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Prostorska identiteta

V zadnjem času prihajata v ospredje tematiki prostorske identitete in značilne arhitekturne tipologije, ki sta bili vsaj v Sloveniji dolga desetletja zapostavljeni. Očitno se tako strokovnjaki kot laiki končno začenjamo zavedati kakovosti prostora, ki izginja zaradi generičnih novogradenj in prenov, še posebej na podeželju in na mestnem obrobju.

V junijski številki *Urbanega izziva* objavljamo dva znanstvena članka, ki obravnavata identiteto podeželskih območij. V članku o razvoju gorskih letovišč so analizirani primeri izgradnje velikih objektov in struktur na naravno ohranjenih gorskih območjih, s čimer so bile povzročene občutne spremembe, in ugotovljeno je bilo, da prostorsko načrtovanje pogosto ne zmore učinkovito usmerjati ambiciozno načrtovanih posegov in pritiskov kapitala. V članku turških avtorjev pa je predstavljena raziskava o identiteti krajine, katere sestavni del so podeželska naselja, ki poleg naravnih danosti dajejo največji pečat videzu krajine in prepoznavnosti določene regije.

Razumevanje razlik med mestnimi in podeželskimi naselji je ključno pri usmerjanju njihovega razvoja. Dograjevanje podeželskih naselij, ki ne upošteva arhitekturne tipike in značilne oblike naselij, se prepogosto kaže v nizih novih hiš, ki so zgrajene brez dialoga z okolico in v podeželski krajini delujejo kot tujek.

Pri tem je zanimiv naš dvojni odnos do prostora: kadar obiskujemo tuje kraje, nas navdušujejo tradicionalne vasi in stara mestna jedra, v lastnem bivalnem okolju pa smo pogosto nekritični do posegov in krnitve značilne podobe naselij, saj to dojemamo kot razvoj in izboljšanje bivalnih standardov. Kadar gradimo ali prenavljamo lastne nepremičnine, je vpliv, ki ga ima stavba na videz celotnega naselja, drugotnega pomena. Mnogi bi radi živeli v sodobni hiši na podeželju, a ko je tam zgrajena množica takšnih hiš, podeželja, ki smo ga prej občudovali, ni več.

Damjana Gantar, glavna urednica

Spatial identity

Recently, the issue of spatial identity and site-specific architectural typology - which, at least in Slovenia, has been neglected for decades - has been increasingly placed at the forefront. It seems that both experts and the general public have finally begun to appreciate the quality of space, which is disappearing due to generic development and redevelopment, especially in the countryside and peri-urban areas.

The June issue of *Urbani izziv* features two articles focusing on the identity of rural areas. The article discussing the development of mountain resorts analyses examples in which the construction of large complexes and structures introduced significant changes to the natural mountainous landscape. It establishes that spatial planning is often unable to effectively define the conditions for ambitiously conceived projects and limit pressures from neoliberal capital. The second article explores landscape identity, an integral part of which is rural settlements. Along with natural elements, these have the greatest impact on the character of a landscape and the distinctiveness of a region.

Understanding the differences between urban and rural settlements is key to guiding their development. New construction in rural settlements that fails to consider the architecture and settlement forms characteristic of the area is too often reflected in rows of new houses that are not built in dialogue with the natural environment and seem out of place in the rural landscape.

Our double perspective on space is interesting in this context: we tend to admire traditional villages and historical city centres when we travel abroad as tourists, whereas in our own living environments we often uncritically agree with various changes and the loss of the traditional form of settlements because we perceive them as development and improving our living standards. When we build or renovate our own properties, the impact that our own house will have on the character of the entire settlement is of secondary importance to us. Many would like to have a modern house in the countryside, but if houses like that are built there en masse, the countryside we admired is lost.

Damjana Gantar, Editor-in-Chief

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Alma HUDOVIĆ KLJUNO

Hitra urbanizacija na Bjelašnici: od olimpijskih iger do neoliberalnih investicij

V prvem desetletju 21. stoletja se je območje pod vrhom Bjelašnice, ene izmed štirih gora v okolici Sarajeva, ki so bile leta 1984 prizorišče zimskih olimpijskih iger, začelo hitro urbanizirati. Da bi to območje spremenili v sodobno letovišče, so bili tam zgrajeni novi hoteli in stanovanjski objekti, čeprav brez skupne oblikovalske vizije in ob precejšnjem neodobravanju prebivalcev. Avtorici sta v članku proučevali razvoj gorskega letovišča Babin Do pod vrhom Bjelašnice in ga primerjali z razvojem podobnih zimskih letovišč v Franciji. Za študijo primera sta izbrali francoski gorski letovišči Flaine in Les Arcs, ki so ju v šestdesetih letih 20. stoletja v okviru vladnega programa Plan Neige zasnovali ugledni arhitekti, od takrat pa sta se že precej spremenili in povečali. Njuni izsledki so pokazali nekatere podobnosti v urbanističnem načrtovanju in arhitekturi Babinega Doja ter proučevanih francoskih letovišč, čeprav je med njimi šestdeset let razlike. Nekatere stavbe v Babinem Doju ustvarjajo prijetno gorsko letoviško ozračje, ker pa za to območje ni regulacijskega načrta in je zato natrpano z nastanitvenimi objekti, hkrati pa nima dovolj skupnih javnih prostorov in storitev, ki bi privabljale obiskovalce vse leto, tega gorskega letovišča ne moremo obravnavati kot primer uspešnega prostorskega razvoja. Treba bi bilo čim bolj zmanjšati nadaljnje škodljive vplive na naravno okolje, človekovi posegi v naravo pa bi morali biti bolj premišljeni in trajnostno usmerjeni.

Ključne besede: gorska letovišča, urbanizacija, olimpijske igre, Sarajevo, francoski program Plan Neige

1 Uvod

Urbanistično načrtovanje obsega več kot samo razvoj mest. Tudi za podeželska območja (npr. gorske krajine), ki se urbanizirajo, bi morale veljati podobne smernice, kot se uporabljajo pri načrtovanju mest. Kot navajajo Ultramari idr. (2023), je intelektualna lepota načrtovanja v tem, da nakazuje aktivno preobrazbo in natančno izvedbo prvotno nameravanega. Težava pri razvoju Babinega Doja, ki leži na planoti pod vrhom Bjelašnice, je pomanjkanje natančne zasnove, oblikovane na podlagi urbanističnega načrta, ki bi zagotovil smernice za nadaljnji razvoj območja. Preobrazba Babinega Doja v sodobno smučarsko središče se je začela v prvem desetletju 21. stoletja, v zadnjih petih letih pa se je še pospešila. Kljub veliki zaskrbljenosti in ogorčenju javnosti zaradi izsekavanja gozda na Bjelašnici v zadnjih dvajsetih letih občinske oblasti v Trnovu, ki upravljajo zemljišča na tem območju, niso predstavile načrta ali predloga za trajnostno urbanizacijo in turistični razvoj Babinega Doja. Zdaj je bolj kot kadarkoli pomembno razmišljati o trajnostnem razvoju. V povezavi s prihodnostjo mest avtorici Poljak Istenič in Gulin Zrnić (2022) omenjata gospodarski, okoljski in socialni vidik trajnostnega razvoja, ti pa so enako pomembni tudi za razvoj podeželskih ali gorskih območij. Pri tem bi bilo treba upoštevati zlasti okoljski vidik, saj vsakršna oblika gradnje na gorskih območjih, kot je Babin Do, pomeni poseg v naravo, zato je pri tem potrebna previdnost. Kot navaja Goodland (1995), nekateri vidijo okolje kot veliko oviro za človeški napredek, zato je uničevanje okolja manj pomembno od dobička, ki ga prinašajo gradbeni projekti. Navedeno je še zlasti opazno pri neoliberalnih investicijskih projektih, ki se osredotočajo na finančno korist peščice posameznikov, kar je značilno tudi za razvoj smučarskega središča Babin Do pod vrhom Bjelašnice.

Avtorici sta se v članku osredotočili na neoliberalne gradbene projekte pod vrhom Bjelašnice in težave, ki so posledica nenačrtovanega urbanističnega razvoja Babinega Doja. Najprej sta proučili tradicionalno arhitekturo in turistični razvoj na Bjelašnici, nato pa sta se osredotočili na dediščino zimskih olimpijskih iger. Za boljše razumevanje razvoja smučarskih letovišč sta uporabili Delormovo klasifikacijo, pri čemer sta se osredotočili na francoski smučarski vasici, zgrajeni v šestdesetih letih prejšnjega stoletja v okviru programa Plan Neige. Izbrani študiji primera (Les Arcs in Flaine) sta analizirali ter ju na podlagi prostorskih in arhitekturnih značilnosti primerjali z Babinim Dojem. Na koncu sta podrobno predstavili razvoj Babinega Doja v zadnjih dvajsetih letih.

2 Raziskovalni pristop, gradivo in metode

Članek temelji na večstopenjski raziskavi obravnavanega problema, kot se pojavlja v prostoru, ter na primerjalnih analizah nekaterih prostorskih in urbanističnih značilnosti Bjelašnice in obravnavanih francoskih letovišč. Izhodišče primerjave sta bila nastanek in razvoj francoskih smučarskih središč, zlasti vasic Flaine in Les Arcs. Avtorici sta proučili tudi tipologijo vasi pod vrhom Bjelašnice in njihovo arhitekturo, na podlagi česar sta lahko bolje razumeli nastanek, razvoj, obliko in prostorsko rabo Babinega Doja.

Z metodama analize in vrednotenja sta podrobno proučili preobrazbo socialne in prostorske zgradbe izbranih gorskih letovišč in izsledke prikazali v preglednicah. Uporabljene analitične metode so vključevale opisno statistiko, analizo trendov in prostorsko analizo, z metodo vrednotenja pa sta proučili še neoliberalne vplive ter socialne in kulturne vrednote kot izraz sprememb v prostoru. Z navedenimi metodami se lahko določijo dejavniki (npr. državna in prostorska politika, gospodarski dejavniki in družbene spremembe), ki vplivajo na zgradbo urbanih naselij. Z metodo vrednotenja pa se lahko proučijo vplivi teh sprememb in dejavnikov na urbani prostor in družbo kot celoto, hkrati se lahko določijo vrednote, ki so bile v procesu urbanih sprememb izgubljene ali ustvarjene. Analiza nazadnje da celovito sliko vseh procesov urbanizacije gorskih letovišč, posledičnih sprememb in njihovih vplivov, kar je lahko podlaga za nadaljnji razvoj.

3 Bjelašnica: ozadje

Bjelašnica je gora v osrednjem delu Bosne in Hercegovine, tj. približno 25 km jugozahodno od Sarajeva in je del Dinarskega gorovja. Obdana je z več gorskimi planotami: Igmanom na severu, ki se ga pravzaprav dotika, ter Treskavico in Visočico na jugu. Goro od novembra do maja prekriva sneg, včasih pa se snežna odeja tam obdrži tudi poleti. Po tem je dobila tudi ime, saj beseda *bijela* pomeni 'bel'. Na slikoviti gori vladajo neprijazne vremenske razmere, ki so posledica njene geografske lege v Dinarskem gorovju, geološke sestave, nadmorske višine ter mešanja vplivov sredozemskega in celinskega podnebja v najvišjih predelih Dinarskega gorovja.

Pod vrhom Bjelašnice je deset vasi, v katerih živi skupno okoli 2.500 ljudi, ki se večinoma preživljajo s poljedelstvom in živinorejo. Ena izmed teh vasi je Lukomir (slika 1), ki leži na južnem pobočju Bjelašnice na višini 1495 m. To je najvišje ležeča vas v Bosni in Hercegovini in edina nad 1300 m (Bobetić, 2012). Znana je po dobro ohranjeni tradicionalni arhitekturi, ki izraža njeno geografsko lego. V raziskavi arhitekture

Slika 1: Lukomir, tradicionalna vas pod vrhom Bjelašnice (foto: Alma Hudović Kljuno)

Preglednica 1: Razvoj turizma na Bjelašnici (vir: Opačić in Banda, 2018)

Obdobje	Značilnosti
1878–1918 (Avstro-Ogrska)	– gradnja planinske infrastrukture
	– izdaja planinskih vodnikov
	– zametki rekreativnega turizma
1918–1945 (med obema vojnama)	– številne ekskurzije
	– prvi večji alpinistični dosežki
	– smučarske tekme v okviru dogodka Bjelašnički dani
	– razvoj zimske turistične ponudbe
1945–1978 (od konca druge svetovne vojne do izbora za prizorišče zimskih olimpijskih iger)	– prve smučke prinesene na goro leta 1957
	– začetek smučarskih tečajev v sezoni 1957/1958
	– razvoj zimske in poletne turistične ponudbe
	– veliko turistov v planinskih kočah
1978–1992 (vključno z zimskimi olimpijskimi igrami leta 1984 do razpada Jugoslavije)	– masovni smučarski turizem
	– podaljšana sezona z nižjimi poletnimi cenami
	– mednarodne smučarske tekme
1996–2000 (povojna obnova turizma)	– obnova objektov in infrastrukture
	– prevlada zimskega turizma
po letu 2000 (sodobnost)	– zimski turizem in rekreacija
	– prizadevanja za razvoj poletne turistične ponudbe
	– težave zaradi nenačrtovane gradnje
	– pomanjkanje strategije turističnega razvoja

kamnitih hiš v Bosni in Hercegovini, zlasti na dinarskem krasu in v gorski pokrajini severne Hercegovine, je Astrida Bugarski ugotovila, da so kamnite hiše konec 19. in v začetku 20. stoletja, ko se je tovrstni način gradnje iz zaledja jadranske obale razširil na gorska območja Bosne in Hercegovine, postopno nadomestile lesena bivališča (Bugarski, 1997). V vaseh severne Hercegovine, od katerih jih je nekaj tudi na južnih pobočjih Bjelašnice, so bile kamnite hiše popolnoma prilagojene naravnemu okolju ter življenjskemu slogu in dejavnosti lokalnih prebivalcev (Bugarski, 1991). Tudi hiše v Lukomirju so zgrajene iz lokalnih materialov ter imajo preprosto in uporabno zasnovo, ki stanovalcem zagotavlja potrebno funkcionalnost. Stavbno telo je narejeno z kamna, tako da se videz hiš sklada z naravnim okoljem, hkrati pa je zaradi kamna njihova konstrukcija trdna in dobro obstojna. Strehe so strme, da lahko pozimi sneg hitro zdrsi s hiš, tradicionalno so krite s skodlami, položenimi v edinstven vzorec. Hiše imajo majhna okna, kar pomaga pozimi zadrževati toploto v notranjosti, hkrati pa so poslopja tako bolje zaščitena pred močnim vetrom. Hiše so prilagojene topografiji terena in se lepo zlivajo z naravnim okoljem. Navedene značilnosti prispevajo k edinstvenemu arhitekturnemu slogu tradicionalnih hiš v vasi, ki izražajo kulturno dediščino lokalne skupnosti in zgodovino območja ter so pomemben primer še ohranjene tradicionalne gorske arhitekture v Bosni. Treba je omeniti, da se lahko posamezne hiše med seboj razlikujejo po obliki in drugih značilnostih, saj so bile mnoge sčasoma prenovljene in spremenjene.

Pomembne prostorske in razvojne spremembe so se okoli Bjelašnice zgodile v času komunizma v drugi polovici 20. stoletja, turistični potencial območja pa je bil prvič prepoznan že v času Avstro-Ogrske. V raziskavi alternativnih oblik turizma na Bjelašnici sta Opačić in Banda (2018) ugotovila, da je Bjelašnica vzorčni primer gorske turistične destinacije, pri katerem je minilo več faz turističnega razvoja. V preglednici 1 je kronološko predstavljen razvoj tamkajšnje turistične dejavnosti in za to potrebne prostorske in arhitekturne infrastrukture. Leta 1893 so avstro-ogrske oblasti na delu Bjelašnice in Igmana ustanovile lovski revir. Naslednje leto so na vrhu Bjelašnice (2067 m) postavili prvi meteorološki observatorij, zaradi česar je vrh med domačini poznan tudi kot *Opservatorij* (Babić, 2022). To je bil prvi sodobni zidani objekt, postavljen na gori, pred tem so bile na tem območju označene in kartirane samo pohodne poti.

Leta 1923 je športni klub Slavija zgradil planinsko kočo na severni strani Bjelašnice, blizu izvira pod vasjo Gradina, na nadmorski višini 1345 m. V koči je bilo 15 ležišč, namenjena pa je bila predvsem smučarjem in planincem (Babić, 2022). To je bil prvi nastanitveni turistični objekt na Bjelašnici, ki je spodbudil nadaljnjo gradnjo. V naslednjih nekaj desetletjih je bilo zgrajenih še več podobnih objektov. Nekateri še stojijo in se uporabljajo za prvotni namen, čeprav so bili nekoliko spremenjeni (dozidave in drugi materiali).

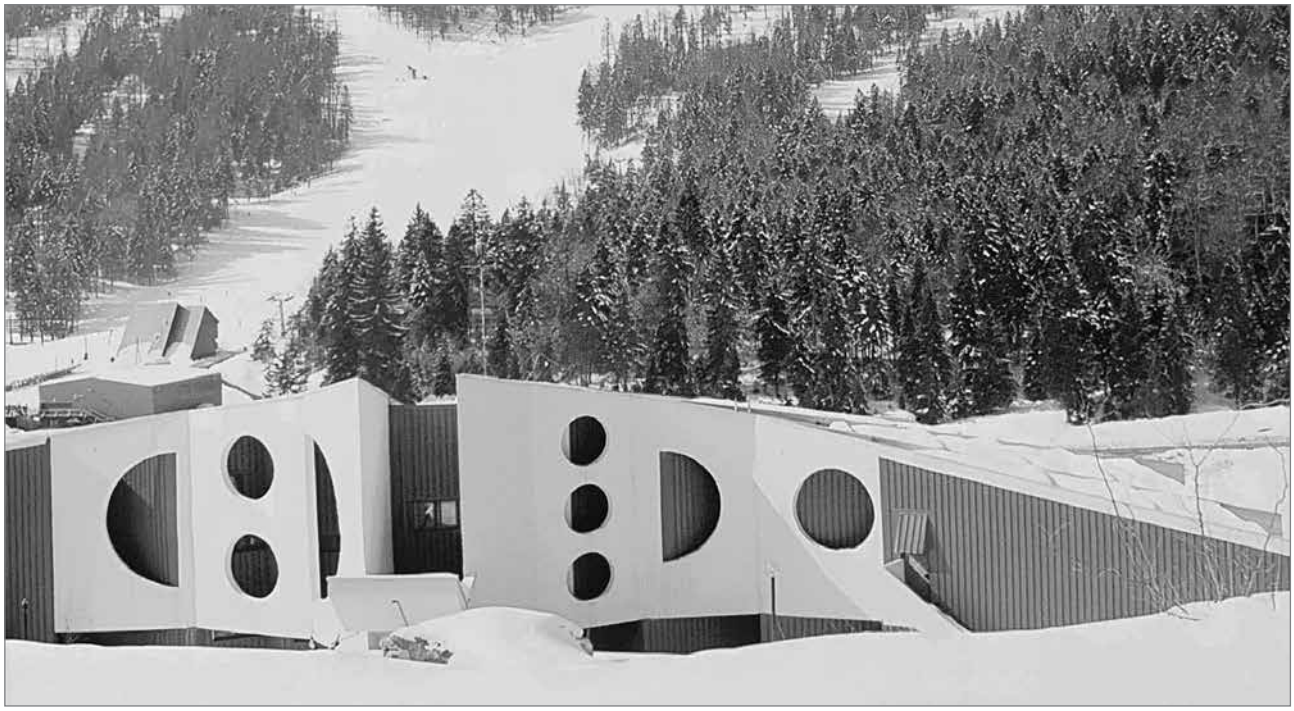
Čeprav so bili med drugo svetovno vojno (1941–1945) vsi objekti na Bjelašnici, namenjeni planincem, ljubiteljem narave in lovcem, vključno z meteorološkim observatorijem, uničeni, je bilo območje v obdobju komunizma, ki je sledilo, prepoznano kot priljubljena turistična destinacija za zimske športe. Gora je postala znana zlasti po smučiščih, kar je spodbudilo tudi njen prostorski in arhitekturni razvoj. Glavni dogodek, ki je spodbudil hitro urbanizacijo pogorja, so bile zimske olimpijske igre, ki so od 8. do 19. februarja 1984 potekale v Sarajevu. To so bile prve zimske in druge olimpijske igre, organizirane v komunistični državi (po poletnih olimpijskih igrah v Moskvi leta 1980) (Vuic, 2015).

Sarajevo je bilo za gostitelja zimskih olimpijskih iger leta 1984 izbrano leta 1978. To je spodbudilo arhitekturni in urbanistični preporod mesta v okviru priprav na ta pomembni dogodek. Zgrajena je bila najrazličnejša infrastruktura, potrebna za organizacijo olimpijskih iger, vključno s hoteli in športnimi objekti. Na Bjelašnici so potekale tekme v alpskem smučanju za moške, za potrebe česar so zgradili hotela Smuk in Famos (slika 2). Poleg teh dveh nastanitvenih objektov so bili na Bjelašnici še stavba observatorija (na njenem vrhu) in več manjših planinskih koč za pohodnike in smučarje. Sarajevo je hitro raslo, z njim pa tudi infrastruktura na okoliških gorah. Razvoj infrastrukture in zimske olimpijske igre so pomembno vplivali na razvoj turizma in arhitekture.

Poleg omenjenih hotelov je Bjelašnica dobila še novinarsko središče (veliko stavbo, zgrajeno v brutalističnem arhitekturnem slogu, s fasado iz kompozitnih plošč izstopajoče modre barve) ter restavraciji v Babinem Doju in na vrhu gore (slika 3). Čeprav so zimske olimpijske igre Bjelašnico postavile na zemljevid zimskih športnih središč, se je obsežnejša gradnja na tem območju, ki poteka še danes, začela v postkomunističnem obdobju pod vplivom neoliberalnega kapitala in zasebnih investitorjev.

Avtorici se v članku osredotočata na neuspela prizadevanja za obnovitev pozitivnih vplivov, ki so jih zimske olimpijske igre kot odskočna deska za prihodnji družbeno-gospodarski in urbanistični razvoj območja Bjelašnice imele na prostorsko ureditev gore in njeno rabo. Poleg tega proučujeta druge težave, kot sta na primer nejasen položaj Sarajeva kot glavnega mesta države, ki je razmeroma nova na neoliberalističnem kapitalističnem odru, kar povzroča najrazličnejše zlorabe pri prostorskem načrtovanju gore, in pomanjkanje pravnega okvira (Hadžialić, 2002).

Slika 2: Hotel Famos, Slobodan in Duška Jovandić, 1982/1983 (vir: Nalo, 2015)



Slika 3: Novinarsko središče (vir: ANUBiH, 2002)

4 Geneza, prostorski razvoj in nove zgodbe

Razvoj in gradnja smučarskih letovišč segata v zgodnje 20. stoletje, ko je bilo smučanje kot šport še v povojih, koncepta masovnega turizma pa sploh še ni bilo. Delorme (2014) je opredelil faze razvoja smučarskih letovišč na podlagi njihovega razvijanja in značilnosti. Čeprav ni splošno dogovorjene kategorizacije tovrstnih letovišč, se običajno uporablja klasifikacija, predstavljena v nadaljevanju.

Smučarska letovišča prve generacije (pred drugo svetovno vojno) so se pojavila na začetku 20. stoletja, ko je smučanje postajalo priljubljena oblika rekreacije. Ta letovišča so bila na gorskih območjih s primernimi snežnimi razmerami, privabljala pa so obiskovalce, ki so se ukvarjali z zimskimi športi. Primera sta St. Moritz v Švici in Chamonix v Franciji.

Slika 4: Francosko smučarsko letovišče La Plagne (vir: Koumanov, B., 2011)

Smučarska letovišča druge generacije (po drugi svetovni vojni) sovpadajo z obdobjem velike rasti in modernizacije smučarske industrije. Zanje so bile značilne izboljšave v smučarski infrastrukturi, vključno z žičnicami, urejenimi smučarskimi progami in bolj raznovrstno ponudbo nastanitvenih možnosti. Primera sta St. Anton v Avstriji in Cortina d'Ampezzo v Italiji.

Smučarska letovišča tretje generacije (med šestdesetimi in sedemdesetimi leti 20. stoletja) sovpadajo z obdobjem izjemno povečane priljubljenosti in razvoja zimskih letovišč. Pogosto so vključevala namensko zgrajene smučarske vasi z močnim poudarkom na hitrem in neposrednem dostopu do prog, dobro razvitem žičniškem sistemu ter široki ponudbi storitev in aktivnosti po smučarskem dnevu. Primera sta Val d'Isère v Franciji in Aspen v Združenih državah Amerike.

Pri smučarskih letoviščih četrte generacije (med osemdesetimi in devetdesetimi leti 20. stoletja) je bil poudarek na konceptu smučarske destinacije. Pomembnejše so postale aktivnosti, ki niso povezane s smučanjem, kot so nakupovanje, dobra hrana in zabava. Ta letovišča so pogosto imela obsežne sisteme zasneževanja, ki so zagotavljali stalno snežno odejo na smučiščih. Primera sta Whistler Blackcomb v Kanadi in Vail v Združenih državah Amerike.

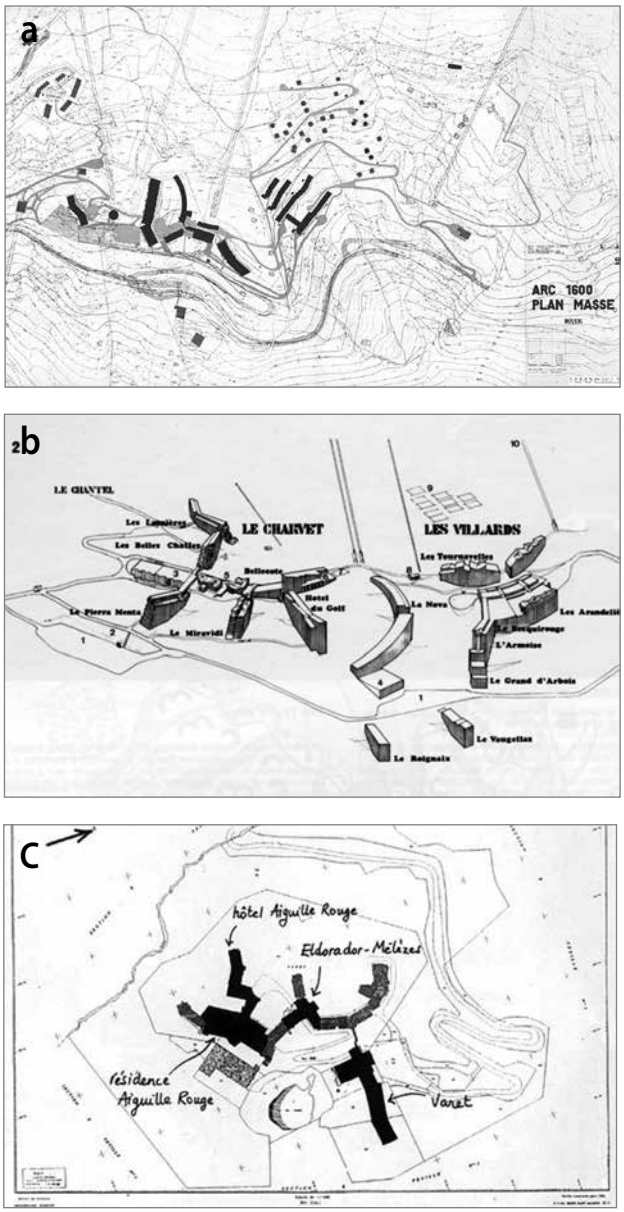
Smučarska letovišča pete generacije (po letu 2000) se osredotočajo na trajnostnost, okoljsko ozaveščenost in izboljšano izkušnjo gostov. Poleg smučanja zagotavljajo še številne druge aktivnosti in storitve, kot so krpljanje, snežni parki za deskanje na snegu, velnes in kulturni dogodki. Pogosto dajejo prednost okolju prijaznim praksam in spodbujajo razvoj celoletnega turizma. Primera sta Park City Mountain Resort v Združenih državah Amerike in Zermatt v Švici.

Na podlagi zgornje klasifikacije bi lahko Babin Do opredelili kot letovišče tretje in četrte (mogoče tudi pete) generacije, saj njegovi začetki segajo v šestdeseta leta 20. stoletja, kot letovišče pa se je zares razvil šele v prvem desetletju 21. stoletja. Kot je bilo omenjeno že na začetku, avtorici v članku primerjata Babin Do z drugimi podobnimi kraji v Evropi. V šestdesetih letih 20. stoletja je francoska vlada zgradila nova smučarska središča na podlagi programa Plan Neige, s katerim je spodbujala razvoj zimske športne infrastrukture na francoskih gorskih območjih. Namen programa je bil podpirati rast smučarskih letovišč, povečati njihovo dostopnost in spodbuditi razvoj turizma na teh območjih. Francoska vlada je zagotovila finančne spodbude, subvencije in infrastrukturne naložbe, da bi pospešila gradnjo smučišč in z njimi povezane infrastrukture. S programom so poskušali povečati privlačnost in konkurenčnost francoskih smučarskih letovišč na nacionalni in mednarodni ravni. Vanj

so bili vključeni kraji, kot so Flaine, Tignes, Les Arcs in Val Thorens, poleg gradnje novih smučišč in širitve starih je bil poudarek tudi na gradnji nastanitvenih in drugih turističnih objektov, kot so bili hoteli, koče, počitniške hišice in druge oblike nastanitve blizu smučarskih prog. Tem je sledila še podporna infrastruktura v obliki restavracij, trgovin ter objektov in območij za razvedrilo in prosti čas.

Na teh območjih so pogosto gradili monumentalne objekte, za katere se je zdelo, da niso s tega sveta. Imeli so zelo futuristične prvine, kot so ostri koti, in industrijski videz, ki se ni skladal z okoljem. Kot navaja Skinner (2021), je bila generacija visoko ležečih smučarskih mestec z neposrednim dostopom do smučišč, nastalih v šestdesetih letih 20. stoletja, nesramno moderna in usmerjena v široko potrošnjo. Oblikovali so jih ugledni urbanisti, arhitekti in oblikovalci tistega časa, ki so sledili urbanističnim in arhitekturnim doktrinam (večinoma so bili to Le Corbusierovi študenti ali sodelavci), brez upoštevanja oblik, materialov in načinov gradnje, značilnih za lokalno ljudsko arhitekturo. Duh modernizma še vedno vpliva na sodobne arhitekturne oblike, stavbe, zgrajene na začetku 21. stoletja, pa še vedno sledijo osnovam monumentalnosti, s čimer ustvarjajo močan vizualni učinek in se mogočno dvigajo nad dolino.

Ne glede na oblikovanost površja ali druge naravne značilnosti okolja, v katerem so, smučarska letovišča, kot so Isola 2000, La Grange (blizu Val d'Isera) ali La Plagne (slika 4), ustvarjajo drugačen in razmeroma edinstven urbani tloris, ki pa ima skupno značilnost: gigantske apartmajske bloke, ki nimajo nikakršne povezave z okolico, zato ustvarjajo grob prehod med okoljem in stavbno maso. Te velikanske bloke, ki so večinoma zasedeni samo med smučarsko sezono, bi zlahka umestili kam drugam v Evropi ali celo na gosto poseljena stanovanjska območja na Kitajskem. V zvezi s tem Snégaroff (2015) omenja negodovanje javnosti nad ogromnimi nastanitvenimi objekti oziroma čedalje ostrejše kritike ljudi, ki v teh smučarskih tovarnah vidijo kopijo predmestij velikih mest.



Slika 5: Urbanistični načrti letovišča Les Arcs: a) Arc 1600, b) Arc 1800, c) Arc 2000 (vir: Hidden Architecture, 2005)

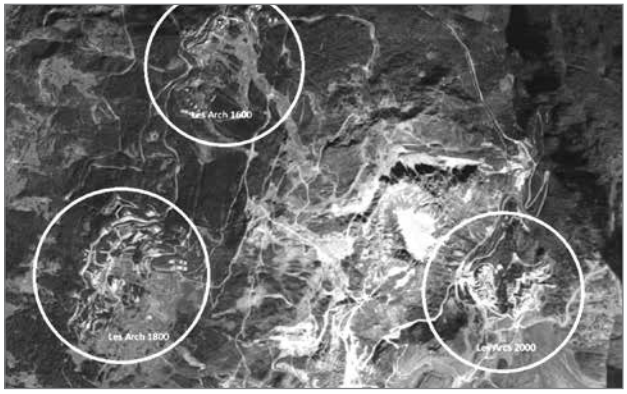
4.1 Študiji primera: Flaine in Les Arcs

Francoski gorski letovišči Flaine in Les Arcs, zgrajeni v šestdesetih letih prejšnjega stoletja v okviru programa Plan Neige, sta podobni zgoraj omenjenim primerom, vendar imata večjo arhitekturno in zgodovinsko vrednost. Flaine je zasnoval arhitekt Marcel Breuer, ki se je šolal na znameniti šoli Bauhaus. Oblikovan je v pravem brutalizmu v skladu z glavnimi Bauhausovimi načeli, pri katerih je bil poudarek na ustvarjanju funkcionalnih stavb, ki učinkovito izpolnjujejo svoj namen, oblikovalske prvine pa ne smejo imeti samo okrasne vloge, ampak morajo biti uporabne tudi v praksi. Kraj slovi tudi po skulpturah, ki so jih izdelali slavni umetniki, kot so Picasso, Dubuffet in Vasarely.

Letovišče Les Arcs (slika 5) je bilo urbanistično in arhitekturno zasnovano in zgrajeno pod vodstvom Charlotte Perriand, Le Corbusierove sodelavke. Obe letovišči sta bili takrat sprejeti s skepticizmom in pogosto kritizirani, danes pa sta obravnavani z nostalgijo in cenjeni kot izjemna primerka brutalističnega arhitekturnega sloga. Obe kažeta resen in premišljen pristop k urbanističnemu in arhitekturnemu oblikovanju gorskih podeželskih območij (sliki 6 in 7). Sledi njuna primerjava z Babinim Dojem, pri čemer so analizirani razni vidiki urbanističnega in arhitekturnega oblikovanja (preglednice 2a, 2b in 2c).

Preglednica 2a: Zasnova in arhitektura letovišča Les Arcs, 1967

Zasnova in arhitektura	
Objekti	Več kot deset hotelov, številni nastanitveni objekti za najem, bari in restavracije, trgovine z živili, izposojevalnice smuč, smučarski servisi, žičnice, teniška igrišča
Funkcija	Vse leto: velnes, kolesarjenje in pohodništvo Zima: smučanje in deskanje na snegu Poletje: tenis, golf, lokostrelstvo, raznovrstne aktivnosti za otroke in odrasle
Urejanje prostora	Tri lokacije na treh nadmorskih višinah, pri čemer je vsaka 200 m višje: Arc 1600 (1600 m), Arch 1800 (1800 m) in Arch 2000 (2000 m). Na podlagi zamisli o popolnem udobju je bil cilj izpopolniti koncept počitniškega naselja (station intégrée) (Stacher, 2020), pri čemer sta imela glavno vlogo neposredni dostop do smučišča iz apartmajev in široka ponudba javnih storitev.
Arhitektura	
Slog	Nenavadni, v brutalističnem slogu zgrajeni objekti se z leseno fasadno oblogo tesno navezujejo na alpsko arhitekturo. Poudarek je na kaskadni obliki (slika 8).
Materiali	Vidni materiali vključujejo zlasti les in kamen na fasadnih oblogah ter beton.
Višina	Stavbe so različnih višin, od tronadstropnih alpskih hišic in poslovnih stavb do nastanitvenih objektov z 12 ali 13 nadstropji.
Ambient	Letovišče obsega tri območja na različnih nadmorskih višinah, pri čemer stavbe s svojimi oblikami, volumni, fasadnimi oblogami iz naravnih materialov in poševnimi strehami ustvarjajo ambient gorskega letovišča. Pri tej razporeditvi stavb, ki sledi naravni morfologiji terena, ni jasno, ali obstaja tudi osrednji del letovišča, ki se lahko uporablja za raznovrstne sezonske aktivnosti.



Slika 6: Postopna gradnja: Arc 1600 (1967–1975), Arc 1800 (1974–1989) in Arc 2000 (1978–1989; vir: Google Maps, 2023a)

Slika 7: Sledenje oblikovanosti površja: letovišče Flaine (1960–1976; vir: Google Maps, 2023b)

Slika 8: Les Arcs, 1967 (vir: Hidden Architecture, 2005)

Preglednica 2b: Zasnova in arhitektura letovišča Flaine, 1968

Zasnova in arhitektura	
Objekti	Sedem hotelov, številni nastanitveni objekti za najem, bari in restavracije, supermarketi in živilske trgovine, izposojevalnice smuč, smučarski servisi, žičnice, teniška igrišča, golf klub, kapela
Funkcija	Vse leto: velnes, kolesarjenje, pohodništvo in bovling Zima: smučanje, deskanje na snegu, prilagojeno smučanje za ljudi s posebnimi potrebami Poletje: tenis, golf, plezanje, jadralno padalstvo, jamarstvo, soteskanje, ribolov, letenje z baloni, raznovrstne aktivnosti za otroke in odrasle
Urejanje prostora	Stavbe so zgrajene na treh robovih pred podolgovato skalno steno iz apnenca, ki določa zgradbo in oblikovanost površja. Objekti se barvno zlivajo s skalami in zato, kot je trdil Breuer, terena ni treba ščititi, saj stavbe zaradi načela posnemanja okolice v njem skoraj optično izginejo (same delujejo kot skale). Kot arhitekturno nasprotje prevladujoči geometriji navpičnih apnenčastih skal je uporabil vodoravne betonske nize na pročeljih, na katerih betonske plošče v obliki diamanta razbijajo monotonost dolgih betonskih fasad. Celotna kompozicija se zliva z veličastno in divjo krajino Flaina, s katero sodeluje in ji daje človeško noto (Stacher, 2020).
Arhitektura	
Slog	Stavbe Marcela Breuerja so zasnovane v brutalističnem slogu (slika 9), druge pa sledijo sodobnim oblikovalskim smernicam brez ali z zelo malo povezave s tradicionalno gorsko arhitekturo.
Materiali	Stavbe so zgrajene iz armiranega betona, z vidnim, golim betonom na fasadah. Večina drugih stavb ima fasadne obloge iz kamna in lesa.
Višina	Stavbe imajo od tri do deset nadstropij. Kapela in nakupovalni center sta enonadstropna.
Ambient	Zaradi tipologije stavb, njihove višine, oblike in večinoma ravnih streh ter materialov, vidnih na fasadah, je kraj videti bolj kot predmestje kot gorsko letovišče. Čeprav Flaine omogoča veliko aktivnosti tudi poleti, so nastanitve večinoma zasedene pozimi. Tloris naselja ne sledi vzorcu tradicionalnih gorskih vasi. Ni prepoznavnega središča ali trga za glavne dejavnosti. Kraj sestavljajo tri ločena območja s skupinami večnamenskih stavb, parkirišči in zelenimi površinami.

Slika 9: Flaine, 1968 (vir: Chadwick, 2016)

Preglednica 2c: Zasnova in arhitektura Babinega Doja, od leta 1982

Zasnova	
Objekti	Štirje delujoči hoteli, več restavracij in barov, trgovina z živili, izposojevalnice smuči, gorske koče, žičnice, pohodne poti, teniški igrišči, številne stavbe (večinoma sezonsko zasedeni apartmaji)
Funkcija	Vse leto: velnes, kolesarjenje in pohodništvo Zima: smučanje in deskanje na snegu Poletje: tenis in jadralno padalstvo
Urejanje prostora	Ni jasnega prostorskega načrta za razvoj Babinega Doja. Večina stavb je umeščenih ob glavni cesti v smeri sever–jug, s prizidki, ki gledajo proti jugozahodu in vzhodu. Večina objektov ob glavni cesti ima pogled na smučišče, a nima neposrednega dostopa do njega. Takšen dostop delno omogočajo stavbe v jugozahodnem delu doline.
Arhitektura	
Slog	Zaradi različnih oblikovalskih pristopov različnih arhitektov ima letovišče objekte najrazličnejših oblik in arhitekturnih slogov, ki izražajo sodobno neoliberalno filozofijo (slika 10).
Materiali	Stavbe so večinoma zgrajene iz armiranega betona in betonskih zidakov z izolacijo. Imajo navadne izolirane fasade ali fasade, obložene z lesom ali kamnom.
Višina	Vrstne hiše imajo tri nadstropja, hoteli in drugi objekti imajo lahko tudi do osem nadstropij.
Ambient	Stavbe v Babinem Doju so večinoma postavljene linearno ob glavni cesti, s prizidki ob dovozni cesti na jugozahodni strani. Z arhitekturnimi značilnostmi, oblikami, višinami in materiali delno ustvarjajo ambient gorske vasice. Nekatere stavbe imajo poševne strehe in fasadno oblogo iz naravnih materialov, za druge pa se zdi, da bi lahko stale kjer koli drugje kot v gorski vasi. Stavbe na jugozahodnem koncu ustvarjajo manjši trg kot podaljšek naravne planote Babinega Doja, ki se uporablja kot osrednji prostor za glavne aktivnosti na prostem.

Slika 10: Babin Do, 2023 (foto: Alma Hudović Kljuno)

5 Bjelašnica: nasprotja med tradicionalnim in sodobnim, pomanjkanje vsebine

Preden je bilo Sarajevo izbrano za gostitelja zimskih olimpijskih iger leta 1984, sta bila turizem in zanj potrebna infrastruktura (objekti in storitve) na tem območju šele v povojih. Kot navaja Petranović (1990), je bilo v obdobju hitrega gospodarskega razvoja po drugi svetovni vojni Sarajevo razmeroma slabo razvito in pod jugoslovanskim povprečjem. Sčasoma je bil prepoznan turistični potencial mesta in bližnjih vrhov (Trebević, Jahorina, Bjelašnica in Igman), Sarajevo pa je postalo dober kandidat za zimske olimpijske igre. V okviru pospešene urbanizacije pred zimskimi olimpijskimi igrami so bili zgrajeni večji športni in kulturni objekti v mestu in njegovi okolici. Kot navajata Nermina Zagora in Dina Šamić (2021), je v obdobju socializma arhitektura v Sarajevu izražala družbene in kulturne vrednote, zato si zasluži posebno pozornost. Z združitvijo modernizma in jugoslovanskega socializma v obliki arhitekturne znamke neuvrščene države sta se uspešno častila ideala bratstva in enotnosti ter samoupravljanja, hkrati pa so se z univerzalnim pristopom odpravljale notranje etnične razlike. Mesto je moralo izvesti 163 večjih gradbenih projektov, saj je melo samo eno ledeno dvorano, na okoliških gorah pa je delovala samo ena žičnica (na Jahorini). Kot ugotavljata Bojana Bojanić in Sonja Ifko (2019), Sarajeva v svetu zimskih športov dejansko ni bilo. Da je lahko gostilo olimpijske igre, je poleg izgradnje športnih objektov, kot so bile proga za bob, sankaška steza, skakalnice, steza za hitrostno drsanje itd., potrebovalo tudi smučišča, predvsem pa vso podporno infrastrukturo, vključno s 160 km cest, kanalizacijo, energetskimi vodi, telefonsko napeljavo, parkirišči, žičnicami, sanitarijami, garderobami, restavracijami, letališčem, železniško postajo, olimpijskima vasema, novinarskim središčem ter devetimi novimi in petimi prenovljenimi hoteli (Vuic, 2015).

V nasprotju z lepimi primerki sodobne jugoslovanske arhitekture, ki so poudarjali tradicijo in lokalno kulturo, kot sta bila hotel Vučko na Jahorini in hotel Igman na Igmanu, sta bila pod vrhom Bjelašnice za potrebe zimskih olimpijskih iger v povsem drugačnem slogu zgrajena že omenjena hotela Famos (slika 2) in Smuk. Hotel Vučko (slika 11), ki ga je zasnoval arhitekt Zlatko Ugljen, je zanimiv primer arhitekturne usklajenosti zunanjosti in notranjosti, ki se kaže v okrasnih lesenih detajlih na zunanjem ovoju stavbe in vidnih lesenih tramovih v notranjosti. V intervjuju za revijo *Oris* (Roš in Rusan, 2001) je Ugljen povedal, da se je poskušal izogniti hotelski sterilnosti, zato je ustvaril ambient, ki se je skladal z okoljem. Vztrajal je pri občutkih, ki jih ustvarja primarna plastika, in jih na podlagi sekundarne plastike reproduciral v notranjosti (npr. s stropnimi in strešnimi konstrukcijami, svetlobnicami, nišami, večnivojsko ureditvijo prostora, ognjiščem itd.). Enako uspešen primer je bil hotel Igman (slika 12), ki ga je zasnoval Ahmed Džuvić. Arhitekt se je spretno poigral z nasprotji med streho in zidovi, ki so vsi poševni in obloženi z lesom. Strme strešine in osrednje osi spominjajo na tradicionalne stavbe, podobno tudi vizualna ločenost pritličja od zgornjih nadstropij. Silhueta hotela je nekako razdrobljena, a se kljub temu sklada z obrisi gore, kar tudi v notranjosti ustvarja zanimivo in toplo vzdušje.

Slika 11: Gorski turizem v času komunizma: hotel Vučko, Zlatko Ugljen, 1983 (vir: Niebyl, 2021)

Figure 12: Gorski turizem v času komunizma: hotel Igman, Ahmed Džuvić, 1983 (vir: Džuvić, 2023)

Hotela Vučko in Igman odlikujeta arhitekturni slog in pristop, ki združujeta značilnosti ljudske arhitekture in sodobne oblikovalske vplive. Namen take oblikovalske strategije je bil ustvariti občutek navezanosti na kraj ter povezavo z okolico in kulturno dediščino. Žal je današnja gradnja, zlasti v Babinem Doju pod vrhom Bjelašnice, živo nasprotje opisanega in pogosto ne upošteva pozitivnih vplivov tradicionalnih praks. Številne nove stavbe nimajo nikakršne povezave z lokalnim okoljem.

5.1 Urbanizacija Babinega Doja v 21. stoletju

V zadnjih letih se v Babinem Doju čedalje več gradi, pri čemer nenačrtno nastajajo posamične stavbe, ki večinoma poudarjajo svojo individualnost in v vseh pogledih izstopajo iz okolice. Prve stavbe, zgrajene v Babinem Doju na začetku novega

Slika 13: Prvi nastanitveni objekti pod vrhom Bjelašnice, Izet Arslanagić, 2005 (foto: Alma Hudović Kljuno)

Slika 14: Eklektična arhitektura v Babinem Doju (foto: Alma Hudović Kljuno)

tisočletja, so bile vrstne hiše, ki jih je po načrtih Izeta Arslanagića postavilo veliko farmacevtsko podjetje Bosnalijek (slika 13). Čeprav sta vzporedni vrsti, v katerih so hiše zgrajene, malce predolgi, se ujemata s tradicionalnim alpskim oblikovalskim slogom. Vrsti sledita oblikovanosti površja, hiše pa imajo poudarjen vhod in strmo streho, ki se na drugi strani nadaljuje navzdol ter ustvarja in pokriva dodatne ravni, ki se spuščajo skupaj s terenom. Z leseno oblogo poskušajo hiše posnemati tradicionalne alpske stavbe.

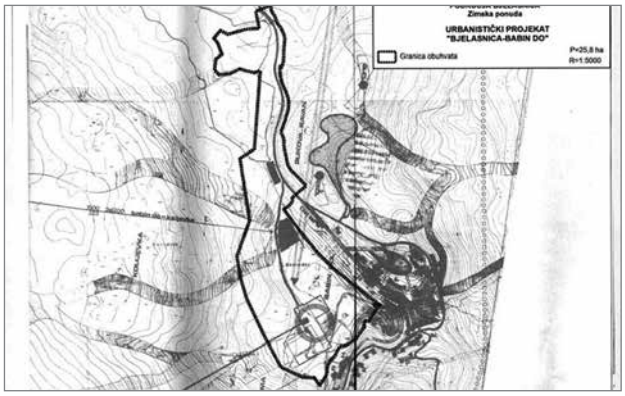
Kot (novo) naselje Babin Do nima jasne prostorske ureditve in tudi na novo zgrajene stavbe nimajo značilnega ali skupnega arhitekturnega sloga. V nasprotju z omenjenimi francoskimi letovišči, ki so bila zgrajena v okviru programa Plan Neige in so temeljila na močni arhitekturni doktrini, so novi objekti v Babinem Doju zasnovani in zgrajeni na najrazličnejših neprimernih postmodernističnih podlagah, ki so zelo daleč od zlatih časov lokalne gorske arhitekture. Modna arhitektura, ki nastaja brez vsakršne povezave z okolico ali logike, postaja

novo pravilo, ki se skoraj nezavedno množi na številnih lokacijah v nejasnem urbanem tkivu, ki obdaja goro. Pri tem so vidne velike razlike v navpičnih in vodoravnih volumnih stavb. Arhitekturna podoba Babinega Doja se ne sklada z okolico, investitorji pa objekte skoraj vedno oglašujejo kot visokokakovostne in inovativne, z vso sodobno opremo in udobjem, ki ju omogoča 21. stoletje. Tovrstno prilaščanje arhitekture in tak način delovanja sta največkrat posledica splošnega pomanjkanja kulture in razgledanosti v družbi, ki tovrstno arhitekturo vrednoti kot moderno, posebno in drago (slika 14).

Prostorski razvoj letovišča gre v napačno smer in daje ponesrečene rezultate. To je posledica tega, da ni regulacijskega načrta, kar daje priložnost in prostor manipulacijam. Leta 2016 je občinski svet v Trnovu zaprosil za izdelavo urbanističnega projekta za območje Bjelašnice (Odluka, 2016), ki pa v praksi ni bil nikoli izveden (slika 15). Današnje stanje prostora na tem območju je torej posledica neukrepanja ter nenačrtovane ali nerazumne urbanistične in prostorske politike, tj. številnih sprememb in prilagoditev regulacijskih načrtov na željo posameznih investitorjev. Arcuset (2009) navaja primer srednje velikega alpskega letovišča (podobne velikosti kot Babin Do), ki je imelo na začetku prvega desetletja 21. stoletja premalo nastanitvenih zmogljivosti, nato pa je doseglo prelomno točko v razvoju, ko so lokalne oblasti uvedle model dobičkonosnosti, ki je temeljil na razmerju med fondom nastanitvenih objektov in zmogljivostjo žičnic (Francois in Marcelpoil, 2008), in začele izvajati obsežen program, ki je zagotovil dodatna ležišča.

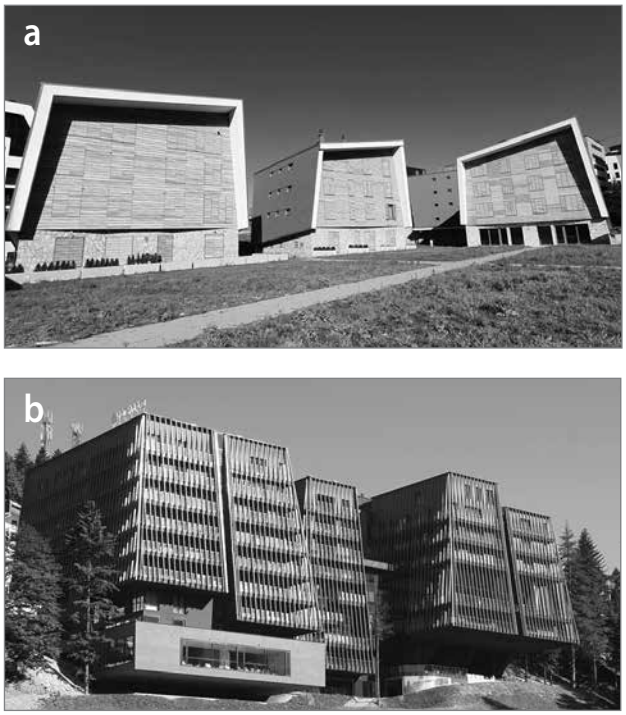
Skica na sliki 16 prikazuje postopno pozidavo Babinega Doja od začetka 21. stoletja do danes. Analiza linearne pozidave kraja potrjuje, da je gradnja kaotična in večinoma nenačrtovana. Stavbe so zgrajene ob glavni cesti, sčasoma pa so zapolnile ves prostor na obeh straneh ceste v smeri sever–jug. Stavbe na skrajnem severu, ki so nekako ločene od glavnega dela naselja, še niso dokončane (graditi so jih začeli leta 2021), na večjem delu zemljišča pa so morali pred gradnjo izsekati gozd.

Gradijo se večinoma zasebni apartmaji, druge infrastrukture, ki bi podpirala razvoj letovišča, pa je zelo malo. Na območju so štirje delujoči hoteli. Peti hotel, zgrajen leta 1983 in še vedno v prvotnem stanju, je nevzdrževan in ostaja zaprt. Poleg tega ima kraj več restavracij in barov, samo eno trgovino z živili, več smučarskih koč, žičnice, pohodne poti in teniški igrišči. Poudarek je na zimski sezoni, saj kraj omogoča zelo malo celoletnih aktivnosti, med njimi tenis, jadralno padalstvo in pohodništvo (na žalost je zadnje kljub velikemu potencialu slabo razvito). Koncerti in drugi večji dogodki so redki, odvisni zgolj od volje in prizadevanj posameznikov ter niso del organiziranega razvoja turistične ponudbe letovišča. Kot opozarjata Clarimont in Vlès (2008), lahko samo sprememba odločevalskih praks učinkovito spodbudi neko vrsto razvoja z vzpostavitvijo ustreznih mehanizmov.



Slika 15: Regulacijski načrt Babinega Doja, ki ni bil nikoli izveden (vir: Odluka, 2016)

Slika 16: Postopna pozidava Babinega Doja: 1) v gradnji, 2) 2004–2009, 3) 2009–2018, 4) 2018–2021 (ilustracija: Leila Krivošić Dizdarević)



Slika 17: Sodobne ljudske prvine: a) apartmajsko naselje Srebrna Lisica, Studio Non-Stop, 2019; b) hotel Nomad, Vedad Kasumagić in Feđa Hadžibegović, 2022 (foto: Alma Hudović Kljuno)

Vseeno je treba poudariti, da so nekateri arhitekturni projekti, izvedeni v zadnjih letih, poskušali ohraniti naravno okolje, kar jim je tudi uspelo in so se lepo zlili z okolico. Cilj je bil združiti moderno arhitekturo s tradicionalnimi oblikovalskimi prvinami in stavbe učinkovito vkomponirati v naravno krajino, ob tem pa ustvariti svež in sodoben videz. Stavbe, ki vključujejo ljudske arhitekturne prvine okoliških vaških bivališč, se lepo zlivajo z okolico, s čimer ustvarjajo prijeten ambient. Take stavbe niso impresivne z vidika velikosti, ampak jih odlikuje predvsem to, da vključujejo naravne lokalne materiale, kot sta kamen in les, in da morfološko sledijo tradicionalnim vzorcem (slika 17).

6 Razprava

Analiza in primerjava izbranih francoskih letovišč in letovišča Babin Do pod vrhom Bjelašnice sta pokazali, da prostorski razvoj Babinega Doja poteka spontano in brez skupne podlage, saj za območje ni regulacijskega načrta. Objekti in prostorske ureditve iz obdobja komunizma, ki so temeljili na egalitarnem pristopu, so v popolnem nasprotju s sodobnimi pristopi, ki se osredotočajo predvsem na potrebe in načrte posameznikov, ki jih omogoča neoliberalni kapital. Prav ti sodobni pristopi k razvoju gorskega letovišča so oblikovali tudi podobo Babinega Doja, ki razen osnovnih smučarskih prog in obilice zasebnih nastanitvenih objektov ne ponuja veliko druge infrastrukture in vsebin. Impresivni kompleksi, ki so nastali v Franciji v okviru programa Plan Neige, so resda zgrajeni v brutalističnem slogu, vendar so uspešno zadovoljili potrebe in želje donosnega letovišča s skrbno načrtovano prostorsko zasnovo.

Lokalne oblasti in turistična organizacija kantona Sarajevo bi morale imeti aktivnejšo vlogo pri razvoju letovišča ter poskrbeti za raznovrstnejše vsebine in celoletne gorske aktivnosti. Po Delormovi klasifikaciji Babin Do spada med letovišča tretje in četrte generacije, prizadevati pa bi se bilo treba za to, da bi razvil značilnosti letovišč pete generacije. V duhu 21. stoletja bi to vključevalo trajnostne okoljske rešitve, načrtni razvoj nadaljnjih projektov in nadgradnjo zdajšnjih prvin, kar bi izboljšalo izkušnjo obiskovalcev in prostorske značilnosti kraja. Poudarek bi moral biti na raznovrstni ponudbi vse leto, zaradi česar bi se spremenilo tudi prostorsko načrtovanje območja. Kot navaja Paquot (2009), raznovrstna tipologija grajenega tkiva izboljša javni prostor. Ta je v Babinem Doju delno v arhitekturnem smislu, ne pa tudi v urbanističnem. Kot opozarja Zepf (2004), je treba urbani prostor urejati na podlagi prostorskega načrtovanja na vseh treh ozemeljskih ravneh razvoja: makro-, mezo- in mikroravni. Žal v Babinem Doju ni bilo tako, območje pa je še največ pridobilo z razvojem na makroravni v obdobju komunizma.

7 Sklep

Mnoga smučarska središča so stara že več kot šestdeset let, zaradi česar se spopadajo s težavami na področju prostorskega (in arhitekturnega) razvoja. Gradbeni projekti v sedemdesetih in osemdesetih letih prejšnjega stoletja so se osredotočali na javne objekte, nastanitve z neposrednim dostopom do smučišč in smučarsko infrastrukturo, novejša gradnja pa se osredotoča na zadovoljevanje najrazličnejših prostočasnih in potrošniških potreb, kar zahteva tudi prostorske prilagoditve. Razvoj Babinega Doja pod vrhom Bjelašnice ne temelji na prostorskem (ali katerem koli drugem) načrtovanju. Neugodne prostorske razmere in težave, s katerimi se območje trenutno spopada, so posledica razvoja smučarskega letovišča brez upoštevanja parametrov in smernic za njegov nadaljnji razvoj, vključno z zagotavljanjem nujne in spremljevalne infrastrukture. Brez regulacijskega načrta so lahko vse aktivnosti v Babinem Doju podvržene zlorabam in odločitvam peščice posameznikov, katerih glavnih cilj je dober zaslužek. Občinske oblasti v Trnovu ne razmišljajo o oblikovanju gospodarsko, okoljsko in socialno trajnostnega letovišča, saj se še vedno osredotočajo na gradnjo veliko stavb brez podporne infrastrukture in dolgoročne vizije razvoja Babinega Doja.

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Koncept prilagajanja geokonstrukcij z upoštevanjem vplivov podnebnih sprememb

Članek predstavlja problematiko potencialno nestabilnih pobočnih območij v kontekstu podnebnih sprememb. Predstavljen je možni pristop urejanja in upravljanja pobočij, ki upošteva različne rešitve, predvsem temelječe na naravi. Uporabljena je metodologija načrtovanja, ki upošteva vplive podnebnih sprememb na geomehanske lastnosti tal in posledično odziv tal in konstrukcij. Prikazani so tudi učinki izbranih ukrepov na prilagajanje podnebnim spremembam. Predlagan je koncept prilagajanja potencialno nestabilnih geokonstrukcij, glede na pričakovane podnebne spremembe za geomehanske analize in geotehničnega načrtovanja, ki upošteva vzročno verigo s t. i. signali podnebnih sprememb, učinki, vplivi (posledice) in ukrepi. Implementacija koncepta je prikazana na tipičnem primeru analize stabilnosti pobočja. Sklep analize je, da so za stabilnost pobočja pogosto ključni dejavniki, kot so neto infiltracija vode v pobočje, vodoprepustnost zemljine in pretok podzemne vode v pobočju. Te dejavnike lahko reguliramo tudi z na naravi temelječimi rešitvami.

Ključne besede: prilagajanje podnebnim spremembam, na naravi temelječe rešitve, stabilnost pobočij, infiltracija padavin, neto infiltracija vode

1 Uvod

Iz izkušenj s plazovi vemo, da so najbolj kritične pobočne površine v suburbanih območjih, plazovi se praviloma pojavljajo na mestih, ki so redko pozidana s stavbami in v območju lokalnih cest. V Sloveniji je zato uveljavljena praksa, da se za takšna območja v fazi načrtovanja objektov in pridobivanja gradbenega dovoljenja izvede raziskava, ki obravnava verjetnost pojava plazu, in se projektna dokumentacija dopolni z ustreznim geološko- geotehničnim poročilom, ki je temelj za geomehansko analizo in načrtovanje.

Pri geomehanskih analizah z upoštevanjem podnebnih sprememb se zaradi tega pojavljajo razne težave, ki s predpisi in s standardi še niso dovolj rešene:

- Opis podnebnih značilnosti z ovrednotenjem podnebnih sprememb je težko izvedljiv, v raziskavi so zato podnebne značilnosti in pričakovane spremembe podnebja v prihodnosti opisane s t. i. signali podnebnih sprememb, ki se določijo iz klimatoloških napovedi (podnebnih podatkov in modelov napovedi podnebnih sprememb). Težava je, da ti signali niso natančno določljivi, njihove vrednosti imajo veliko odstopanje, glede na izbrani scenarij podnebnih sprememb in tudi sicer niso neposredno uporabni kot vhodni podatek v geomehanski analizi.
- Učinki podnebnih sprememb povzročajo spremenjene geološke značilnosti nekega območja in spremenjene geomehanske parametre tal. Ti učinki so težko natančno določljivi (geološki modeli, geomehanski preizkusi in modeli), tudi če bi bili signali natančno določeni.
- Podnebni signali in učinki so medsebojno soodvisni. Vsak posamezni signal povzroči enega ali več učinkov, vendar ne vseh hkrati.
- Signali in učinki povzročijo odziv, tj. odzive (posledice) na tla in konstrukcijo, ki so težko določljivi zaradi hkratnih signalov, učinkov in drugih (nepodnebnih) vplivov, ki so standardno upoštevani v analizi.
- Obstaja veliko geokonstrukcij, vsak tip pa zahteva specifično geomehansko analizo in ustrezne geotehnične ukrepe. Za analize posameznih tipov geokonstrukcij so znani standardni pristopi, ki pa ne podajajo napotkov glede podnebnih sprememb.
- Opredelitev vzročne povezave signali–učinki–odzivi je zahtevna, povezava je pri vsaki geokonstrukciji drugačna.
- Obstaja širok nabor možnih geotehničnih ukrepov, treba pa je ugotoviti, kako ukrepi vplivajo na signale in učinke podnebnih sprememb in na varnost geokonstrukcije.

Predstavljen je koncept prilagajanja potencialno nestabilnih geokonstrukcij, z upoštevanjem vplivov podnebnih sprememb, ki je splošen in ga je mogoče uporabiti za vse tipične geokonstrukcije. Med geokonstrukcije prištevamo tudi brežine in pobočja. V ta namen je razvita vzročna veriga: signali podnebnih sprememb–učinki–odzivi (posledice)–ukrepi. Implementacija koncepta je predstavljena na primeru pobočja pod cesto, s katere se prosto razliva meteorna voda. Predlagan je možen pristop urejanja in upravljanja, ki temelji na rešitvah, temelječih na naravi. To so rešitve, ki jih navdihuje in podpira narava. So stroškovno učinkovite, hkrati zagotavljajo okoljske, družbene in gospodarske koristi. Omogočajo, da bolj raznovrstna narava, naravne lastnosti in procesi preidejo v mesta, krajine in morske krajine z lokalno prilagojenimi, učinkovitimi in sistemskimi posegi (Evropska komisija, 2023).

Predstavljena tema je del raziskovalnega projekta, ki ga izvaja delovna skupina Climate Change Adaptation (ELGIP, 2022), v okviru evropske platforme geotehničnih inštitutov ELGIP - European Large Geotechnical Institute Platform (ELGIP, Geotechnical Research in Europe, 2022). Raziskava omenjene delovne skupine je omejena na območje Evrope. Raziskava, predstavljena v tem članku, je bila razdeljena v tri glavne faze. V prvi fazi je bil izveden pregled literature. V drugi fazi je bila analizirana vzročna povezava med signali in učinki podnebnih sprememb ter možnimi vplivi signalov in učinkov podnebnih sprememb na pobočja in konstrukcije (podnebna geomehanska zasnova signali–učinki–odziv–ukrepi). V tretji fazi je bil podan koncept za geomehansko analizo in načrtovanje z upoštevanjem vplivov podnebnih sprememb. Na podlagi tega koncepta smo v članku poskusili upoštevati vse težave, ki nastopijo pri analizah zdajšnjih in novih geokonstrukcij, in to ob upoštevanju podnebnih sprememb, ter jih implementirati in prikazati na realnem primeru plazu.

1.1 Pregled literature

Mednarodne organizacije za podnebne spremembe so objavile številne publikacije in dokumente, ki se nanašajo na podnebne spremembe. Mnogi avtorji razpravljajo o vplivih podnebnih sprememb na okolje. V tem prispevku se omejujemo le na geotehnični vidik prilagajanja podnebnim spremembam. Vardon (2015) je leta 2014 proučil vplive podnebnih sprememb, ki bodo najverjetneje učinkovali na okolje. Opisal je naslednje značilnosti podnebnih sprememb: temperatura, padavine, veter, višanje morske gladine, neurja, rečni tok, mraz, ki bodo imele vpliv na geokonstrukcije. Davies (2011) navaja, da je kvantifikacija neto infiltracije vode v tla odvisna od podatkov o podnebju, od tal in rastlinja.

Podnebne parametre (padavine, relativna vlažnost, temperatura, hitrost vetra in sončno sevanje) je mogoče meriti na vremenskih postajah, lastnosti tal in vegetacije pa lahko ugotavljamo v laboratoriju ali na terenu (Vardon, 2015). Površinski odtok vode nastane, če količina padavin preseže zmogljivost

infiltracije tal. Računski postopki za določitev vsake vodne bilance so kompleksni in vsebujejo številne predpostavke (Davies, 2011). Za proučevanje stabilnosti in značilnosti pronicanja vode na pobočju v padavinskih razmerah se lahko uporabljajo laboratorijski testi modelov (Chen idr, 2019) in analiza programske opreme končnih elementov (Yan in Jiao, 2018). V geomehansko analizo je treba vključiti vpliv številnih dejavnikov na tla, kot so strižni kot zemljine, vsebnost vode, hidravlična prepustnost, trajanje in intenzivnost padavin (Cho, 2017; Chen idr., 2019; Dyson idr., 2019; Oggero idr., 2021).

Prvo analizo nevarnosti zemeljskega plazu v povezavi s podnebjem je zagotovil projekt SafeLand (2012). Uporabil je kontinuum infiltracije tal, vključno z evapotranspiracijo za analizo stabilnosti. Vahedifard idr. (2018) so se osredotočili na geokonstrukcije pod delno nasičenimi pogoji, pri čemer je sprememba lastnosti tal opredeljena kot vzrok vpliva podnebnih sprememb. Pk (2017) je analiziral stabilnost nasipov za sedanje in prihodnje podnebje z uporabo numeričnega modeliranja in pokazal, da so učinki podnebnih sprememb močno odvisni od hidravlične lastnosti nasipnih materialov. Procesi infiltracije in izhlapevanja vode na površini tal so na splošno odvisni glede na prevladujoče podnebne razmere in vsebnost vode v tleh. Skupna količina vode, ki se infiltrira v tla, pomembno vpliva na porni tlak in stabilnost pobočij. Med padavinami deževnica pronica v pobočje in postopoma tvori prehodno nasičeno območje. Sukcija se postopoma zmanjšuje, kar zmanjša strižno trdnost tal na pobočju in se poveča tveganje za nestabilnost pobočja (Andreea, 2016; Wang idr., 2018; Zhou idr., 2019). Park idr. (2019) so analizirali nasipe in stabilnost brežin, z upoštevanjem statističnih podatkov vzorcev padavin in hidromehanskih lastnosti tal. Insana idr. (2021) so raziskali, kako se problemi z geokonstrukcijami pod vplivom podnebnih sprememb obravnavajo v nacionalnih načrtih za prilagajanje. Ugotovili so, da posebne določbe za prilagajanje geokonstrukcij na podnebne spremembe na splošno primanjkujejo in so podane predvsem v obliki strategij za specifične probleme.

Za Slovenijo so po napovedih podnebnih sprememb Agencije Republike Slovenije za okolje v poročilu Podnebne spremembe 2021 (2021) napovedane spremembe temperature zraka in padavin, pri čemer bo to, kako velike bodo te spremembe, odvisno od količine toplogrednih plinov. V primeru različnih podnebnih scenarijev naj bi ta temperatura zraka v primerjavi z obdobjem 1981–2012 narasla za od 1,3 °C do 4,1 °C. Bertalanič idr. (2018) napovedujejo, da lahko do sredine stoletja pričakujemo veliko ekstremnih vremenskih dogodkov: hudo vročino poleti, povečano spremenljivost temperature in padavin poleti, več močnih padavinskih dogodkov, okrepitev hidrološkega cikla, pogostejše zdajšnje stoletne poplave, precejšnje povečanje pogostosti poletne suše, verjetno povečanje števila dni z ugodnimi razmerami za nastanek poletnih neurij.

Prilagajanje mest na ekstremne dogodke ali njihova krepitev odpornosti proti tem dogodkom je kompleksen proces, za katerega sta potrebna vključitev in sodelovanje vseh deležnikov, ki (so)oblikujejo in upravljajo mestni prostor (Klemen, 2020). Radinja idr. (2021) opozarjajo na problematiko upravljanja voda v mestih, ki je lahko uspešna le v interdisciplinarnem povezovanju pristojnih iz vseh strok (vodarji, prostorski načrtovalci, urbanisti, arhitekti in krajinski arhitekti, gradbeniki, geografi, sociologi idr.). Predlagajo ukrepe s t. i. modro in zeleno infrastrukturo. Modro-zelena infrastruktura so naravni in polnaravni decentralizirani sistemi, ki so namenjeni upravljanju padavinskih voda v mestih in hkrati opravljajo zelo raznovrstne ekosistemske storitve. Razen v nekaj tujih mestih, kjer so že sprejeli strategije za njihovo sistematično uvedbo, je uvajanje modro-zelene infrastrukture omejeno na zgolj posamezne osamljene primere. Krajnc (2019) ugotavlja, da učinki podnebnih sprememb in zdajšnje stanje v urbanih naseljih oblikujejo razmere, ki jim mestna infrastruktura v kritičnih trenutkih (npr. ekstremne padavine, vročinski valovi) vedno pogosteje ni več kos. Kristl idr. (2020) obravnavajo poglavitne izzive v zvezi z odpornostjo proti podnebnim spremembam z vidika stavbnega sektorja, kot so sheme prilagajanja podnebnim spremembam, energijska učinkovitost in ukrepi za blaženje teh sprememb. Izzivi so ovrednoteni glede na najnovejše stanje razvoja področja, raziskovalni interes in regulativna vprašanja, pri čemer se pri pregledu znanstvene literature presoja napredek in se opredeljujejo raziskovalne vrzeli. Pregled literature nakazuje, da se odpornost proti podnebnim spremembam večinoma nanaša na večje sisteme, na ravni stavb pa se to področje šele razvija.

Raymond idr. (2017) in Cohen-Shacham idr. (2016) predstavljajo rešitve, s katerimi je mogoče obravnavati številne družbene izzive hkrati. Te temeljijo na naravi in vključujejo krepitev človekove blaginje, urbano regeneracijo, izboljšanje obalne odpornosti, večnamensko upravljanje povodij in obnovo ekosistemov, povečanje trajnostne rabe snovi in energije, razvoj zavarovalne vrednosti ekosistemov in povečano sekvestracijo ogljika. Seznam možnih ukrepov, ki so dobro znani v geotehničnem inženirstvu, je bil predstavljen v podatkovni bazi LaRimiT (Uzielli idr., 2017; Capobianco idr., 2022). Podatkovna baza LaRiMiT, ki je sprva vključevala le običajne rešitve, ki temeljijo na tradicionalnih metodah, je bila razširjena na rešitve, temelječe na naravi, za obvladovanje erozije in ublažitev plitvih plazov z rastlinami in uporabo naravnih materialov. Rešitve, temelječe na naravi, in konvencionalne rešitve je mogoče združiti tudi v hibridne rešitve.

2 Zgradba raziskave in metode dela

Podnebne značilnosti, kot so veter, vlažnost, oblačnost, megla, atmosferski tlak itd., in njihove spremembe pomembno vpliva-

jo na tla in na objekte (nasipi, temelji, podporne konstrukcije itd.). Vendar opis značilnosti podnebnih sprememb ne omogoča izvedbe geotehnične analize, zato jih je treba izraziti v uporabnejši obliki. Vse signale, učinke in vplive podnebnih sprememb je skupaj predlagala in predstavila delovna skupina ELGIP Climate Change Adaptation, ki je začela delovati aprila 2018. Ta delovna skupina je predstavila opis značilnosti podnebnih sprememb s signali in učinki podnebnih sprememb in jih predstavila v članku (Insana idr., 2021).

Značilnosti podnebnih sprememb zagotavljajo opis podnebnih sprememb, ki pa je preveč splošen za reševanje geotehničnih problemov. Najpomembnejši signali podnebnih sprememb za tla so povečane padavine, zmanjšana količina padavin/podaljšana sušna obdobja, povišana temperatura zraka in obdobja toplega vremena pozimi, povečano število ciklov močnega dežja in suše, povečano število ciklov zmrzali in odmrznitve, povečana pogostost in intenzivnost ciklonov in neviht, zvišanje morske gladine in povečana hitrost vetra (Insana idr., 2021).

Signali podnebnih sprememb imajo različne učinke na tla, kamninsko podlago, podtalnico, površinske vode in rastlinstvo ter vplivajo na spreminjanje tal in objektov. Te vplive, v tem prispevku imenovane učinki podnebnih sprememb, ugotavljajo geološki in geotehnični strokovnjaki na podlagi klimatoloških podatkov. Najbolj značilni učinki podnebnih sprememb z geotehničnega vidika so poslabšanje nosilnosti tal, povečano preperevanje, povečana vodna erozija, povečan površinski odtok vode, zvišan nivo in povečan pretok površinske in podzemne vode, znižan nivo in zmanjšan pretok površinske in podzemne vode, povečana vetrna erozija, spremenjene geotehnične lastnosti zmrznjenih zemljin, povečan površinski odtok zaradi taljenja snega, spremenjene lastnosti glinenih tal pri krčenju in nabrekanju, povečana vodna in vetrna erozija, pogosto in višje zvišanje morske gladine zaradi nevihtnih valov, povečana obremenitev zaradi močnega vetra in valov, obalna erozija, povečana dinamična obremenitev (Insana idr., 2021).

2.1 Odzivi pobočij na podnebne spremembe

Signali in učinki podnebnih sprememb povzročijo odziv pobočja in druge posledice, ki se v primeru pobočij kažejo kot nestabilnost in v skrajnem primeru tudi porušitev pobočja. V skladu z evropskim standardom EN 1997: Geotehnično načrtovanje (Evrokod 7: Geotehnično Projektiranje - 1. Del: Splošna pravila, 2005) se odziv izračuna kot posledica povečane obremenitve in spremembe (poslabšanja) lastnosti materiala, ki tvori pobočje (SIST EN 1997-1, 2005). Pojavne oblike nestabilnosti pobočja so različne (preglednica 1) in odvisne od geometrije in slojevitosti pobočja, materiala nestabilne mase ter podnebnih signalov in učinkov.

Preglednica 1: Oblike nestabilnosti pobočij (vir: prilagojeno po Varnes, 1978)

Tip nestabilnosti	Rotacijski/translacijski plaz
	Padanje
	Prevrnitev
	Bočni razmik
	Tok
Material	Zemljina
	Drobir
	Kamnina
Globina	Površinsko (≤ 0,5 m)
	Plitvo (0,5 m–3 m)
	Srednje globoko (3 m–8 m)
	Globoko (8 m–15 m)
	Zelo globoko (≥ 15 m)
Hitrost	Skrajno hitro (≥ 3 m/s)
	Zelo hitro (~ 30 cm/min)
	Hitro (~ 1 m/dan)
	Srednje (~ 1 m/mesec)
	Počasi (~ 1 m/leto)
	Zelo počasi (≤ 30 cm/leto)

2.2 Ukrepi

Podnebne spremembe lahko predstavimo z uporabo raznih scenarijev značilnih potekov vsebnosti toplogrednih plinov (Representative Concentration Pathways, RCP). Obstajajo štirje poteki vsebnosti toplogrednih plinov, vsak vključuje razpon osnovnih vrednosti in ocenjenih emisij do leta 2100: scenarij blaženja RCP2.6, dva vmesna scenarija RCP4.5 in RCP6.0 ter scenarij z visokimi emisijami RCP8.5 (Medvladni panel za podnebne spremembe, 2022). Učinke podnebnih sprememb je smiselno upoštevati tako pri načrtovanju novih objektov kot pri analizi zdajšnjega stanja. Preglednica 2 prikazuje splošne napotke za oba primera. Kadar načrtujemo nov objekt, zmeraj najprej naredimo analizo, v kateri upoštevamo podnebne spremembe za v prihodnje in na podlagi tega sledi načrtovanje. Če pa proučujemo zdajšnjo geokonstrukcijo, je ukrep odvisen od predpostavljenih posledic podnebnih sprememb. Če analiza pokaže, da se bodo poslabšale lastnosti tal, da bo posledično nižji faktor varnosti in kriteriji za varnost objekta na pobočju niso zadovoljeni, je treba opraviti korake, kot so predvideni za novi objekt. Kadar se poškodba na objektu ali porušitev že zgodi, se izvedejo interventni ukrepi.

Preglednica 2: Koraki načrtovanja, kriteriji in ukrepi za nove in zdajšnje geokonstrukcije (vir: prilagojeno po Bračko, T., idr., 2022)

Objekt	Projektni koraki	Kriteriji (podnebno prilagajanje)	Ukrepi
Nova geokonstrukcija	Študija izvedljivosti	Merila za varnost in uporabnost so, ob upoštevanju podnebnih sprememb, upoštevana.	Novo načrtovanje
	Idejna zasnova		
	Podrobna zasnova		
	Izvedba		
Obtoječa geokonstrukcija	Preveritev ustreznosti	Kriteriji varnosti in uporabnosti, ob upoštevanju podnebnih sprememb, so izpolnjeni.	Ni ukrepov
		Kriteriji varnosti in uporabnosti, ob upoštevanju podnebnih sprememb, niso izpolnjeni.	Ponovno načrtovanje
		Poslabšane mehanske značilnosti slojev pobočja	
		Znaki poškodb in porušitev pobočja	Interventni ukrepi

Pristopi za blažitev posledic podnebnih sprememb vključujejo gradbene ukrepe; za vsako geotehnično konstrukcijo in pričakovani vpliv podnebnih sprememb sledi ustrezen ukrep s seznama možnih ukrepov (gl. SafeLand, 2012). V tem prispevku obravnavamo samo ukrepe, ki so uporabni za pobočja in so hkrati na naravi temelječe rešitve. Iz preglednice 3 je razvidno, da nekateri ukrepi v celoti izpolnjujejo pogoje za na naravi temelječe rešitve. Za nekatere ukrepe pa je potrebna kombinacija na naravi temelječih rešitev in konvencionalnih rešitev z vgradnjo umetnih materialov.

Da ukrep obravnavamo kot na naravi temelječo rešitev, so bili v raziskavi opredeljeni naslednji pogoji: (1) za ukrep se uporabljajo naravni procesi, (2) ukrep zagotavlja ali izboljšuje družbene koristi, (3) ukrep zagotavlja ali izboljšuje gospodarske koristi, (4) ukrep zagotavlja ali izboljšuje okoljske koristi in (5) ukrep je koristen za biotsko raznovrstnost.

Pri analizah prilagajanja na podnebne spremembe se pojavi težava, kako uporabiti znane računske modele za geomehanske analize pobočij in kako vnesti vhodne podatke, ki čim bolj realno opisujejo pričakovane podnebne spremembe. Zato je v prispevku opisan koncept prilagajanja potencialno nestabilnih geokonstrukcij glede na pričakovane podnebne spremembe (slika 1), pri čemer so podnebne značilnosti, kot so padavine, temperatura, veter, morska gladina itd., opisane s signali podnebnih sprememb. Podnebne spremembe povzročijo učinke na tla in konstrukcije. Vsak signal povzroči enega ali več učinkov podnebnih sprememb. Signali in učinki podnebnih sprememb pa so vzrok za posledice podnebnih sprememb, ki se kažejo kot spremenjene fizikalne lastnosti tal in kot dodatni vplivi (obtežbe). Glede na predvideni odziv tal in konstrukcije na pričakovane podnebne spremembe se zatem določijo potrebni geotehnični ukrepi za zagotavljanje varnosti in stabilnosti tal.

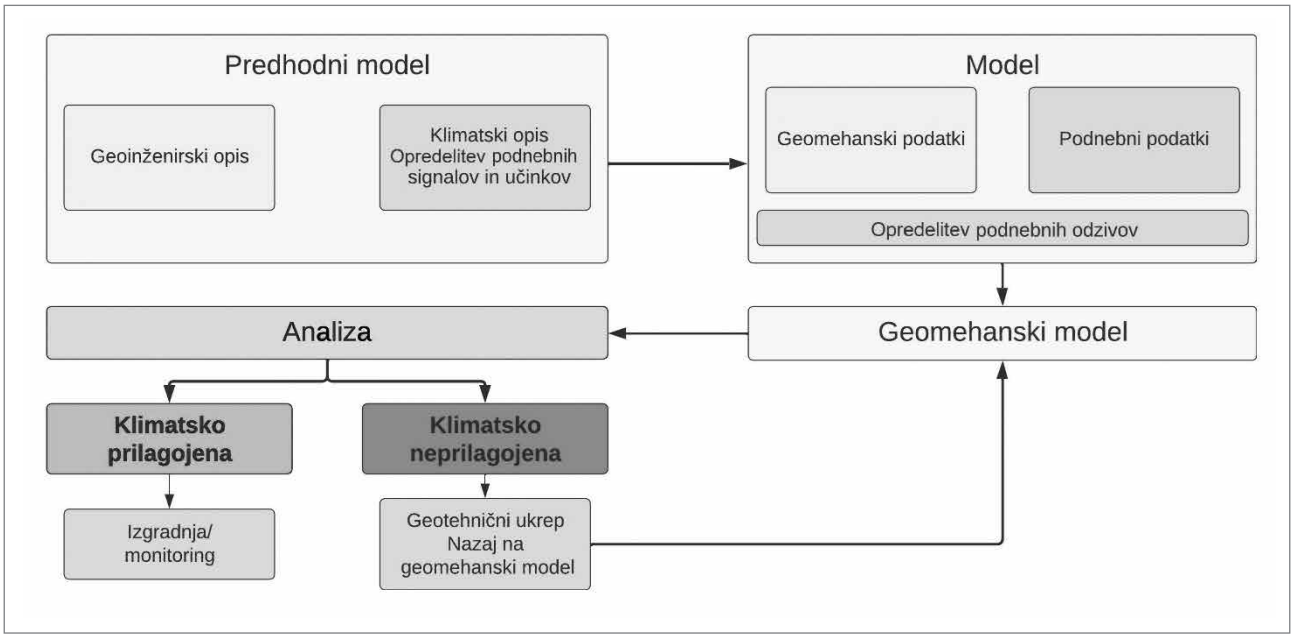
Pomembno je, da se za obravnavano geokonstrukcijo najprej opredeli, kateri so najpomembnejši signali podnebnih sprememb, katere učinke podnebnih sprememb povzročajo ter katere bi bile morebitne posledice zaradi signalov in učinkov. Signalov in posledičnih učinkov je za vsak primer več, zato je pomembno razumeti korelacije med posameznimi parametri podnebnih sprememb. Zato je bila v okviru omenjene delovne skupine izvedena raziskava (spletna anketa), v kateri so sodelovali geotehnični strokovnjaki iz evropskih držav, da bi podali oceno vpliva signalov podnebnih sprememb, učinkov na območja in konstrukcije ter za urbana območja in konstrukcije oceno najbolj problematičnih posledic. Iz rezultatov ankete je razvidno, da so v večini držav najbolj problematični signali podnebnih sprememb povečana ali zmanjšana količina padavin, povečano število ciklov dežja/suše in povečano število ciklov zmrzali/odmrznitve (ELGIP, 2022).

Oblikovana je bila metodologija za prepoznavanje podnebnih signalov, oceno vplivov podnebnih sprememb in zagotavljanje smernic za vključevanje podnebne spremenljivosti v geotehnično analizo in načrtovanje. Ta metodologija sledi postopkovnemu zaporedju, ki ga pogosto uporabljajo geotehnični inženirji pri ocenjevanju in načrtovanju znanih in novih geotehničnih struktur. Posamezni koraki tega zaporedja so prikazani na sliki 1. Poleg tega je ključno upoštevanje projektnih specifikacij iz Evrokoda 7 (SIST EN 1997-1, 2005).

V začetni fazi se izvajajo temeljite analize, ki jih opravljajo strokovnjaki s področij geotehnike, geologije, seizmologije in klimatologije. Glavni cilj analiz je razvoj modela za nadaljnjo

Preglednica 3: Ukrepi za zagotavljanje stabilnosti pobočij (vir: prilagojeno po Copobianco, V., idr., 2022)

	Opis ukrepa	Naravni ukrepi	Kamen, les	Umetni in recikli-rani materiali
Površinska zaščita	Zatravitev, ozelenitev, posaditev dreves	✓		
	Ojačitev z geosintetiki			✓
	Drenažna odeja		✓	✓
	Protierozijski nasip obrežij		✓	
	Sidrane obloge	✓		✓
Prilagajanje geometrije pobočja	Odstranitev nestabilnega pobočnega materiala	✓		
	Odstranjevanje nestabilnih hribinskih blokov	✓		
	Odvoz materiala z voznih površin	✓		
	Zamenjava materiala z lahkim polnilom			✓
	Dodajanje materiala na peti nestabilnega pobočja		✓	
Spreminjanje režima odvodnjavanja	Površinska drenažna dela	✓	✓	
	Lokalno premeščanje materiala za povečano odtekanje vode	✓		
	Tesnjenje nateznih razpok v hribini	✓		
	Izolacijske pregrade, geomembrane			✓
	Vegetacijsko-hidrološki učinki	✓		
	Dela za nadzorovanje hidroloških vplivov	✓		
	Odvodni kanali	✓		
Spreminjanje režima podzemne vode	Plitvi jarki, napolnjeni z drenažnim materialom		✓	
	Globoki jarki, napolnjeni z drenažnim materialom		✓	
	Vrtine za podzemno odtekanje vode	✓		
	Drenaža za iztoke	✓		
	Drenažni tuneli, galerije, odtoki iz vodnjakov	✓		
Spreminjanje mehanskih lastnosti nestabilne površine	Rastlinje	✓		
	Zamenjava materiala površine		✓	
	Površinsko zgoščevanje tal	✓		
	Globinsko zgoščevanje	✓		
	Mehansko globinsko mešanje z apnom in/ali cementom			✓
	Nizkotlačno injektiranje s cementnim ali kemičnim vezivom			✓
	Injektiranje			✓
Prenos obremenitev na nosilne sloje	Vertikalne drenaže			✓
	Piloti		✓	✓
	Diafragme			✓
	Mehanski učinki s kesoni			✓
	Žebljanje			✓
	Mozniki in sidra			✓
	Sidranje v kamnino			✓
	Sidra			✓
Podporne konstrukcije	Armirana zemljina			✓
	Gabioni		✓	✓
	Kašte		✓	
	Suhe kamnite zložbe		✓	
	Težnostni zidovi		✓	✓
	Armiranobetonski zidovi			✓



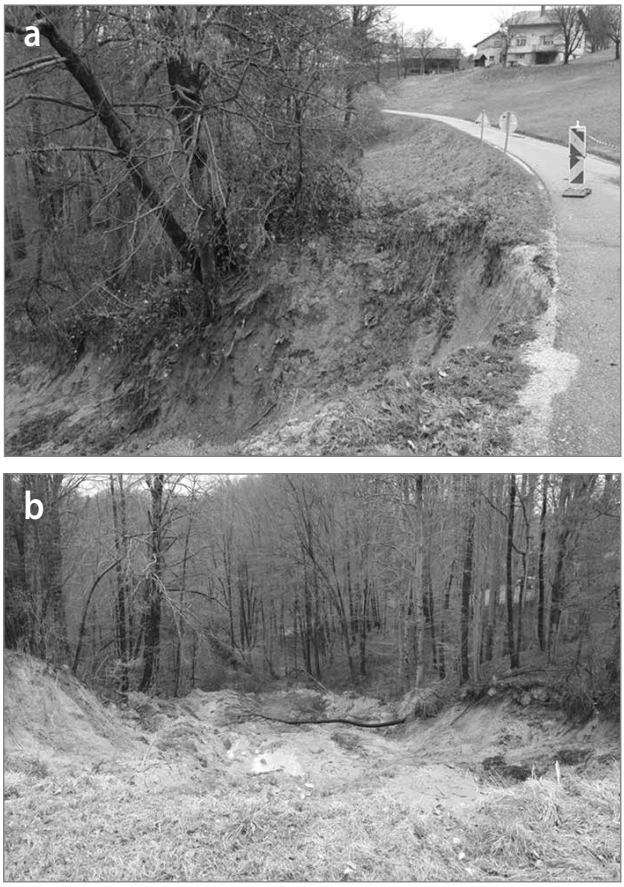
Slika 1: Zasnova za geomehansko analizo in načrtovanje geokonstrukcij s poznavanjem vplivov podnebnih sprememb (vir: avtorji)

geomehansko analizo. Če geomehanska analiza pokaže, da je konstrukcija prilagojena podnebnim spremembam, se postopek gradnje oziroma monitoring nadaljuje. Če pa se ugotovi, da konstrukcija ni prilagojena podnebnim spremembam, se izvedejo geotehnični ukrepi in se postopek analize ponovi.

