.5	4

Population density	Class
<10	1
10-1000	2
1000-10000	3
>10000	4

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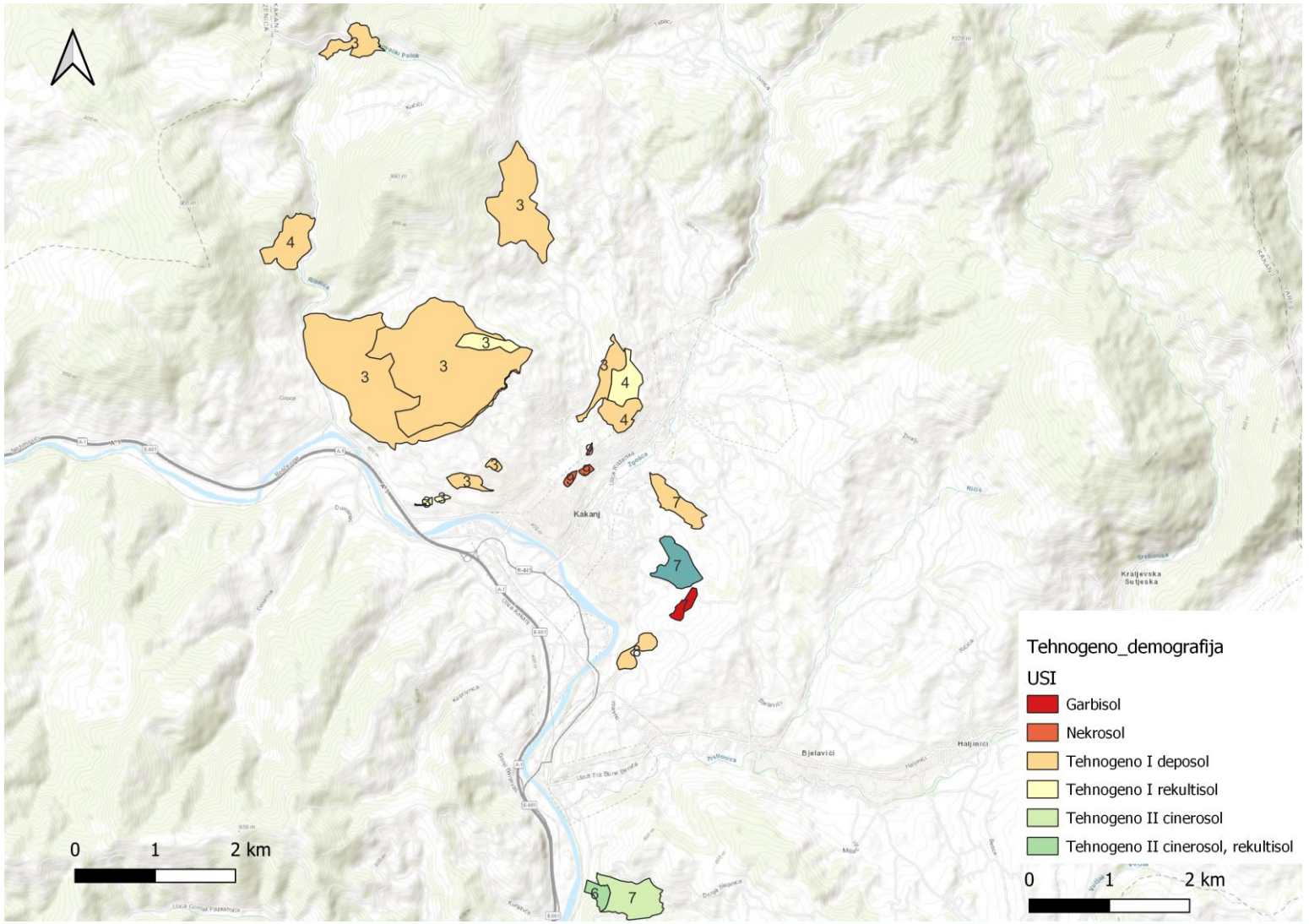
Results