V primeru zdajšnjih geokonstrukcij je skladnost mogoče doseči z modificiranjem geotehnične strukture, če je to izvedljivo, s tehničnimi ukrepi vzdrževanja. Seznam možnih strukturnih ukrepov za omilitev, dobro znanih v geotehničnem inženirstvu, je naveden v preglednici 3. Predlagani postopek za geomehansko analizo in načrtovanje je mogoče uporabiti za vse tipične geotehnične strukture, vključno s pobočji in nasipi, saj ne spreminja uveljavljenih temeljnih načel in analitičnih pristopov geotehničnega načrtovanja, temveč dodaja vidike, povezane s podnebjem.

3 Rezultati in razprava: primer uporabe koncepta prilagajanja potencialno nestabilnih geokonstrukcij glede na pričakovane podnebne spremembe

V preglednici 1 so prikazane pojavne oblike (tipi) nestabilnosti pobočij, ki so različne glede na geometrijo in slojevitosti pobočja, material nestabilne mase in vpliv podnebnih signalov in učinkov. Za vsak tip pobočja se izvede specifična geomehanska analiza in se izberejo ustrezni geotehnični ukrepi. Za prikaz



Slika 2: a) Tipični čelni odlom plazu kot posledica infiltracije vode v pobočje in hkratnega izlivanja meteorne vode s ceste in b) telo plazu z narivi zemljine na peti plazu (foto: Bojan Žlender)

uporabe koncepta je bil izbran primer pobočja pod cesto, s katere se prosto razliva meteorna voda. Prikazan je primer analize stabilnosti pobočja, kjer je verjetnost nastanka zemljinskega plazu. Upoštevana sta vpliv podnebnih sprememb in ukrep z uporabo na naravi temelječih rešitev.

3.1 Predhodni model

Namen analize je razumeti vzroke za morebitno nestabilnost plazu ter načrtovati in preveriti učinkovitost omilitvenih ukrepov, da se zagotovi podnebna prilagojenost pobočja, ceste in varnosti stanovanjskega objekta v neposredni bližini. Skladno s standardom Evrokod je življenjska doba konstrukcij in drugih običajnih objektov 50 let (SIST EN 1990, 2004).

S karte verjetnosti pojavljanja plazov je razvidno, da je obravnavana lokacija na območju velike verjetnosti pojavljanja plazov, z opozorilne karte erozije pa, da je na območju zahtevnih zaščitnih ukrepov. Ključni signali podnebnih sprememb so povečana količina padavin, povišana temperatura zraka in povečana hitrost vetra. Predhodna ocena geoloških razmer obravnavanega območja je podana na podlagi geološke karte obravnavanega območja. Oligocenske plasti pobočja so sestavljene iz sive laporaste gline in skrilavca, glinenega laporja in sljudnega skrilavca. Holocenske plasti so aluvialni nanosi, sestavljeni iz drobnozrnatih kamenčkov, peska, mulja in gline. Rezultati klasifikacije tal so bili pridobljeni v skladu s standardom SIST ISO TS 17892-4:2017. Ocenjena sta gladina in pretok podzemne vode, ki sta odvisna od letnega časa in količine padavin. Seizmični podatki upoštevajo priporočila standarda EN 1998-1: 2005, ki upošteva povratno dobo potresov 475 let. Območje, ki se obravnava, spada v 7. stopnjo po evropski makroseizmični lestvici. Glede na projektno karto pospeška tal je projektni pospešek tal za obravnavano območje 0,2 g (SIST EN 1998-1, 2005).

3.2 Model

Raziskave so pokazale, da so tla sestavljena iz plasti peščene gline, so lahke do srednje kompaktne konsistence in segajo 3 metre v globino. Globlje je glina srednje do težke konsistence, prehaja v poltrdno stanje in sega do globine 6 metrov. Še globlje je hribinska osnova laporja. Podnebni učinki, povezani s podnebnimi signali, so poslabšanje trdnosti materiala zaradi povečane zasičenosti z vodo, povečana vodoprepustnost, intenzivnejše preperevanje, zvišana gladina in povečan pretok podzemne vode, vključno s tlakom porne vode. Izvedena je bila geotehnična raziskava lokacije, ki je vključevala geodetski posnetek, sondiranje in vzorčenje tal, merjenje nivoja podzemne vode, terensko testiranje (SPT) in laboratorijske preiskave (razvrstitev tal, določitev gostote, neposredni strižni preizkus, preizkus vodoprepustnosti, edometerski preizkus). Določene so bile lastnosti laporja in peščene gline. Model tal upošteva največji kot trenja in ničelni kot dilatacije. Po metodi Van-Genuchtena in Nielsena (1985) je bila določena karakteristična krivulja zemlja-voda na pobočju in pridobljena krivulja funkcije vodoprepustnosti.

Za vključitev podnebnih sprememb v model so bile upoštevane napovedane podnebne spremembe do leta 2050 in temu primerno povečane količine padavin. Izbrana je bila ocena trenutnih ekstremnih padavin (povratna doba 100 let) in padavin v letu 2050 za izbrano plazišče po scenariju podnebnih sprememb RCP4.5. Trenutna ekstremna količina padavin je bila opredeljena kot P = 139 mm/dan. Prihodnji ekstrem bo dosežen s povečanjem trenutne količine padavin za 7,2 % (P = 149 mm/dan). Računski postopki za določanje infiltracije vode v tla so kompleksni in vključujejo številne predpostavke (Yan in Jiao, 2018). V analizi je uporabljena enačba, ki jo je razvilo ameriško združenje gradbenih inženirjev (ASCE) (Pk, 2017).

3.3 Geomehanski model

V tej fazi se geomehanski model pridobi z vključitvijo rezultatov modeliranja podnebja v geotehnični model in analizo vhodnih podatkov, ki izraža povečanje padavin z neto vodno infiltracijo, ovrednoteno na podlagi ekstremnih padavin. Ustvarjena sta bila dva modela, FEM (metoda mejnega ravnovesja) in LEM (metoda končnih elementov), z velikostjo mreže 1 m × 1 m. Pri metodi FEM se predpostavljajo mejni pogoji. Zajema proučevanje ravnovesja med togim telesom, kot je pobočje, in drsno površino poljubne oblike. Iz tega ravnovesja se izračunajo strižne napetosti in primerjajo z razpoložljivo strižno odpornostjo. LEM je močna alternativna metoda za analizo stabilnosti pobočij, je natančna, vsestranska in zahteva manj predhodnih predpostavk, zlasti glede mehanizma porušitve.

Geometrija modela je prikazana na sliki 3. Dimenzije modela so 45 m × 20 m, z opredeljenima dvema slojema tal, zgornja plast je peščena glina in spodnja plast je lapor. Predvidene so bile podnebne spremembe do leta 2050 in temu primerno povečane količine padavin. Za lokacijo plazu so bili uporabljeni podatki iz poročila o padavinskih spremembah. Izveden je bil izračun sprememb ravni padavin do leta 2050, ki predvideva povečanje količine padavin in zvišanje temperature za izbrano plazišče z uporabo scenarija podnebnih sprememb RCP4.5. Intenzivnost padavin je opredeljena kot podnebna sprememba in je trenutno, ob upoštevanju stoletne povratne dobe, 139 mm/dan, povečanje ekstremnih padavin zaradi podnebnih sprememb je 5-odstotno. Preglednica 4 prikazuje vhodne podatke obravnavanega numeričnega modela. Za lapor so bile izbrane privzete vrednosti, saj gre za intaktno kamnino in njegove lastnosti strižne trdnosti niso relevantne pri analizi pobočja.

Preglednica 4: Vhodni podatki numeričnega modela (vir: Bračko, T., idr., 2022)

	Enota	Peščena glina	Lapor
Prostorninska teža	γ (kN/m^3)	18,5	24
Kohezija	c (kPa)	2	200
Strižni kot	φ (˚)	20	45
Volumetrična vsebnost vode	VWC = V_w/V_s (–)	0,2	/
Prepustnost	$k_y = k_x$ (m/s)	$5{\cdot}10^{-7}$	$5{\cdot}10^{-11}$
Stisljivost	m_v (1/kPa)	$5{\cdot}10^{-4}$	$1{\cdot}10^{-8}$

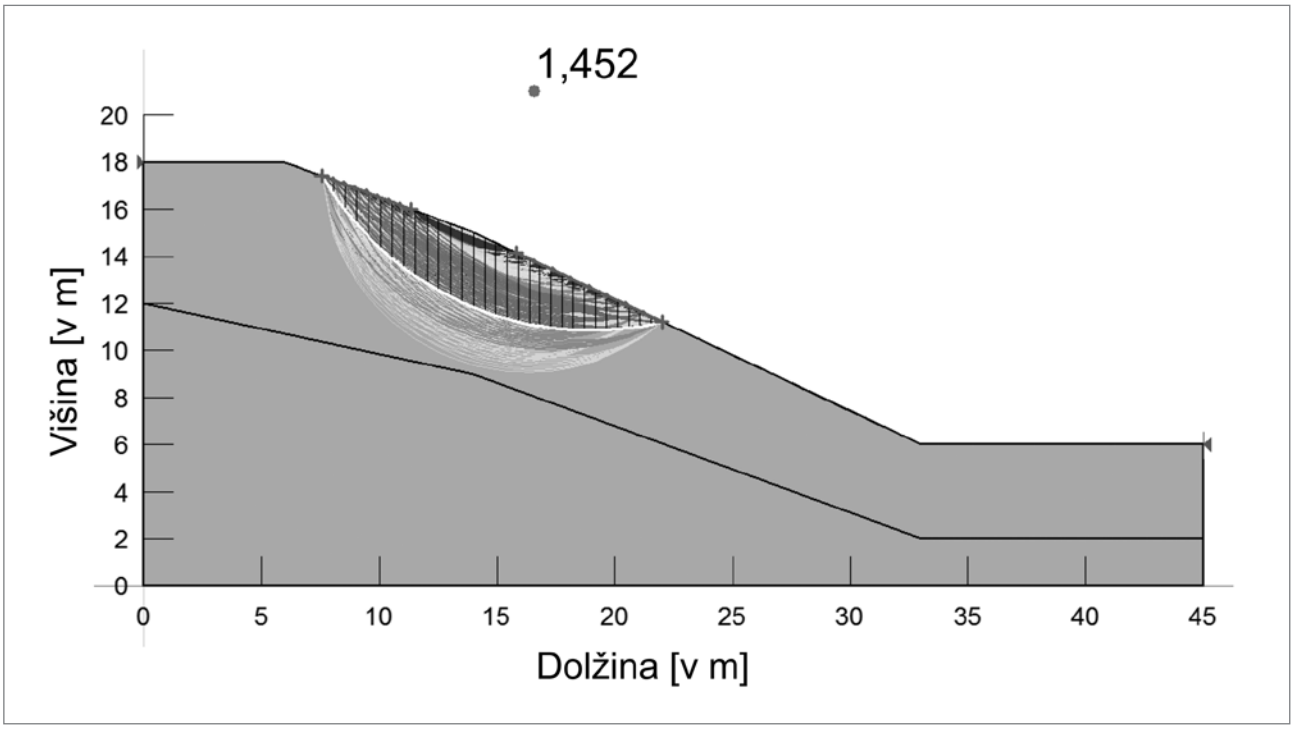
Slika 3: Geometrija in mreža numeričnega modela pobočja (vir: Bračko, T., idr., 2022)

Stabilnost pobočja je ocenjena z varnostnim faktorjem pobočja, pred padavinami in med njimi, z numeričnim modeliranjem FEM. Spremembe vsebnosti površinske vode in pornega tlaka v procesu infiltracije smo analizirali s programsko opremo SEEP/W modul GeoStudio. SLOPE/W je 2D program za modeliranje stabilnosti pobočij, ki zagotavlja široko paleto zmogljivosti. Program ima obsežen seznam materialov. Glavna prednost je, da lahko modeliramo delno zasičena tla. SEEP/W je modul pronicanja paketa GeoStudio in se lahko uporablja za simulacijo pretoka vode v nasičenih ali nenasičenih tleh. Ker sta tako SEEP/W kot SLOPE/W del istega programskega paketa GeoStudio, omogočata preprosto spajanje in izračun faktorja varnosti za vse časovne korake simulacije.

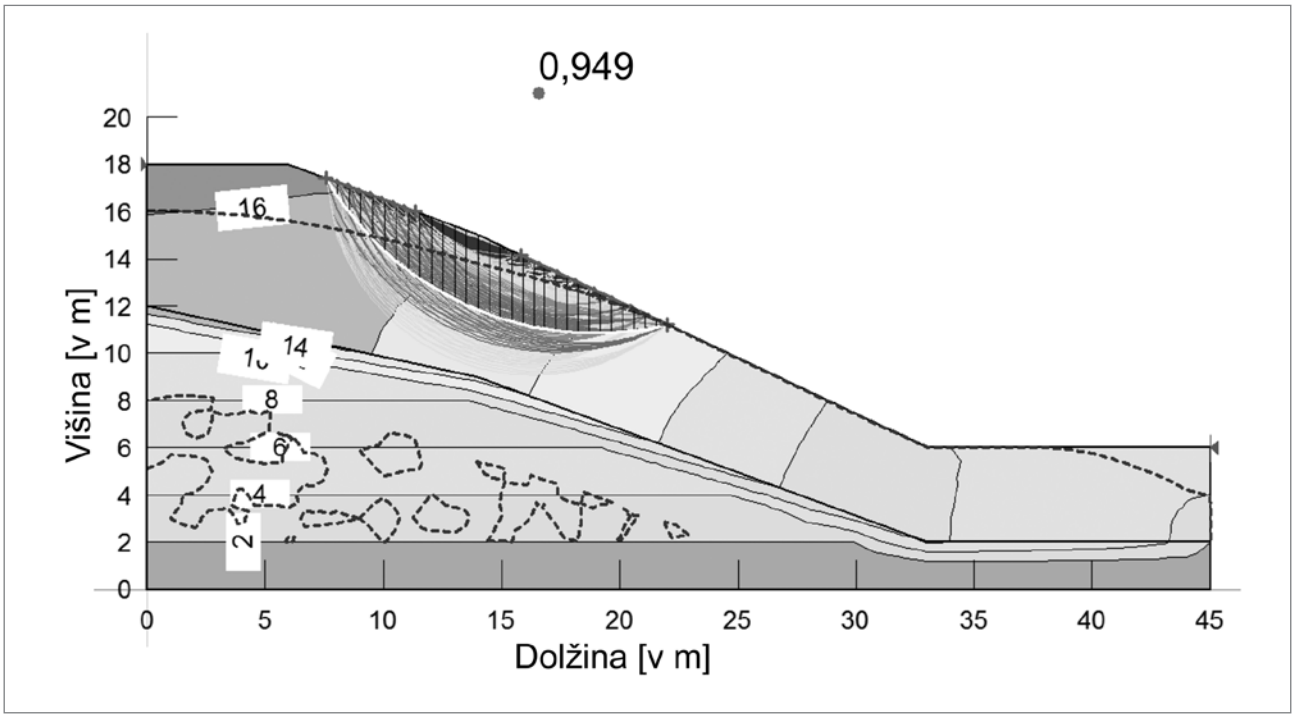
3.4 Analiza

Na podlagi rezultatov analize je mogoče oceniti podnebno prilagodljivost pobočja. Analiza dokazuje, da pobočje ni prilagojeno na predvidene podnebne spremembe in so potrebni prilagoditveni ukrepi. Analiza vključuje tri faze: prvo fazo, ki je začetno stanje, drugo fazo, v kateri so intenzivne padavine, ki trajajo tri dni, in tretjo fazo, ko padavine prenehajo.

Analiza upošteva vpliv podnebnih sprememb na nestabilnost pobočij zaradi povečanih padavin, povišane temperatura zraka in povečane hitrosti vetra. Ugotovljeno je bilo, da na stabilnost pobočij najbolj vplivajo povečane količine padavin, povišana temperatura zraka in povečana hitrost vetra pa sta po ocenah manj pomembni (ELGIP, Geotechnical Research in Europe,



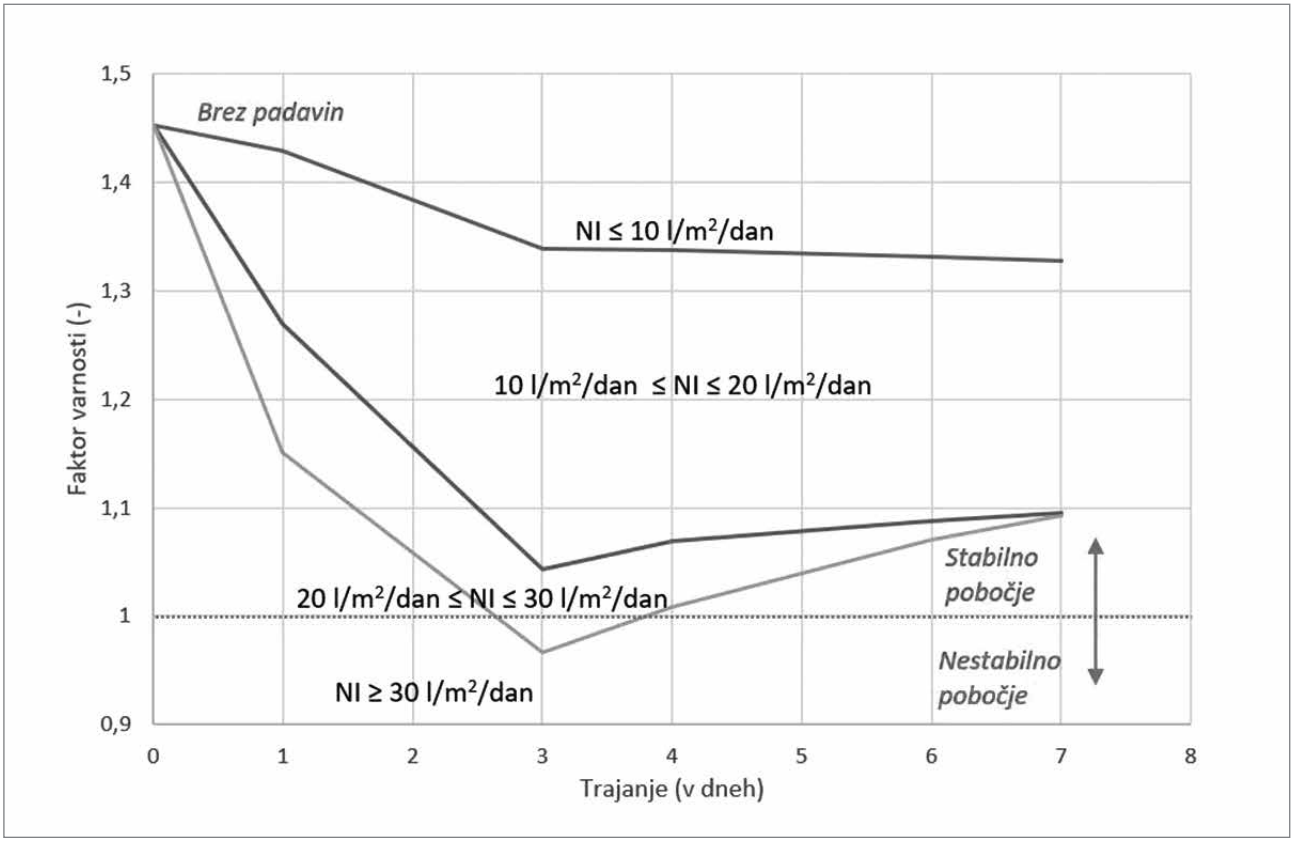
Slika 4: Kritična porušnica in faktor varnosti brez vpliva infiltracije vode (ni dežja) (ilustracija: avtorji)



Slika 5: Kritična porušnica in faktor varnosti (3 dni dežja, NI = 30 l/m^2/dan) (ilustracija: avtorji)

2022), vendar je treba poudariti, da je neto infiltracija vode posledica vseh treh medsebojno delujočih podnebnih signalov. Posledično so glavni vplivi podnebnih sprememb na nestabilnost pobočij poslabšanje parametrov trdnosti materiala, povečano površinsko odtekanje vode, zvišan nivo in povečan pretok podtalnice ter sprememba pornega tlaka vode.

Analiza kaže, da faktor varnosti na stabilnost pobočja, ko ni dežja, zagotavlja stabilnost (slika 4). S časom trajanja padavin se faktor varnosti znižuje, in to v odvisnosti od količine padavin in s tem infiltracije vode v pobočje. Ko se poveča infiltracija vode v pobočje, se poveča porni vodni tlak in zato hkrati tudi vodoprepustnost zemljine v pobočju. Faktor varnosti pada z



Slika 6: Vpliv infiltracije vode v pobočje na časovni razvoj faktorja varnosti na stabilnost, pri hkratnem nižanju strižne trdnosti zemljine (ilustracija: avtorji)

naraščajočo infiltracijo vode v pobočje, pri hkratnem povečanju vodoprepustnosti. Pri tem je raziskava vodoprepustnosti zemljine v pobočju zelo pomembna, saj je ta težko natančno določljiva za razmere v naravi in pomembno vpliva na rezultate. Zanimivo je, da se stabilnost pobočja zmanjšuje zelo počasi, če je vodoprepustnost zemljine v pobočju dovolj majhna (k ≤ 10^{-7} m/s), kar je ugodno, saj pobočje ostane stabilno. Ko se vodoprepustnost poveča, se faktor varnosti na stabilnost pobočja znižuje hitreje, vendar do neke meje. Za analizirane podatke je ta čas tri dni, tudi če se padavine še nadaljujejo (slika 5). Za analizirane podatke je meja, ko bi pobočje še vedno ostalo stabilno, malo nad mejo NI = 20 l/m^2/dan, ob predpostavki, da se ne bi hkrati neugodno spreminjali še vodoprepustnost in strižna trdnost zemljine v pobočju (slika 6).

Še ena težava je, da se s povečano infiltracijo vode v pobočje povečata tudi vlažnost zemljine v pobočju in porni vodni tlak, zato posledično strižna trdnost pade. Zato se faktor varnosti še bolj zniža. Odnos med faktorjem varnosti in strižno trdnostjo zemljine v pobočju je skoraj linearen. Rezultati analize so podrobneje navedeni v članku Bračko idr. (2022) in kažejo velik vpliv podnebnih sprememb na stabilnost pobočij. Za zagotovitev ustrezne stabilnosti pobočij je treba izvesti ukrepe, ki upoštevajo tudi pričakovane podnebne spremembe. Če pogoji stabilnosti niso zadovoljeni, se postopek analize vrne na korak II. Koncept analize. Izvedejo se sanacijski ukrepi, ki ustrezajo na naravi temelječi rešitvi, tj. kamnita podporna konstrukcija, drenaža, odvodnjavanje ceste in zasaditev rastlinja. Po izvedbi ukrepov bi bilo koristno meriti pomike na cestišču in odtok vode v revizijskem jašku in na iztoku odtočnih cevi.

4 Sklep

Podnebne spremembe bodo v prihodnosti velik izziv. Pomembno je, da znamo najprej opredeliti vzročno povezavo med podnebnimi signali (podnebne značilnosti) in učinki (geološki in geomehanski opis) ter opredeliti posledice (odziv geokonstrukcij). Ker se pri geomehanskih analizah, v okviru katerih poskušamo proučiti posledice podnebnih sprememb, kažejo številne težave, ki s predpisi in standardi še niso rešene, je v članku podan koncept za podnebno prilagojeno geomehansko analizo in načrtovanje.

Za lažje razumevanje je koncept predstavljen na primeru stabilnosti pobočja, skupaj z rezultati analiz s programom SEEP/W modul GeoStudio. Sklep analize je, da so za zagotavljanje stabilnosti pobočja pogosto ključni neto infiltracija

vode v pobočje, vodoprepustnost zemljine in pretok podzemne vode v pobočju. Prikazani koncept analize bi se v prihodnosti lahko uporabil kot temelj za razvoj geomehanskih analiz, ki bi bile uspešne pri pravočasnem odkrivanju posledic podnebnih sprememb. Zato je treba izvajati dober monitoring pobočij in zbirati ustrezne podatke, ki bodo v prihodnje koristni za analize in proučevanje vpliva podnebnih sprememb na pobočja.

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Določanje najboljše poti za gibalno ovirane: študija kampusa univerze İnönü v Turčiji

Gibalno ovirani študenti imajo pravico, da se samostojno gibajo po celotnem območju kampusa. Avtorice v članku predstavljajo model vrednotenja poti, ki temelji na kriterijih dostopnosti in omogoča, da se v univerzitetnem kampusu določijo najustreznejše poti za invalidne osebe. Najprej so glavne dejavnike dostopne mobilnosti določili in ovrednotili gibalno ovirani študenti, nato pa so avtorice z metodo analitičnega hierarhičnega procesa določile uteži kriterijem in alternativam poti. Študenti so ovrednotili mrežo poti v kampusu univerze İnönü, ki so ga avtorice izbrale za raziskavo, pri čemer so ocenili tudi dostopnost treh glavnih poti v kampusu. Izsledki so pokazali, da sta med desetimi ključnimi kriteriji najpomembnejša naklon klančin in vrsta tlaka. Avtorice so s terensko analizo potrdile pravilnost rezultatov, pridobljenih z metodo analitičnega hierarhičnega procesa. Na podlagi izsledkov so oblikovale model določanja optimalne poti s čim manj ovirami za čim lažje vsakodnevno gibanje invalidnih oseb.

Ključne besede: univerzitetni kampus, urbanistično oblikovanje, analitični hierarhični proces (AHP), gibalna oviranost, gibanje, Turčija

1 Uvod

Invalidne osebe imajo tako kot vsi drugi temeljno pravico do izobraževanja (Della Fina idr., 2017). Med invalidnimi študenti prevladujejo tisti z gibalno oviranostjo, ti pa imajo težave pri gibanju po prostorsko slabo zasnovanih univerzitetnih kampusih (Ashigbi idr., 2017). Nekatere značilnosti grajenega okolja (npr. pločniki in njihovi robovi, klančine in stopnice) namreč ovirajo njihovo premikanje po poteh po kampusih - ti bi morali biti načrtovani in zgrajeni s čim manj ovirami, ki lahko takim študentom preprečujejo učinkovit dostop do predavanj in družabnih aktivnosti (Imrie in Kumar, 1998; Ferreira in Sanches, 2007). Čeprav se v zadnjih letih močno spodbuja urejanje površin za pešce, ki so prilagojene gibalno oviranim, zlasti univerzitetni kampusi še vedno ne zagotavljajo dobre dostopnosti za invalide (Chiarella in Vurro, 2020).

Mobilnost se nanaša na zmožnost varnega in samostojnega gibanja za potrebe vsakodnevnih aktivnosti ali opravil (Clarke idr., 2009). Za invalidne osebe in zlasti gibalno ovirane je to lahko velika težava. Na poteh, ki jih uporabljajo, lahko naletijo na ovire, kot so visoki robniki, stopnice, neravna ali slabo tlakovana tla, ozki pločniki in strme klančine (Kasemsuppakorn idr., 2015). Mnogi gibalno ovirani posamezniki se izogibajo novim potem, saj se bojijo, da bodo v neznanem okolju naleteli na nepričakovane ovire. Brez informacije o tem, kako dostopna je pot, je gibanje po njej lahko zanje težavno (Ugalde idr., 2022). To je lahko zlasti velika težava v univerzitetnih kampusih v predmestjih, kamor se vsak dan vozi veliko študentov in osebja ter v katerih prevladuje raba osebnih avtomobilov (Miralles-Guasch in Domene, 2010). Ljudje običajno uporabljamo najkrajšo pot do nečesa, mobilno ovirani pa imajo rajši daljše poti brez klančin. Ker število gibalno oviranih študentov na univerzah narašča (Organizacija združenih narodov, 2023), je ključno, da se ovrednotijo poti v kampusih in se ustvari dostopno okolje za te študente.

Na podlagi ovrednotenja kakovosti poti se lahko izdelajo modeli ali karte dostopne mobilnosti, s katerimi se lahko določi najboljša pot za invalide (Menkens idr., 2011). Kasemsuppakorn in Karimi (2009) sta določila glavne prostorske ovire, ki otežujejo dostop osebam na vozičkih, in razvila metodo za določitev najboljše poti za posameznega uporabnika na podlagi opredelitve stopnje oviranosti. Izumi idr. (2009) so predstavili spletno orodje za določanje najboljših poti na podlagi podatkov o ovirah, s katerim lahko osebe z oviranostmi ugotovijo zahtevnost posamezne poti. Matthews idr. (2003) so na podlagi povratnih informacij oseb na invalidskih vozičkih opredelili glavne ovire in oblikovali karte dostopnosti za gibalno ovirane. Mariela A. Alfonzo (2005) je razvila hierarhični model človekovih potreb po hoji, ki temelji na petih ravneh odločanja, povezanih z izvedljivostjo hoje (odvisno od telesnih omejitev), dostopnostjo, varnostjo, udobjem in užitkom. Kasemsuppakorn idr. (2015) so z metodo AHP izdelali model določanja najboljše poti za uporabnike vozičkov, ki temelji na nekaterih značilnostih pločnikov (naklon, vrsta tlaka, širina, stopnice, razdalja in pretok ljudi). Na podlagi želja in potreb uporabnikov so vsaki poti določili številsko utež. Gharebaghi idr. (2021) so ovrednotili in določili najpomembnejše kriterije dostopnosti, ki vplivajo na dnevno mobilnost gibalno oviranih ljudi, nato pa predlagali metodo določanja poti, prilagojeno posameznikovim potrebam in primerno za uporabo na spletu. Ugalde idr. (2022) so predlagali algoritem za navigacijski sistem, ki temelji na geografskem informacijskem sistemu in osebam na vozičku omogoča določanje najkrajših poti brez ovir. Še vedno pa se le malo raziskav ukvarja z dostopom za gibalno ovirane v univerzitetnih kampusih. Univerze, ki upoštevajo potrebe vseh študentov, tudi gibalno oviranih, so namreč lahko zgled za načrtovanje ustrezno dostopnih območij tudi drugod po mestu.

V Turčiji je velik delež invalidnih oseb, res pa je, da trenutno njihovo točno število ni znano. V anketi o zdravju, ki jo je leta 2016 izvedlo turško ministrstvo za družino, delo in socialne zadeve, ni bilo ugotovljeno točno število invalidnih oseb (Engelliler Konfederasyonu, 2020), po podatkih turškega statističnega urada iz leta 2002 pa naj bi bilo invalidnih oseb oseb v Turčiji 12,29 %, od katerih naj bi bilo 23,9 % gibalno oviranih (Engelsiz Yaşam Derneği, 2024). V primerjavi s podobnimi raziskavami v drugih evropskih državah 16,2 % turških prebivalcev spada v kategorijo invalidnih oseb, ki imajo stalne težave z izvajanjem najosnovnejših aktivnosti. Na podlagi omenjenih izsledkov in neuradnih podatkov naj bi bilo tako v Turčiji najmanj 8,5 milijona invalidnih oseb (Engelliler Konfederasyonu, 2020). Po podatkih turškega visokošolskega informacijskega sistema je bilo v študijskem letu 2022/2023 v Turčiji 56.000 invalidnih študentov (Yükseköğretim Kurulu, 2023). Pravica invalidnih oseb do univerzitetne izobrazbe je v državi zagotovljena z zakoni in drugimi predpisi (Zencir idr., 2017). Zadnjih nekaj let je na vsaki univerzi na voljo služba za svetovanje in pomoč invalidnim študentom, ki skrbi, da so univerzitetni kampusi zanje dostopni, in rešuje razne težave, s katerimi se ti študenti spopadajo (Pouya in Demirel, 2019). Kljub vsemu univerze še vedno niso zagotovile kart dostopnosti, ki bi gibalno oviranim študentom pomagale izbrati najboljšo pot po posameznem kampusu.

Gibalno ovirani študenti izberejo najboljšo pot tako, da primerjajo značilnosti več možnih poti in določijo tisto, na kateri je čim manj fizičnih ovir. Avtorice so v članku postavile hipotezo, da bi z razvrščanjem kriterijev dostopnosti in vrednotenjem poti na podlagi teh kriterijev oblikovalcem in upravljavcem

lahko zagotovili uporabne informacije za oblikovanje območij, dostopnim za vse, tudi gibalno oviranim.

Avtorice so v raziskavi proučevale glavne kriterije okolja brez ovir za invalidne osebe in načine, kako bi se lahko uporabili za določanje najboljše poti po univerzitetnem kampusu za gibalno ovirane študente. Kot primer so analizirale mrežo možnih poti za invalidne študente v kampusu univerze İnönü. Poti, ki jih gibalno ovirani študenti v kampusu običajno uporabljajo, so analizirale z metodo AHP in terenskimi analizami. Izsledki njihove raziskave dajejo uporabne informacije, ki lahko pripomorejo k boljšemu načrtovanju in upravljanju univerzitetnih kampusov z vidika zagotavljanja pravic gibalno oviranih študentov do samostojnega in varnega gibanja.

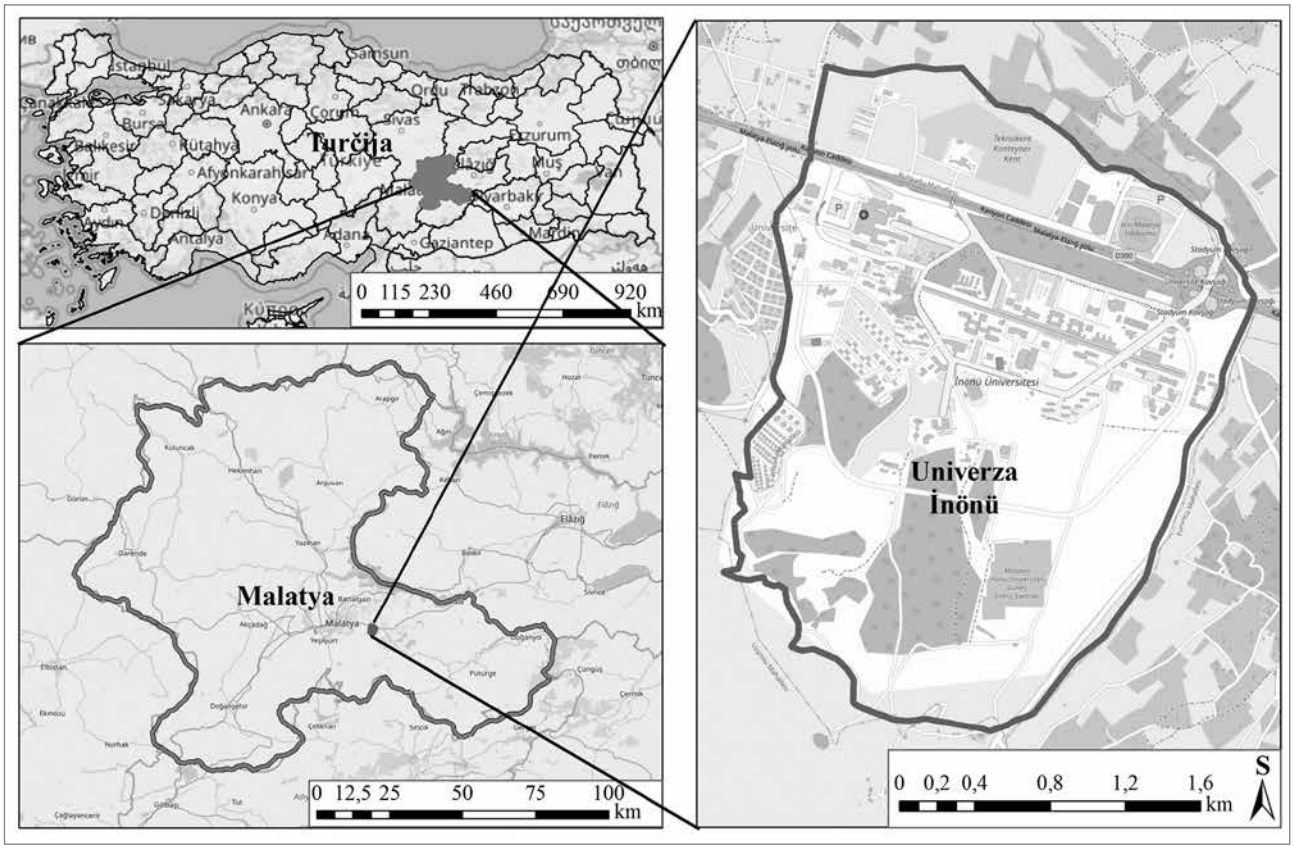
2 Metodologija

Osebe s telesnimi okvarami se pri gibanju v grajenem okolju spopadajo s številnimi težavami, zato morajo vnaprej proučiti poti in izbrati tiste, ki so zanje najdostopnejše. Glavni cilj raziskave je bil določiti glavne kriterije, ki jih gibalno ovirani študenti upoštevajo pri izbiri najboljše poti. Vanjo je bila zato vključena skupina gibalno oviranih študentov, ki so ovrednotili različne poti v kampusu z vidika kriterijev mobilnosti.

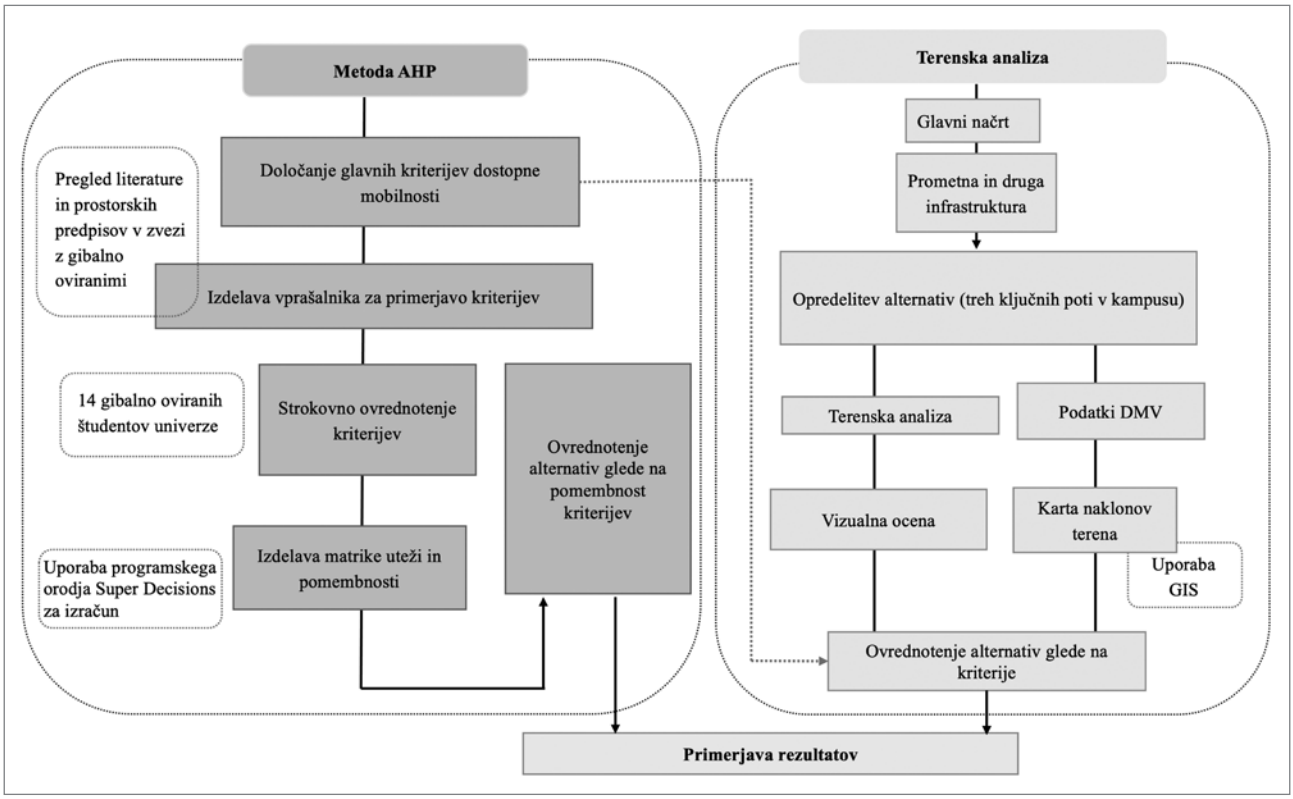
2.1 Študija primera

Avtorice so za študijo primera izbrale kampus univerze İnönü (slika 1), ki je od Malatye, mesta v turški pokrajini Vzhodna Anatolija, oddaljen 10 km. Kampus obsega 700 ha in meji na sosesko Yıldıztepe. Univerza je bila ustanovljena leta 1975, obiskuje pa jo približno 40.000 študentov (Univerza İnönü, 2022). Vključuje 13 fakultet, konservatorij, dva kolidža, štiri visoke šole, šest inštitutov, tehnološki park in 31 raziskovalnih središč. V kampusu so upravne stavbe, predavalnice, menze, športni objekti in študentski domovi. Glavno javno prevozno sredstvo v Malatyi je trolejbus (trambüs), ki vozi po 37 km dolgi progi med avtobusno postajo Maşti in univerzo. Ima 37 postajališč, od katerih jih je osem v univerzitetnem kampusu (Motaş, 2022).

V študijskem letu 2022/2023 je univerzo obiskovalo 120 oseb z oviranostmi (npr. okvarami sluha ali vida, gibalno oviranostjo ali kroničnimi boleznimi). Gibalno oviranih je bilo 47 (39 %) študentov, med njimi so štirje obiskovali visoko šolo, štirideset fakulteto in trije podiplomski študij. Večina je bila vključena v redni študij, pri čemer so nekateri obiskovali večerne programe ali so se šolali na daljavo (Yükseköğretim Kurulu, 2023).



Slika 1: Lokacija univerze İnönü v Turčiji (ilustracija: Hatice Kocaaslan)



Slika 2: Postopek, uporabljen v raziskavi (ilustracija: Sahar Sönmez)

V kampusu deluje posebna služba za invalidne študente, ki je med drugim izdala tudi priročnik o osebah z invalidnostjo, v katerem so predstavljene vrste invalidnosti in potrebe invalidnih študentov. Univerza vsako leto organizira tudi razne konference in družabne dogodke za invalidne študente. Leta 2022 je bila ena izmed desetih turških univerz, ki so prejele nagrado univerza brez ovir, prejela pa je tudi posebno priznanje, ki ga turški svet za visoko šolstvo podeljuje univerzam, ki zagotavljajo študijsko okolje, dostopno za vse (Engelsiz İnönü Koordinatörlüğü, 2022).

2.2 Metoda AHP

Glavna metoda, ki so jo avtorice uporabile, je bila metoda AHP. Pri odločanju, ki vsebuje veliko kompleksnih podatkov, je nujno, da se ti razvrstijo v hierarhijo. Saaty (1988) je razvil metodo razstavljanja problema v podprobleme, ki so lažje razumljivi in jih je lažje ovrednotiti. Z metodo AHP se subjektivne ocene pretvorijo v kvantitativne vrednosti in obdelajo, na podlagi česar se nato alternative razvrstijo na številski lestvici. Z metodo se določijo vsi kriteriji, ki imajo kakršen koli vpliv na obravnavani problem, in vse pomembne alternative (Bhushan in Rai, 2014). Metoda AHP vključuje štiri glavne korake: urejanje kriterijev v hierarhijo, vrednotenje njihove relativne pomembnosti, primerjavo alternativ za vsak kriterij in končno razvrščanje alternativ. Metoda je bila uspešno uporabljena za vrednotenje dostopnosti javnih prostorov za gibalno ovirane osebe (Lima in Machado, 2019), razvrščanje inteligentnih sistemov mobilnosti kot storitve (MaaS) (Belossarov idr., 2023), proučevanje razlik med potrebami uporabnikov in prednostnimi nalogami oblikovalcev politik pri načrtovanju dostopnih sistemov javnega prevoza (Park idr., 2020), določanje dejavnikov, ki vplivajo na izbiro najboljše poti za gibalno ovirane (Ugalde idr., 2022), ter analizo dostopnosti in primernosti območij za postavitev zdravstvenih ustanov (Parvin idr., 2021). Raziskava, predstavljena v tem članku, pa dokazuje, da se lahko metoda AHP uporablja tudi za določanje najdostopnejše poti z najmanj ovirami za gibalno ovirane študente.

V skladu z metodo AHP so avtorice najprej določile ključne kriterije mobilnosti gibalno oviranih študentov. Nato je kriterije ovrednotila skupina gibalno oviranih študentov in jih razvrstila po pomembnosti. Na podlagi uteži vsakega kriterija so avtorice na koncu določile najboljše poti v kampusu.

Avtorice so dobljene rezultate potrdile s terenskimi analizami, vključno z analizo naklonov terena. Kot je razvidno s slike 2, so v raziskavi uporabile dve glavni metodi za oblikovanje modela vrednotenja poti z vidika mobilnosti gibalno oviranih študentov: AHP in terensko analizo. Posamezni koraki obeh metod so razloženi v nadaljevanju.

Preglednica 1: Glavni kriteriji (dejavniki) dostopne mobilnosti za gibalno ovirane osebe

Kriterij	Vidiki	Oznaka
Klančine	Ustrezen naklon klančine: 5 % ali manj	K1
	Ograja na obeh straneh klančine	K2
Tlak	Površine so prekrite s primernimi materiali (gladkimi, obstojnimi in mehkimi materiali, ki ne drsijo)	K3
Širina poti	Dovolj široke poti (120 cm na območjih, kjer ni veliko ljudi, in 150 cm na območjih, kjer je večja gneča)	K4
Smetnjaki	Smetnjaki na poteh so na dostopni višini (90 do 120 cm)	K5
Označbe	Primerni in čitljivi smerokazi, označbe in znaki	K6
Razsvetljava	Primerna razsvetljava	K7
Avtobusna in železniška postajališča	Postajališča, ki jih lahko invalidne osebe varno dosežejo, ne da bi naletele na ovire ali potrebovale pomoč	K8
	Prostor za invalide (vsaj 120 cm ob klopeh na postajališčih mora biti prostih za osebe na invalidskih vozičkih)	K9
Rastline	Rastline ne smejo ovirati prehoda (ne smejo imeti povešenih listov ali trnja in ne smejo biti nižje od 220 cm)	K10

Legenda: K = kriterij.

Vir: Evropska konferenca ministrov za promet (2000); Erkovan (2013); Kuter in Çakmak (2017); Saplıoğlu in Ünal (2019); Department of Transport (2021).

2.2.1 Določanje glavnih kriterijev dostopne mobilnosti gibalno oviranih študentov

Prvi korak po metodi AHP je vključeval določitev ključnih parametrov, značilnih za pot, da bi ta lahko omogočala neoviran prehod gibalno oviranim študentom. Raziskave, v katerih so gibalno ovirane osebe ovrednotile značilnosti površin za pešce, so pokazale, da so glavne težave, s katerimi se te osebe spopadajo, preozki pločniki in prehodi, stopnice, strmi ali kako drugače nagnjeni predeli, premalo klančin, slabo tlakovane površine, odkriti jaški, razpoke, neravna tla, pritrjena oprema na poteh, visoki robniki in slab dostop do javnega prevoza (Lysack idr., 1999; Meyers idr., 2002; Inada idr., 2014; Kasemsuppakorn idr., 2015)

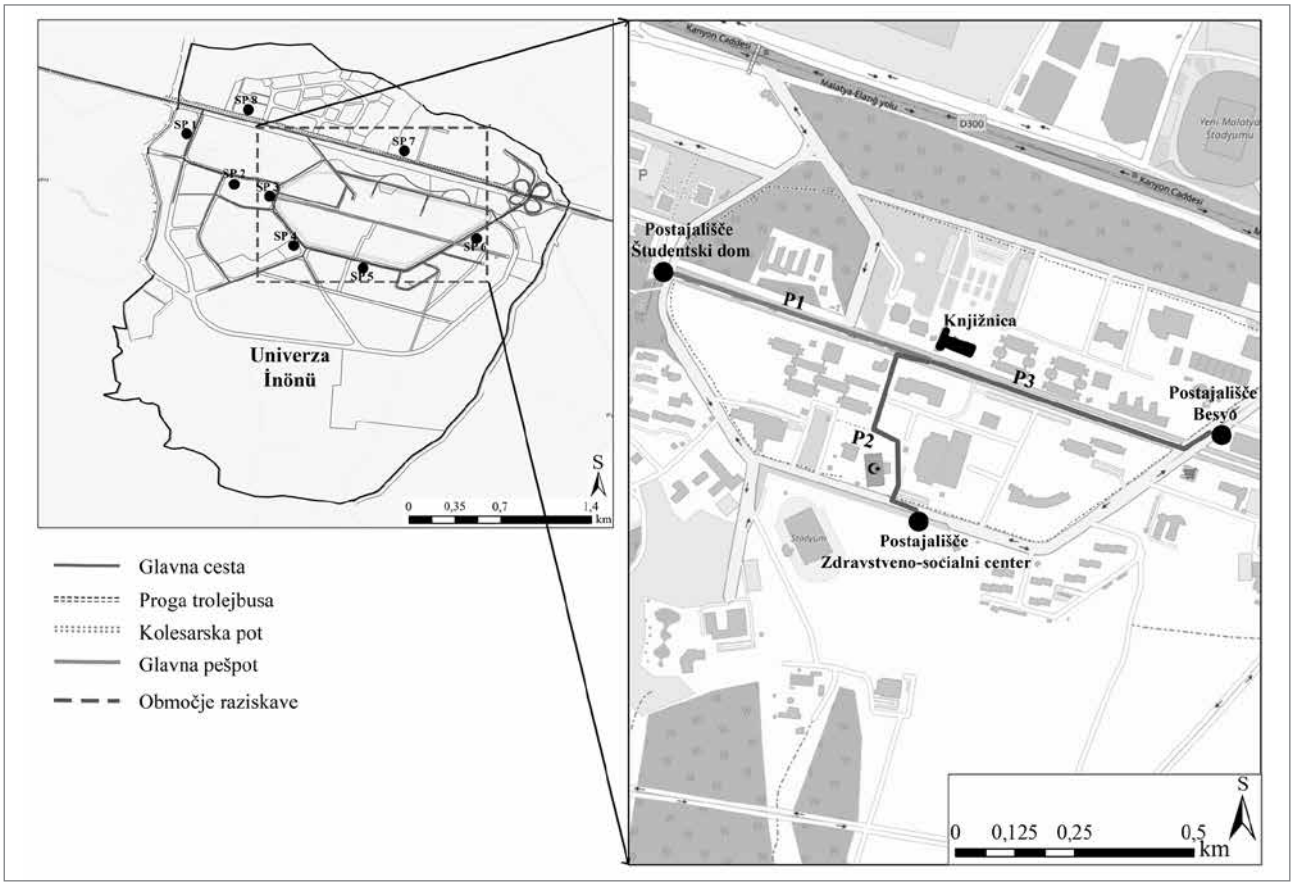
Gibalno ovirane osebe si gibanje olajšajo s pripomočki, kot so nožne proteze, invalidski vozički, bergle in palice, nekatere pa lahko hodijo tudi brez pripomočkov, čeprav stežka (Department for Transport, 2021). Z vidika mobilnosti so to osebe s posebnimi potrebami. V zvezi z njihovimi potrebami pri gibanju na odprtih površinah, tudi v mestih, so bili v Evropi in ZDA določeni nekateri posebni standardi in smernice za načrtovanje površin in poti za pešce (Evropska konferenca ministrov za promet, 2000). Tudi v Turčiji so bili sprejeti načrtovalski in oblikovalski predpisi, ki se nanašajo na mobilnost invalidnih oseb v odprtem prostoru. Avtorice so v raziskavi proučevale pomembne prvine, povezane z mobilnostjo gibalno oviranih oseb, in ovrednotile dejavnike, ki so zanje najbolj ključni. Na podlagi pregleda tuje in turške literature so določile deset ključnih dejavnikov, povezanih z gibanjem teh oseb (preglednica 1).

Nato so te dejavnike ovrednotili gibalno ovirani študenti. Nekateri dejavniki niso bili vključeni na seznam, ker niso pomembni za vse gibalno ovirane posameznike (npr. invalidi na vozičkih ne uporabljajo stopnic, zato niso bile dodane na seznam).

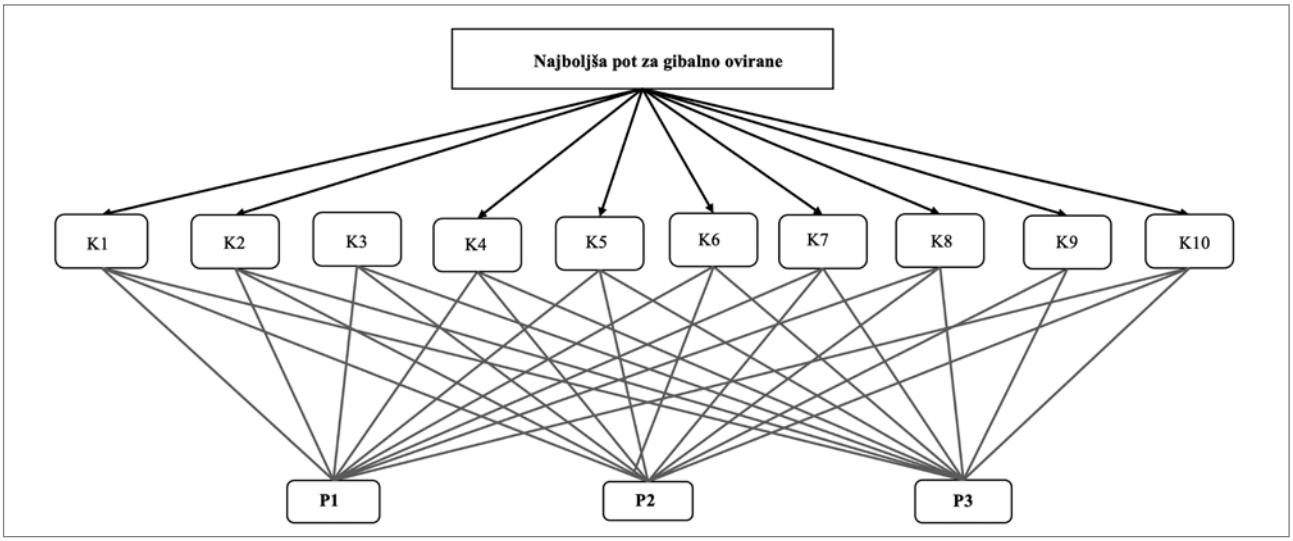
2.2.2 Določanje alternativ

V naslednjem koraku so avtorice določile poti v kampusu kot alternative, ki so jih ovrednotile na podlagi izbranih kriterijev. Eno izmed ključnih vprašanj v raziskavi je bilo, katera pot med postajo trolejbusa in univerzitetnim kampusom bi bila najboljša za gibalno ovirane študente. Analiza sistema javnega potniškega prevoza v kampusu in njegovega glavnega načrta je pokazala, da so v kampusu tri postajališča trolejbusa, kar pomeni, da lahko študenti v kampus vstopajo na treh mestih, in da ima knjižnica središčno lego v kampusu, saj stoji ob glavni peš-poti, od koder so dobro dostopne tudi druge stavbe (poleg tega je knjižnica priljubljeno zbirališče študentov, tudi invalidnih).

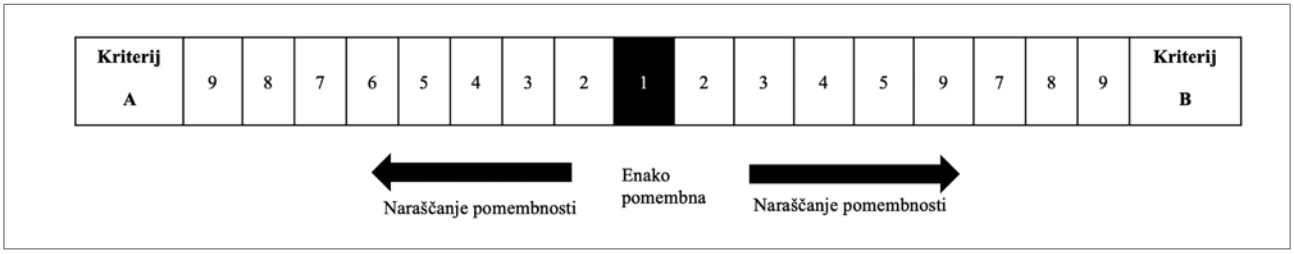
Avtorice so zato za tri glavne alternative izbrale poti med postajališči trolejbusa in osrednjo knjižnico (ki jih dnevno uporablja večina študentov). Te tri poti so prikazane na sliki 3: pot med postajališčem ob študentskem domu in knjižnico (P1), pot med postajališčem ob zdravstveno-socialnem centru in knjižnico (P2) ter pot med postajališčem Besyo in knjižnico (P3).



Slika 3: Izbrane tri poti (ilustracija: Hatice Kocaaslan)



Slika 4: Hierarhični model odločanja po metodi AHP; K = kriterij (ilustracija: Sahar Sönmez)



Slika 5: Parna primerjava pomembnosti kriterijev (A in B) (Saaty, 1994). Opomba: Višja ko je vrednost, bolj pomemben je kriterij.

2.2.3 Razvrščanje kriterijev in alternativ

V zadnjem koraku so avtorice oblikovale hierarhijo po metodi AHP, z ravnjo pomembnih kriterijev in ravnjo treh alternativ (slika 4).

V tem koraku so avtorice najprej kvantitativno primerjale in ovrednotile deset ključnih dejavnikov grajenega okolja, ki vplivajo na mobilnost gibalno oviranih oseb. Nato so glede na posamezne kriterije med seboj primerjale še tri opredeljene alternative. Na tej podlagi so pripravile dva vprašalnika, enega za parno primerjavo in razvrščanje glavnih kriterijev (45 vprašanj) ter enega za razvrščanje poti (30 vprašanj).

Vprašalnika sta temeljila na parnih primerjavah kriterijev po metodi AHP, pri čemer so anketiranci primerjali pomembnost kriterijev v posameznem paru na podlagi vrednostne lestvice (preglednica 2), kot je prikazano na sliki 5.

Vprašalnika so izpolnili gibalno ovirani študenti. Avtorice so domnevale, da bodo gibalno ovirane osebe namreč bolje poznale izzive ali ovire na posamezni poti kot osebe, ki nimajo tovrstnih težav. Poleg tega so gibalno ovirani študenti dobro poznali izbrane tri alternative poti, saj so jih redno uporabljali. Ker so osebni podatki teh študentov zaupni, se avtorice z njimi niso mogle osebno srečati, zato so z njimi navezale stik prek posebne skupine v aplikaciji WhatsApp, namenjeni invalidnim študentom na univerzi İnönü.

V skupino so najprej poslale splošno sporočilo o anketi, nato pa so študentom, ki so bili pripravljeni v njej sodelovati, poslale vprašanja v zasebnem sporočilu. Po potrebi so jim pri izpolnjevanju vprašalnikov nudile pomoč po telefonu. V anketi je sodelovalo 14 gibalno oviranih študentov univerze İnönü. Odgovori dveh niso bili veljavni, tako da so za nadaljnjo analizo uporabile samo odgovore preostalih dvanajstih študentov. Za izvedbo ankete so potrebovale štiri mesece, od junija do septembra 2022.

2.2.4 Izračun in razvrščanje podatkov

V skladu z metodo AHP je treba izračunati in normalizirati odgovore strokovnjakov pri parnih primerjavah kriterijev, da se lahko določijo prednostne izbire. Srednje vrednosti so urejene v matrike, parcialna pomembnost kriterijev pa se določi z izračunom največje lastne vrednosti matrik in z normalizacijo odgovorov. Največja lastna vrednost se izračuna tako, da se najprej pomnožijo vsi elementi v vsaki vrstici matrike, nato pa se izračuna *n*-ti koren tega zmnožka (enačba 1).

Preglednica 2: Lestvica pomembnosti po metodi AHP

Vrednost	Pomembnost
1	Enaka
3	Zmerna
5	Močna
7	Zelo močna
9	Izjemna

Vir: Saaty (1994)

$$n\text{-ti koren zmnožka podatkov} = \text{II} = \sqrt[n]{a1a2a3a4\ldots\ldots}$$

pri čemer je *n* število presoj v posamezni matriki, *a* pa označuje elemente v vsaki vrstici matrike.

Zadnji korak vključuje razvrščanje alternativ. Vrednost vsake alternative se pomnoži z utežmi kriterijev, zmnožki pa se seštejejo, s čimer dobimo končne vrednosti alternativ.

Metoda AHP vključuje tudi določanje konsistentnosti posamezne primerjalne matrike problema odločanja. Stopnja konsistentnosti (CR) pokaže veljavnost odgovorov, izračuna pa se kot kvocient indeksa konsistentnosti (CI) in naključnega indeksa (RI) (enačba 2).

$$CR = CI/RI$$

pri čemer je RI naključni indeks, odvisen od reda matrike.

Indeks konsistentnosti se izračuna na naslednji način (enačba 3):

$$CI = (\lambda\ \max\_n)/(n\_1)$$

pri čemer je λ max največja lastna vrednost primerjalne matrike, *n* pa je število primerjanih značilnosti.

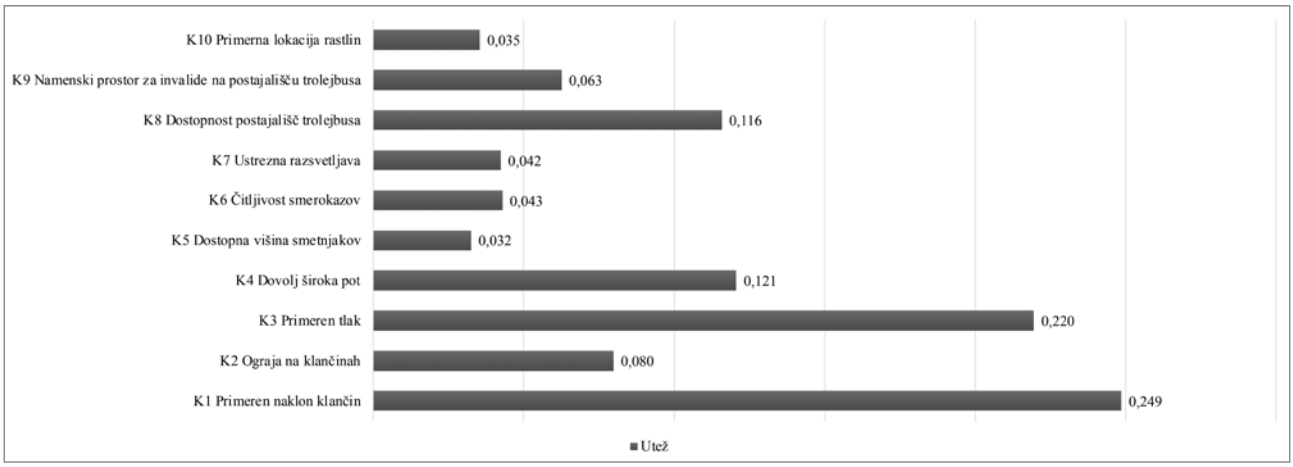
Indeks konsistentnosti lahko primerjamo z vrednostmi naključnih indeksov, navedenimi v preglednici 3. Po Saatyju (1994) stopnja konsistentnosti ne sme biti višja od 0,1.

Potem ko so avtorice pridobile odgovore vseh študentov, so izračunale povprečne vrednosti parnih primerjav in jih ročno vnesle v spletno orodje Super Decisions, ki omogoča izvedbo kompleksnih izračunov po metodi AHP. Rezultati dveh študentov niso bili upoštevani, saj je bila stopnja konsistentnosti njunih presoj višja od 0,1. Tako so pridobile kvadratno matriko vrednosti in diagrame prednostnih izbir s sprejemljivo stopnjo konsistentnosti.

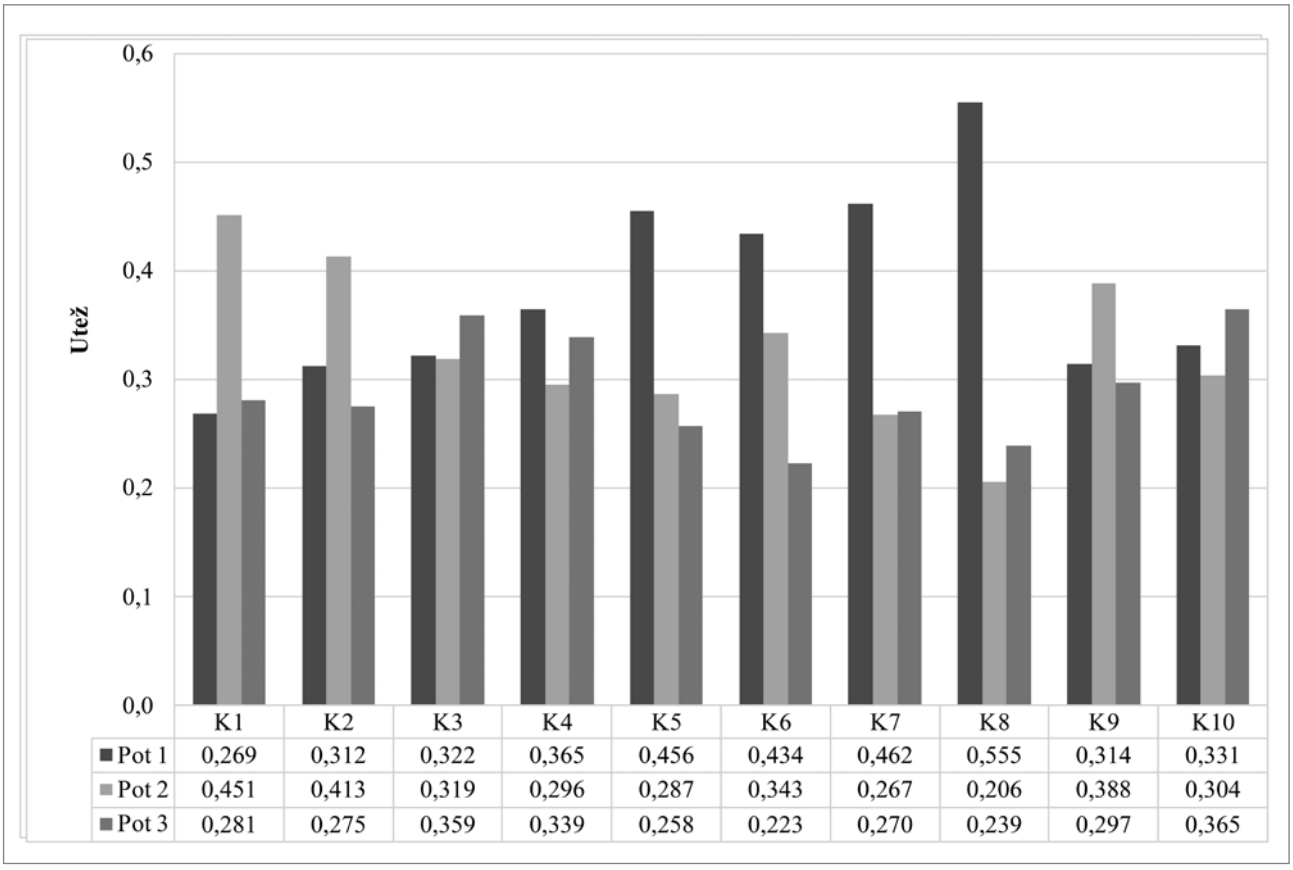
Preglednica 3: Vrednosti naključnih indeksov (RI) za velikosti matrik (*n*)

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RI	0,00	0,00	0,58	0,90	1,12	1,24	1,32	1,41	1,45	1,49	1,51	1,48	1,56	1,57	1,59

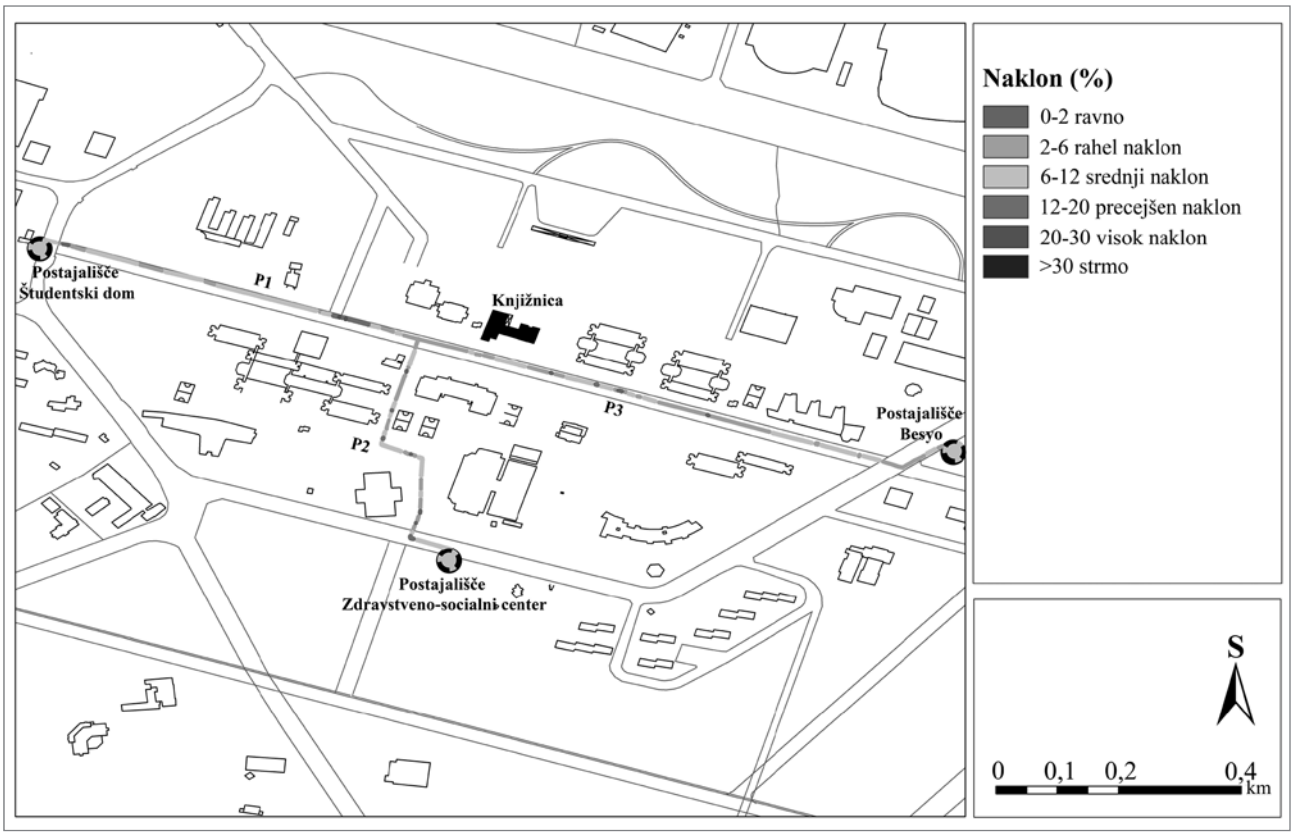
Vir: Saaty (1994)



Slika 6: Relativne uteži in stopnje pomembnosti ključnih kriterijev dostopne mobilnosti za gibalno ovirane študente (ilustracija: Sahar Sönmez)



Slika 7: Primerjava normaliziranih uteži alternativ, izračunanih z metodo AHP (ilustracija: Sahar Sönmez)



Slika 8: Karta naklonov na treh proučevanih poteh v kampusu (ilustracija: Hatice Kocaaslan)

2.2.5 Razvrščanje naklonov poti in terenska analiza

Da bi avtorice zbrale še več podatkov za učinkovito analizo rezultatov, pridobljenih z metodo AHP, so izvedle tudi terenske analize. Na podlagi podatkov digitalnega modela višin (DMV) so izdelale karto naklonov proučevanega območja, s katero so lahko analizirale naklon poti. Poleg tega so za vsako proučevano pot izpolnile kontrolni seznam pozitivnih in negativnih vidikov. Rezultate terenskih analiz so obdelale v treh preglednicah na podlagi vnaprej določenih kriterijev dostopne mobilnosti za gibalno ovirane osebe. Na koncu so rezultate terenskih analiz primerjale s podatki, pridobljenimi z metodo AHP.

3 Rezultati

3.1 Uteži kriterijev

Avtorice so z anketo pridobile številske vrednosti pomembnosti desetih izbranih kriterijev, povezanih z mobilnostjo gibalno oviranih oseb. Po tem ko so prejele izpolnjene vprašalnike, so srednje vrednosti parnih primerjav vnesle v programsko orodje Super Decisions, na podlagi česar so pridobile končne uteži (prednostne izbire) in stopnje konsistentnosti (slika 6).

Rezultati so pokazali, da na gibanje gibalno oviranih ljudi in njihovo izbiro poti kot najpomembnejša dejavnika vplivata ustrezen naklon klančin (K1) in kakovost tlaka (K3). Najmanj pomembna dejavnika pa sta višina smetnjakov (K5) in ustrezna lokacija rastlin (K10).

3.2 Razvrščanje poti

V tej fazi so avtorice primerjale tri poti, ki so jih izbrale za vrednotenje z modelom AHP. Za vsako so izračunale normalizirane uteži glede na posamezni kriterij (slika 7).

Avtorice so vse tri alternative poti v univerzitetnem kampusu nazadnje razvrstile po primernosti. Vrednosti vsake alternative so pomnožile z utežmi kriterijev in jih nato seštele, da so za vsako dobile končno vrednost: 0,355 za pot 1, 0,345 za pot 2 in 0,300 za pot 3. Dobljene vrednosti kažejo, da so bile razlike med tremi proučevanimi potmi majhne.

Na podlagi teh rezultatov je najprimernejša pot za gibalno ovirane pot 1, ki pelje od postajališča trolejbusa pri študentskem domu do osrednje knjižnice. Največ ovir za gibalno ovirane študente pa ima pot 3 (med postajališčem Besyo in knjižnico).

Preglednica 4: Dolžina odsekov s posameznimi nakloni na treh proučevanih poteh

Naklon (v %)	Pot 1, v m (v %)	Pot 2, v m (v %)	Pot 3, v m (v %)
0–2	13 (2,1)	29 (5,7)	19 (3)
2–6	203 (34,3)	241 (47,7)	332 (52,7)
6–12	323 (54,6)	211 (41,7)	174 (43,4)
12–20	43 (7,3)	25 (4,9)	6 (1)
20–30	9 (1,6)	0	0
> 30	0	0	0
Dolžina (v m)	592	506	630

Preglednica 5: Analiza treh proučevanih poti z vidika desetih kriterijev mobilnosti

Pot	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10
1	+	–	–	+	+	+	+	+	+	+
2	+	+	+	+	+	–	–	–	+	+
3	+	–	–	+	+	+	+	+	+	–

Legenda: + = primerna, – = ni primerna.

Preglednica 6: Vizualna ocena kriterijev mobilnosti za vsako alternativo

Pot	Kriterij	Negativni vidik	Pomembnost
1	K2	Ograja na stopnicah, ne pa tudi na klančinah.	5
	K3	Obrabljen, razpokan ali prekinjen tlak.	2
2	K6	Neustrezni smerokazi in table.	7
	K7	Neustrezna razsvetljava.	8
	K8	Do postajališča trolejbusa ni pločnika, peron pa je dostopen s klančino, ki ni varna.	4
3	K2	Ograja na stopnicah, ne pa tudi na klančinah.	5
	K3	Kamenje na tleh lahko povzroča težave osebam na invalidskih vozičkih.	2
	K10	Lokacija rastlin na pločnikih ni ustrezna.	9

3.3 Razvrščanje naklonov poti

Nakloni treh proučevanih poti so bili razvrščeni v razrede in kartirani s programom ArcGIS. Kot je razvidno s slike 8, so avtorice naklone za vsako pot razvrstile v šest razredov.

V preglednici 4 so navedeni nakloni vsake poti in dolžine odsekov s posameznimi nakloni. Najprimernejša naklona za gibalno ovirane ljudi sta v razponih od 0 do 2 % in od 2 do 6 %. Po podatkih iz preglednice 4 je torej na približno 36 % poti 1, 53 % poti 2 in 56 % poti 3 naklon primeren.

Pot 1 ima najmanj odsekov z nakloni, primernimi za gibalno ovirane študente, poleg tega je edina, ki ima na nekaterih odsekih naklon od 20 to 30 %. Naklon poti 2 in 3 ne presega 20 %, pot 3 ima tudi najmanj odsekov z naklonom med 12 in 20 %. To pomeni, da imata primernejši naklon za gibalno ovirane osebe kot pot 1.

Primerjava skupne dolžine posameznih poti je pokazala, da je pot 3 najdaljša, pot 2 pa najkrajša. Obe pa imata približno enako skupno dolžino odsekov s primernim naklonom za gibalno ovirane študente. Z vidika naklona je najprimernejša pot od postajališč do knjižnice pot 3, sledi ji pot 2. Na podlagi razvrščanja poti po metodi AHP pa je najprimernejša pot 1, kar pomeni, da bi lahko prevelik naklon te poti, ki je lahko za invalidne študente resna ovira, odpravili z ustreznimi rešitvami.

3.4 Terenske analize

Terenske analize lahko pripomorejo k boljši analizi rezultatov, pridobljenih z metodo AHP. Avtorice so fotografirale nekatere značilnosti proučevanih poti, nato pa so fotografije analizirale z vidika desetih prej opredeljenih kriterijev. Tako so na primer za vsako pot proučile tlak, klančine in razsvetljavo. Rezultati njihove analize so navedeni v preglednici 5.

Analiza je pokazala, da ima pot 1 dva negativna vidika, poti 2 in 3 pa jih imata po tri. Negativni vidiki vsake poti so navedeni v preglednici 6.

Kot je razvidno iz preglednice 5, pot 1 ne izpolnjuje kriterijev 2 in 3, pot 2 ne izpolnjuje kriterijev 6, 7 n 8, pot 3 pa ne kriterijev 2, 3 in 10. Avtorice so nato rezultate primerjale glede na že določene uteži posameznih kriterijev.

Iz preglednice 6 je razvidno, da ima pot 1 najmanj negativnih vidikov in je zato najboljša alternativa za gibalno ovirane študente. Poti 2 in 3 nimata skupnih negativnih vidikov, vendar je prva dostopnejša, saj so negativni vidiki poti 3 za gibalno ovirane osebe pomembnejši kot pa negativni vidiki poti 2.

4 Razprava

Avtorice so v raziskavi določile najpomembnejše značilnosti poti, ki bi jih bilo treba upoštevati pri načrtovanju in oblikovanju prostorov za gibalno ovirane osebe. Najpomembnejša kriterija za gibalno ovirane študente sta naklon (K1) in tlak (K2). Analiza treh proučevanih poti z metodo AHP je pokazala, da je najboljša pot za te študente pot 1, ki pelje od postajališča trolejbusa ob študentskem domu do knjižnice. Tudi terenska analiza je pokazala, da je za gibalno ovirane najprimernejša pot 1. Na podlagi vizualne ocene so avtorice namreč ugotovile, da ima manj negativnih vidikov kot poti 2 in 3 (preglednica 5). Primerjava zadnjih dveh je pokazala, da so pozitivni vidiki poti 2 pomembnejši od pozitivnih vidikov poti 3, poleg tega ima pot 2 manj ovir, ki so za invalidne osebe res problematične. Zato je pot 2 druga najprimernejša pot za gibalno ovirane študente. Navedeno kaže, da je treba za določitev najboljše poti za gibalno ovirane celovito proučiti in primerjati značilnosti vseh možnih poti.

Čeprav je pot 1 za gibalno ovirane študente najboljša in ima manj fizičnih ovir, je nekaj njenih značilnosti še vedno problematičnih. Terenske analize so pokazale, da tlak na njej ni ustrezen in da so klančine brez ograj. Tlak je verjetno začel razpadati, ker je to ena glavnih pešpoti v univerzitetnem kampusu in jo vsak dan uporablja veliko študentov.

Glavna težava pri poti 2 je dostop do postaje trolejbusa. Na poti ni pločnika, po katerem bi lahko gibalno ovirani študenti dostopali do perona. Do njega namreč lahko pridejo samo po navadni cesti, ki je s peronom povezana samo z eno klančino, ki pa za gibalno ovirane študente ni varna. To je glavna težava poti 2 in če bi jo odpravili, bi bila lahko ta pot najprimernejša za gibalno ovirane. Pot 3 je najdaljša in zato najmanj primerna za gibalno ovirane študente. Z vidika naklona je sicer kar 56 % njene trase primerne za invalidne osebe, težava pa je v tem, da so na njej klančine brez ograj, tlak je razpokan in na njej je moteče grmovje.

Ker na poteh ni mogoče odstraniti vseh ovir, so avtorice proučile tiste njihove značilnosti, ki so najpomembnejše z vidika mobilnosti gibalno oviranih študentov. Za to je bila najprimernejša metoda AHP, ki vključuje sistematični postopek, ki mu je lahko slediti ter omogoča analitične primerjave in določanje numeričnih uteži parametrom poti na podlagi preferenc strokovnjakov. Tudi terenske analize so potrdile rezultate, pridobljene z metodo AHP, kar pomeni, da lahko z modelom AHP pravilno določimo najboljše poti za gibalno ovirane osebe. Hierarhični model, uporabljen v tej raziskavi, se lahko prilagodi ali spremeni glede na cilje raziskave, ciljno populacijo in prostorske značilnosti alternativ poti.

Podobne raziskave, v katerih so sodelovale osebe na invalidskih vozičkih (Simpson, 2005; Bizjak, 2022), so razkrile različne dejavnike, ki vplivajo na dostopnost zlasti notranjih prostorov (npr. dostopni vhodi, dvigala in stranišča). V raziskavi, predstavljeni v tem članku, pa so avtorice proučevale zunanje ovire in gibalno ovirane posameznike, kot so osebe na invalidskih vozičkih in osebe, ki težko hodijo. Proučevale so samo poti med postajališči trolejbusa in knjižnico, čeprav bi lahko enak postopek uporabile za vse poti v kampusu in za celotno omrežje pešpoti v mestu. Poleg dostopnosti poti bi lahko enako proučevale tudi druge dejavnike mobilnosti, kot so varnost, udobje in užitek. Pomembno pa je, da tovrstne raziskave omogočajo sodelovanje gibalno oviranih oseb. Izsledki te raziskave lahko upravljavcem in oblikovalcem pomagajo, da na podlagi prostorskih podatkov ustvarijo prostore, primerne za gibalno ovirane ljudi. Poleg tega so lahko podatki, pridobljeni v raziskavi, uporabni pri prihodnjem načrtovanju in umeščanju ustreznih storitev in infrastrukture, ki bi omogočale vključenost vseh ljudi in trajnostni razvoj območij.

Avtorice so imele med raziskavo težavo s tem, kako navezati stik z invalidnimi študenti. Zdi se, da se ti študenti ne udeležujejo družabnih aktivnosti v univerzitetnem kampusu, kar je morda posledica pomanjkanja zanje primerne infrastrukture in storitev na zunanjih površinah. V Turčiji so bile pred kratkim uvedene nove smernice za zadovoljevanje potreb invalidnih oseb, povezane z dostopnostjo odprtih prostorov in urbanih območij.

Čeprav se prizadevanja na tem področju v Turčiji krepijo, so v praksi še vedno na začetni stopnji in nezadostna. Na zunanjih površinah so še vedno ovire, ki invalidnim osebam preprečujejo, da se v celoti vključijo v družbene dejavnosti, zlasti v izobraževanje. Z drugimi besedami, do zdaj še ni bil razvit uporaben navigacijski sistem, ki bi olajšal mobilnost gibalno oviranih oseb v Turčiji. Univerze so lahko na področju

prostorskega oblikovanja in načrtovanja zgled za vse mesto, pri čemer morajo zadovoljevati potrebe vseh študentov. Na splošno lahko univerze k reševanju te problematike prispevajo na naslednje načine:

- ozaveščajo ljudi o potrebah invalidnih oseb prek konferenc, delavnic, tečajev in raznih projektov, v katerih sodelujejo razni strokovnjaki, zlasti prostorski načrtovalci in oblikovalci;
- preverijo, ali univerzitetni kampusi omogočajo varno in samostojno mobilnost invalidnih oseb, pri tem bi morale izdelati karto ali aplikacijo s podatki o najboljših poteh za gibalno ovirane študente;
- ustvarijo priložnosti in ustrezne programe za druženje invalidnih študentov, dokumentiranje njihovih pripomb in mnenj ter omogočijo njihovo polno vključenost v izobraževalni proces in družabne in kulturne aktivnosti.

5 Sklep

Sodobni navigacijski sistemi in aplikacije, ki jih uporablja čedalje več ljudi, žal ne upoštevajo potreb invalidnih oseb. Tudi gibalno ovirani ljudje imajo pravico do uporabe zemljevida ali aplikacije, ki poišče najkrajšo pot do izbrane točke, na kateri je čim manj ovir in strmih odsekov, ki ima kakovostne tlakovane površine itd. S tega vidika je pomembno, da so v raziskave vključene tudi invalidne osebe, ki bolje prepoznajo ovire in lahko bolje ovrednotijo svoje bivalno okolje. Poleg tega je treba razlikovati med raznimi vrstami ovir za raznovrstne invalidnosti. Nujno je potreben celovit načrtovalski pristop, pri katerem bi različne skupine invalidnih oseb določile najpomembnejše fizične kriterije poti, ki vplivajo na njihovo mobilnost. Izdelava tovrstnega zemljevida z ogromnim številom podatkov za različna območja v mestu se morda zdi zamudna in težavna naloga. Dobro izhodišče za uvedbo tovrstnih rešitev so lahko univerzitetni kampusi, ki imajo veliko manjših odprtih prostorov. Pri upravljanju in urejanju odprtih površin v univerzitetnih kampusih bi bilo treba znova proučiti primernost pešpoti z vidika potreb invalidnih študentov. Z metodo AHP se lahko določi pomembnost kriterijev in se ovrednotijo zdajšnje poti, na podlagi česar se nato izberejo tiste, ki so za invalidne študente najprimernejše.

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Krajinska identiteta podeželskih naselij: primer egejske regije v Turčiji

Avtorji v članku predstavljajo metodologijo proučevanja krajinske identitete podeželskih naselij, s katero so opisno analizirali naravne, grajene, družbeno-gospodarske in družbeno-kulturne parametre krajinske identitete na različnih ravneh. Za študijo primera so izbrali egejsko regijo v Turčiji, ki ima zelo raznovrstna podeželska naselja, ki so posledica geomorfoloških, arhitekturnih, podnebnih, gospodarskih in družbeno-kulturnih razlik. Več izsledkov raziskave se nanaša na fizično krajinsko identiteto. V članku predstavljajo tudi pomembne vidike podeželskih naselij, povezane s krajinsko identiteto, in izpostavijo pomen pristopov k trajnostnemu razvoju podeželskih območij, ki upoštevajo njihovo identiteto.

Ključne besede: krajinska identiteta, podeželska naselja, podeželska krajina, Turčija

1 Uvod

Podeželska naselja se v marsičem razlikujejo od mestnih naselij, razumevanje razlik med njimi pa je ključno za zadovoljevanje potreb sodobnega urbanizma in razvoja ter razumevanje njihovih vplivov na podeželska območja. Zaradi demografskih sprememb, mobilnosti prebivalcev, stanovanjskih potreb in čedalje večjega povpraševanja po naravnih območjih, namenjenih rekreaciji, se podeželska območja preobražajo enako temeljito kot mesta. Vsi našteti dejavniki so povzročili preobrazbo podeželskega prostora, to preobrazbo pa spremljajo še družbeno-gospodarske in družbeno-kulturne spremembe (Carlin in Saupe, 1993; Boyle in Halfacree, 1998; Dax, 1999; Mahon, 2007; Lampietti idr., 2009; Silva in Figueiredo, 2013).

Zadnjih nekaj desetletij se podeželska območja v Turčiji temeljito spreminjajo. Poleg splošnih trendov, značilnih za ves svet, kot so migracije, globalizacija in tehnološki razvoj, ter njihovih vplivov na podeželska območja preobrazbo turških podeželskih območij pospešujejo tudi prizadevanja za pristop k Evropski uniji, evropska perspektiva prostorskega razvoja, nova kmetijska politika, razprave o okoljskih vprašanjih in trajnosti ter novi pravni okviri upravljanja podeželskih zemljišč (Oğuz, 2013; Çörek Öztaş in Karaaslan, 2017). S sprejetjem zakona št. 6360 leta 2012 so bila nekdanja srednje velika mesta razglašena za metropolitanske občine, nekdanje podeželske vasi pa za mestne soseske (Soydal in Türk, 2016). Z novo zakonsko ureditvijo za podeželska območja metropolitanskih občin velja upravljavska politika, ki omejuje kmečke gospodarske dejavnosti in storitve na območju mest. Jasno je, da zakon ogroža kmečko naravo teh območij in da je treba nujno razviti nove strategije in načine nadziranja procesa preobrazbe s prostorskega, družbenega in gospodarskega vidika.

Do zdaj je le malo raziskav ponudilo metodološki pristop k proučevanju večplastne zgradbe podeželskih naselij. Večina raziskav se osredotoča na tri vidike. Nekatere proučujejo podeželska naselja z geografskega vidika, pri čemer jih razvrščajo glede na geomorfologijo, etnično sestavo, gospodarstvo, funkcijo in velikost (Mitković idr., 2002). Druge jih razvrščajo z urbanističnega vidika oziroma glede na makroobliko (strnjena, razložena, obcestna naselja itd.) (Sharp, 1946; Bunce, 1982; Mandal, 2001; Roberts, 2006), precej pa se jih osredotoča tudi na kmečko arhitekturo kot ljudsko prvino podeželskih naselij (Oliver, 2003; Sabatino, 2010; Donovan in Gkartzios, 2014; Philokyprou in Michael, 2021). Nekateri uporabni pristopi in zamisli so bili uvedeni z Evropsko konvencijo o krajini (Svet Evrope, 2000), v kateri je poudarjeno varovanje ruralnih značilnosti in identitete kulturne krajine. V Združenem kraljestvu je na primer Agencija za podeželski razvoj Anglije že od osemdesetih let 20. stoletja opozarjala na pomembno vlogo krajinskih vrednot, ki ustvarjajo poseben podeželski značaj območij, pri upravljanju sprememb in doseganju trajnostnega razvoja podeželja (Swanwick, 2004; Tudor, 2014). Ocena krajinskih značilnosti se je izkazala za eno najpomembnejših in celostnih metod prepoznavanja in opisovanja značilnosti krajin na različnih ravneh. Poleg te se za določanje značaja podeželskih naselij uporabljajo tudi nekatere druge uporabne metode in pristopi, kot so opredelitev značaja mestne krajine, smernice za oblikovanje vasi in izjave prebivalcev o oblikovanju vasi. Njihov namen je opredeliti značilnosti vasi, vključno z njihovo arhitekturo, odprtim prostorom in zelenimi površinami, kar zagotavlja, da je njihov prihodnji razvoj skladen z njihovimi zdajšnjimi značilnostmi (Swanwick, 2004; Landscape Institute, 2017).

Krajinska identiteta je tako v literaturi kot strateških dokumentih prepoznana kot pomembna vrednota. Tako kot raziskave krajinskih značilnosti se tudi opredelitev krajinske identitete osredotoča na značilnosti, po katerih se posamezne krajine ločijo od drugih (Stobellar in Pedroli, 2011; Loupa-Ramos, 2016; Nitavska, 2020; Shao idr., 2020). Danes podeželska naselja pogosto izgubljajo svojo identiteto, zato so avtorji v raziskavi, predstavljeni v tem članku, razvili posebno metodo proučevanja krajinske identitete, ki razkriva večplastne značilnosti podeželskih naselij, tudi materialne prvine, kot so arhitektura, odprt prostor, ulična zasnova, raba zemljišč in naravne značilnosti, ter nematerialne prvine, kot so družbene, kulturne in gospodarske značilnosti življenja na podeželju. V raziskavi so tako opredelili parametre krajinske identitete, značilne za podeželska naselja, in predstavili metodo, s katero so oblikovali kazalnike fizične krajinske identitete, na podlagi katerih so lahko objektivno predstavili vpliv posameznega parametra na oblikovanje te identitete, pridobili podrobne podatke o podeželskih naseljih kot osnovo za načrte razvoja podeželja in predlagali okvir za vladno odločanje o podeželskih naseljih.

Krajinska identiteta je opredeljena kot zaznavna edinstvena zgradba kraja (Stobellar in Pedroli, 2011), ki jo ustvarja kombinacija značilnosti, po katerih se krajine med seboj razlikujejo, in kot celostna struktura, ki v ljudeh vzbuja močan občutek pripadnosti (Jackson 1984; Hough 1990, Shao idr., 2020). Stobellar in Pedroli (2011) ločita štiri vrste krajinske identitete: osebno-eksistencialno, kulturno-eksistencialno, kulturno-prostorsko in osebno-prostorsko. Krajinska identiteta lahko obsega vse značilnosti, po katerih se neka krajina loči od drugih, nekateri raziskovalci pa proučujejo tudi, kako ljudje na podlagi značilnosti krajine ustvarijo individualno in kolektivno identiteto. Ne glede na uporabljeni raziskovalni pristop krajinska identiteta vedno razkriva vzajemni odnos med človekom in krajino (Loupa-Ramos idr., 2016; Loupa-Ramos idr., 2019).

V literaturi se obravnava krajinske identitete osredotoča bolj na njen človeški vidik kot na fizično realnost. V tej povezavi je Shelley Egoz (2013) opredelila krajino in identiteto kot odnos med krajino in identiteto ljudi, ki so z njo povezani, pri čemer je izpostavila konstruktivno vlogo krajinske identitete pri oblikovanju individualne in kolektivne identitete. Loupa-Ramos idr. (2016) so predstavile drugačen pogled na krajinsko identiteto: oblikovale so transakcijski model krajinske identitete. Takšen model zagotavlja konceptualni okvir za razumevanje krajinske identitete, na katero vplivajo družbeni dejavniki in spremembe v okolju (Loupa-Ramos idr., 2019). Poudarile so, da krajinsko identiteto oblikujeta dve ravni vzajemnega odnosa med krajino in ljudmi: raven zaznavanja in raven aktivnosti. V skladu z enim od pristopov, ki se pojavlja v literaturi, krajinska identiteta temelji na zaznavnih značilnosti krajine in značilnostih krajine kot grajene dobrine (Altman in Rogoff, 1987; Werner idr., 2002; Loupa-Ramos idr., 2016; Loupa-Ramos idr., 2019). Drug pristop, ki se uporablja, pa temelji na domnevi, da sta se družba in krajina razvili kot odziv na človekove posege v krajini (in so del krajinske politike, načrtovanja in upravljanja). Osredotoča se na to, kako ti posegi spreminjajo krajino in njene značilnosti ter kako krajina posledično oblikuje povezave med ljudmi in prostorom (Antrop, 2005; Selman, 2012; Ramos idr., 2016).

V zadnjih desetletjih je krajinska identiteta postala pomemben vidik trajnostnih načrtovalskih pristopov, za njeno opredelitev pa so bile razvite razne metodologije in orodja (Stobellar in Pedroli, 2011; Loupa-Ramos idr., 2016; Shao idr., 2020; Nitavska, 2020), ki temeljijo na kvalitativnih pristopih in se osredotočajo na to, kako lahko krajinska identiteta postane uporabnejša in koristnejša za prostorsko načrtovanje. Raziskava, predstavljena v tem članku, temelji na okviru, ki je bil razvit v raziskavi iz leta 2012, ki se je osredotočala na krajinsko identiteto v povezavi s podeželskimi naselji. Avtorji krajinsko identiteto obravnavajo kot kazalnik edinstvenih značilnosti podeželskih naselij in predstavljajo celosten pristop k proučevanju naselij kot del širšega pogleda na krajino (glej Erdem, 2012; Erdem Kaya, 2013). Raziskava iz leta 2012 je bila podlaga za določanje parametrov krajinske identitete, ki pa so jih avtorji na novo razvrstili, ob tem so razvili tudi novo metodologijo za določanje indeksov krajinske identitete. Čeprav lahko krajinsko identiteto razumemo tako s fizičnega kot družbenega vidika, je v tem članku predstavljena samo metoda proučevanja fizične krajinske identitete.

2 Zgradba raziskave in metodologija

Avtorji so v raziskavi uporabili mešano metodo, ki je vključevala tako kvalitativne kot kvantitativne pristope k proučevanju parametrov in indeksov krajinske identitete. Izraz *parameter* se nanaša na prvine, ki sestavljajo krajinsko identiteto, *indeks* pa na kvantitativno vrednost vpliva posameznega parametra na oblikovanje fizične krajinske identitete. Podatki so bili zbrani s terenskimi opazovanji, intervjuji, analizo dokumentov, kartiranjem, tipološko klasifikacijo, klasifikacijo pokrovnosti tal, skaliranjem in uteževanjem parametrov krajinske identitete. Avtorji so obravnavali naslednja raziskovalna vprašanja:

1. Kako lahko opredelimo krajinsko identiteto?
2. Ali lahko merimo parametre krajinske identitete in s tem ugotovimo njihov vpliv na oblikovanje krajinske identitete?
3. Ali je podeželska naselja mogoče primerjati na podlagi krajinske identitete?

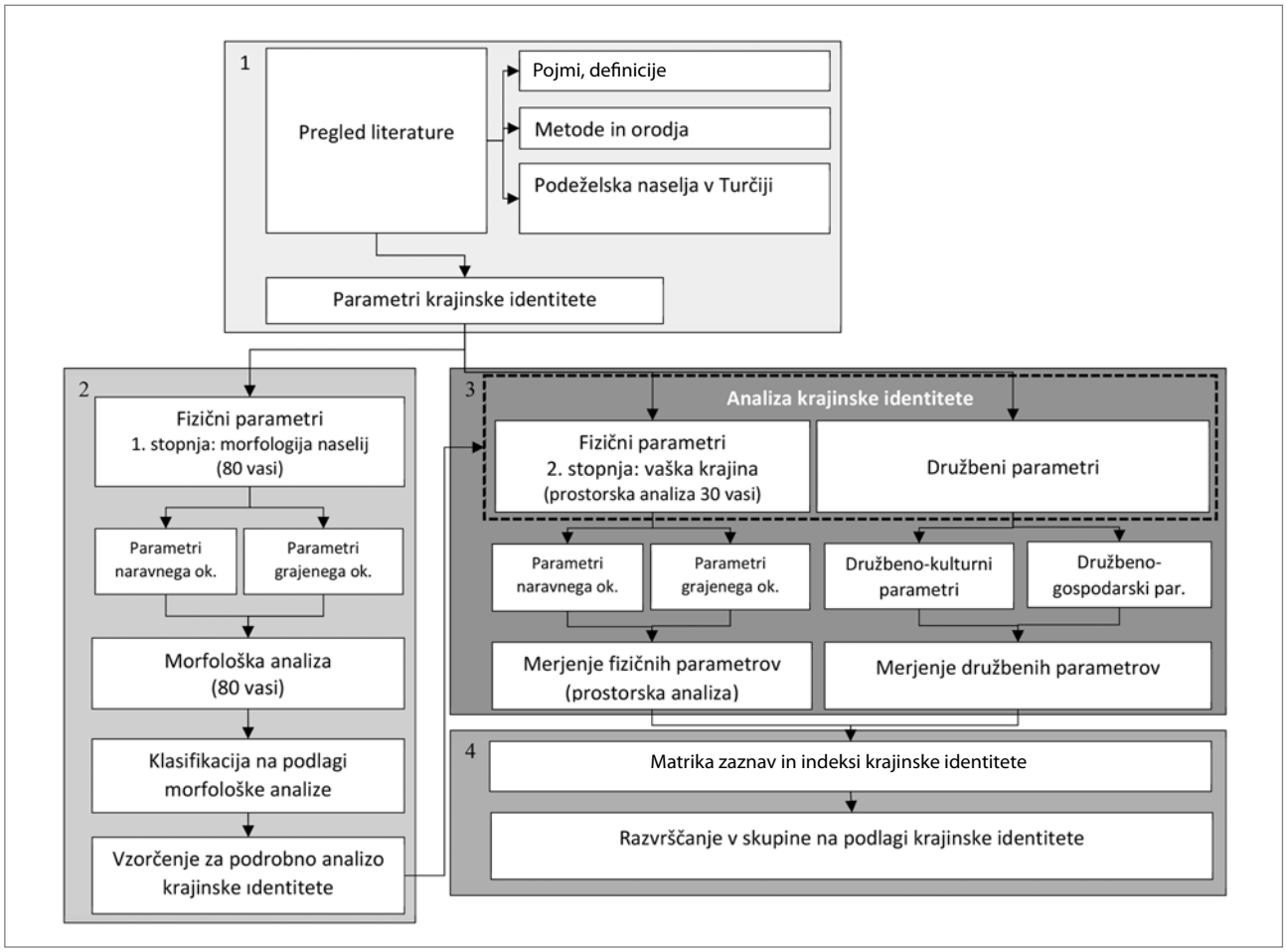
S temi vprašanji so preverjali naslednje hipoteze:

1. Na posameznem geografskem območju lahko opredelimo več tipov krajinske identitete.
2. Današnja dinamika razvoja negativno vpliva na krajinsko identiteto podeželskih naselij.
3. Negativne vplive na podeželska naselja lahko merimo s parametri krajinske identitete.
4. Parametri krajinske identitete omogočajo bolj sistematično in podrobnejšo klasifikacijo podeželskih naselij, ki se razlikuje od tiste, ki temelji na tradicionalnih metodah klasifikacije.

Da bi avtorji odgovorili na raziskovalna vprašanja in preverili veljavnost postavljenih hipotez, so oblikovali metodologijo, ki je vključevala štiri faze (slika 1). V prvi fazi so na podlagi poglobljenega pregleda literature opredelili parametre krajinske identitete, v drugi fazi pa so izvedli splošno analizo parametrov fizične identitete 80 podeželskih naselij v egejski regiji v Turčiji. Naselja so na podlagi geomorfoloških značilnosti razdelili v več glavnih skupin (dolinske, nižinske, obalne in hribovske vasi ter vasi ob vznožjih hribov), s tehnologijo daljinskega zaznavanja pa so analizirali tudi pokrovnost tal. V tretji fazi so opravili podrobne terenske raziskave 30 podeželskih naselij, na podlagi katerih so opredelili parametre fizične in družbene krajinske identitete. Vse parametre so zbrali v obliki matrike. Nato so opravili faktorsko analizo in analizo razvrščanja v skupine, na podlagi česar so ugotovili podobnosti in razlike med vasmi ter prikazali prostorsko razporeditev identitetnih skupin v egejski regiji. V četrti fazi so oblikovali matriko, s katero so opredelili indekse krajinske identitete 30 podeželskih naselij.

2.1 Vzorčenje

Raziskava se je osredotočala na podeželska naselja v egejski regiji v Turčiji. Avtorji so to regijo izbrali zato, ker so v njej zelo različna podeželska naselja, hkrati je območje raznovrstno tudi z vidika naravnega in grajenega okolja ter kmetijskih značilnosti. V regiji so tako obalna naselja kot vasi, ki so v notranjosti Anatolije. Po drugi strani so v regiji tudi velika mesta, kot



Slika 1: Raziskovalne metode (ilustracija: Meltem Erdem Kaya)

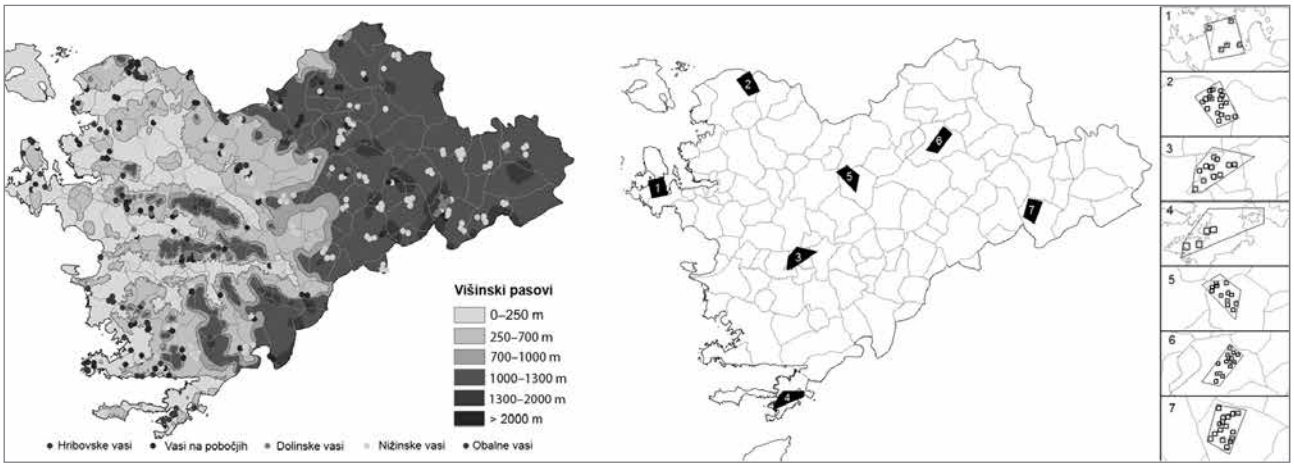
je İzmir, in pomembna industrijska središča Anatolije, kot je Denizli. Povpraševanje po turističnih in sorodnih storitvah je tudi zunaj mest zelo veliko.

Po podatkih Turškega statističnega inštituta (2024) je bilo leta 2023 v egejski regiji 2.916 vasi s 150 do 2.000 prebivalci. Avtorji so vzorec vasi za raziskavo določili z metodo naključnega vzorčenja skupin, za izbor pa so bila ključna naslednja tri osnovna merila:

1. predstavitev osnovnih geomorfoloških kategorij podeželskih območij v egejski regiji;
2. vključitev vasi na različnih višinskih pasovih in z različnim rastlinjem;
3. oblikovanje skupin s čim večjim številom vasi različnih morfoloških tipov.

Najprej so izbrali 400 vasi, te so na podlagi osnovnih geomorfoloških značilnosti območij, na katerih so, razdelili v hribovske vasi, vasi ob vznožjih hribov, dolinske, nižinske in obalne vasi. Poleg tega so upoštevali nadmorsko višino, saj so poleg morfoloških razlik želeli prikazati tudi razlike v rastlinskem pokrovu. Za analizo fizičnih značilnosti krajin so morali od teh 400 naselij izbrati najmanj 78 vasi s 95-odstotnim intervalom zaupanja in 10-odstotno napako. Hkrati so morala biti vzorčna območja velika najmanj 100 km^2, razdalja med točkama na posameznem območju pa je morala biti vsaj 5 km, kar sta tudi pogoja, da se naredijo satelitski posnetki. Ker je moralo imeti vsako območje čim več vasi, so avtorji na vsakem območju velikosti 100 km^2 določili pravokotnik, katerega stranice so bile dolge največ 20 km. Nato so najprej izračunali razdaljo med posamezno vasjo in vsemi sosednimi vasmi v polmeru 20 km, potem pa so opredelili skupine vasi z najmanjšimi skupnimi razdaljami. Izbrali so sedem skupin z največjim možnim številom vasi na površini 100 km^2, ki so vključevale šest višinskih pasov in enako število vasi istega morfološkega tipa. Iz teh skupin so na koncu izbrali skupno 80 vasi (slika 2).

Na vzorčnih območjih so analizirali splošne fizične značilnosti krajine in oblikovali skupine fizične krajinske identitete kot podlago za izbor vasi za podrobnejšo analizo. Za analizo fizične krajinske identitete je bilo treba izbrati najmanj 28 vasi z 80-odstotnim intervalom zaupanja in napako velikosti ±10 %, za analizo korelacij med neodvisnimi spremenljivkami pa je bilo treba izbrati najmanj 30 vasi. Pogoj, da vzorec vsebuje

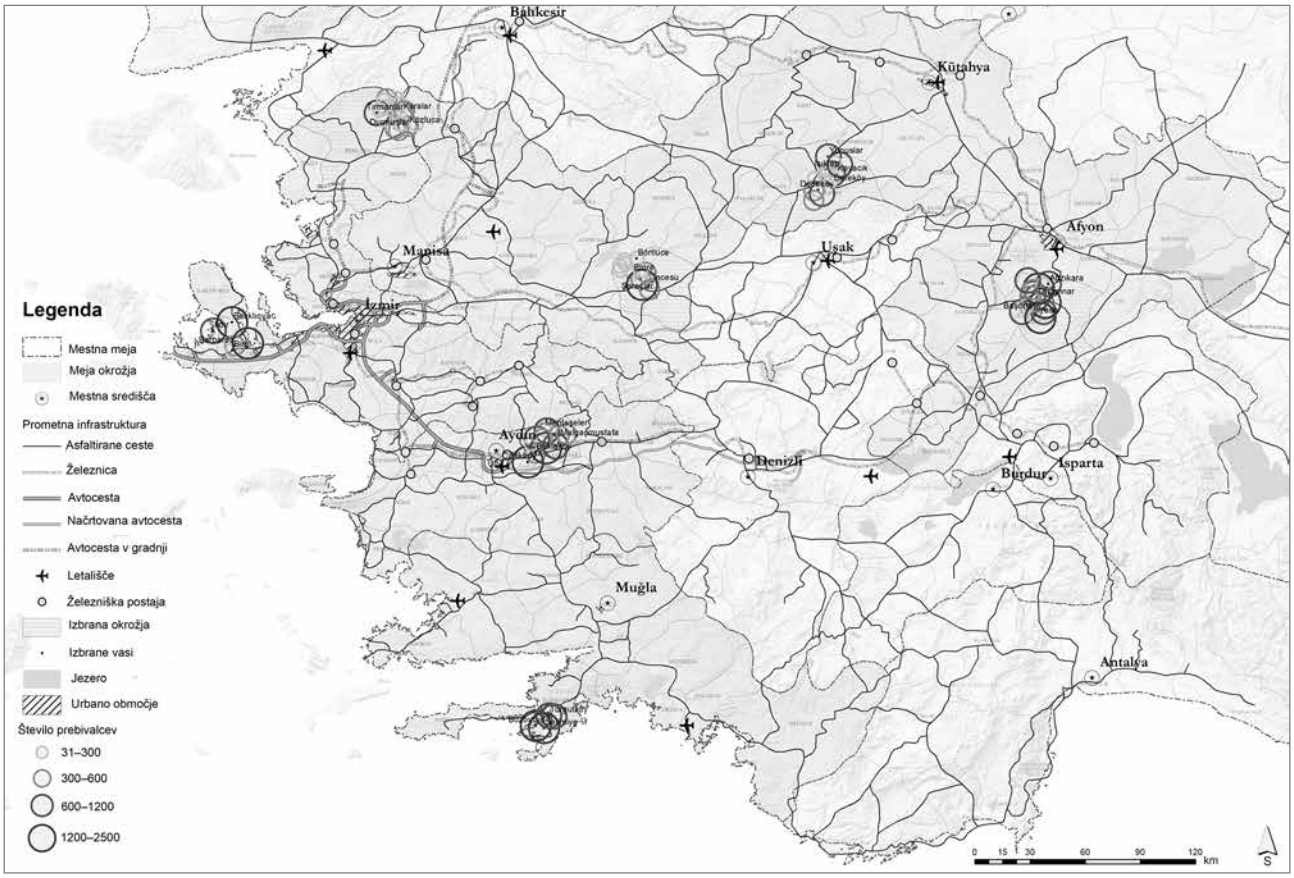


Slika 2: Tipi vasi in prostorska porazdelitev 400 vasi glede na nadmorsko višino (levo); oblikovane skupine vasi in 80 izbranih vasi (desno) (ilustracija: Hasan Serdar Kaya)

Preglednica 1: Izbranih 30 vasi v egejski regiji

Provinca, okrožje, vas	Št. prebivalcev (2023)	Oddaljenost od središča (v km)		Prevladujoča dejavnost
		Mesto	Okrožje	
Afyonkarahisar, Şuhut, Ağzıkara	620	25,4	7,6	Poljedelstvo
Afyonkarahisar, Şuhut, Başören	674	47,4	16,1	Živinoreja, čebelarstvo, vrtnarstvo
Afyonkarahisar, Şuhut, Güneytepe	356	38,1	7,3	Poljedelstvo, živinoreja
Afyonkarahisar, Şuhut, İlyaslı	166	42,5	11,7	Upokojenci
Afyonkarahisar, Şuhut, Ortapınar	759	35,2	4,0	Poljedelstvo, živinoreja, storitveni sektor
Aydın, Köşk, Baklaköy	288	20,4	2,2	Poljedelstvo, živinoreja, oljkarstvo
Aydın, Köşk, Çiftlikköy	1.486	18,8	5,6	Poljedelstvo, živinoreja
Aydın, Köşk, Menteşeler	196	33,4	15,1	Poljedelstvo, živinoreja, gojenje fig
Aydın, Sultanhisar, Eskihisar	1.110	30,0	5,4	Poljedelstvo, sadjarstvo, živinoreja, čebelarstvo
Aydın, Sultanhisar, Malgaçmustafa	410	37,2	7,7	Poljedelstvo, sadjarstvo, oljkarstvo
İzmir, Çeşme, Ildır	742	81,0	23,7	Poljedelstvo, turizem
İzmir, Urla, Balıklıova	1.240	67,8	30,0	Poljedelstvo, turizem, ribolov
İzmir, Urla, Barbaros	427	59,0	25,2	Poljedelstvo, turizem, ribolov
İzmir, Urla, Birgi	199	61,7	25,0	Sadjarstvo
İzmir, Bergama, Durmuşlar	371	137,0	31,8	Upokojenci, živinoreja, dninarstvo
İzmir, Bergama, Karalar	255	138,0	32,8	Poljedelstvo
İzmir, Bergama, Kozluca	254	133,0	29,0	Živinoreja, čebelarstvo, vrtnarstvo
İzmir, Bergama, Tırmanlar	442	135,0	30,3	Poljedelstvo, živinoreja
Kütahya, Gediz, Dedeköy	178	97,2	6,0	Upokojenci
Kütahya, Gediz, Işıklar	84	82,0	17,7	Poljedelstvo, živinoreja, storitveni sektor
Kütahya, Gediz, Kayacık	98	87,0	18,0	Poljedelstvo, živinoreja, oljkarstvo
Kütahya, Gediz, Yaylaköy	190	79,0	14,0	Poljedelstvo, živinoreja
Kütahya, Gediz, Yunuslar	711	75,8	18,9	Poljedelstvo, živinoreja, gojenje fig
Manisa, Kula, Börtlüce	202	131,0	33,0	Poljedelstvo, sadjarstvo, živinoreja, čebelarstvo
Manisa, Kula, Emre	190	110,0	20,0	Poljedelstvo, sadjarstvo, oljkarstvo
Manisa, Kula, İncesu	164	124,0	8,0	Poljedelstvo, turizem
Manisa, Kula, Saraçlar	367	115,0	11,5	Poljedelstvo, turizem, ribolov
Muğla, Marmaris, Bozburun	2.240	100,0	47,4	Poljedelstvo, turizem, ribolov
Muğla, Marmaris, Turgutköy	826	81,6	31,1	Sadjarstvo
Muğla, Marmaris, Selimiye	1.360	102,0	43,4	Upokojenci, živinoreja, dninarstvo

Vir: Türkiye Nüfusu İl ilçe, Mahalle, Köy Nüfusları (2023)



Slika 3: Izbrane vasi v egejski regiji (ilustracija: Hasan Serdar Kaya, Gökçe Şahin)

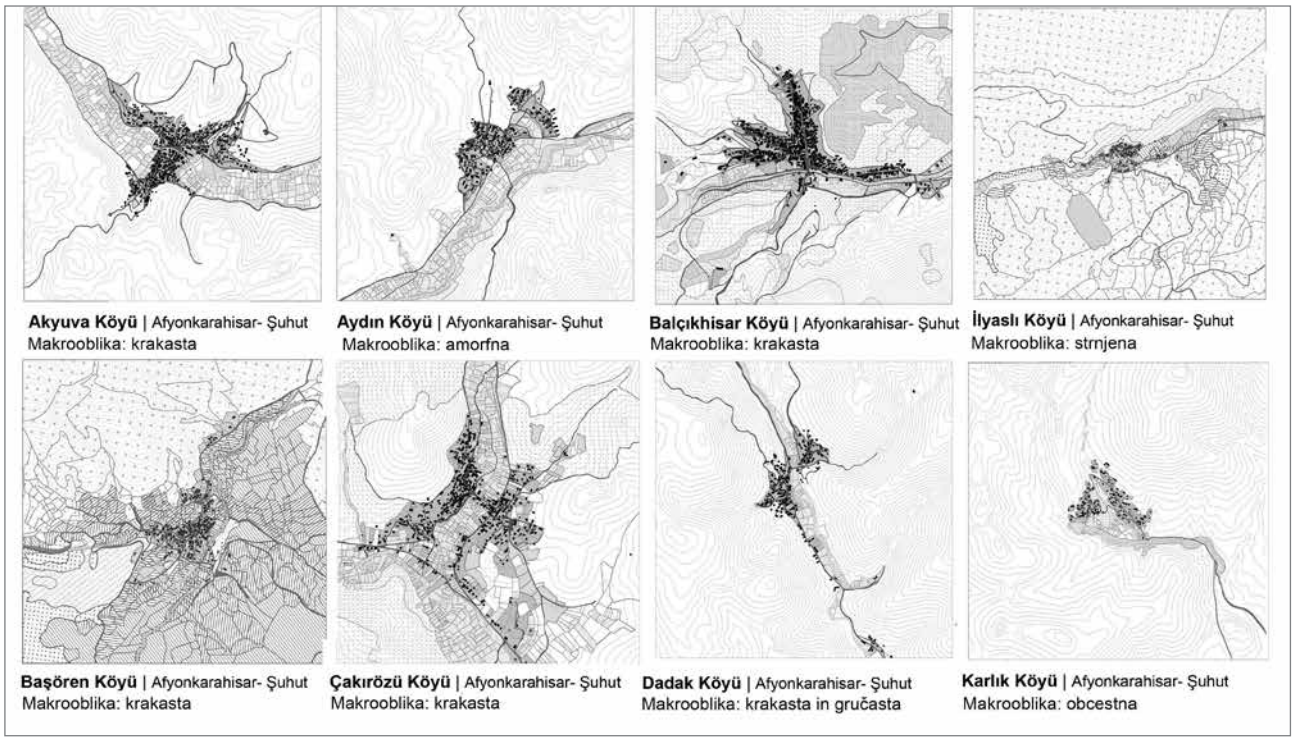
Preglednica 2: Parametri splošne analize naselij

Naravni parametri	Grajeni parametri
Topografija: nadmorska višina, orientacija, geomorfologija, naravni robovi	*Pozidan in prazen prostor*: razdalja med stavbami, gostota stavb, pozidano okolje, lokacija stavb, zaprt in odprt prostor
Rastlinstvo: naravno rastlinstvo, pokrovnost tal, naravni robovi, delež in vrsta rastlinja, ki prodira v naselje	*Odprt prostor*: tipologija odprtih prostorov
Vodni viri: vodna površina, vrste, naravni robovi	*Produktivna krajina*: sistem polj, meje, mejice
Podnebje: makroklima	

najmanj 30 vasi, je bil pomemben tudi z vidika prispevka raziskave k varovanju identitete podeželskih naselij v Turčiji in omogočanja primerjalnih statističnih analiz, kot je multivariatna analiza, za primerjavo z rezultati študij v drugih regijah (preglednica 1, slika 3). Zato so avtorji za podrobno analizo krajinske identitete izbrali 30 vasi in v vsaki opravili dvodnevno terensko raziskavo.

2.2 Izbrane vasi

Vasi, izbrane iz sedmih skupin, so na različnih geografskih območjih egejske regije, od obale do hribovitega sveta. Po podatkih Turškega statističnega inštituta (2024) v njih živi od 84 do 2.240 ljudi. V obalnih vaseh je običajno več prebivalcev kot v drugih vaseh, v nekaterih pa se število prebivalcev manjša in v njih živi manj kot 100 ljudi. Iz nekaterih vasi se ljudje izseljujejo, v druge pa priseljujejo. V večini vasi prevladujejo starejši prebivalci, saj je le malo ljudi, ki v njih živijo, mlajših od 40 let. Vasi so blizu središčem posameznih okrožij. Trinajst vasi je od središča oddaljenih manj kot 15 km, enajst vasi je od središča oddaljenih od 16 do 30 km, sedem vasi pa je od središča oddaljenih več kot 31 km. Glavni vir dohodka v vaseh, ki so najbližje središčem, sta poljedelstvo in živinoreja. Za vasi na srednji ali daljši razdalji od središč okrožij je značilna večja gospodarska raznovrstnost. V nasprotju z vasmi, ki so bližje središčem okrožij, je v najbolj oddaljenih vaseh v povprečju več prebivalcev (890 ljudi).



Slika 4: Vzorec tipologije vasi na podlagi geomorfološke zgradbe in makrooblike: dolinske vasi v okrožju Şuhut v provinci Afyonkarahisar (ilustracija: Hasan Serdar Kaya in Ezgi Güler Tozluoğlu)

Preglednica 3: Naravni in grajeni parametri krajinske identitete (2. faza)

Naravni parametri	Grajeni parametri
Topografija	Fizična podoba
Rastlinstvo	Arhitekturne značilnosti
Geološka zgradba	Značilnosti odprtega prostora
Vodne površine	Prometna infrastruktura
	Kmetijska zemljišča in nasadi

Razen v nekaj obalnih vaseh, kjer prevladuje turizem, je glavna gospodarska dejavnost v vseh vaseh poljedelstvo. Poleg tega se prebivalci ukvarjajo še z živinorejo, čebelarstvom, vrtnarstvom in ribolovom. V nekaterih vaseh prevladujejo upokojenci, v drugih pa večina prebivalcev dela v storitvenem sektorju (slika 3).

2.3 Zbiranje in analiza podatkov

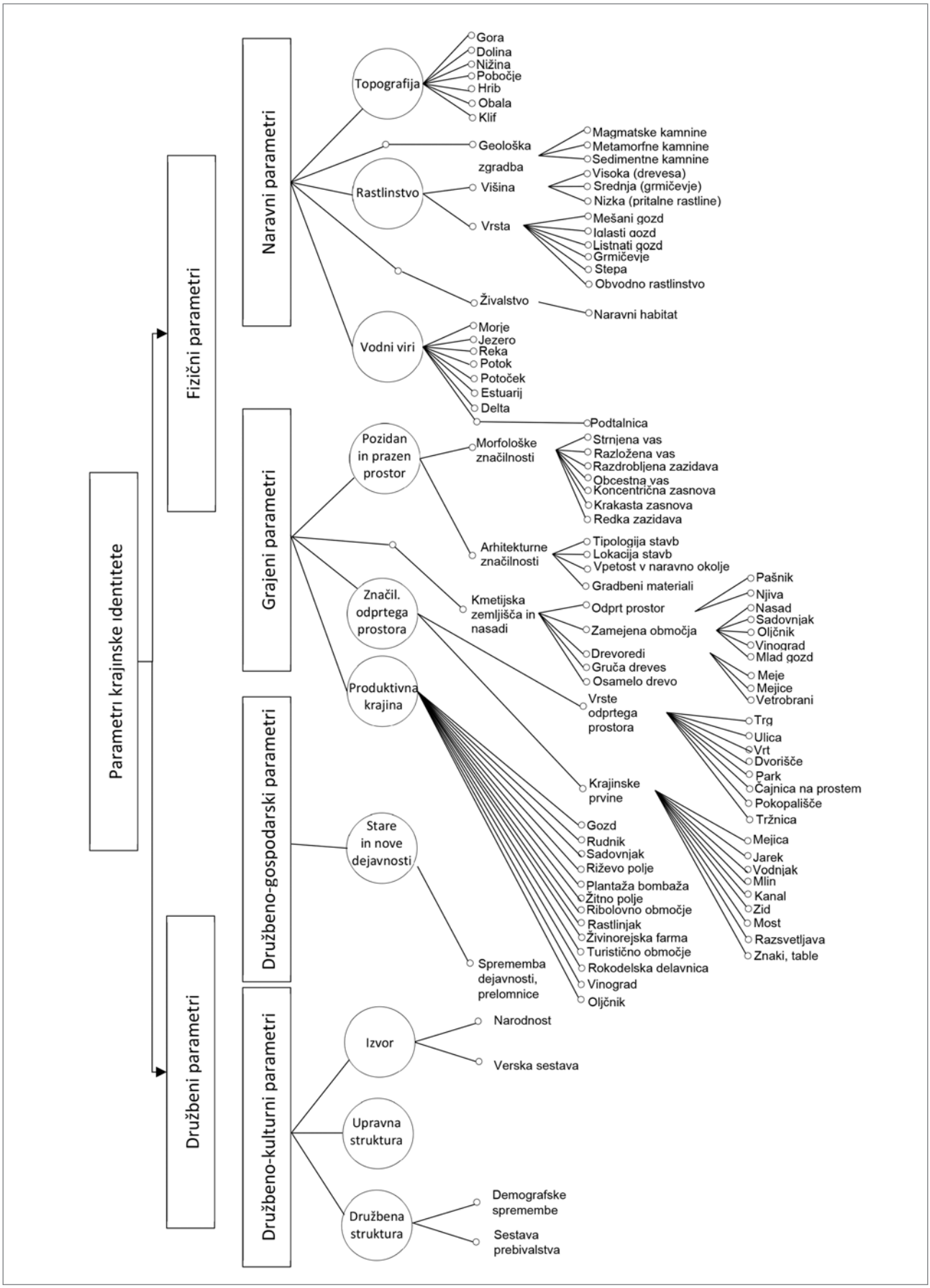
Avtorji so sekundarne podatke pridobili iz objavljenih dokumentov in spletnih virov, kot so spletna stran turškega statističnega inštituta (www.tuik.gov.tr), portal lokalne uprave (https://www.yerelyonetim.net/) ter uradne spletne strani okrožij Muğla (https://www.mugla.bel.tr/), Afyon (www.afyon.bel.tr), Kütahya (www.kutahya.bel.tr), Manisa (www.manisa.bel.tr), Çeşme (www.cesme.bel.tr), Aydın (www.aydin.bel.tr) in Bergama (www.bergama.bel.tr). Primarne podatke so zbrali s terenskimi opazovanji, intervjuji z vaškimi poglavarji in pridobljenimi mnenji strokovnjakov.

V raziskavi so uporabili metodo analize na več ravneh, ki je vključevala analizo splošnih značilnosti medsebojnega vpliva zasnove naselij in njihove okolice, ki se izraža v makroobliki naselja, in prostorsko analizo značilnosti, kot so ulična zasnova, vrsta odprtega prostora, zelene površine, arhitektura, produktivna krajina, ukrepi proti eroziji (vodni, vetrni itd.) in makrooblika. Model določanja indeksa krajinske identitete podeželskih naselij so sestavljale štiri faze.

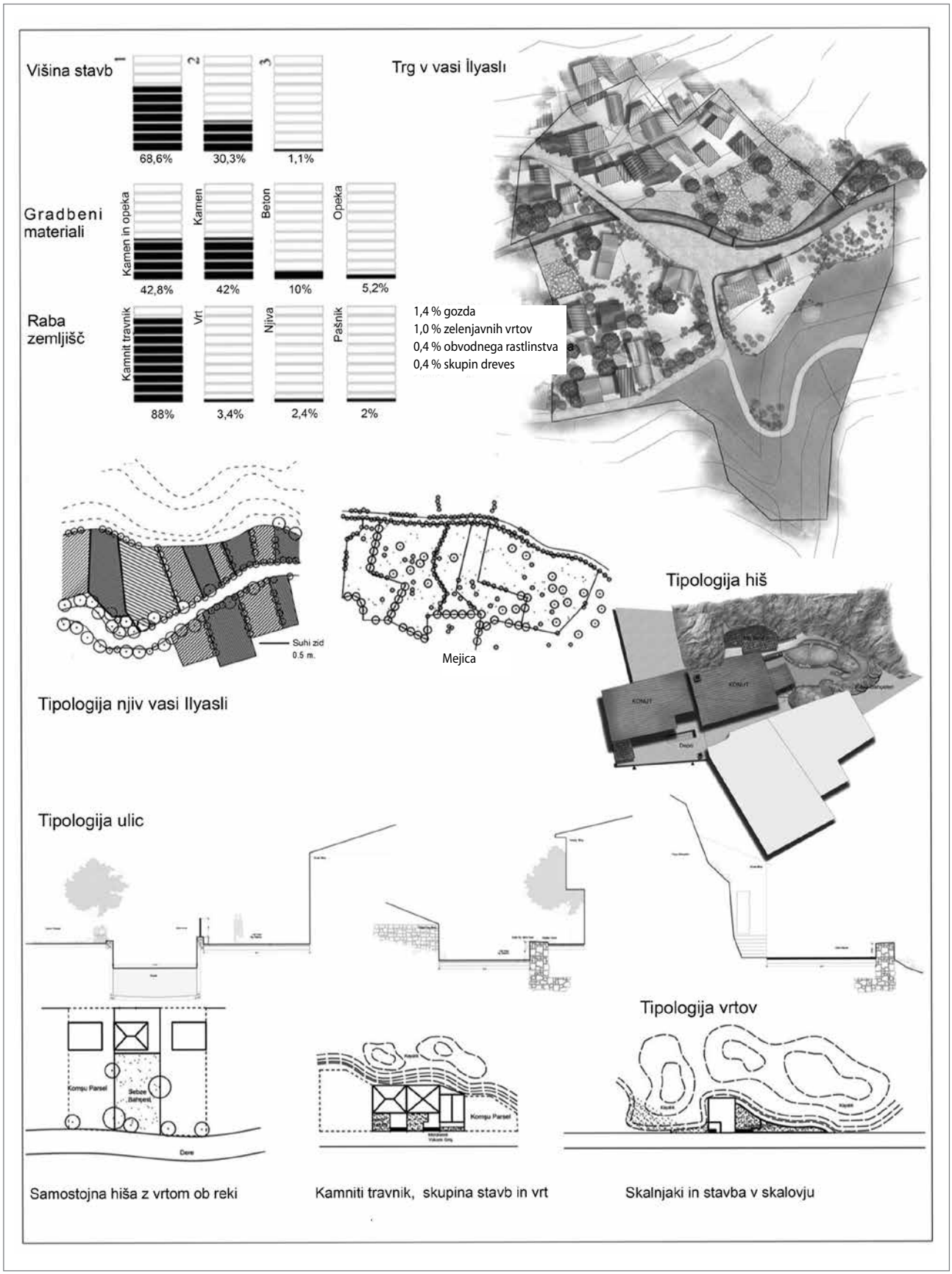
2.3.1 Prva faza: splošna analiza naselij

V prvi fazi so avtorji opravili splošno analizo prvin fizične identitete izbranih 80 vasi v egejski regiji. Uporabljeni parametri omogočajo čim boljše razumevanje krajinske identitete, razkrivajo pa tudi prostorsko zgradbo, okoljske razmere in rabo zemljišč v naseljih (preglednica 2).

Avtorji so okoli vasi določili kvadratna območja s stranicami, dolgimi 2 km, ki so vključevala stanovanjske dele in sosednja



Slika 5: Parametri krajinske identitete (ilustracija: Meltem Erdem Kaya)



Slika 6: Primer analize tipologije stanovanjskih stavb, ulic, vrtov in njiv v vasi İlyaslı (ilustracija: Meltem Erdem Kaya, S. Elif Serdar Yakut in Ezgi Güler Tozluoğlu)

Preglednica 4: Rezultati faktorske analize naravnih parametrov krajinske identitete: matrika rotiranih komponent

Parameter	Faktor						
	1	2	3	4	5	6	7
DT_Stepa	–,786	,159	,115	–,066	–,203	,235	–,075
DT_Makija	,705	,429	–,402	,198	–,073	,041	–,159
DF_Grmičevje (sklenjeno)	,687	–,217	,175	,408	,017	,128	,122
DF_Grmičevje (skupine)	,685	,198	–,313	,059	–,154	–,241	–,149
D_Nadmorska višina	–,655	–,119	,463	,132	,101	,102	,335
D Vodne površine	,630	–,171	,283	,037	–,489	,281	,069
DT_Gozd	–,141	–,911	–,075	–,052	,154	,028	–,034
DF_Drevesa (sklenjeno)	,168	–,899	–,014	,227	–,178	,000	–,175
DF_Drevesa (skupine)	–,125	,425	,811	,058	,123	–,046	–,023
DF_Drevesa (posamična)	,200	,285	–,781	–,248	,104	–,050	,249
DT_Obvodno rastl.	–,029	,079	,735	,008	–,040	,070	,487
D_Naklon (%)	,201	–,041	,040	,876	,111	–,137	,114
DF_Y Poljedelstvo	–,053	,043	–,151	–,739	,299	–,226	–,022
DF_Y Travnik	–,098	,061	,096	–,013	,898	,186	,116
DF_Y Skale	–,267	,282	,078	,265	–,643	,310	,355
DF_Y Pesek	,057	,076	–,019	,005	,002	–,905	–,104
DF_C Posamično drevo	–,334	,356	,019	,292	,303	,511	–,259
D_Geološka zgradba	–,044	,110	,016	,102	,005	,041	,857

Opombe: Metoda ekstrakcije: analiza glavnih komponent, metoda rotacije: Varimax s Kaiserjevo normalizacijo. Rotacija je bila izvedena v 22 ponovitvah.

naravna območja, na podlagi česar so nato izvedli splošno analizo vasi. S to analizo so lahko opredelili primarne identitetne razrede naselij (dolinske, nižinske, obalne, hribovske vasi in vasi ob vznožjih hribov) in makrooblike naselij (strnjene, razložene, gručaste, krakaste vasi itd.) (slika 4).

2.3.2 Druga faza: parametri krajinske identitete podeželskih naselij

V drugi fazi so avtorji pregledali metodologije, kot so popisi pokrajin, morfološki modeli, ekološki modeli, ocena krajinskih značilnosti, vizualna ocena krajine, ocena zgodovinske podeželske krajine, opredelitev značaja mestne krajine, smernice za oblikovanje vasi in izjave prebivalcev o oblikovanju vasi, ter oblikovali parametre krajinske identitete podeželskih naselij, nato pa so te razdelili v dve glavni kategoriji: parametre fizične in družbene krajinske identitete. Nato so parametre v vsaki kategoriji analizirali in na tej podlagi oblikovali indekse.

Podrobna analiza krajinske identitete je zajemala podrobno analizo fizične krajinske identitete naselij na podlagi terenskih raziskav (slika 4). Avtorji so fizično identiteto proučevali na podlagi dveh kategorij parametrov, in sicer naravnih in grajenih parametrov krajinske identitete (preglednica 3).

2.3.3 Tretja faza: terenske raziskave 30 vasi

Avtorji so fizične in družbene parametre krajinske identitete proučili z dvodnevnimi terenskimi raziskavami vsake vasi, na podlagi česar so kartirali arhitekturne značilnosti, rabo odprtega prostora, ulice, vaške trge in njive ter izdelali tipološke skice za vsako vas (slika 6). Fizične parametre krajinske identitete so tudi fotografirali, s čimer so si olajšali vizualno analizo posamezne vasi.

2.3.4 Četrta faza: matrika in indeksi krajinske identitete podeželskih mest

Podatki, zbrani s terenskimi raziskavami, so bili urejeni v matriko parametrov krajinske identitete, s katero so bile opisno predstavljene prvine identitete naravne in grajene krajine (slika 8). Na fotografijah, posnetih na raznih prostorskih ravneh in na katerih so bili razvidni ulične značilnosti, odprti prostori, neposredna okolica vasi, raba zemljišč in arhitekturne značilnosti, so nato člani raziskovalne ekipe (krajinski arhitekti, urbanisti, arhitekt, inženir geomatike in inženir gozdarstva) proučili vse vizualne značilnosti vasi in določili njihov vpliv na oblikovanje fizične krajinske identitete. Vpliv vsakega parametra so ocenili na lestvici od 1 do 5, pri čemer je vrednost 1 pomenila najmanjši, vrednost 5 pa največji vpliv. Matrika vključuje povprečje vseh ocen in posamezne ocene članov raziskovalne

Preglednica 5: Rezultati faktorske analize grajenih parametrov krajinske identitete: matrika rotiranih komponent

Parameter	Faktor									
	1	2	3	4	5	6	7	8	9	10
YMK_G Materiali	,857	,081	,099	–,028	–,015	–,090	–,202	,243	,096	–,096
YPD_G Materiali za zidove	,809	–,187	–,046	,063	,007	,024	–,100	–,155	–,196	–,197
YPS Naravna meja	,653	–,191	–,245	,170	,173	–,132	,331	–,039	–,195	,187
YAS Ulica	–,593	–,315	,362	,047	–,387	–,078	,078	,078	,153	–,062
YMY_S Redka zazidava	,113	–,923	–,095	–,058	,032	–,142	,052	–,137	,099	,029
YMY Gosta zazidava	–,144	,867	–,046	–,012	,053	,170	–,076	,013	,004	–,071
YB Strnjena vas	,163	,678	,297	,007	,065	,021	,016	–,063	,056	,470
YB Razložena vas	–,243	–,490	–,276	,013	,107	,270	,309	,126	–,017	–,385
YPK_AK Mešana raba prostora	–,087	,166	,912	–,042	–,036	–,143	,004	,029	,014	,049
YPK_AK Samostojna hiša	,031	,035	–,689	,278	–,387	–,173	–,076	–,068	–,260	,257
YPK Meja med zemljišči	–,172	,138	,570	,123	,198	,037	–,383	,463	–,242	,211
YP Kmetijska zemljišča	–,125	,204	–,111	,860	–,008	–,129	,036	–,112	,137	,078
YPU Vrt	–,092	,035	,227	–,712	–,071	,163	–,041	,357	,228	,233
YME Pomožna stavba	,351	–,129	,253	,708	–,164	,117	–,311	,119	–,137	,117
YPZ_D Vrsta tlaka na ulicah	,450	–,260	–,002	,480	,254	,230	–,166	,011	,366	–,069
YPU Njiva	,093	–,065	–,068	,198	,904	–,119	,101	,084	–,028	,181
YPU Oljčnik	–,121	–,122	–,330	,352	–,807	–,125	–,003	–,036	,152	–,006
YMB Druge stavbe	,209	–,118	,076	,021	,124	–,891	,040	,101	–,072	,113
YMB Stanovanjske	,160	,175	,037	–,118	,119	,877	,123	,165	,047	,154
YPK_TA Prevladujoča raba	–,044	,024	,074	,001	,209	,067	,892	,141	,105	–,022
YP Vodni objekt	,248	,347	,108	,166	,247	–,010	–,663	,151	,068	–,011
YPU Pašnik	,096	,186	,209	–,250	,057	,132	,058	,818	–,088	–,200
YPU Gozd	,053	,272	,446	,062	–,077	,217	–,099	–,635	–,379	–,158
Y_CK Ukrepi proti eroziji	–,313	–,002	,059	,092	–,021	,112	,058	–,037	,788	–,006
YMA Umestitev stavb	,188	–,046	,007	–,247	–,344	–,007	,039	,086	,605	–,370
YAT Odprt prostor	–,153	,018	–,072	–,020	,135	,034	–,004	–,026	–,112	,847

Opombe: Metoda ekstrakcije: analiza glavnih komponent, metoda rotacije: Varimax s Kaiserjevo normalizacijo. a Rotacija je bila izvedena v 20 ponovitvah.

ekipe. Predstavljene so v dveh glavnih kategorijah: naravne in grajene značilnosti. Pod vsako glavno kategorijo so opredeljene podkategorije vsake značilnosti z ocenami. Po pridobitvi ocen za vsak parameter je bila parametrom določena utež v glavni kategoriji. Podatki o družbenih parametrih krajinske identitete, pridobljeni z intervjuji in terenskimi raziskavami, niso bili vključeni v ocenjevanje in so bili namesto tega uporabljeni kot pomožni podatki za analizo krajinske identitete.

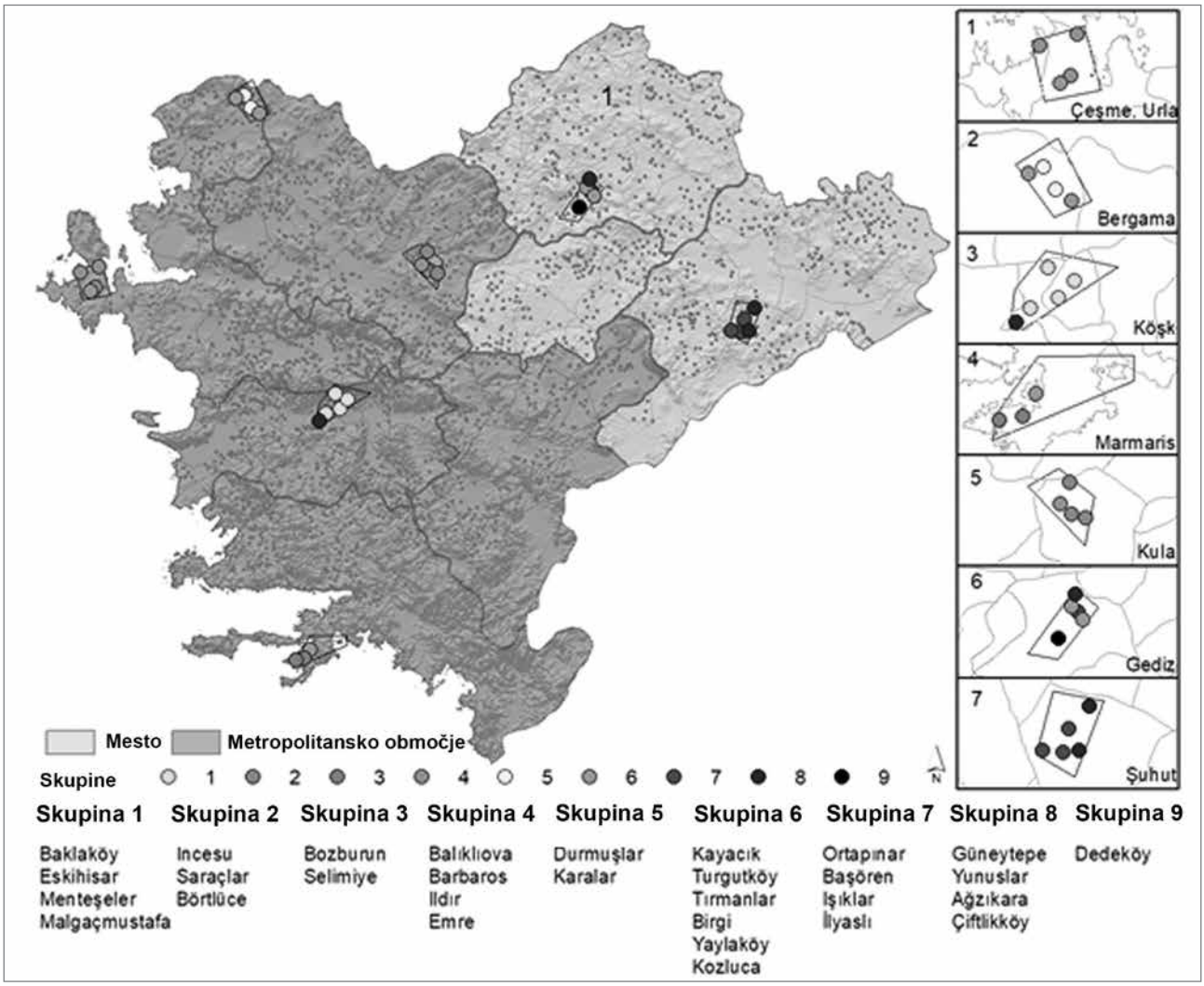
2.3.5 Faktorska analiza: naravni in grajeni parametri krajinske identitete

Pri faktorski analizi so bili parametri na najnižji ravni združeni s tistimi na najvišjih ravneh, tako da je bilo število naravnih parametrov krajinske identitete zmanjšano na 18, število grajenih parametrov pa na 29. Ker je bilo število parametrov večje od števila vasi, je bila faktorska analiza opravljena za vsak parameter posebej. Tako je bilo za naravne parametre določenih sedem faktorjev, za grajene pa deset. Čeprav je bila vrednost Kaiser-Myer-Olkinovega testa zelo majhna (tj. 0,391 za naravne in 0,414 za grajene parametre), je Barttletov test pokazal, da so bili podatki vseeno ustrezni za izvedbo faktorske analize. Potrjena je bila tudi ustreznost podskupin parametrov, ki sestavljajo posamezne faktorje. Naravni parametri so bili združeni v sedem faktorjev.

Grajeni parametri krajinske identitete so zelo raznovrstni, zato jih je bilo zelo veliko. Poenostavljenih je bilo samo nekaj parametrov, značilnih za nekatere vasi, tako da je bilo njihovo skupno število zmanjšano na 26. Po desetem faktorju so lastne vrednosti padle pod 1.

2.3.6 Razvrščanje v skupine

Na podlagi izračunanih vrednosti faktorjev so avtorji vasi razvrstili v skupine glede na njihove skupne značilnosti. Za



Slika 7: Prostorska porazdelitev identitetnih skupin v egejski regiji (ilustracija: Hasan Serdar Kaya)

to so uporabili metodo hierarhičnega razvrščanja. Ker je bilo v raziskavi opredeljenih pet osnovnih geomorfoloških tipov vasi, je bilo najmanjše možno število skupin pet, ker pa je bilo vseh vasi 30, je bilo največje možno število skupin, določenih po tej metodi, 15. Avtorji so na koncu vasi razdelili v devet skupin (preglednica 6).

Prostorska porazdelitev vasi v posameznih skupinah je zelo heterogena. Obalne vasi, kot sta Balıklıova in Ildır, so bile na primer razvrščene v isto skupino kot nižinska vas Barbaros in vas na pobočju hriba Emre, ki sta daleč od obale. Barbaros in Emre sta živahni vasi z ugodnimi gospodarskimi možnostmi, pomembnimi zgodovinskimi in arhitekturnimi prvinami (zlasti Emre) ter dobrimi možnostmi za razvoj lokalnega turizma, zato se močno razlikujeta od drugih vasi v nižinah in na pobočjih hribov, kjer prevladujeta poljedelstvo in živinoreja. Prostorsko najbolj heterogene so vasi v šesti skupini, te vasi so tako na obali kot v notranjosti regije.

3 Rezultati in razprava

Med 30 proučevanimi vasmi imata İlyaslı, dolinska vas v okrožju Şuhut v provinci Afyonkarahisar, in Bozburun, obalna vas v okrožju Marmaris v provinci Muğla, najvišji indeks fizične krajinske identitete (0,62). Glede na ocene vseh parametrov v matriki je vrednost indeksa naravne krajinske identitete vasi İlyaslı 0,37, vrednost indeksa njene grajene krajinske identitete pa je 0,26. Glavni parametri njene naravne krajinske identitete so geološka zgradba, rastlinstvo in obrežni pas, ti prispevajo tudi k njeni izjemni fizični krajinski identiteti. Edinstvene in značilne lokalne prvine so zlasti skalnjaki, v katerih prebivalci gojijo raznovrstne rastline. V tem okviru sta naravna zgradba vasi in njej prilagojena raba zemljišč pomembna dejavnika, ki vplivata na indeks krajinske identitete vasi. Indeks naravne krajinske identitete obalne vasi Bozburun znaša 0,36, indeks njene grajene krajinske identitete pa je 0,26. Vpliv naravnega

Preglednica 6: Skupine, opredeljene z metodo razvrščanja v skupine

Vas	Geomorfološki tip	Skupina
Eskihisar	Ob vznožju hriba	1
Baklaköy	Dolinska	
Menteşeler	Na pobočju	
Malgaçmustafa	Na pobočju	
İncesu	Ob vznožju hriba	2
Börtlüce	Na pobočju	
Saraçlar	Na pobočju	
Bozburun	Obalna	3
Selimiye	Obalna	
Emre	Ob vznožju hriba	4
Ildır	Obalna	
Balıklıova	Obalna	
Barbaros	Nižinska	
Durmuşlar	Hill	5
Karalar	Dolinska	
Birgi	Nižinska	6
Yaylaköy	Hill	
Kozluca	Hill	
Tırmanlar	Hill	
Turgutköy	Dolinska	
Kayacık	Na pobočju	
İlyaslı	Dolinska	7
Başören	Dolinska	
Ortapınar	Na pobočju	
Işıklar	Na pobočju	
Güneytepe	Ob vznožju hriba	8
Yunuslar	Ob vznožju hriba	
Ağzıkara	Nižinska	
Çiftlikköy	Nižinska	
Dedeköy	Nižinska	9

okolja na krajinsko identiteto je v tej vasi še bolj izrazit, kar je posledica njene obalne lege in raznovrstne vegetacije (razne rastlinske vrste v priobalnem delu in grmičevje v hribovitih predelih).

Še ena vas z visokim indeksom krajinske identitete (0,6) je İncesu. Edinstvene prvine te nižinske vasi so topografska zgradba, strnjena zasnova, nizke stavbe, kamniti zidovi in objekti ter trg z vodnjaki. Kljub posegom na kamnitih objektih (npr. prizidki iz opeke), ki pomembno vplivajo na identiteto vasi, je vas ohranila lokalni značaj. Na krajinsko identiteto negativno vplivajo številne porušene stavbe v vasi, težave z vzdrževanjem objektov in infrastrukture ter prakse, ki niso v skladu z lokalnim značajem (npr. uporaba betona in opeke). Vodnjaki na trgu izrazito vplivajo na kakovost prostora. Indeks grajene krajinske identitete vasi je višji kot indeks njene naravne krajinske identitete, glavni razlogi za to pa so ohranjene lokalne arhitekturne prvine (kamnite stavbe z opečnato streho), pločniki iz naravnega kamna in strnjena oblika vasi z nizkimi hišami.

V 19 vaseh je bil indeks naravne krajinske identitete višji od indeksa grajene krajinske identitete, v desetih pa je bilo ravno obratno. V eni vasi sta bila oba indeksa enaka. Rezultati so pokazali, da ima v podeželskih naseljih naravno okolje pomembno vlogo pri oblikovanju fizične krajinske identitete. Poleg tega ima mnogo vasi edinstvene arhitekturne in gradbene značilnosti, razvidne na tradicionalnih objektih, narejenih iz lokalnih materialov. Tradicionalna podoba vasi je zaradi sodobnih posegov začela razpadati, kar je tudi eden glavnih razlogov, da imajo številne vasi nizek indeks grajene krajinske identitete. Poleg tega so v skoraj vseh vaseh ulice tlakovane s tlakovci. Na splošno se materiali, ki izvirajo z območja, na katerih so proučevane vasi, uporabljajo zelo malo ali se sploh ne uporabljajo, kar tudi najbolj ogroža identiteto grajene krajine. Način gradnje, višina stavb (število nadstropij), vpetost stavb v naravno okolje in obris vasi v krajini pozitivno vplivajo na krajinsko identiteto. Spreminjanje teh prvin in posledično slabša kakovost grajenega okolja negativno vplivata na krajinsko identiteto vseh vasi. Indeks krajinske identitete 23 vasi je znašal 0,5 ali več. Sedem izmed teh vasi je dolinskih, štiri so obalne, šest je nižinskih, štiri ležijo ob vznožju hriba, dve pa sta hribovski. Ti podatki kažejo, da na krajinsko identiteto podeželskih naselij močno vplivata topografija in obalna lega. V nižinskih vaseh imajo velik vpliv na krajinsko identiteto prevladujoča kmetijska krajina in njene prvine, v dolinskih vaseh pa izstopa postopnost gradnje, ki je posledica nagnjenega terena. Tudi reke so pomembna prvina dolinskih vasi, ki pozitivno vpliva na njihovo krajinsko identiteto. Zlasti rastlinstvo in vrtovi ob rekah na edinstven način vplivajo na identiteto. V mnogih vaseh pa so bile rečne struge sanirane in preoblikovane v kanale, s čimer reke niso več prostorsko povezane z vasjo.

V vseh vaseh njive zajemajo povprečno 33 % zemljišč. Osemnajst vasi ima oljčnike, ki v povprečju obsegajo 26 % skupne rabe zemljišč in imajo status posebnih pridelovalnih površin. Enaindvajset vasi ima gozdove, ki v povprečju obsegajo 23 % vseh zemljišč in veljajo za površine z visokim gospodarskim potencialom. V produktivni krajini vasi imajo pomembno vlogo tudi zasebni vrtovi. Na primer, stanovanjske hiše z obsežnimi vrtovi v vasi Turgutköy (v okrožju Marmaris v provinci Muğla), ki so ponekod neposredno povezani z ulicami in so brez ograj, prispevajo k prevladujoči vrtni identiteti vasi. Stavbe različnih oblik in barv, zgrajene iz različnih materialov, ter pomanjkanje enotnega arhitekturnega sloga pa negativno vplivajo na krajinsko identiteto kraja.

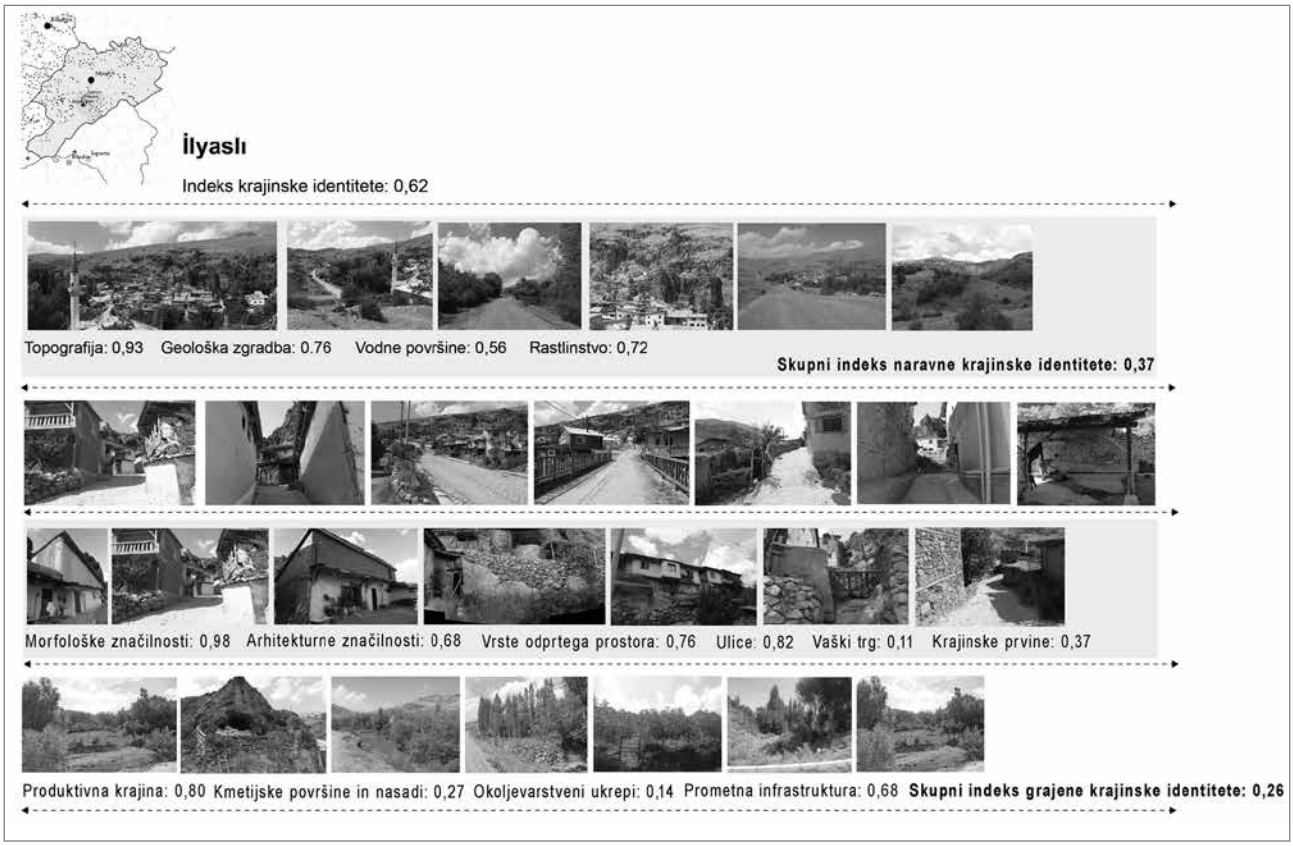
Okrožje	Vas	Tip vasi	Ločene postavke				Po vsej naravni krajini			
			Topografija: 45	Geologija/prst: 45	Vodna telesa: 45	Rastlinstvo: 180	Topografija	Geologija/prst	Vodna telesa	Rastlinstvo
Afyon	İlyaslı	**Dolinska**	93%	76%	58%	72%	13%	11%	12%	29%
Afyon	Ortapınar	**Dolinska**	64%	7%	67%	64%	9%	1%	13%	25%
Afyon	Güneytepe	**Na pobočju**	84%	0%	18%	53%	12%	0%	8%	22%
Afyon	Başören	**Dolinska**	69%	7%	60%	68%	10%	1%	12%	27%
Afyon	Ağzıkara	**Nižinska**	76%	4%	40%	49%	11%	1%	9%	19%
Kütahya	Dedeköy	**Nižinska**	89%	0%	7%	61%	13%	0%	13%	22%
Kütahya	Yaylaköy	**Hribovske**	82%	0%	0%	61%	12%	0%	11%	23%
Kütahya	Işıklar	**Na pobočju**	89%	0%	53%	71%	13%	0%	16%	25%
Kütahya	Kayacık	**Dolinska**	78%	0%	58%	61%	11%	0%	16%	19%
Kütahya	Yunuslar	**Na pobočju**	69%	0%	13%	61%	10%	0%	8%	27%
Manisa	Börtlüce	**Na pobočju**	96%	0%	2%	77%	14%	0%	14%	30%
Manisa	Emre	**Nižinska**	89%	0%	16%	71%	13%	0%	12%	28%
Manisa	İncesu	**Nižinska**	91%	0%	0%	75%	13%	0%	14%	29%
Manisa	Saraçlar	**Na pobočju**	89%	56%	0%	62%	13%	8%	13%	23%
Muğla	Bozburun	**Obalna**	98%	11%	96%	76%	14%	2%	17%	26%
Muğla	Selimiye	**Obalna**	98%	0%	98%	74%	14%	0%	15%	28%
Muğla	Turgutköy	**Nižinska**	80%	0%	76%	61%	11%	0%	14%	21%
Aydın	Baklaköy	**Nižinska**	87%	0%	24%	69%	12%	0%	13%	27%
Aydın	Çiftlikköy	**Nižinska**	96%	0%	20%	49%	14%	0%	10%	18%
Aydın	Menteşeler	**Dolinska**	89%	0%	18%	66%	13%	0%	15%	24%
Aydın	Eskihisar	**Nižinska**	89%	0%	49%	51%	13%	0%	13%	16%
Aydın	Malgaçmustafa	**Dolinska**	91%	0%	47%	53%	13%	0%	14%	17%
İzmir	Durmuşlar	**Obalna**	96%	11%	16%	60%	14%	2%	12%	24%
İzmir	Karalar	**Dolinska**	96%	0%	69%	64%	14%	0%	14%	23%
İzmir	Kozluca	**Na pobočju**	80%	0%	16%	70%	11%	0%	15%	28%
İzmir	Tırmanlar	**Na pobočju**	87%	0%	33%	52%	12%	0%	15%	17%
İzmir	Balıklıova	**Obalna**	96%	0%	98%	76%	14%	0%	15%	29%
İzmir	Barbaros	**Nižinska**	96%	0%	27%	71%	14%	0%	16%	29%
İzmir	Birgi	**Nižinska**	82%	0%	51%	63%	12%	0%	17%	26%
İzmir	Ildır	**Obalna**	91%	7%	93%	71%	13%	1%	12%	28%

Okrožje	Vas	Tip vasi	Ločene postavke									
			Morfološke značilnosti: 45	Arhitekturne značilnosti: 315	Vrsta odprtega prostora: 45	Značilnosti ulic: 45	Značilnosti trga: 45	Krajinske prvine: 225	Produktivna krajina: 45	Kmetijske površine in nasadi: 135	Prometna infrastruktura: 45	Ukrepi proti eroziji: 90
Afyon	İlyaslı	**Dolinska**	96%	68%	76%	82%	11%	37%	80%	27%	62%	14%
Afyon	Ortapınar	**Dolinska**	80%	58%	49%	60%	16%	30%	89%	47%	20%	10%
Afyon	Güneytepe	**Na pobočju**	67%	48%	36%	47%	27%	34%	82%	41%	33%	0%
Afyon	Başören	**Dolinska**	91%	53%	84%	64%	20%	18%	80%	43%	60%	7%
Afyon	Ağzıkara	**Nižinska**	89%	47%	71%	62%	13%	33%	89%	33%	62%	3%
Kütahya	Dedeköy	**Nižinska**	82%	61%	84%	80%	18%	43%	96%	44%	80%	0%
Kütahya	Yaylaköy	**Hribovske**	93%	71%	47%	67%	9%	50%	84%	36%	62%	0%
Kütahya	Işıklar	**Na pobočju**	93%	67%	82%	76%	9%	51%	78%	48%	58%	26%
Kütahya	Kayacık	**Dolinska**	93%	75%	80%	80%	20%	64%	87%	50%	64%	24%
Kütahya	Yunuslar	**Na pobočju**	89%	51%	76%	67%	9%	36%	82%	41%	58%	24%
Manisa	Börtlüce	**Na pobočju**	80%	74%	73%	84%	2%	55%	96%	16%	53%	0%
Manisa	Emre	**Nižinska**	84%	73%	84%	78%	40%	65%	82%	47%	73%	0%
Manisa	İncesu	**Nižinska**	87%	75%	60%	76%	71%	76%	84%	38%	60%	0%
Manisa	Saraçlar	**Na pobočju**	80%	68%	51%	71%	11%	44%	87%	30%	56%	0%
Muğla	Bozburun	**Obalna**	80%	55%	80%	76%	56%	44%	80%	24%	80%	22%
Muğla	Selimiye	**Obalna**	84%	49%	76%	58%	53%	38%	56%	17%	69%	1%
Muğla	Turgutköy	**Nižinska**	84%	50%	67%	76%	11%	47%	96%	35%	56%	17%
Aydın	Baklaköy	**Nižinska**	80%	54%	67%	64%	22%	32%	100%	40%	51%	2%
Aydın	Çiftlikköy	**Nižinska**	84%	47%	80%	56%	44%	44%	89%	30%	38%	3%
Aydın	Menteşeler	**Dolinska**	84%	60%	56%	78%	36%	38%	98%	41%	36%	4%
Aydın	Eskihisar	**Nižinska**	78%	58%	73%	78%	44%	53%	96%	37%	51%	0%
Aydın	Malgaçmustafa	**Dolinska**	84%	57%	58%	82%	24%	40%	93%	30%	24%	0%
İzmir	Durmuşlar	**Obalna**	89%	79%	38%	73%	33%	58%	60%	37%	53%	0%
İzmir	Karalar	**Dolinska**	78%	63%	53%	71%	36%	51%	80%	24%	31%	26%
İzmir	Kozluca	**Na pobočju**	84%	62%	78%	84%	51%	62%	87%	33%	40%	0%
İzmir	Tırmanlar	**Na pobočju**	89%	62%	60%	62%	33%	37%	82%	30%	44%	0%
İzmir	Balıklıova	**Obalna**	87%	51%	76%	64%	18%	42%	69%	15%	76%	10%
İzmir	Barbaros	**Nižinska**	84%	56%	89%	60%	24%	58%	84%	27%	53%	2%
İzmir	Birgi	**Nižinska**	73%	52%	38%	64%	11%	44%	82%	21%	33%	0%
İzmir	Ildır	**Obalna**	89%	68%	71%	76%	2%	34%	76%	39%	62%	0%

Okrožje	Vas	Tip vasi	Po vsej grajeni krajini									
			Morfološke značilnosti: 45	Arhitekturne značilnosti: 315	Vrsta odprtega prostora: 45	Značilnosti ulic: 45	Značilnosti trga: 45	Krajinske prvine: 225	Produktivna krajina: 45	Kmetijske površine in nasadi: 135	Prometna infrastruktura: 45	Ukrepi proti eroziji: 90
Afyon	İlyaslı	**Dolinska**	4%	21%	3%	4%	0%	8%	3%	4%	3%	1%
Afyon	Ortapınar	**Dolinska**	3%	18%	2%	3%	1%	7%	4%	6%	1%	1%
Afyon	Güneytepe	**Na pobočju**	3%	15%	2%	2%	1%	7%	4%	5%	1%	0%
Afyon	Başören	**Dolinska**	4%	16%	4%	3%	1%	4%	3%	6%	3%	1%
Afyon	Ağzıkara	**Nižinska**	4%	14%	3%	3%	1%	7%	4%	4%	3%	0%
Kütahya	Dedeköy	**Nižinska**	4%	18%	4%	3%	1%	9%	4%	6%	3%	0%
Kütahya	Yaylaköy	**Hribovske**	4%	22%	2%	3%	0%	11%	4%	5%	3%	0%
Kütahya	Işıklar	**Na pobočju**	4%	20%	4%	3%	0%	11%	3%	6%	3%	2%
Kütahya	Kayacık	**Dolinska**	4%	23%	3%	3%	1%	14%	4%	6%	3%	2%
Kütahya	Yunuslar	**Na pobočju**	4%	15%	3%	3%	0%	8%	4%	5%	3%	2%
Manisa	Börtlüce	**Na pobočju**	3%	22%	3%	4%	0%	12%	4%	2%	2%	0%
Manisa	Emre	**Nižinska**	4%	22%	4%	3%	2%	14%	4%	6%	3%	0%
Manisa	İncesu	**Nižinska**	4%	23%	3%	3%	3%	17%	4%	5%	3%	0%
Manisa	Saraçlar	**Na pobočju**	3%	21%	2%	3%	0%	9%	4%	4%	2%	0%
Muğla	Bozburun	**Obalna**	3%	17%	3%	3%	2%	10%	3%	3%	3%	2%
Muğla	Selimiye	**Obalna**	4%	15%	3%	3%	2%	8%	2%	2%	3%	0%
Muğla	Turgutköy	**Nižinska**	4%	15%	3%	3%	0%	10%	4%	5%	2%	1%
Aydın	Baklaköy	**Nižinska**	3%	16%	3%	3%	1%	7%	4%	5%	2%	0%
Aydın	Çiftlikköy	**Nižinska**	4%	14%	3%	2%	2%	10%	4%	4%	2%	0%
Aydın	Menteşeler	**Dolinska**	4%	18%	2%	3%	2%	8%	4%	5%	2%	0%
Aydın	Eskihisar	**Nižinska**	3%	18%	3%	3%	2%	11%	4%	5%	2%	0%
Aydın	Malgaçmustafa	**Dolinska**	4%	17%	3%	4%	1%	9%	4%	4%	1%	0%
İzmir	Durmuşlar	**Obalna**	4%	24%	2%	3%	1%	13%	3%	5%	2%	0%
İzmir	Karalar	**Dolinska**	3%	19%	2%	3%	2%	11%	3%	3%	1%	2%
İzmir	Kozluca	**Na pobočju**	4%	19%	3%	4%	2%	14%	4%	4%	2%	0%
İzmir	Tırmanlar	**Na pobočju**	4%	19%	3%	3%	1%	8%	4%	4%	2%	0%
İzmir	Balıklıova	**Obalna**	4%	16%	3%	3%	1%	9%	3%	2%	3%	1%
İzmir	Barbaros	**Nižinska**	4%	17%	4%	3%	1%	13%	4%	3%	2%	0%
İzmir	Birgi	**Nižinska**	3%	16%	2%	3%	0%	10%	4%	3%	1%	0%
İzmir	Ildır	**Obalna**	4%	21%	3%	3%	0%	7%	3%	5%	3%	0%

Okrožje	Vas	Tip vasi	Skupna ocena: 2.070					
			Skupaj	Skupni odstotek	Ocena naravnih parametrov	Naravni par.ametri/skupni odstotek	Ocena grajenih parametrov	Grajeni par.ametri/skupni odstotek
Afyon	İlyaslı	**Dolinska**	1292	0.62	762	36.8%	530	25.6%
Afyon	Ortapınar	**Dolinska**	1048	0.51	585	28.3%	463	22.4%
Afyon	Güneytepe	**Na pobočju**	881	0.43	467	22.5%	414	20.0%
Afyon	Başören	**Dolinska**	1053	0.51	601	29.0%	452	21.8%
Afyon	Ağzıkara	**Nižinska**	915	0.44	470	22.7%	445	21.5%
Kütahya	Dedeköy	**Nižinska**	1048	0.51	503	24.3%	545	26.3%
Kütahya	Yaylaköy	**Hribovske**	1029	0.50	480	23.2%	549	26.5%
Kütahya	Işıklar	**Na pobočju**	1219	0.59	628	30.3%	591	28.6%
Kütahya	Kayacık	**Dolinska**	1221	0.59	562	27.1%	659	31.8%
Kütahya	Yunuslar	**Na pobočju**	972	0.47	483	23.3%	489	23.6%
Manisa	Börtlüce	**Na pobočju**	1150	0.56	598	28.9%	552	26.7%
Manisa	Emre	**Nižinska**	1212	0.59	572	27.6%	640	30.9%
Manisa	İncesu	**Nižinska**	1234	0.60	578	27.9%	656	31.7%
Manisa	Saraçlar	**Na pobočju**	1094	0.53	582	28.1%	512	24.7%
Muğla	Bozburun	**Obalna**	1280	0.62	752	36.3%	528	25.5%
Muğla	Selimiye	**Obalna**	1169	0.56	729	35.2%	440	21.3%
Muğla	Turgutköy	**Nižinska**	1088	0.53	588	28.4%	500	24.2%
Aydın	Baklaköy	**Nižinska**	1047	0.51	575	27.8%	472	22.8%
Aydın	Çiftlikköy	**Nižinska**	928	0.45	460	22.2%	468	22.6%
Aydın	Menteşeler	**Dolinska**	1059	0.51	549	26.5%	510	24.6%
Aydın	Eskihisar	**Nižinska**	1048	0.51	506	24.4%	542	26.2%
Aydın	Malgaçmustafa	**Dolinska**	994	0.48	519	25.1%	475	22.9%
İzmir	Durmuşlar	**Obalna**	1122	0.54	536	25.9%	586	28.3%
İzmir	Karalar	**Dolinska**	1146	0.55	621	30.0%	525	25.4%
İzmir	Kozluca	**Na pobočju**	1126	0.54	555	26.8%	571	27.6%
İzmir	Tırmanlar	**Na pobočju**	968	0.47	483	23.3%	485	23.4%
İzmir	Balıklıova	**Obalna**	1194	0.58	733	35.4%	461	22.3%
İzmir	Barbaros	**Nižinska**	1124	0.54	601	29.0%	523	25.3%
İzmir	Birgi	**Nižinska**	997	0.48	568	27.5%	429	20.7%
İzmir	Ildır	**Obalna**	1210	0.58	700	33.8%	510	24.6%

Slika 8: Matrika in indeksi krajinske identitete 30 proučevanih vasi (ilustracija: Hasan Serdar Kaya in Ezgi Güler Tozluoğlu)



Slika 9: Primer vizualne ocene in vrednosti indeksov ene izmed proučevanih vasi (ilustracija: Meltem Erdem Kaya)

Preglednica 7: Faktorji naravne krajinske identitete

Faktor	Opis
1	Rastlinstvo v odvisnosti od nadmorske višine
2	Gostota rastlinstva
3	Obvodno rastlinstvo
4	Kmetijske površine na pobočjih
5	Porasle skalnate površine
6	Rastlinstvo na obalnih območjih
7	Geološka zgradba

Preglednica 8: Faktorji grajene krajinske identitete

Faktor	Opis
1	Meje med zemljišči v grajenem okolju
2	Oblika gradnje
3	Meje v naravnem okolju
4	Zunanje značilnosti podeželske krajine
5	Kmetijska krajina
6	Tipologija stavb
7	Prevladujoče prvine
8	Naravni viri
9	Ukrepi proti eroziji
10	Skupni prostor

Najnižji indeks fizične krajinske identitete med vsemi 30 vasmi (tj. 0,43) je imela vas Güneytepe v okrožju Şuhut province Afyonkarahisar. Vzrok za to so zlasti propadajoče grajeno okolje v vasi, ki leži ob vznožju hriba, intenzivni in pogosti gradbeni posegi, ki se ne ujemajo z lokalno identiteto, in neurejen odprt prostor v vasi.

Javni prostori lokalne skupnosti, kot so trgi, dvorišča in vrtovi pred mošejami, se v številnih proučevanih vaseh še vedno aktivno uporabljajo. Vaški trg je pomembno zbirališče, zlasti ob porokah in obredih obrezovanja, v nekaterih vaseh pa se še vedno uporablja za skupna opravila (npr. v vasi Emre).

3.1 Faktorska analiza 30 vasi

Med terenskimi raziskavami so bili proučeni fizični podatki, s faktorsko analizo pa so bile podobne komponente združene v skupine. Začetnih 18 spremenljivk naravne identitete je bilo združenih v 7 faktorjev, 29 spremenljivk grajene krajinske identitete pa v 10 faktorjev.

3.1.1 Faktorska analiza komponent naravne identitete

Po opredeljenih sedmih faktorjih naravne krajinske identitete so lastne vrednosti začele padati (z 1,015 na 0,7), zato je bilo v analizi uporabljenih sedem faktorjev. Prvi faktor je vključeval komponente stepa, makija, sklenjeno grmičevje, skupine grmičevja, nadmorska višina in vodni viri. Drugi faktor je vključeval gozd in sklenjena drevesa, tretji skupino dreves, posamična drevesa in obvodno rastlinstvo. Četrti faktor je vključeval pobočje in kmetijske površine, peti travišča in skalnate površine (zadnje imajo negativno vrednost), šesti faktor pa peščene sipine in posamično grmičevje. Sedmi faktor se je nanašal na geološko zgradbo (preglednica 7).