376,98 km2 --- 1,6% Technosol

589 ha

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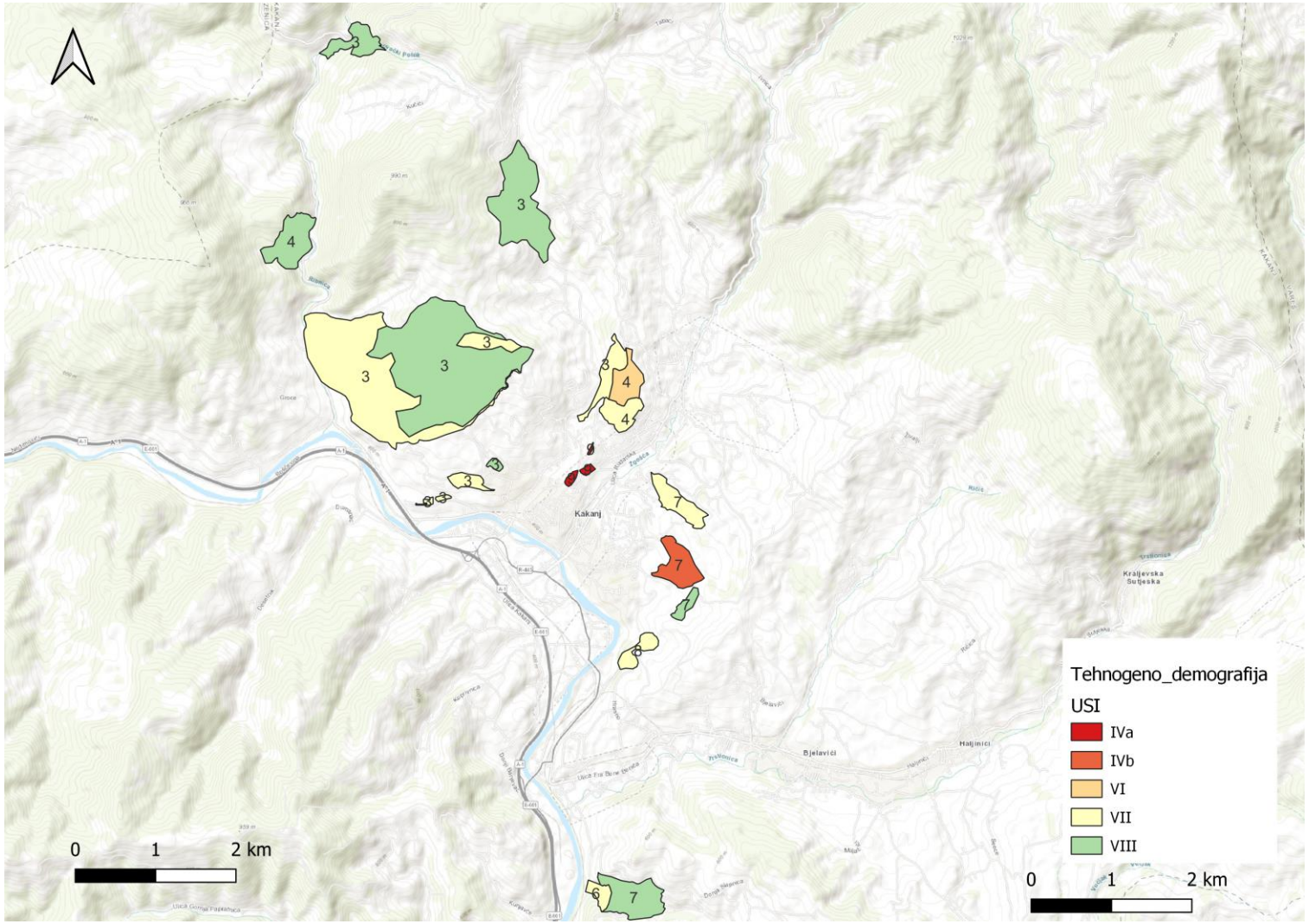
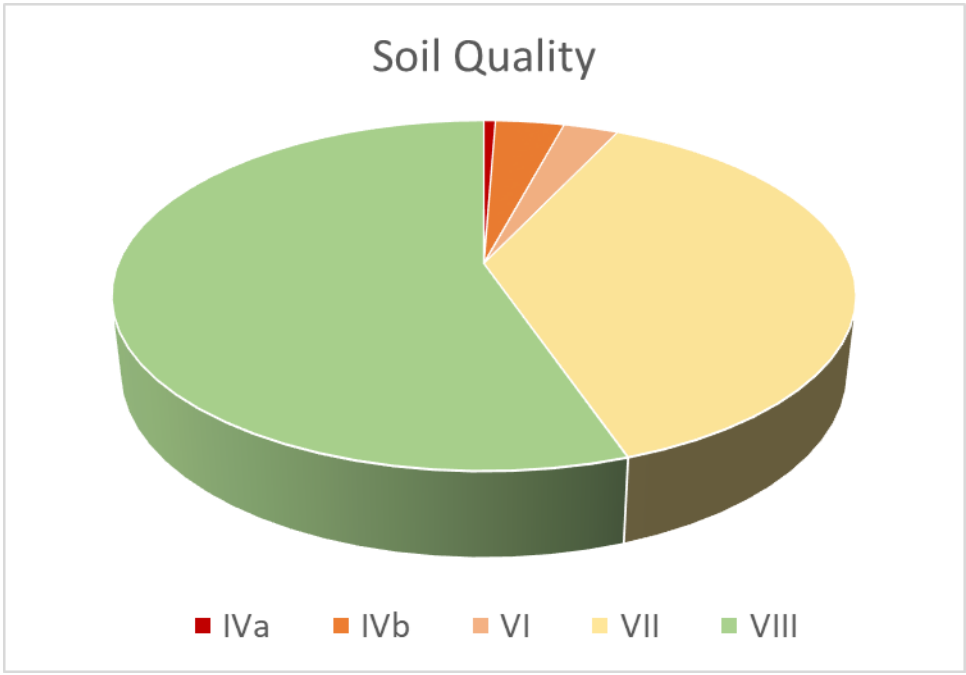
Results





% Area of each soil quality cathegory

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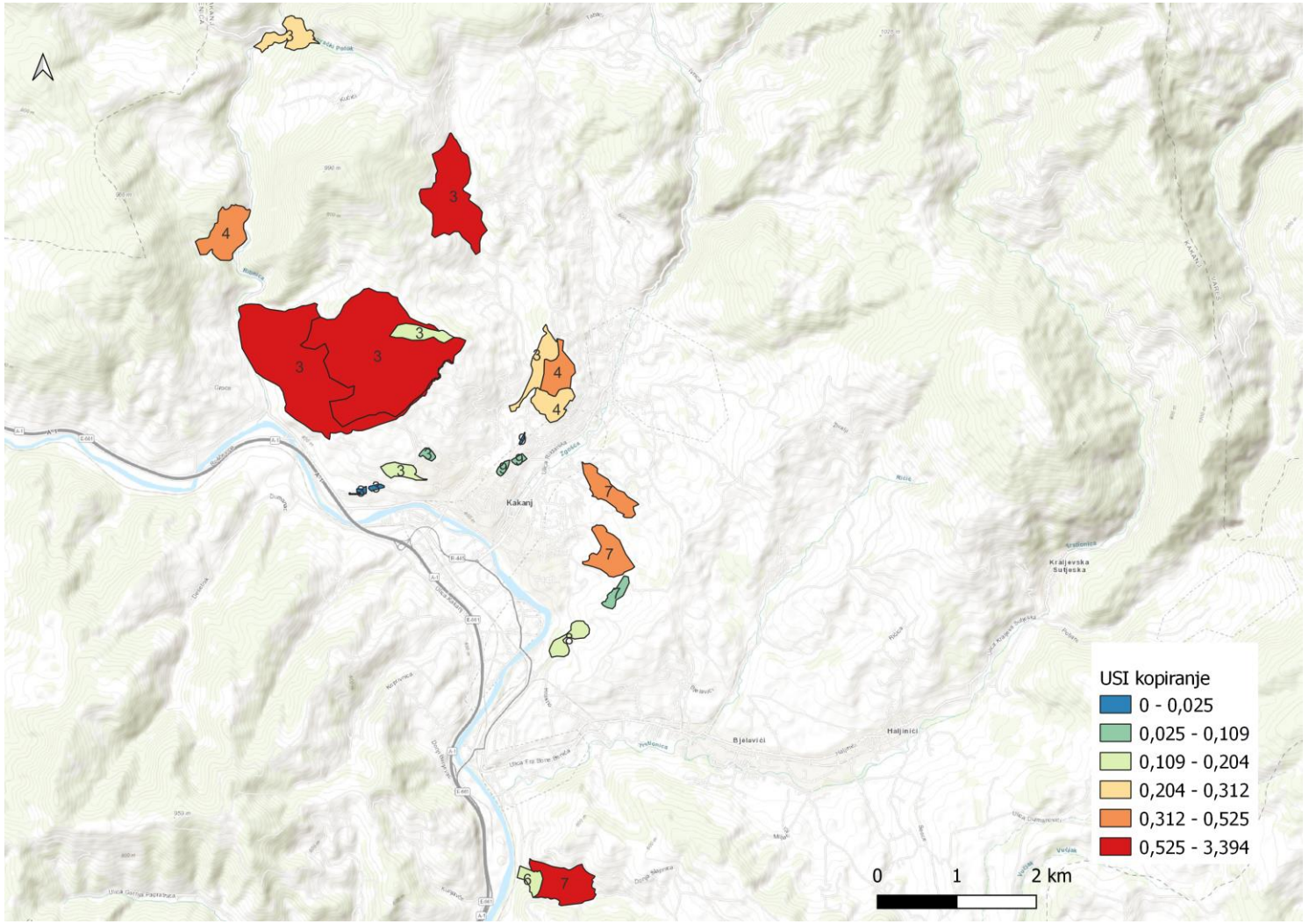
Results