3.1.2 Faktorska analiza grajenih parametrov krajinske identitete

S faktorsko analizo je bilo pridobljenih deset faktorjev. Prvi se nanaša na naravne materiale, ki se uporabljajo za gradnjo hiš in razmejitvenih zidov. Drugi faktor se nanaša na gostoto in obliko naselij, tretji vključuje raznovrstna drevesa, drevesa iste vrste in mejice, četrti pa produktivno krajino, vrtove, stanovanjske prizidke v vrtovih in značilnosti pritalnega rastlinstva. Peti faktor kot parametra vključuje njive in oljčnike, šesti bivališča in značilne nestanovanjske objekte, kot so mošeje, sedmi prevladujoča osamela drevesa in vodne objekte. Osmi faktor sestavljajo pašniki in gozd, devetega ukrepi proti eroziji. Deseti faktor vključuje samo en parameter: odprt prostor (preglednica 8).

3.2 Razvrščanje 30 vasi v skupine

Po faktorski analizi so avtorji na podlagi vrednosti faktorjev naravne in grajene krajinske identitete vasi razvrstili v skupine. Primerjava osnovnih morfoloških značilnosti vasi med skupinami je pokazala, da so skupine vključevale vasi različnih morfoloških tipov. Ta ugotovitev podpira hipotezo, da se lahko vasi na podlagi podatkov o grajeni krajinski identiteti združujejo v različne skupine. Dejstvo, da so bile dolinske in nižinske vasi ter vasi ob vznožju hribov in na pobočjih vključene v več skupin kot druge, kaže, da so geografske značilnosti manj pomembne od drugih. Hribovske in obalne vasi so bile razvrščene v dve skupini. Glavni razlog za to je dejstvo, da so obalne vasi po navadi najbolj dostopne, hribovske pa najmanj; razlikujejo se v stopnji razvoja, pri čemer je v obalnih vaseh glavna gospodarska panoga turizem, v hribovskih pa prevladujeta živinoreja in poljedelstvo. Hribovske in obalne vasi se od drugih vasi razlikujejo po številu prebivalstva, naravni krajini in rastlinstvu. Ustvarjene skupine izražajo raznovrstno identiteto vasi. Podrobnejša analiza pokaže podobnosti med vasmi v posamezni skupini in med skupinami. Zato ta razvrstitev ne more biti alternativa geomorfološki klasifikaciji. Oblikovane skupine kažejo, da se lahko vasi združujejo v skupine, če se vrednotijo z različnih vidikov in večjim številom parametrov. Tako večdimenzionalno strukturo bi bilo treba upoštevati tudi pri vrednotenju vasi.

4 Sklep

Avtorji so z raziskavo, ki se je osredotočala na krajinsko identiteto, poskušali odgovoriti na tri raziskovalna vprašanja. Prvo se je nanašalo na opredelitev krajinske identitete, ki so jo avtorji predstavili in proučili kot celostni pristop k določanju značilnosti podeželskih naselij. Podeželska naselja odsevajo življenjske sloge, povezane s produktivno krajino in naravnim okoljem. V njih se zaradi pragmatičnih prilagoditev naravnim razmeram razvijejo edinstveni kulturni vzorci. Avtorji so podeželska naselja obravnavali kot prostorske enote s produktivno krajino, z uporabljenim pristopom določanja krajinske identitete pa so poudarili povezanost kulture z naravno krajino. S tega vidika so krajinsko identiteto razdelili v fizično in družbeno. Pri drugem raziskovalnem vprašanju so proučevali, ali se lahko parametri krajinske identitete kvantitativno merijo. Predlagali so metodo, s katero so poskušali objektivno pokazati, zaradi katerih parametrov je posamezno naselje izjemno in vredno, da se zavaruje. Metoda poleg tega omogoča primerjavo naselij z vidika krajinske identitete. Matrika krajinske identitete, ki so jo izdelali za 30 proučevanih podeželskih naselij, vsebuje vrednosti indeksov za vsak parameter, s čimer odgovarja na drugo in tretje raziskovalno vprašanje ter dokazuje, da imajo lahko vasi na istem geografskem območju različno krajinsko identiteto. Ta ugotovitev potrjuje prvo in četrto hipotezo raziskave. Matrika poleg tega kaže, da so naravno okolje, podeželska raba zemljišč in arhitekturne značilnosti najpomembnejši parametri krajinske identitete, ki so poleg ohranjenih družbenih vzorcev še vedno v podeželskih naseljih, vendar jih ogroža urbanizacija. Razumevanje teh podeželskih značilnosti je v čedalje bolj urbaniziranem svetu ključno za varovanje vrednot in nadziranje razvoja. Avtorji zato predlagajo, da se vrednotenje krajinske identitete lahko uporabi kot raziskovalni pristop, metoda ali način razmišljanja o podeželskih območjih, na podlagi česar se lahko določijo regionalne in lokalne značilnosti območij, ter kot orodje za spodbujanje trajnostnega razvoja podeželja.

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Območja izboljšanega poslovanja in njihov vpliv na teritorialne blagovne znamke: študije primera

Številna mesta po svetu svoja središča upravljajo z uporabo območij izboljšanega poslovanja. Avtorji so v članku analizirali vpliv teh območij na teritorialne blagovne znamke mest. S študijami primera so na podlagi matrike teritorialne blagovne znamke v okviru regionalnega razvoja kvalitativno analizirali izbrana območja izboljšanega poslovanja. Njihovi izsledki so potrdili, da imajo ta območja v regionalnem razvoju vlogo vsestranskih teritorialnih blagovnih znamk in vplivajo na strateške razprave ter lokalni, regionalni in mednarodni ugled mesta. Raziskava je pokazala, da območja izboljšanega poslovanja pomembno krepijo blagovno znamko svojih mest, za kar prejemajo podporo na različnih ravneh. Poleg tega je razkrila, da imajo ta območja ključno vlogo v političnih in kulturnih razpravah, ki so del procesov mestnega in regionalnega razvoja.

Ključne besede: območja izboljšanega poslovanja, teritorialna blagovna znamka, upravljanje mestnih območij, mestni in regionalni razvoj, prenova mest

1 Uvod

Razprave s področja mestnega in regionalnega razvoja vključujejo najrazličnejše vidike. V razpravah, ki obravnavajo povezave med lokalnim in globalnim, se pojavlja kulturni vidik, in to kot podaljšek političnega vpliva (Williams, 2011). V zapletenih mestnih in regionalnih procesih imajo ključno vlogo teritorialne blagovne znamke, in to v okviru regionalnega razvoja (Almeida, 2018) in z vidika območja izboljšanega poslovanja (Charenko, 2015; Guimarães, 2021).

Območja izboljšanega poslovanja (ang. *business improvement districts,* BID) so mestne upravljavske strukture, ki so se v Kanadi pojavile v šestdesetih letih 20. stoletja (Mitchell, 2008). Temeljijo na načelu, da morajo zasebna podjetja na posameznem geografskem območju financirati upravljavski organ, ki razvija aktivnosti, s katerimi se krepi privlačnost območja. Financiranje po navadi traja pet let, nato pa se lahko območje izboljšanega poslovanja (v nadaljevanju: OIP) obnovi (Guimarães, 2018).

Raziskave kažejo, da imajo lahko OIP prek raznovrstnih mehanizmov, kot so privatizacija javnih prostorov in mestne infrastrukture, urbana revitalizacija (Serin idr., 2020) ali institucionalizacija regij (Zimmerbauer, 2013), vključno z okrožji, pomembno vlogo pri komodifikaciji mestnih območij. Vse našteto ima gospodarske posledice (Dotti idr., 2021; Kim idr., 2023) in vpliva na oblikovanje mestnih regij (Salder, 2020).

V raziskavi, predstavljeni v tem članku, so avtorji proučevali vlogo OIP kot polzasebnih subjektov pri oblikovanju teritorialnih blagovnih znamk območij, na katerih delujejo, in pri splošnem znamčenju mestnih območij. Pomen OIP je razviden tudi na mednarodni ravni, zlasti iz projektov, izvedenih v ZDA. Poleg tega imajo precejšen vpliv na urbanistično odločanje. Aktivnosti, ki se izvajajo v okviru OIP, so se sčasoma razvijale in širile (Silva in Cachinho, 2021), tako da danes ne vključujejo več samo funkcionalnih vidikov, ampak tudi posege, kot so pobude za polepšanje območij in sodelovanje pri strateškem urbanističnem odločanju, ki vpliva na strukturo upravljanja mest. OIP torej niso samo javno-zasebni subjekti, ampak imajo tudi pomembno vlogo pri upravljanju regij in mest.

Avtorji v članku torej OIP obravnavajo kot sestavni del upravljanja, s čimer jih umeščajo v okvir kvazijavnih subjektov (Ratcliffe in Flanagan, 2004; Zieberth, 2020). Z izvajanjem aktivnosti, ki vplivajo na podobo območja, OIP pomagajo izboljšati poslovno okolje zadevnega območja, ga ločijo od konkurenčnih območij in aktivno sodelujejo pri ustvarjanju teritorialne blagovne znamke razvojnega območja. Njihov vpliv sega dlje od gospodarskega področja, saj zagotavljajo tudi večjo etnično in kulturno raznovrstnost, ki je v današnji urbani družbi prepoznana kot vrednota (Schmiz, 2017), ki vpliva na strategije upravljanja krajev (Anholt, 2010) in urbane ustvarjalne dejavnosti (Uršič, 2021).

Avtorji so v članku predstavili izsledke, ki potrjujejo pomembno vlogo OIP pri upravljanju. Osredotočili so se na pojem teritorialne blagovne znamke in postavili hipotezo, da aktivnosti OIP izražajo strategijo teritorialne blagovne znamke. Pri tem so izpostavili simbolični pomen teritorialne blagovne znamke, v okviru katere se usklajujejo in povezujejo družbeni akterji in lokalne zgodbe (Almeida, 2018). Tovrstne znamke imajo pomembno vlogo pri ustvarjanju občutka pripadnosti (Martin in Capelli, 2018; Pedeliento in Kavaratzis, 2019; Jain idr., 2022), določanju mej (Scott in Sohn, 2019) – kot prostori, ki jih opredeljujejo razmerja moči (Raffestin, 1993), in pri oblikovanju teritorialne identitete (Jiménez-Medina idr., 2020; Ramos in Royuela, 2020). Te znamke so poleg tega vključene v pobude znamčenja mestnih območij, katerih cilj je oblikovati identiteto krajev, na katero vpliva domišljija mestnih prebivalcev (Donald in Kofman, 2008; Kourtit idr., 2020). Navedeno presega tradicionalno trženje mest (Gotham, 2007) in z njim povezane aktivnosti.

Avtorji so v raziskavi z več študijami primerov (glej Yin, 2015) proučili izbrana OIP v Angliji. Pri tem so uporabili matriko teritorialne blagovne znamke v okviru regionalnega razvoja, ki jo je razvila Giovana Almeida (2024). Matrika je bila prej uporabljena v literaturi o znamčenju, avtorji pa so jo v tej raziskavi na podlagi podatkov, pridobljenih na spletu, uporabili za področje urbanizma.

2 Ozadje

2.1 Območja izboljšanega poslovanja

Dinamični razvoj mest se kaže tudi v spreminjanju njihove hierarhične zgradbe. Območja izboljšanega poslovanja (OIP) imajo pri tem ključno vlogo, saj delujejo kot mehanizmi revitalizacije, ki jih izvajajo podjetniki na posameznih mestnih območjih in odobrijo državne oblasti. Število raziskav o OIP se je po letu 2000 resda močno povečalo, a se večinoma osredotočajo na angloameriško okolje (Silva idr., 2022).

Na splošno OIP vključujejo zlasti pobude za prenovo mest (Grail idr., 2020). Guimarães (2021) ugotavlja, da se avtorji, ki pišejo o OIP, osredotočajo na štiri glavne vidike: upravljanje mest, prenos politik, vrste OIP in območja, na katerih se izvajajo modeli OIP, ter aktivnosti, ki potekajo na zadevnem območju. Vsi ti vidiki so značilni za OIP kot neoliberalni

mehanizem poseganja v mestni prostor (Wee, 2016; Richner in Olesen, 2019).

Raziskave o OIP in njihovi vlogi pri upravljanju mest poudarjajo preobrazbene posledice OIP za upravljavsko strukturo posameznega območja. Uspešnost OIP je precej odvisna od doseženega soglasja med javnimi in zasebnimi deležniki, ki je pogosto izraženo v obliki javno-zasebnih partnerstev. Ta hkrati zmanjšujejo vlogo države pri zagotavljanju javnih storitev, kar nakazuje premik od vladanja k upravljanju (Cook, 2009). Ker se v okviru OIP izvajajo javne aktivnosti in storitve, sta Justice in Skelcher (2009) OIP označila za kvazivladne subjekte.

V raziskavah se vključenost OIP v upravljanje posameznih mestnih območij obravnava s treh vidikov (Morçöl idr., 2014). Nekateri raziskovalci proučujejo OIP kot instrumente javnih politik, usklajene s strategijami mestne prenove, pri kateri je poudarek na gradnji novih nakupovalnih središč (Guimarães, 2021). Drugi analizirajo OIP kot ključne akterje upravljanja posameznih mestnih območij (Briffault, 1999), nekateri pa jih obravnavajo kot zasebne subjekte, ki upravljajo javne prostore. Čeprav OIP nimajo neposrednega vpliva na javni sektor in delujejo podobno kot zasebni sektor, hkrati upravljajo zamejene javne prostore (De Magalhães, 2014), kar odpira razprave o tem, da bi morali prevzeti odgovornost za svoja dejanja in uspešnost (Farhat, 2012; Unger, 2017).

Model OIP postaja v svetu čedalje pomembnejši, saj ga uvaja čedalje več držav. Nekateri raziskovalci se ukvarjajo z njegovim prenosom (Peyroux idr., 2012). Model OIP naj bi se razvil v Torontu, na območju poslovnega razvoja soseske Bloor West Village (Charenko, 2015). Mesta, kot je New York, poudarjajo pomen OIP in s tem vplivajo na druge države, da tudi te uvajajo podobne modele (Sutton, 2014). Ključni akterji pri prenosu modela OIP, kot so odločevalci in urbanisti, izpostavljajo OIP kot modele dobre prakse na področju prenove mestnih središč (Stein idr., 2017). Nekatere raziskave se osredotočajo na geografski okvir uvedbe OIP, na primer na Južno Afriko (Kaye-Essien, 2020), Nemčijo (Kreutz, 2009) in Švedsko (Cook in Ward, 2012). Vsaka država mora za uvedbo OIP sprejeti posebno zakonodajo, ki ureja obvezno financiranje izvedbe poslovnih načrtov OIP. Zaradi prilagajanja različnim pravnim okvirom so med OIP razlike, ki izražajo nacionalne, regionalne in lokalne posebnosti.

Z vidika vrst OIP in območij, na katerih se ti modeli izvajajo, kot tretjega področja raziskav, mesta po navadi veljajo za najprimernejša območja za izvajanje projektov OIP (Ruffin, 2008; Grail idr., 2020). Modeli OIP se večinoma uporabljajo v mestnih okoljih, kjer je njihov cilj izboljšati uspešnost podjetij (Sutton, 2014; Pitkeathley, 2019). Raziskave o OIP, opravljene v Milwaukeeju (Ward, 2007), Malmöju (Kronkvist in Ivert, 2020), New Yorku (Yoon in Byun, 2020) in drugih mestih, so se osredotočale na ožje zamejena območja, kot je središče mesta (npr. Ward, 2007; Coca-Stefaniak in Carroll, 2015; Unger, 2017).

Četrto raziskovalno področje se osredotoča na aktivnosti, ki se izvajajo v okviru OIP. V zadnjih letih se je nabor teh aktivnosti močno razširil, pri čemer je treba opozoriti, da so zelo raznovrstne in tesno povezane z značilnostmi vsakega območja in sposobnostmi projektnih vodij. Povsod pa imajo pomemben vpliv na to, katere aktivnosti imajo prednost, finančna sredstva, dodeljena projektom.

Na podlagi vseh navedenih osnovnih predpostavk glede OIP je bila oblikovana podrobna tipologija pobud, ki so usmerjene predvsem v krepitev poslovnega okolja. V tej tipologiji (Gross, 2005; MacDonald idr., 2013) je model OIP v ospredju kot idealni pristop k mestni prenovi, ki temelji na gradnji novih trgovskih središč (Lloyd idr., 2003), ali kot učinkovit model gospodarskega razvoja (Elmedni idr., 2018). Na splošno lahko aktivnosti, ki se izvajajo v okviru OIP, opredelimo kot čiste, zelene in varne (De Magalhães, 2012). V Veliki Britaniji (Silva in Cachinho, 2021) lahko njihove aktivnosti poleg sodelovanja pri projektih prenove mest ter družbenih in skupnostnih pobudah vključujejo tudi poslovno lobiranje, digitalno izobraževanje ter trženje in znamčenje območij. Pri trženju in znamčenju mora biti poudarek na trženjskih akcijah in animacijah, katerih cilj je povečati privlačnost območja. Na področjih tako znamčenja območij kot teritorialnih blagovnih znamk so potrebne nadaljnje raziskave, ki bi omogočale boljše razumevanje vloge OIP pri oblikovanju in krepitvi teritorialnih blagovnih znamk.

Pri teoretični analizi OIP je treba opozoriti še na dvoje. Prvič, čedalje več avtorjev kritizira OIP. Richner in Olesen (2019) ter Valli in Hammami (2021) na primer trdijo, da lahko projekti OIP povzročajo privatizacijo in gentrifikacijo območij, na katerih se izvajajo. Zelo pomembne so razprave o tem, ali lahko posegi v okviru OIP izboljšajo mestno okolje in hkrati omogočajo dostop do izboljšanih predelov za vse prebivalstvo. Drugič, pravni okviri, potrebni za uvedbo modela OIP, se med državami razlikujejo. Ob upoštevanju razlike med OIP v Severni Ameriki, Veliki Britaniji in na drugih območjih ter razlik med tistimi v Angliji in na Škotskem so se avtorji tega članka osredotočili na OIP v Angliji, ki imajo enake osnovne pravne temelje. Pri tem so iz raziskave namenoma izključili OIP v Londonu, in sicer zaradi posebnosti v pravnem okviru.

2.2 Znamčenje območja in teritorialna blagovna znamka

Pojmi, kot so znamčenje območja (ang. *place branding*), blagovna znamka območja (ang. *place brand*) in teritorialna bla-

govna znamka (ang. *territorial brand*), se razumejo in uporabljajo zelo različno (Anholt, 2010). Almeida (2018) ugotavlja, da se v Braziliji znamčenje območja razume kot oblika strateškega upravljanja blagovnih znamk, ne kot samostojen izdelek (tj. teritorialna blagovna znamka). Na Portugalskem izraza znamčenje območja in teritorialna blagovna znamka pomenita isto, kar kaže, da se terminologija razlikuje glede na državo ali geografsko lokacijo (Ntounis in Kavaratzis, 2017). Anholt (2010) poudarja, da se znamčenje območja razlikuje od pojma blagovne znamke, kot je obravnavan v literaturi s področja marketinga, saj vključuje upravljanje ugleda in podobe območja ter se zato nanaša na veliko več kot samo prepoznavni znak ali logotip. Razprave o različnih pomenih izrazov so ključne za proučevanje tako znamčenja območij kot teritorialnih blagovnih znamk, saj lahko nejasnosti zmedejo bralce, ki so strokovnjaki na področju blagovnih znamk (Almeida, 2018). Težave so tudi pri izrazih območje (ang. *place*), regija (ang. *region*) in teritorij (ang. *territory*), ki imajo v geografiji točno določen pomen (Raffestin, 1993; Santos, 1996). Pri uporabi na področju znamčenja območij se lahko zaradi nerazumevanja pomenskih razlik med njimi pojavijo teoretične in praktične napake. Pojem teritorialne blagovne znamke v okviru regionalnega razvoja se nanaša na ciklični proces vzpostavljanja ali oblikovanja razmerij moči (Almeida, 2018), pri čemer presega gole družbene konstrukte in razmerja na posameznem območju in zunaj njega. Teritorialne blagovne znamke so strateško orodje, s katerim akterji, ki sodelujejo pri upravljanju posameznega območja, upravičujejo svoje diskurze (Almeida, 2018).

V okviru teritorialnega ali regionalnega razvoja se povezave med blagovno znamko in območjem analizirajo s treh vidikov: z vidika blagovnih znamk na območju, območij blagovnih znamk in območja kot blagovne znamke (Almeida, 2015). Znamčenje območja se sklada z zadnjim vidikom, saj se nanaša na pristop upravljanja blagovnih znamk, ki upošteva posamezno območje. Ključno se je zavedati, da tako kot izdelek in blagovna znamka (Kotler, 2001) tudi pojma znamčenje območja in teritorialna blagovna znamka ne pomenita isto. Znamčenje območja se nanaša na upravljanje kolektivnega izdelka (tj. območja), ki ima lahko blagovno znamko ali je nima (Rainisto, 2003; Kavaratzis in Ashworth, 2006; Anholt, 2007), teritorialna blagovna znamka pa je produkt znamčenja območij (Almeida, 2018).

Razumevanje teh temeljnih razlik je pomembno, saj je teritorialna blagovna znamka glavna tema razprav s področja znamčenja, marketinga, politične diplomacije, mestnega in regionalnega razvoja, uprave itd., kar potrjuje njeno interdisciplinarno naravo. V literaturi s področja znamčenja območij se je blagovna znamka v preteklosti običajno proučevala zlasti z gospodarskega vidika (Kotler, 2001; Anholt, 2007; Kavaratzis, 2015), v zadnjem času pa se čedalje pogosteje obravnava v okviru javne politike (Lucarelli, 2018) in kulturologije (Almeida, 2018).

Ključno je razlikovanje med blagovno znamko in logotipom, saj je logotip samo sestavina blagovne znamke, ne blagovna znamka kot taka (Aaker, 1996). Pri mnogih teritorialnih blagovnih znamkah je poudarek na trženju območij (Kotler, 2001) z namenom krepitve gospodarskega razvoja, kar je pogosto sestavni del strategij samopromocije lokalnih oblasti. V Latinski Ameriki se blagovna znamka pogosto uporablja kot promocijska prvina, zaradi česar ima kratko življenjsko dobo (Almeida, 2018). Nasprotno pa se v Evropi blagovna znamka dojema institucionalno in z dolgotrajnega vidika (Semprini, 2010). Posledica uporabe blagovne znamke za neko območje brez ustreznega upravljanja (tj. znamčenja območja) ali zgolj za označevanje ne glede na velikost območja je pogosto kratkotrajen logotip, ne trajna blagovna znamka (Almeida, 2018).

V tem konceptualnem okviru se teritorialna blagovna znamka na področju regionalnega razvoja nanaša na skupek simbolov, kultur in identitet, načrtno preoblikovanih v prepoznavne znake (blagovne znamke), ki so lahko vizualni, besedilni ali mešani (vizualno-besedilni) ter omogočajo oblikovanje strategij, ki ustvarjajo razmerja moči na nekem območju in zunaj njega (Almeida, 2018, str. 244). Strategije so orodja, ki omogočajo doseganje zastavljenih ciljev (Seitan, 2018), vključno z oblikovanjem, ohranjanjem ali spreminjanjem teritorialnih blagovnih znamk, s katerimi se lahko strateško ohranjajo teritorialna identiteta (Almeida, 2018) in sodobne mestne dobrine.

3 Metodologija

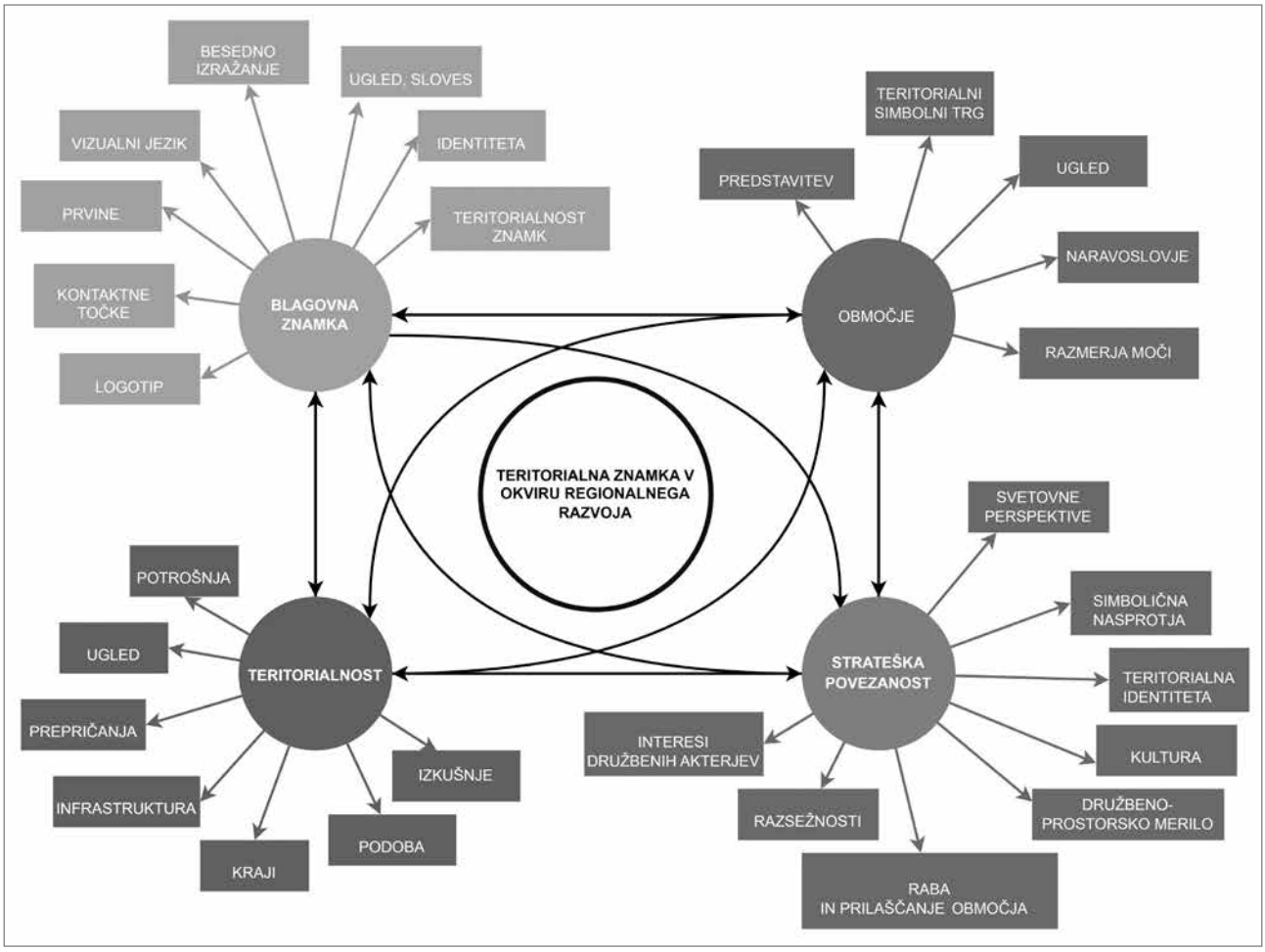
Velik del raziskav o OIP predpostavlja močno povezavo med OIP in teritorialnimi blagovnimi znamkami na območjih, na katerih se izvaja OIP. Raziskava, predstavljena v tem članku, temelji na induktivni kvalitativni metodi in sekundarnih podatkih, pridobljenih iz uradnih dokumentov štirih OIP v Angliji (v Manchestru, Bristolu, Leicestru in Norwichu). Manchester leži na severozahodu, Leicester v regiji East Midlands, Norwich na vzhodu in Bristol na jugozahodu Anglije. Avtorji v analizo niso vključili londonske regije, saj so tamkajšnja OIP del drugačne upravljavske strukture, zaradi česar se težko primerjajo z OIP v drugih angleških mestih. Razen Norwicha, ki ima manj kot 100.000 prebivalcev, so vsa mesta srednje velika (preglednica 1).

Čeprav je prvoomenjeno mesto največje, ima na zamejenem OIP najmanj ljudi, ki plačujejo prispevke, namenjene projektom na tem območju. Vseeno to ne zmanjšuje pomena tega OIP, saj vključuje glavne trgovske ulice v mestu in na okoliškem metropolitanskem območju. Preostala tri OIP imajo

Preglednica 1: Splošni podatki o analiziranih mestih in njihovih OIP

Mesto	Št. prebivalcev	Št. mandatov OIP	Št. plačnikov	Proračun (letno povprečje, v GBP)	Območje izvajanja
Manchester	389.000 (metropolitanski okraj)	Dva (2013–2018, 2018–2023)	Več kot 400	1,000.000	Mestno središče
Bristol	323.000 (enotna uprava)	Eden (2017–2022)	763	1,212.000	Mestno središče
Leicester	230.000 (enotna uprava)	Eden (2018–2023)	714	850.000 (4,268.989 v petletnem obdobju)	Mestno središče
Norwich	96.000 (nemetropolitanski okraj)	Dva (2012–2017, 2017–2022)	Več kot 700	1,147.466	Mestno središče

Vir: avtorji



Slika 1: Matrika teritorialne znamke v okviru regionalnega razvoja (vir: Almeida, 2024, prevedeno v slovenski jezik)

po približno 700 plačnikov namenskih prispevkov, poleg tega imajo podoben letni proračun (po približno milijon funtov). Čeprav so štiri izbrana OIP v različnih mestih, so primerljiva z vidika središčne lokacije v mestu in raznovrstnosti gospodarskih dejavnosti na območjih.

Raziskava je temeljila na podatkih, dostopnih na uradnih spletnih straneh posameznih OIP, pri čemer so se avtorji osredotočili na štiri kategorije, povezane s teritorialno blagovno znamko v okviru regionalnega razvoja: blagovno znamko, območje, teritorialnost in strateško povezanost. Kategorije se ujemajo z matriko teritorialne znamke v okviru regionalnega razvoja, ki jo je razvila Giovana Almeida (2018, 2024; slika 1), pri čemer vsako kategorijo določa drug sklop kvalitativnih mikrospremenljivk. Matrika zagotavlja temelj za analizo teritorijev s teritorialno blagovno znamko v okviru regionalnega razvoja, ki se ne osredotoča samo na gospodarski vidik.

Preglednica 2: Kategorija blagovne znamke

Prvina	Manchester	Bristol	Leicester	Norwich
Logotip				
Prvine logotipa	Simbol srca, rdeča in siva barva	Poudarjena črka B, modra barva	Cvet (s petimi venčnimi listi), magentna barva	Niz simetričnih puščic, učinek gibanja
Teritorialnost blagovne znamke	Mestno središče	Mesto	Mestno središče	Lokalno območje in celotna država
Identiteta blagovne znamke	Spodbujanje živosti mestnega središča, gospodarske uspešnosti in podpiranje javnih agencij v mestu. Cilj je izboljšati poslovanje in pritegniti dodatne stranke z raznovrstnimi aktivnostmi, dogodki in storitvami.	Uvedba pomembnih izboljšav za plačnike prispevkov. Cilj je povečati prepoznavnost mestnega središča kot varnega in privlačnega območja, odprtega za vse, ki delajo, študirajo in živijo v mestu.	Preobrazba mestnega središča v prostor, ki bo bolj privlačen za prebivanje, delo, obisk, študij in poslovanje.	Pozicioniranje Norwicha med vodilna britanska mesta.
Verbalni/vizualni jezik	Smo stičišče zasebnega in javnega sektorja.	Bristol bo postal še boljši kraj za vse.	Preobrazba mestnega središča	Mesto zgodb
Ugled, sloves blagovne znamke	Konzorcij vodilnih 400 trgovskih in gostinskih znamk na glavnem nakupovalnem območju	OIP vključuje 763 plačnikov prispevkov. Upravlja ga združenje Visit West. Registrirano je v Angliji in Walesu (št. 3715280).	OIP zastopa 714 podjetij in organizacij	Pojavljanje v uglednih publikacijah, kot sta The Guardian in The Metro, izvedenih 360 digitalnih marketinških akcij. Norwich slovi kot toplo in odprto mesto ter eden najboljših krajev za delo, prebivanje in nakupovanje v Veliki Britaniji.
Kontaktne točke	Twitter, LinkedIn, YouTube, Flickr, Instagram, telefon, e-pošta	Instagram, Facebook, Twitter, LinkedIn, e-pošta	E-pošta, telefon, Twitter	LinkedIn, Twitter, Instagram, e-pošta, telefon

Vir: avtorji na podlagi spletnih strani OIP

Avtorji so podatke analizirali na podlagi matrike teritorialne znamke v okviru regionalnega razvoja (Almeida, 2018, 2024), s katero so proučili povezave med blagovno znamko in območjem. Ob obravnavi OIP kot splošne teritorialne znamke se s to matriko lahko določijo odnosi in povezave v okviru OIP. Raziskava je potekala od avgusta 2021 do oktobra 2023 v sklopu mednarodne študije povezav med OIP, teritorialnimi blagovnimi znamkami ter mestnim in regionalnim razvojem. Model OIP se že uporablja v številnih državah, mnoge države pa še vedno samo razmišljajo o njegovi morebitni vključitvi v urbanistične okvire, tudi Brazilija (Chede Neto, 2021) in Portugalska (Guimarães in Cachinho, 2020).

4 Empirični del

4.1 Blagovna znamka

Na proučevanih OIP so avtorji določili prvine, ki sestavljajo teritorialno blagovno znamko (preglednica 2).

Vsa analizirana OIP imajo logotip, ki grafično predstavlja blagovno znamko. Logotipi se med sabo razlikujejo po obliki in barvi (preglednica 2). Teritorialnost blagovne znamke sega od lokalne do državne ravni (tj. mestnega središča in mesta do države). Pri identiteti svojih blagovnih znamk OIP poudarjajo pomen mestnega središča kot glavnega gonila preobrazbe in ustvarjanja dobrega ugleda. Samo pri OIP v Norwichu je poudarek tudi na širjenju lokalnega ugleda na državno raven.

Preglednica 3: Kategorija teritorija

	Manchester	Bristol	Leicester	Norwich
Meje				
Razmerja moči	Gospodarska in politična	Gospodarska, politična in kulturna	Gospodarska in politična	Gospodarska in politična
Predstavitev	Dogodki, logotip v obliki srca (občutek pripadnosti), različne barve	Modra barva (zaupanje, resnost), dogodki, logotip. Na podlagi prizadevanj in prispevkov naših financerjev ustvarjamo boljše mesto: bolj ljubeče in odprto, varnejše, čistejše, bolj raznovrstno in bolje oglaševano.	Magentna barva (občutek pripadnosti), dogodki, logotip	Dogodki, grafični simboli, logotip
Simbolni teritorialni trg	Da	Da	Da	Da
Ugled	Konzorcij vodilnih 400 trgovskih in gostinskih znamk.	Vključuje 763 plačnikov prispevkov.	OIP zastopa 714 podjetij in organizacij.	Podpora medijev, kot sta The Guardian in The Metro.
Zgodbe	Povezujemo ljudi, projekte in ideje, ki so glavno gonilo gospodarstva v mestnem središču.	Deležniki sodelujejo med seboj, da bi Bristol postal še boljši kraj za vse.	Preobrazba mestnega središča v prostor, ki bo bolj privlačen za prebivanje, delo, obisk, študij in poslovanje.	Mesto zgodb. Pomagamo Norwichu do uspeha.

Vir: avtorji na podlagi spletnih strani OIP

Identiteto blagovne znamke pomaga ustvarjati tudi jezik ali diskurz OIP, ki v Manchestru poudarja javno-zasebno partnerstvo, v Bristolu lokalne izboljšave, v Leicestru urbano preobrazbo in v Norwichu lokalne zgodbe. Ti diskurzi ustvarjajo ugled, ki sloni na blagovni znamki, financerjih, sodelujočih podjetjih ter podpori lokalnih in regionalnih medijev (npr. časopisov *The Guardian* in *The Metro*). Bristolsko OIP poleg tega svoje aktivnosti predstavlja in oglašuje na uradni spletni strani, na kateri je poudarjeno, da je registrirano v Angliji in Walesu. Glavna kontaktna sredstva, ki omogočajo stik med potrošniki in blagovno znamko (OIP), so družbena omrežja, e-pošta in telefon (preglednica 2).

4.2 Teritorij

Vsako OIP zastopa točno določeno območje, ki je predstavljeno na zemljevidu na spletni strani vsakega OIP (preglednica 3). To pomeni, da vsako OIP vključuje omejen lokalni prostor, ki ga določajo zlasti politična in gospodarska razmerja moči.

Kulturni vidik je na spletni strani poudarilo samo bristolsko OIP, in sicer z nizom grafičnih simbolov, podobnih tistim, ki sestavljajo logotip portugalskega mesta Porto (sliki 2 in 3). Med oblikami predstavitve teritorialnih blagovnih znamk so tudi lokalni dogodki, ki jih OIP podpirajo za spodbujanje lokalne potrošnje. OIP na podlagi blagovne znamke ustvarjajo občutek pripadnosti med potrošniki, in sicer z barvami (modra – samozavest, magenta – karizma, rdeča – čustva, črna – resnost in znanje), oblikami (logotipi in grafičnimi simboli), predstavitvami turističnih znamenitosti, katerih cilj je povečati lokalno potrošnjo, in z oglaševalskim jezikom (boljše, pozornejše, bolj odprto, varnejše, čistejše, bolj raznovrstno in bolje oglaševano mesto).

4.3 Teritorialnost (dvojna: blagovna znamka in družbeni akterji)

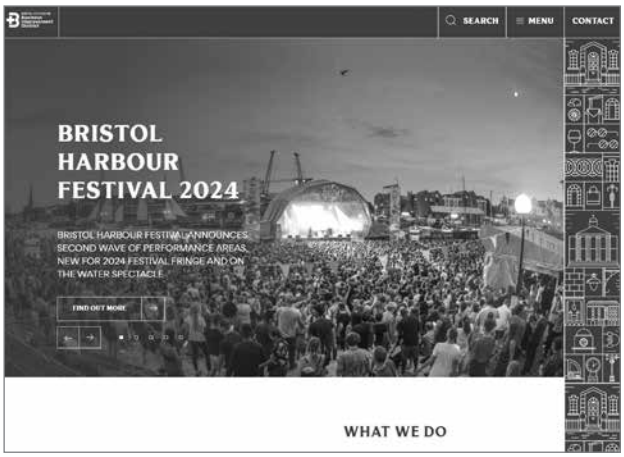
Odnosi med deležniki na proučevanih območjih ustvarjajo teritorialnost, ki se nanaša na rabo in oblike prilaščanja območja z namenom ustvarjanja občutka pripadnosti (preglednica 4).

Podkategorija območje v tej kategoriji se nanaša na prostorsko raven OIP, pri čemer so vsa obravnavana OIP na lokalni (občinski) ravni ali konkretneje v mestnem središču. OIP se tako osredotočajo na mikroraven, nižjo od lokalne ravni, oziroma samo na njen manjši del. Ugled vseh OIP se utrjuje in potrjuje na različne načine (s številom plačnikov prispevkov, vključenih podjetij in omrežij družbenih akterjev). Nadaljnja prvina, ki sestavlja kategorijo teritorialnosti, je prepričanje, da OIP oblikujejo javno-zasebna partnerstva (Manchester) in obetajo izboljšave (Bristol in Leicester), ki mestom omogočajo, da postanejo uspešna (Norwich). Za doseganje teh izboljšav potrebujejo infrastrukturo, ki podpira in upravičuje njihovo teritorialnost, naj bodo to storitve, varnostni ukrepi, razne pobude za pritegnitev strank ali ukrepi za doseganje prijetne, trajnostne in živahnejše podobe območja. Čeprav je poudarek na prostoru, ki ga kolektivno ustvarjajo OIP (tj. na lokalni mikroravni), imajo projekti vpliv na celotno mesto (tj. na lokalno makroraven). V OIP prevladuje gospodarska potrošnja, opazna pa je tudi kulturna potrošnja. OIP utrjujejo podobo svoje blagovne znamke z navajanjem, kolikšen odstotek podjetij je glasoval za njihovo ustanovitev, kdo jih upravlja in koga zastopajo. Na te načine družbeni akterji vzdržujejo svojo teritorialnost na posameznem območju, ki se oblikuje na podlagi izvajanja OIP. Zadnja prvina v tej kategoriji so izkušnje, pri katerih je poudarek na dogodkih in ambasadorjih blagovne znamke.

4.4 Strateška povezanost

Analiza kategorije strateške povezanosti družbenih akterjev je vključevala notranje in zunanje scenarije. Čeprav je za družbene akterje na vseh proučevanih OIP značilen širok svetovni nazor, so njihovi interesi predvsem gospodarski (preglednica 5).

Opazna so simbolična nasprotja z drugimi območji v mestu, saj vsako OIP zase trdi, da je boljše od drugih oziroma da je na najboljšem kraju v mestu ali da je najboljše OIP v mestu. Na splošno je teritorialna identiteta mesta izražena s povezanostjo blagovne znamke z območjem. Družbeno-prostorska raven obravnavanih OIP je lokalna ter lokalna in občinska, samo OIP v Norwichu vključuje lokalno in državno raven. Družbeni akterji imajo v glavnem gospodarske interese, vendar javno-zasebna partnerstva, na podlagi katerih so bila OIP ustanovljena, razkrivajo tudi druge vidike (politične in kulturne), rabe in oblike prilaščanja teritorija (poslovni prostori, točno določeni deli mestnega središča, javno-zasebni prostor, namenjen različni rabi, tudi turistični, pogajanja med deležniki z različnimi interesi itd.).



Slika 2: Domača stran bristolskega OIP (vir: https://bristolcitycentre-bid.co.uk/)

Slika 3: Grafični simboli, ki sestavljajo logotip portugalskega mesta Porto (vir: https://www.cm-porto.pt/marca-porto/marca-porto in http://www.jornalarquitectos.pt/en/journal/uid-4cbbb98c/urbi-et-uber)

Preglednica 4: Kategorija teritorialnosti

	Manchester	Bristol	Leicester	Norwich
Območje	Mestno središče	Mestno središče	Mestno središče	Mestno središče
Ugled	Utrjen	Utrjen	Utrjen	Utrjen
Prepričanja	Javno-zasebno partnerstvo	Spreminjanje mesta v še boljši kraj za vse	Preobrazba mestnega središča	Omogočiti, da postane Norwich uspešno mesto.
Infrastruktura	Najrazličnejše podporne storitve za podjetja	Spodbujanje razvoja mestnega središča kot varnega in prijetnega območja za delo, prebivanje in preživljanje prostega časa.	Razni projekti in pobude, ki pomagajo podjetjem pritegniti nove stranke.	Poskrbeti za viden pozitiven vpliv na živost mestnega središča.
Potrošnja	Poleg gospodarske potrošnje je poudarek tudi na zaznani potrošnji.	Poleg gospodarske potrošnje je poudarek tudi na zaznani potrošnji.	Poleg gospodarske potrošnje je poudarek tudi na zaznani potrošnji.	Poleg gospodarske potrošnje je poudarek tudi na zaznani potrošnji.
Podoba	OIP zastopa interese plačnikov prispevkov.	Logotip je podoben logotipu Porta (grafični simboli).	85 % podjetij je glasovalo za uvedbo OIP.	OIP upravljajo lokalna podjetja za lokalna podjetja. OIP se je kot pravni subjekt izkazalo za zelo inovativno, energično in napredno organizacijo.
Izkušnje	Najpomembnejše trgovske in gostinske znamke v mestu	Ustvarjanje čistejšega in bolj zelenega mesta z večjo dostopnostjo (parkirišča) in ambasadorji, ki skrbijo za njegovo prepoznavnost.	Projekti in dogodki	Poudarjanje izkušnje, ki jo mesto zagotavlja.

Vir: avtorji

Preglednica 5: Kategorija strateške povezanosti

	Manchester	Bristol	Leicester	Norwich
Svetovni nazor	Širok	Širok	Širok	Širok
Simbolična nasprotja	Najboljši kraj v mestu	Najboljši kraj v mestu	Najboljši kraj v mestu	Najboljši kraj v mestu
Teritorialna identiteta	Povezana z mestom	Povezana z mestom	Povezana z mestom	Povezana z mestom
Kultura	Lokalna dediščina teh mest je tesno povezana z industrijo, razen v Bristolu, kjer je povezana s pomorstvom. Vsa mesta se poskušajo uveljaviti kot postindustrijska mesta, pri čemer se osredotočajo na trgovino (in potrošnjo), nove industrije (npr. kreativne industrije), kulturo in umetnost. Na državni ravni je opazen neoliberalni pogled, ki sega v zadnja desetletja 20. stoletja, ko se je začela razvijati kultura javno-zasebnih partnerstev, vzorčni primeri katerih so programi upravljanja mestnih središč in OIP.			
Družbeno-prostorske ravni	Lokalna raven (del mesta)	Lokalna in občinska raven	Lokalna in občinska raven	Lokalna in državna raven
Raba in prilaščanje teritorija	Da	Da	Da	Da
Vidiki	Gospodarski, kulturni, politični, okoljski, družbeni	Gospodarski, kulturni, politični, okoljski, družbeni	Gospodarski, kulturni, politični, okoljski, družbeni	Gospodarski, kulturni, politični, okoljski, družbeni
Interesi družbenih akterjev	Gospodarski	Gospodarski	Gospodarski	Gospodarski

Vir: avtorji

5 Razprava

Avtorji so proučevana OIP obravnavali kot splošne teritorialne blagovne znamke, kar jim je dalo vpogled v zapletena razmerja moči na teh območjih. OIP običajno nastanejo na podlagi političnih in gospodarskih vezi, ki se sčasoma razširijo še na kulturno, okoljsko in turistično raven. Pomembno se je zavedati, da je teritorialna blagovna znamka veliko več kot samo logotip ali vizualna identiteta, saj imajo blagovne znamke, povezane s posameznim območjem, pomembno vlogo v kontekstu teritorialnega razvoja. Ena temeljnih vlog teritorialne blagovne znamke je upravičevanje dejanj družbenih akterjev na posameznem območju. Za vzpostavljanje smiselne povezave med OIP in teritorialno blagovno znamko je zato ključno zavedanje, da OIP nastajajo v prostorih, ki jih zamejuje teritorialni vpliv družbenih akterjev, pri čemer se oblikuje posebna teritorialna identiteta OIP. V okviru teh opredeljenih (materialnih in nematerialnih) meja se v okviru OIP izvajajo izboljšave in razvojni programi, hkrati se vzpostavlja tudi lastna teritorialna identiteta posameznega OIP, ki se lahko razume kot oblika teritorialne blagovne znamke, čeprav tradicionalno ne predstavlja celotnega mesta, regije ali države.

Da se lahko OIP obravnavajo kot teritorialne blagovne znamke, morajo vključevati štiri kategorije, ki se nanašajo na teritorialne blagovne znamke v okviru regionalnega razvoja. Za njihovo analizo je zato primerna uporaba matrike teritorialne znamke v okviru regionalnega razvoja, ki jo je Giovana Almeida (2024) oblikovala na podlagi razmerij moči, ki jih vsebujejo tovrstne znamke. OIP torej ustvarjajo ugled in podobo posameznega območja v širšem urbanem okviru. Z analizo OIP kot teritorialnih blagovnih znamk, ki se upravljajo v obliki javno-zasebnega partnerstva, torej priznavamo njihov vpliv na oblikovanje in promocijo identitete posameznega mestnega prostora. Ta pogled poudarja vlogo OIP pri določanju podobe in predstavljanju značilnosti posameznega območja, s čimer prispevajo k oblikovanju teritorialne blagovne znamke na mikrolokalni ravni.

Matrika teritorialne znamke v okviru regionalnega razvoja je torej uporabno orodje za proučevanje dinamike moči teritorialnih blagovnih znamk. Ker imajo OIP glavno vlogo pri oblikovanju identitete in promociji lokalnih posebnosti, lahko z omenjeno matriko celoviteje proučimo vpliv OIP na dinamiko moči v mestu. Ta pristop je ključen za razumevanje medsebojnih vplivov med OIP in teritorialnimi blagovnimi znamkami v razvoju mest, vključno z vidnimi in skritimi razmerji moči. Za razumevanje potrebnih pogojev za obnovo petletnih mandatov OIP je ključna cikličnost dinamike moči pri teritorialnih blagovnih znamkah posameznih OIP. Navedena razmerja razkrivajo teritorialnost družbenih akterjev, ki oblikujejo kolektivni prostor, usmerjen v potrošnjo izdelkov in kulture. V tem okviru OIP upravičujejo diskurze družbenih akterjev, s čimer spodbujajo trojno konkurenco: med splošnimi teritorialni blagovnimi znamkami OIP, med OIP in med akterji, ki izvajajo OIP (javnimi in zasebnimi subjekti). Upravičevanje znamke OIP na podlagi diskurza teritorialne blagovne znamke se sklada s predpostavkami Giovane Almeida (2018) glede uporabe, prilaščanja in dinamike območja. Ta strategija se ujema s konceptom območja kot blagovne znamke, ki ga je predlagala (Almeida, 2015).

Analiza OIP vključuje dva vidika. Prvi se nanaša na upravljanje ugleda in podobe območja (znamčenje območja), drugi pa na produkt tega upravljanja, tj. teritorialno blagovno znamko. Pri tem je pomembno ločevati med izrazoma znamčenje območja in teritorialna blagovna znamka, saj prvi vključuje upravljanje, drugi pa je njegov produkt. Analizirana angleška OIP uporabljajo teritorialno blagovno znamko v okviru regionalnega razvoja, pri čemer z edinstvenim simbolizmom strateško spreminjajo identitete v posebne znake (tj. teritorialno blagovno znamko). Tovrstno upravljanje, ki je del znamčenja območij, vključuje načrtovana prizadevanja za oblikovanje strategij, ki ustvarjajo razmerja moči na posameznem območju in zunaj njega (Almeida, 2018).

Analiza matrike teritorialne znamke v okviru regionalnega razvoja poleg tega razkriva pomen OIP pri znamčenju mest. OIP se izvajajo na strogo zamejenih območjih (v mestnih središčih), vpliv teritorialne blagovne znamke pa je precej širši, saj prispeva k boljši prepoznavnosti celotnega mesta. Čeprav imajo angleška OIP jasno gospodarsko komponento, saj jih neposredno financirajo podjetniki, ne poskušajo izboljšati samo gospodarskega okolja, ampak tudi privlačnost območja za bivanje in preživljanje prostega časa. Zdi se torej, da je njihov cilj izboljšati tudi druga območja, ne samo tisto, ki ga obsega posamezno OIP.

Posegi v okviru OIP so podobni urbani akupunkturi, saj se identiteta znamke nanaša na ustvarjanje multiplikacijskih učinkov, ki segajo dlje od ulic, vključenih v OIP. Navedeno je povezano s kategorijo teritorialnosti, saj je območje, v katero se posega, mestno središče, hkrati pa vplivi posegov, izvedeni na tem območju, segajo dlje. OIP torej pozitivno vplivajo tako na mestno središče (območje posegov) kot njegovo okolico, hkrati pa tudi na podobo celotnega mesta. Samo bristolski OIP ima logotip, ki se nanaša samo na zamejeni prostor OIP, tj. ulico Broadmead. Logotipi preostalih treh OIP se nanašajo na celotno mesto. To pomeni, da je cilj, da bi vpliv znamke segal prek občinske ravni, in da je bila znamka oblikovana predvsem za ljudi od drugod, ne za ljudi, ki živijo ali delajo na zadevnem območju.

Raznovrstnost učinkov OIP je lažje razumljiva ob upoštevanju, da OIP niso samo orodja za revitalizacijo gospodarstva, ampak neposredno prispevajo k upravljanju mestnega prostora (Briffault, 1999). OIP zato vključujejo tudi kategorijo strateške povezanosti, zlasti zaradi potrebe po povezovanju interesov zasebnih in javnih akterjev, hkrati pa tudi kategorijo območja, saj je njihov obstoj povezan z dvojnim razmerjem moči. Prvič, to razmerje se nanaša na to, da že omenjeni soobstoj akterjev, ki imajo pogosto različne cilje, v okviru OIP zahteva kompromise. Drugič, zaradi različnih akterjev in razmeroma velike svobode pri izvajanju ukrepov na vsakem območju, ki je po izvoru javno, so OIP podobni upravljavskim subjektom z določeno močjo; ta vidik poudarjajo zlasti raziskovalci, ki se ukvarjajo s tem, kdo je odgovoren za aktivnosti, ki jih razvijajo OIP (Farhat, 2012; Unger, 2017).

Ko je OIP vzpostavljeno in deluje na nekem predelu mestnega središča, lahko ta predel pridobi teritorialno blagovno znamko. V tem primeru v OIP izstopa gospodarska plast moči, čeprav so še druge, manj vidne plasti (npr. družbena) ali plasti, ki ostanejo strateško skrite (npr. politična). Pri povezavi med OIP in teritorialno blagovno znamko je pomembno razjasniti, da ne gre za to, da ima neko območje značilnosti, zaradi katerih postane blagovna znamka, ampak za to, da ko se območje dojema in oglašuje kot subjekt z lastno identiteto, se sam po sebi spremeni v teritorialno blagovno znamko.

Oblikovanje znamke mestnega središča kot rezultat delovanja OIP je zelo pomemben vidik, ki zahteva poglobljeno analizo na podlagi matrike teritorialne znamke v okviru regionalnega razvoja. Ima lahko močne posledice, ne samo z vidika gospodarskih možnosti, ampak tudi družbene kohezije, privabljanja naložb in izboljšanja kakovosti življenja prebivalcev.

Oblikovanje znamke za izbrano območje mestnega središča kot posledice delovanja posameznega OIP vključuje veliko več kot samo ustvarjanje podobe ali ugleda območja, kar dokazuje tudi matrika teritorialne znamke v okviru regionalnega razvoja. OIP kot blagovne znamke namreč obsegajo več kot samo vizualno podobo in vpliv na gospodarski razvoj (spodbujanje naložb, turizma in lokalne trgovine), saj postanejo tudi gonilo družbenega in kulturnega razvoja, čeprav je obseg njihovih vplivov lahko različen.

6 Sklep

OIP imajo po svetu čedalje pomembnejšo vlogo pri upravljanju območij v mestnih središčih. So več kot samo javno-zasebni subjekti, vključeni v upravljanje mest. Njihova čedalje večja vloga je vidna zlasti v državah z uveljavljenimi modeli OIP. Podobno velja tudi za teritorialne blagovne znamke, ki so v Evropi in Severni Ameriki že dobro uveljavljene, drugod pa imajo kratek rok trajanja (npr. v Braziliji so šele v zametkih). Matrika teritorialne znamke v okviru regionalnega razvoja, ki jo je oblikovala Giovana Almeida (2018, 2024), razkriva jasne povezave med družbenimi akterji, območji in OIP, kar potrjuje, da je učinkovito orodje za analizo OIP.

Avtorji so v članku proučevali, ali OIP vplivajo na teritorialno blagovno znamko lokacij, na katerih se izvajajo. Ugotovili so, da imajo spletni komunikacijski kanali OIP dvojni namen: funkcionalno širijo informacije v več smeri ter vzpostavljajo in utrjujejo teritorialno blagovno znamko OIP. Analizirana območja so zamejena s teritorialnimi blagovnimi znamkami, kar pomeni, da imajo OIP fizične meje in vključujejo območje, ki ga zamejujejo različna razmerja moči, ki so večinoma gospodarske in politične narave. Strateška povezanost OIP vključuje notranje in zunanje scenarije ter večinoma gospodarske, politične in kulturne interese. Avtorji so lahko do teh ugotovitev prišli samo tako, da so OIP obravnavali kot teritorialne blagovne znamke in upoštevali različna razmerja moči na teh območjih.

Članek omogoča boljše teoretično razumevanje OIP in teritorialnih blagovnih znamk v okviru regionalnega razvoja. Povezava teh pojmov je nova in spreminja pogled na to, kako se OIP obravnavajo in upravljajo. Z obravnavo OIP kot teritorialnih blagovnih znamk avtorji lokalnim javnim organom in upravljavcem OIP ponujajo dragocen vpogled v delovanje OIP, na podlagi česar lahko oblikujejo celovitejše strategije in znamko razumejo kot dinamično enoto, ki jo je treba nenehno prilagajati. Poimenovanje OIP po mestih doda mestnemu prostoru politično razsežnost. Ljudem, ki živijo ali delajo na teh območjih in v njihovi okolici, omogočajo razne koristi, ki jih zagotavljajo teritorialne blagovne znamke, in izboljšajo kakovost življenja.

Izsledki raziskave so potrdili vpliv OIP na oblikovanje teritorialnih blagovnih znamk in pokazali, da imajo tudi OIP koristi od blagovne znamke mest. Ta ciklični odnos vključuje OIP, teritorialne blagovne znamke in delno zasebno upravljanje mest, ki vplivajo na rabo posameznega območja in njegove okolice. V procese mestnega in regionalnega razvoja, ki vsebujejo politične in kulturne razprave, so vključene tudi teritorialne blagovne znamke. V nadaljnjih raziskavah bi lahko proučili tudi OIP v drugih državah in jih med seboj primerjali.

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Vita ŽLENDER

Proučevanje potenciala za zagotavljanje kulturnih ekosistemskih storitev pri načrtovanju zelene infrastrukture v obmestni krajini: pristop z matriko strokovnih ocen

S širjenjem mestnih območij v obmestne krajine postaja potreba po učinkovitem načrtovanju zelene infrastrukture čedalje pomembnejša za ohranjanje ekološke celovitosti območij in človekovega dobrega počutja. V članku je predstavljena matrika strokovnih ocen kot metoda vrednotenja potenciala območij, da zagotavljajo kulturne ekosistemske storitve (KES), pri načrtovanju zelene infrastrukture (ZI) v obmestni krajini. Strokovnjaki z več področij so sistematično ovrednotili različne vrste rabe zemljišč in pokrovnosti tal ter varstvene režime, značilne za obmestne krajine, in to glede na kategorije KES. Poleg potenciala za zagotavljanje kulturnih ekosistemskih storitev so ovrednotili tudi potencial za povzročanje kulturnih ekosistemskih nevšečnosti. Njihove ocene so bile združene in na tej podlagi so bile izdelane karte, na katerih so razvidna območja z visokim potencialom za zagotavljanje KES in tista, na katerih bi lahko ekosistemi povzročili nevšečnosti. Opisani pristop je bil nato uporabljen v treh študijah primera, pri tem je bila dokazana njegova učinkovitost pri določanju prednostnih območij za načrtovanje ZI in izvedbo upravljavskih posegov. Izsledki raziskave opozarjajo na pomen upoštevanja KES pri načrtovanju ZI, saj lahko to izboljša odpornost krajin, družbeno blaginjo in ohranjanje kulturne dediščine v dinamičnih obmestnih okoljih. S presojo, vrednotenjem zbranih strokovnih ocen in jasno prostorsko predstavitvijo rezultatov za posamezno proučevano območje je bila potrjena uporabnost matrike strokovnih ocen kot uporabnega orodja za načrtovanje trajnostne ZI v krajinskem merilu.

Ključne besede: obmestna krajina, prostorsko načrtovanje, ekosistemske storitve, zelena infrastruktura, matrika

1 Uvod

V zadnjem času ekosistemske storitve (ES) pritegujejo precejšno pozornost na področju okoljskih študij in okoljske politike, hkrati pa so temeljni okvir za določanje zapletenih povezav med naravnimi sistemi in človekovim dobrim počutjem. ES obsegajo raznovrstne koristi, ki jih človeški družbi zagotavljajo ekosistemi, od čiste vode in hrane do uravnavanja podnebja in nadzora bolezni (MEA, 2005; TEEB, 2008). Razumevanje ES in njihovega pomena je za trajnostni razvoj in učinkovito odločanje zato postalo nuja (Fürst idr., 2017). Odločitve glede rabe zemljišč imajo pomembne posledice za delovanje ekosistemov, ohranjanje biotske raznovrstnosti in dobro počutje ljudi. V preteklosti se je raba zemljišč načrtovala ločeno po sektorjih in razdrobljeno, brez upoštevanja večnamenskosti in povezanosti ekosistemov. Mnogi raziskovalci se osredotočajo na pomen razumevanja ES, ki jih zagotavljajo krajine, in kartiranja njihove prostorske razporeditve za prilagoditveno upravljanje rabe zemljišč ter zagotavljanje celostnega in povezovalnega pristopa k odločanju (De Groot idr., 2010; Haines-Young in Potschin, 2018; Müller idr., 2020). Odločevalci lahko tako bolje proučijo koristi, določijo sinergije in spodbujajo bolj trajnostne prakse rabe zemljišč (Turner idr., 2007).

Prostorski vidik ES je pomemben za učinkovito načrtovanje in upravljanje rabe prostora. ES so prostorsko opredeljive, na njihovo prostorsko razporeditev pa vplivajo dejavniki, kot so pokrovnost tal, raba zemljišč, topografija in hidrologija. Jasna prostorska kartiranje in modeliranje ES načrtovalcem omogočata, da določijo prednostna območja ohranjanja, sanacije in trajnostnega razvoja, s čimer lahko izboljšajo zagotavljanje ES v krajinah (Maes idr., 2012). V zvezi z jasno prostorsko opredelitvijo ES se težava pojavi zlasti pri kulturnih ekosistemskih storitvah (KES). KES so nematerialne koristi, ki jih ljudje prejemajo od ekosistemov (npr. rekreacijske, estetske, duhovne in izobraževalne vrednote) in so močno prepletene s človeško kulturo, tradicijami in identitetami, zato imajo ključno vlogo pri oblikovanju družbenih vrednot in vedenj (MEA, 2005). Po navadi so neoprijemljive in jih je težko količinsko opredeliti, zaradi česar se pri odločanju pogosto podcenjujejo ali zanemarjajo. Hernández-Morcillo idr. (2013) navajajo, da samo 23 % raziskav KES vključuje njihovo jasno prostorsko opredelitev. Pri tem skrb vzbuja še zlasti to, da je pri vključevanju ES v krajinsko načrtovanje in odločanje poudarek na natančnem merjenju in kartiranju (Casado-Arzuaga idr., 2014). Glede na to, da so KES neoprijemljive, subjektivne in jih je težko količinsko opredeliti, so redko celostno vključene v presojo ES (MEA, 2005; De Groot idr., 2010; Chan idr., 2011; La Rosa idr., 2018). Kljub čedalje večjemu priznavanju pomena KES jih je še vedno težko učinkovito vključiti v okvire upravljanja rabe zemljišč in prostorskega načrtovanja. Čeprav je v Sloveniji pomen KES poudarjen v nekaterih državnih in regionalnih dokumentih, KES pa so bile tudi predmet nekaj nedavnih raziskav (npr. Ribeiro in Šmid Hribar, 2019; Kostanjšek in Golobič, 2023), niso izrecno upoštevane v nobenem državnem, regionalnem ali lokalnem predpisu, kar lahko pripelje do neustreznih načrtovalskih odločitev (Žlender, 2021a). Zato je ključno proučevati metode merjenja in validacije KES, saj se lahko s tem zajamejo dejavniki, ki jih drugače ni preprosto kartirati. Kartiranje KES se močno priporoča tudi v okviru številnih politik EU (Evropska agencija za okolje, 2014; Evropska komisija, 2013, 2020).

Članek je osredotočen na obmestno krajino, tj. krajino med mestnimi in podeželskimi območji, za katero sta značilni raznovrstni pokrovnost tal in raba zemljišč (Žlender, 2021a, 2021b). V obmestnih krajinah se KES pogosto izražajo prek zelene infrastrukture (ZI), ki vključuje naravne in polnaravne prvine, kot so parki, gozdovi, mokrišča in zeleni pasovi, ki prispevajo k oblikovanju lokalne identitete, občutka pripadnosti prostoru in povezanosti skupnosti (Daniel idr., 2012). Evropska komisija (2013) je prepoznala ZI kot pametno rešitev, ki ljudem in družbi zagotavlja raznovrstne dobrine in storitve. Zato se čedalje bolj krepi zavedanje o potrebi po celovitejših ekosistemskih pristopih k upravljanju rabe zemljišč in načrtovanju prostora v obmestnih krajinah, s posebnim poudarkom na povečevanju potenciala ZI za zagotavljanje raznovrstnih (K)ES.

Zaradi čedalje večjega širjenja mest in zazidave zemljišč je težko učinkovito kartirati in meriti KES, na podlagi česar se lahko sprejemajo informirane odločitve in se ohranja ZI. Z vključitvijo kartiranja KES v načrtovalske procese lahko odločevalci določijo prednostna območja, ki bi jih bilo treba ohraniti, načrtujejo posege, ki upoštevajo družbene vrednote skupnosti, in v odločanje vključijo deležnike (La Rosa idr., 2016; Spyra idr., 2020). Kartiranje KES lahko poleg tega omogoči razvoj inovativnih načrtovalskih orodij, kot so kazalniki in metode vrednotenja KES, s katerimi se lahko določijo ustrezni ukrepi politike in prednostne naložbe. Posledično bi bilo treba nujno razviti robustne metodologije za opredelitev in vrednotenje obmestnih krajin, zlasti z vidika njihovih KES (Geneletti idr., 2017). V zadnjem času narašča zanimanje za izboljšanje razumevanja pomena KES v obmestnih krajinah, povečalo se je tudi število metod za kartiranje KES (glej npr. Plieninger idr., 2013; Roy idr., 2014; Zhang in Muñoz Ramírez, 2019). Razširjena je uporaba metode, ki temelji na pokrovnosti tal in vključuje kvantitativno analizo zmožnosti posamezne kategorije pokrovnosti tal, da zagotavlja ES (Burkhard idr., 2009). Razširjenost te metode lahko pripišemo hitremu postopku vrednotenja, ki zagotavlja jasne koristi za odločanje in je zanj potrebnih malo vhodnih podatkov (Zhang in Muñoz Ramírez, 2019). Omenjena metoda je zato uporabljena tudi v tem članku, in sicer za vrednotenje potenciala za zagotavljanje KES.

Na podlagi sodelovanja strokovnjakov je bil sistematično ovrednoten potencial za zagotavljanje KES, povezan z različnimi vrstami pokrovnosti tal in varstvenimi režimi na izbranih obmestnih območjih v Sloveniji, poleg tega je ponujen vpogled v proučevanje ZI na podlagi njenega potenciala za zagotavljanje KES. Poleg tega je bila proučena uporabnost uporabljene metode za doseganje zastavljenih ciljev raziskave, ob tem so predstavljene njeni prednosti, izzivi in možne izboljšave. Postavljeno je bilo naslednje raziskovalno vprašanje: Kako je lahko matrika strokovnih ocen v podporo načrtovanju ZI v večnamenski obmestni krajini z vidika zagotavljanja in ohranjanja KES?

V nadaljevanju je najprej podrobneje predstavljena metodologija zbiranja, analize in interpretacije podatkov, nato pa so predstavljeni rezultati raziskave in njihov pomen za urbanistično načrtovanje in upravljanje krajin. Raziskava je bila del večjega projekta, katerega cilj je vzpostaviti okvir vrednotenja KES v obmestni krajini za izboljšanje krajinskega načrtovanja in krajinske politike.

2 Gradivo in metode

2.1 Območja raziskave

Za raziskavo so bili izbrani Ljubljana, Kranj in Koper, za ta mesta je bilo namreč v prejšnjih raziskavah že ugotovljeno, da se njihovo obmestno območje širi. V Ljubljani, glavnem in največjem slovenskem mestu, je to posledica priseljevanja, zaradi katerega se večajo potrebe po novih stanovanjih ter širjenju gospodarskih dejavnosti in infrastrukture na mestnem obrobju. Zaradi pomanjkanja celostnega načrtovanja mestno regijo ogrožajo obsežna zazidava in druge negativne posledice urbanizacije in periurbanizacije (Pichler-Milanović, 2002). To je bilo delno zamejeno z vstopom Slovenije v Evropsko unijo in uvedbo evropskih načrtovalskih programov, še posebno za Ljubljano pa sprejetje občinskega prostorskega načrta Mestne občine Ljubljana (Šašek Divjak, 2008; Sviršić Gotovac idr., 2021). Urbanizacija in suburbanizacija Kranja in Kopra, srednje velikih mest s starim mestnim jedrom, sta se začeli po letu 1950. Čeprav sta obe mesti precej manjši od Ljubljane, sta regionalni vozlišči in pomembni gospodarski, kulturni in družbeni središči. V obeh se kmetijska zemljišča čedalje bolj pozidavajo, zlasti s stanovanji in infrastrukturo (Nilsson idr., 2013; Spyra idr., 2021). Vsa tri mesta so bila že vključena v več projektov, povezanih z raziskavami obmestnih območij (npr. Piorr idr., 2011; Žlender, 2021b; Interreg Europe, 2023).

Meje obmestnega območja vsakega mesta so bile določene s posebno metodologijo. Več informacij o tem in značilnostih izbranih območij je objavljenih v članku Vite Žlender in Roka Brišnika (2023). Na sliki 1 so prikazani trenutna raba zemljišč in pokrovnost tal ter varstveni režimi na proučevanih območjih.

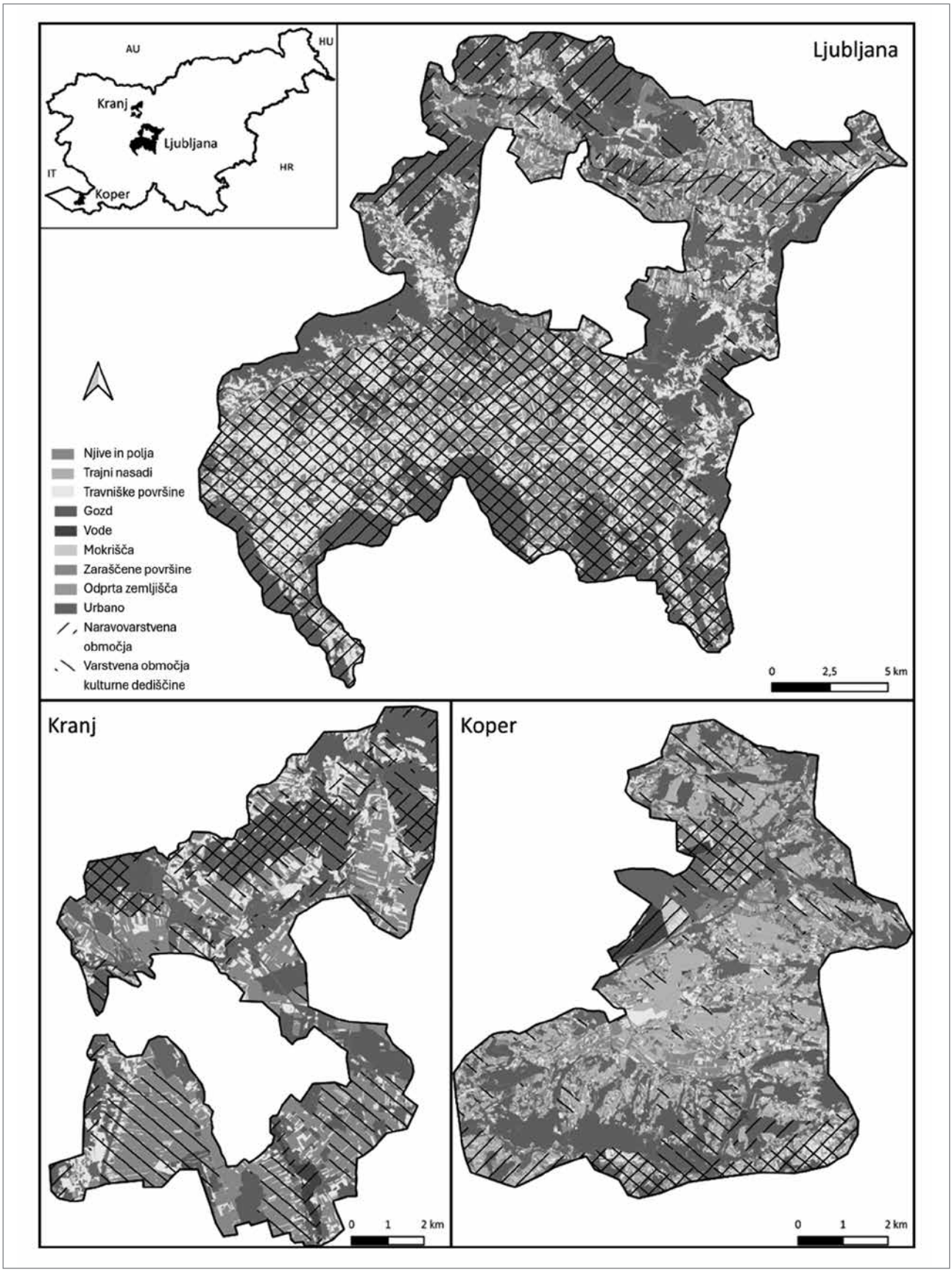
2.2 Izbor KES

Na podlagi priznavanja pomembne vloge KES pri oblikovanju človekovih interakcij s krajino in njihovega pomena za splošno dobro počutje ljudi je bilo predlaganih že mnogo klasifikacijskih sistemov za razvrščanje teh storitev, na primer v okviru milenijske ocene ekosistemov (ang. *Millennium Ecosystem Assessment*) (MEA, 2005), skupne mednarodne klasifikacije ekosistemskih storitev (ang. *Common International Classification of Ecosystem Services* ali CICES) (Haines-Young in Potschin, 2018) in pobude Ekonomija ekosistemov in biotske raznovrstnosti (ang. *The Economics of Ecosystems and Biodiversity*) (TEEB, 2008). Ti sistemi niso enotni, kar povzroča razdrobljenost in neenotno kategorizacijo KES, ki se pojavljata tudi v usmeritvah politik (Hirons idr., 2016). Pri izbiranju kategorij KES za raziskavo je bila težnja zajeti čim več različnih področij, pomembnih z vidika obmestnih krajin. Poleg metodološkega namena raziskave so bile upoštevane tudi značilnosti obmestnih krajin kot vmesnih prostorov med mestnimi in podeželskimi območji, zaradi česar imajo te krajine posebno kulturno dinamiko. To zahteva bolj poglobljeno razumevanje KES v teh krajinah, ki imajo svoje posebnosti in edinstvene potrebe. V preglednici 1 so navedeni razlogi za izbor posameznih kategorij.

Ekosistemi ustvarjajo koristi, hkrati pa lahko povzročajo tudi nevšečnosti, med katere spadajo med drugim škodljivci, propadanje infrastrukture, bolezni in alergeni. Nevšečnosti vključujejo tako razvrednotenje okolja, ki ga povzroča človek, kot negativne vplive na človekovo dobro počutje, povezane s popolnoma nedotaknjenimi ekosistemi. Kulturne ekosistemske nevšečnosti se nanašajo na nematerialno škodo, ki je povezana z ekosistemi in je lahko naravnega izvora (npr. nelagodje zaradi prisotnosti divjih živali) ali pa je posledica človekovega delovanja (npr. nelagodje zaradi razvrednotenja ekosistemov kot posledice človekove dejavnosti) (Plieninger idr., 2013). Proučevanje teh nevšečnosti je zapleteno, saj se lahko posamezna funkcija ekosistema dojema kot storitev (korist) ali nevšečnost, odvisno od območja in pomena funkcije. Zaradi raznovrstnosti obmestnih krajin so bile v raziskavo vključene tri kulturne ekosistemske nevšečnosti (preglednica 1).

2.3 Opredelitev tem

V skladu z metodo, ki so jo predlagali Burkhard idr. (2009), je klasifikacija rabe zemljišč in pokrovnosti tal osnovni korak pri kvantitativni analizi zmožnosti zagotavljanja (K)ES na podlagi



Slika 1: Raba zemljišč, pokrovnost tal in varstveni režimi v obmestnih krajinah proučevanih mest (avtor: Rok Brišnik, na podlagi uradnih in prosto dostopnih podatkovnih zbirk)

Preglednica 1: Podatki o KES, uporabljenih v raziskavi

Št.	Kategorija	Opis	Razlog za izbor
Kulturne ekosistemske storitve (KES)			
1	Prostočasne in rekreacijske dejavnosti	Sprehajanje, pohodništvo, kolesarjenje, plezanje, sprostitev, uživanje v privlačnih pogledih in pobeg od stresa v obmestni krajini.	Obmestne krajine so pogosto pomembna rekreacijska območja za bližnje mestne prebivalce. Ta kategorija poudarja pomen prostočasnih dejavnosti za dobro počutje ljudi in ustvarjanje občutka povezanosti z naravo v obmestni krajini.
2	Pripadnost prostoru in identiteta	Občutek pripadnosti prostoru se nanaša na naravne in grajene prvine ekosistema, ki spodbujajo kompleksno čustveno povezanost ljudi s prostorom (npr. navezanost, pripadnost ali identiteto).	Za obmestne krajine je značilna edinstvena mešanica mestnih in podeželskih prvin, ki prispeva k oblikovanju posebnega občutka pripadnosti prostoru in lokalne identitete. S proučevanjem te kategorije lahko bolje razumemo, kako posamezniki dojemajo svojo okolico in se povezujejo z njo, kar vpliva na povezanost skupnosti in navezanost na krajino.
3	Estetska vrednost	Estetska vrednost se nanaša na odnos ljudi do okolja na podlagi tega, kako dojemajo lepoto narave.	Estetske značilnosti obmestnih krajin oblikujejo zaznave in želje ljudi; s proučevanjem teh značilnosti lahko določimo vizualne vidike, zaradi katerih ljudje bolj cenijo krajino.
4	Vir navdiha	Vir navdiha za nove zamisli in ustvarjalno izražanje.	Z razumevanjem značilnosti obmestnih krajin, ki dajejo navdih, lahko dobimo vpogled v kulturne in simbolne pomene, ki jih obmestnim krajinam pripisujejo družbene skupine.
5	Socialni odnosi	Obmestne krajine ljudem zagotavljajo prostor za druženje s prijatelji in družino ter spodbujajo socialne stike in vključenost v skupnost.	Kategorija poudarja vlogo krajine pri spodbujanju socialne kohezije ter športnih in kulturnih dogodkov, s čimer podpira družbeno blaginjo in vključenost
6	Duhovne in sakralne storitve	Duhovne in verske izkušnje ter verski skupnostni dogodki.	Proučevanje te kategorije osvetljuje duhovne povezave in kulturne prakse, povezane z obmestnimi krajinami, ter razkriva, da niso pomembne samo z vidika ekologije in rekreacije.
7	Vir izobraževanja	Kategorija se nanaša na pridobivanje znanj, razvitih v kulturah (tradicionalna in strokovna znanja prebivalcev posameznega območja).	Obmestne krajine omogočajo izobraževanje na področjih ekologije, kmetijstva, zgodovine in vrst tradicionalne rabe zemljišč, kot učilnice na prostem pa omogočajo izkustveno učenje in s tem spodbujajo okoljsko pismenost otrok in odraslih.
8	Vir raziskav	Omogočanje raziskav o biotski raznovrstnosti območij.	Obmestne krajine omogočajo proučevanje ekoloških procesov, dinamike rabe zemljišč ter povezav med človekom in okoljem. Kot viri raziskav so tako te krajine pomembne tudi za znanost.
9	Kulturni pomen	Kategorija se nanaša na prispevek k raznolikosti (kulturne) krajine ali krajinsko značilne živalske in rastlinske vrste.	Obmestne krajine imajo kulturno dediščino, tradicije in zgodbe. Prepoznavanje njihovega kulturnega pomena je ključno za spodbujanje njihovega ohranjanja ob sodobnih pritiskih urbanizacije.
Kulturne ekosistemske nevšečnosti			
10	Hrup	Hrup, ki ga povzročajo najrazličnejši dejavniki (promet, industrijske dejavnosti, kmetijski stroji, oglašanje divjih živali)	Čezmerna obremenitev s hrupom negativno vpliva na zdravje, dobro počutje in kakovost življenja. S proučevanjem hrupa kot ekosistemske nevšečnosti se lahko določijo njegovi viri, posledice in ukrepi za njegovo blaženje. Učinkovito upravljanje hrupa v obmestnih krajinah prebivalcem zagotavlja bolj zdravo zvočno okolje.
11	Nevarnost	Izvor nevarnosti je lahko narava (npr. prisotnost nekaterih živalskih ali rastlinskih vrst) ali človekovo delovanje (npr. zanemarjenost, razvrednotenje ekosistemov).	Proučevanje nevarnosti na teh območjih daje vpogled v zaznavanje tveganj in strategije njihovega upravljanja. Razumevanje nevarnosti je ključno za zagotavljanje varnosti ljudi in preprečevanje nesreč.
12	Neprijetnost	Izvor neprijetnega občutka je lahko narava (npr. prisotnost nekaterih živalskih ali rastlinskih vrst) ali človekovo delovanje (npr. zanemarjenost, razvrednotenje ekosistemov).	Neprijetni občutki vplivajo na čutne zaznave in ljudem preprečujejo, da bi uživali v obmestni krajini. Prepoznavanje in odpravljanje virov neprijetnih občutkov sta ključna za izboljšanje privlačnosti krajine ter s tem povečanje zadovoljstva in dobrega počutja prebivalcev in obiskovalcev.

Preglednica 2: Seznam tem in njihovih opisov

Št.	Tema	Opis
1	Njive in polja	Kmetijska območja, stalno obdelane površine brez trajnih nasadov (npr. njive).
2	Trajni nasadi	Površine, na katerih se gojijo trajne kulture (npr. rastlinjaki, vinogradi, sadovnjaki in oljčniki).
3	Travniške površine	Območja, ki se uporabljajo za košnjo in pašo.
4	Gozd	Območja, poraščena z gozdom.
5	Vode	Naravne in umetne površinske vode (reke, jezera, morje).
6	Mokrišča	Barja, zamočvirjena zemljišča, trstičje, soline.
7	Zaraščena območja	Območja, ki se zaraščajo z gozdnim drevjem.
8	Odprta zemljišča	Nepozidana, večinoma naravna zemljišča z malo ali brez rastlinja (plaže, sipine, peščene površine, melišča).
9	Prometna infrastruktura	Ceste, parkirišča, železniške proge, letališča, pristanišča.
10	Javna infrastruktura	Energetski objekti (vse vrste elektrarn), odlagališča in zbirni centri, daljnovodi itd.
11	Razvrednotena območja	Degradirana, opuščena in antropogeno razgaljena območja (peskokopi, rudniki).
12	Izključna raba	Nebivalne večje pozidane površine v izključni rabi (industrijska, logistična in vojaška območja).
13	Širša raba	Nebivalne večje pozidane površine za širšo rabo (univerzitetni kampusi, nakupovalna središča, bolnišnice).
14	Zelene površine	Vzdrževane zelene površine in pripadajoča infrastruktura za javno rabo (parki, otroška igrišča, objekti za prosti čas, pohodne in kolesarske poti).
15	Šport in turizem	Vzdrževane zelene površine in pripadajoča infrastruktura za športno in turistično rabo (stadioni, igrišča za golf, hipodromi, kampi).
16	Stanovanjska območja	Območja, na katerih prevladujejo stanovanjske hiše in/ali stanovanjsko-kmetijski objekti.
17	Območja mešane rabe	Območja, na katerih prevladuje mešana raba prostora (stanovanja, javne storitve, trgovine, turistični objekti itd.).
18	Naravovarstvena območja	Naravovarstvena območja nacionalnega ali širšega pomena (območja Nature 2000, krajinski parki itd.).
19	Kulturno vredne krajine in objekti	Zgodovinsko in kulturno pomembne krajine in njihovi deli (arheološka najdišča, dediščina, spomeniki, izjemne krajine).
20	Kulturno vredna naselja in njihovi deli	Stara vaška jedra, tradicionalne oblike vasi.

pokrovnosti tal. Zaradi prostorskega obsega raziskave in ker je bil njen cilj proučiti potencial ZI za zagotavljanje KES, so bile v analizo vključene še dodatne kategorije, s katerimi so bila zajeta tudi območja velike biotske raznovrstnosti, ki ljudem zagotavljajo še več KES (Kopperoinen idr., 2014). Poleg rabe zemljišč in pokrovnosti tal so bili tako v raziskavo vključeni še varstveni režimi, mestna raba zemljišč pa je bila razdeljena v podrazrede.

Z navedeno klasifikacijo je bil pridobljen vpogled v prostorsko porazdelitev in sestavo krajinskih prvin, na podlagi česar so bila določena območja velike ekološke vrednosti, območja povezanosti krajinskih prvin in območja s prostorskimi možnostmi za izboljšanje ZI. Pri izboru podatkov za opredelitev tem je bila težnja k zajetju posebnosti obmestnih krajin, kot so mešanica mestne in podeželske rabe zemljišč, prepletanje grajenih in nepozidanih območij ter posebni objekti, kot so čistilne naprave in logistični centri.

Izbor digitaliziranih podatkov je bil osredotočen na najnovejše prosto dostopne prostorske podatke. Med podatkovnimi viri je bila težnja k uporabi uradnih podatkovnih zbirk, zaradi pomanjkanja nekaterih podatkov pa je bila uporabljena tudi podatkovna zbirka OpenStreetMap (2023). Digitalizirani podatkovni sloji, ki so se nanašali na podobne geografske pojave, so bili nato združeni v teme (Kopperoinen idr., 2014) (npr. vsi hidrološki podatkovni sloji so bili združeni v podatkovni sloj »vode«). Oblikovanje tem je omogočilo združevanje podatkov iz različnih virov, njihovo poenostavitev in prostorsko analizo podobnih podatkov. Tako pripravljeno klasifikacijo tem je najprej preverilo nekaj strokovnjakov. Na podlagi njihovih povratnih informacij je bilo prilagojeno število kategorij tem z opisi in primeri, poleg tega je bil oblikovan končni seznam dvajsetih tem, ki najbolje zajemajo razne vidike potenciala za zagotavljanje KES (preglednica 2). Celoten seznam podatkov, uporabljenih za vsako temo, je na voljo pri avtorici na zahtevo.

2.4 Metodologija vrednotenja in izbor strokovnjakov

Izdelana je bila matrika tem in KES, v kateri so morali anketiranci oceniti 240 kombinacij, in sicer tako, da so odgovarjali na

vprašanji: Kako tema prispeva k ustvarjanju prostorskih razmer za zagotavljanje KES v obmestni krajini? Kako tema prispeva k ustvarjanju prostorskih razmer za povzročanje nevšečnosti v obmestni krajini? Sistem vrednotenja je bil povzet iz članka Leene Kopperoinen idr. (2014), ki so predlagali naslednjo lestvico za vrednotenje prispevka posamezne teme k ustvarjanju prostorskih razmer za zagotavljanje posamezne KES: 3 = zelo ugodno (prispeva), 2 = ugodno, 1 = nekoliko ugodno, 0 = brez prispevanja/nevtralno, −1 = nekoliko škodljivo, −2 = škodljivo in −3 = zelo škodljivo. Izdelana je bila tudi lestvica za merjenje vpliva posamezne teme na potencial za povzročanje kulturne ekosistemske nevšečnosti z naslednjimi vrednostmi: 3 = zelo preprečuje (nevšečnost), 2 = preprečuje, 1 = nekoliko preprečuje, 0 = brez učinka/nevtralno, −1 = nekoliko prispeva (k nevšečnosti), −2 = prispeva in −3 = zelo prispeva. Bolj kot vrednotenje ponudbe ES je za načrtovanje, upravljanje in raziskave pomembno vrednotenje prispevka k ustvarjanju prostorskih razmer za zagotavljanje posamezne kategorije KES v obmestni krajini, saj je potencial za zagotavljanje KES pojmovan hipotetično in za daljše obdobje (Syrbe idr., 2017). Tako je bil merjen največji hipotetični potencial za zagotavljanje posamezne KES, ne njena dejanska prisotnost v krajini. V skladu s priporočili C. Sylvie Campagne in Philipa K. Rocha (Campagne in Roche, 2018) je bilo v matriko vključeno tudi vrednotenje stopnje samozaupanja v oceno, pri čemer so morali strokovnjaki izbirati med tremi odgovori: v svojo oceno sem prepričan(a), v svojo oceno sem razmeroma prepričan(a) in v svojo oceno nisem prepričan(a). V raziskavi so sodelovali strokovnjaki z različnih področij, ki se ukvarjajo s prostorom (načrtovanjem, varstvom, upravljanjem in prostorskim odločanjem). Pojasnjen jim je bil namen raziskave, poleg tega so bili zaprošeni za dovoljenje, da se jim pošlje povezava do spletnega vprašalnika z ocenjevalno matriko in petimi dodatnimi vprašanji.