Degradation ratio



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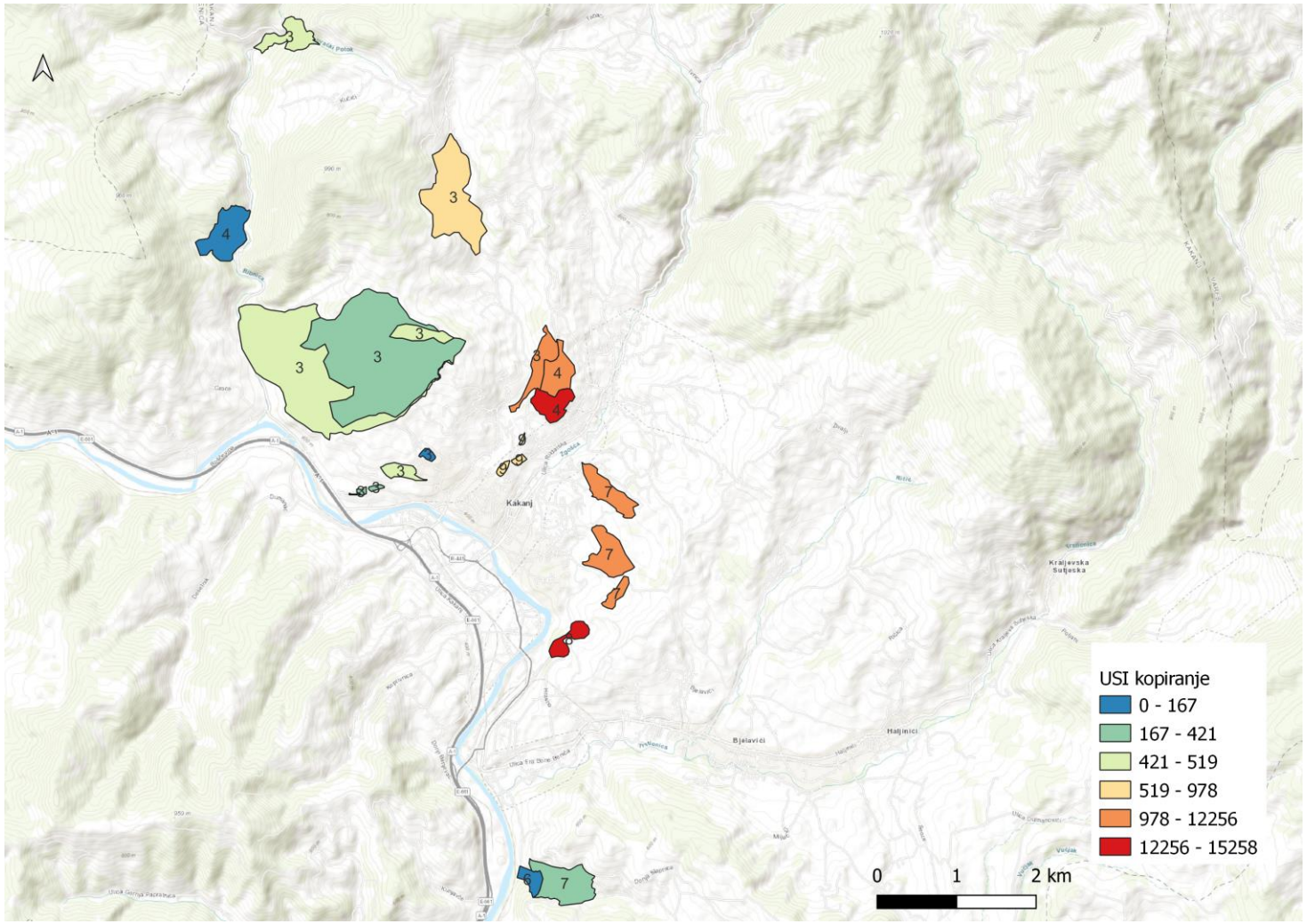
Results

Population density



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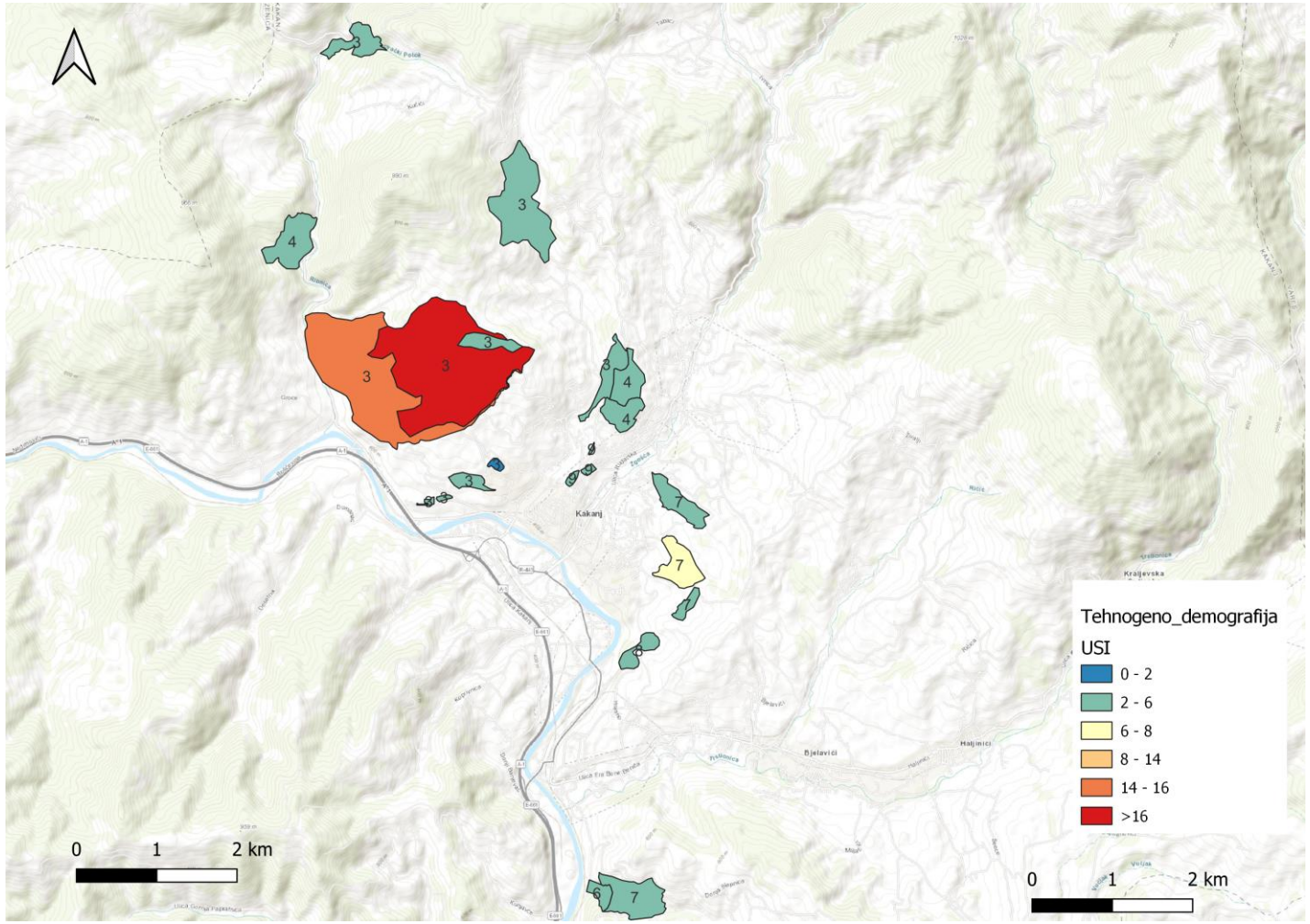