2.5 Obdelava in analiza podatkov

Za vsako temo je bil določen njen potencial za zagotavljanje KES oziroma za povzročanje nevšečnosti tako, da so bile izračunane povprečne vrednosti ocen, ki so jih podali strokovnjaki. Pri tem je bila upoštevana njihova ocena stopnje samozaupanja v odgovor kot utež (utež = 1, če je bil izbran odgovor v svojo oceno sem prepričan(a), utež = 0,75, če je bil izbran odgovor v svojo oceno sem razmeroma prepričan(a), in utež = 0,5, če je bil izbran odgovor v svojo oceno nisem prepričan(a). Dobljeni rezultati so bili skupaj s temami kot atributi vneseni na sloj mreže z velikostjo celic 100 × 100 m (za podrobnejšo razlago postopka glej Žlender in Brišnik, 2023). S programskim orodjem QGIS Desktop 3.28 so bili združeni prostorski podatki in izdelane so bile karte potenciala za zagotavljanje KES in za povzročanje nevšečnosti. Nato so bile vrednosti celic normalizirane v intervalih po 0,85 na lestvici od −3 do 3, pri čemer je bila vsaka KES ali nevšečnost pri združevanju v skupne sloje podatkov o obeh potencialih obravnavana kot enako pomembna. Za določanje podobnosti med KES ali nevšečnostjo in temami je bila uporabljena metoda hierarhičnega razvrščanja v skupine ter predstavitev s toplotnimi prikazi in dendrogrami. Podobnost med skupinami je bila določena na podlagi povprečnih in evklidskih razdalj. Na koncu je bila izvedena statistična analiza podatkov s programskima orodjema SPSS 29.0 in Python with Seaborn.

3 Rezultati

3.1 Splošni pregled analiziranih podatkov

Matriko je izpolnilo 25 strokovnjakov: 19 raziskovalcev, 9 prostorskih načrtovalcev, 6 visokošolskih učiteljev, trije odločevalci, trije strokovnjaki s področja upravljanja zemljišč in en izvajalec. Imeli so visokošolsko izobrazbo različnih smeri, kot so krajinska arhitektura in prostorsko načrtovanje (n = 12), arhitektura in urbanizem (n = 3), gozdarstvo (n = 3), agronomija in naravni viri (n = 2), varstvo narave (n = 2), geografija (n = 2) in biologija (n = 1). Njihova strokovna področja delovanja so bila zelo različna in so obsegala vse od okoljskega, infrastrukturnega, prometnega, urbanističnega in prostorskega načrtovanja, daljinskega zaznavanja, gozdne hidrologije, krajinske arhitekture, varstva narave, pedologije, regionalnega razvoja, strateškega prostorskega načrtovanja, krajinske tipologije, vrednotenja krajin in urbanega gozdarstva do vrednotenja in upravljanja krajin. Osemnajst strokovnjakov je pred tem že uporabljalo koncept ES pri svojem delu, večina (n = 13) se je z njim seznanila med letoma 2011 in 2019. Trije so se s konceptom seznanili že prej, pet po letu 2019, štirje pa koncepta niso poznali.

Na koncu vprašalnika so strokovnjaki lahko dodali svoje komentarje. Večina je zapisala, da je bila matrika predolga in vrednotenje preveč subjektivno. Menili so, da pri KES in zlasti pri ekosistemskih nevšečnostih ni bilo mogoče podati jasnega odgovora ali ocene. Pri analizi podatkov so bile pri ocenah nevšečnosti odkrita mnoga neskladja. Strokovnjakom ni bilo jasno, ali morajo vrednotiti teme ali njihov vpliv na ljudi. Mnenja glede stopnje samozaupanja so bila deljena, enako tudi mnenja o tem, ali bi moralo biti tem več ali manj. En strokovnjak je predlagal, da bi moral biti na voljo tudi odgovor Ne vem. Vse njihove pripombe so bile upoštevane pri končnem vrednotenju uporabljenega pristopa.

3.2 Potencial za zagotavljanje KES na podlagi ovrednotenih tem

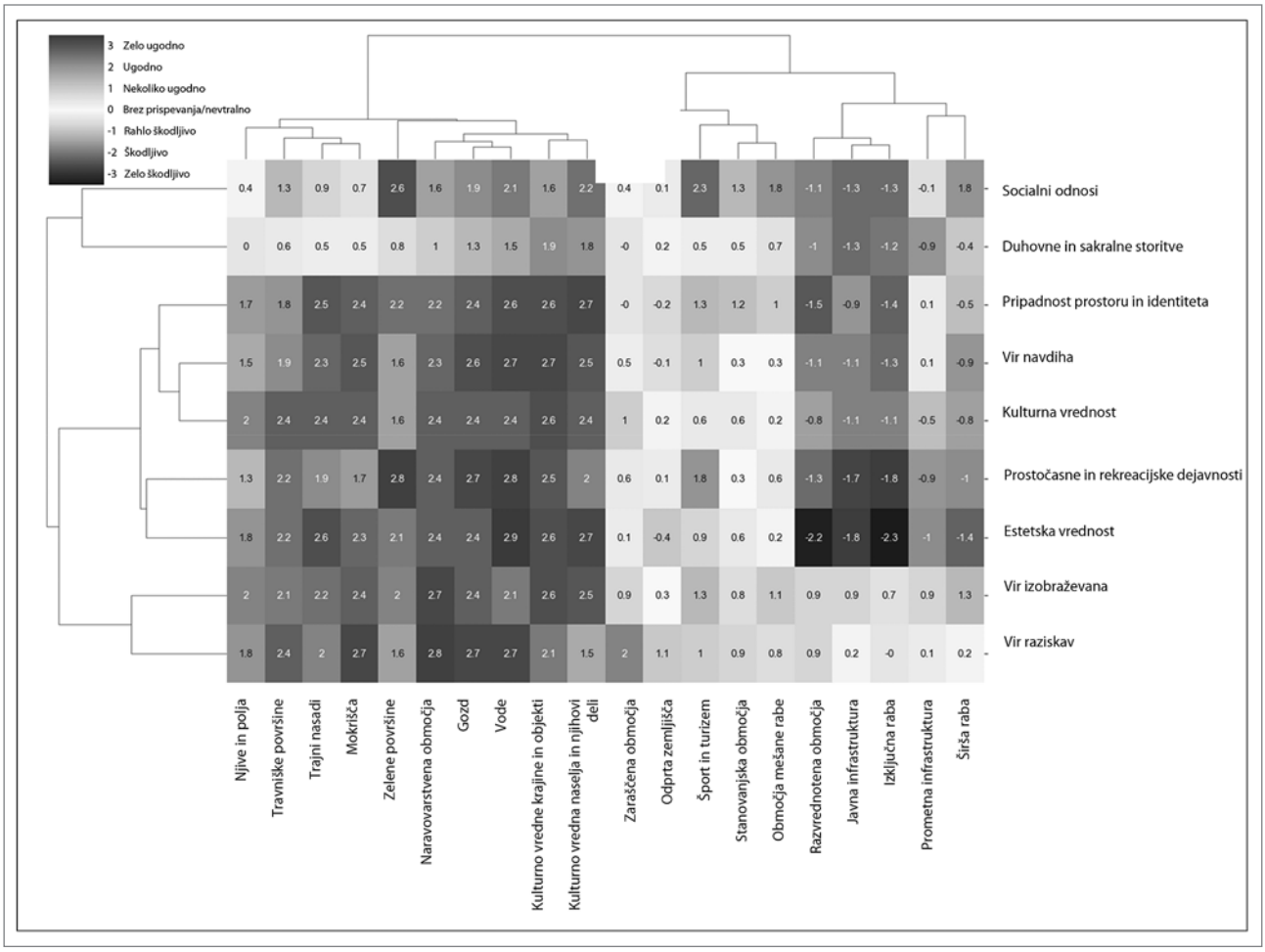
Najprej so bila pregledana povprečja ocen za pare tema-KES in tema-nevšečnost (v tem poglavju so zaradi boljšega razumevanja teme napisane poševno, KES in nevšečnosti pa v narekovajih). Ob zaokrožitvi povprečij na 0,5 se je izkazalo, da s proučevanimi temami ni bilo mogoče oceniti potenciala za zagotavljanje »duhovnih in sakralnih storitev«. Najpomembnejše teme so bile *vode* (za pet KES) ter *kulturno vredne krajine in objekti* in *kulturno vredna naselja in njihovi deli* (za tri KES). K ustvarjanju prostorskih razmer za »duhovne in sakralne storitve« po mnenju strokovnjakov pomembnejšega doprinosa ni imela nobena tema, k ustvarjanju »socialnih odnosov« pa naj bi po njihovem mnenju doprinesle samo *zelene površine*. Nobena tema ni bila ocenjena kot zelo škodljiva, najnižja ocena (−2,3) pa je bila pripisana ustvarjanju prostorskih razmer *izključne rabe* za zagotavljanje »estetske vrednosti«. Pri nevšečnostih je bilo za pet tem ocenjeno, da so brez vpliva na »hrup«, za dve pa je bilo ocenjeno, da najbolj prispevata k »hrupu« (tj. *prometna infrastruktura* in *izključna raba*). K »nevarnosti« in »neprijetnosti« je po ocenah strokovnjakov prispevalo po pet tem (pripisali so jim oceno, nižjo od 0,5). Za nobeno temo ni bilo ocenjeno, da močno preprečuje nevšečnosti. *Prometni infrastrukturi* je bilo pripisano, da zelo prispeva k povzročanju »hrupa«, za večino tem pa je bilo ocenjeno, da so brez učinka.

Na slikah 2 in 3 so s toplotnim prikazom in dendrogramom prikazani rezultati hierarhičnega razvrščanja v skupine, skupaj z združenimi povprečnimi ocenami strokovnjakov, te ocene pa so utežene s stopnjami samozaupanja v odgovor. V dendrogramu je prikazana povezanost KES. Skupina, ki jo tvorita KES »vir navdiha« in »kulturni pomen«, je vsebovala najbolj podobne ocene tem, ki vplivajo na njun potencial. Svojo skupino tvorita tudi KES »prostočasne in rekreacijske dejavnosti« in »estetska vrednost« ter KES »vir izobraževanja« in »vir raziskav«. Prej omenjeni skupini, ki jo sestavljata KES »vir navdiha« in »kulturni pomen«, je bila dodana še KES »pripadnost prostoru in identiteta«. Na splošno so te skupine pokazale srednji do velik pomen nepozidanih zemljišč, kot so *njive in polja, mokrišča in gozdovi* (izjeme so *zaraščene površine* in *odprta zemljišča*). Dendrogram prikazuje tudi povezanost tem. Med njimi izstopata skupini, ki združujeta rabe pretežno nepozidanih zemljišč, obe srednjega do velikega pomena, med njima pa *zelene površine* tvorijo ločeno skupino, kar kaže posebno vlogo te rabe. Drugi dve skupini sta vključevali bolj urbane rabe, pri čemer je ena skupina vsebovala teme, ki niso imele vpliva na KES, in temo, ki je imela potencialno škodljiv vpliv. Z vidika potenciala za povzročanje ekosistemske nevšečnosti so skupino s škodljivim in zelo škodljivim vplivom tvorile teme: *prometna infrastruktura, javna infrastruktura, izključna raba in razvrednotena območja.* Večina tem, ki se nanašajo na nepozidana zemljišča, je bila precej razpršena in so tvorile samo manjše skupine. Posamezne skupine so na primer vključevale *gozd* in *naravovarstvena območja* (nekoliko ugoden do ugoden vpliv na zagotavljanje KES) ali pa *kulturno vredne krajine in objekte, zelene površine, travniške površine* ter *kulturno vredna naselja in njihove dele*, ki so bili večinoma brez učinka na povzročanje ekosistemskih nevšečnosti.

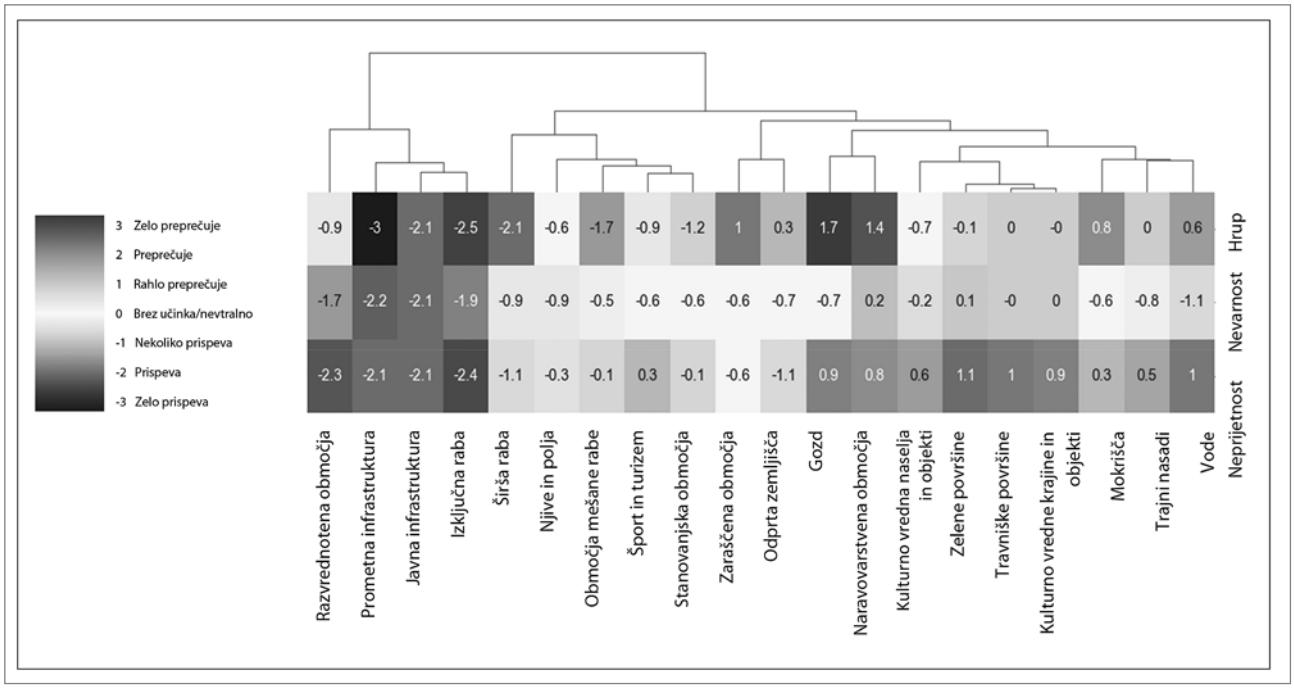
Za analizo razpršenosti odgovorov strokovnjakov od povprečja je bil izračunan standardni odklon (*SD*). Njegova vrednost za KES je bila med 0,28 in 2,01, za ekosistemske nevšečnosti pa med 0,22 in 1,83. Analiza je največjo stopnjo ujemanja (*SD* < 0,5) pokazala za prispevek *gozda*, *voda* in *zelenih površin* k zagotavljanju prostorskih razmer za »rekreacijske dejavnosti«, prispevek *kulturno vrednih naselij in njihovih delov* k ustvarjanju prostorskih razmer za zagotavljanje »pripadnosti prostoru in identitete«, vpliv *voda* in *kulturno vrednih naselij in njihovih delov* na »estetsko vrednost« ter pomen *gozda*, *voda*, *mokrišč* in *naravovarstvenih območij* kot »vira raziskav«. Pri nevšečnostih je bil tak *SD* ugotovljen za vpliv *odprtih zemljišč* in *prometne infrastrukture* na povzročanje »hrupa«. Za boljše razumevanje neskladij med odgovori so bili izmerjeni tudi standardni odkloni nad 1,5; ti so bili izmerjeni za prispevek *prometne infrastrukture*, *javne infrastrukture* in *razvrednotenih območij* k ustvarjanju prostorskih razmer za zagotavljanje »vira navdiha«, vpliv *prometne infrastrukture* na »socialne odnose«, vpliv *prometne infrastrukture*, *javne infrastrukture*, *razvrednotenih območij*, *izključne* in *širše rabe* ter *zelenih površin* na zagotavljanje »vira raziskav« in vpliv *zaraščenih površin* na »kulturno vrednost krajine«. Pri nevšečnostih je bil *SD* nad 1,5 izmerjen za vpliv *voda* na povzročanje »hrupa«, vpliv *gozda* na »nevarnost« ter vpliv *gozda* in *zelenih površin* na povzročanje »neprijetnosti«.

3.3 Prostorska porazdelitev potenciala za zagotavljanje KES in povzročanje nevšečnosti

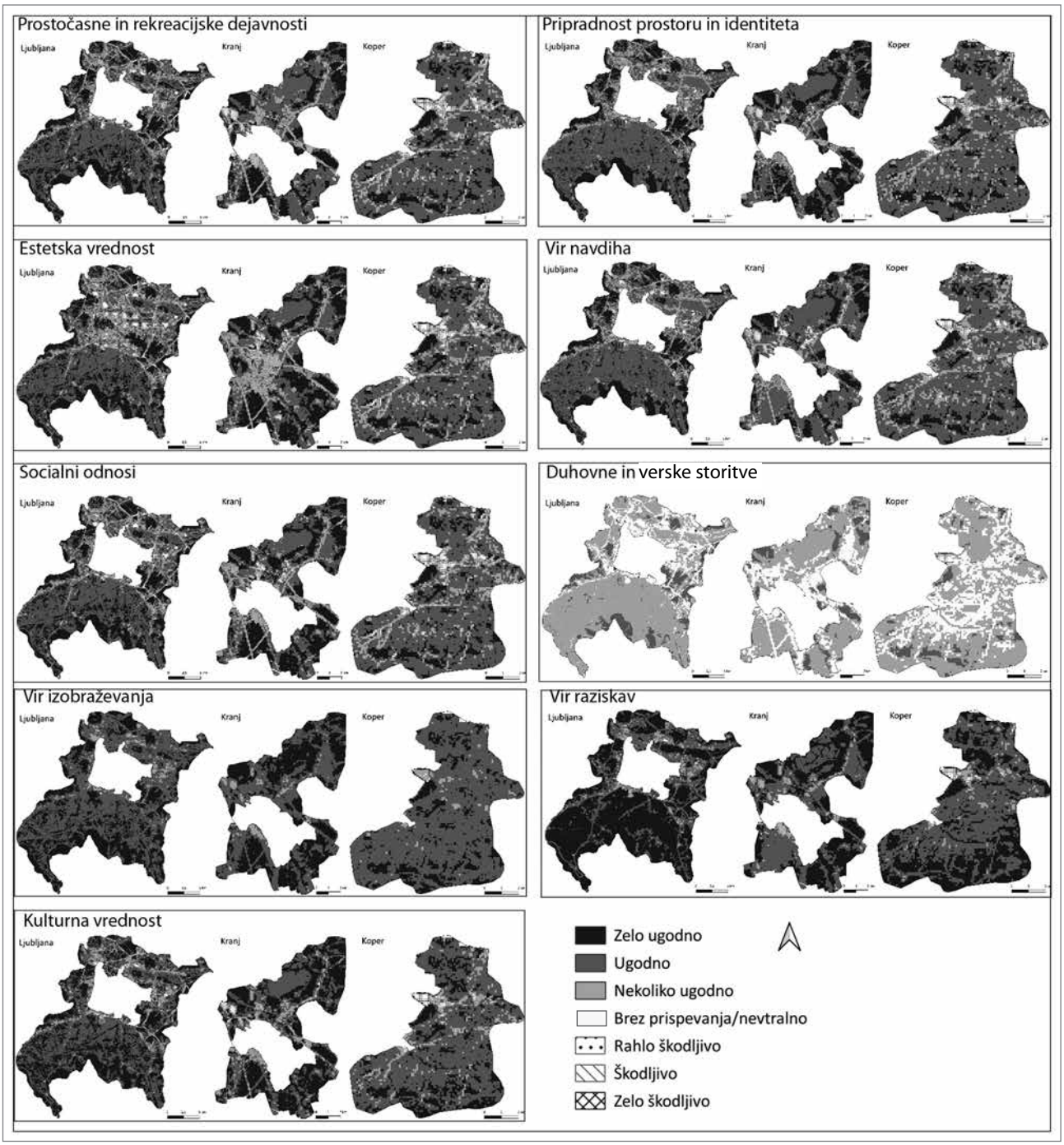
Na podlagi matrike so bili izdelani zemljevidi (sliki 4 in 5) in sintezne karte (slika 6) potenciala za zagotavljanje KES in povzročanje kulturnih ekosistemskih nevšečnosti. Značilnosti prostorske porazdelitve KES na treh proučevanih območjih kažejo, da imajo najugodnejše prostorske razmere zlasti polnaravna območja, kot so predeli, porasli z gozdom na slemenih hribov nad Koprom, na Kraškem robu in v naravnem rezervatu Škocjanski zatok. V Kranju taka polnaravna območja vključujejo gozdnate zaplate okrog mesta, gozdnati del posestva Brdo in Trbojsko jezero, v Ljubljani pa rob barja na jugu, gozdnata zelena klina na vzhodu in zahodu ter nekaj osamelcev na severu. Navedena območja so pomemben del ZI teh mest. Opazni so negativni vplivi umetnih območij, na katerih človek močno



Slika 2: Metoda hierarhičnega razvrščanja v skupine s toplotnim prikazom in dendrogramom, ki ponazarja stolpce združevanja tem in vrstice združevanja KES v skupine. V vsaki celici je navedena skupna povprečna vrednost ocen strokovnjakov, utežena s stopnjo njihovega samozaupanja v odgovor in obarvana z ustreznim odtenkom na barvni lestvici (ilustracija: Vita Žlender in Stefano Gemin)

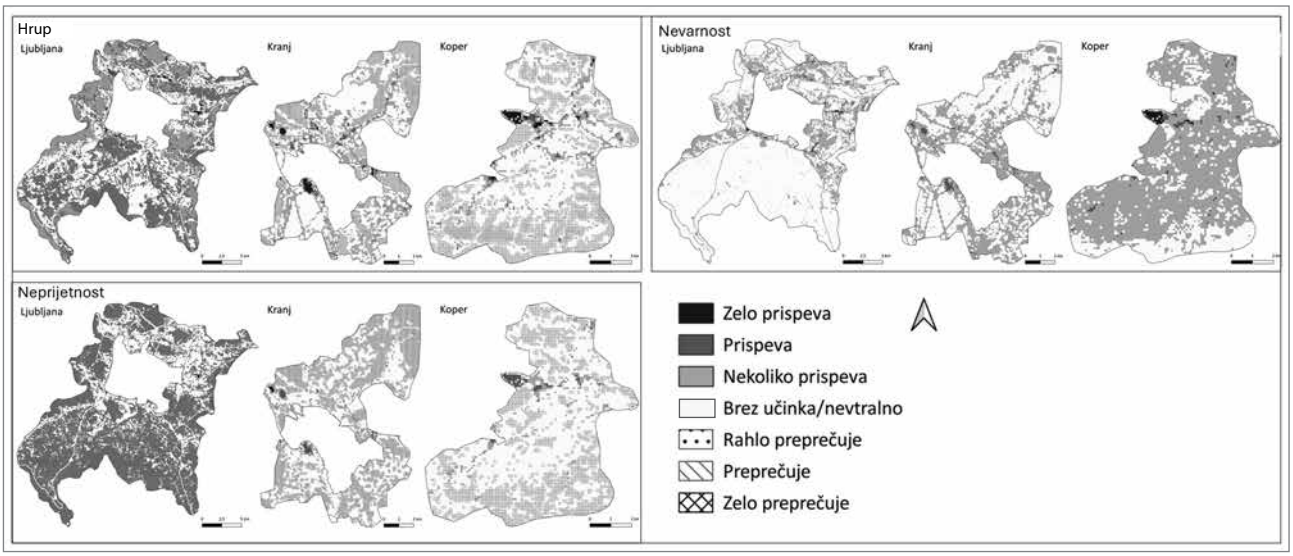


Slika 3: Metoda hierarhičnega razvrščanja v skupine s toplotnim prikazom in dendrogramom, ki ponazarja združevanje tem v skupine za vsako nevšečnost. V vsaki celici je navedena združena povprečna vrednost ocen strokovnjakov, utežena s stopnjo njihovega zaupanja in obarvana z ustreznim odtenkom na barvni lestvici (ilustracija: Vita Žlender in Stefano Gemin)

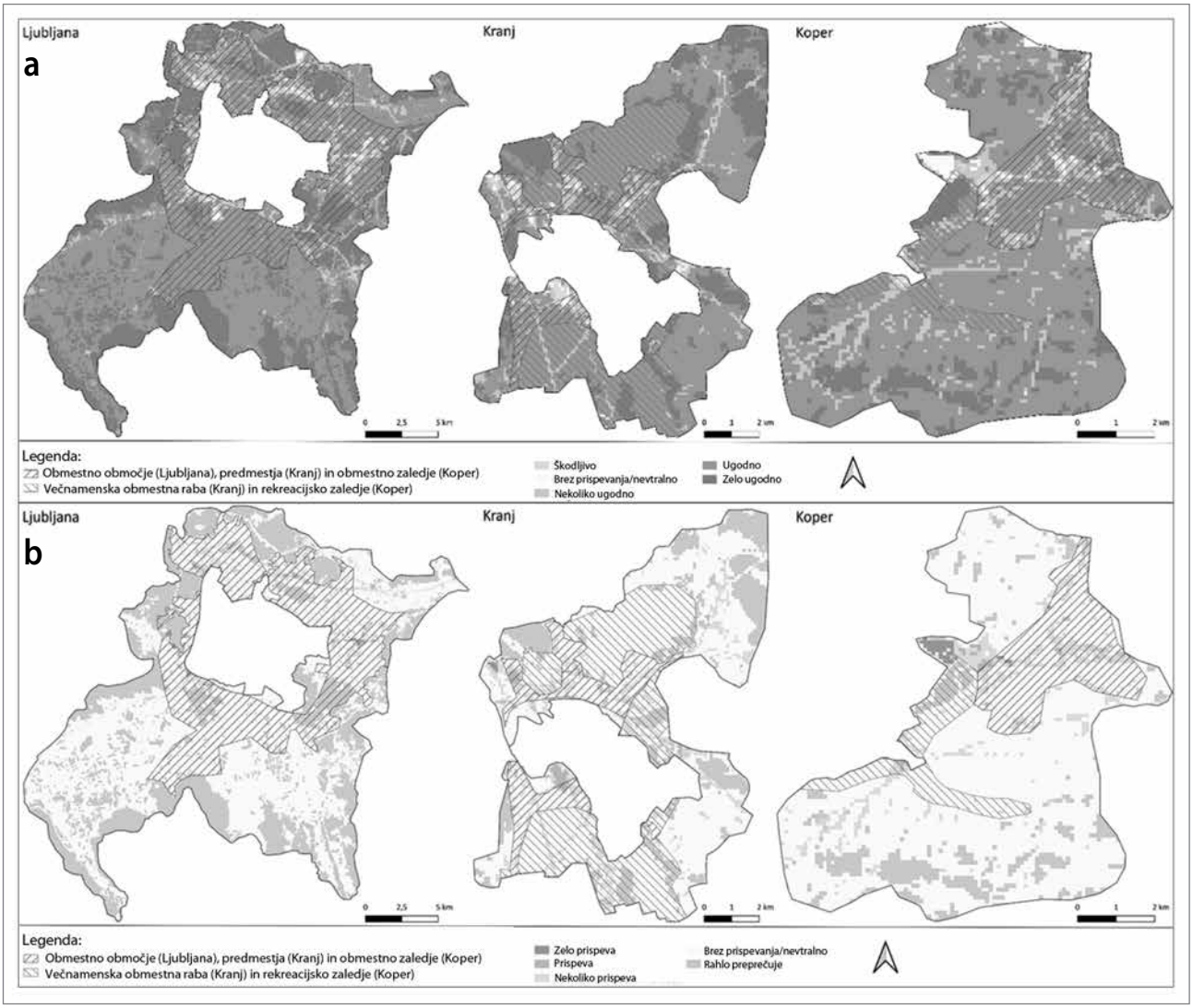


Slika 4: Karte treh proučevanih območij, ki kažejo njihov skupni potencial za zagotavljanje posameznih kategorij KES, določen na podlagi strokovnih ocen in digitaliziranih podatkov (ilustracija: Vita Žlender in Rok Brišnik)

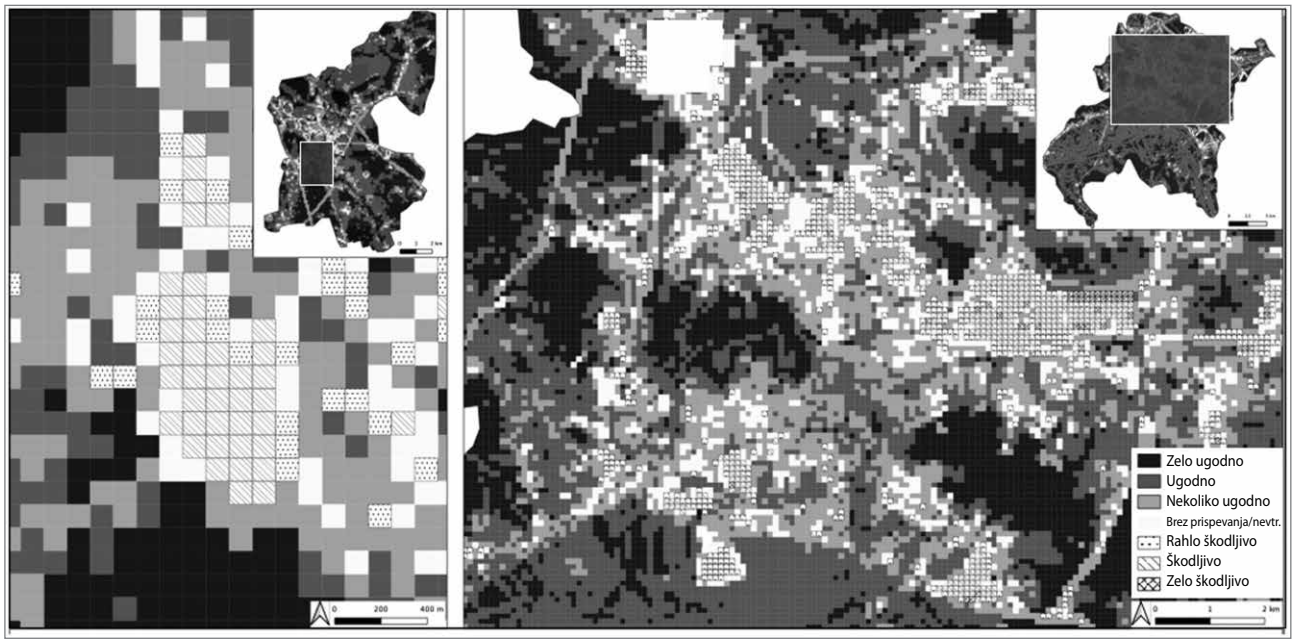
posega v prostor, kot so območja prometne infrastrukture, odlagališča ter industrijska ali logistična območja, med katerimi najbolj izstopajo poslovne cone (npr. Brnčičeva ulica v Ljubljani, Labore, Šenčur in Naklo v Kranju in njegovi okolici ter Bivje in Sermin v Kopru). Zmožnost teh območij, da zagotavljajo KES, je zelo majhna, problematična so tudi zato, ker so zaradi pomanjkanja pomembnih povezav z območji z visoko zmožnostjo zagotavljanja KES postala izolirana. Na sliki 7 je prikazano območje v Kranju z večinoma neugodnimi prostorski razmerami za zagotavljanje KES. Karte potenciala za povzročanje nevšečnosti kažejo, da prav ta območja največ prispevajo k proučevanim nevšečnostim. Presenetljivo je, da imata Kranj in Koper večja območja s škodljivim vplivom na zagotavljanje KES kot Ljubljana, ki je večja od njiju. Res pa je, da je v Ljubljani več takih območij v središču mesta (slika 7). Ta območja so brez ZI in posledično brez potenciala za zagotavljanje KES.



Slika 5: Karte treh proučevanih območij, ki kažejo njihov potencial za povzročanje kulturnih ekosistemskih nevšečnosti, določen na podlagi strokovnih ocen (ilustracija: Vita Žlender in Rok Brišnik)



Slika 6: (a) Sintezne karte devetih normaliziranih slojev KES za tri proučevana območja, ki prikazujejo prostorsko porazdelitev potenciala za zagotavljanje KES na podlagi strokovnih ocen in digitaliziranih podatkov; (b) sintezne karte treh normaliziranih slojev ekosistemskih nevšečnosti (ilustracija: Vita Žlender in Rok Brišnik, in Odlok … Koper, 2022; Odlok … Ljubljana, 2010; Odlok … Kranj, 2014)



Slika 7: (a) Izsek obmestne krajine v Kranju s škodljivimi prostorskimi razmerami za zagotavljanje KES v velikosti približno 500 m; (b) izsek območja v Ljubljani, iz katerega je razvidno, da je največ površin s škodljivimi prostorskimi razmerami v mestnem središču (ilustracija: V. Žlender in R. Brišnik).

Rezultati so bili primerjani z rabo zemljišč v občinskih prostorskih načrtih (OPN) (slika 6). V Ljubljani imajo ugodne in zelo ugodne prostorske razmere za zagotavljanje KES zlasti odprta zelena zemljišča, ki se ujemajo z območji »zelenega zaledja« v OPN (niso označena na karti). Na območjih, ki so v OPN navedena kot »obmestna območja« (slika 6), pa je opazna velika potreba po izboljšanju trenutnega stanja, zlasti na severu in severovzhodu. V Kranju ima večina območij, ki so v OPN označena kot »večnamenska obmestna območja«, ugodne ali celo izjemno ugodne prostorske razmere za zagotavljanje KES. Območja, ki so v OPN označena kot »predmestja«, imajo ugodne ali zelo ugodne prostorske razmere za KES, območja na severu in severozahodu pa imajo neugodne razmere. V Kopru imajo ugodne in zelo ugodne razmere za zagotavljanje KES območja, ki so v OPN označena kot »rekreacijsko zaledje«. Območja, označena kot »obmestno zaledje«, pa vključujejo zaplate s škodljivimi prostorskimi razmerami za zagotavljanje KES, zato bi bile tam potrebne izboljšave (zlasti v obliki ZI) za povečanje potenciala za zagotavljanje KES.

4 Razprava

4.1 Načrtovanje ZI v obmestni krajini z upoštevanjem ekosistemskih storitev

Obmestna krajina ima zapleteno in pogosto nejasno zgradbo, z različnimi vrstami rab in pokrovnosti tal, ki kažejo na dinamično prepletanje pritiskov urbanizacije in naravnih prvin. ZI ima pomembno vlogo pri izboljšanju ekološke, družbene in gospodarske odpornosti obmestnih krajin (O'Brien idr., 2017). V članku je bila predstavljena metoda za prepoznavanje in prostorsko določanje raznih prvin ZI z vidika potenciala za zagotavljanje KES v krajinskem merilu. Na podlagi vnaprej določene klasifikacije KES in tem, ki združujejo kategorije rabe zemljišč, pokrovnosti tal in varstvenih režimov, so bili na podlagi znanj raznovrstnih strokovnjakov analizirani prostorski podatki.

Z navedeno metodo so bili pridobljeni novi vpogledi v prostorsko razporeditev območij z vidika njihovega potenciala za zagotavljanje KES in za povzročanje ekosistemskih nevšečnosti v treh proučevanih primerih. Rezultati so pokazali, katera območja imajo majhen potencial ter so zanje potrebne izboljšave za okrepitev mreže ZI in s tem povečanje večnamenskosti obmestne krajine. Navedeno je bilo ugotovljeno zlasti za Kranj in Koper. Kartiranje KES je pokazalo, da je majhen potencial za zagotavljanje KES značilen za velike površine urbaniziranih zemljišč, zlasti tistih, namenjenih izključni rabi (npr. industrijski in logistični rabi ter prometni in javni infrastrukturi). Za učinkovitejše načrtovanje ZI in povečanje večnamenskosti obmestnih krajin ter preprečevanje konfliktov, povezanih z rabo zemljišč, ki jih povzročajo družbene potrebe po (K)ES, bi bilo smiselno načrtovati mozaične krajine z raznovrstno rabo zemljišč, kar bi povečalo tudi ponudbo KES v obmestnih krajinah (Stürck in Verburg, 2017). Treba je omeniti, da mozaične kulturne krajine, v katerih se prepletajo različne vrste rabe zemljišč in pokrovnosti tal (npr. njive, travniki in gozd), veljajo za značilnost in simbol slovenske narodne identitete

(Golobič in Lestan, 2016), čemur sledijo tudi OPN vseh treh proučevanih mest.

Ugoden potencial za zagotavljanje KES je bil največkrat pripisan zelenim in modrim površinam, kot so gozdovi, vode in namenske zelene površine, kar se ujema tudi z izsledki drugih raziskav (npr. Navara in Vedamuthu, 2022) in omogoča oblikovanje arhetipov za vrednotenje rabe zemljišč (Karrasch idr., 2019). Navedene površine imajo v obmestni krajini pogosto večnamensko rabo. Treba bi bilo spodbujati ohranjanje in izboljšanje gozdnih in vodnih površin, saj imajo velik potencial za zagotavljanje KES. Za to pa so potrebne enotne politike ter celostna orodja in predpisi, ki presegajo sektorske odločitve (Filyushkina idr., 2022; Gottero idr., 2023). Samo tako se lahko omogoči razvoj večnamenskih območij in se integrira podpora za načrtovanje ZI, da se zmanjša konkurenca za prostor in vire.

Raziskava daje pomembne izsledke za oblikovanje prihodnjih politik, ki imajo neposreden vpliv na KES, s katerimi bi se lahko izboljšalo trajnostno upravljanje območij z velikim potencialom za zagotavljanje KES in bi se izboljšala območja z majhnim potencialom. S tega vidika so pomembni zlasti občinski prostorski načrti in prihodnji regionalni prostorski načrti, predvideni z Zakonom o urejanju prostora (Ur. l. RS, št. 199/2021). Rezultati raziskave so pokazali, da se lahko območja z majhnim potencialom za zagotavljanje KES izkoristijo za razvoj obmestnih krajin, pri čemer se morajo ustrezno upoštevati tudi druge načrtovalske zahteve in potrebe. Pomembno je zlasti, da se obmestne krajine, za katere ja značilna izrazita večnamenska raba, ohranjajo, hkrati pa je treba strateško določiti območja, kamor se bo mesto širilo v prihodnje. Raziskava je pomemben vir za širše vrednotenje ekosistemov in njihovih storitev, uporabljena metoda pa podpira določanje zemljišč, primernih za prihodnji razvoj, na podlagi njihovega potenciala za zagotavljanje ES. Navedeno so že proučevali tudi drugi raziskovalci (npr. Zhang in Muñoz Ramírez, 2019; Navara in Vedamuthu, 2022). Raznovrstne uporabljene teme zagotavljajo prostorsko jasno določljive kazalnike za območja, pomembna za zagotavljanje raznih KES. Pri oblikovanju in vzdrževanju tovrstnih območij imajo ključno vlogo prostorski načrtovalci in upravljavci, ki lahko izboljšajo njihovo dostopnost in dovolijo nekatere rabe, s čimer lahko povečajo njihov razvojni potencial in spodbujajo okolju prijazno vedenje (Žlender in Gemin, 2020, 2023; Gottwald idr., 2021). Zato bi morali tesno sodelovati z lokalnimi oblastmi in javnostjo, da bi se izognili enostranskemu načrtovanju in odločanju, na kar so opozorili že drugi raziskovalci (npr. McDonald idr., 2005; Zhang in Muñoz Ramírez, 2019; Spyra idr., 2021).

4.2 Ovrednotenje uporabljene metode

Ena izmed pomembnih prednosti uporabljene metode strokovnega vrednotenja je ta, da omogoča vključitev raznovrstnih pogledov in področij znanja v vrednotenje. Z vključitvijo strokovnjakov z več področij je bil dobljen celovit vpogled v potencial za zagotavljanje KES, povezan z raznimi temami. Uporabljeni multidisciplinarni pristop je izboljšal robustnost raziskave in omogočil upoštevanje raznovrstnih dejavnikov, ki vplivajo na zagotavljanje KES. Poleg tega je omogočil sistemsko in pregledno analizo raznih KES ter primerjavo vrst rab zemljišč z vidika njihovega potenciala za zagotavljanje kulturnih koristi. Pristop omogoča odločanje na podlagi dejstev pri načrtovanju ZI, saj lahko z njim deležniki primerjajo relativni pomen KES pri določanju prednostnih strategij, povezanih z rabo zemljišč. Metoda je poleg tega zelo prožna, saj se lahko prilagodi lokalnim razmeram in preferencam, zaradi česar je primerna za uporabo v najrazličnejših subregionalnih okoljih. S prilagoditvijo tém specifičnim geografskim, družbeno-gospodarskim in kulturnim razmeram so izsledki uporabni za lokalne deležnike in odločevalce. Inovacija uporabljene metode v tej raziskavi je v tem, da je prostorska analiza temeljila na mreži celic in da je posamezna celica lahko vsebovala več tem. Seštete vrednosti kažejo razmerje med posameznimi temami. Zaradi prostorske kompleksnosti slovenskih obmestnih krajin je bil uporabljeni pristop za vrednotenje KES in ekosistemskih nevšečnosti v obmestni krajini primernejši od metode vrednotenja posameznih vrst rabe zemljišč in pokrovnosti tal, ki so jo predlagali Burkhard idr. (2009) in večinoma temelji na podatkovni zbirki CORINE, ki jo kritizirajo zaradi nezadostne kompleksnosti podatkov (Zhang in Muñoz Ramírez, 2019). Osredotočanje na kompleksnost krajin je pomembno ne samo z vidika te raziskave, ki je vključevala obmestne krajine, ampak tudi za celotno Slovenijo, za katero je značilna drobna strukturiranost rab in pokrovnosti tal.

Uporabljeni pristop je zelo uporaben za hitre pregledne analize kompleksnih sistemov, kot so obmestne krajine. Še zlasti uporaben je za prostorsko načrtovanje, in sicer za hitro pridobivanje objektivnih vpogledov v stanje proučevane obmestne krajine z vidika prostorske porazdelitve njenih KES in ekosistemskih nevšečnosti ter za monitoring pri upravljanju krajin. Metoda je pregledna, saj se lahko vse matrike ocen in podatkovni sloji kart, izdelani na njihovi podlagi, proučujejo skupaj ali ločeno; poleg tega lahko ocene, na katerih temeljijo rezultati, vedno pogledamo za nazaj. V raziskavi je bila podana samo prva ocena stanja, z dodatnimi raziskavami pa bi se lahko določile vrste ZI, ki bi jih bilo treba načrtovati in oblikovati na različnih območjih, in bi se proučili najboljši možni pristop k trajnostnemu razvoju in upravljanju zemljišč. Za celovitejšo raziskavo je priporočljivo združiti kvantitativne in kvalitativne podatke ter v vrednotenje vključiti različne poglede. Uporabljeni

pristop se lahko združi z drugimi pristopi, ki se pogosto uporabljajo v prostorskem načrtovanju, na primer z vrednotenjem ustreznosti območij (Martínez-Martínez idr., 2022). Takšna kombinacija metod se lahko uporabi v začetni fazi načrtovalskega projekta za določanje najprimernejših območij za želeno dejavnost, s katero se najmanj posega v zagotavljanje KES.
Čeprav ima pristop s strokovnimi ocenami jasne prednosti, ni brez omejitev. Treba je opozoriti na subjektivnost in možno pristranskost strokovnih presoj (Müller idr., 2020), ki bi ju bilo treba zmanjšati z uporabo pregledne metodologije in dosledno validacijo. V proučevanem primeru je bila vključena skupina strokovnjakov pristranska, saj je bila večinoma sestavljena iz raziskovalcev s področja prostorskega načrtovanja ali okoljskih študij, lokalni odločevalci in predstavniki javnosti pa zaradi narave raziskovalnega projekta niso bili povabljeni k sodelovanju. Sodelovanje lokalnih prebivalcev je še zlasti pomembno pri raziskavah na manjših območjih, kjer načrtovalske odločitve bolj neposredno vplivajo na ljudi (Kopperoinen idr., 2014; Navara in Vedamuthu, 2022). Tudi podatki za teme bi bili lahko drugače izbrani, saj je njihova zanesljivost vedno vprašljiva. Podobno so tudi ocene vedno subjektivne, saj temeljijo na širokih teoretičnih načelih, ne na natančnih kvantitativnih povezavah v danem kontekstu (Zhang in Muñoz Ramírez, 2019). Kategorizacija tem na podlagi strokovnih mnenj mora biti opravljena pred vrednotenjem, saj se lahko tako odkrijejo dodatne teme, značilne za obmestne krajine. Niso vse teme enako uporabne za proučevane kategorije KES, z vključitvijo podrobnejših ocen izbranih vrst pokrovnosti tal, varstvenih režimov, krajinskih značilnosti, naravnih vrednot in drugih prvin (Karrasch idr., 2019) pa se vrednotenje KES lahko izboljša.

Kljub navedenim slabostim uporabljeni pristop daje neko splošno sliko potenciala KES in ga zaradi tega lahko ovrednotimo kot uporabnega.

5 Sklep

Predstavljeni pristop z matriko strokovnih ocen se je izkazal za uporabno orodje za vrednotenje potenciala za zagotavljanje KES in za povzročanje ekosistemskih nevšečnosti v povezavi z raznimi temami. Metoda zagotavlja praktične koristi za informirano načrtovanje ZI v krajinah, tako na namenskih zelenih površinah, kot so mestni parki ali naravni rezervati, kot na odprtih zemljiščih ali razvrednotenih območjih. Tako pomaga ovrednotiti prednosti in slabosti načrtovanja ZI na izbranih območjih. Ker metoda temelji na uporabi strokovnega znanja in zagotavlja sistematični okvir za vrednotenje, lahko prispeva k bolj informiranemu in vključujočemu odločanju na področju načrtovanja in upravljanja krajin.

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The rapid urbanization of Mount Bjelašnica: From Olympic Games to neoliberal investments

In the early 2000s, Mount Bjelašnica, one of the four Olympic mountains around the city of Sarajevo, experienced rapid urbanization. In an attempt to create a modern mountain resort, but without a general design vision and with substantial criticism from residents, new hotels and other accommodation were built. This article offers insight into the development of the mountain resort at Babin Do on Mount Bjelašnica, comparing it with the development of similar mountain resorts in France. Case studies are the mountain villages of Flaine and Les Arcs, both created in the 1960s by prominent architects as a part of the government program Plan Neige; however, they have largely been changed and extended since then. The findings show certain similarities in the urban planning and architecture at Babin Do with the case studies examined in France, even over a period of sixty years. Although certain buildings in Babin Do create a positive mountain resort ambience, the absence of a regulatory plan that has caused overcrowding with accommodation, and the lack of common public space along with poor all-year activities show that this mountain resort cannot be considered a successful development. Further damage to nature should be minimized, and development should have been more considered and sustainable.

Keywords: mountain resorts, urbanization, Olympic Games, Sarajevo, Plan Neige, France

1 Introduction

The scope of urban planning extends beyond the development of cities. Rural areas (including mountain landscapes) that are being urbanized should follow guidelines similar to those applied in city planning. According to Ultramari et al. (2023) "the intellectual beauty of planning is that it implies active transformation and suggests the exact implementation of what was originally intended." The problem with the development of the mountain plateau Babin Do on Mount Bjelašnica is the lack of a defined concept supported through an urban plan guiding how this area should be further developed. The transformation of Babin Do into a "modern" ski resort started in the early 2000s and has intensified in the last five years. Despite strong public concern and indignation about the deforestation of the mountain during the past twenty years, the municipal authorities of Trnovo, who are responsible for Babin Do, did not offer any plan or proposal for its sustainable urbanization and tourism development. Now, more than ever, it is important to think about sustainable development on several dimensions. Thinking about the urban future, Poljak Istenič and Gulin Zrnić (2022) mention three levels of urban sustainability: economic, environmental, and social. These categories are equally important for the development of rural areas, including mountains. In particular, the environmental segment should be taken into consideration because any construction activity in mountain areas like Babin Do is an intrusion into the natural environment and should be done carefully. According to Goodland (1995), for some people the environment represents a major obstacle to human progress. Therefore, its destruction is less important than the profit gained through construction. This is particularly visible in neoliberal investments focusing on the financial gain of a few individuals, which is also present in the development of the ski resort at Babin Do.

This article discusses neoliberal investments on Mount Bjelašnica and presents the problems of unplanned urban development of Babin Do. The research investigates the traditional architecture and tourism development on Mount Bjelašnica, and it then focuses on the legacy of the Winter Olympics. To understand the development of ski resorts, the authors refer to Delorm's classification of ski resorts, focusing on two examples from France that were developed as part of Plan Neige in the 1960s. These two case studies (Les Arcs and Flaine) are analysed and compared with Babin Do, examining various aspects of their spatial and architectural characteristics. Finally, the development of Babin Do in the last twenty years is presented and discussed in detail.

2 Research approach, materials, and methods

This article is based on a staged investigation of the topic through its manifestation in space and comparative analyses of certain spatial and urban features on Mount Bjelašnica and the mountains in the scope of Plan Neige in France. The genesis of French ski resorts, in particular Flaine and Les Arc, is taken as a starting point for the comparison. A discussion of the village typologies (and their architecture) on Mount Bjelašnica helps in understanding certain aspects of the origin, development, form, and spatial utilization of Babin Do.

Through analysis and valorization, the text examines the transformation of the social and spatial structure of these mountain resorts in detail, presenting this in separate tables. The methods of analysis include descriptive statistics, trend analysis, and spatial analysis, and the valorization method discusses neoliberal influences, social values, and cultural values as a reflection of changes in space. These methods make it possible to identify patterns and factors that influence processes in urban settlement structures, including transitional processes, state policies, spatial policies, economic factors, and social changes. The valorization method makes it possible to assess the various effects of these changes on urban space and society as a whole, and to identify values that were lost or created through urban changes. Ultimately, the analysis helps create a comprehensive picture of all the processes involved in urbanizing a mountain resort, the associated changes, and their effects as a basis for future development.

3 Mount Bjelašnica: background

Mount Bjelašnica stands in the central part of Bosnia and Herzegovina, about 25 km southwest of the capital city of Sarajevo. Mount Bjelašnica is part of the Dinaric Alps. It is neighboured by Mount Igman to the north, which practically abuts Mount Bjelašnica, and Mount Treskavica and Mount Visočica (both to the south). The mountain is covered with snow from November to May, and sometimes also in the summer. This is the origin of its name because the word *bijela* means 'white'. The beauty of the mountain is enhanced by the harshness of its climate, which is the result of the geographical position of Mount Bjelašnica in the Dinaric mountains, its geological composition, and its elevation. The highest part of the Dinaric mountains are influenced by two contrasting climates: Mediterranean and continental.

Historically, Mount Bjelašnica had around ten villages and a population of 2,500, mainly making a living from agriculture and animal husbandry. Among these villages is Lukomir (Fig-

Figure 1: Lukomir, a traditional village on Mount Bjelašnica (photo: Alma Hudović Kljuno).

ure 1), on the southern slope of the mountain at an elevation of 1,495 m. This is the highest-elevation village in Bosnia and Herzegovina (and the only one above 1,300 m; Bobetić, 2012). The village is known for its unique and well-preserved traditional architecture, which reflects its context, and it is well positioned on the mountain plateau. In her research on the architecture of stone houses in Bosnia and Herzegovina, particularly in the Dinaric karst and Upper Herzegovina mountain region, Astrida Bugarski states that stone houses gradually replaced wooden houses at the end of the nineteenth century and the beginning of the twentieth century, when this influence spread from the Adriatic hinterland toward the mountain regions of Bosnia and Herzegovina (Bugarski, 1997). In the villages of northern Herzegovina, which are partially also located on the southern slopes of Mount Bjelašnica, "the stone house was fully adapted to the natural environment and the way of life and business of the local population" (Bugarski, 1991). Hence, the compact design of typical houses in Lukomir is based on local traditions and materials used to create a simple and utilitarian layout while providing necessary functionality. The main body of the house is made of stone to blend with the natural surroundings, and it also provides a sturdy and durable structure. The roof is traditionally covered in wooden shakes in a characteristic design with a very sharp pitch to allow snow to slide off. The house typically has small windows. This helps retain heat during the winter and protects against strong winds. The houses follow the topography of the terrain, blending in harmoniously with their natural surroundings. These characteristics highlight the unique architectural style of the traditional houses in Lukomir. The houses reflect the cultural heritage of the local community, serve as a testament to the history of the area, and are valued for their preservation of the traditional mountain architecture of Bosnia. However, it is important to note that individual houses may vary in their design and features because they have been adapted and modified over time.

Although there were significant spatial and developmental changes on Mount Bjelašnica in the second half of twentieth century during the communist period, the Austro-Hungarians were the first to recognize the potential that the mountain offers. In their study of alternative forms of tourism on Mount Bjelašnica, Opačić and Banda (2018) state that Mount "Bjelašnica is a representative example of a mountain tourism destination that has passed through several stages of tourism development." Table 1 chronologically presents the development of tourism activities and necessary spatial and architectural infrastructure. In 1893, the Austro-Hungarian authorities in Bosnia created a hunting reserve on parts of Mount Bjelašnica and Mount Igman. Due to the harsh and variable weather conditions, in the following year the first meteorological observatory was built at the very top of Mount Bjelašnica (2,067 m), and the peak is locally known as *Opservatorij* 'Observatory' (Babić, 2022). This was the first modern masonry

Table 1: Development of tourism on Mount Bjelašnica (source: Opačić & Banda, 2018).

Period	Characteristics
1878–1918 (Austria-Hungary)	– Construction of hiking facilities
	– Publication of mountain guides
	– Start of recreational tourism
1918–1945 (interwar period)	– Many field trips
	– First alpine feats
	– Bjelašnica Days skiing competitions
	– Development of winter recreation
1945–1978 (World War II to selection for Winter Olympics)	– First skis introduced to the villages in 1957
	– Ski courses start in 1957/1958
	– Development of winter and summer recreation
	– Large number of tourists in lodges
1978–1992 (1984 Winter Olympics to breakup of Yugoslavia)	– Large-scale winter ski tourism
	– Extended season with lower summer prices
	– International ski competitions
1996–2000 (postwar reconstruction)	– Reconstruction of facilities
	– Winter tourism still prevailing
Since 2000 (modern period)	– Winter tourism and recreation
	– Efforts to develop summer tourism
	– Problems with unplanned construction
	– Lack of a tourism development strategy

structure built on the mountain. Prior to this, only hiking routes were mapped and marked.

In 1923, the Slavija sports club built a mountain lodge on the north side of Mount Bjelašnica near the spring below Gradina at an elevation of 1,345 m. The facility had fifteen beds and was primarily intended for skiers and mountaineers (Babić, 2022). This building was the first facility to accommodate tourists on Mount Bjelašnica, and it heralded further architectural development on the mountain. Over the next few decades, similar structures were built. Some of them are still standing and are used for their original purpose, but with certain extensions or changes to the material.

Although the Second World War (1941–1945) saw the destruction of all facilities on Mount Bjelašnica used by mountaineers, nature lovers, and hunters, including the weather observatory on the very top, the subsequent communist period recognized Mount Bjelašnica as a popular winter sports destination. The mountain gained prominence primarily for its ski slopes, and with this the spatial and architectural development of the mountain started. The main event that triggered the rapid urbanization of the mountain was the Winter Olympics. The 1984 Winter Olympics were held from 8 to 19 February in Sarajevo, then part of Yugoslavia. These were the first Winter Olympics held in a communist country and the second Olympic Games in a communist country after the 1980 Summer Olympics in Moscow (Vuic, 2015).

Sarajevo was selected as the host of the 1984 Winter Olympics in May 1978. This triggered an architectural and urban renaissance for the city as part of preparations for this very important event. Groundwork cleared room for the construction of a variety of facilities and amenities as part of the necessary Olympic infrastructure. This included hotels and sports facilities as well as other necessary structures. Mount Bjelašnica hosted men's Alpine skiing competitions, for which two hotels were built, the Hotel Smuk and the Hotel Famos (Figure 2). Apart from the two hotels, Mount Bjelašnica had an observatory building on its very peak and several smaller mountain lodges for hikers and skiers. The city grew rapidly, and infrastructure on the surrounding mountains expanded. The development of infrastructure and the hosting of the Winter Olympics significantly influenced the growth of tourism and architecture.

Figure 2: The Hotel Famos, Slobodan Jovandić and Duška Jovandić, 1982/1983 (source: Nalo, 2015).

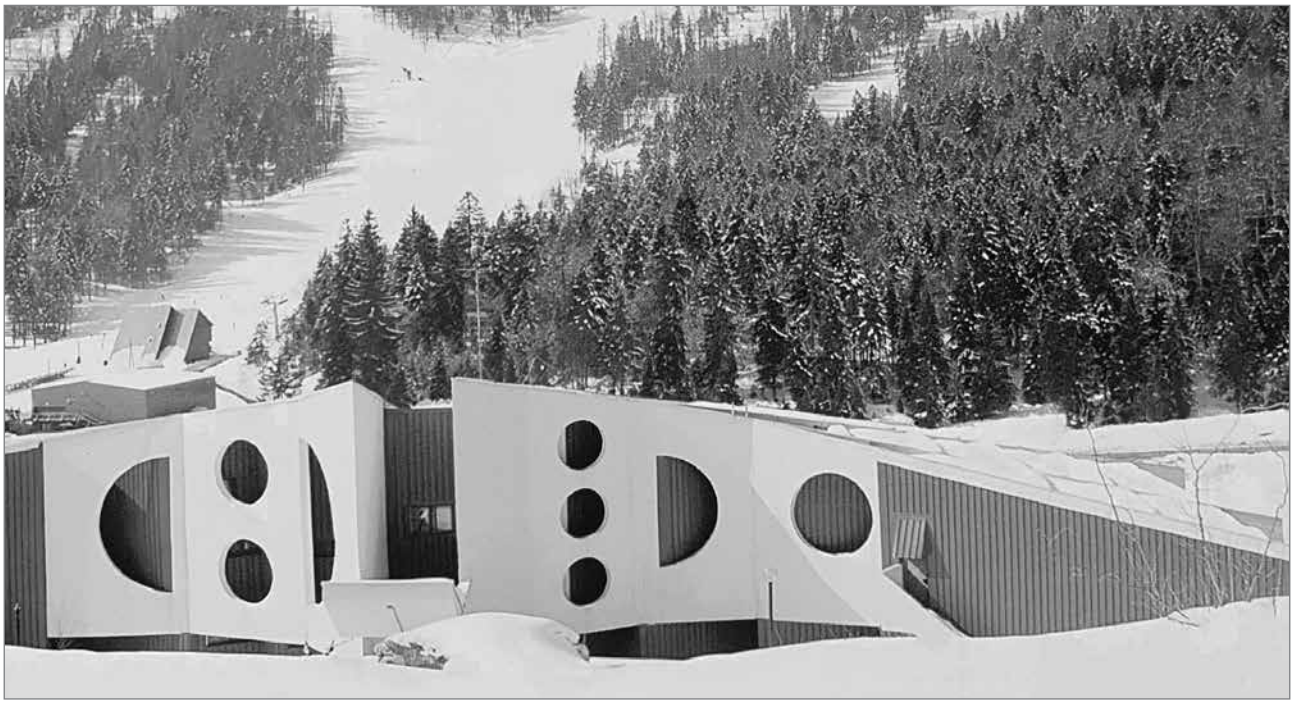

Figure 3: Press Center (source: ANUBiH, 2002).

In addition to the two hotels, the mountain gained a press centre (a large brutalist building clad in composite panels in a distinct blue colour), a restaurant at Babin Do, and a restaurant at the very top of the mountain (Figure 3). Although the Winter Olympics helped place Mount Bjelašnica on the winter sports map, the major development of the mountain, which is still ongoing, started in the post-communist period under the influence of neoliberal capital and private investors. This article focuses on the failure to reestablish the positive impacts that the Winter Olympics had on the mountain's spatial organization and its use as a launchpad for Mount Bjelašnica's future socioeconomic and urban development. Other issues include Sarajevo's unclear status as the capital of a nation that is relatively new to the neoliberal capitalist stage, which has resulted in various misuses in the mountain's spatial planning, and the lack of a legal framework (Hadžialić, 2002).

Figure 4: France's La Plagne ski resort (source: Koumanov B., 2011).

4 Genesis, spatial development, and new narrative(s)

The development and creation of ski resorts date back to the early twentieth century, when skiing as a sport was in its infancy and the concept of mass tourism did not even exist. Delorme (2014) has defined the stages of development of ski resorts based on their evolution and characteristics. Although there is no universally agreed-upon categorization, the following classification is commonly used:

First-generation ski resorts (pre–World War II) emerged in the early twentieth century, when skiing gained popularity as a recreational activity. They were often located in mountainous regions with suitable snow conditions and began attracting visitors seeking winter sports. Examples include St. Moritz in Switzerland and Chamonix in France.

Second-generation ski resorts (post–World War II) saw the ski industry experience significant growth and modernization. Second generation resorts were characterized by improved ski infrastructure, including ski lifts, groomed slopes, and expanded accommodation options. Examples include St. Anton in Austria and Cortina d'Ampezzo in Italy.

Third-generation ski resorts (1960s–1970s) witnessed a surge in popularity and development. They often featured purpose-built ski villages with a strong focus on ski-in / ski-out access, extensive lift systems, and a wide range of amenities and après-ski activities. Examples include Val d'Isère in France and Aspen in the United States.

Fourth-generation ski resorts (1980s–1990s) highlighted the concept of destination skiing. They placed greater emphasis on non-skiing activities, such as shopping, dining, and entertainment. These resorts often incorporated extensive snowmaking systems to ensure consistent snow coverage. Examples include Whistler Blackcomb in Canada and Vail in the United States.

Fifth-generation ski resorts (2000s–present) focus on sustainability, environmental consciousness, and improved guest experiences. They strive to offer a diverse range of activities beyond skiing, such as snowshoeing, snowboarding parks, spa facilities, and cultural events. These resorts often prioritize environmentally friendly practices and promote year-round tourism. Examples include Park City Mountain Resort in the United States and Zermatt in Switzerland.

Babin Do, according to the classification provided above, is a trans-generational development that belongs to the third and fourth (and possibly fifth) generation of ski resorts with its

beginnings in the late 1960s but not truly developed until the 2000s. As mentioned at the beginning of the text, this article compares Babin Do and other similar facilities in Europe. In the 1960s, France's government developed new ski centres as part of Plan Neige, a program to promote the development of winter sports infrastructure in mountainous regions of France. The program was implemented to support the growth of ski resorts, improve accessibility, and boost tourism in these areas. The French government provided financial incentives, subsidies, and infrastructure investments to facilitate the construction of ski resorts and related facilities. The program sought to enhance the attractiveness and competitiveness of French ski resorts at the domestic and international levels. Places such as Flaine, Tignes, Les Arcs, and Val Thorens were part of the development and, in addition to developing new ski slopes and expanding old ones, the focus was on accommodation and other tourism facilities. This included hotels, lodges, chalets, and other accommodation options close to the slopes. This was followed by other supporting infrastructure such as restaurants, commercial spaces, and entertainment venues.

The architecture that was introduced to the slopes was often monumental and out of this world, with very strong futuristic elements of sharp angles and quasi-industrial characteristics that visually contradict the context. As Skinner (2021) suggests, "the Sixties generation of high-altitude, ski-in and ski-out towns were unashamedly modern and mass-market." Prominent urbanists, architects, and designers of the time were involved in creating these towns, following urban and architectural doctrines (most of them were students of or collaborators with Le Corbusier) and not making connections or taking references from the surrounding vernacular architecture in terms of forms, materials, construction methods, and so on. The spirit of modernism still influences contemporary architectural forms, and the buildings constructed in the early 2000s still follow the fundamentals of monumentality, creating a strong visual presence and dominating the valley(s).

Regardless of the terrain configuration or other natural features of the context, developments such as Isola 2000, La Grange (next to Val d'Isere), or La Plagne (Figure 4) create a different and relatively unique urban layout, featuring one common characteristic: all of them have gigantic multistorey residential buildings with no connection to the existing context, creating a rough transition between the surroundings and the mass of the building volume. These huge apartment buildings, which are mostly occupied during the ski season, could equally be positioned elsewhere in Europe or even in dense Chinese residential areas. Referring to this, Snégaroff (2015) writes about criticism of these large accommodation facilities, coming from the common folk: "increasingly virulent criticism from those who see in these ski factories the replica of the suburbs of the big cities."

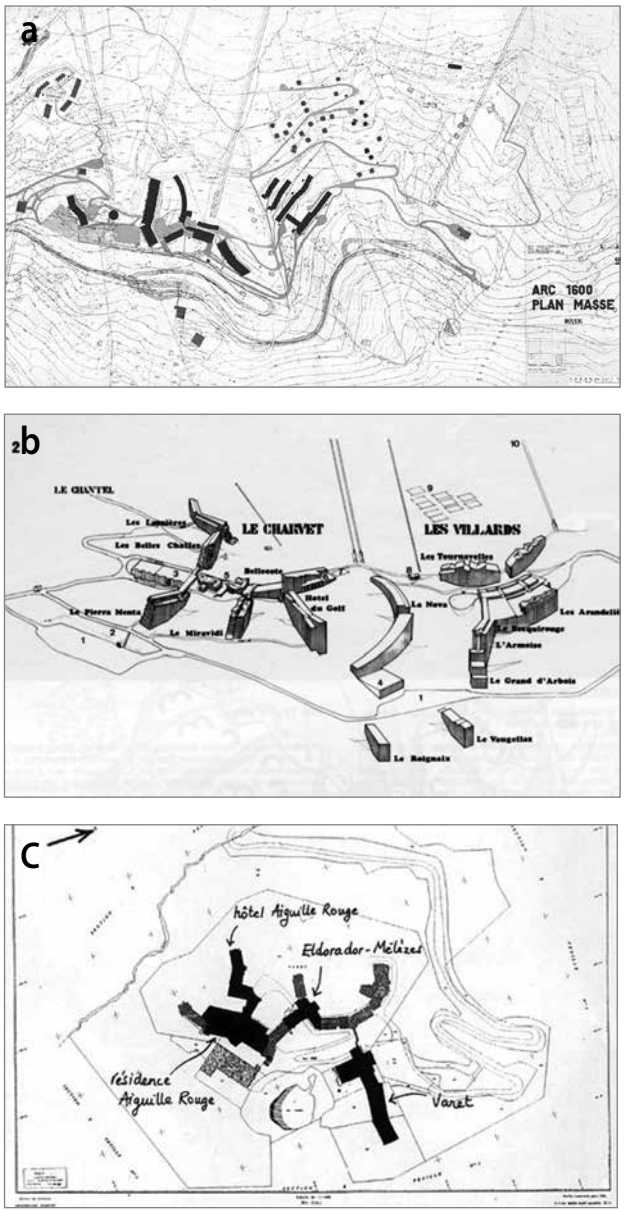

Figure 5: Urban plans of Les Arcs: a) Arc 1600, b) Arc 1800, c) Arc 2000 (source: Hidden Architecture, 2005).

4.1 Case studies: Flaine and Les Arcs

Akin to the examples mentioned above, but containing substantial architectural and historical value and character, are the mountain resorts of Flaine and Les Arcs, both constructed in the 1960s as part of Plan Neige. Flaine was designed by the Bauhaus architect Marcel Breuer. The resort is designed in the true brutalist style, respecting the main principles of Bauhaus, placing focus on creating functional buildings that fulfil their purpose efficiently and effectively, in which the design elements are meant to serve a practical purpose rather than being merely ornamental. The resort famously also includes sculptures by

Table 2a: Content and architecture of Les Arcs, 1967.

Content	
Facilities	More than ten hotels, many buildings with rental options, bars and restaurants, groceries, ski rentals/services, ski lifts, tennis courts
Function	All seasons: spa, biking, and hiking Winter: skiing and snowboarding Summer: tennis, golf, archery, and various activities for children and adults
Spatial planning	Three elevation locations with 200 m between each: Arc 1600 (at 1,600 m), Arch 1800, and Arch 2000. Based on the idea of complete comfort, the concept of the station intégrée 'resort town' (Stacher, 2020) was to be perfected, starting with direct access from accommodation to the slopes and a wide range of public facilities.
Architecture	
Style	Brutalist in approach, the atypical design features a strong connection with alpine architecture with an abundance of wooden cladding. Emphasis is placed on a cascading form (Figure 8).
Materials	Visible materials are mostly timber and stone cladding in combination with concrete.
Height	The structures vary between three stories for chalets and commercial structures to accommodation facilities twelve to thirteen stories high.
Ambience	Even though the resort has three separate areas at different elevations, the building forms, their volumes, mostly natural cladding, and sloped roofs contribute to creating the ambience of a mountain resort. In this arrangement of buildings naturally following the terrain morphology, it is also not clear if there is a central part of the resort that can be used for various seasonal activities.

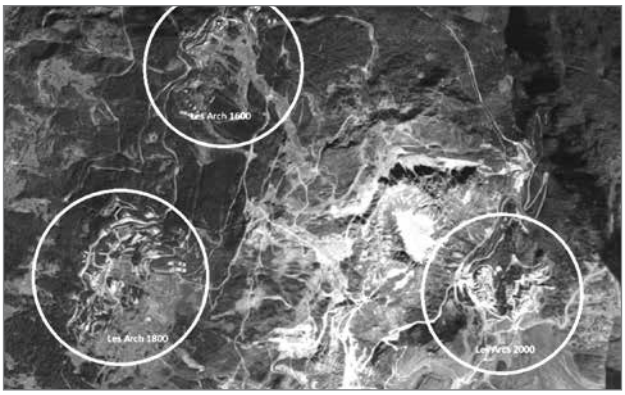

Figure 6: Gradual development: Arc 1600 (1967–1975), Arc 1800 (1974–1989), and Arc 2000 (1978–1989; source: Google Maps, 2023a).

Figure 7: Following the configuration of the terrain: Flaine (1960–1976; source: Google Maps, 2023b).

Figure 8: Les Arcs, 1967 (source: Hidden Architecture, 2005).

Table 2b: Content and architecture of Flaine, 1968.

Content	
Facilities	Seven hotels, many buildings with rental options, bars and restaurants, supermarkets and groceries, ski rental/service shops, ski lifts, tennis courts, golf club, and a chapel
Function	All seasons: spa, biking, hiking, and bowling Winter: skiing, snowboarding, adapted skiing for disabled people Summer: tennis, golf, climbing, paragliding, potholing, canyoning, fishing, hot air balloon rides, and various activities for children and adults
Spatial planning	"Built on three edges in front of a long limestone cliff wall that shapes the structure and morphology of the terrain, blending in with the colour of the rocks 'so the terrain does not need to be protected because the buildings almost optically disappear due to the mimesis principle,' Breuer argued. He set an architectural counterpoint to the dominant geometry of the vertical limestone rocks through horizontal concrete bars, whose diamond-shaped facets brought variety and life to the long fronts of the concrete facades. 'The entire composition is integrated into the magnificent and wild landscape of Flaine, which it partners and humanises'" (Stacher, 2020).
Architecture	
Style	Marcel Breuer's buildings are in the Brutalist style (Figure 9). The others follow contemporary design expression with no or very little connection to traditional mountain structures.
Materials	The buildings are made of reinforced concrete with exposed concrete visible. Other buildings are mostly clad with stone and timber.
Height	Building heights are between three and eleven stories. The chapel and the commercial building are one story high.
Ambience	Due to the typology of the buildings, their height, form, and mostly flat roofs, and the materials visible on facades, this place looks more like a suburb than a mountain resort. Flaine does offer a lot of activities even in the summer; however, the place is mostly seasonally occupied. The layout of the resort does not seem to follow any patterns of mountain villages. There is no recognizable central part or square for main activities. It consists of three separately functioning areas with groups of multifunctional buildings, parking lots, and greenery.

Figure 9: Flaine, 1968 (source: Chadwick, 2016).

Table 2c: Content and architecture of Babin Do, 1982–present.

Content	
Facilities	Four operational hotels, several restaurants and bars, one grocery shop, ski rental, ski cottages, ski lifts, hiking trails, tennis courts, numerous buildings (mostly rental units and seasonally occupied)
Function	All seasons: spa, biking, and hiking Winter: skiing and snowboarding Summer: tennis and paragliding
Spatial planning	There is no clear spatial plan on how to develop Babin Do. The buildings are mostly positioned along the main road in a north–south direction with extensions towards the southwest and east. Most buildings along the main road have a view of the ski slope, but no direct access to it. The buildings in the southwest part of the valley partly have ski-in / ski-out possibilities.
Architecture	
Style	Various design approaches due to the engagement of multiple authors demonstrate the diversity of forms and architectural manifestations as a reflection of the modern neoliberal philosophy (Figure 10).
Materials	Buildings are mostly constructed with reinforced concrete and concrete blocks with insulation. The external appearance varies from regular insulated facades to wooden or stone cladding.
Height	Building heights range from three stories for row houses up to eight stories for some hotels and other buildings.
Ambience	The buildings in Babin Do are mostly linear, set along the main road with a southwest extension along the service road. The architectural language of the existing buildings, their form and heights, as well as the materials partly create the ambience of a mountain village. Some buildings have sloped roofs and use natural cladding materials whereas others could be located anywhere else. The group of buildings on the southwest extension creates a small square as an extension to the natural plateau of Babin Do, which serves as a central space for the main outdoor activities.

Figure 10: Babin Do, 2023 (photo: Alma Hudović Kljuno).

Picasso, Dubuffet, and Vasarely. The urban and architectural design as well as the construction of Les Arcs (Figure 5) was led by Charlotte Perriand, who collaborated with Le Corbusier. Seen with scepticism and often criticized back then, but nowadays observed with nostalgic emotions and granted the high architectural value of brutalist architecture, both examples display a serious and thoughtful approach to the urban and architectural design of mountainous, rural areas (Figures 6 and 7). The two examples from France are compared with Babin Do, analysing various aspects of urban and architectural design (Tables 2a, 2b, and 2c).

5 Mount Bjelašnica in detail: traditional vs contemporary, deficiency in content

Before Sarajevo was awarded the 1984 Winter Olympics, tourism and with it the necessary infrastructure (facilities and amenities) were in their infancy. As Petranović (1990) suggests, in the rapid period of postwar economic development (in the former Yugoslavia), Sarajevo was fairly undeveloped and lagged behind the national average. The tourist potential of the city, with surrounding Mount Trebević, Mount Jahorina, Mount Bjelašnica, and Mount Igman with proximity to the city, was realized and Sarajevo became a good contestant for the Winter Olympics. Increased urbanization of the city before hosting the Winter Olympics consisted of the construction of major sports and cultural facilities in the town as well as in its surroundings. As Zagora and Šamić (2021) state, "Socialist-era architectural production in Sarajevo embodied high social and cultural values, and deserves special consideration. The marriage between modernism and Yugoslav socialism in the form of a Non-Aligned architectural brand successfully celebrated the ideals of 'brotherhood and unity' and 'self-management', while simultaneously reconciling its internal ethnic diversity in a universal language." The city was faced with constructing 163 major projects because there was only one ice hall in town, a number of possible trails for the ski facilities on the mountains, and one functioning lift on Mount Jahorina. As Bojanić and Ifko (2019) concluded, "in the world of winter sports, without exaggeration, Sarajevo was a nonentity." To host the games, in addition to construction of the necessary facilities such as bobsled, luge runs, ski jumps, speed skating, and so on, Sarajevo needed ski resorts but also the supporting infrastructure, such as 160 km of roads, sewer lines, power lines, telephone lines, parking lots, ski lifts, bathrooms, locker rooms, restaurants, a new airport and railway station, two Olympic villages, a press village, nine new hotels, and five refurbished hotels (Vuic, 2015).

Figure 11: Communist-era mountain hospitality: the Hotel Vučko, Zlatko Ugljen, 1983 (source: Niebyl, 2021).

Figure 12: Communist-era mountain hospitality: the Hotel Igman, Ahmed Džuvić, 1983 (source: Džuvić, 2023).

Unlike great examples of contemporary Yugoslav architecture, with an emphasis on traditional and cultural characteristics combined, such as the Hotel Vučko on Mount Jahorina and the Hotel Igman on Mount Igman, Bjelašnica was not as fortunate, and it had the aforementioned Famos (Figure 2) and Smuk hotels built for the Winter Olympics. The design by the architect Zlatko Ugljen displayed in the Hotel Vučko (Figure 11) is a compelling architectural unity of the exterior and the interior celebrated in the use of a detailed wooden envelope of decorative minutiae, and beam and truss connections openly displayed as a part of the interior. Ugljen, in an interview for the journal *Oris* (Roš & Rusan, 2001), said that he was trying to avoid a sterile (hotel) atmosphere and "created an environment which agrees with the locality. I insist on the sensations produced by the primary sculpture and reproduce them from within using the secondary sculpture, such as the roof or ceiling structures, light wells, niches, multilevel structures, the fireplace, and so on." Equally successful is the example of the Hotel Igman (Figure 12) designed by Ahmed Džuvić, who created a skilful play of opposition of roof and walls, all sloping, and clad in wood. The steep roof slopes and the central axes resemble the traditional building style as well as the division between the ground floor and the upper floors. The design silhouette

Figure 13: The first accommodation built at Babin Do, Izet Arslanagić, 2005 (photo: Alma Hudović Kljuno).

Figure 14: Eclectic architecture at Babin Do (photo: Alma Hudović Kljuno).

is somehow fragmented but manages to link to the contours of the mountain, creating an interesting and cozy atmosphere in the interior as well.

The Hotel Vučko and the Hotel Igman are celebrated for their architectural style and approach, integrating vernacular characteristics with contemporary design influences resulting in a modern hotel design. This design strategy aimed to create a sense of place and a connection to the surrounding environment and cultural heritage. It is unfortunate that the present-day construction, in particular on Mount Bjelašnica, is a far cry from past times and often excludes the positive impact of old traditions. Numerous recent buildings are completely detached from the native influences of the surrounding context.

5.1 Urbanization of Babin Do in the twenty-first century

Intensified development of Babin Do has been taking place in the last few years, with what seems like the uncontrolled

erection of lone buildings that mostly suggest their own individuality and sit out of context in every way. The first buildings that were introduced to the mountain were two sets of row houses built at the beginning of the new millennium by the large pharmaceutical company Bosnalijek and designed by Izet Arslangić (Figure 13). The two parallel rows, although inconveniently long, are built to respect the traditional alpine design approach. The position of the rows follows the configuration of the terrain on the entry side, and the houses consist of an entrance with a steep sloping roof that on the other side continues further down, creating and covering additional levels that roll down with the terrain. The applied wooden cladding is an attempt to imitate traditional alpine buildings.

Babin Do, analysed as a (new) settlement, unfortunately has no defined spatial narrative, and the lack of a specific or even systematic style in the new architecture is also a subject to be questioned. Unlike the given examples in the scope of Plan Neige, which applied a strong architectural doctrine, new architectural realization and design at Babin Do are essentially without context and find visual identity and foothold in a variety of inadequate templates with postmodernist influences, very far from the examples of the golden age of local mountain architecture. Far from any avant-garde, fashionable architecture that emerges without context and rationale is becoming the new norm. This norm is multiplied in various locations around the undefined urban footprint of the mountain, almost unconsciously, and is subject to many changes in its vertical and horizontal volume. The architectural expression of Babin Do is very questionable because it is not integrated into the context, and it is almost always advertised by investors as high-quality and innovative with all the modern conveniences of the twenty-first century. This appropriation of architecture, as well as a new modus operandi, is most often associated with the general state of lack of culture and education of society, which evaluates this kind of architecture as modern, unconventional, and expensive (Figure 14).

The spatial development of the mountain resort goes in the wrong direction, leading to abortive or unthought-of results. This happens due to the lack of a defined regulatory plan, which in turn provides opportunity and space for manipulation. In 2016, the Trnovo municipal council requested an urban planning project be created for Babin Do (Odluka, 2016), but it has never been implemented (Figure 15). As an outcome of lack of action, the current state of the space is the result of non-planned and/or non-rational urban policies and spatial planning; that is, numerous alterations and adjustments of regulatory plans to satisfy the policies and wishes of individual investments. Arcuset (2009) gives an example of under-equipped tourism, and a turning point of a medium-sized resort in the Alps in the 2000s (similar in size to Babin Do), for which

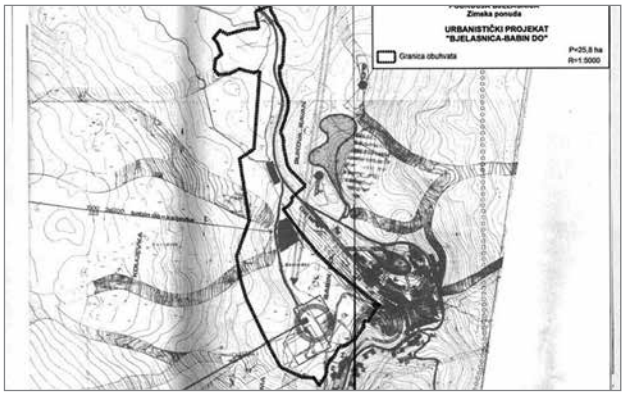

Figure 15: Regulatory plan for Babin Do that has never been implemented (source: Odluka, 2016)

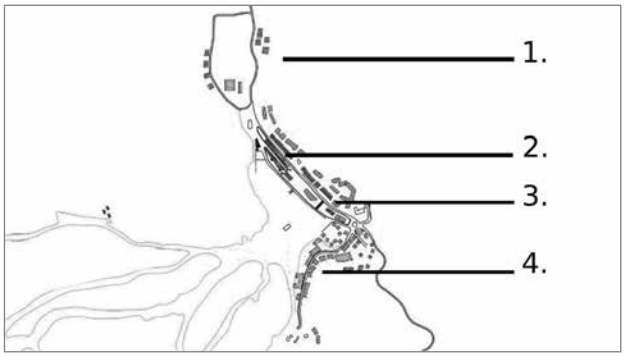

Figure 16: Phased development at Babin Do: 1) currently under construction; 2) 2004–2009; 3) 2009–2018; 4) 2018–2021 (illustration: Leila Krivošić Dizdarević).

Figure 17: Contemporary vernacular qualities: a) Srebrna Lisica self-catering apartment complex, Studio Non-Stop, 2019; b) the Hotel Nomad, Vedad Kasumagić and Feđa Hadžibegović, 2022 (photos: Alma Hudović Kljuno).

the local authorities chose to adopt "a model of profitability based on the proportionality relationship between the stock of accommodation and ski lift capacity" (Francois & Marcelpoil, 2008) and started a vast program to address the issue.

Figure 16 shows the gradual construction of the buildings in Babin Do from the early 2000s up to now. Chaotic development, with very little advance planning, can be confirmed by analysing the linear development of the resort. The developments are all oriented toward the main axis point and have gradually filled both sides of the road, in a north–south direction. The buildings on the very north of the site, which are somehow dislocated from the main part of the resort, are a very recent (from 2021 or later) development still under construction, for which a large part of the land was deforested.

There has not been much growth of additional supporting infrastructure in terms of other content aside from the development of accommodation typologies, the majority of which are privately owned. The mountain features four operational hotels. However, the fifth hotel, built in 1983 and still in its original state, remains closed due to neglect. In addition to this, there are several restaurants and bars, a single grocery store, ski cottages, ski lifts, hiking paths, and tennis courts. The emphasis is on the winter occupancy of the space, and the year-round activities are sparse, with two tennis courts and the possibility of paragliding and hiking (although the latter unfortunately has not been developed enough despite the large potential). Concerts and other large gatherings are infrequent, are based solely on individuals' will and effort, and are not part of the organized resort content development. As Clarimont and Vlès (2008) emphasize, only a change in decision-making practices will make it possible to promote a specific development effectively through the establishment of appropriate mechanisms.

To conclude, it is important to emphasize that some of the architecture that has sprung up in recent years has sought to and succeeded in preserving the environment and promoting architectural harmony with the place. Efforts have been made to blend modern architecture with traditional design elements and integrate buildings into the natural landscape effectively while creating a fresh and modern look. Buildings that mimic the vernacular qualities of the nearby village dwellings seem to blend in with the setting, providing the best ambience. Such buildings are not grand in volume but are grand in their design using natural, locally sourced materials such as stone and wooden panels as well as morphologically following historical patterns (Figure 17).

6 Discussion

Based on the analysis and comparison between the given examples in France and on Mount Bjelašnica, the main findings of this research show that spatial development at Babin Do has been spontaneous and without a general concept due to the lack of a defined and adopted regulatory plan. The communist-era development and spatial planning with a focus on an egalitarian approach is in complete contrast to the modern trends, which, unfortunately, focus on individual needs and plans heavily influenced by neoliberal capital. It is this approach to the development of the mountain resort that has shaped the resort itself. The lack of content and other facilities, except for the basic ski slopes and a lot of privately owned accommodation, is the result of this. Grand developments in the scope of Plan Neige in France might have resulted in brutalist architectural ensembles, but they have successfully capped the needs and wants of a lucrative resort with a carefully planned and designed spatial layout.

The local authority and tourism office of Sarajevo Canton should play a more active role in adding a variety of content and creating a year-round mountain experience. Going back to Delorme's classifications of ski resort development, Babin Do (although classified somewhere between level three and level four) should be focusing on the qualities of level-five development. In the spirit of the twenty-first century, this would include sustainable environmental solutions, conscious development of further projects, and upgrading existing features to improve the guest experience and the spatial qualities of the place. Emphasis should be placed on diversity in what is offered, regardless of the season, which will result in different spatial planning of the mountain. As Paquot (2009) suggests, diversity in built typologies will improve the public space, which is partly present at Babin Do in terms of architecture, but not in terms of urban planning. According to Zepf (2004), spatial planning should be addressed at all three territorial levels of development for the organization of urban space: macro-, meso-, and micro-territory. Unfortunately, Babin Do has not fully benefited from any of these, except the macro development that has been left as a communist legacy.

7 Conclusion

The ski resorts, as we know them, are now more than sixty years old, and it is safe to say that they are experiencing problems concerning their spatial (and architectural) development. The 1970s and 1980s developments were focused on public developments and ski-in / ski-out facilities and skiing infrastructure, whereas the more recent developments are focused

on a variety of entertainment and consumer needs, which as a result will need spatial adaptation to meet changing practices. The development of Babin Do on Mount Bjelašnica does not respond to any of the issues regarding spatial (or any other) planning. The adverse spatial situation and the problems that Mount Bjelašnica is facing at the moment were created in developing the ski resort without parameters and guidelines regarding the ski resort's trajectory, which would include necessary and accompanying infrastructure. Without an adopted development plan, all activities taking place at Babin Do can be subject to the misbehaviour and decisions of a few individuals whose primary goal is financial gain. The idea of creating an economically, environmentally, and socially sustainable resort is non-existent for the authorities of the municipality of Trnovo. Currently, the focus is still on the construction of a large number of self-catering apartment buildings without supporting infrastructure and without a long-term vision and concept of how the ski resort at Babin Do should operate and sustain itself in the future.

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A concept for adapting geotechnical structures considering the influences of climate change

This article addresses potentially unstable slope areas in the context of climate change. A possible approach to mitigating and adapting slopes is presented, considering various solutions primarily based on natural processes. The methodology incorporates planning considerations for the effects of climate change on the geomechanical properties of soils and consequently the response of soils and structures. The effects of selected measures to adapt to climate change are also demonstrated. A concept for adapting potentially unstable geotechnical structures is proposed, considering anticipated climate changes for geomechanical analyses and geotechnical planning, which encompasses the causal chain: climate change signals, effects, impacts (consequences), and measures. The implementation of the concept is illustrated through a typical slope stability analysis. The conclusion of the analysis highlights factors such as water net infiltration into the slope, soil permeability, and groundwater flow within the slope, which are often crucial for slope stability. These factors can also be regulated through nature-based solutions.

Keywords: climate change adaptation, nature-based solutions, slope stability, rainfall infiltration, water net infiltration

1 Introduction

Experiences with landslides show that the most critical slope surfaces are in suburban areas; landslides typically occur in areas sparsely built with structures and within the vicinity of local roads. In Slovenia, it is therefore common practice that for such areas, during the phase of planning and obtaining building permits, a survey is conducted to assess the landslide probability, and the project documentation is supplemented with appropriate geological and geotechnical reports, which serve as the basis for geomechanical analysis and planning.

Geomechanical analyses considering climate change present several challenges that are not adequately addressed by regulations and standards:

- Describing climate characteristics with an evaluation of climate change is difficult; hence, climate characteristics and anticipated climate change in the future are described using so-called climate change signals, determined from climatological forecasts (climate data and climate change prediction models). The challenge lies in the fact that these signals are not precisely determinable, their values have significant deviations depending on the selected climate change scenario, and they are not directly usable as input data in geomechanical analysis.
- The effects of climate change lead to altered geological characteristics of an area and altered geomechanical parameters of soils. The effects of climate change are difficult to precisely determine (geological models, geomechanical tests, and models), even if the signals were accurately determined.
- Climate signals and effects are interdependent. Each individual signal causes one or more effects, but not all simultaneously.
- Signals and effects induce responses (consequences) on the soil and structure, which are difficult to determine due to the simultaneous occurrence of various signals and effects and simultaneous other (non-climatic) influences that are standardly considered in the analysis.
- There are a large number of geotechnical structures, and each type requires specific geomechanical analysis and appropriate geotechnical measures. Standard approaches to analysing individual types of geotechnical structures are known, but they do not provide guidance regarding climate change.
- Defining the causal connection between signals, effects, and responses is challenging; the connection varies for each geotechnical structure.
- There is a wide range of possible geotechnical measures; it is necessary to determine how measures affect climate change signals and effects, and how they affect the safety of geotechnical structures.

A concept for adapting potentially unstable geotechnical structures taking into account the impacts of climate change is presented, which is generally applicable to all typical geotechnical structures. Geotechnical structures here also include embankments and slopes. For this purpose, a causal chain has been developed: climate change signals, effects, responses (consequences), and measures. The implementation of the concept is illustrated using a case study in which meteoric water flows down the slope from the road above. A possible approach to slope adaptation using nature-based solutions (NBS) is proposed. These are solutions inspired and supported by nature. They are cost-effective while simultaneously providing environmental, social, and economic benefits. They bring more diverse nature, natural features, and processes into cities, landscapes, and coastal areas with locally adapted, efficient, and systemic interventions (European Commission, 2023).

The topic presented is part of a research project conducted by the Climate Change Adaptation research group WG-CCA (ELGIP, 2022) within the framework of the European Large Geotechnical Institute Platform (ELGIP, 2022). The WG-CCA study specifically focuses on the European region. The research presented in this article was divided into three main phases. In the first phase, a literature review was conducted. The second phase analysed the causal relationship between climate-change signals and effects, and the potential impacts of climate-change signals and effects on slopes and structures (climate geomechanical design: signals, effects, responses, measures). The third phase provided a concept for geomechanical analysis and planning considering the influences of climate change. Based on this concept, the authors of the article attempted to address all the challenges encountered in analysing existing and new geotechnical structures, considering climate change, and to implement and demonstrate them using a real landslide case study.

1.1 Literature review

International organizations dealing with climate change have previously released numerous publications and documents related to climate change. Many authors discuss the impacts of climate change on the environment. Here, we limit ourselves to the geotechnical aspect of climate change adaptation. Vardon (2015) examined the impacts of climate change likely to affect the environment. He described the following characteristics of climate change: temperature, precipitation, wind, sea level rise, storms, river flow, and frost, which will have an impact on geotechnical structures. Davies (2011) states that the quantification of water net infiltration into the soil depends on climate data, soil, and vegetation.

Climate parameters (precipitation, relative humidity, temperature, wind speed, and solar radiation) can be measured at weather stations, whereas soil and vegetation properties can be determined in the laboratory or in the field (Vardon, 2015). Surface water runoff occurs when the amount of precipitation exceeds the soil infiltration capacity. Computational procedures for determining each water balance are complex and involve numerous assumptions (Davies, 2011). Laboratory tests of models (Chen et al., 2019) and finite element software analysis (Yan & Jiao, 2018) can be used to study slope stability and water infiltration characteristics under rainfall conditions. Geomechanical analysis needs to include the influence of various factors on the soil, such as soil friction angle, water content, hydraulic permeability, and duration and intensity of rainfall (Cho, 2017; Chen et al., 2019; Dyson et al., 2019; Oggero et al., 2021).

As part of the SafeLand project (2012), the risk of landslides was analysed in connection with climate. It used a continuum of soil infiltration, including evapotranspiration, for stability analysis. Vahedifard et al. (2018) focused on geotechnical structures under partially saturated conditions, with changes in soil properties defined as the cause of climate change impacts. Pk (2017) analysed the stability of embankments for current and future climates using numerical modelling and showed that the effects of climate change are strongly dependent on the hydraulic properties of embankment materials. Infiltration and evaporation processes on the soil surface generally depend on prevailing climatic conditions and soil water content. The total amount of water infiltrating the soil significantly affects pore pressure and slope stability. During rainfall, water infiltrates into the slope and gradually forms a transient saturated zone. Suction gradually decreases, reducing the shear strength of the soil on the slope and increasing the risk of slope instability (Andreea, 2016; Wang et al., 2018; Zhou et al., 2019). Park et al. (2019) analysed embankments and slope stability, considering statistical rainfall patterns and soil hydromechanical properties. Insana et al. (2021) explored how issues with geotechnical structures under the influence of climate change are addressed in national adaptation plans. They found that specific provisions for adapting geotechnical structures to climate change are generally lacking and are mainly provided in the form of strategies for addressing specific problems.

According to climate change predictions from the Slovenian Environment Agency in the Climate Change Report 2021 (Agencija Republike Slovenije za okolje, 2021), changes in air temperature and precipitation are forecasted, with the magnitude of changes depending on the amount of greenhouse gases. In various climate scenarios, the air temperature is expected to increase compared to the period from 1981 to 2012 by 1.3 °C to 4.1 °C (Bertalanič et al., 2018). Bertalanič et al. (2018) predict that by mid-century we can expect an increase in the number of extreme weather events: severe heatwaves in the summer, increased temperature and precipitation variability in the summer, more intense rainfall events, a strengthened hydrological cycle, more frequent floods, a significant increase in the frequency of summer droughts, and a probable increase in the number of days conducive to the formation of summer storms.

Adapting cities to extreme events or enhancing their resilience to these events is a complex process that requires the involvement and collaboration of all stakeholders shaping and managing urban space (Klemen, 2020). Radinja et al. (2021) highlight the issue of urban water management, which can only be successful through interdisciplinary cooperation involving experts from all fields (water engineers, spatial planners, urban planners, architects and landscape architects, builders, geographers, sociologists, etc.). They propose measures involving so-called blue-green infrastructure (BGI). BGI comprises natural and semi-natural decentralized systems designed to manage stormwater in urban areas while simultaneously providing a wide range of ecosystem services. Except for a few cities in other countries where strategies for its systematic introduction have already been adopted, the implementation of BGI is limited to isolated cases. Krajnc (2019) notes that the effects of climate change and the current state in urban settlements create conditions where urban infrastructure is increasingly unable to cope during critical moments (e.g., extreme rainfall and heatwaves). Kristl et al. (2020) address the main challenges related to climate change resilience from the perspective of the building sector, such as climate change adaptation schemes, energy efficiency, and measures to mitigate these changes. Challenges are evaluated based on the latest developments in the field, research interests, and regulatory issues, with the literature review assessing progress and identifying research gaps. The literature shows that resilience to climate change mostly relates to larger systems, but at the level of building structures this area is still evolving.

Raymond et al. (2017) and Cohen-Shacham et al. (2016) present solutions that address numerous social challenges simultaneously. These solutions are nature-based and include enhancing human wellbeing, urban regeneration, improving coastal resilience, integrated flood management and ecosystem restoration, promoting sustainable use of materials and energy, enhancing ecosystem insurance value, and increasing carbon sequestration. A list of possible measures, well known in geotechnical engineering, has been presented in the LaRimiT database (Uzielli et al., 2017; Capobianco et al., 2022). Initially including conventional solutions based on traditional methods, the LaRiMiT database has been expanded to include NBS for erosion control and shallow landslide mitigation

using vegetation and natural materials. NBS and conventional solutions can also be combined into hybrid solutions.

2 Research structure and methodology

Climate characteristics such as wind, humidity, cloudiness, fog, atmospheric pressure, and so on, and their changes significantly affect soils and structures (embankments, foundations, retaining structures, etc.). However, describing the characteristics of climate change does not make geotechnical analysis possible; therefore, they need to be expressed in a more usable form. All signals of climate change, the effects of climate change, and the impacts of climate change were collectively proposed and presented by the ELGIP Climate Change Adaptation working group (WG-CCA), which began its work in April 2018. The WG-CCA produced a description of climate change characteristics with signals and effects of climate change and presented them in an article (Insana et al., 2021).

The characteristics of climate change describe climate change, but this is too general to address geotechnical problems. The most important signals of climate change for soils are increased precipitation, decreased precipitation or prolonged drought periods, elevated air temperature and warm periods in winter, an increased number of heavy rain and drought cycles, an increased number of freeze-thaw cycles, increased frequency and intensity of cyclones and storms, sea level rise, and increased wind speed (Insana et al., 2021).

Signals of climate change have various effects on soils, bedrock, groundwater, surface water, and vegetation, affecting the behaviour of soils and structures. These impacts, referred to here as the effects of climate change, are determined by geological and geotechnical experts based on climatological data. The most characteristic effects of climate change from a geotechnical perspective include reduced soil bearing capacity, increased weathering, increased water erosion, increased surface runoff, increased or decreased level and flow of surface water and groundwater, increased wind erosion, altered geotechnical properties of frozen soils, increased surface runoff due to snowmelt, altered properties of clayey soils during shrinkage and swelling, increased water and wind erosion, frequent and higher sea level rise due to storm surges, increased loading due to strong winds and waves, coastal erosion, and increased dynamic loading (Insana et al., 2021).

2.1 Slope responses to climate change

Signals and effects of climate change induce responses in slopes and consequent outcomes, which, in the case of slopes, manifest as instability and, in extreme cases, slope failure. According to European standard EN 1997: Geotechnical design (Eurocode 7, 2005), the response is calculated as a result of increased loading and changes (deterioration) in the properties of the material forming the slope (Eurocode 7, 2005). The manifestations of slope instability are diverse (Table 1) and depend on the geometry and layering of the slope, the material of the unstable mass, and climate signals and effects.

Table 1: Forms of slope instability.

Type of instability	Rotational/translational landslide
	Rockfall
	Toppling
	Lateral spread
	Flow
Material	Soil
	Debris
	Rock
Depth	Surface (≤ 0.5 m)
	Shallow (0.5–3 m)
	Medium depth (3–8 m)
	Deep (8–15 m)
	Very deep (≥ 15 m)
Velocity	Extremely fast (≥ 3 m/s)
	Very fast (~ 30 cm/min)
	Fast (~ 1 m/day)
	Moderate (~ 1 m/month)
	Slow (~ 1 m/year)
	Very slow (≤ 30 cm/year)

Source: adapted from Varnes (1978).

2.2 Measures

Climate change can be represented using various scenarios of greenhouse gas concentrations (Representative Concentration Pathways, RCP). There are four pathways of greenhouse gas concentrations, each encompassing a range of baseline values and estimated emissions until 2100: the mitigation scenario RCP2.6; two intermediate scenarios, RCP4.5 and RCP6.0; and the high-emission scenario RCP8.5 (Intergovernmental Panel on Climate Change, 2022). It is advisable to consider the effects of climate change both in the planning of new structures and in the analysis of existing conditions. Table 2 provides general guidelines for both scenarios. When planning a new geotechnical structure, an analysis is always carried out first,

Table 2: Planning steps, criteria, and measures for new and existing geotechnical structures.

Object	Project steps	Criteria (climate adaptation)	Actions
New geotechnical structure	Feasibility study	Criteria are considered for safety and usability, taking into account climate change.	New design
	Preliminary design		
	Detailed design		
	Implementation		
Existing geotechnical structure	Suitability assessment	Criteria for safety and usability, considering climate change, are met.	No actions required
		Criteria for safety and usability, considering climate change, are not met.	Redesign
		Deteriorated mechanical characteristics of slope layers	
		Signs of slope damage and collapse	Intervention measures

Source: adapted from Bračko et al. (2022).

taking into account climate change for the future, followed by planning based on the results. However, when examining an existing geotechnical structure, the action depends on the assumed consequences of climate change. If the analysis shows a deterioration of the soil properties that leads to a lower safety factor and non-compliance with the safety criteria, similar steps as for a new structure are required. Intervention measures are carried out when damage to the structures or slope failure has already occurred.

Approaches to mitigate the consequences of climate change include construction measures; for each geotechnical structure and the expected impact of climate change, an appropriate measure from the list of possible measures is followed (see SafeLand, 2012). Here, we only address measures that are applicable to slopes and are simultaneously NBS. Table 3 shows that some measures fully meet the criteria for NBS. However, for some measures, a combination of NBS and conventional solutions with the incorporation of artificial materials is required.

To classify a measure as an NBS, the following criteria had to be met: 1) natural processes are used for the measure, 2) the measure provides or enhances social benefits, 3) the measure provides or enhances economic benefits, 4) the measure provides or enhances environmental benefits, and 5) the measure is beneficial for biodiversity.

In analyses of adaptation to climate change, a challenge arises regarding how to utilize existing computational models for geomechanical slope analyses and how to incorporate input data that accurately describe expected climate changes. Therefore, this article delineates an approach for adapting potentially unstable geotechnical structures to expected climate changes (see Figure 1), using climate parameters such as precipitation, temperature, wind, and sea level as indicators of climate variability. Climate changes induce effects on soils and structures. Each signal triggers one or more effects of climate change. Signals and effects of climate change are the cause of consequences of climate change, which are reflected as altered physical properties of soils and additional influences (i.e., loads). Based on the predicted response of soils and structures to expected climate changes, the necessary geotechnical measures for ensuring safety and stability of soils are then determined.

For the geotechnical structure under consideration, it is important to first define which signals of climate change are most significant and what effects of climate change they cause, as well as what potential consequences might arise due to the given signals and effects. For each specific case, there are multiple signals and resultant effects, and so it is crucial to understand the correlations between individual parameters of climate change. Therefore, within the WG-CCA, a study (an online survey) was conducted involving geotechnical experts from European countries to provide an assessment of the impact of signals of climate change, effects on areas and structures, and the most problematic consequences for urban areas and structures. The survey results indicate that, in most countries, the most problematic signals of climate change are increased or decreased precipitation, increased cycles of rain/drought, and increased cycles of freezing/thawing (ELGIP, 2022).

A methodology has been formulated to recognize climate signals, assess the impacts of climate change, and provide guidance for incorporating climate variability into geotechnical analysis and design. This methodology follows a procedural sequence commonly used by geotechnical engineers for evaluating existing geotechnical structures and designing new ones.

Table 3: Measures for ensuring slope stability.

	Action description	Natural measures	Stone, wood	Artificial and recycled materials
Surface protection	Hydroseeding, turfing, and trees/bushes	✓		
	Geosynthetic reinforcement			✓
	Drainage blanket		✓	✓
	Beach replenishment, rip rap		✓	
	Dentition	✓		✓
Slope geometry modification	Removal of (potentially) unstable slope mass	✓		
	Removal of loose (potentially) unstable blocks	✓		
	Removal of material from driving areas	✓		
	Substitution of material with lightweight fill			✓
	Addition of material to maintain stability		✓	
Modifying surface water regime, surface drainage	Surface drainage work	✓	✓	
	Local regrading to facilitate runoff	✓		
	Sealing tension cracks	✓		
	Insulation barriers, geo-membranes			✓
	Vegetation, hydrological effect	✓		
	Hydraulic control work	✓		
	Diversion channels	✓		
Modifying groundwater regime	Shallow trenches filled with free-draining material		✓	
	Deep trenches filled with free-draining material		✓	
	Sub-horizontal drains	✓		
	Wells	✓		
	Drainage tunnels, adits, galleries	✓		
Modifying the mechanical characteristics of unstable mass	Vegetation	✓		
	Substitution		✓	
	Compaction from surface	✓		
	Deep compaction	✓		
	Mechanical deep mixing with lime and/or cement			✓
	Low-pressure grouting with cement/chemical binder			✓
	Jet grouting			✓
Transfer of loads to more competent strata	Counterfort drains			✓
	Piles		✓	✓
	Diaphragm walls			✓
	Caissons, mechanical effects			✓
	Soil nailing			✓
	Dowels and harnessing			✓
	Rock bolting			✓
	Strand anchors			✓
Retaining structures	Reinforced soil			✓
	Gabion walls		✓	✓
	Crib walls		✓	
	Drystack masonry walls		✓	
	Mass concrete or masonry walls		✓	✓
	Reinforced concrete stem walls			✓

Source: adapted from Capobianco et al. (2022).

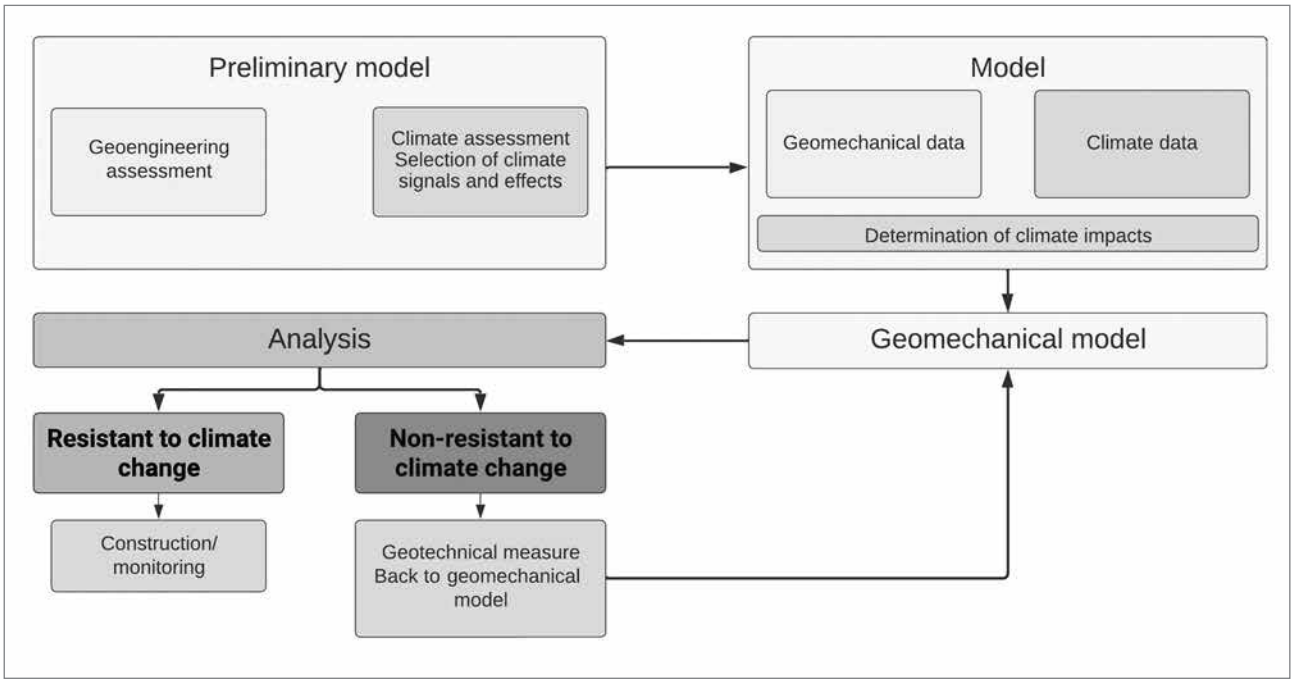

Figure 1: Conducting geomechanical analysis and designing geostructures taking into account climate change impacts (illustration: authors).

The individual steps of this sequence are shown in Figure 1. In addition, compliance with the project specifications defined in Eurocode 7 (2005) is essential.

In the initial phase, comprehensive analyses are carried out by experts in geotechnical engineering, geology, seismology, and climatology. These analyses aim to develop a model for a subsequent geomechanical analysis. If the geomechanical analysis shows that the structure can withstand the effects of climate change, the construction process or monitoring is continued. However, if the structure is found to be at risk from climate change, geotechnical measures are taken and the analysis process is repeated.

In the case of existing geotechnical structures, compliance can be achieved by modifying the geotechnical structure, if feasible, with technical maintenance interventions. A list of possible structural mitigation measures, well known in geotechnical engineering, is presented in Table 3. The suggested procedure for geomechanical analysis and design can be applied to all typical geotechnical structures, including slopes and embankments, because it does not change established fundamental principles and analytical approaches of geotechnical design but adds aspects related to climate.

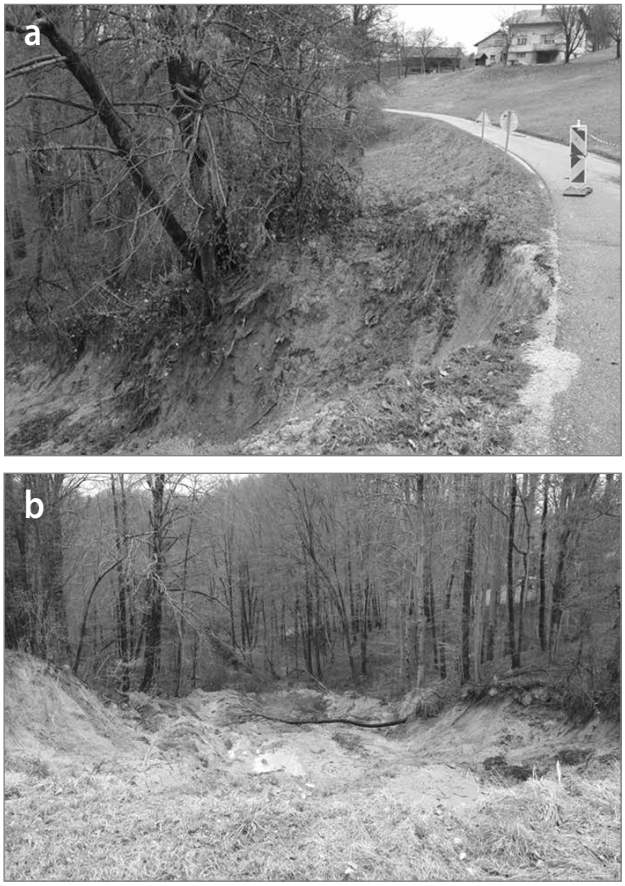

Figure 2: a) typical slope failure resulting from water infiltration into the slope and simultaneous runoff of stormwater from the road, and b) the body of the landslide with earth ridges at the base of the slope (photo: Bojan Žlender).

3 Results and discussion: a case study applying the concept of adaptation of potentially unstable geotechnical structures to expected climate change

Table 1 illustrates the occurrence forms (i.e., types) of slope instability, which vary based on slope geometry, stratification, material of the unstable mass, and the influence of climate signals and effects. Specific geomechanical analyses are conducted for each type of slope, and appropriate geotechnical measures are selected. As an example of the application of the concept, a case study of a slope beneath a road with free-flowing stormwater runoff was chosen. The example demonstrates the stability analysis of the slope, focusing on the probability of landslide occurrence. The impact of climate change is considered, and a measure involving the use of NBS is implemented.

3.1 Preliminary model

The purpose of the analysis is to understand the causes of potential slope instability and to plan and verify the effectiveness of mitigation measures to ensure climate resilience of the slope and the road, and the safety of residential structures nearby. In accordance with the Eurocode standard, the design life is fifty years (Eurocode, 2004).

The landslide probability map shows that the location under consideration is in an area with a high probability of landslides, and the erosion warning map indicates that it is in an area requiring demanding protective measures. Key signals of climate change include increased precipitation, elevated air temperature, and increased wind speed. A preliminary assessment of the geological conditions of the area under consideration is provided by the geological map of the area. The Oligocene layers of the slope consist of grey schistose clay and slate, clayey shale, and slaty shale. The Holocene layers are alluvial deposits composed of fine-grained pebbles, sand, silt, and clay. The results of soil classification were obtained following the standard ISO TS 17892-4:2016 (2016). The groundwater level and flow rate, which depend on the season and rainfall amount, were estimated. Seismic data consider the recommendations of the standard EN 1998-1:2005 (Eurocode 8, 2005), which accounts for a seismic return period of 475 years. The area under consideration falls into the seventh degree on the EMS (European Macroseismic Scale). According to the project's ground acceleration map, the design ground acceleration for the area under consideration is 0.2 g (Eurocode 8, 2005).

3.2 Model

The research has shown that the soils at the site consist of layers of sandy clay, with a light to medium compact consistency, extending to a depth of three metres. Deeper layers consist of clay of medium to heavy consistency, transitioning to a semi-hard state, and extending to a depth of six metres. Below lies shale bedrock. Climate-related effects associated with climate signals include deteriorating material strength due to increased water saturation, increased permeability, intensified physical weathering, and elevated groundwater levels and flow, including pore water pressure. A geotechnical survey of the site was conducted, which included topographic surveying, soil probing and sampling, groundwater level measurements, field standard penetration testing (SPT), and laboratory tests (soil classification, density determination, direct shear test, permeability test, oedometer test). The properties of shale and sandy clay were determined. The soil model considers the maximum friction angle and zero dilation angle. The soil-water characteristic curve on the slope and the permeability function curve were determined using the Van-Genuchten and Nielsen method (1985).

Projected climate change effects until 2050 and accordingly increased rainfall amounts were considered for inclusion in the model. An assessment was made of current extreme rainfall (with a return period of 100 years) and rainfall in 2050 for the selected landslide site based on the RCP4.5 climate change scenario. The current extreme rainfall amount was defined as P = 139 mm/day. The future extreme is achieved by increasing the current rainfall amount by 7.2% (P = 149 mm/day). Computational procedures for determining water infiltration into the soil are complex and involve numerous assumptions (Yan & Jiao, 2018). The analysis uses an equation developed by the American Society of Civil Engineers (ASCE; Pk, 2017).

3.3 Geomechanical model

The geomechanical model is obtained in this phase by incorporating the results of climate modelling into the geotechnical model and input data analysis, expressing the increase in rainfall with water net infiltration, evaluated based on extreme rainfall. Two models, FEM (Finite element method) and LEM (Limit equilibrium method), were created, with a mesh size of 1 × 1 m. Boundary conditions were also determined: the upper limit is set as the rainwater infiltration boundary, the bottom of the model is impermeable, and the right boundary allows water drainage. The depth of infiltration is determined by the geometry of the layers and hydraulic conductivities due to the impermeable bedrock.

Table 4: Input data for the numerical model.

	Unit	Sandy clay	Shale
Bulk density	γ (kN/m^3)	18.5	24
Cohesion	c (kPa)	2	200
Shear angle	φ (°)	20	45
Volumetric water content	VWC = V_w/V_s (–)	0.2	/
Permeability	$k_y = k_x$ (m/s)	5×10^{-7}	5×10^{-11}
Compressibility	m_v (1/kPa)	5×10^{-4}	1×10^{-8}

Source: Bračko et al. (2022).

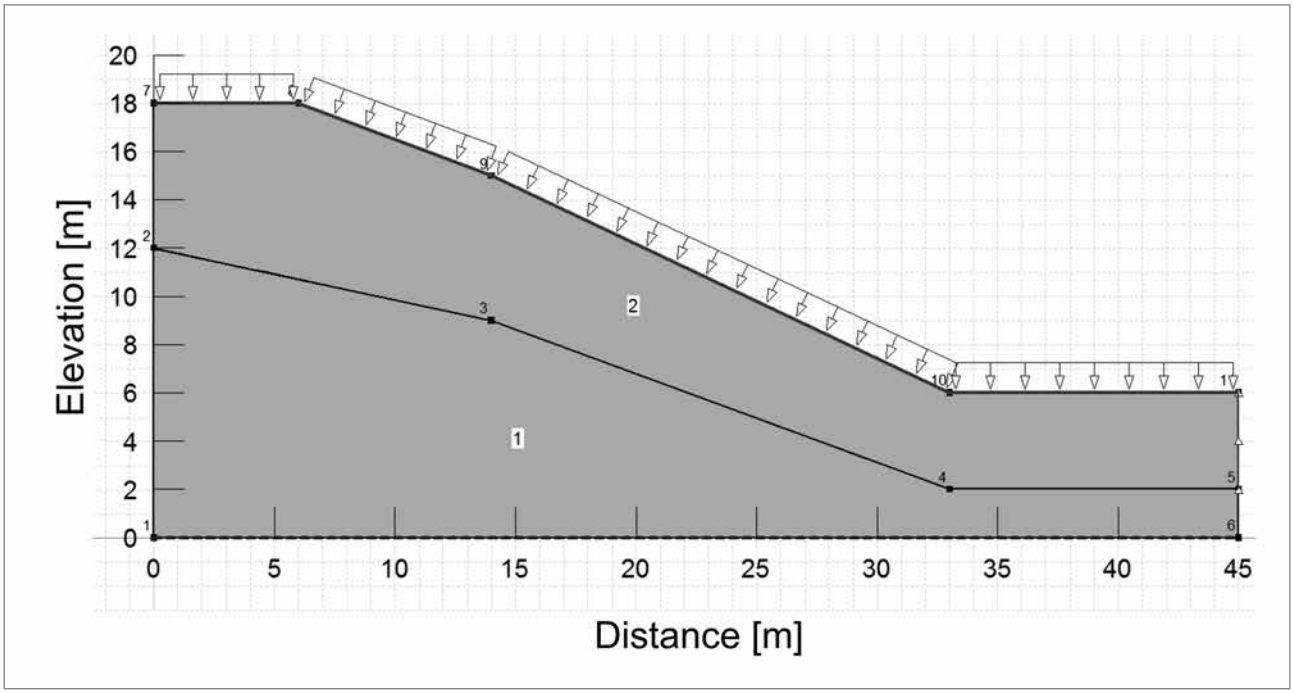

Figure 3: Geometry and mesh of the numerical slope model (source: Bračko et al., 2022).

The model geometry is shown in Figure 3. The model dimensions are 45 × 20 m, with two defined soil layers: the upper layer is sandy clay, and the lower layer is shale. Climate change projections until 2050 and accordingly increased rainfall amounts were considered. Data from the precipitation change report were used for the landslide location. Calculations were made for changes in precipitation levels until 2050, assuming increased rainfall and temperature for the selected landslide site using the RCP4.5 climate change scenario. The rainfall intensity is defined as a climate change, and currently, considering a hundred-year return period, it is 139 mm/day, with a 5% increase in extreme rainfall due to climate change. Table 4 shows the input data for the numerical model analysed. Default values were selected for shale because it is intact rock, and its shear strength properties are not relevant for slope analysis.

The slope stability is assessed using the slope safety factor before and during rainfall through FEM numerical modelling. Changes in surface water content and pore pressure during the infiltration process were analysed using the SEEP/W module of GeoStudio. SLOPE/W is a 2D program for slope stability modelling that provides a wide range of capabilities. The program has an extensive list of materials. The main advantage is the ability to model partially saturated soils. SEEP/W is a module of the GeoStudio permeation package and can be used to simulate water flow in saturated or unsaturated soils. Because both SEEP/W and SLOPE/W are part of the same GeoStudio software package, they allow easy integration and calculation of the safety factor of the slope for all time steps of the simulation.

3.4 Analysis

Based on the results of the analysis, it is possible to assess the slope's climate adaptability. The analysis demonstrates that the slope is non-resistant to the predicted climate changes and

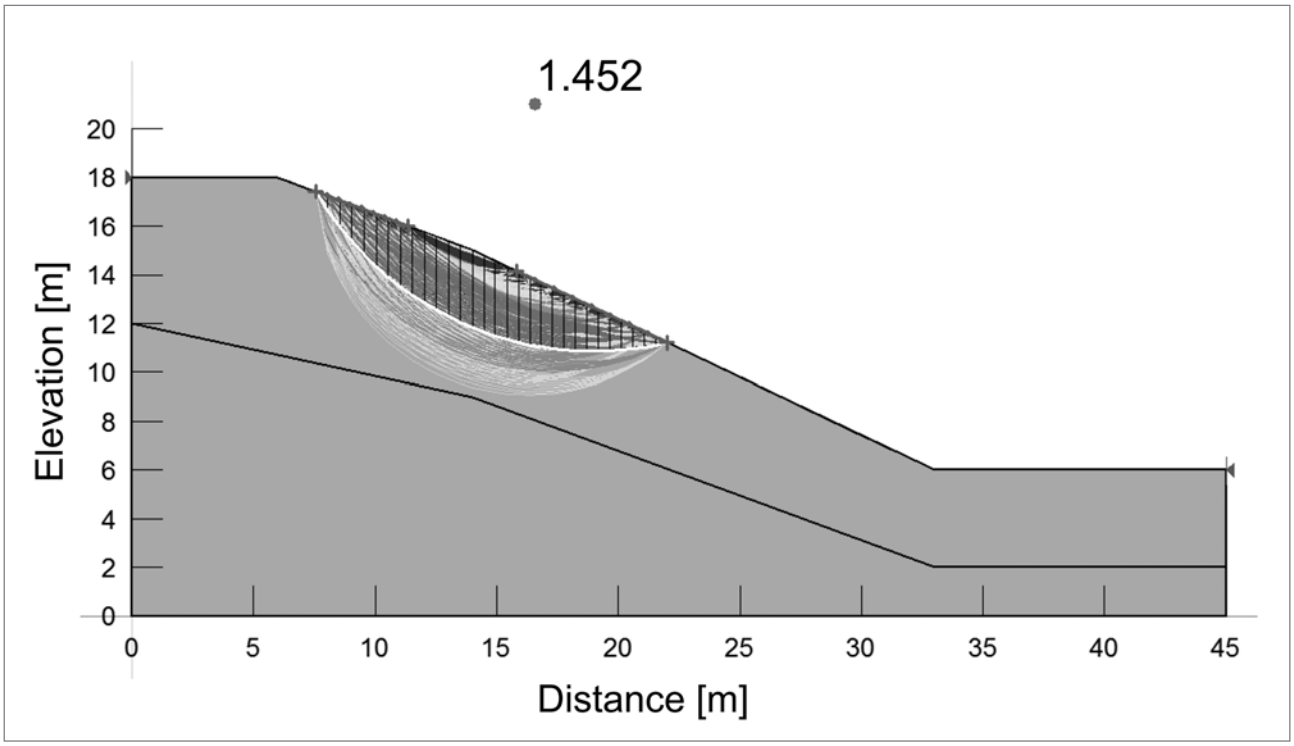

Figure 4: Critical failure and safety factor without the influence of water infiltration (no rainfall; illustration: authors).

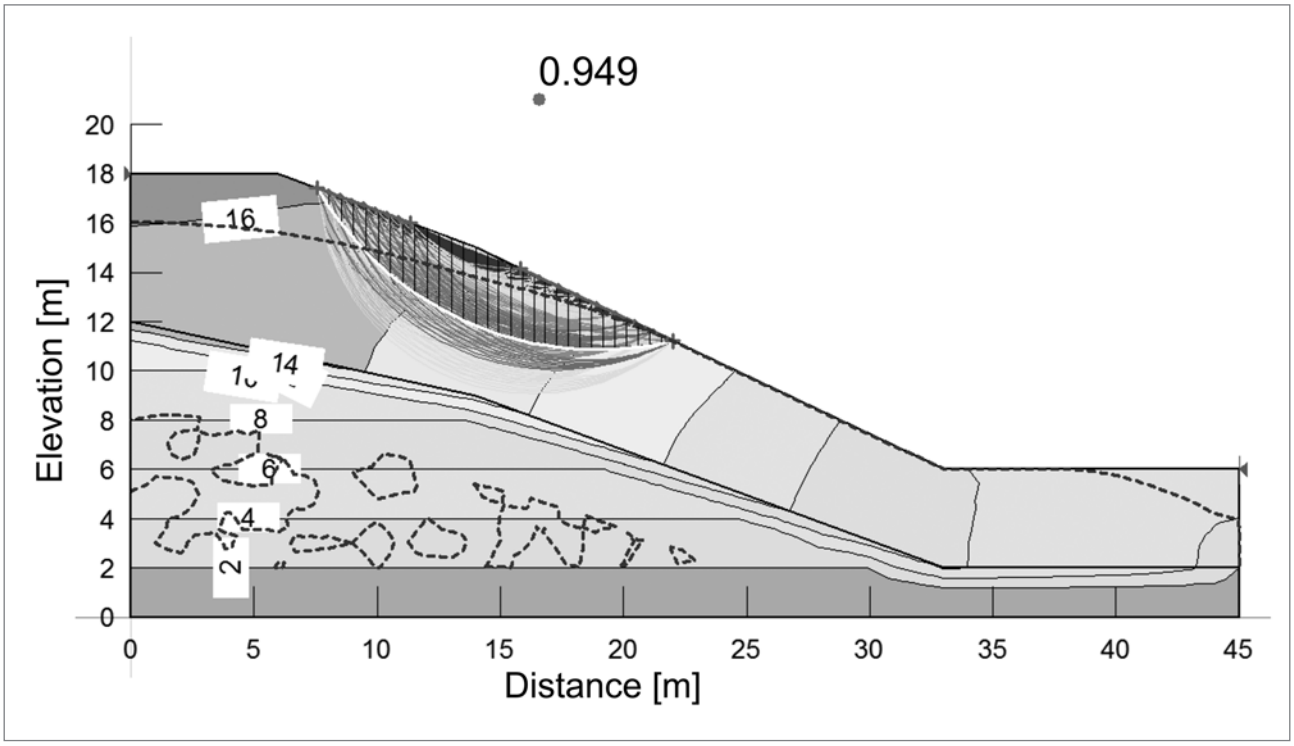

Figure 5: Critical failure and safety factor (three days of rainfall, NI = 30 l/m^2/day; illustration: authors).

requires adaptive measures. The analysis comprises three phases: the first phase represents the initial state, the second phase involves intense rainfall lasting for three days, and the third phase occurs when the rainfall ceases.

The analysis considers the impact of climate change on slope instability due to increased rainfall, elevated air temperature, and increased wind speed. It was found that increased precipitation has the most significant impact on slope stability, whereas elevated air temperature and increased wind speed are

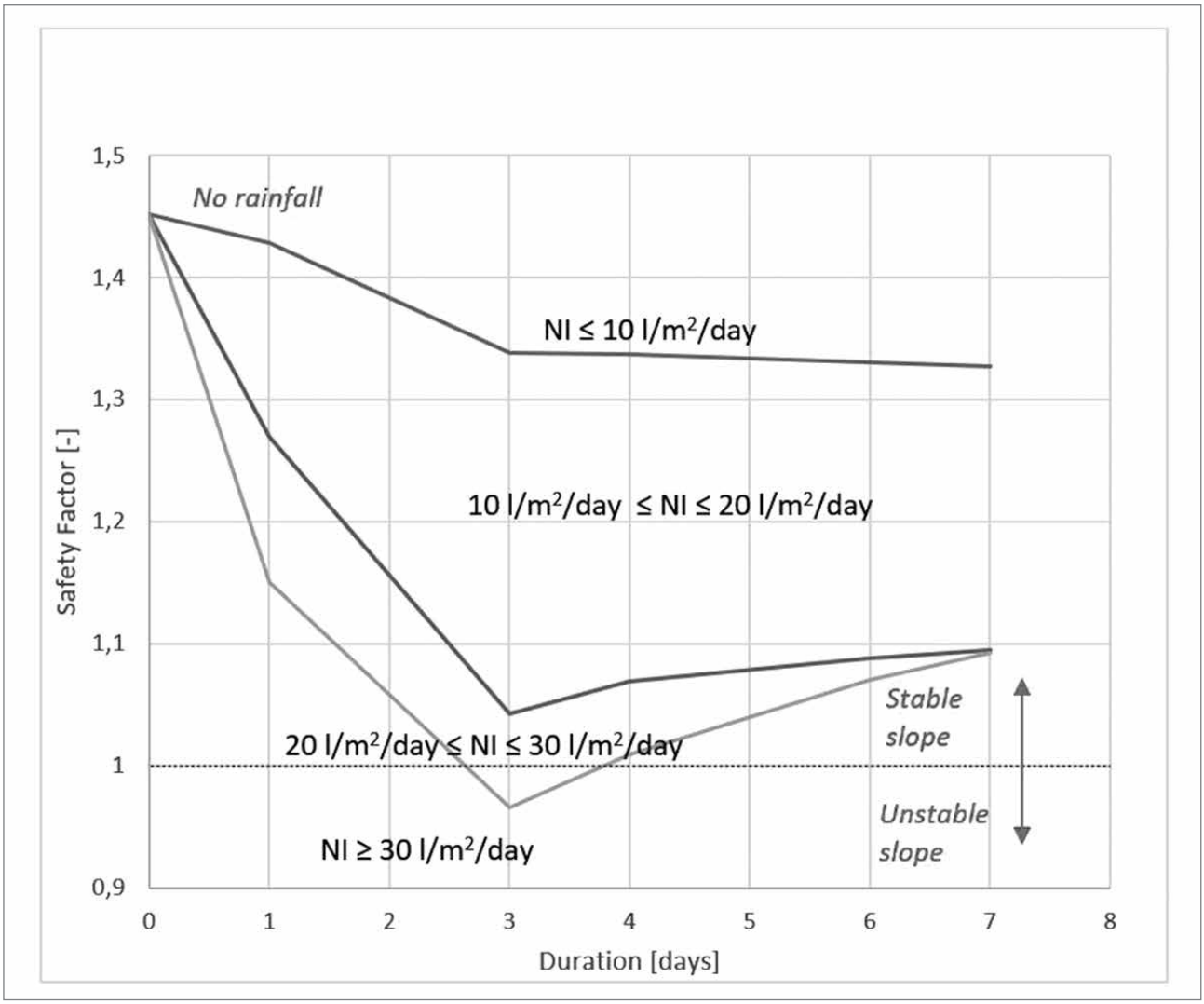

Figure 6: Influence of water infiltration into the slope on the temporal evolution of the safety factor for stability, with simultaneous reduction in soil shear strength (illustration: authors).

considered less important (ELGIP, 2022). However, it should be emphasized that net water infiltration is the result of all three interacting climate signals. Consequently, the main influences of climate change on slope instability are the deterioration of material strength parameters, increased surface water runoff, elevated groundwater levels and flow, and changes in pore water pressure.

The analysis shows that the safety factor for slope stability in the absence of rainfall ensures stability (Figure 4). As the duration of rainfall increases, the safety factor decreases, depending on the amount of rainfall and thus water infiltration into the slope. With increased water infiltration into the slope, pore water pressure increases, leading to increased soil permeability within the slope. The safety factor decreases with increasing water infiltration into the slope, accompanied by increased permeability. In this regard, research on soil permeability within the slope is crucial because it is difficult to accurately determine for natural conditions and significantly affects the results. Interestingly, slope stability decreases very slowly when soil permeability within the slope is sufficiently low ($k \leq 10^{-7}$ m/s), which is favourable for maintaining slope stability. However, as permeability increases, the safety factor for slope stability decreases more rapidly, but up to a certain limit. For the data analysed, this limit is three days, even if rainfall continues (Figure 5). For the data analysed, the threshold at which the slope would still remain stable is slightly above the limit of NI = 20 l/m²/day, assuming that both soil permeability and shear strength do not unfavourably change simultaneously within the slope (Figure 6).

A further issue is that increased water infiltration into the slope also increases the soil moisture content and pore water pressure, consequently leading to a decrease in shear strength.

Therefore, the safety factor decreases even further. The relationship between the safety factor and the shear strength of the slope soil is nearly linear. The results of the analysis are elaborated further in the article by Bračko et al. (2022), indicating a significant impact of climate change on slope stability. To ensure adequate slope stability, measures need to be implemented that also consider expected climate changes. If the stability conditions are not met, the analysis process reverts to Step 2 (Concept analysis). Remedial measures are then implemented in accordance with the NBS conditions; that is, counterfort drains, drainage, road runoff management, and vegetation planting. After the implementation of measures, it would be beneficial to monitor road displacements and water drainage at the inspection manhole and outlet of drainage pipes.

4 Conclusion

Climate change will pose a significant challenge in the future. It is crucial to first define the causal relationship between climate signals (climate characteristics) and their effects (geological and geomechanical description), as well as to delineate the consequences (response of geotechnical structures). However, geomechanical analyses aimed at studying the effects of climate change encounter a series of unresolved issues concerning regulations and standards. Therefore, this article presents a concept for climate-adapted geomechanical analysis and planning.

For easier comprehension, the concept is illustrated using a slope stability example, along with the analysis results from the SEEP/W module of GeoStudio software. The conclusion of the analysis emphasizes that ensuring slope stability often relies significantly on factors such as net infiltration of water into the slope, soil permeability, and groundwater flow within the slope. The analysis concept presented could serve as a foundation for developing geomechanical analyses that effectively detect the consequences of climate change in a timely manner. Therefore, it is essential to conduct thorough slope monitoring and gather relevant data for future analyses and examination of the impact of climate change on slopes.

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Finding the optimal route for people with mobility impairments: A case study of the İnönü University campus

Students with mobility impairments have the right to move independently throughout university campuses. This study presents a model to evaluate routes based on accessibility criteria to determine the most suitable paths for disabled individuals navigating a university. First, the main factors of accessible mobility were determined and rated by students with physical disabilities. Within this context, this study used the analytical hierarchy process (AHP) to weight criteria and route alternatives. İnönü University was selected for quantifying the path network of its campus by physically handicapped students. Three main campus routes were evaluated to find the most accessible route for students. Based on the results, among ten key factors, ramp slope and paving are the most important. Furthermore, on-site analyses demonstrated the accuracy of the AHP method for this research. Contributions of the study include a model for determining the optimal route with the fewest physical obstacles to facilitate disabled individuals' daily movement.

Keywords: university campuses, urban design, analytical hierarchy process (AHP), mobility impairment, navigation, Turkey

1 Introduction

Persons with disabilities have the fundamental right to education, like all other people (Della Fina et al., 2017). As the most numerous among disabled students, students with mobility impairments experience challenges to education on poorly designed university campuses (Ashigbi et al., 2017). Certain characteristics of the built environment (e.g., pavements, ramps, steps, and curbs) pose barriers in the path network at universities for students with mobility impairments (SWMIs). Thus, the campus environment needs to be planned and designed with the fewest number of barriers that may impede effective access and participation of SWMIs in courses and other social programs (Imrie & Kumar, 1998; Ferreira & Sanches, 2007). Although much effort has been made to promote pedestrian networks to adapt them to persons with mobility impairments, accessible mobility has remained a challenge on campuses in particular (Chiarella & Vurro, 2020).

Mobility refers to the ability to move safely and independently for carrying out daily activities (Clarke et al., 2009). This has been a serious challenge for disabled persons, especially for individuals with mobility impairments. They may encounter some environmental barriers on routes such as high curbs, stairs, uneven paving, narrow pavements, poor paving, steep ramps, and so on (Kasemsuppakorn et al., 2015). Many mobility-impaired persons hesitate to take new routes due to unpredictable obstacles they may face in an unfamiliar environment. Navigating a route alone without prior information about its accessibility has been a problem for them (Ugalde et al., 2022). This is even more significant on university campuses located in suburban settings with daily commuting by students, longer distances travelled, and the predominance of car users (Miralles-Guasch & Domene, 2010). People typically take the shortest route, but individuals with mobility impairments may prefer a longer route without a slope. Because the number of SWMIs is growing at universities (UN, 2023), it is imperative to evaluate routes on campuses to create an accessible environment for SWMIs.

Path quality can be evaluated to create an accessible mobility model or map to identify the optimal route for disabled persons (Menkens et al., 2011). Kasemsuppakorn and Karimi (2009) identified the primary environmental obstacles that affect accessibility for wheelchair users and developed a technique that allows route personalization by defining the obstacle level for wheelchair users. Izumi et al. (2009) proposed a tool for determining optimal routes based on barrier-free information that assists persons with disabilities to determine the difficulty level of taking a route. Matthews et al. (2003) employed feedback from wheelchair users to identify the most important barriers and generate accessibility maps. Alfonzo (2005) developed a hierarchical model of walking needs with five decision-making levels, including the feasibility of walking (i.e., related to personal limits), accessibility, safety, comfort, and pleasure. Kasemsuppakorn et al. (2015) produced a model including some pavement parameters (slope, paving, pavement width, steps, distance, and pavement traffic) to personalize routes for wheelchair users using an analytical hierarchy process (AHP) method. They assigned a numerical weight to each pavement parameter based on user preferences and priorities. A study by Gharebaghi et al. (2021) estimated accessibility criteria to determine the most important factors, and then an approach for user-specific routing was proposed for a web-based platform. Finally, Ugalde et al. (2022) proposed a routing algorithm using a geographic information system to determine the shortest paths or barrier-free routes for use in a wheelchair navigation system. However, evaluating university campuses for SWMI mobility remains inadequate. Universities considering the needs of all students, including SWMIs, can serve as an ideal planning model for the entire city.

The share of disabled persons in Turkey is considerable, although there is currently no consensus on their exact number. The Turkey Health Survey conducted in 2016 by the Ministry of Family, Labor, and Social Services did not provide an exact figure, (Engelliler Konfederasyonu, 2020) but according to 2002 data from the Turkish Statistical Institute, the percentage of persons with disabilities is 12.29%, among whom 23.9% have mobility impairments (Engelsiz Yaşam Derneği, 2024). Compared to similar studies in European countries, 16.2% of the Turkish population can be categorized as disabled persons that constantly experience difficulties with basic activities. Furthermore, taking unregistered numbers into account, it is estimated that at least 8.5 million people have disabilities in Turkey (Engelliler Konfederasyonu, 2020). According to the higher education information system data, there were around 56,000 disabled students in Turkey during the 2022-2023 academic year (Yükseköğretim Kurulu, 2023). Turkey's national regulations have provided various legal provisions for disabled individuals to receive a university education (Zencir et al., 2017). Over the last few years, at every university, a disabled counselling and coordination centre has been established to ensure that university campuses are accessible to disabled students and to provide solutions (Pouya & Demirel, 2019). Apart from the good efforts by this centre, Turkish universities have not produced an accessible navigation map that can assist SWMIs in choosing optimal routes on campuses.

SWMIs consider various physical characteristics of routes before deciding on a particular one. They compare possible routes based on these characteristics to determine the best route with the least physical barrier. This study hypothesizes that provid-

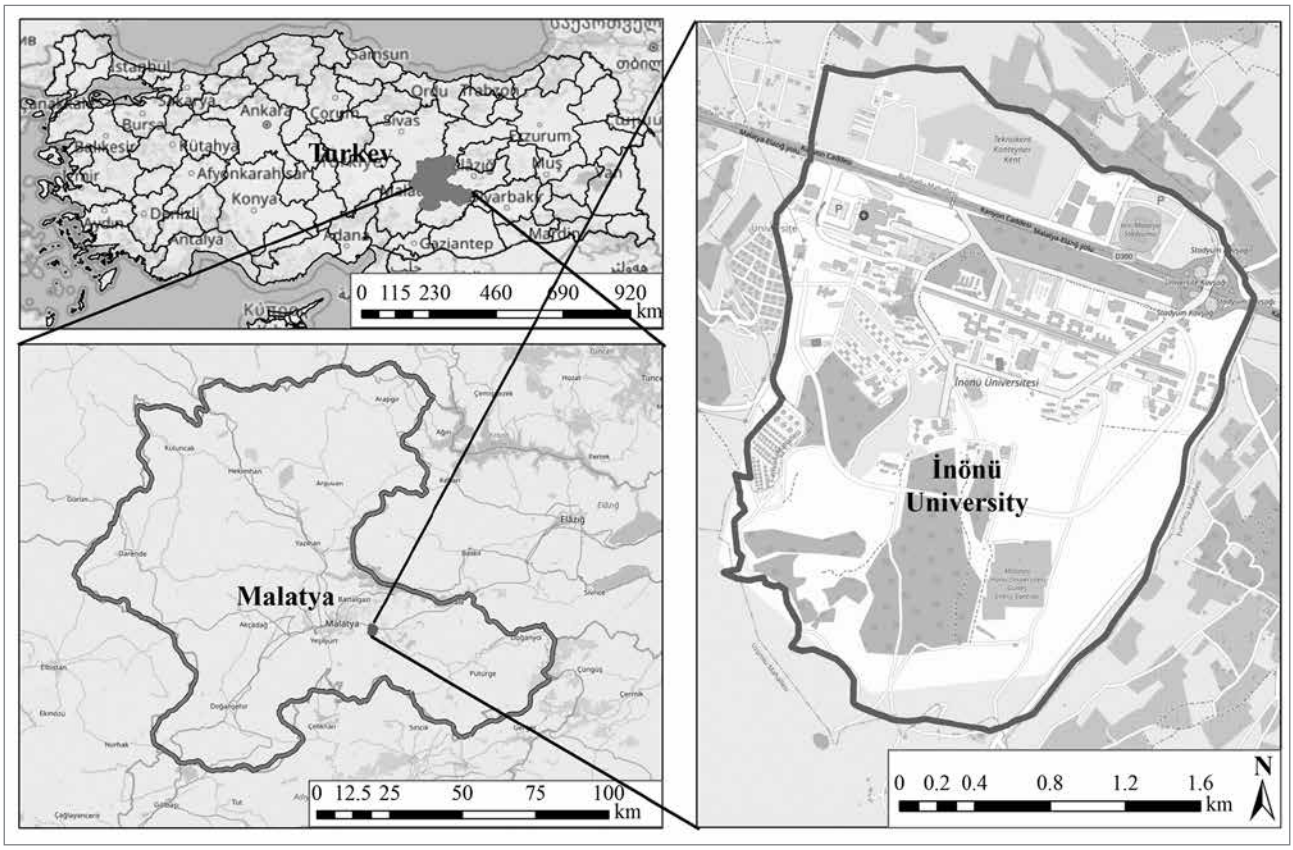


Figure 1: Location of İnönü University in Turkey (illustration: Hatice Kocaaslan).

ing a way to rank accessibility criteria and assess routes based on such criteria would provide useful information to designers and managers in creating an area accessible to all, including people with mobility impairments.

This study evaluates the main criteria for a barrier-free environment and how they can be used to determine the optimal route for SWMIs on a campus. İnönü University is used as a case study to analyse campus path networks for SWMIs. The AHP is a systematic approach to decision-making processes that provides weights and priorities for the mobility parameters. Therefore, common student routes on the campus are examined using the AHP model and on-site analyses. Regarding the right of SWMIs to independent and safe mobility on campus, this study provides practical information that can contribute to planning and managing campuses and to further addressing some aspects of this issue.

2 Methodology

Persons with physical disabilities face numerous mobility challenges mainly created by the built environment. Thus, they need to consider and choose the most accessible route. The main goal of this research is to determine the important criteria that SWMIs consider when choosing a route that is less difficult. It also offers a route assessment in terms of mobility criteria by involving individuals with mobility impairments in the project. For this study, the target group is the small category of students suffering from mobility impairments.

2.1 Case study

İnönü University campus was selected as a case study for this research (Figure 1). The university is 10 km from Malatya, a city in the Eastern Anatolia region of Turkey. With an area of 700 hectares, it is located on the borders of the Yıldıztepe neighbourhood. İnönü University was founded in 1975 and has approximately 40,000 students (İnönü University, 2022). It comprises thirteen faculties, one state conservatory, two colleges, four vocational-technical schools, six institutes, one techno city (a science park), and thirty-one research centres. The built structures on the campus include administrative buildings, academic buildings, social buildings such as dining halls and sports facilities, and dormitories and other residences. The TramBüs trolleybus line is the main public transport system in Malatya. It has a 37 km route, and it operates between the Maşti bus terminal and the university. The trolleybus line has thirty-seven stops, eight of which are on the university campus (Motaş, 2022).

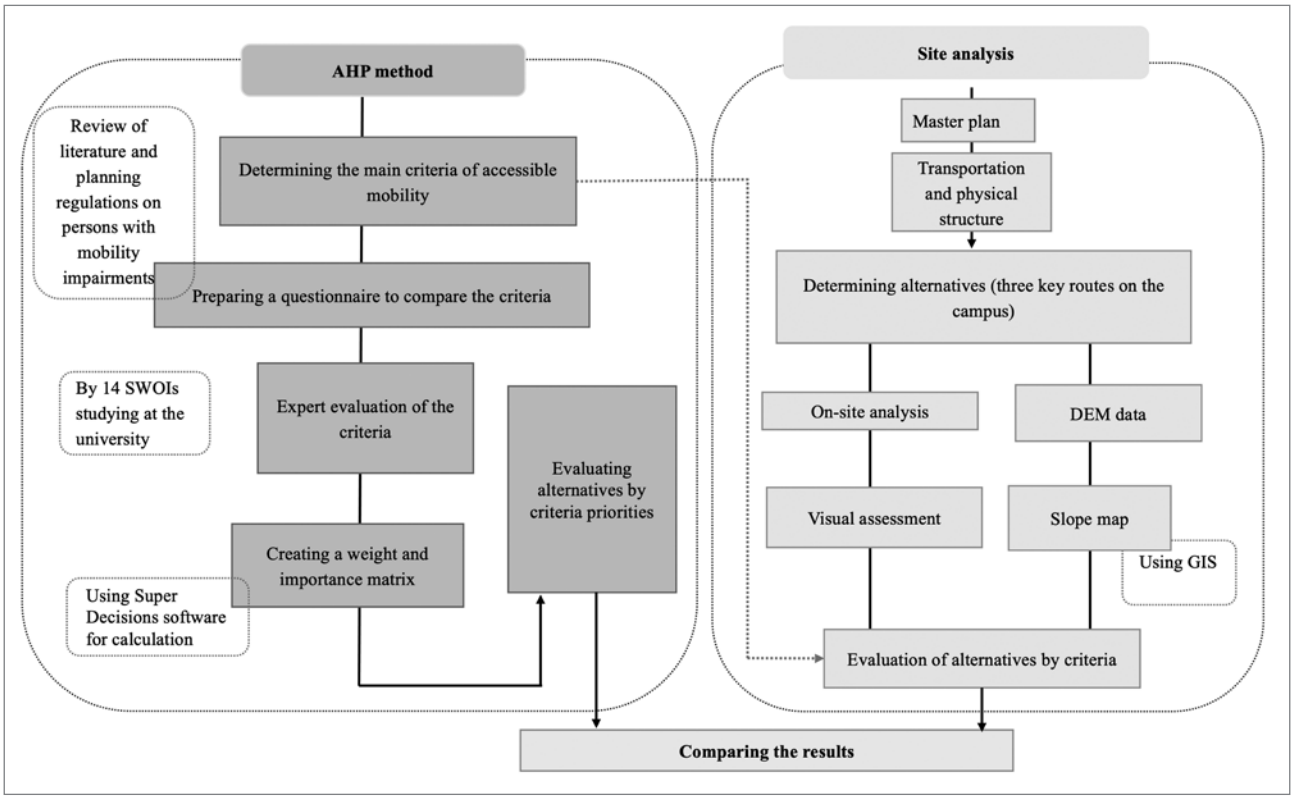


Figure 2: The process applied (illustration: Sahar Sönmez).

According to the estimate for the 2022-2023 academic year, 120 persons with disabilities (e.g., hearing impairment, visual impairment, mobility impairment, or other chronic diseases) were studying at the university. Forty-seven students (39%) had mobility impairments, limiting their ability to perform their daily activities. Among SWMIs, four persons were in vocational schools, forty were undergraduates, and three were graduate students. The majority of SWMIs were receiving formal education, but some were engaged in evening courses and distance learning (Yükseköğretim Kurulu, 2023).

On the university campus, there is a special administrative unit for students with disabilities. Among its achievements is a handbook on individuals with disabilities that contains necessary information about their conditions and their specific requirements. At the university, various conferences and social events are also held for students with disabilities on special days every year. In 2022, İnönü University was one of ten universities in Turkey to receive the Barrier-Free University Award, and it also received the Orange Flag, which is conferred on universities with easy accessibility to all on behalf of the Turkey Council of Higher Education (Engelsiz İnönü Koordinatörlüğü, 2022).

2.2 The AHP method

The main method utilized in this research is the AHP. To deal with large and complex decision-making, it is essential to break this down into a hierarchy. Saaty (1988) developed a means of deconstructing a problem into a hierarchy of sub-problems that can more easily be understood and evaluated. Using the AHP, subjective evaluations are converted into quantitative values and then processed to rank each alternative on a numerical scale. The AHP provides all the criteria that have some impact on the given problem, and all the relevant alternatives are represented in the hierarchy (Bhushan & Rai, 2014). It involves four main steps: structuring multiple-choice criteria into a hierarchy, evaluating the relative importance of these criteria, comparing alternatives for each criterion, and determining the general ranking of the alternatives.

This method has been used successfully in similar research to evaluate accessibility for persons with reduced mobility in public spaces (Lima & Machado, 2019), to rank existing Mobility as a Service (MaaS) applications (Belossarov et al., 2023), to investigate gaps between users' needs and practitioners' prioritization of accessibility features (Park et al., 2020), to identify the factors influencing the selection of the best route for people with mobility disabilities (Ugalde et al., 2022), and to analyse accessibility and site suitability for healthcare services (Parvin

Table 1: Main criteria (physical factors) for accessible mobility of people with mobility impairments.

Criterion	Aspects	Labelled
Ramps	Appropriate ramp slope, 5% or less	C1
	Handrails and edge protection on both sides of ramp	C2
Covering	Paving or covering with suitable material (smooth, solid, durable, soft non-slip fabric)	C3
Path width	Appropriate width of path (120 cm in lightly populated areas and 150 cm in busier area)	C4
Garbage bins	Accessible height of garbage bins on path (90 to 120 cm)	C5
Marking and signs	Adequate and readable directions, marking, and signs	C6
Lighting	Adequate lighting	C7
Bus or train station/stops	Accessibility to stops so disabled people can reach them safely, without obstacles or needing assistance	C8
	Dedicated place at stops (at least 120 cm must be left free next to the benches at stops for wheelchair users)	C9
Plants	Plants not obstructing path (without drooping branches, not thorny plants, less than 220 cm high).	C10

Note: C = criterion.

Source: European Conference of Ministers of Transport (2000); Erkovan (2013); Kuter & Çakmak (2017); Saplıoğlu & Ünal (2019); Department of Transport (2021)

et al., 2021). This study also shows the potential and accuracy of the AHP as a method for determining the most accessible route with a minimum number of barriers for SWMIs.

According to the AHP, first of all, the key criteria of SWMI mobility were determined. Then the factors were evaluated and ranked by the sample group. Finally, route alternatives were assessed based on the weights of each parameter.

Furthermore, on-site analyses and site slope assessments were conducted to confirm the findings and provide a better discussion of the results obtained by the AHP process. As Figure 2 shows, the study applied two key techniques to provide an assessment model for route evaluation in terms of SWMI mobility criteria: the AHP and site analysis. The steps of the method are explained below.

2.2.1 Determining the main criteria of accessible mobility

The first step of the AHP included determining the key parameters that a route should have to provide easy mobility for individuals with mobility impairments. According to various studies in which pedestrian network was evaluated by users with mobility impairments, the main challenges such individuals encounter are insufficient width of pavements and narrow corridors, steps, steepness and incline, a lack of ramps, poor flooring materials, raised manhole covers, cracks, uneven paving, immovable fixtures on the route, high curbs, and less accessibility to public transport with compatible standards (Lysack et al., 1999; Meyers et al., 2002; Inada et al., 2014; Kasemsuppakorn et al., 2015)

People with mobility impairments may use aids to promote their mobility, such as prosthetic limbs, wheelchairs, crutches, and walking sticks, or they may walk but only with difficulty (Department for Transport, 2021). They have specific needs for mobility. Considering their requirements for outdoor and urban mobility, some specific standards and guidelines have been defined for planning pedestrian routes in Europe and the US (European Conference of Ministers of Transport, 2000). Similarly, in Turkey, planning and design regulations have been adopted to address the mobility of disabled populations in open spaces. This study explored significant elements related to accessible mobility for people with mobility impairments. The most critical factors common to persons with mobility impairments were evaluated. A review of international and Turkish sources identified ten key factors linked to the movement of these populations (Table 1).

These factors were weighted and evaluated by people with mobility impairments. Some issues were not included in the list of important criteria because they are not an issue for all physically disabled individuals For example, stairs and steps are not used by wheelchair users, and so this factor was ignored.

2.2.2 Determining route alternatives

The next step determined the routes on the campus as alternatives to evaluate based on the criteria selected. One key question of the research was which would be the best route for SWMIs to get from their trolleybus stop to the university campus. Analysing the campus transport system and the master plan of the university shows that: 1) the trolleybus has three stops on the campus, and so students have three choices for

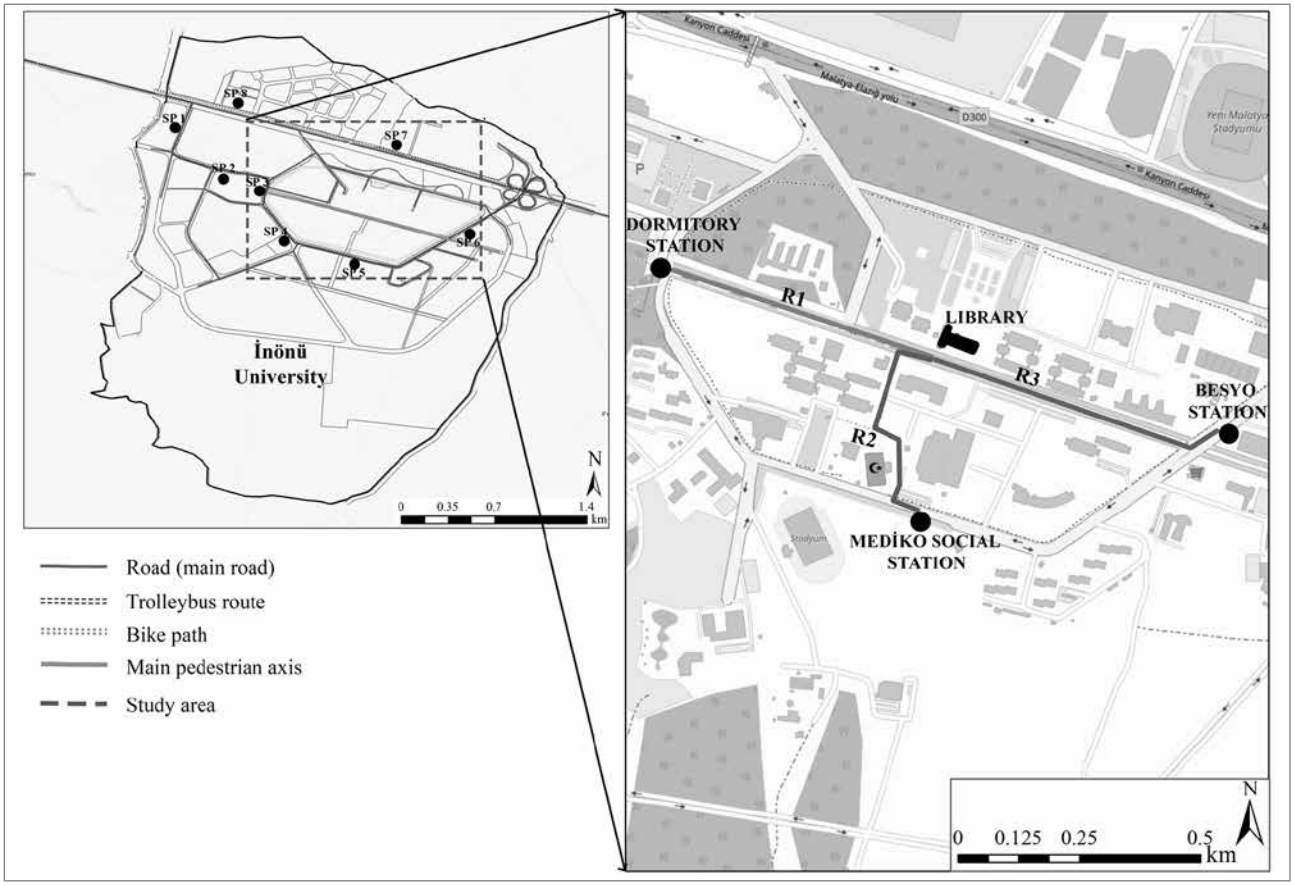


Figure 3: Routes evaluated in the study (illustration: Hatice Kocaaslan).

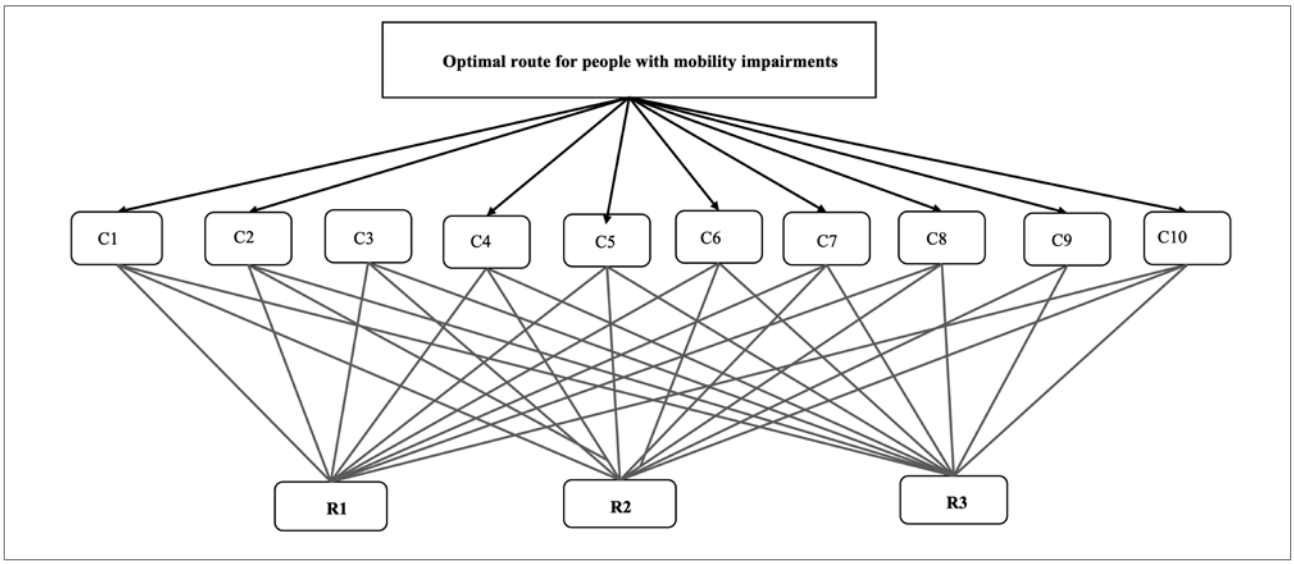


Figure 4: Hierarchy structure of the AHP method considered in this study; C = criteria (illustration: Sahar Sönmez).

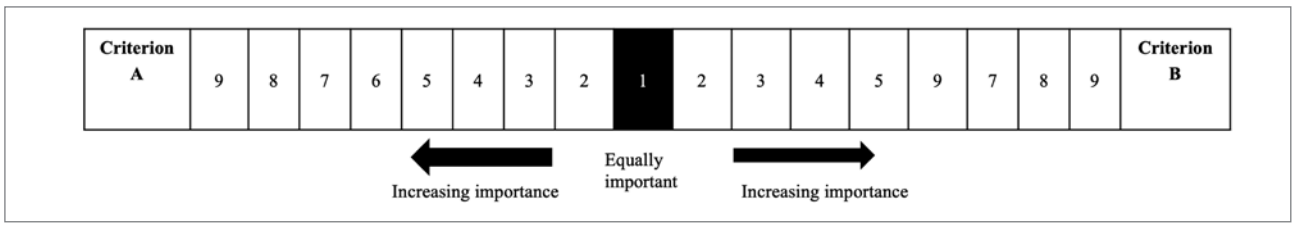


Figure 5: The importance scale in pair comparison of two criteria (A and B). The importance of the criteria increases by choosing high numbers for each criterion (source: Saaty, 1994).

Table 2: Definition of importance in the AHP structure.

Importance	Definition
1	Equally important
3	Moderately important
5	Strongly important
7	Very strongly important
9	Extremely important

Source: Saaty (1994).

entering the university, and 2) the library with its central location is on the main pedestrian route and has good accessibility to other buildings. It is also a meeting point for students, including the disabled.

Therefore, the routes from the trolleybus stops to the central library (as common daily directions for most students) were selected as three route alternatives to be evaluated. These three paths are shown in Figure 3: Route 1 from the student dormitory station to the library, Route 2 from the Mediko social station to the library, and Route 3 from the Besyo station to the library.

2.2.3 Ranking the criteria and alternatives

During the last steps, the general structure for the AHP method was created, with one level of substantial criteria and a level of three alternatives (Figure 4).

In this step, first ten key factors related to the built environment for mobility of people with mobility impairments were quantitatively compared and valued. Then, the three alternatives were compared in terms of the determinant criteria. In this way, two types of questionnaires were prepared: one for pairwise comparison and ranking the main criteria (forty-five questions), and one for ranking the routes (thirty questions).

The format of the questionnaires was created based on the pairwise structure of the AHP, which has a value scale (Table 2) with numbers allowing a choice between two factors, as shown in Figure 5.

The questionnaires were completed by SWMIs. It was hypothesized that persons with mobility impairments would know more about their challenges on a particular route than persons without disabilities. They also knew the three route alternatives well because they were using them regularly. Because the SWMIs' personal information was confidential, it was not possible to meet with them face to face. Therefore, they were reached through the WhatsApp group Disabled İnönü.

A general message was first sent to the students' group and then the students were sent the questions through a private message. If necessary, telephone calls were made to assist them. A total of fourteen SWMIs at İnönü University participated in the survey. Among them, two groups of answers were not valid, and the judgments of only twelve SWMIs were useable for later analyses. It took approximately four months, from June to September 2022, to fully collect the responses.

2.2.4 Data calculation and prioritization

According to the AHP, experts' responses to the criteria comparisons should be calculated and normalized to obtain prioritizations. The mean values are arranged into matrices, and the partial importance of various factors is achieved by calculating the principal eigenvalue of the matrices and normalizing the answers. The principal eigenvalue is obtained by multiplying the elements in each row of the matrix and then taking the *n*th root of the product (Equation 1).

$$n\text{th root of data multiple} = \Pi = \sqrt[n]{a1a2a3a4\ldots\ldots}$$

where n = the number of judgments in each particular matrix and a = elements in each row of the matrix.

The final step is to prioritize the alternatives. The value of each alternative is multiplied by the weights of the criteria and aggregated to obtain global ratings concerning each criterion.

The AHP also includes a measure of consistency for the individual comparison matrix of the decision problem. The consistency ratio (CR) shows the validity of the responses using a quotient between a consistency index (CI) and a random index (RI; Equation 2). The CR formula is:

$$CR = CI / RI$$

where RI = random index, dependent on the matrix degree.

The consistency index is calculated with (Equation3):

$$CI = (\lambda \max\_n) / (n\_1)$$

where λ max = maximum self-value (the maximum eigenvalue) of the comparison matrix of rank n and n = the number of characteristics compared.

CI can be compared with the RI shown in Table 3. According to Saaty (1994), the consistency ratio should not be more than 0.1.

Table 3: Random consistency index.

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.59

Source: Saaty (1994).

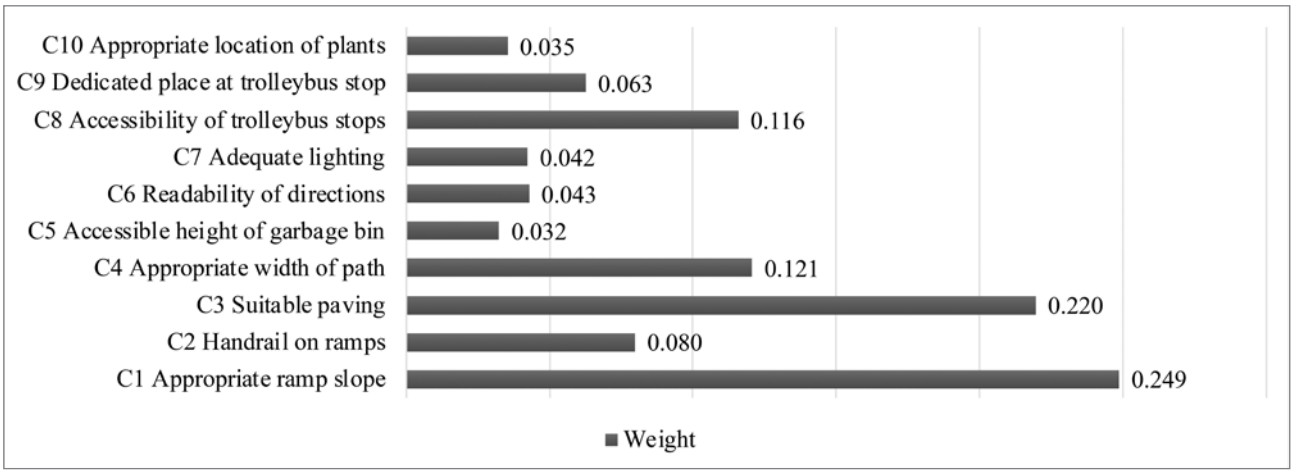
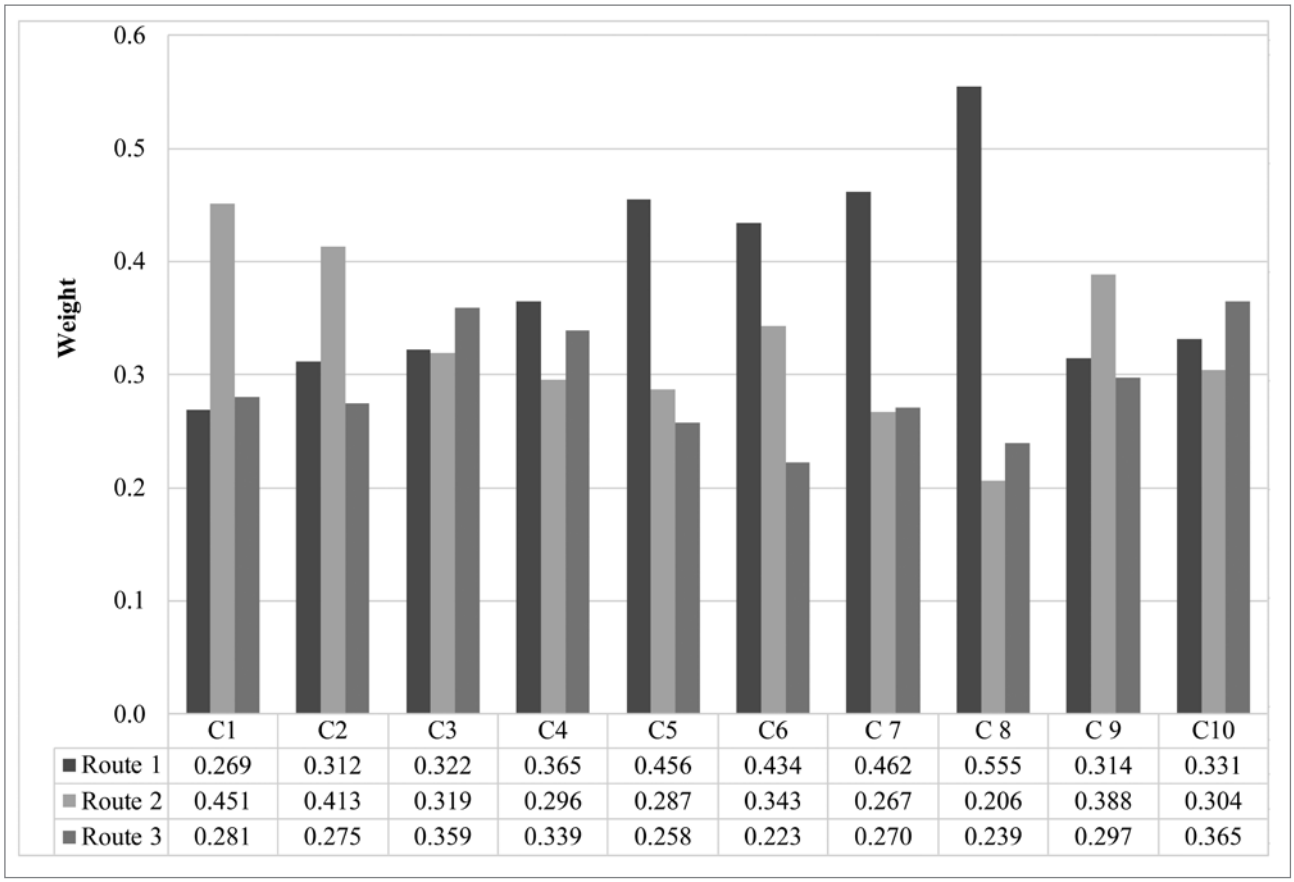


Figure 6: Relative weight and importance levels of the key criteria for accessible mobility of SWMIs (illustration: Sahar Sönmez).



	C1	C2	C3	C4	C5	C6	C 7	C 8	C 9	C10
Route 1	0.269	0.312	0.322	0.365	0.456	0.434	0.462	0.555	0.314	0.331
Route 2	0.451	0.413	0.319	0.296	0.287	0.343	0.267	0.206	0.388	0.304
Route 3	0.281	0.275	0.359	0.339	0.258	0.223	0.270	0.239	0.297	0.365

Figure 7: Comparing the normalized weights of alternatives obtained using the AHP method (illustration: Sahar Sönmez).

In this study, after collecting the students' answers, the average amount of pairwise comparisons was estimated for manual entry into the Super Decisions tool. This software is an online application that is able to perform the complex calculation of the AHP and CR. The scores of two students' answers out of fourteen were not considered for the evaluation because the CR of their evaluations was more than 0.1. Finally, the square matrix of values and prioritization diagrams with an acceptable consistency ratio (CR) were obtained.

2.2.5 Route slope classification and on-site analysis

On-site analyses were performed to collect more information for facilitating a good discussion of the AHP results. DEM data of the site were surveyed to generate a slope map. Thus, the data on the route slopes could be analysed. Moreover, through the on-site analyses, a checklist of positive and negative aspects of the routes was completed to understand the results. The results of the on-site analyses of the routes were evaluated in three separate tables in terms of predetermined criteria for the accessible mobility of persons with mobility impairments. Finally, the results of the on-site analyses were compared with the data obtained with the AHP method.

3 Results

3.1 Weights of criteria

The survey of the SWMIs provided the importance rates (numerical values) of the ten defined criteria related to the mobility parameters. After receiving the completed questionnaires, the mean of the comparisons was put into Super Decisions to obtain the final priorities and consistency rates. The final weight and numerical values obtained from the averaged participant answers are summarized in Figure 6.

According to the results, the appropriate slope of the ramp on the routes (C1) and the quality of the paving (C3) are the most important factors for people with mobility impairment when navigating or deciding to take a route. In contrast, garbage bins' height (C5) and the appropriate location of the plants (C10) have the lowest importance level.

3.2 Ranking the routes

This step compared the three routes selected for assessment with the AHP model. Values and normalized weights were calculated for each route in terms of each criterion. The numerical values obtained in this step are shown in Figure 7.

The final step was to prioritize the three route alternatives on the campus. The values of each alternative were multiplied by the weights of the criteria and aggregated to obtain the total scores for each alternative. The differences between the final priorities of the three routes were small: 0.355 for Route 1, 0.345 for Route 2, and 0.300 for Route 3.

Based on these results, the optimal route for people with mobility impairments was Route 1, which is the direction that the students take from the dormitory trolleybus station to the central library. In contrast, Route 3 (from the Besyo station to the library) had the most physical obstacles for SWMIs.

3.3 Classification of the routes' slope

The slope range of the three routes was classified and mapped through the ArcGIS program. As Figure 8 shows, the routes are categorized into six classes of slope range.

The slope ranges of each route and the length of each slope range are presented in Table 4. The most suitable slopes for people with mobility impairments are in the ranges of 0% to 2% and 2% to 6%. Thus, according to Table 4, the total length of routes with suitable slopes is around 36% on Route 1, 53% on Route 2, and 56% on Route 3.

Considering the length of routes with a suitable slope for easy mobility of people with mobility impairment, Route 1 has less length with the appropriate slope range. Apart from that, only Route 1 has a slope range of 20% to 30% in comparison to the other two paths. On Routes 2 and 3, the slopes do not exceed 20%, and Route 3 in particular has the least length with a 12% to 20% slope range. This means that Routes 3 and 2 have more length with an appropriate slope than Route 1.

In addition, comparing the total lengths of the routes, Route 3 has the longest distance to the university library, whereas Route 2 is the shortest path from the trolleybus stops to the library. However, the two routes have similar lengths with a suitable slope for the mobility of SWMIs. Based on the slope analysis, Route 3 is the most suitable route and Route 2 is the next most suitable route on the campus from the stops to the library. However, based on prioritization using the AHP method, Route 1 has the highest priority. This may mean that the high slope of Route 1 could be correctly addressed by physical solutions so that it is not a serious obstacle to SWMIs.

3.4 On-site analyses

A visual evaluation performed as part of the on-site analyses of the routes can contribute to a better analysis of the results of the AHP. Some photos of the routes' physical features were

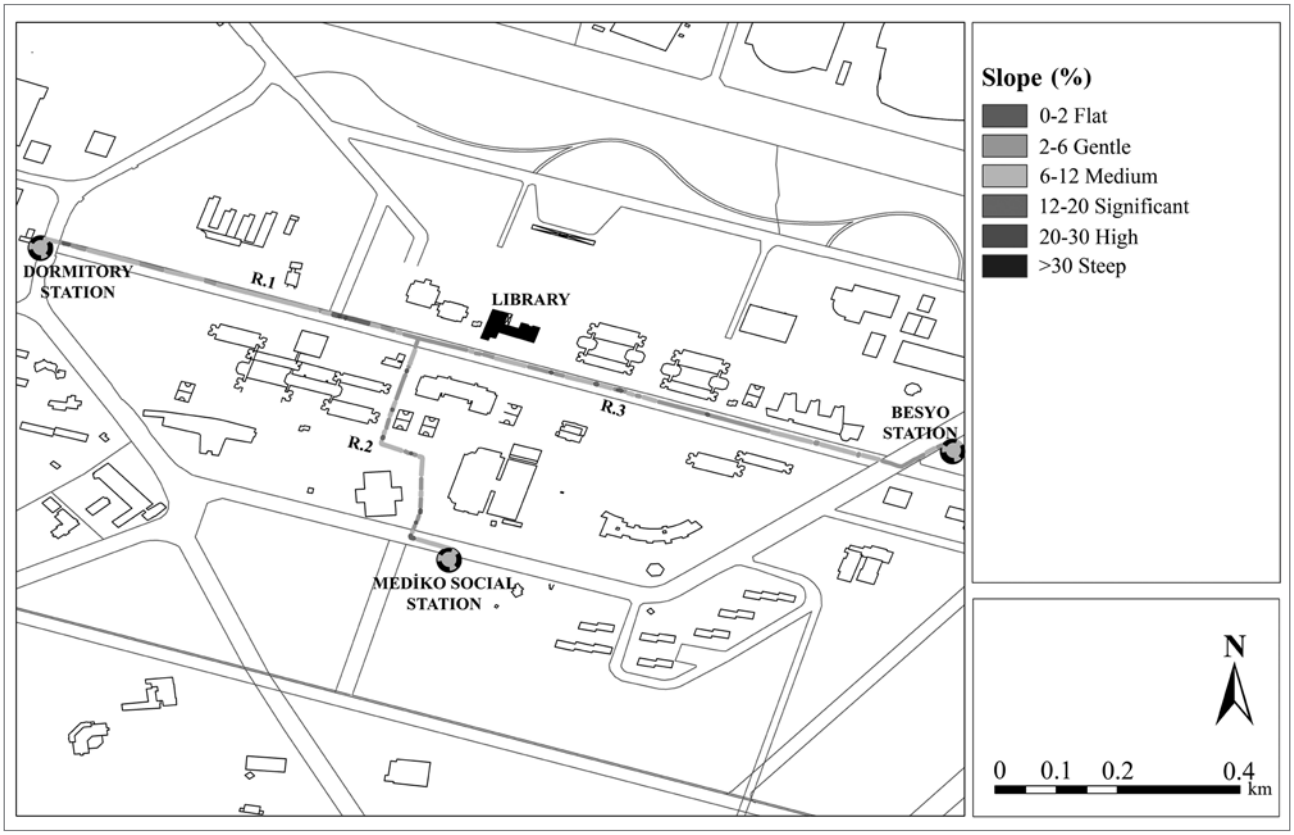


Figure 8: Slope map of the site, including the three routes on the campus (illustration: Hatice Kocaaslan).