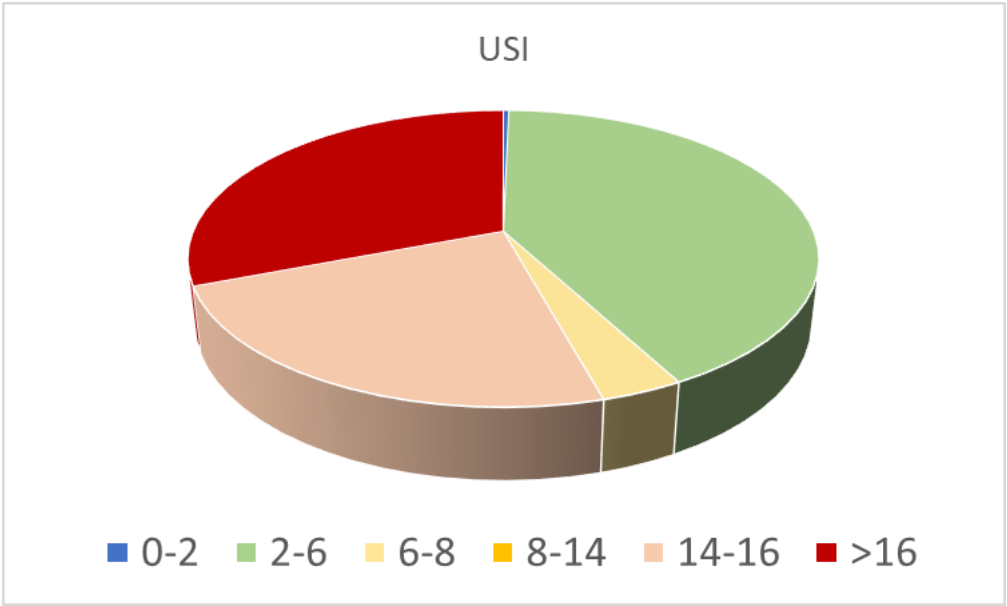

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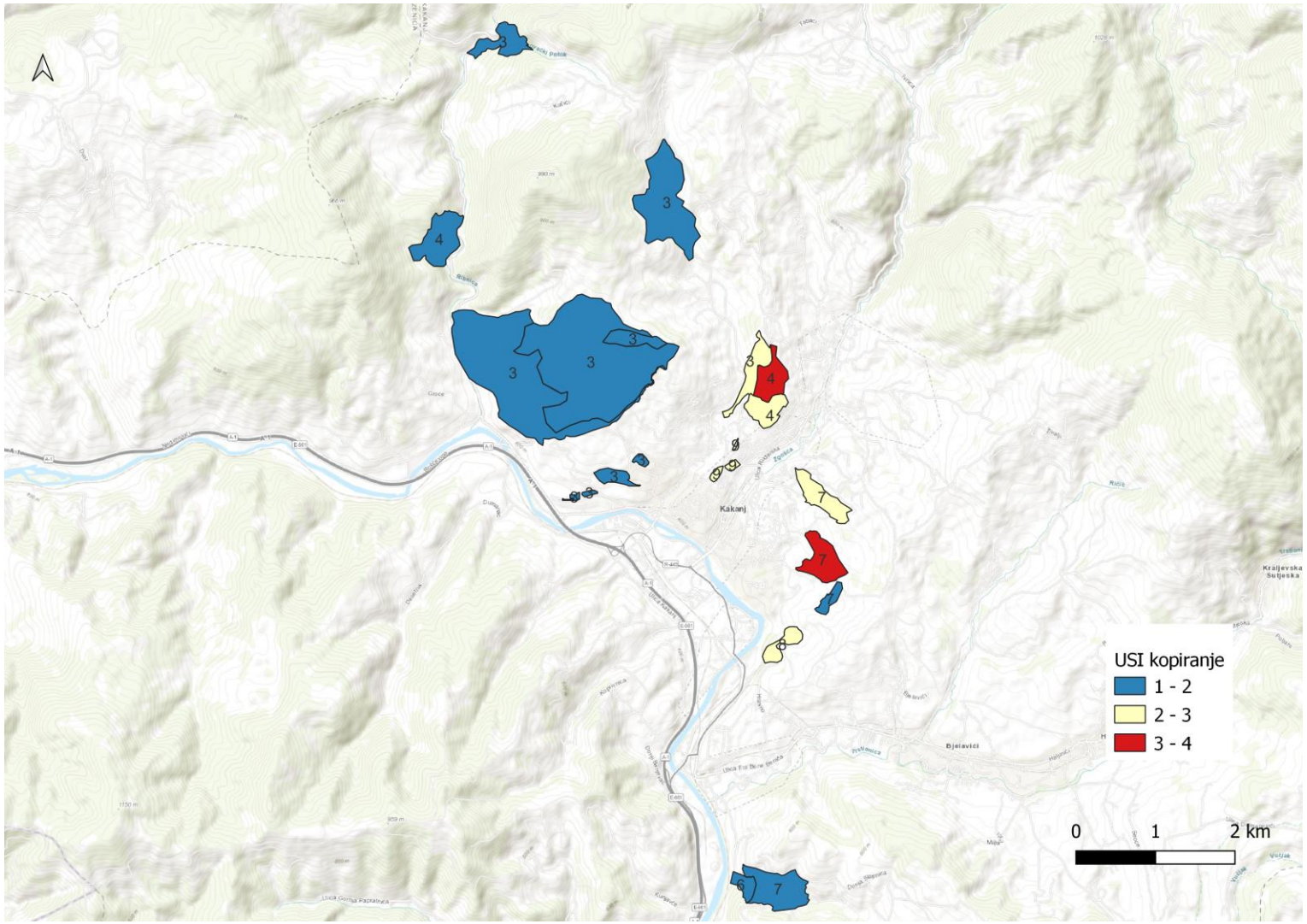

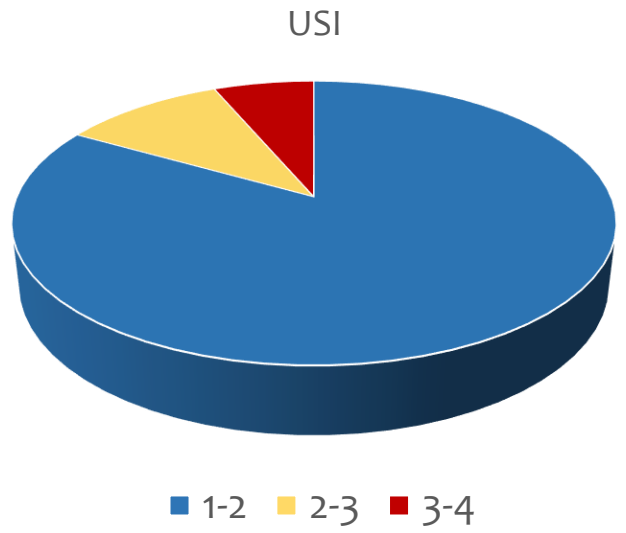

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Conclusions

- 1,6% Technosol, 589 ha
- Types of technosols like cinerosols, deposol and recultisols are important for improving land use.
- Soil quality for most technosols is VII and VIII
- Areas with the lowest soil quality, the highest ratios between degraded land and other cathegories, also the highest population density are the most important for recultivation.

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