Table 4: Length of each slope range on the three routes of the study.

Slope, %	Route 1, m (%)	Route 2, m (%)	Route 3, m (%)
0–2	13 (2.1)	29 (5.7)	19 (3)
2–6	203 (34.3)	241 (47.7)	332 (52.7)
6–12	323 (54.6)	211 (41.7)	174 (43.4)
12–20	43 (7.3)	25 (4.9)	6 (1)
20–30	9 (1.6)	0	0
> 30	0	0	0
Length (m)	592	506	630

Table 5: Evaluation of three routes in terms of the mobility criteria determined in the study.

Route	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
1	+	–	–	+	+	+	+	+	+	+
2	+	+	+	+	+	–	–	–	+	+
3	+	–	–	+	+	+	+	+	+	–

Notes: + = suitable; – = unsuitable.

taken and then assessed in terms of the ten criteria identified in the research. For instance, each path was checked for parameters related to paving, ramps, lights, and so on. The results of the visual analysis are presented in Table 5.

According to the on-site analyses based on the mobility criteria, Route 1 has two negative aspects and Route 2 and Route 3 have three negative aspects each. Table 6 presents the negative aspects found for each route.

As shown in Table 5, criteria 2 and 3 of Route 1; criteria 6, 7, and 8 of Route 2; and criteria 2, 3, and 10 of Route 3 were found inadequate for SWMI mobility. After determining the negative criteria for each route through on-site analyses, the

Table 6: Visual assessment of alternatives for mobility criteria through on-site analyses.

Route	Criterion	Negative aspect	Importance
1	C2	Handrails on stairs, but not on ramps.	5
	C3	Paving is worn, broken, cracked, or unconnected.	2
2	C6	Directions and signboards are inadequate.	7
	C7	Lighting is dim and insufficient.	8
	C8	There is a ramp to the trolleybus stop, but no safe passage or pavement at the stop.	4
3	C2	Handrails on stairs, but not on ramps.	5
	C3	Stones on the paving may cause problems for wheelchairs.	2
	C10	Pavement plants are improperly located.	9

results were compared considering the weight of the criteria already identified in this study.

Table 6 shows that Route 1 has the fewest negative dimensions and is the optimum alternative for SWMIs. Routes 2 and 3 have no negative criteria in common. However, Route 2 is more accessible than Route 3 because the negative aspects of Route 3 are among the most important factors for people with mobility impairments compared to the negative dimensions for Route 2.

4 Discussion

This work presents the priority of significant characteristics of routes that should be considered when planning and designing spaces for persons with mobility impairments. According to the findings of the criteria valuation, the most important parameters for SWMIs are slope (C1) and paving (C2). By evaluating the three routes using the AHP, Route 1 (from the dormitory trolleybus stop to the library) ranked the highest. Regarding the on-site analyses, Route 1 was again the most preferable path. Visual evaluations of the sites showed that the negative aspects of Routes 2 and 3 exceed those of Route 1, which only has two negative issues (Table 5). However, a comparison of Routes 2 and 3 (with three physical problems each) showed that the weights of the positive dimensions for Route 2 exceeded the numerical values of the positive aspects for Route 3. On the other hand, Route 2 has fewer critical issues than Route 3. This is why Route 2 is the second-best route for SWMIs. This shows that an optimal route for accessible mobility of persons with mobility impairments needs comprehensive assessments and comparisons of all physical qualities of the possible routes.

Even though Route 1 is preferred by SWMIs and has fewer physical restrictions, it still has critical problems. The on-site analyses showed that Route 1 lacks appropriate paving and has no railings on the ramps. This is the main part of the campus pedestrian route, and it is used by a large number of students every day, which may have caused the paving to deteriorate.

The on-site analysis of Route 2 showed that the main problem is accessing the trolleybus station. There is no pavement for SWMIs to access the station, and they have to use the road to reach the station platform. Only one ramp connects the road to the trolleybus platform, and it seems unsafe for SWMIs. This is the main issue for Route 2, and solving it may make the route the most preferred one. With the longest length, Route 3 is the least preferred alternative for SWMIs. According to slope analysis, around 56% of this route suits people with mobility impairments. However, the on-site analysis showed that there is no guardrail on the ramps, the paving is broken, and shrubs are inappropriately located on the route.

Because it is impossible to eliminate all physical barriers on the routes, this work has tried to rank the most important physical qualities of the routes for SWMI mobility. The AHP is an appropriate method because it uses a systematic process for surveying elements that is clear to follow, and it provides analytical comparisons and numerical weights of route parameters based on experts' preferences. On-site analyses also confirmed the results obtained by the AHP method, which means the AHP model can correctly determine optimal routes for the mobility of persons with mobility impairments. The hierarchy model discussed in this study can be modified or changed depending on the research goals, target populations, and spatial characteristics of the alternative routes.

From the point of view of accessibility, various factors have been revealed through similar research, particularly in indoor environments (accessible entrance, elevators, and bathrooms) through the participation of wheelchair users (Simpson, 2005; Bizjak, 2022). This work surveyed outdoor obstacles and addressed individuals with diverse mobility impairments such as wheelchair users and those that have difficulty walking. This

study evaluated only one destination; however, the same process can be applied to all routes on the campus and to urban networks as well. This can also be applied to other mobility factors such as safety, comfort, and pleasure. Here, the important issue that should be considered is to generate opportunities for individuals with mobility impairments to participate in this kind of project. As hypothesized, the findings of this study can help managers and designers use information about spatial arrangement and analysis to create spaces that are more suitable for people with mobility impairments. In addition, the data obtained can be useful in deciding where to locate navigation system services and facilities in future planning to achieve inclusiveness and sustainable development.

One difficulty faced during this research was contact with disabled students. This group of students does not seem to participate in campus social activities. One reason may be a lack of appropriate facilities and services to meet their requirements when they are outdoors. In Turkey, new guidelines and approaches have appeared to cover the accessibility needs of disabled individuals in open areas and urban regions.

Even though the efforts in this area are growing in Turkey, in practice they are preliminary and inadequate. Outdoor obstacles still exist and prevent disabled users from fully participating in education in particular. In other words, a usable navigation system has not been created to ensure accessibility for people with mobility impairment in Turkey. The university can act as a model of design and planning to lead a whole city and should necessarily meet the diverse needs of the students. Generally, to address the issue comprehensively, the university can contribute by:

- Increasing social awareness through ongoing conferences, workshops, courses, and relevant projects with the participation of various experts, especially planners and designers.
- Re-evaluating campuses' accessibility for safe and independent mobility of disabled people. A map or application with information about optimal routes on campus is necessary.
- Providing opportunities and incentive programs to gather disabled students, record their concerns, and facilitate their full participation in education and other social and cultural activities.

5 Conclusion

Unfortunately, the modern navigation systems and routing applications that are increasingly used by everyone do not consider the specific needs of disabled people. Mobility-impaired people also have the right to access a map or an application that determines the shortest distance, minimum barriers, fewest slopes, high-quality paving, and other physical qualities of routes. To do so, the contribution of disabled users in related research has been critical because they can better recognize obstacles and assess their living environment. It is also necessary to differentiate between types of barriers based on the diverse attributes of disabled individuals. Thus, there seriously needs to be an integrated planning approach considering the cooperation of all groups of disabled people in identifying the most fundamental physical criteria of routes for easy mobility. It seems like a time- and labour-intensive task to provide such a map with a large amount of data for each region of a city. However, with smaller open areas, a university campus can be a good starting point to apply such initiatives. Re-assessment of the navigation network based on the critical needs of students with disabilities should be considered in managing and arranging universities' open areas. The AHP method can be applied to recognize the importance level of criteria and evaluate existing routes to choose the most optimal ones.

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The landscape identity of rural settlements: Turkey's Aegean Region

This research presents a methodology for assessing the landscape identity of rural settlements. The methodology evaluates landscape identity parameters as descriptive units and analyses landscape identity according to natural, built, socioeconomic, and sociocultural parameters at various scales. Turkey's Aegean Region was selected as a case study for the research because of its rich rural pattern created by the combination of diverse geomorphology, a unique rural architectural character, climatic conditions, the rural economy, and sociocultural structures. The research presents several findings related to physical landscape identity. In addition, it shows important aspects of rural settlements through the lens of landscape identity and highlights the importance of identity-based approaches for sustainable rural development.

Keywords: landscape identity, rural settlements, rural landscape, Turkey

1 Introduction

Rural settlements differ from urban settlements in many ways. Understanding these differences is crucial to meet the challenging demands of contemporary urbanism and development trends and to understand their impact on rural areas. However, rural areas have undergone just as radical a transformation as urban areas due to factors such as demographic changes, population mobility, housing needs, and increased demand for nature and recreation areas. All these factors lead to the transformation of rural space, accompanied by socioeconomic and sociocultural changes (Carlin & Saupe, 1993; Boyle & Halfacree, 1998; Dax, 1999; Mahon, 2007; Lampietti et al., 2009; Silva & Figueiredo, 2013).

Turkey has been experiencing dramatic changes in rural areas over the last decades. In addition to general trends that can be seen everywhere in the world, such as migration, globalization, technological development, and its impact on rural space, some of the important factors that have accelerated the rural transformation process are the EU accession process, the European Spatial Development Perspective, new agricultural policies, environmental and sustainability debates, and new legal frameworks for the management of rural lands (Çörek Öztaş & Karaaslan, 2017; Oğuz, 2013). In particular, with the enactment of law no. 6360 in 2012, previously medium-sized cities were declared "metropolitan municipalities", and the previously rural "villages" were declared "urban neighbourhoods" (Soydal & Türk, 2016). With this regulation, the rural areas of metropolitan municipalities have been subjected to management policies restricting rural-based economic activities and providing services within an urban jurisdiction. It is obvious that this regulation threatens rural character and signals an urgent need to develop new strategies and methods to control the transformation process physically, socially, and economically.

The number of studies that offer a methodological approach to describing the multi-layered structure of rural settlements is limited. The tendency of studies can be observed in three main areas. One group of studies evaluates rural settlements from a geographical point of view and typologically classifies them according to geomorphology, ethnic structure, economy, function, and size (Mitković et al., 2002). Some studies offer a typological classification according to the macro form (compact, dispersed, linear, etc.) of the rural settlements from an urban planning perspective (Sharp, 1946; Bunce, 1982; Mandal, 2001; Roberts, 2006). A remarkable number of studies focus on rural architecture to document the vernacular character (Oliver, 2003; Sabatino, 2010; Donovan & Gkartzios, 2014; Philokyprou & Michael, 2021). Some valuable approaches and ideas have emerged with the adoption of the European Landscape Convention (Council of Europe, 2000), which emphasizes the protection of rural character and identity as part of the cultural landscape. In particular, since the 1980s the Countryside Agency of England emphasized countryside character and landscape values that create a distinctive rural character to help manage change and achieve sustainable development (Swanwick, 2004; Tudor, 2014). Landscape character assessment has emerged as one of the most important and comprehensive methods of identifying and describing the characteristics of a landscape at multiple scales. There are some other valuable approaches and methods for identifying the character of rural settlements, such as townscape character assessment, village design guidelines, and village design statements, all of which tend to identify the characteristics of rural settlements, including architectural features, open space, and green space characteristics, to guide development in harmony with the existing character (Swanwick, 2004; Landscape Institute, 2017).

Landscape identity, as another approach, is considered an important asset in both literature and policy documents. Like landscape character studies, landscape identity assessment also focuses on the perceptible characteristics of a landscape that distinguish it from other landscapes (Stobellar & Pedroli, 2011; Loupa-Ramos et al., 2016; Nitavska, 2020; Shao et al., 2020).

Based on the problem of identity loss in rural settlements in the contemporary era, this research evaluates landscape identity as a method specifically developed to reveal the multifaceted characteristics of rural settlements, including tangible elements such as architecture, open space, street patterns, land-use patterns, and natural features as well as social, cultural, and economic features that are associated with rural life. In this respect, the research identifies landscape identity parameters that are intrinsic to rural settlements and introduces a method to obtain physical landscape identity indices 1) to objectively show the contribution of the parameter to defining physical landscape identity, 2) to provide detailed information about rural settlements as a basis for rural development plans, and 3) to propose a framework for the decision-making process by the government concerning rural settlements.

Landscape identity is defined as the perceivable unique structure of a place (Stobellar & Pedroli, 2011), formed by the combination of characteristics that distinguish one landscape from others, and as an integrated structure that evokes a strong spatial feeling in people (Jackson, 1984; Hough, 1990; Shao et al., 2020). Stobellar and Pedroli (2011) distinguish between four types of landscape identity: personal-existential landscape identity, cultural existential landscape identity, cultural-spatial landscape identity, and personal-spatial landscape identity. Landscape identity can represent all the characteristics that

distinguish one landscape from others, and there are also studies on how people utilize the landscape to create individual and collective identities. However, regardless of the approach, landscape identity emphasizes the reciprocal relationship between people and the landscape (Loupa-Ramos et al., 2016, Loupa-Ramos et al., 2019).

In the literature, landscape identity focuses more on the human perspective than on the physical reality of the landscape. In this context, Egoz (2013) defines "landscape and identity" as the relationship between the landscape and the identity of the people that are associated with the landscape, emphasizing the constructive role of landscape identity in shaping both individual and collective identity. Loupa-Ramos et al. (2016) have developed a different perspective on landscape identity by proposing a transactional model of landscape identity. This model provides a conceptual framework for understanding landscape identity that is influenced by social factors as well as physical changes in the environment (Loupa-Ramos et al., 2019). Their approach emphasizes that landscape identity is shaped by two distinct levels of reciprocal interaction between the landscape and people: perception and activity. The first approach asserts that landscape identity is based not only on the perceivable character of the landscape but also on the character of the landscape as a built asset (Altman & Rogoff, 1987; Werner et al., 2002; Loupa-Ramos et al., 2016, Loupa-Ramos et al., 2019). The second approach is that society and landscape have evolved in response to people's physical acts affecting the landscape (e.g., policy, planning, and management). It focuses on how these acts change the landscape and its characteristics and thus how the landscape shapes the connections between people and space (Antrop, 2005; Selman, 2012; Ramos et al., 2016).

In recent decades, landscape identity has been considered an important source for sustainable planning approaches, and methodologies and tools have been developed to determine identity (Stobellar & Pedroli, 2011; Loupa-Ramos et al., 2016; Shao et al., 2020; Nitavska, 2020) and character. These methodologies are based on qualitative approaches and discuss how landscape identity can be made more operational and meaningful for spatial planning. This study is structured around a framework that was developed in a 2012 study addressing landscape identity in relation to rural settlements. This study considers landscape identity an indicator of the unique characteristics of the rural settlements and provides a holistic approach to assessing settlements as a part of a broader landscape perspective (see Erdem, 2012; Erdem Kaya, 2013). The previously developed study provided a basis for the identification of landscape identity parameters. These parameters were developed and reclassified in the context of the research, and a new methodology was developed to identify landscape identity indices. Although landscape identity can be understood from both a physical and social perspective, only the evaluation method of physical landscape identity is presented in this paper.

2 Research design and methodology

The research is structured around a combined method that includes both qualitative and quantitative components to assess the landscape identity parameters and indices. Here the term *parameter* defines the components that make up the landscape identity and *indices* refer to the quantitative value of the level of contribution of each parameter to the construction of the physical landscape identity. Data collection through field observations, interviews, document analysis, mapping, typological classification, land cover classification, scaling, and weighting of the landscape identity parameters are the components of the methodology. The research questions of the study are as follows: 1) How can we define the landscape identity? 2) Can we measure the landscape identity parameter to see the level of contribution of the parameters in defining the landscape identity? and 3) Is it possible to compare rural settlements based on landscape identity? These questions were structured to test the following hypotheses: 1) It is possible to identify different types of landscape identity within a given geographical region; 2) Today, development dynamics have a negative impact on the landscape identities in rural settlements; 3) Negative impacts on rural settlements can be measured with landscape identity parameters; and 4) Landscape identity parameters allow a more systematic and detailed classification of rural settlements, different from the groups identified by traditional classification methods.

To answer the research questions and test the hypotheses, a four-step methodology was designed (Figure 1). The first step involves data collection through an in-depth literature review to define the parameters of landscape identity. The second step involves a large-scale analysis of eighty selected rural settlements in Turkey's Aegean Region according to physical identity parameters. In this step, these eighty rural settlements were classified into major landscape identity groups based on geomorphology such as valley villages, plain villages, foothill villages, coastal villages, and hill villages, and land-cover analyses were conducted using remote sensing technology. In the third step, detailed field surveys were conducted for thirty rural settlements to define physical and social landscape identity parameters. All the parameters were collected in the form of a matrix. After collecting the data, factor analysis and cluster analysis were carried out to show the similarities and differences between villages and the spatial distribution of identity groups across the Aegean Region. The fourth step involved the creation of a matrix to define the physical landscape identity indices for the thirty rural settlements.

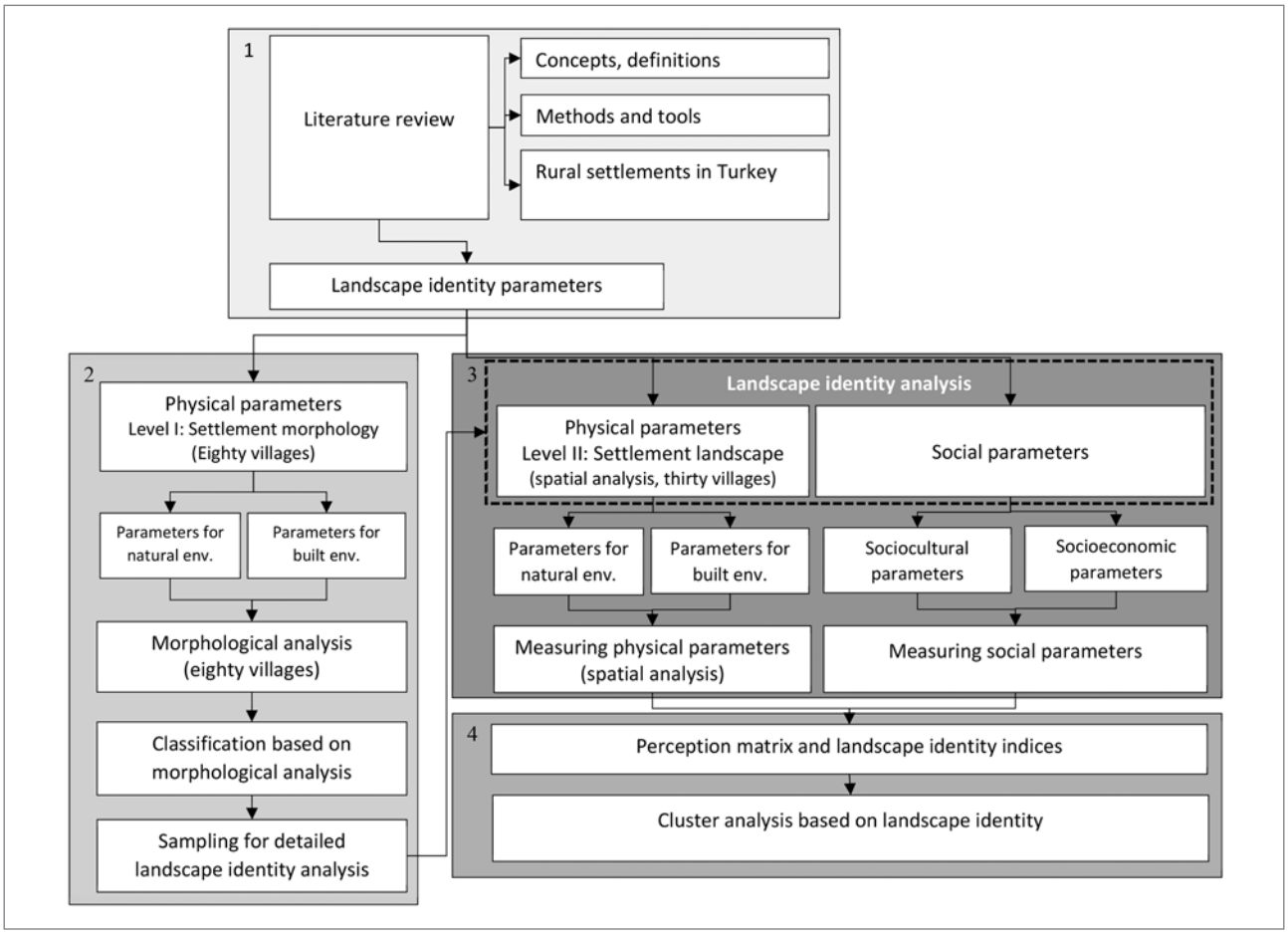

Figure 1: Research methods (illustration: Meltem Erdem Kaya).

2.1 Sampling

This research focuses on the rural settlements of the Aegean Region. The Aegean Region was chosen because it has rural settlements with quite a different character, and the region is also diverse in terms of the natural environment, the built environment, and its agricultural characteristics. The Aegean Region has both coastal settlements and examples of central Anatolian rural settlements. On the other hand, the Aegean Region is home to large cities, such as İzmir, and important industrial cities of Anatolia, such as Denizli. Beyond the urban scale, the demand for tourism and related uses within the region is very high.

According to the Turkish Statistical Institute (2024), the Aegean Region had 2,916 villages with a population between 150 and two thousand in 2023. Sampling was carried out using the categorical random sampling method. Three basic criteria played a determining role in the sampling: 1) presentation of the basic geomorphological categories of the rural areas of the Aegean Region; 2) representation of the various elevation levels with different vegetation cover; and 3) formation of groups containing the maximum number of villages with different morphological types.

First, four hundred villages were selected from among the target population, and then the villages were classified into hill villages, foothill villages, valley villages, plain villages, and coastal villages according to the basic geomorphological structure of the area they are located in, and elevation was also taken into account to show the differences in vegetation cover in addition to the morphological differences in the sample areas. From these four hundred samples, it was necessary to select at least seventy-eight villages with a confidence interval of 95%, with a ±10% error, to analyse the physical characteristics of the landscape. The sample areas also had to have a minimum area of 100 km^2 in each independent area and a minimum distance of 5 km between two points, which is required for taking satellite images. Accordingly, because each area is required to cover the maximum number of villages, it is assumed that a 100 km^2 area contains a rectangle with a maximum side length of 20 km. First, the distance between each village in the Aegean Region and the neighbouring villages within the area within a radius of 20 km was calculated. Then the village groups with the

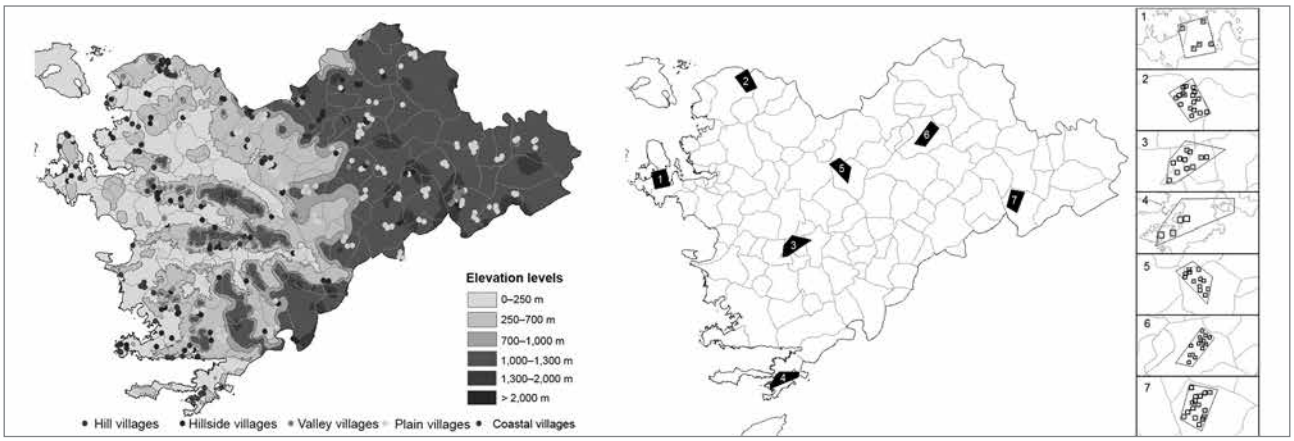

Figure 2: Village types and spatial distribution of four hundred villages according to elevation (left); village groups and the eighty villages selected (right) (illustration: Hasan Serdar Kaya).

Table 1: Thirty selected villages in Turkey's Aegean Region.

Province, district, village	2023 population	Distance to centre (km)		Economy
		City	District	
Afyonkarahisar, Şuhut, Ağzıkara	620	25.4	7.6	Agriculture
Afyonkarahisar, Şuhut, Başören	674	47.4	16.1	Husbandry, apiculture, horticulture
Afyonkarahisar, Şuhut, Güneytepe	356	38.1	7.3	Agriculture, husbandry
Afyonkarahisar, Şuhut, İlyaslı	166	42.5	11.7	Retired
Afyonkarahisar, Şuhut, Ortapınar	759	35.2	4.0	Agriculture, husbandry, service
Aydın, Köşk, Baklaköy	288	20.4	2.2	Agriculture, husbandry, olive cultivation
Aydın, Köşk, Çiftlikköy	1,486	18.8	5.6	Agriculture, husbandry
Aydın, Köşk, Menteşeler	196	33.4	15.1	Agriculture, husbandry, fig orchards
Aydın, Sultanhisar, Eskihisar	1,110	30.0	5.4	Agriculture, orchards, husbandry, apiculture
Aydın, Sultanhisar, Malgaçmustafa	410	37.2	7.7	Agriculture, orchards, olive cultivation
İzmir, Çeşme, Ildır	742	81.0	23.7	Agriculture, tourism
İzmir, Urla, Balıklıova	1,240	67.8	30.0	Agriculture, tourism, fishery
İzmir, Urla, Barbaros	427	59.0	25.2	Agriculture, tourism, fishery
İzmir, Urla, Birgi	199	61.7	25.0	Orchards
İzmir, Bergama, Durmuşlar	371	137.0	31.8	Retired, husbandry, day-labour
İzmir, Bergama, Karalar	255	138.0	32.8	Retired, husbandry, day-labour
İzmir, Bergama, Kozluca	254	133.0	29.0	Agriculture, husbandry
İzmir, Bergama, Tırmanlar	442	135.0	30.3	Agriculture, husbandry
Kütahya, Gediz, Dedeköy	178	97.2	6.0	Agriculture, husbandry
Kütahya, Gediz, Işıklar	84	82.0	17.7	Agriculture
Kütahya, Gediz, Kayacık	98	87.0	18.0	Agriculture, forestry, husbandry
Kütahya, Gediz, Yaylaköy	190	79.0	14.0	Husbandry
Kütahya, Gediz, Yunuslar	711	75.8	18.9	Agriculture, husbandry
Manisa, Kula, Börtlüce	202	131.0	33.0	Agriculture, husbandry, tobacco, retired
Manisa, Kula, Emre	190	110.0	20.0	Agriculture, husbandry
Manisa, Kula, İncesu	164	124.0	8.0	Agriculture, husbandry
Manisa, Kula, Saraçlar	367	115.0	11.5	Agriculture, husbandry
Muğla, Marmaris, Bozburun	2,240	100.0	47.4	Tourism
Muğla, Marmaris, Turgutköy	826	81.6	31.1	Apiculture, agriculture
Muğla, Marmaris, Selimiye	1,360	102.0	43.4	Tourism, agriculture, husbandry

Source: Türkiye Nüfusu İl ilçe, Mahalle, Köy Nüfusları (2023)

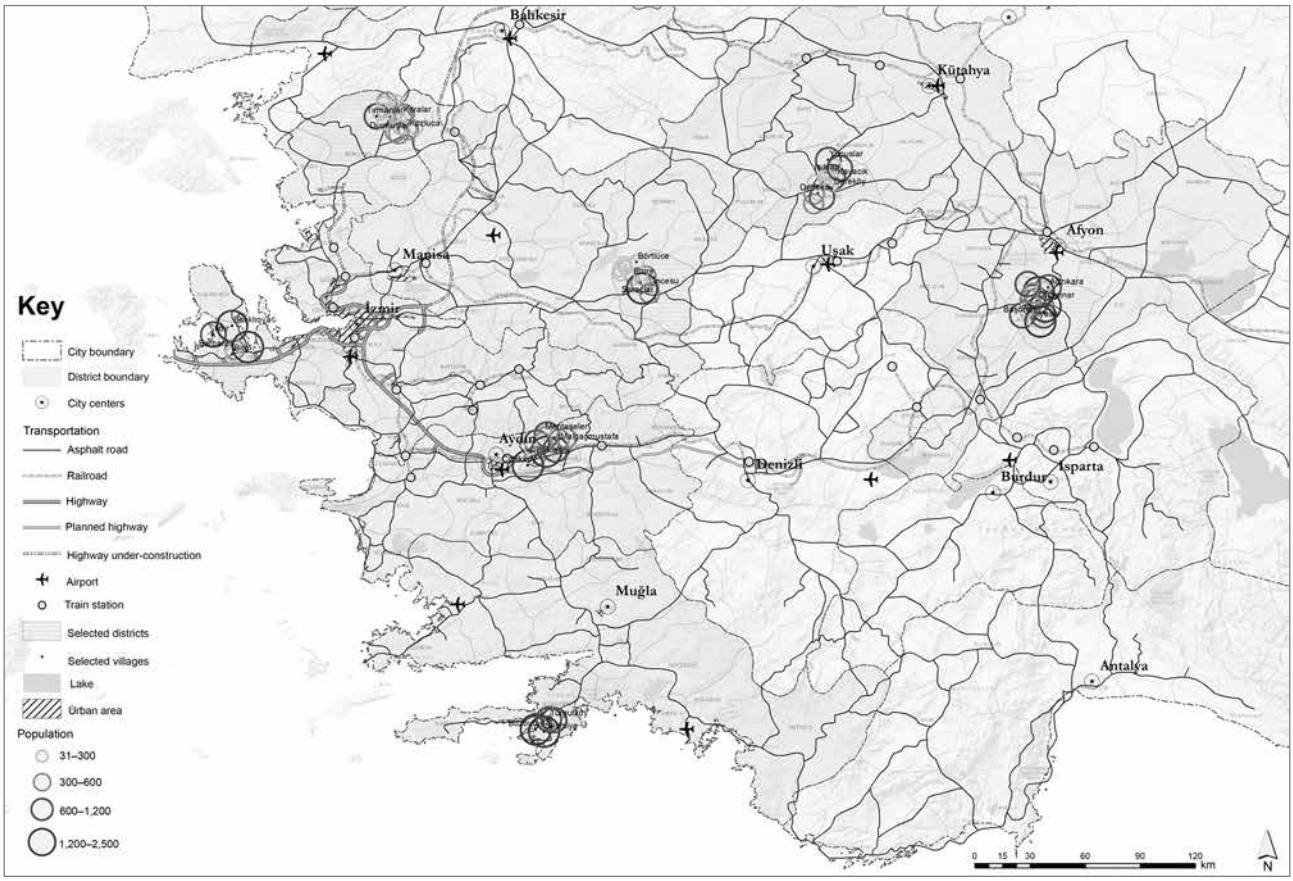

Figure 3: Selected villages within Turkey's Aegean Region (illustration: Hasan Serdar Kaya, Gökçe Şahin).

minimum total distances were determined. Seven groups of villages, consisting of the maximum number of villages in a 100 km^2 area, were selected to include six different elevation areas and an equivalent number of samples from each morphological group. A total of eighty villages were then selected from among these groups (Figure 2).

In the sample areas, a general physical landscape identity analysis was carried out to form physical landscape identity groups as a basis for selecting the samples for a detailed analysis. Considering the distribution of eighty villages according to the physical landscape identity groups, a minimum of twenty-eight rural settlements with a total confidence interval of 80% and a sampling error of ±10% was required to select samples for physical landscape identity analysis. A minimum of thirty samples was required to assess the correlation between independent variables with a correlation analysis. This requirement was also important in terms of the study's contribution to protecting the identity of rural settlements in Turkey and allowing statistical comparative analyses such as comparative multivariate analysis for comparison with studies conducted in other regions (Table 1, Figure 3). Accordingly, this study selected thirty villages for detailed landscape identity analyses, and a two-day field survey was conducted in each sample area.

2.2 Selected villages

The selected villages among the seven groups of villages represent different geographical conditions within the region, ranging from the coast to highlands. The population of the villages ranges from eighty-four to 2,240 according to the Turkish Statistical Institute (2024). Coastal villages tend to have a larger population than the other villages. Some villages have experienced population loss and have fewer than one hundred inhabitants. In some villages, the population tends to decrease as a result of migration, whereas in other villages the population has increased. In most villages, the majority of the population is elderly, and only a few villages have a few people under age forty. The villages are physically closer to the district centres. There are thirteen villages with a distance less than 15 km to the district centre, eleven villages with a distance of 16 to 30 km, and seven villages with a distance of more than 31 km. The main sources of livelihood are agriculture and animal husbandry in the villages close to the district centre. Economic diversity is seen in the villages located a medium or long distance from the district centre. Unlike the villages that are close to the provincial centre, the average population of the villages that are farthest from the district centre is higher (890 persons).

Table 2: Parameters used in the large-scale analysis.

Natural parameters	Built parameters
Topography: Elevation, aspect, geomorphology, natural edges	*Mass and void:* Distance between buildings, building density, built-up setting, location in topography, closure, openness
Vegetation: Natural vegetation, land cover, natural edges, percentages, and types that penetrate the settlement pattern	*Open spaces:* Open space typologies
Water resources: Water surface, types, natural edges	*Productive landscape:* Field system, boundaries, hedges
Climate: Macroclimate	

The main economic activity is agriculture in all the villages except for a few coastal villages, where the economy mainly depends on tourism. In addition to agriculture, animal husbandry, beekeeping, horticulture, and fishing are the other economic activities that support the rural character. Some villages have a retired population, and others have a population working in the service sector (Figure 3).

2.3 Data collection and analysis

Secondary data were collected from published documents and internet resources such as the Turkish Statistical Institute (TÜİK, https://www.tuik.gov.tr), the local government portal (https://www.yerelyonetim.net/), and the official websites of the districts: Muğla (https://www.mugla.bel.tr/), Afyon (www.afyon.bel.tr), Kütahya (www.kutahya.bel.tr), Manisa (www.manisa.bel.tr), Çeşme (www.cesme.bel.tr), Aydın (www.aydin.bel.tr), and Bergama (www.bergama.bel.tr). The primary data were collected through field observations, interviews with village mukhtars, and expert opinions.

The research used a multiscale analysis method, which included a large-scale analysis to reveal the general characteristics of the interaction between the settlement pattern and the surrounding environment, which is reflected in the macro form of the settlement, as well as spatial analysis, which was carried out to reveal spatial characteristics such as street patterns, open space types, green areas, architectural features, productive landscapes, environmental control measures, and the macro form. The model to determine the rural settlement landscape identity index consisted of four phases.

2.3.1 Phase 1: Large-scale analysis

This step involves a large-scale analysis of eighty rural settlements in the Aegean Region based on components of physical identity. The parameters help understand landscape identity to the maximum extent, and they also reveal the physical structure, environmental relationship, and land-use patterns of the settlement (Table 2).

Squares measuring 2 km on each side were structured around the village and covering the residential area, and the adjacent natural areas were determined and a large-scale analysis was carried out. The large-scale analysis made it possible to determine the primary identity classes of the settlements, including valleys, plains, coasts, hills, and foothills, and the macroform of the settlements: compact, scattered, clustered, star-shaped, and so on (Figure 4).

2.3.2 Phase 2: Rural settlement landscape identity parameters

This step reviewed methodologies such as landscape inventories, morphological aesthetic models, ecological models, landscape character assessment, visual landscape assessment, historic rural landscape assessment, townscape character, village design guidelines, and statements. The landscape identity parameters of rural settlements were developed and categorized under two main headings: physical identity parameters and social identity parameters. The parameters under each main heading were identified, and a parameter index was produced.

The detailed landscape identity analysis aimed at in this study includes physical analyses based on field research (Figure 4). Physical identity is assessed under two main categories: natural parameters and built parameters (Table 3).

2.3.3 Phase 3: Field studies of thirty villages

Field studies were conducted to assess selected villages based on their physical and social landscape identity parameters. A two-day field study aimed to identify landscape identity parameters for each village. Architectural features and open space use, streets, village squares, and agricultural plots were mapped, and typological drawings were developed for each village (Figure 6). Photos were taken to reflect the physical landscape identity and were organized to facilitate visual assessment.

2.3.4 Phase 4: Rural landscape identity matrix and indices

The data obtained from the fieldwork research were arranged in the landscape identity parameter matrix. The matrix de-

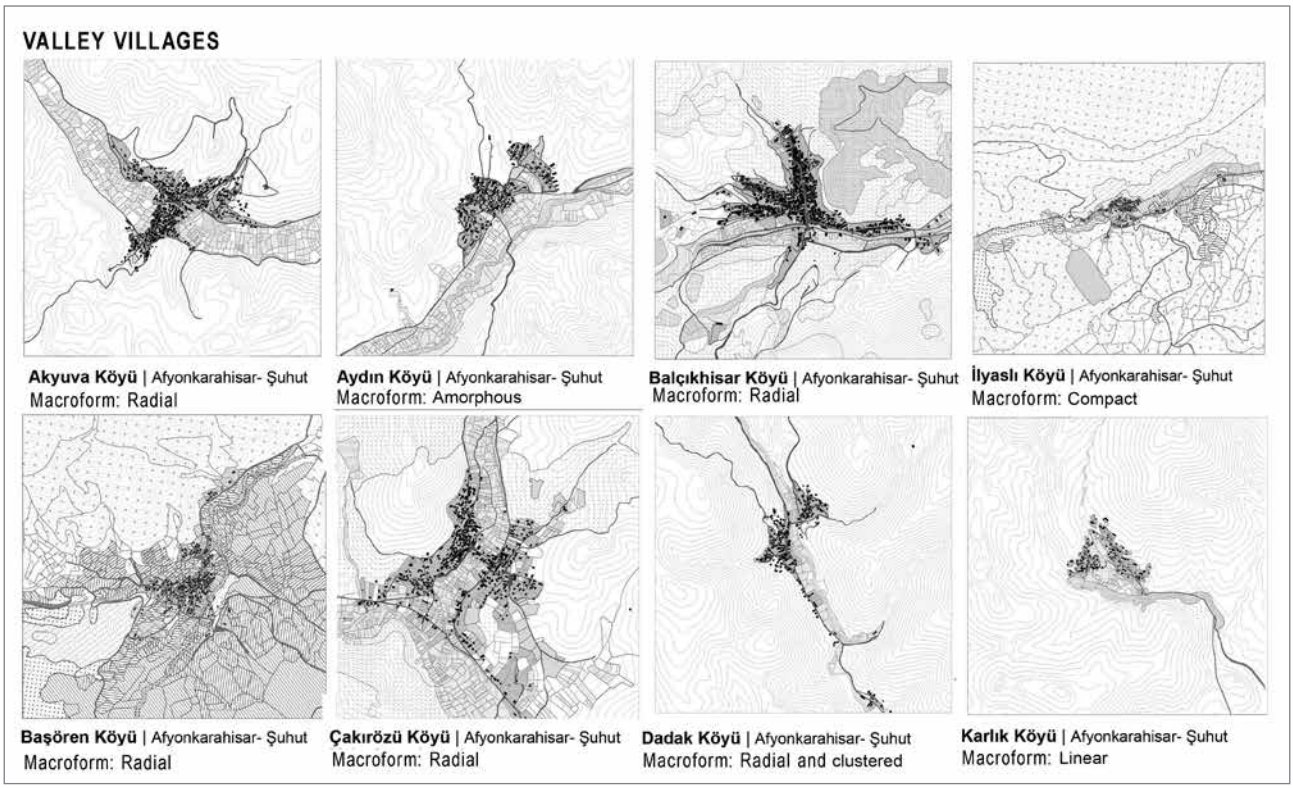

Figure 4: Sample village typology based on geomorphology and macroform: valley villages in the Şuhut district of the Afyonkarahisar province (illustration: Hasan Serdar Kaya and Ezgi Güler Tozluoğlu).

Table 3: Physical landscape identity parameters (phase 2).

Natural parameters	Built parameters
Topography	Physical character
Vegetation	Architectural features
Geology	Open space setting
Water surfaces	Transportation/communication
	Cultural vegetation

scriptively shows the elements that make up the identity of the natural and built landscape (Figure 8). Photos were taken at various levels to reflect street characteristics, open spaces, the immediate environment, land-use patterns, and architectural features, and then classified. The members of the research team (landscape architects, urban planners, an architect, a geomatics engineer, and a forest engineer) evaluated all the visual features to determine their contribution to creating a perceptible identity in terms of physical characteristics. Based on the experts' review, each parameter was scored on a scale of 1 to 5, where 1 was the lowest level of contribution and 5 was the highest. The matrix consists of the average of the sum of the scores obtained from the individual assessments and the scores of each member. The matrix includes the scores in the main headings: natural features and built features. Under the main headings, the subcategories of each feature were identified and scored as an individual element. After obtaining the individual scores for each parameter, its weight within the main category was also determined. Information on social identity parameters was obtained from interviews and field surveys and excluded from the scoring; instead, this information was used as supporting data to assess landscape identity.

2.3.5 Factor analysis: natural parameters and built parameters

To perform the analysis, the lowest-level parameters were grouped with the upper-level parameters; the natural identity components were reduced to eighteen parameters, and the built identity components to twenty-nine parameters. Because the total number of parameters exceeds the number of villages, factor analysis was calculated separately for each parameter. As

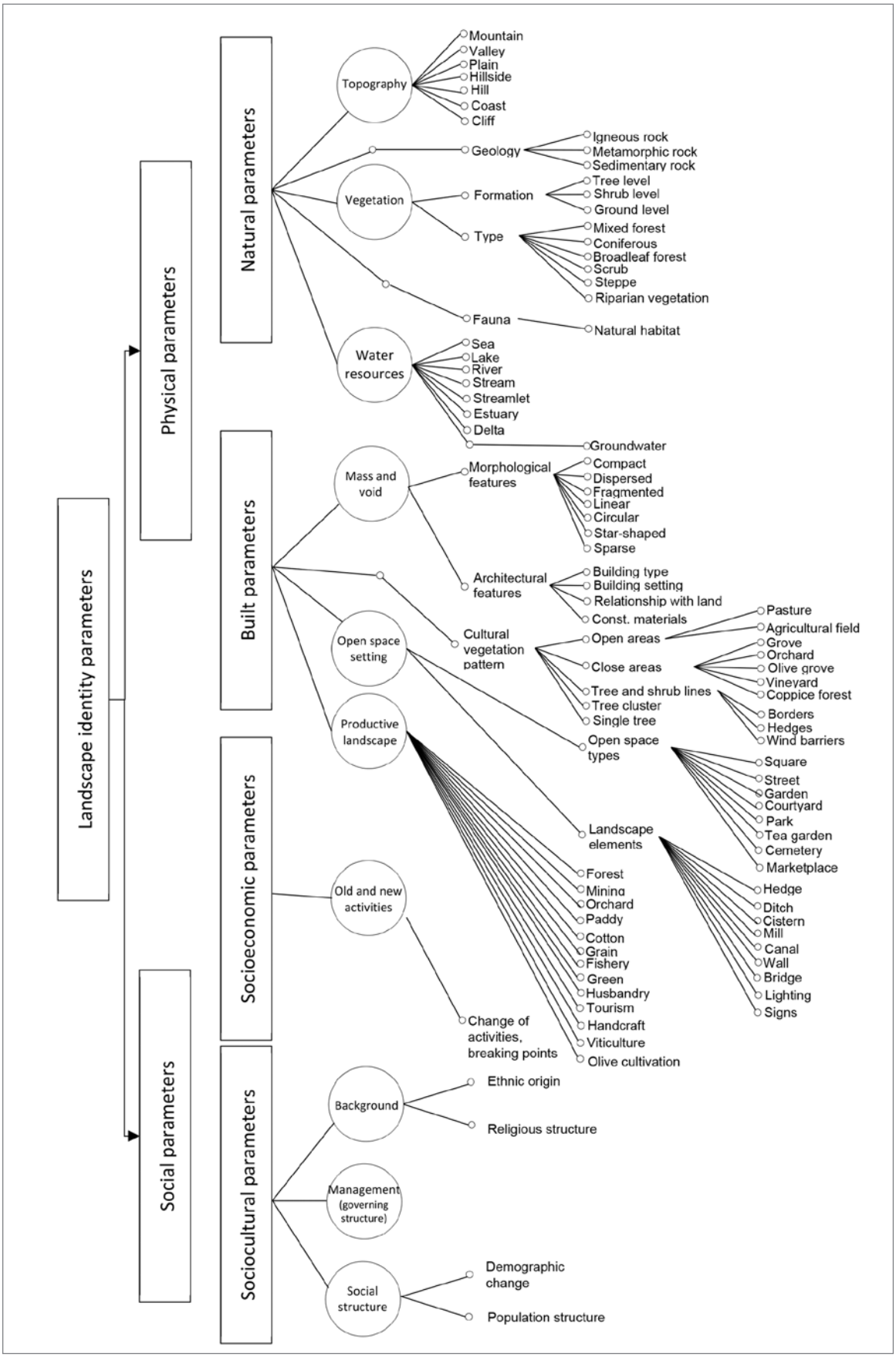

Figure 5: Landscape identity parameters (illustration: Meltem Erdem Kaya).

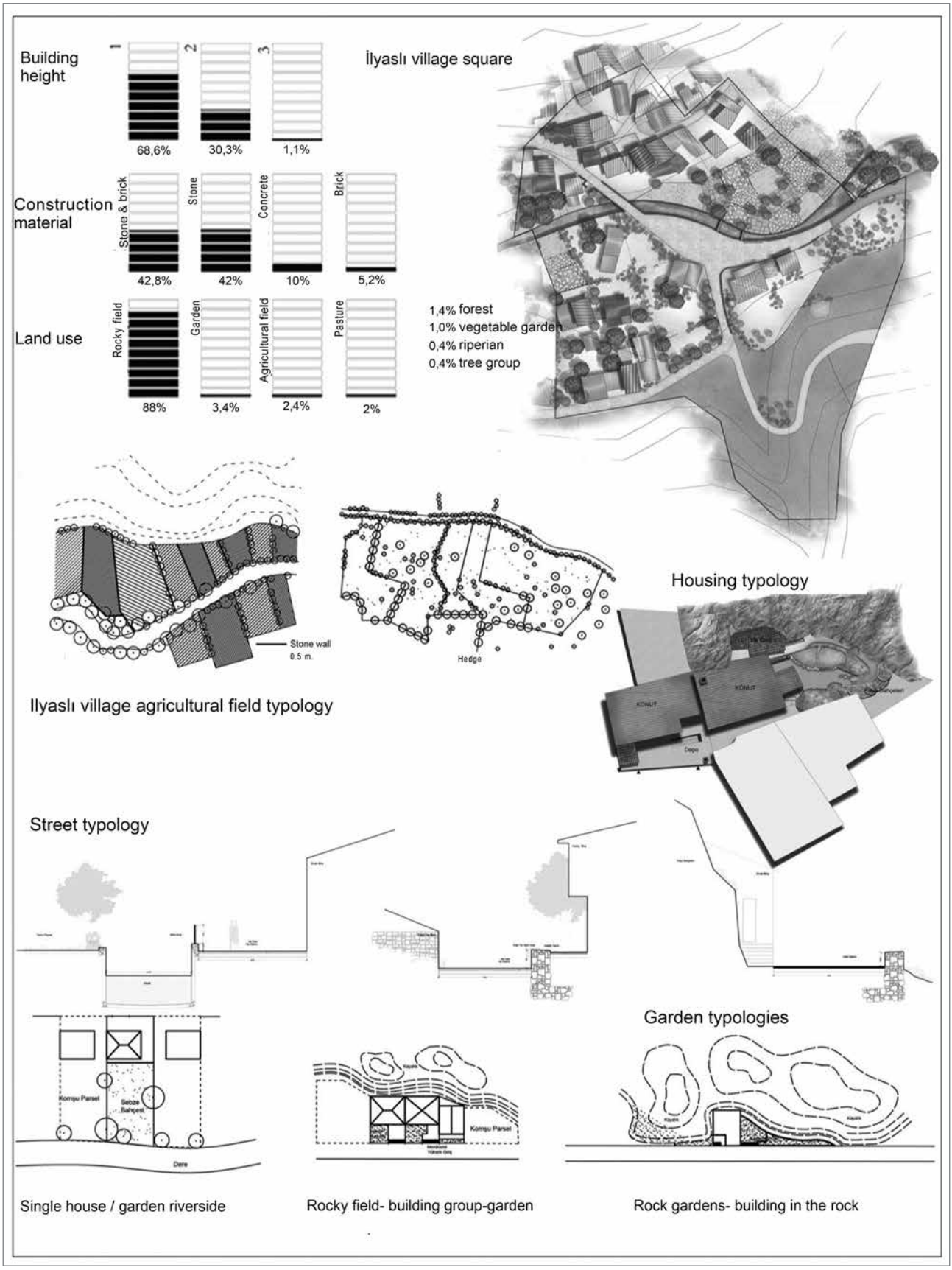

Figure 6: Sample village studies: İlyaslı housing, street, garden, and field typology (illustration: Meltem Erdem Kaya, S. Elif Serdar Yakut, and Ezgi Güler Tozluoğlu).

Table 4: Results of factor analysis of natural components: rotated component matrix.

Parameter	Factor						
	1	2	3	4	5	6	7
DT_Steppe	–.786	.159	.115	–.066	–.203	.235	–.075
DT_Maquis	.705	.429	–.402	.198	–.073	.041	–.159
DF_Shrub-Mass	.687	–.217	.175	.408	.017	.128	.122
DF_Shrup-Group	.685	.198	–.313	.059	–.154	–.241	–.149
D_Elevation	–.655	–.119	.463	.132	.101	.102	.335
D Water Surface	.630	–.171	.283	.037	–.489	.281	.069
DT_Forest	–.141	–.911	–.075	–.052	.154	.028	–.034
DF_Tree-Mass	.168	–.899	–.014	.227	–.178	.000	–.175
DF_Tree-Group	–.125	.425	.811	.058	.123	–.046	–.023
DF_Tree-Single	.200	.285	–.781	–.248	.104	–.050	.249
DT_Stream Veg. VEJ	–.029	.079	.735	.008	–.040	.070	.487
D_Slope%	.201	–.041	.040	.876	.111	–.137	.114
DF_Y Agriculture	–.053	.043	–.151	–.739	.299	–.226	–.022
DF_Y Meadow	–.098	.061	.096	–.013	.898	.186	.116
DF_Y Rock	–.267	.282	.078	.265	–.643	.310	.355
DF_Y Sand	.057	.076	–.019	.005	.002	–.905	–.104
DF_C Single	–.334	.356	.019	.292	.303	.511	–.259
D_Geology	–.044	.110	.016	.102	.005	.041	.857

Note: Extraction method: principal component analysis; rotation method: Varimax with Kaiser normalization. Rotation converged in twenty--two iterations.

a result, seven-factor groups were defined for natural parameters, and ten-factor groups were defined for built parameters. Although the KMO value for factor analysis was found to be very small, such as 0.391 (natural) and 0.414 (built), these values were found to be meaningful according to Bartlett's test data. It was found that the parameters that form the factors also form meaningful subgroups. Natural parameters were grouped into seven factors.

Built landscape identity includes a wide range of parameters. This is why the number of parameters was so large and detailed. Only some parameters that were found in some villages were simplified, and the total number of parameters was reduced to twenty-six. After the tenth factor, eigenvalues were reduced below the score of 1.

2.3.6 Cluster analysis

Cluster analysis was performed on the calculated factor scores, and groups were defined that included the villages that shared the same characteristics. Clusters were defined by using hierarchical cluster analysis. Because there were five basic groups based on their geomorphological characteristics, the minimum number of clusters was defined as five. Because there were thirty villages in a detailed analysis, a maximum of fifteen group options were allowed to emerge from the analysis to prevent each village from being a separate group.

As a result of the analysis, the villages were divided into nine groups (Table 6).

The spatial distribution of villages within the region also shows a heterogeneous structure. Coastal villages such as Balıklıova and Ildır can be grouped with Barbaros and Emre, which are plain and hillside villages located far from the coast. The fact that Barbaros and Emre are lively villages with good economic opportunities, the presence of important historical and architectural values in Emre, and the local tourism potential distinguish them from other plain and hillside villages where agriculture and animal husbandry predominate. The greatest spatial diversity can be observed in the sixth cluster, where villages are located both on the coast and in the interior.

3 Results and discussion

Among the thirty villages, İlyaslı, a valley village in the Şuhut district of the Afyonkarahisar province, with a score of 0.62, and Bozburun, a coastal village in the Marmaris district of the Muğla province, also with a score of 0.62, were identified as

Table 5: Results of factor analysis of built components: rotated component matrix.

Parameter	Factor									
	1	2	3	4	5	6	7	8	9	10
YMK_G Material	.857	.081	.099	−.028	−.015	−.090	−.202	.243	.096	−.096
YPD_G Wall Material	.809	−.187	−.046	.063	.007	.024	−.100	−.155	−.196	−.197
YPS_Natural Border	.653	−.191	−.245	.170	.173	−.132	.331	−.039	−.195	.187
YAS_Street	−.593	−.315	.362	.047	−.387	−.078	.078	.078	.153	−.062
YMY_SDiscrete	.113	−.923	−.095	−.058	.032	−.142	.052	−.137	.099	.029
YMY_Thick	−.144	.867	−.046	−.012	.053	.170	−.076	.013	.004	−.071
YB_Compact	.163	.678	.297	.007	.065	.021	.016	−.063	.056	.470
YB_Dispersed	−.243	−.490	−.276	.013	.107	.270	.309	.126	−.017	−.385
YPK_AK Mixed	−.087	.166	.912	−.042	−.036	−.143	.004	.029	.014	.049
YPK_AK Isolated	.031	.035	−.689	.278	−.387	−.173	−.076	−.068	−.260	.257
YPK_Plant Border	−.172	.138	.570	.123	.198	.037	−.383	.463	−.242	.211
YP_Production	−.125	.204	−.111	.860	−.008	−.129	.036	−.112	.137	.078
YPU_Garden	−.092	.035	.227	−.712	−.071	.163	−.041	.357	.228	.233
YME_Adjunct Building	.351	−.129	.253	.708	−.164	.117	−.311	.119	−.137	.117
YPZ_DPavement	.450	−.260	−.002	.480	.254	.230	−.166	.011	.366	−.069
YPU_Field	.093	−.065	−.068	.198	.904	−.119	.101	.084	−.028	.181
YPU_Olive grove	−.121	−.122	−.330	.352	−.807	−.125	−.003	−.036	.152	−.006
YMB_Other Buildings	.209	−.118	.076	.021	.124	−.891	.040	.101	−.072	.113
YMB_Residential	.160	.175	.037	−.118	.119	.877	.123	.165	.047	.154
YPK_TADominant	−.044	.024	.074	.001	.209	.067	.892	.141	.105	−.022
YP_Water Structure	.248	.347	.108	.166	.247	−.010	−.663	.151	.068	−.011
YPU_Pasture	.096	.186	.209	−.250	.057	.132	.058	.818	−.088	−.200
YPU_Forest	.053	.272	.446	.062	−.077	.217	−.099	−.635	−.379	−.158
Y_CKEnv. Ctrl. Measure	−.313	−.002	.059	.092	−.021	.112	.058	−.037	.788	−.006
YMA_Grading	.188	−.046	.007	−.247	−.344	−.007	.039	.086	.605	−.370
YAT_Open Space	−.153	.018	−.072	−.020	.135	.034	−.004	−.026	−.112	.847

Note: Extraction method: principal component analysis; rotation method: Varimax with Kaiser normalization. Rotation converged in twenty iterations.

the villages with the highest physical landscape identity index. According to the scaling of each parameter in the matrix, the natural landscape identity index value of İlyaslı was determined to be 0.37, and the built landscape identity index value was determined to be 0.26. The geological formation, vegetation, and riparian zone are the dominant parameters of the natural landscape identity of İlyaslı, which contribute to the formation of a remarkable physical landscape identity. In particular, rock gardens have emerged as original and site-specific formations that are used as small niches for plant cultivation and are one of the characteristic elements of the village. In this context, the natural structure and the patterns of use adapted to this structure are important factors influencing the landscape identity index of İlyaslı. In Bozburun, which is a coastal village, the natural landscape identity index was found to be 0.36, and the built landscape identity index was found to be 0.26. In Bozburun, the effect of the natural environment on the landscape identity is more pronounced. The main reason for this is that the village is geomorphologically located on the coast, and it has different coastal types and natural scrub vegetation on the hilly land.

Another village with a high landscape identity index is İncesu, a plain village, with an index value of 0.6. The originality components of İncesu are the topographic structure, meadow vegetation, compact formal structure, low buildings, natural stone walls and stone structures, and a square with wells. Interventions in the stone structures (brick additions, etc.) are one of the most important factors affecting the identity of the settlement. Despite these interventions, the village has maintained its local character. However, the presence of many ruined buildings in the village, maintenance problems, and practices that are not in keeping with the local character (e.g., use of concrete and bricks) damage the identity of the

Table 6. Groups created with cluster analysis.

Village	Geomorphology	Cluster
Eskihisar	Foothill	1
Baklaköy	Valley	
Menteşeler	Hillside	
Malgaçmustafa	Hillside	
İncesu	Foothill	2
Börtlüce	Hillside	
Saraçlar	Hillside	
Bozburun	Coast	3
Selimiye	Coast	
Emre	Foothill	4
Ildır	Coast	
Balıklıova	Coast	
Barbaros	Plain	
Durmuşlar	Hill	5
Karalar	Valley	
Birgi	Plain	6
Yaylaköy	Hill	
Kozluca	Hill	
Tırmanlar	Hill	
Turgutköy	Valley	
Kayacık	Hillside	
İlyaslı	Valley	7
Başören	Valley	
Ortapınar	Hillside	
Işıklar	Hillside	
Güneytepe	Foothill	8
Yunuslar	Foothill	
Ağzıkara	Plain	
Çiftlikköy	Plain	
Dedeköy	Plain	9

landscape. The correlation between the wells in the square and the quality of space is quite distinct. In İncesu, the built landscape identity index was higher than that of the natural landscape. The main reason for this is the preservation of the local architectural features consisting of stone buildings and tiled roofs, the presence of natural stone pavements on the streets, and its compact macroform with low-rise housing.

In nineteen villages, the natural landscape identity index was higher than the built landscape identity index. In ten villages, the situation was the opposite. In one village, the natural and built landscape identity indices were equal. It can be concluded that, in rural settlements, the natural environment plays an important role in the formation of physical landscape identity. In addition, many villages have site-specific architectural and construction features that are integrated with traditional architectural structures and reflect the use of local materials. However, this structure has begun to deteriorate with modern interventions. This is the main reason why the built landscape identity index is low in many villages. On the other hand, in almost all villages, with a few exceptions, the streets are paved with cobblestones. Village-specific materials are either used very little or not at all. This is a major threat to the identity of the built landscape. Construction style, the number of storeys, the relationship with the natural environment, and the village skyline in the landscape have a positive impact on landscape identity. However, the deterioration in the quality of these components is the main factor affecting the landscape identity of all villages. The landscape identity index of twenty-three villages was 0.5 or higher. Seven of these villages are valley villages, four are coastal villages, six are plain villages, four are foothill villages, and two are hill villages. Based on these data, the topographic structure and the presence of the coast have a significant impact on the landscape identity of rural settlements. The dominant agricultural landscape and its elements in the plain villages have a significant impact on landscape identity, whereas in the valley villages the gradual building order created by the sloping topography stands out as an important characteristic. The presence of streams in the valley villages is another important element that has a positive impact on landscape identity. In particular, the presence of vegetation and gardens along the course of the stream has emerged as a unique value that influences the identity of the landscape. However, in many villages the streams have been rehabilitated and turned into canals. As a result, the streams have lost their spatial relationship with the village.

In all the villages, fields account for an average of 33% of the village's land use. Eighteen villages have olive groves. On average, olive groves account for 26% of the total land use; they have the status of a special product field and play an important role in the land-use pattern of the villages. Twenty-one villages have forests. With an average share of 23% of their total land use, the forest areas are considered areas with high economic potential. Gardens, especially those associated with residential use, appear as an important sub-identity group in the villages as part of the productive landscape. For example, the residential structure with gardens located on large plots of land in Turgutköy (in the Marmaris district of the Muğla province), and its direct connection to the street in some places and the absence of any limiting elements, support the dominant garden identity of the village. On the other hand, the buildings with different shapes, colours, and materials and the lack of an architectural language are among the negative effects on the landscape identity.

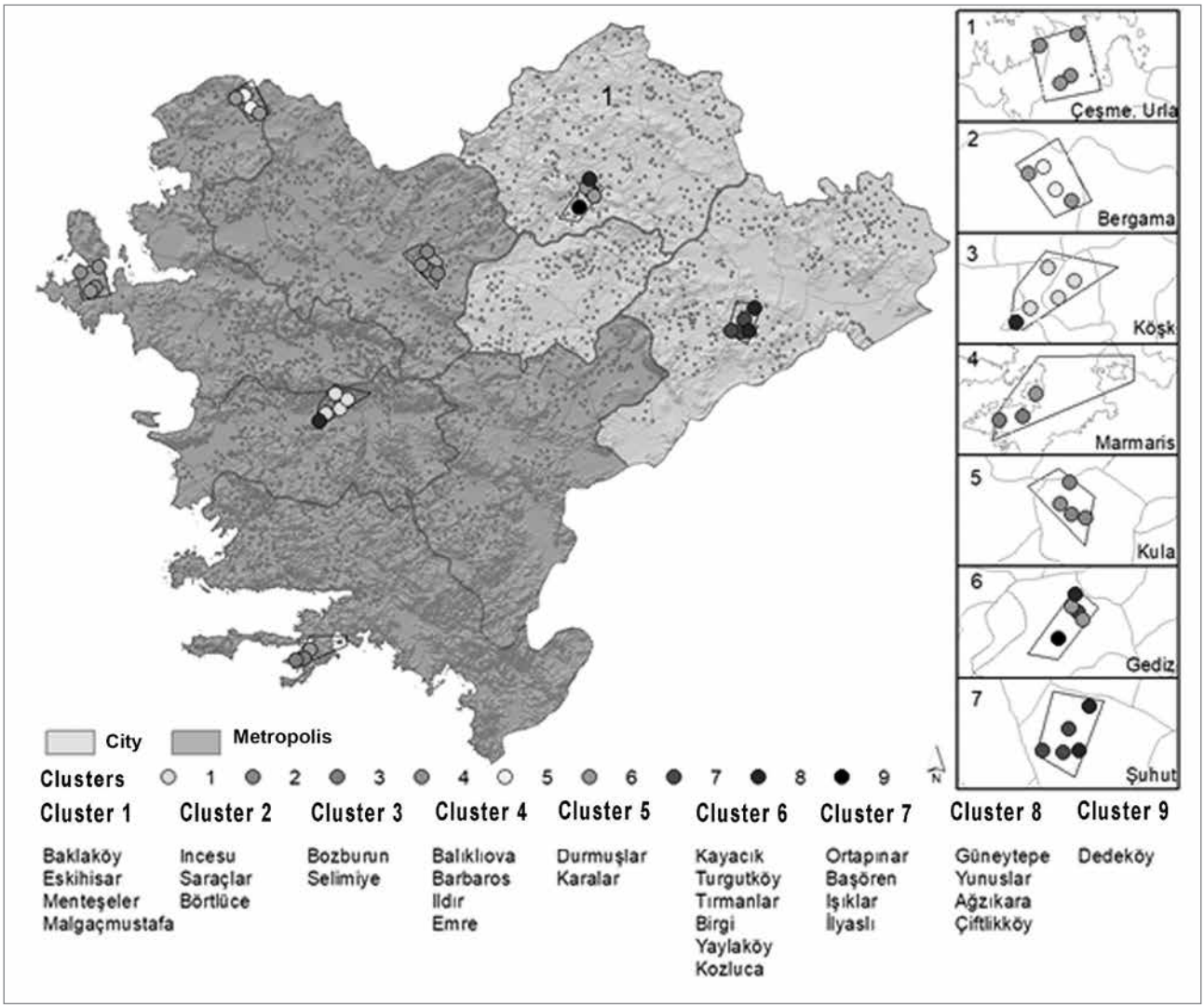

Figure 7: Spatial distribution of identity groups in the Aegean Region (illustration: Hasan Serdar Kaya).

Among the thirty villages, the village with the lowest physical landscape identity index was Güneytepe in the Şuhut district of the Afyonkarahisar province, with a score of 0.43. The deterioration of the built environment observed in the settlement located at the foot of a hill, the intensity and frequency of repetition of interventions that are incompatible with the local identity, and the lack of development of the open space structure within the village are the features that have a negative impact on the landscape identity index.

Community spaces such as the square, mosque courtyard, mosque garden, and plaza are still actively used in many of the villages covered by the fieldwork. Especially for rituals such as weddings and circumcisions, the village square serves as an important meeting place. In some villages, the village square is still used for collective work (e.g., in Emre).

3.1 Factor analysis of thirty villages

During the field study, the physical data were examined and factor analysis was used to group related components. Natural identity components were reduced from eighteen variables to seven factors, and twenty-nine variables belonging to built landscape identity components were grouped into ten factors.

3.1.1 Factor analysis of natural identity components

After seven factors in the natural identity components, the eigenvalues decrease from 1.015 to 0.7. Therefore, seven factors were used. Steppe, maquis, mass bush, group bush, elevation, and water resources form one group. The second factor consists of the parameters forest and mass tree. The third factor group

			UNDER OWN TITLE				THROUGHOUT THE NATURAL STRUCTURE				UNDER OWN TITLE										THROUGHOUT THE BUILT-UP STRUCTURE										GRAND TOTAL SCORE 2,070					
District name	Village name	Village type	TOPOGRAPY = 45	GEOLOGY/SOIL = 45	WATER BODIES= 45	VEGETATION = 180	TOPOGRAPHY	GEOLOGY /SOIL	WATER BODIES	VEGETAION	MORPHOOGICAL FEATURES = 45	ARCHITECTURAL FEATURES = 315	OPEN SPACE TYPE = 45	STREET FEATURES = 45	SQARE FEATURES = 45	LANDSCAPE ELEMENTS = 225	PRODUCTIVE LANDSCAPE = 45	CULTURAL VEGETATION = 135	TRANSPORTATION / COMMUNICATION = 45	ENVIRONMENTAL CONTROL MEASURES = 90	MORPHOOGICAL FEATURES = 45	ARCHITECTURAL FEATURES = 315	OPEN SPACE TYPE = 45	STREET FEATURES = 45	SQUARE FEATURES = 45	LANDSCAPE ELEMENTS = 225	PRODUCTIVE LANDSCAPE = 45	CULTURAL VEGETATION = 135	TRANSPORTATION / COMMUNICATION=45	ENVIRONMENTAL CONTROL MEASURES=90	TOTAL	TOTAL PERCENTAGE	NATURAL	NATURAL / TOTAL PECENTAGE	BUILT TOTAL	BUILT TOTAL PERCENTAGE
Afyon	İlyaslı	Valley	93%	76%	58%	72%	13%	11%	12%	29%	96%	68%	76%	82%	11%	37%	80%	27%	62%	14%	4%	21%	3%	4%	0%	8%	3%	4%	3%	1%	1292	0.62	762	36.8%	530	25.6%
Afyon	Ortapınar	Valley	64%	7%	67%	64%	9%	1%	13%	25%	80%	58%	49%	60%	16%	30%	89%	47%	20%	10%	3%	18%	2%	3%	1%	7%	4%	6%	1%	1%	1048	0.51	585	28.3%	463	22.4%
Afyon	Güneytepe	Hill-side	84%	0%	18%	53%	12%	0%	8%	22%	67%	48%	36%	47%	27%	34%	82%	41%	33%	0%	3%	15%	2%	2%	1%	7%	4%	5%	1%	0%	881	0.43	467	22.5%	414	20.0%
Afyon	Başören	Valley	69%	7%	60%	68%	10%	1%	12%	27%	91%	53%	84%	64%	20%	18%	80%	43%	60%	7%	4%	16%	4%	3%	1%	4%	3%	6%	3%	1%	1053	0.51	601	29.0%	452	21.8%
Afyon	Ağzıkara	Plain	76%	4%	40%	49%	11%	1%	9%	19%	89%	47%	71%	62%	13%	33%	89%	33%	62%	3%	4%	14%	3%	3%	1%	7%	4%	4%	3%	0%	915	0.44	470	22.7%	445	21.5%
Kütahya	Dedeköy	Plain	89%	0%	7%	61%	13%	0%	13%	22%	82%	61%	84%	80%	18%	43%	96%	44%	80%	0%	4%	18%	4%	3%	1%	9%	4%	6%	3%	0%	1048	0.51	503	24.3%	545	26.3%
Kütahya	Yaylaköy	Hill	82%	0%	0%	61%	12%	0%	11%	23%	93%	71%	47%	67%	9%	50%	84%	36%	62%	0%	4%	22%	2%	3%	0%	11%	4%	5%	3%	0%	1029	0.50	480	23.2%	549	26.5%
Kütahya	Işıklar	Hill-side	89%	0%	53%	71%	13%	0%	16%	25%	93%	67%	82%	76%	9%	51%	78%	48%	58%	26%	4%	20%	4%	3%	0%	11%	3%	6%	3%	2%	1219	0.59	628	30.3%	591	28.6%
Kütahya	Kayacık	Valley	78%	0%	58%	61%	11%	0%	16%	19%	93%	75%	80%	80%	20%	64%	87%	50%	64%	24%	4%	23%	3%	3%	1%	14%	4%	6%	3%	2%	1221	0.59	562	27.1%	659	31.8%
Kütahya	Yunuslar	Hill-side	69%	0%	13%	61%	10%	0%	8%	27%	89%	51%	76%	67%	9%	36%	82%	41%	58%	24%	4%	15%	3%	3%	0%	8%	4%	5%	3%	2%	972	0.47	483	23.3%	489	23.6%
Manisa	Börtlüce	Hill-side	96%	0%	2%	77%	14%	0%	14%	30%	80%	74%	73%	84%	2%	55%	96%	16%	53%	0%	3%	22%	3%	4%	0%	12%	4%	2%	2%	0%	1150	0.56	598	28.9%	552	26.7%
Manisa	Emre	Plain	89%	0%	16%	71%	13%	0%	12%	28%	84%	73%	84%	78%	40%	65%	82%	47%	73%	0%	4%	22%	4%	3%	2%	14%	4%	6%	3%	0%	1212	0.59	572	27.6%	640	30.9%
Manisa	İncesu	Plain	91%	0%	0%	75%	13%	0%	14%	29%	87%	75%	60%	76%	71%	76%	84%	38%	60%	0%	4%	23%	3%	3%	3%	17%	4%	5%	3%	0%	1234	0.60	578	27.9%	656	31.7%
Manisa	Saraçlar	Hill-side	89%	56%	0%	62%	13%	8%	13%	23%	80%	68%	51%	71%	11%	44%	87%	30%	56%	0%	3%	21%	2%	3%	0%	9%	4%	4%	2%	0%	1094	0.53	582	28.1%	512	24.7%
Muğla	Bozburun	Coast	98%	11%	96%	76%	14%	2%	17%	26%	80%	55%	80%	76%	56%	44%	80%	24%	80%	22%	3%	17%	3%	3%	2%	10%	3%	3%	3%	2%	1280	0.62	752	36.3%	528	25.5%
Muğla	Selimiye	Coast	98%	0%	98%	74%	14%	0%	15%	28%	84%	49%	76%	58%	53%	38%	56%	17%	69%	1%	4%	15%	3%	3%	2%	8%	2%	2%	3%	0%	1169	0.56	729	35.2%	440	21.3%
Muğla	Turgutköy	Plain	80%	0%	76%	61%	11%	0%	14%	21%	84%	50%	67%	76%	11%	47%	96%	35%	56%	17%	4%	15%	3%	3%	0%	10%	4%	5%	2%	1%	1088	0.53	588	28.4%	500	24.2%
Aydın	Baklaköy	Plain	87%	0%	24%	69%	12%	0%	13%	27%	80%	54%	67%	64%	22%	32%	100%	40%	51%	2%	3%	16%	3%	3%	1%	7%	4%	5%	2%	0%	1047	0.51	575	27.8%	472	22.8%
Aydın	Çiftlikköy	Plain	96%	0%	20%	49%	14%	0%	10%	18%	84%	47%	80%	56%	44%	44%	89%	30%	38%	3%	4%	14%	3%	2%	2%	10%	4%	4%	2%	0%	928	0.45	460	22.2%	468	22.6%
Aydın	Menteşeler	Valley	89%	0%	18%	66%	13%	0%	15%	24%	84%	60%	56%	78%	36%	38%	98%	41%	36%	4%	4%	18%	2%	3%	2%	8%	4%	5%	2%	0%	1059	0.51	549	26.5%	510	24.6%
Aydın	Eskihisar	Plain	89%	0%	49%	51%	13%	0%	13%	16%	78%	58%	73%	78%	44%	53%	96%	37%	51%	0%	3%	18%	3%	3%	2%	11%	4%	5%	2%	0%	1048	0.51	506	24.4%	542	26.2%
Aydın	Malgaçmustafa	Valley	91%	0%	47%	53%	13%	0%	14%	17%	84%	57%	58%	82%	24%	40%	93%	30%	24%	0%	4%	17%	3%	4%	1%	9%	4%	4%	1%	0%	994	0.48	519	25.1%	475	22.9%
İzmir	Durmuşlar	Hill	96%	11%	16%	60%	14%	2%	12%	24%	89%	79%	38%	73%	33%	58%	60%	37%	53%	0%	4%	24%	2%	3%	1%	13%	3%	5%	2%	0%	1122	0.54	536	25.9%	586	28.3%
İzmir	Karalar	Valley	96%	0%	69%	64%	14%	0%	14%	23%	78%	63%	53%	71%	36%	51%	80%	24%	31%	26%	3%	19%	2%	3%	2%	11%	3%	3%	1%	2%	1146	0.55	621	30.0%	525	25.4%
İzmir	Kozluca	Hill-side	80%	0%	16%	70%	11%	0%	15%	28%	84%	62%	78%	84%	51%	62%	87%	33%	40%	0%	4%	19%	3%	4%	2%	14%	4%	4%	2%	0%	1126	0.54	555	26.8%	571	27.6%
İzmir	Tırmanlar	Hill-side	87%	0%	33%	52%	12%	0%	15%	17%	89%	62%	60%	62%	33%	37%	82%	30%	44%	0%	4%	19%	3%	3%	1%	8%	4%	4%	2%	0%	968	0.47	483	23.3%	485	23.4%
İzmir	Balıklıova	Coast	96%	0%	98%	76%	14%	0%	15%	29%	87%	51%	76%	64%	18%	42%	69%	15%	76%	10%	4%	16%	3%	3%	1%	9%	3%	2%	3%	1%	1194	0.58	733	35.4%	461	22.3%
İzmir	Barbaros	Plain	96%	0%	27%	71%	14%	0%	16%	29%	84%	56%	89%	60%	24%	58%	84%	27%	53%	2%	4%	17%	4%	3%	1%	13%	4%	3%	2%	0%	1124	0.54	601	29.0%	523	25.3%
İzmir	Birgi	Plain	82%	0%	51%	63%	12%	0%	17%	26%	73%	52%	38%	64%	11%	44%	82%	21%	33%	0%	3%	16%	2%	3%	0%	10%	4%	3%	1%	0%	997	0.48	568	27.5%	429	20.7%
İzmir	Ildır	Coast	91%	7%	93%	71%	13%	1%	12%	28%	89%	68%	71%	76%	2%	34%	76%	39%	62%	0%	4%	21%	3%	3%	0%	7%	3%	5%	3%	0%	1210	0.58	700	33.8%	510	24.6%

Figure 8: Landscape identity matrix and indices of thirty villages (illustration: Hasan Serdar Kaya and Ezgi Güler Tozluoğlu).

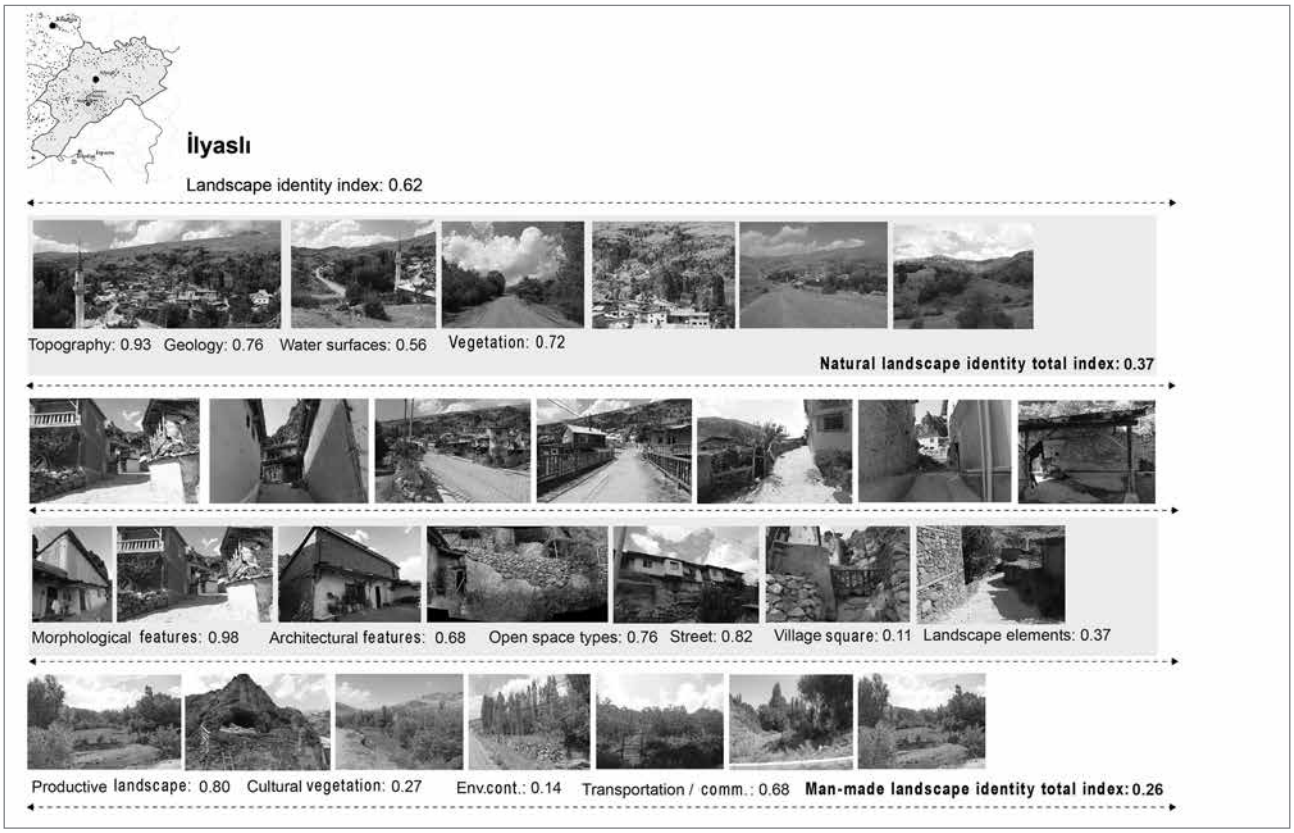

Figure 9: Visual assessment and index values for a sample village (illustration: Meltem Erdem Kaya).

includes the parameters tree group, single tree, and riparian vegetation. The fourth factor consists of slope and agricultural area parameters. The fifth factor consists of grassland and rocky surfaces. A rocky surface has a negative value. The sixth factor consists of dune surface and single bush parameters. The last factor is geology (Table 7).

3.1.2 Factor analysis of built landscape identity parameters

Factor analysis revealed ten factors. The first factor shows the presence of natural materials in buildings, walls, and boundaries. The second factor refers to settlement density and form. The third factor consists of the parameters of mixed trees, single-species trees, and vegetative boundary element. The fourth factor consists of the production landscape, gardens, additional residential structures in a garden, and ground-cover characteristics. The fifth factor includes field and olive grove parameters. The sixth factor represents the presence of dwellings and characteristic non-residential structures, such as mosques. The seventh factor includes the dominance of single-tree and water structures. The eighth factor consists of pasture and forest parameters. The ninth factor includes environmental control measures. The last factor consists only of the open area parameter (Table 8).

Table 7: Natural landscape identity factors.

Factor	Description
1	Elevation-dependent vegetation
2	Vegetation density
3	Streamside vegetation
4	Agricultural surface on sloping land
5	Vegetation on rocky surface
6	Vegetation in coastal areas
7	Geologic structure

Table 8: Built landscape identity factors.

Factor	Description
1	Built environment boundary elements
2	Form of construction
3	Natural environment border elements
4	Rural outdoor features
5	Agricultural landscape
6	Building typology
7	Focal elements
8	Natural resource areas
9	Environmental control measures
10	Common spaces

3.2 Cluster analysis of thirty villages

Following the factor analysis, a cluster analysis was carried out using the natural and built landscape identity factor scores. Comparing the basic morphological characteristics of the villages and the clusters, it was found that that valley, plain, foothill, hillside, hill, and coastal villages were in different clusters. This result supports the hypothesis that villages can form different groups based on built landscape identity data. The fact that valley, plain, foothill, and hillside villages are found in more clusters means that geographical features are less dominant than other features. Hill and coastal villages are grouped into two clusters. The main reason for this is that the coastal villages are generally the most accessible and the hill villages are the least accessible, the level of development varies, and the economic sectors are focused on tourism in the coastal villages and animal husbandry and agriculture in the hill villages. Hill and coastal villages differ from other villages in terms of population, natural environment, and vegetation. The clusters formed are indicators of the rich identity of the villages. Looking at clusters of villages, it can be seen that there are similarities within each cluster, as well as between clusters. For this reason, the groups formed are not considered village clusters as an alternative to geomorphological classification. These clusters show that villages can form different clusters when evaluated from different perspectives and with more parameters. This multidimensional and rich structure should be taken into account when making evaluations and suggestions about villages.

4 Conclusion

This research focusing on landscape identity was structured to find answers to three research questions. The first research question concerns the definition of landscape identity. The research introduces and evaluates landscape identity as a holistic approach to identifying rural settlements. Rural settlements as catalysts of the rural system represent patterns of life associated with productive landscapes and natural environments. These settlements are places where pragmatic adaptation to natural conditions generates cultural patterns that are site-specific. In the research, the rural settlement was evaluated as an entity with its operative landscape, and the landscape identity approach used underlies the integration of culture with the natural landscape. In this regard, it has been proposed that landscape identity has two main components: physical landscape identity and social landscape identity. The second research question seeks to understand whether landscape identity parameters can be measured quantitatively. The proposed method is therefore an attempt to objectively show which parameters make the settlement remarkable, qualified, and worthy of protection. The method also makes it possible to compare settlements in terms of landscape identity. The landscape identity matrix developed for thirty rural settlements reflects index values for each parameter as an answer to the second and third research questions and proves that even within the same geographical context the villages show diversity in terms of landscape identity. This result confirms the first and fourth hypotheses of the research. The matrix also shows that the natural environment, rural land-use patterns, and architectural features are the dominant parameters of landscape identity. These qualities, in addition to continuing social patterns of life, still exist in rural settlements but are threatened by the pressures of urbanisation. Understanding these rural characteristics becomes crucial in a continuously urbanizing world to protect values and control development. In this regard, it is suggested that landscape identity can be used as an approach, method, and way of thinking about rural areas to reveal regional and local characteristics, and that it can be used as a tool for sustainable rural development.

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Business improvement districts and their impact on territorial brands: A case study analysis

Numerous cities worldwide employ business improvement districts (BIDs) to manage their central areas. This article analyses the contribution of BIDs to cities' territorial brands. Employing a case study methodology, we utilize the "territorial brand in regional development" (TBRD) matrix for qualitative analysis of selected BIDs. The findings underscore BIDs' role as a versatile territorial brand in regional development shaping strategic discussions and fostering local, regional, and global reputations. It can be concluded that BIDs significantly enhance the territorial brand of their cities, receiving endorsement across various scales. Furthermore, urban and regional development processes involve political and cultural discussions, and this article revealed that BIDs are an active player in these discussions.

Keywords: business improvement districts, territorial brand, management of urban areas, urban and regional development, urban renewal

1 Introduction

Discussions on urban and regional development encompass a multitude of dimensions. The cultural dimension, as an extension of political influence (Williams, 2011), shapes discussions on the interconnections between the local and the global. The territorial brand in regional development (Almeida, 2018) and business improvement districts (Charenko, 2015; Guimarães, 2021) play crucial roles in complex urban and regional processes.

Business improvement districts (BIDs) are urban governance structures that first emerged in Canada during the 1960s (Mitchell, 2008). At their core is the principle that the private agents of an area, depending on the geographical context, have a financial obligation to contribute to a management structure that will develop activities that promote the attractiveness of the area. Usually, this contribution takes place over five years, after which the BID may or may not be renewed (Guimarães, 2018).

Research underscores that BIDs may participate in the commodification of urban areas through diverse mechanisms, such as the privatization of public spaces and urban infrastructure, revitalization efforts (Serin et al., 2020), or institutionalization of regions (Zimmerbauer, 2013), including districts. This involvement generates economic impacts (Dotti et al., 2021; Kim et al., 2023) and contributes to the establishment of city regions (Salder, 2020).

This study examines the role of BIDs as semi-private entities in shaping the territorial brand of areas they intervene in and contributing to the overall place branding of cities. The significance of BIDs has been evident at the international level, mainly from projects implemented in the United States. Furthermore, their importance is underscored by substantial influence on decision-making within urban planning. Notably, the activities carried out by BIDs have evolved over time (Silva & Cachinho, 2021), going beyond functional aspects, encompassing interventions such as beautification initiatives in the area intervened in and involvement in strategic urban planning decisions that may reshape the urban governance structure. Thus, BIDs are not merely public-private entities; instead, they are integral participants in regional and urban governance.

Thus, we position BIDs as integral components of governance, placing them within the framework described by some authors as quasi-public entities (Ratcliffe & Flanagan, 2004; Zieberth, 2020). By engaging in activities that influence an area's character, BIDs help improve its economic environment, differentiate it from competing areas, and actively participate in creating a territorial brand for the development zone. This contribution extends beyond economic aspects to encompass ethnocultural diversity, recognized as an asset in contemporary urban society (Schmiz, 2017), influencing place management strategies (Anholt, 2010) and urban creative activities (Uršič, 2021).

This article presents evidence of the role of BIDs in governance. Thus, it focuses on the specific aspect of the territorial brand, hypothesizing that BIDs reflect the territorial brand strategy in their activity. From this perspective, the symbolic value of the territorial brand is acknowledged, emphasizing the coordination and participation of diverse social actors and local narratives within the framework of a brand (Almeida, 2018). These brands play a role in the sense of belonging (Martin & Capelli, 2018; Pedeliento & Kavaratzis, 2019; Jain et al., 2022), in boundaries (Scott & Sohn, 2019) as spaces defined by power relations (Raffestin, 1993), and in territorial identity (Jiménez-Medina et al., 2020; Ramos & Royuela, 2020). Territorial brands are also integrated into urban branding initiatives aimed at shaping the identity of places influenced by urban imagination (Donald & Kofman, 2008; Kourtit et al., 2020). This extends beyond traditional city marketing (Gotham, 2007) and its related activities.

Employing a multiple case study methodology (see Yin, 2015), this article examines BIDs within the English context. It uses the "territorial brand in regional development" (TBRD) matrix developed by Almeida (2024). This matrix has been previously used in the context of branding literature. In this research, this framework is applied to urban studies, using information collected from websites.

2 Background

2.1 Business improvement districts

The dynamic evolution of cities is manifested in the reshaping of their hierarchical structure. BIDs play a pivotal role in this restructuring scenario, serving as revitalization mechanisms initiated by entrepreneurs within specific urban areas and authorized by public authorities to legitimize their actions. Although research on BIDs has surged since the early 2000s, it predominantly remains an Anglo-American focus (Silva et al., 2022).

From a broad perspective, BIDs are perceived as urban regeneration initiatives (Grail et al., 2020). Guimarães (2021) identifies four dimensions in the literature on BIDs: a) urban governance, b) policy transfer, c) type of BIDs and areas of implementation, and d) developed activities. These dimensions

form BIDs as a neoliberal intervention mechanism in urban spaces (Wee, 2016; Richner & Olesen, 2019).

Research on BIDs in urban governance emphasizes the transformative effects of BID implementation on the governance structure of each area. The success of BID projects hinges significantly on achieving consensus among stakeholders from public and private domains, often materialized through public-private partnerships. These partnerships concurrently entail a diminishing role of the state in delivering public services, signalling a shift from government to governance (Cook, 2009). Because BIDs implement public activities and services, Justice and Skelcher (2009) characterize them as quasi-governmental entities.

Three groups categorize the involvement of BIDs in the urban governance of a given territory (Morçöl et al., 2014). First, BIDs are viewed as instruments of public policies aligned with retail-led urban regeneration strategies (Guimarães, 2021). Second, BIDs are analysed as key players in the urban governance of their operating areas (Briffault, 1999). Finally, BIDs are considered private entities governing public spaces. Despite not directly impacting the public sector, their modus operandi mirrors those of the private sector, yet they wield managerial control over delimited public areas (De Magalhães, 2014), sparking discussions on their accountability for their actions and performance (Farhat, 2012; Unger, 2017).

The BID model has gained international prominence as more countries adopt this intervention approach. Some research delves into the BID policy transfer process (Peyroux et al., 2012). First, Toronto and the development in the Bloor West Village Business Improvement Area is the acknowledged birthplace of the BID model (Charenko, 2015). Second, cities such as New York highlight the significance of BIDs, influencing other countries to adopt a similar model (Sutton, 2014). Key actors in BID transfer, such as decision-makers and urban planners, have emphasized BIDs as best-practice models for revitalizing central areas (Stein et al., 2017). Research also focuses on the geographic contexts in which BIDs are adopted, including South Africa (Kaye-Essien, 2020), Germany (Kreutz, 2009), and Sweden (Cook & Ward, 2012). Each country's adoption of the BID model requires specific legislation, particularly to regulate mandatory contributions from entrepreneurs for executing BID business plans. This adaptation to legal frameworks results in BID variations, highlighting specific national, regional, and local features.

Regarding the third axis of research, concerning the type of existing BIDs and their implementation areas, cities are commonly regarded as privileged spaces for BID projects (Ruffin, 2008; Grail et al., 2020). BIDs predominantly occur in urban environments to increase the viability of existing businesses (Sutton, 2014; Pitkeathley, 2019). Some research-specific examples such as Milwaukee (Ward, 2007), Malmö (Kronkvist & Ivert, 2020), or New York (Yoon & Byun, 2020) concentrate on more circumscribed areas such as "downtown" (Ward, 2007; Unger, 2017) or the "town centre" (Coca-Stefaniak & Carroll, 2015).

The fourth dimension emphasized in studies focuses on the activities developed within BIDs, which have experienced notable evolution in recent years. It is crucial to recognize that, although these activities are categorizable, they are diverse and closely linked to the characteristics of each area and the project management structure's capacity. In essence, the financial resources allocated to the project significantly influence the prioritization of activities.

Considering these foundational assumptions, a discerning typology of initiatives emerges, primarily geared toward enhancing the commercial environment. This comprehensive typology (Gross, 2005; MacDonald et al., 2013), positions the BID model at the forefront as an ideal approach to retail-led urban regeneration (Lloyd et al., 2003) or as a powerful economic development model (Elmedni et al., 2018). Common activities undertaken by BIDs are often encapsulated by the label "clean, green, and safe" (De Magalhães, 2012). Regarding BIDs in the UK (Silva & Cachinho, 2021), their scope can extend further, including participation in urban requalification projects, business lobbying, collaboration in social and community initiatives, digital training, and place marketing and branding. In this regard, emphasis should be placed on marketing campaigns and animation initiatives, which contribute to improving the BID area's attractiveness. Within the conceptual framework of place branding and territorial brand literature, further exploration is needed to understand the role of BIDs in establishing and/or consolidating a territorial brand.

Regarding the theoretical analysis of BIDs, two other aspects merit attention. The first is that there is a growing body of critical literature on BIDs. Studies by Richner and Olesen (2019) and Valli and Hammami (2021) criticize BIDs for potentially privatizing and gentrifying the areas they intervene in. The discussion on whether BID interventions improve urban environments without neglecting access for the entire population to the area is of paramount interest. Second, legal frameworks of BIDs vary between the different countries where the model is implemented. Recognizing differences between BIDs in North America, Britain, and other areas, as well as variations between English and Scottish BIDs, we focused on established BIDs in England, which share a basic legal structure. We intentionally excluded London BIDs due to particular aspects of their legal framework.

2.2 Place branding and territorial brand

The terms *place branding*, *place brand*, and *territorial brand* are subject to debate (Anholt, 2010). Almeida (2018) argues that in Brazil place branding is viewed as strategic brand management rather than the product itself (a territorial brand). However, in countries such as Portugal, the terms *place branding* and *territorial brand* are used interchangeably, suggesting that the terminology of place branding is context-dependent, influenced by geographical location (Ntounis & Kavaratzis, 2017). Furthermore, Anholt (2010) emphasizes that place branding diverges from the concept of a brand in marketing literature because it entails managing the reputation and character of a place, extending beyond a mere distinctive sign. These discussions are crucial in examining place branding and territorial brands because a lack of clarity can confound readers specialized in brands (Almeida, 2018). Complexities arise with the terms *place*, *region*, and *territory*, each bearing distinct meanings in geography (Raffestin, 1993; Santos, 1996). When applied in place branding without a nuanced understanding, theoretical and practical errors may occur. Therefore, the concept of a territorial brand in regional development involves a cyclical process of establishing or constructing power relations (Almeida, 2018). However, it transcends mere social constructs and relationships within and beyond the territory. Territorial brands strategically serve to legitimize the discourses of actors engaged in the governance of a given territory (Almeida, 2018), encompassing several spheres.

Within territorial and regional development, the brand-territory relationship is analysed from three perspectives: brands in the territory, brand territories, and territory as a brand (Almeida, 2015). Place branding aligns with the latter, signifying a management approach that incorporates the territory within the realm of brands. It is crucial to recognize that, similar to the product and brand distinction (Kotler, 2001), the terms *place branding* and *territorial brand* are not synonymous. Place branding involves the management of a collective product (a territory), which may or not be branded (Rainisto, 2003; Kavaratzis & Ashworth, 2006; Anholt, 2007), with the territorial brand emerging as the product of place branding (Almeida, 2018).

This fundamental understanding is significant because the territorial brand serves as a focal point in discussions spanning branding, marketing, political diplomacy, urban-regional development, administration, and more, affirming its interdisciplinary nature. Whereas traditional literature on place branding examines the brand from an economic perspective (Kotler, 2001; Anholt, 2007; Kavaratzis, 2015), there is an increasing exploration of place branding within the contexts of public policies (Lucarelli, 2018) and cultural studies (Almeida, 2018).

In this context, it is crucial to distinguish between a brand and a logo because a logo is a component of a brand, not the brand itself (Aaker, 1996). In many instances of territorial brands, the focus is on place marketing (Kotler, 2001) for economic development, often seen as isolated strategies of self-promotion by local authorities. It is noteworthy that in Latin America the brand is often approached as a promotional element, resulting in its ephemerality (Almeida, 2018). Conversely, in Europe, the brand is viewed institutionally from a long-term perspective (Semprini, 2010). Applying the brand to a territory without specific management (place branding) or solely for identification, irrespective of the size of the territory, often results in a transient logo rather than a lasting brand (Almeida, 2018).

Within this conceptual framework, a territorial brand in regional development is construed as a "set of symbols, cultures, and identities transformed into distinctive signs (brands), visual, discursive, or mixed (visual-discursive), in a planned or organic manner, facilitating the formulation of strategies that engender power relations over, within, and beyond the territory" (Almeida, 2018, p. 244). Strategies are the means to achieve specific objectives (Seitan, 2018), including establishing, maintaining, or altering a territorial brand, which can strategically preserve territorial identity (Almeida, 2018) and modern urban assets.

3 Reasearch methodology

A significant part of the articles on BIDs presupposes a strong connection between these structures and the territorial brand of the locations they intervene in. We anchor the methodology of our article in the inductive method, using a qualitative approach, and in secondary data by analysing the official documents of four English BIDs: Manchester, Bristol, Leicester, and Norwich. All the cities analysed are in England; Manchester is located in northwestern England, Leicester is in the East Midlands, Norwich is in eastern England, and Bristol is in the southwest. It should also be noted that we chose not to include the London region in this analysis because the BIDs in this area fall under a different urban governance structure, making them difficult to compare with BIDs in other cities. Except for Norwich, which has a population of less than 100,000, the remaining cities are medium-sized (Table 1).

The first city, although it is the largest among the sample, has the smallest number of levy payers within the delimited BID implementation area. This information does not diminish the significance of the area, given that it largely consists of the primary commercial streets of the city and the surrounding metropolitan region. The remaining three BIDs cover an area

Table 1: General information about the cities and BIDs analysed.

City	Population	Number of terms	Levy payers (number)	Budget (yearly average, GBP)	Area of implementation
Manchester	389,000 (metropolitan district)	Two (2013–2018, 2018–2023)	+400	1,000,000	City centre
Bristol	323,000 (unitary authority)	One (2017–2022)	763	1,212,000	City centre
Leicester	230,000 (unitary authority)	One (2018–2023)	714	850,000 (4,268,989 in five-year period)	City centre
Norwich	96,000 (non-metropolitan district)	Two (2012–2017, 2017–2022)	+700	1,147,466	City centre

Source: authors.

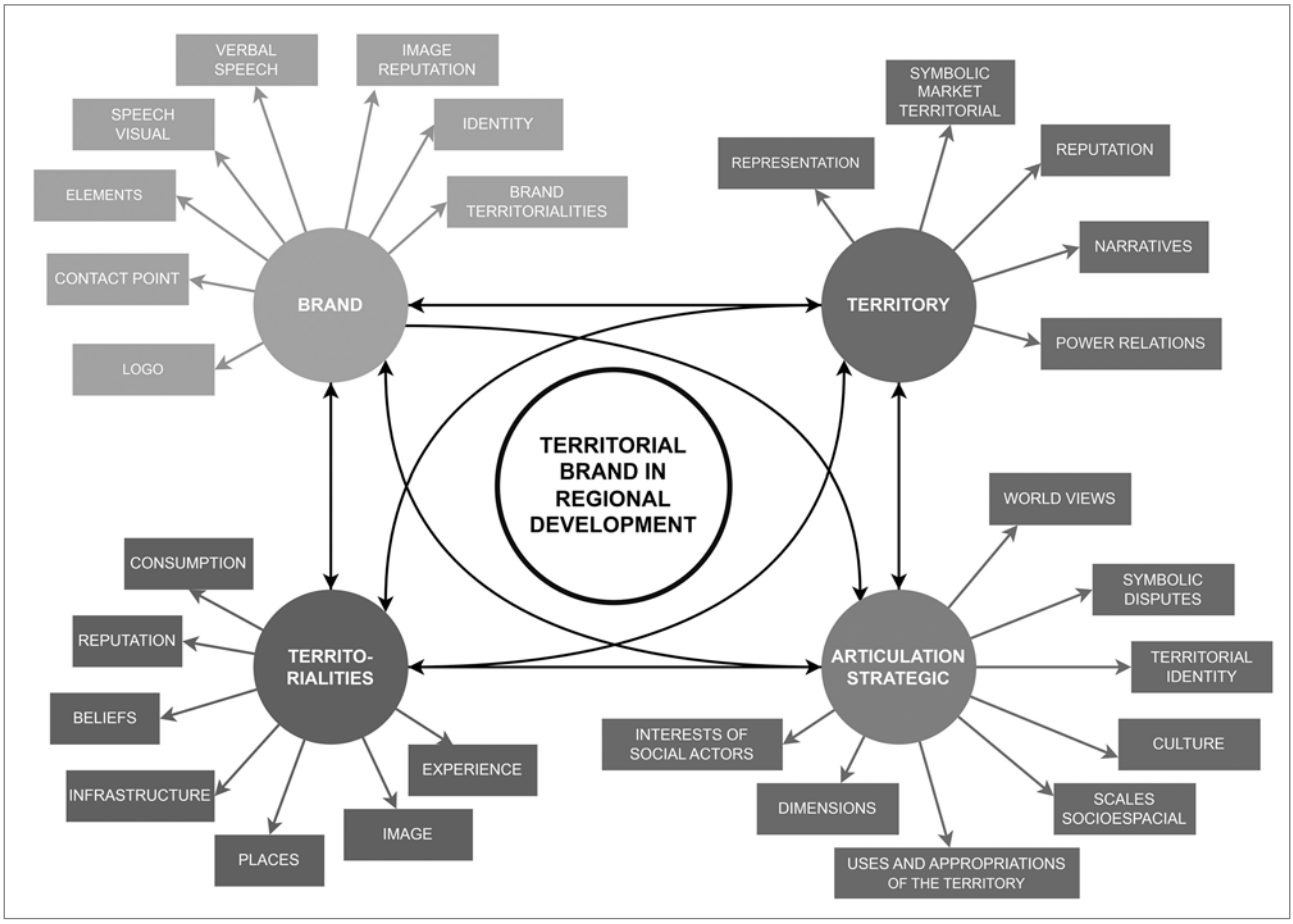

Figure 1: TBRD matrix (source: Almeida, 2024).

with around seven hundred levy payers. The annual budget of the three BIDs is also similar, around a million pounds a year. Acknowledging the BIDs' varied urban contexts, central locations, and broad scopes beyond commerce, these four BIDs become more comparable with one another.

This study focuses on the information available on the official websites of each BID. The research protocol employs four categories related to territorial brand in regional development: brand, territory, territorialities, and strategic articulation. These categories align with the TBRD matrix developed by Almeida (2018, 2024; Figure 1), in which each category is underpinned by distinct qualitative micro-variables. The TBRD matrix provides a framework for analysing territories with a territorial brand in the regional development context, extending beyond economic considerations.

Data analysis was performed using the TBRD matrix (Almeida, 2018, 2024) to investigate the relationships between brand and territory. When considering a BID as a generic territorial

Table 2: The brand axis.

Element	Manchester	Bristol	Leicester	Norwich
Logo				
Logo elements	Heart symbol, red/grey	Highlighted letter B, blue	Flower (five petals), magenta	Set of arrows, symmetrical elements, movement
Brand territorialities	City centre	City	City centre	Local to national
Brand identity	Supporting inner-city vitality, economic success, and Manchester's public agencies. The aim is to improve operations and help attract additional customers through a range of activities, events, and services.	Introducing significant improvements for the benefit of taxpayers. It aims to ensure that the city centre is increasingly known for being safe, attractive, and welcoming to all that work, study, live, and play in the city.	Transforming Leicester's city centre into a better place to live, work, visit, study, and do business	Positioning Norwich as one of Britain's leading cities
Verbal/visual discourse	We are the place where the private and public sectors meet.	Making Bristol an even better place for everyone	Transforming the city centre	The city of stories
Brand image/ reputation	A consortium of four hundred leading retail and hospitality brands in the central shopping area	Collaboration of 763 levy payers. Delivered by Visit West. Registered in England and Wales (no. 3715280).	Representing 714 companies and organizations	Extensive coverage in respected publications such as The Guardian and The Metro, and promotion through 360 digital marketing campaigns. Norwich's reputation as a warm and welcoming city, and one of the UK's best working, living, and shopping environments
Brand points of contact	Twitter, LinkedIn, YouTube, Flickr, Instagram, telephone, e-mail	Instagram, Facebook, Twitter, LinkedIn, e-mail	E-mail, telephone, Twitter	LinkedIn, Twitter, Instagram, e-mail, telephone

Source: authors, based on information from the BIDs' websites.

brand, this matrix can be applied to highlight the relationships in the BID's spaces. The research was conducted from August 2021 to October 2023, being part of international research on correlations between BIDs, territorial brand, and urban-regional development. Despite BIDs being prevalent in numerous countries, many are still deliberating the model's potential integration into their urban planning frameworks, including Brazil (Chede Neto, 2021) and Portugal (Guimarães & Cachinho, 2020).

4 Empirical section

4.1 Brand axis

The elements that constitute a territorial brand were found in the BIDs surveyed (Table 2).

All the BIDs analysed have a logo, indicating the graphic representation of a brand. The elements vary in shape and colour (Table 2). The brand's territorialities are addressed at three delimited scales: city centre, city, and country; thus, ranging from local to national coverage. Regarding the identities of their brands, BIDs prioritize the vitality of the city centre to generate transformations and a reputation for the city. Only the Norwich BID highlighted that it is concerned with expanding the local reputation to the national scale.

When creating a specific identity, brand discourses are involved as the discourses found in BIDs: public-private partnership (Manchester), local improvements (Bristol), urban transformation (Leicester), and local narratives (Norwich). These discourses generate a reputation anchored in the brands, con-

Table 3: The territory axis.

	Manchester	Bristol	Leicester	Norwich
Boundaries				
Power relations	Economic and political	Economic, political, and cultural	Economic and political	Economic and political
Representations	Events, heart (feeling of belonging), variety of colours, logo	Blue (trust, seriousness), events, logo. Thanks to the investment and involvement of our contributors, we are creating a better (city) Bristol: more caring, more welcoming, safer, cleaner, wonderfully diverse, and better promoted.	Magenta (feeling of belonging), events, logo	Events, icons, logo
Territorial symbolic market	Yes	Yes	Yes	Yes
Reputation	A consortium of four hundred leading retail and hospitality brands	Collaboration of 763 levy payers	Represents 714 companies and organizations	Endorsement by The Guardian and The Metro
Narratives	We connect the people, projects, and ideas that are driving Manchester's city--centre economy.	Contributors working together to make Bristol an even better place for everyone	Transform Leicester's city centre into a better place to live, work, visit, study, and do business.	City of Stories. Helping Norwich prosper.

Source: authors, based on information from the BIDs' websites.

tributors, and companies involved, and endorsement of local and regional media (*The Guardian*, *The Metro*). Bristol BID also uses the endorsement strategy on its official website, which highlights the registration of this BID in England and Wales. Moreover, social networks, e-mail, and telephone are the main points of contact between the brand (BID) and its consumer public, facilitating interaction between them (Table 2).

4.2 Territory axis

Each BID represents a specific territory, presented on maps on the respective websites (Table 3). This highlights the limits of spaces produced on a local scale, exposing a territory delimited by and based on power relations, mainly economic and political.

Only the Bristol BID made evident the cultural dimension on its website with the use of a set of icons such as pictograms of the Porto brand in Portugal (Figures 2, 3). The representations found in the brands concerning the territories refer to local events promoted by the BID to generate local consumption. The brand is used as a representation of the BID to generate a sense of belonging. For this, the brand's resources are activated: colours (blue = confidence, magenta = charisma, red = emotion, black = sobriety and knowledge), shapes (logos and icons), tourist attractions, aiming to increase local consumption, and advertising language (a better, more attentive, more welcoming, safer, cleaner, wonderfully diverse, and better-promoted city).

4.3 Territoriality axis (dual: brand and social actors)

The relationships between the different stakeholders in each of the areas analysed generate different territorialities, which involve the uses and appropriation of the territory to generate a feeling of belonging (Table 4).

The category "place of the territoriality axis" refers to the spatial scale of the BIDs, which are all of a local nature (municipal scale), referring specifically to the city centre. Thus, the BIDs analysed focus on a micro-scale smaller than the local scale, being a fragment. Regarding the reputation of BIDs, it can be said that they are consolidated and endorsed in different ways (number of contributors, businesses, and networks of social actors). Another element involved is the belief that they

Figure 2: Bristol BID homepage (source: https://bristolcitycentrebid.co.uk/)

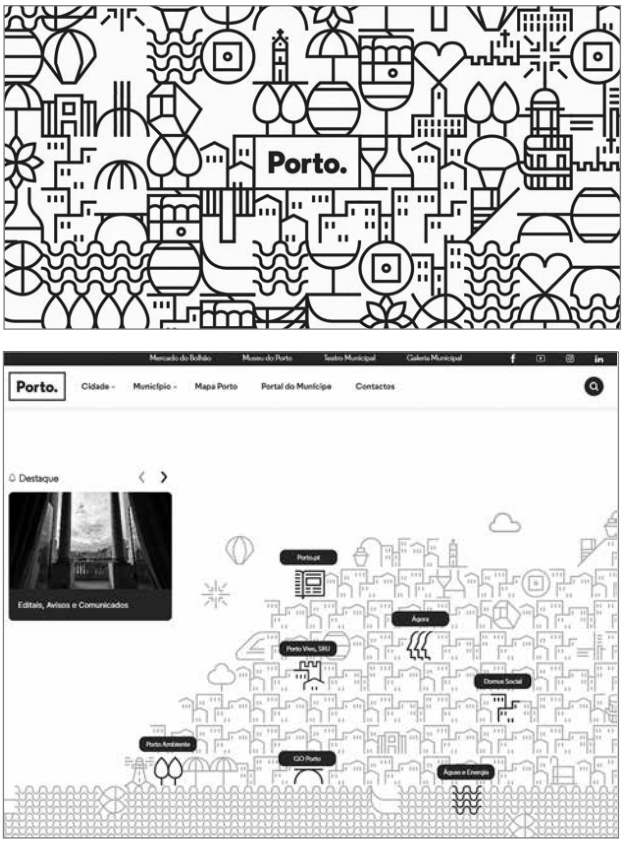

Figure 3: Pictograms of the Porto city brand (source: https://www.cm-porto.pt/marca-porto/marca-porto and http://www.jornalarquitectos.pt/en/journal/uid-4cbbb98c/urbi-et-uber).

generate territorialities, as well as the public-private partnership (Manchester) and the promise of becoming a better place (Bristol and Leicester) so that the city can prosper (Norwich). To sustain these promises, BIDs need an infrastructure that supports and justifies their territoriality, whether through the provision of services, security, or initiatives, or aiming for a pleasant generally sustainable look to promote the vitality of that space (BID area) in particular. However, although the focus is on the space produced collectively by the BID (the local micro-scale), the promise is made for the entire city (the local macro scale). Economic consumption in the BID's territory is evident, with cultural consumption taken as a secondary element. To maintain its image, the BID makes use of endorsements: percentages of approval for installing the BID in each area, who manages it, and whom the BID represents. These are ways that social actors find to maintain their territoriality in the territory that emerges from the implementation of a BID. Finally, there is the experience element, emphasizing the events agenda and brand ambassadors.

4.4 Strategic articulation axis

The analysis of the strategic articulation axis involves internal and external scenarios. In all the BIDs analysed, although the view of the social actors is comprehensive, they mainly direct their interests to the economic sphere (Table 5).

There are symbolic disputes because one place presents itself as better than the other. In this case, each BID mentions that it is in the "best place in town" or it is the "best BID in town." Overall, the territorial identity of the city is evidenced, showing relations between the brand and territory. The socio-spatial scale is local and local-municipal, but the Norwich BID has shown interest in the local-national scale. The interests of the social actors are mainly economic, but the public-private partnership that forms the BIDs reveals other dimensions (political and cultural), uses, and appropriations of the territory (business space, distinct part of the city centre, negotiations between the actors involved in BIDs, and space between public and private for consumption, including tourist consumption).

5 Discussion

The BIDs analysed are classified as a generic territorial brand. Recognizing BIDs as generic territorial brands reveals the intricate power relations within their areas. These territories initially arise from political and economic ties, gradually encompassing additional connections in cultural, environmental, and tourism domains. We would emphasize that a territorial brand goes beyond a mere logo or visual identity because brands linked to territories have territorial protagonism. One of the fundamental roles of a territorial brand is to legitimize the actions of the various social actors within a specific region. Thus, to establish a meaningful relationship between a BID and a territorial brand, it is crucial to recognize that BIDs are established in spaces delimited by the territorialities of social actors and that a specific territorial identity for the BID is created during the process. Within these defined boundaries

Table 4: The territoriality axis.

	Manchester	Bristol	Leicester	Norwich
Place	City centre	City centre	City centre	City centre
Reputation	Consolidated	Consolidated	Consolidated	Consolidated
Beliefs	Partnership between public and private sectors	Making Bristol an even better place for everyone	Transforming Leicester's city centre	Making the city of Norwich prosper
Infrastructure	Range of business support services	Promote the BID area as a safe and pleasant place to work, live, and enjoy leisure	Run various projects and initiatives to help businesses attract customers	Make a clear positive impact on the vitality of the city centre
Consumption	In addition to economic consumption, there is concern about perceptual consumption.	In addition to economic consumption, there is concern about perceptual consumption.	In addition to economic consumption, there is concern about perceptual consumption.	In addition to economic consumption, there is concern about perceptual consumption.
Image	Representing the interests of the levy payers	The sidebar is similar to the Porto brand (icons).	Eighty-five percent of businesses voted yes to the BID.	Run by local businesses for local businesses and has proven to be a highly inventive, energetic, and progressive organization.
Experience	Top retail and hospitality brands in the city	Create a cleaner and greener city with a better location, parking, and ambassadors	Experience through projects and events agenda	Norwich experience

Source: authors, based on information from the BIDs' websites.

Table 5: Strategic articulation axis.

	Manchester	Bristol	Leicester	Norwich
Vision of the world	Embracing	Embracing	Embracing	Embracing
Symbolic disputes	Best place in the city	Best place in the city	Best place in the city	Best place in the city
Territorial identity	Associated with the city	Associated with the city	Associated with the city	Associated with the city
Culture	At the local level, these cities' heritage is strongly connected with the industry sector, except for Bristol with its maritime heritage. All BIDs aim to reposition themselves as post-industrial cities, focusing on retail (and consumption), new industries (such as creative industries), culture, and arts. At the national level, there is a neo-liberalization stance that can be traced to the last decades of the twentieth century, in which a public–private partnership culture evolved, of which town centre management schemes and business improvement districts are paradigmatic examples.			
Socio-spatial scales	Local (part of the city)	Local–municipal	Local–municipal	Local–national
Uses and appropriations of the territory	Yes	Yes	Yes	Yes
Dimensions	Economic, cultural, political, environmental, social	Economic, cultural, political, environmental, social	Economic, cultural, political, environmental, social	Economic, cultural, political, environmental, social
Interests of social actors	Economic	Economic	Economic	Economic

Source: authors, based on information from the BIDs' websites.

(tangible and intangible), BIDs not only implement physical improvements and development programs, but also establish a territorial identity of their own. This identity, even if it does not conventionally represent a city, region, or country, can be considered a form of "territorial brand".

To be considered as such, the BID analysed must encompass the four axes of the TBRD, which also confirms that the BID is a territorial brand. Because the BID is a territorial brand, the application of the TBRD matrix is justified, in line with Almeida's (2024) view of the layers of power relations that are laid out in these brands. In other words, BIDs create a reputation and an image associated with that specific area within the wider urban context. Therefore, by analysing BIDs as a "territorial brand", managed in a public-private format, we are recognizing the impact they have on shaping and promoting

the identity of a defined urban space. This perspective emphasizes the role of BIDs in defining the image and projecting the distinctive characteristics of a defined area, thus contributing to the construction of the micro-local territorial brand.

From this perspective, the TBRD matrix is a useful tool for examining the power dynamics of territorial brands because it specifically addresses this topic. Given the central role of BIDs in shaping identity and promoting distinct area characteristics, using the TBRD matrix allows a more comprehensive assessment of BIDs' impact on urban power dynamics. This approach is vital for understanding the interplay between BIDs and territorial brands in shaping urban development, including both visible and hidden power relations. The cyclical process of power dynamics within BIDs' territorial brands is crucial for understanding the conditions necessary for successful ballot renewals of the five-year term of each BID. These relationships reveal the territorialities of the social actors that shape a collective space oriented toward product and culture consumption. In this context, the BID brand serves to legitimate the discourses of social actors, thereby fostering a triadic competition: among the generic territorial brands of BIDs, among the BIDs themselves, and among the actors implementing BIDs (public and private entities). The legitimation of the BID brand through the discourse of the territorial brand aligns with Almeida's (2018) assumptions regarding the utilization, appropriation, and dynamics of the territory. This strategy is in alignment with the third concept, termed "territory as a brand", as proposed by Almeida (2015).

Two perspectives emerge regarding BIDs. One involves BIDs in the management of a place's reputation and image (place branding), and other necessitates the product of this management process, the territorial brand. This distinction underscores the importance of separating the terms *place branding* and *territorial brand* because the former involves management and the latter represents the product. The English BIDs analysed use the territorial brand in the context of regional development, strategically employing unique symbolism to transform identities into distinctive signs (the territorial brand). This management, conducted through place branding, involves planned and intentional efforts, facilitating the formulation of strategies that generate power relations over, in, and beyond the territory, as noted by Almeida (2018).

The TBRD matrix analysis further highlights the significance of BIDs in city place branding, encompassing a multiscale and multisectoral analysis. On the one hand, BIDs are developed in strictly delimited areas. In the analysis of the brand and the territory, this information is presented, with the city centre standing out as the area of intervention of the respective BID. However, even though the brand's territoriality is associated with this area, the brand's reach is broader because it contributes to the recognition of the city itself and improvement in national rankings. Although the English BIDs have an obvious economic component, insofar as they are directly financed by entrepreneurs, they aim to contribute not only to improving the economic environment but also to increasing the attractiveness of the areas as places to live and engage in leisure. It therefore appears that the territory where BIDs are developed is not the only one that is intended to be improved.

At this level, BID interventions are like urban acupuncture, insofar as the scope of the brand identity refers to the production of multiplier effects that transcend the streets that are part of the BID. The existence of these multiscale and multisectoral elements extends into the territoriality axis, where the city centre is simultaneously highlighted as the intervention area, but its impacts transcend that area. In this understanding, the BID produces positive impacts not only in the city centre (the area of intervention), but also in its surroundings, and in the character of the city itself. Only the Bristol BID logo refers to the specific area where the BID has been developed; namely, Broadmead. The logos of the other three BIDs do not refer only to their specific area, but to the city. On the one hand, this means that the brand's reach is intended to have a supra-municipal scale and, on the other hand, that the brand is built particularly for outsiders, rather than for locals - that is, the population that lives or works in the BID area.

This comprehensiveness of the effects produced by BIDs makes sense when one sees that BIDs are not mere tools for economic revitalization, and that they directly contribute to the governance of urban space (Briffault, 1999). Thus, BIDs are present in the strategic articulation axis, above all due to the need to articulate the interests of the different private and public actors, but they also fall within the territory axis when recognizing the twofold power relations that emanate from the existence of the BIDs. First, this relates to the aforementioned fact that the coexistence of different actors, often with different objectives, within a BID structure means that compromises are necessary. Second, the presence of these different actors and the relative freedom of action in each area, which is public in its genesis, leads the BIDs to be considered governance agents with a certain degree of power; this aspect has been particularly highlighted by authors that question the accountability of the activities developed by the BID (Farhat, 2012; Unger, 2017).

Once the BID operates in a certain area of the city centre, that area can acquire a territorial brand. In this case, the emphasized layer of power in BIDs is economic, but there are other layers that are not so obvious (e.g., social) or those that remain strategically hidden (e.g., political). When referring to the relationship between BIDs and a territorial brand, it

is important to make it clear that it is not about the territory having characteristics that make it a brand, but rather the idea that, when the territory is perceived and promoted as an entity with its own identity, it is effectively transformed into a territorial brand.

The formation of a brand for a city centre, as a result of the operations of a BID, is a crucial aspect and demands an in-depth analysis carried out by using the TBRD matrix. It can have significant implications, not only in terms of economic potential, but also in terms of social cohesion, attracting investment, and improving quality of life for local residents in areas where BIDs are established.

This type of formation of a brand for a certain area of the city centre goes beyond simply creating an image or reputation for a place, and it is in this sense that the TBRD matrix applies. One can more easily see, for example, the attraction of investment and the stimulation of tourism and local commerce as a result of this territorial brand coming from the BID. However, when the TBRD matrix is applied to the BID as a territorial brand, it goes beyond simple visual perception and its (more direct) link to economic development. The phenomenon of the "BID as a territorial brand" places it as a driver of social, cultural, and public-private development, although the scope of the impacts may differ between BIDs.

6 Conclusion

BIDs play an increasingly vital role in managing central urban areas globally. BIDs transcend being mere public-private entities, intricately woven into urban governance. This heightened engagement is notably pronounced in countries with established BID processes. A parallel scenario unfolds with territorial brands, which are solidly present in Europe and North America, but are ephemeral elsewhere (e.g., in Brazil in a nascent stage). Leveraging Almeida's (2018, 2024) TBRD matrix, correlations among social actors, territories, and BIDs are visually apparent, affirming its efficacy as an analytical tool within the BID context.

This study investigated whether BIDs impact the territorial brand of the locations they intervene in. We observed that BIDs' online communication channels serve a dual purpose: functionally transmitting multidirectional information and acting as a catalyst for establishing and consolidating their territorial brand. The areas analysed are delimited by territorial brands, thus highlighting the physical limits of the areas the BIDs intervene in and showing a territory delimited by and from power relations. These relationships are mainly economic and political. Different relationships generate different territorialities in the use and appropriation of the territory. The strategic articulations from BIDs involve internal and external scenarios, and directing interests, mainly economic, political, and cultural. It was only possible to reveal these findings by considering BIDs as generic territorial brands, stressing the multiple power relations in the area where they developed.

Overall, this research contributes to the theoretical understanding of BIDs and territorial brands in regional development. This interconnected approach between the concepts is novel because it considers BIDs territorial brands in regional development, changing the way BIDs are viewed and managed. For local public authorities and BID managers, the study offers valuable insights by framing a BID as a territorial brand. Thus, managers can develop strategies more comprehensively, viewing the brand as a dynamic entity requiring continuous adaptation. Naming BIDs after cities, such as the Manchester BID or Bristol BID, adds a political dimension to urban space. For citizens, it provides urban strategies and benefits from territorial brands, enhancing the quality of life for those residing or working in BID areas and their surroundings.

Our research demonstrates the contribution of BIDs to their cities' territorial brands and it also shows that the BIDs themselves are beneficiaries of the city's own brand. This cyclical relationship involves BIDs, territorial brands, and semi-private urban management, influencing territorial use and expanding to surrounding regions. Urban and regional development processes, integrating political and cultural discussions, include territorial brands. Future studies could explore BIDs in other countries with the BID model for comparative analysis.

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Vita ŽLENDER

Assessing cultural ecosystem service potential for green infrastructure planning in a peri-urban landscape: An expert-based matrix approach

With the encroachment of urban areas into peri-urban landscapes, the requirement for effective green infrastructure (GI) planning has become increasingly important for maintaining ecological integrity and human wellbeing. An expert-based matrix approach is proposed as a method for evaluating the potential of cultural ecosystem services (CES) in making informed GI planning decisions in a peri-urban landscape. Experts from various disciplines and areas of work were consulted to systematically evaluate various types of land-use and land-cover classes, as well as protection regimes characteristic of a peri-urban landscape across the CES categories. In addition to CES provision potential, experts also evaluated the possible potential to cause cultural ecosystem disservices. These scores are aggregated to generate spatially explicit maps that highlight areas with high CES provision potential and those with the potential to cause disservices. This approach was then applied to three case study areas, demonstrating its effectiveness in identifying priority areas for GI planning and management interventions. The results highlight the importance of integrating CES considerations into GI planning processes to enhance landscape resilience, social wellbeing, and cultural heritage preservation in dynamic peri-urban environments. Using scoring, validation exercises, and spatially explicit presentation on case studies, the utility and applicability of the expert-based matrix approach as a valuable tool for sustainable GI planning on a landscape scale is demonstrated.

Keywords: peri-urban landscape, spatial planning, ecosystem services, green infrastructure, matrix

1 Introduction

Recently, ecosystem services (ES) have attracted considerable attention in the realm of environmental science and policy-making, and they are serving as a fundamental framework for determining the intricate linkages between natural systems and human wellbeing. ES encompass the diverse benefits that ecosystems provide to society, ranging from the provisioning of clean water and food to the regulation of climate and disease (MEA, 2005; TEEB, 2008). Thus, the understanding and value of ES have become imperative for sustainable development and effective decision-making (Fürst et al., 2017). Land-use decisions have considerable implications for ecosystem functioning, biodiversity conservation, and human wellbeing. Historically, however, land-use planning has been sectoral and fragmented, failing to account for the multifunctionality and interconnectedness of ecosystems. Many researchers have been focusing on the importance of understanding, acknowledging, and mapping the spatial distribution of ES offered by landscapes for adaptive land-use management and ensuring a holistic and integrative approach to decision-making (De Groot et al., 2010; Haines-Young & Potschin, 2018; Müller et al., 2020). Therefore, decisionmakers can better assess trade-offs, identify synergies, and promote more sustainable land-use practices (Turner et al., 2007).

Furthermore, for effective planning and management, the spatial dimension of ES is important. ES are inherently spatially explicit, with their distribution influenced by factors such as land cover, land use, topography, and hydrology. Spatially explicit mapping and modelling of ES enable planners to identify priority areas for conservation, restoration, and sustainable development, thereby optimizing the delivery of ES across landscapes (Maes et al., 2012). In terms of the spatial explicitness of ES, however, the problem particularly arises in addressing the category of cultural ecosystem services (CES). CES are the non-material benefits that people obtain from ecosystems, including recreational, aesthetic, spiritual, and educational values. These services are extensively intertwined with human cultures, traditions, and identities, playing a crucial role in shaping social values and behaviours (MEA, 2005). CES are often intangible and difficult to quantify, which makes them susceptible to undervaluation and neglect in decision-making processes. Hernández-Morcillo et al. (2013) reported that only 23% of CES studies included an explicit spatial representation. It is especially worrying that the incorporation of ES issues into landscape planning and decision-making focuses on explicit quantification and mapping (Casado-Arzuaga et al., 2014). Such incorporation of CES fails because of their perceived intangible or subjective nature, or because they are challenging to quantify (MEA, 2005; De Groot et al., 2010; Chan et al., 2011; La Rosa et al., 2018). Despite the growing recognition of CES, challenges remain in effectively incorporating these services into land-use management and spatial planning frameworks. Similarly, in Slovenia, although the significance of CES is acknowledged in certain national and regional documents and has been a topic of a few recent studies (e.g., Ribeiro & Hribar, 2019; Kostanjšek & Golobič, 2023), they are not explicitly accounted for in any national, regional, or local regulations, potentially leading to inappropriate planning decisions (Žlender, 2021b). Therefore, it is essential to explore methods of quantifying and validating CES to capture issues that cannot be easily mapped. The mapping of CES has been strongly encouraged by many EU policies (European Environmental Agency, 2014; European Commission, 2013, 2020).

This study focuses on a peri-urban landscape, a transitional zone between urban and rural areas characterized by dynamic land-cover patterns and multifunctional areas (Žlender, 2021a, 2021b). In a peri-urban context, CES often manifest through the presence of green infrastructure (GI), comprising natural and semi-natural elements such as parks, forests, wetlands, and green corridors, which contribute to the local identity, sense of place, and community cohesion (Daniel et al., 2012). The European Commission (2013) has recognized GI as a smart solution for providing people and societies with a broad range of goods and services. Therefore, there is growing recognition of the requirement for more integrative and ecosystem-based approaches for land-use management and spatial planning in a peri-urban landscape, with a particular emphasis on maximizing the potential of GI to deliver multiple (C)ESs.

Amid urban expansion and land development pressure, the challenge is in effectively mapping and quantifying CES for informed decision-making and ensuring GI preservation. By integrating CES mapping into planning processes, decision-makers can identify priority areas for conservation, design culturally sensitive interventions, and engage stakeholders in collaborative decision-making (La Rosa et al., 2016; Spyra et al., 2020). Furthermore, to determine policy interventions and investment priorities, CES mapping can facilitate the development of innovative planning tools, such as CES indicators and valuation methods. Consequently, there is a pressing need to develop robust methodologies for characterizing and evaluating peri-urban landscapes, particularly in terms of their CES, as reported by Geneletti et al. (2017). Recently, there has been considerable interest in advancing the understanding of CES in a peri-urban landscape, and the number of CES mapping methods has increased (see, e.g., Plieninger et al., 2013; Roy et al., 2014; Zhang & Muñoz Ramírez, 2019). Moreover, the land cover-based approach is widely used; it is a quantitative assessment of the supply capacity of ES in a specific land-cover type, as proposed by Burkhard et al. (2009). This may be attributed

to its rapid assessment procedure with clear benefits for the decision-making process and low requirements for input data (Zhang & Muñoz Ramírez, 2019). Therefore, this approach is used to assess CES provision potential.

Using an expert participatory approach, the aim is 1) to systematically assess the CES potential associated with different land-cover types and protection regimes in selected peri-urban areas of Slovenia and 2) to provide certain insights into assessing GI based on the CES provision potential. In terms of the method, its usefulness is assessed in achieving the aims and present advantages, challenges, and possibilities for improving the method. The research aims are addressed based on the following research question: How can the expert-based matrix approach support GI planning in a multifunctional peri-urban landscape to provide and sustain CES?

The following sections of this article elaborate the methodology employed for data collection, analysis, and interpretation, in addition to discussing the implications of the results for urban planning and landscape management. This study is part of a larger research project aiming to set up a valuation framework for landscape planning and policy for CES in a peri-urban landscape.

2 Materials and methods

2.1 Study areas

Ljubljana, Kranj, and Koper were selected because they have all been previously identified as having experienced peri-urbanization. Ljubljana, the capital and largest city of Slovenia, has been facing peri-urbanization owing to inward migration, resulting in a demand for new housing and the expansion of economic activities and infrastructure on the city's urban edge. The city region has been at risk of extensive development and other negative consequences of urbanization and peri-urbanization because of a lack of comprehensive planning (Pichler-Milanović, 2002). To some extent, this has been curbed after Slovenia joined the European Union and adopted its planning programmes and, specifically for the municipality of Ljubljana, since it was adopted a comprehensive spatial plan of the Municipality of Ljubljana (Šašek Divjak, 2008; Sviršić Gotovac et al., 2021). Kranj and Koper, both medium-sized Slovenian towns with historical city centres, experienced (sub) urban growth after the mid-twentieth century. Although considerably smaller than Ljubljana, they are regional hubs and important economic, cultural, and social centres. Both Kranj and Koper are encountering pressures for housing and infrastructure development because agricultural land is primarily impacted (Nilsson et al., 2013; Spyra et al., 2021). Moreover, all three cities have been the focus of many projects investigating peri-urban issues (for further details, see Piorr et al., 2011; Žlender, 2021a; Interreg Europe, 2023).

A distinct methodology was used to define the borders of a peri-urban landscape for each case study. More information on this and on the characteristics of the areas can be found in Žlender and Brišnik (2023). Figure 1 shows the designation of the current land-use and land-cover distribution and protection regimes.

2.2 Selection of CES

Recognizing the importance of CES in shaping human interactions with the landscape and being central to the overall wellbeing of humans, many classification systems have been proposed to categorize these services, notably the Millennium Ecosystem Assessment (MEA 2005), the Common International Classification of Ecosystem Services (CICES) (Haines-Young & Potschin, 2018), and The Economics of Ecosystems and Biodiversity initiative (TEEB, 2008). However, the lack of uniformity across these classification systems is a challenge, leading to the fragmentation and non-unitary categorization of CES, which is also reflected in the policy guidance (Hirons et al., 2016). While selecting the distinctive categories of CES for this study, many important considerations were made to ensure comprehensive coverage and relevance to peri-urban contexts. In addition to alignment with the methodological purpose of this study, the characteristics of a peri-urban landscape were considered as an interface between urban and rural settings, which led to unique cultural dynamics, necessitating a more refined understanding of CES that reflects the specific contexts and requirements of these environments. Table 1 shows the reasons for selecting the distinctive categories.

Ecosystems yield benefits but also incur inconveniences, such as pests, infrastructure degradation, diseases, and allergens, termed ecosystem disservices. These include human-induced degradation and negative effects from intact ecosystems that impact human wellbeing. Cultural ecosystem disservices are responsible for non-material harm from ecosystems, whether natural (e.g., discomfort from wildlife) or anthropogenic (e.g., ecosystem damage; Plieninger et al., 2013). Assessment of disservices is an intricate issue because a function may be considered both a service and a disservice based on the context and value. Owing to the diverse peri-urban landscapes, three disservices were included in this study (Table 1).

2.3 Defining themes

In the method proposed by Burkhard et al. (2009), the division of land-use and land-cover classes serves as a fundamental step

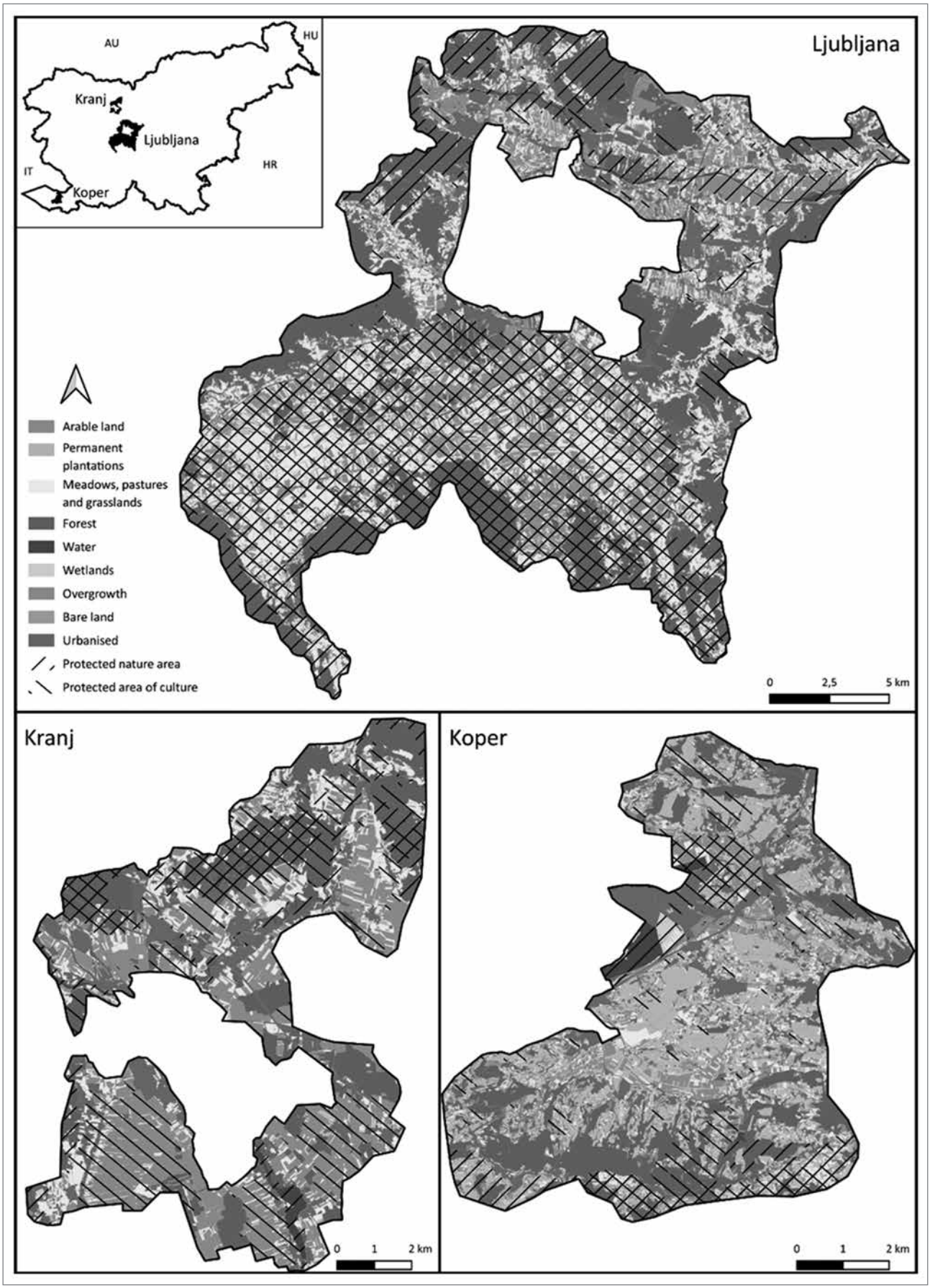

Figure 1: Land-use, land-cover, and protection regimes in the peri-urban landscape of the cases studied (illustration: Rok Brišnik, based on official and open-source databases).

Table 1: Information on CES used in this study.

No.	Category	Description	Reason for selection
Cultural ecosystem services (CES)			
1	Leisure and recreation activities	Such activities refer to walking, hiking, cycling, climbing, relaxing, enjoying attractive views, and escaping from stress in the peri-urban landscape.	Peri-urban landscapes often serve as vital recreational spaces for nearby urban populations. This category acknowledges the importance of leisure activities in enhancing human wellbeing and fostering a connection to nature in a peri-urban landscape.
2	Sense of place and identity	Sense of place (*genius loci*) refers to natural and built elements that are part of the ecosystem and encourage a complex emotional bond between people and place such as attachment, belonging, and identity.	A peri-urban landscape typically exhibits a unique blend of urban and rural characteristics, contributing to a distinct sense of place and local identity. Exploring this category allows for an understanding of how individuals perceive and relate to their surroundings, thereby influencing community cohesion and attachment to the landscape.
3	Aesthetic value	Aesthetic value is the interaction of people with the environment in relation to natural beauty based on human perceptions and evaluations.	The aesthetic qualities of peri-urban landscapes shape public perceptions and preferences; examining these values helps identify visual aspects that enhance landscape appreciation.
4	Source of inspiration	A source of inspiration for providing new thoughts, ideas, and creative expression	Understanding the inspirational qualities of peri-urban landscapes can provide insights into the cultural significance and symbolic meanings attributed to them by different social groups.
5	Social relations	Providing a place to hang out with friends and family, and facilitating social interactions and community engagement	This category emphasizes the role of the landscape in fostering social cohesion, recreational gatherings, and cultural events, thereby promoting social wellbeing and inclusivity.
6	Spiritual and religious services	These are spiritual experiences, religious ceremonies, and religious community events.	Investigating this category sheds light on the spiritual connections and cultural practices associated with peri-urban landscapes, underscoring their importance beyond ecological and recreational values.
7	Educational resource	Refers to the acquisition of various types of knowledge developed by various cultures; for example, traditional and expert knowledge that comes from living in a certain area.	Peri-urban landscapes provide educational opportunities in ecology, agriculture, history, and traditional land uses, serve as outdoor classrooms for experiential learning, and thus foster environmental literacy for children and adults.
8	Research resource	Providing biodiversity research about the flora and fauna of the area	Peri-urban landscapes offer research opportunities in ecological processes, land-use dynamics, and human-environment interactions. Viewing them as research resources highlights their scientific value.
9	Cultural significance	Refers to the contribution to the diversity of the landscape (cultural landscape) or to landscape-specific plant and animal species.	Peri-urban landscapes hold cultural heritage, stories, and traditions. Recognizing their cultural significance is key to promoting conservation amid urbanization pressures.
Cultural ecosystem disservices			
10	Noise	Refers to noise of any origin (e.g., traffic noise, industrial activities, agricultural machinery, wildlife calls).	Excessive noise pollution negatively impacts health, wellbeing, and quality of life. Studying noise as a disservice reveals its sources, impacts, and mitigation strategies. Effective noise management in peri-urban areas promotes a healthier acoustic environment for residents.
11	Danger	The source of danger can be nature (e.g., the presence of certain animals or plants) or human activity (e.g., neglect or degradation of ecosystems).	Assessing danger in these areas offers insights into risk perception and management strategies. Understanding danger is crucial for public safety and accident prevention.
12	Unpleasantness	The source of the unpleasant feeling can be nature (e.g., the presence of certain animals or plants) or human activity (e.g. neglect or degradation of ecosystems).	Unpleasantness affects sensory experiences and detracts from peri-urban landscape enjoyment. Identifying sources of unpleasantness is key to landscape enhancement and beautification. Addressing unpleasantness can lead to sensory restoration and a more positive environment. Improved landscapes enhance satisfaction and wellbeing for residents and visitors.

Table 2: List of themes and their descriptions.

No.	Theme	Description
1	Arable land	Areas for agriculture, constantly tilled surface without permanent plantations (e.g., fields)
2	Permanent plantations	Areas covered by perennial crops such as greenhouses, vineyards, orchards, olive groves
3	Meadows, pastures, grasslands	Areas used for mowing and grazing
4	Forest	Areas covered by forest
5	Water	Natural and artificial surface waters (rivers, lakes, sea)
6	Wetlands	Bogs, wetlands, salt marshes
7	Overgrowth	Areas overgrown with forest trees
8	Bare land	Undeveloped mostly natural land with little or no vegetation (beaches, dunes, gravel areas, scree)
9	Transport infrastructure	Roads (highways, main roads, parking), railways, airports, ports
10	Public infrastructure	Energy production areas (power plants of all kinds), waste management areas, power lines, etc.
11	Brownfield	Degraded, abandoned, and anthropogenically exposed areas (sand pits, mines)
12	Exclusive use	Non-residential large built-up areas for exclusive use (industrial, logistics, military areas)
13	Wider use	Non-residential large built-up areas for wider use (campuses, shopping centres, hospitals)
14	Green space	Maintained green areas and associated infrastructure for public use (parks, children's playgrounds, leisure facilities, hiking/cycle paths)
15	Sport and tourism	Maintained green areas and associated infrastructure for sports and tourism (stadiums, golf courses, racecourses, camp sites)
16	Residential	Areas of predominantly residential houses and/or residential-agricultural compounds
17	Mixed-use areas	Areas of predominately mixed-use (housing, public services, shops, tourism, etc.)
18	Nature conservation	Areas under nature protection of national or wider importance (Natura 2000, landscape parks, etc.)
19	Cultural landscapes	Historically and culturally important landscapes and their parts, such as archaeological sites, heritage, monuments, outstanding landscapes
20	Cultural heritage settlements	Culturally valuable settlements and their parts (historical village cores, traditional village patterns)

in a land cover-based approach for the quantitative assessment of the (C)ES provision capacity. However, because the objective was to assess GI based on the CES provision potential and due to the spatial scale of the study, additional categories were included to focus on areas that are high in biodiversity and enhance CES provision for people's benefit (Kopperoinen et al., 2014). In addition to land-use and land-cover classes, nature and cultural protection regimes were also included, and urban land use was divided into various subclasses.

This classification provided insights into the spatial distribution and composition of various landscape elements, identifying areas of ecological significance, connectivity, and potential GI opportunities. In addition, in the selection of datasets, an attempt was made to capture the specific characteristics of the peri-urban landscape, such as the mix of urban and rural land uses, intermingling of built and unbuilt areas, and the presence of specific land uses, such as waste and sewage treatment plants and logistic centres.

While selecting GIS datasets, focus was placed on the most recent and openly accessible spatial data. For selecting data sources, there was an effort to use formally valid datasets; however, due to the lack of some information, data from OpenStreetMap (2023) were also used. A combination of various GIS datasets representing related geographic features or phenomena was then grouped into themes (Kopperoinen et al., 2014) (e.g., all hydrological layers were combined into a single "Water" layer), which made it possible to consolidate data from different sources, simplified the complexity of the datasets, and facilitated the spatial analysis of similar data. The expression *theme* is used hereafter. The classification of themes was first tested by a few experts. Based on their feedback, the number of categories and their descriptions with examples was adjusted to create a final list of twenty themes, which were considered representative for describing various aspects of CES provision potential (Table 2). The complete list of data used for each theme is available from the author.

2.4 Scoring methodology and expert selection

A matrix of themes and CES was created, for which respondents had to evaluate 240 attributions by answering the following questions: *How does a theme contribute to the creation of spatial conditions for provision of a CES in the peri-urban landscape? How does a theme contribute to creating the spatial conditions for causing a disservice in the peri-urban landscape?* The scoring system for CES was then adapted from Kopperoinen et al. (2014), who proposed a scale assessing the effect of each theme on the prerequisites for the provision potential of each CES: 3 = very favourable, 2 = favourable, 1 = slightly favourable, 0 = no or neutral effect, −1 = slightly harmful, −2 = harmful, and −3 = very harmful. A scale was developed for disservices to measure the effect of each theme on a cultural ecosystem disservice: 3 = greatly prevents, 2 = prevents, 1 = slightly prevents, 0 = no effect or neutral, −1 = somewhat contributes, −2 = contributes, −3 = greatly contributes. Assessing the contribution to the creation of spatial conditions for the provision of each CES category in the peri-urban landscape rather than the ES supply is extremely important for planning, management, and research because they are hypothetically conceptualized for a long time period (Syrbe et al., 2017). In this manner, the hypothetical maximum, rather than the actual supply of a given CES, is measured. Following the advice of Campagne and Roche (2018), the matrix also included the scoring of confidence on a three-level scale: "I feel confident with my score," "I feel fairly confident with my score," and "I don't feel confident with my score." Contact was established with experts from various subject areas in dealing with space in different ways, such as planning, protection, management, and decision-making. They were informed about the intentions and asked for consent to send them an online questionnaire with a valuation matrix and five additional questions to answer.

2.5 Processing and analysing the data

We determined for each theme its provision potential for each CES by computing the weighted mean of experts' scores. Weights have been assigned according to the experts' declared confidence level (weight=1 if the expert selected 'I feel confident with my score', 0.75 for 'I feel fairly confident with my score' and 0.5 for 'I don't feel confident with my score')

The resulting values were, together with themes, applied as attribute values on a 100 m × 100 m grid (for more details on the procedure, see Žlender & Brišnik, 2023). A spatial aggregation analysis was performed using QGIS Desktop version 3.28. Maps were produced showing the potential for providing CES and causing disservices. Then, the cell values were normalized at intervals of 0.85 on a scale from −3 to 3 to treat each CES or disservice as equally important when aggregating them into joint layers for CES provision potential and potential to cause disservices. To determine the similarity between the cultural ecosystem service or disservice and themes, hierarchical cluster analysis (HCA) was performed along with heatmap and dendrogram visualizations. To define the similarity between clusters, the average linkage and Euclidean distance were applied. A statistical analysis was then conducted using SPSS 29.0 and Python with Seaborn.

3 Results

3.1 General overview of the data analysed

Twenty-five experts completed the matrix: of these, nineteen worked in research, nine in spatial planning practice, six in higher education, three in decision-making, three in land management, and one in implementation. They were highly educated in landscape architecture and spatial planning (n = 12), architecture and urban planning (n = 3), forestry (n = 3), agronomy and natural resources (n = 2), nature protection (n = 2), geography (n = 2), and biology (n = 1). Their current areas of work varied extensively and included environmental, infrastructure, traffic, urban and spatial planning, remote sensing, forest hydrology, landscape architecture, nature protection, paedology, regional development, strategic spatial planning, landscape typology, landscape assessment, urban forestry, and landscape valuation and management. Eighteen of these experts had already used the concept of ES in their work, and most of them (n = 13) became familiar with ES between 2011 and 2019. Three experts were familiar with the concept before this period, five after 2019, and four of them were not familiar with the concept.

At the end of the questionnaire, the experts provided additional comments. Most of them commented that the matrix was too long and the scoring was too subjective. They considered that the CES and especially the disservices did not allow an unequivocal answer for scoring. In scoring disservices, many inconsistencies were detected when analysing the data. There were uncertainties about whether they were supposed to score the themes per se or their influence on people. The opinions for scoring confidence levels were split, along with the opinions on whether there should be a greater or fewer number of themes. One expert suggested that an option to select "I don't know" should be provided. All comments were considered for the final evaluation of the approach.

3.2 CES provision potential based on evaluated themes

First, the means for the CES-theme and disservice-theme pairs were examined. In this section, for better understanding of the

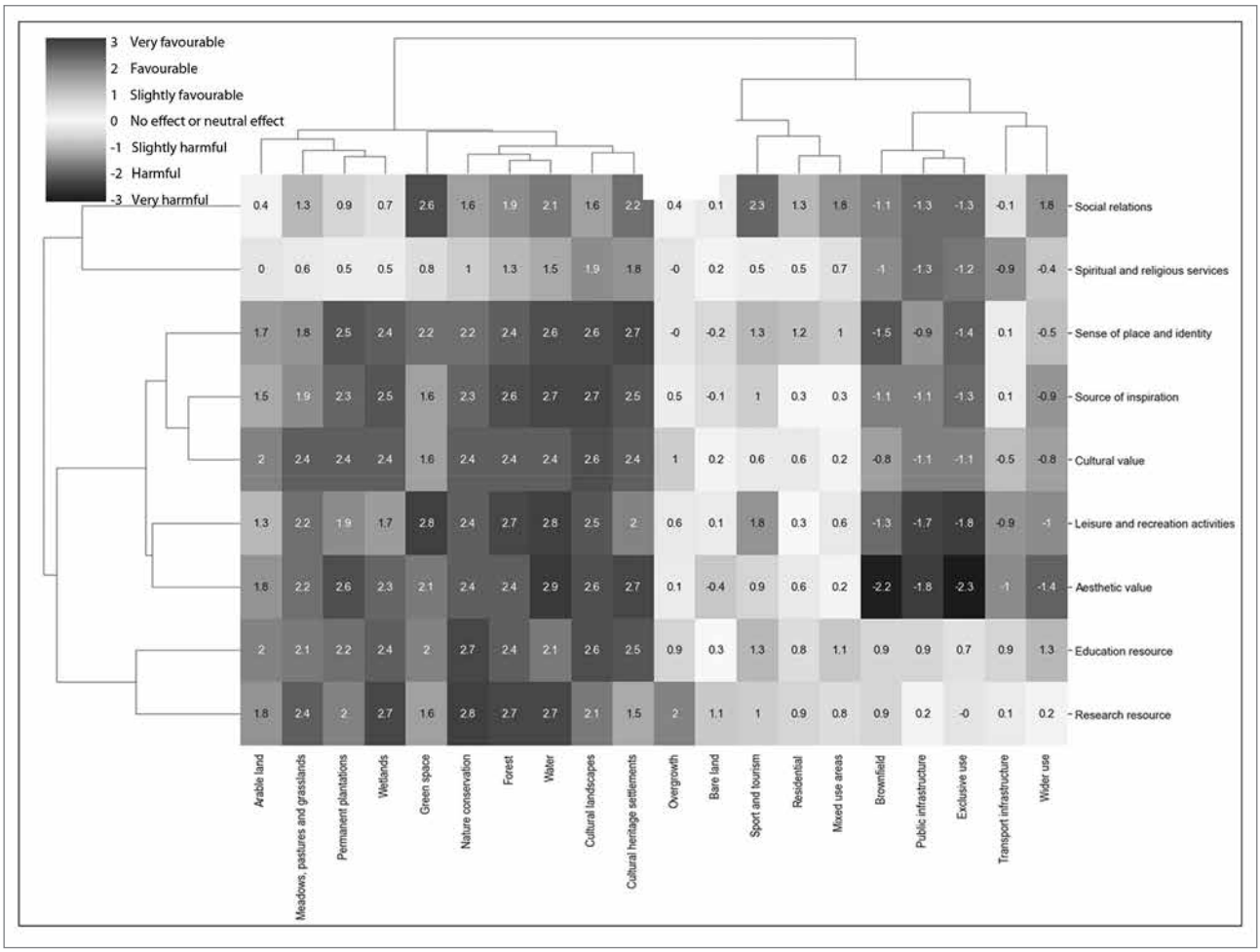

Figure 2: HCA with heatmap and dendrogram visualizations, illustrating clustering of themes in columns and CES in rows. Each cell presents the aggregated mean score of the experts, weighted with their confidence level and coloured according to the scale (illustration: Vita Žlender and Stefano Gemin).

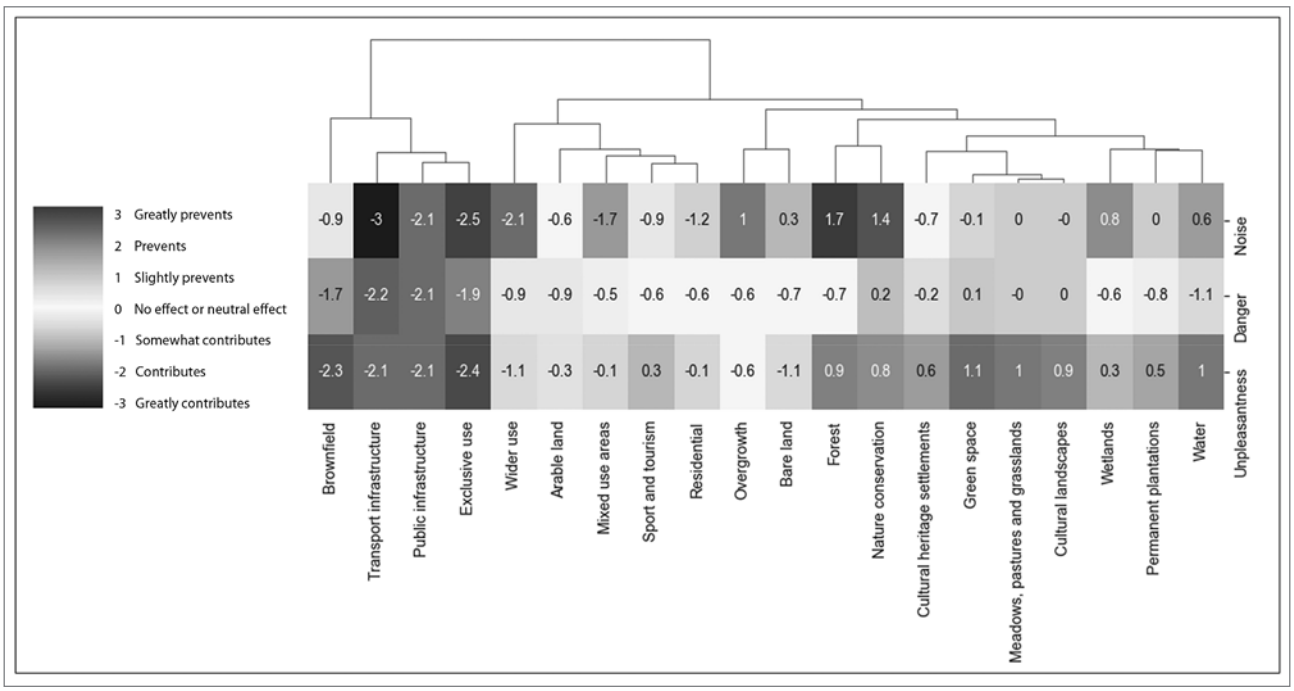

Figure 3: HCA with heatmap and dendrogram visualizations illustrating clustering of themes for each disservice. Each cell presents the aggregated mean score of experts, weighted with their confidence level and coloured according to the scale (illustration: Vita Žlender and Stefano Gemin).

theme, they are written in italics, while "CES" and "disservices" are in quotation marks. When rounding the means to 0.5, the inspected themes proved to be insufficient for assessing the provision potential of "spiritual and religious services". The most relevant themes were *water* for five CES and *cultural landscape and cultural heritage settlements* for three CES. "Spiritual and religious services" were not assigned any theme with high relevance, and "social relations" were assigned only to *green space*. No theme for any CES was assigned as very harmful. The lowest score of −2.3 was attributed to the contribution of *exclusive use* to "aesthetic value". In terms of disservices, five themes were assigned to "noise" with no effect and two with the greatest contribution (i.e., *transport infrastructure* and *exclusive use*). Five themes were assigned to "danger" and five to "unpleasantness", with a score of less than 0.5. No theme was assigned as greatly preventing for disservices. *Transport infrastructure* scored as greatly contributing to "noise"; however, most themes exhibited no effect scores.

Figures 2 and 3 show the HCA along with the heatmap and dendrogram visualization, in addition to the aggregated mean scores of experts, weighted using confidence levels. The dendrogram presents many pair clusters of CES. The cluster "source of inspiration" and "cultural significance" was found to be the strongest in assigning similar scores to themes in terms of providing or not providing potential for these two CES. Furthermore, the clustering of "leisure and recreational activities" and "aesthetic value", as well as that of "education" and "research resources", was demonstrated. Moreover, "sense of place and identity" was added to the extended clustering of "inspiration" and "cultural significance". In general, these clusters demonstrated medium to high relevance of unbuilt land uses and land cover, such as *arable land, wetlands, and forest*, except for *overgrowth* and *bare land*. The dendrogram presents also pair clusters of themes. Among them, two medium- to high-relevance clusters of predominantly unbuilt land uses were demonstrated; however, in between them, *green space* formed its own cluster, indicating the special role of this land use. The additional two clusters included several urban land uses, of which one cluster demonstrated themes without any effect for CES and one theme that was potentially harmful. In terms of the cause potential of themes for disservices, a harmful to very harmful cluster was formed by *transport infrastructure*, *public infrastructure*, *exclusive use*, and *brownfield*. Most themes characterizing unbuilt land uses were rather dispersed; only smaller clusters could be defined. These included *forest* and *nature conservation* with slightly favourable to favourable effects, or *cultural landscapes*, *green space*, *meadows*, *pastures and grasslands,* and *cultural heritage settlements* with mostly no effect on disservices.

To analyse the dispersion of experts' answers from the mean, the *SD* was determined. The *SD* ranged between 0.28 and 2.01 for CES and between 0.22 and 1.83 for disservices. The analysis demonstrated that the highest agreement ($SD < 0.5$) was present for the contribution of *forest*, *water*, and *green space* to providing spatial conditions for the provision of "recreation", *cultural heritage settlements* for "sense of place" and "identity", *water* and *cultural heritage settlements* for "aesthetics", and *forest*, *water*, *wetlands*, and *nature conservation* as "research resources". In terms of disservices, such a *SD* was present for the effect of *bare land* and *transport infrastructure* on causing "noise". To understand the discrepancies in the answers, *SD*s of more than 1.5 were measured, which were present for the contribution of *transport infrastructure*, *public infrastructure*, and *brownfield* for provision of "inspiration", *transport infrastructure* for "social relations", *transport infrastructure*, *public infrastructure*, *brownfield*, *exclusive and wider use*, and *green space* for "research", and *overgrowth* for "cultural significance". In terms of disservices, a *SD* of more than 1.5 was present for the effects of *water* on "noise", *forest* on "danger", and *forest* and *green space* on "unpleasantness".

3.3 Spatial distribution of the CES provision potential and the potential to cause disservices

Based on the matrix, individual maps (Figures 4 and 5) and synthesis maps (Figure 6) for the CES provision potential and the potential to cause disservices were developed. The spatial distribution characteristics of CES in the three study areas demonstrate that predominately seminatural areas have the most favourable spatial conditions, such as forested areas in Koper along ridged hills and on the Karst Rim as well as the Škocjan Lagoon nature reserve. In Kranj, such patches are seen in the forest around the town, the forested part of the Brdo Estate, and Lake Trboje; in Ljubljana, these patches are seen in the fringes of marshland to the south, the two forested green wedges to the east and west, and a few isolated hills to the north. These areas are important supports for cities' GI. There were negative effects of artificial areas with strong human intervention, such as transportation infrastructure, dump sites, and industrial or logistics units, with the most notable examples being business zones; for example, Brnčič Street (*Brnčičeva ulica*) in Ljubljana; Labore, Šenčur, and Naklo in and near Kranj; and Bivje and Sermin in Koper. The CES-providing capacity of these areas is weak; it is even more problematic because they have become isolated owing to a lack of significant connections with high-capacity provisioning areas. Figure 7 shows an example of an area in Kranj with predominantly harmful spatial conditions to provide CES. The maps for the potential to cause disservices demonstrate that it is exactly these areas

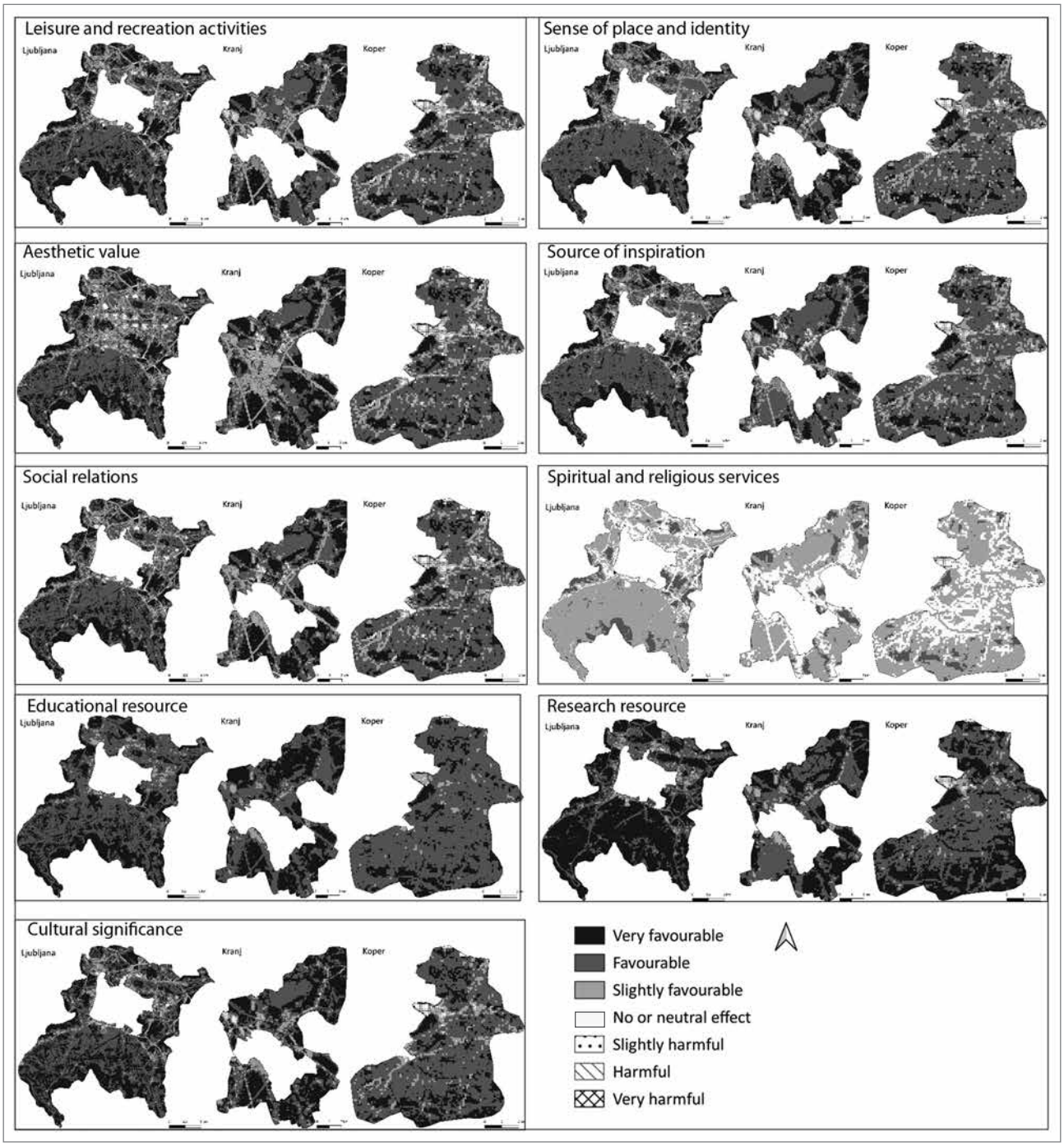

Figure 4: Maps for the three study areas showing the provision potential for individual CES categories, based on expert scores (illustration: Vita Žlender and Rok Brišnik).

that considerably contribute to the disservice inspected. Surprisingly, Kranj and Koper have larger patches of areas with harmful spatial conditions for providing CES than Ljubljana, which is a large city. However, note that in Ljubljana several such areas are located in the city's core area (Figure 7). These areas lack GI and consequently the potential to provide CES.

The results were compared with the depiction of different use areas in municipal spatial plans (OPNs; Figure 6). In Ljubljana, spatial patterns of favourable and very favourable spatial conditions to provide CES mostly occur on open green land, indicating generally positive environmental characteristics. This evaluation agrees with the area in OPNs defined as a "green system hinterland" (note: not indicated on the map). However, in the area described in the OPN as a "peri-urban area" (Figure 6), there is ample need for enhancing the current state, especially in areas to the north and northeast. In Kranj, the area described in the OPN as "multifunctional peri-urban

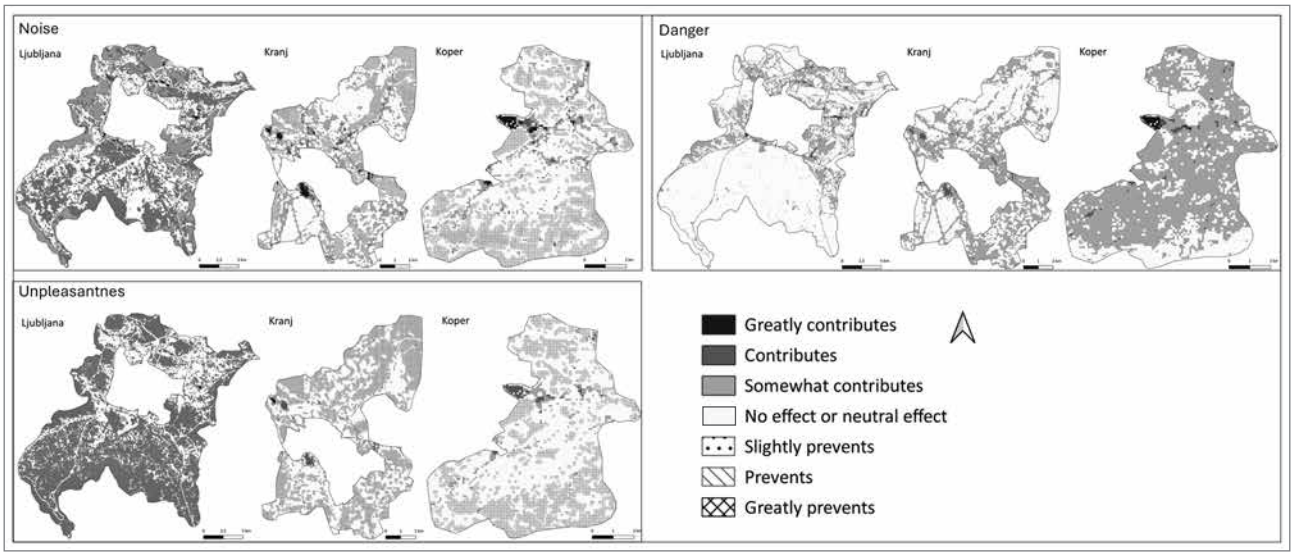

Figure 5: Maps for the three study areas showing the potential to cause individual cultural ecosystem disservice, based on expert scores (illustration: Vita Žlender and Rok Brišnik).

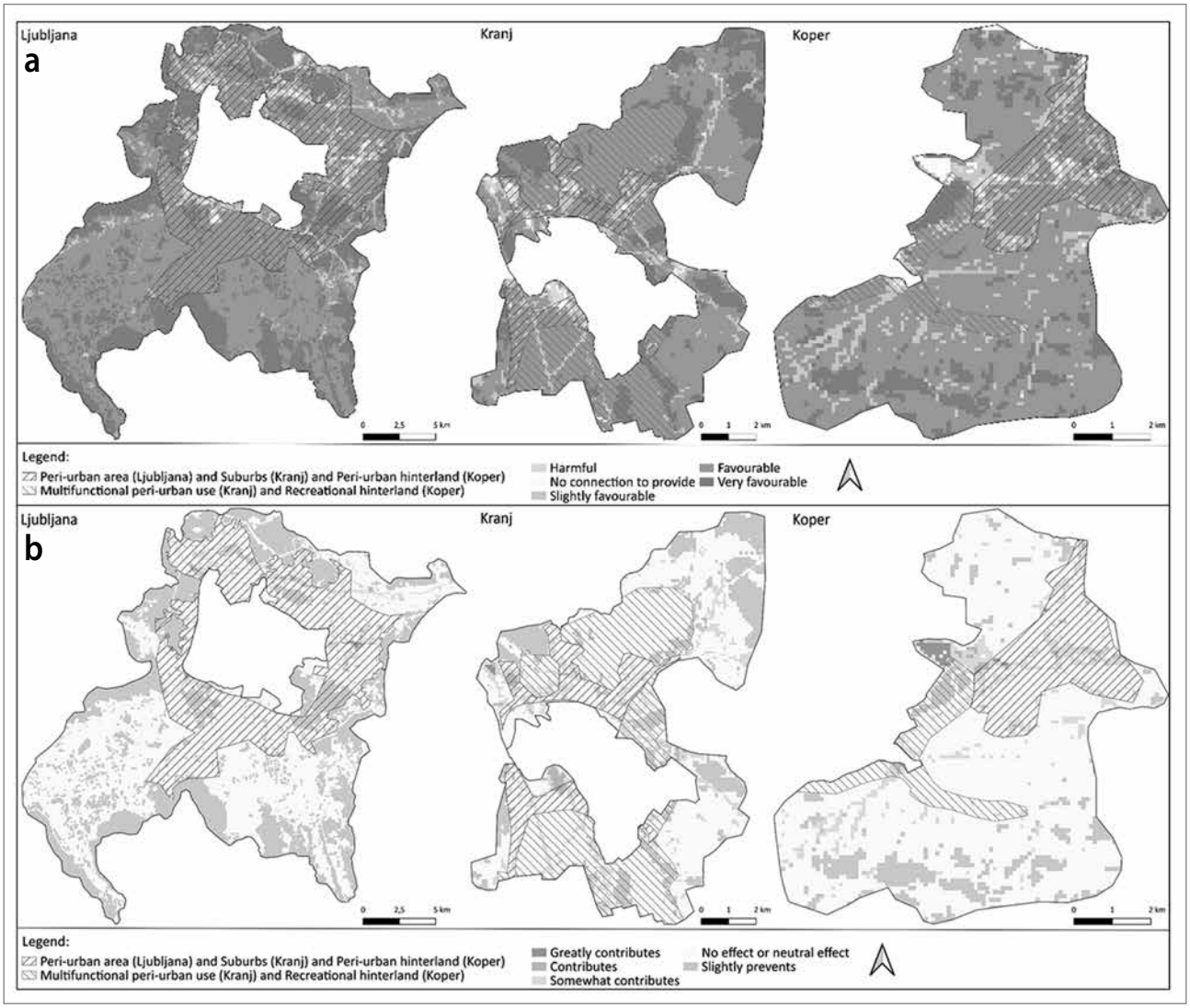

Figure 6: a) top maps show an aggregate of nine normalized CES layers for the three study areas depicting the spatial variation in provision potential based on expert scores and GIS data. b) Bottom maps show an aggregate of the three normalized disservice layers (illustration: Vita Žlender and Rok Brišnik, and Odlok … Koper, 2022; Odlok … Ljubljana, 2010; Odlok … Kranj, 2014).

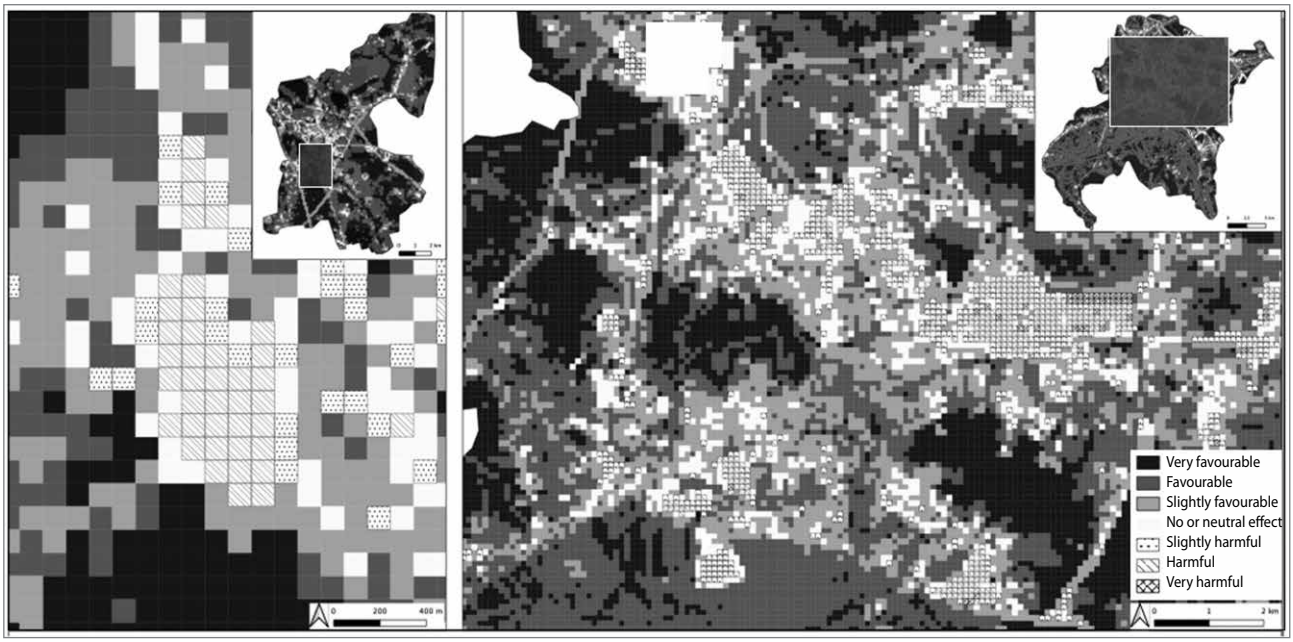

Figure 7: a) detail of an area in Kranj's peri-urban landscape with harmful CES provision potential with a perimeter of approximately 500 m; b): detail of an area in Ljubljana, showing that most of the areas with harmful spatial conditions are in the city core (illustration: Vita Žlender and Rok Brišnik).

use" has a predominantly favourable or even extremely favourable spatial conditions for CES provision. The area described in the OPN as "suburbs" exhibits mixed potential with patches of favourable and very favourable spatial conditions for CES provision; however, there are harmful conditions toward the north and southeast. In Koper, the "recreational hinterland" exhibits favourable and very favourable conditions for CES provision, whereas "peri-urban hinterland" encompasses patches of land with certain harmful conditions for CES provision. Improvements (possibly in the form of GI) are required to increase the provision potential for CES.

4 Discussion

4.1 Ecosystem-based support for GI planning in the peri-urban landscape

The peri-urban landscape has a complex, often ambiguous, character that blends various land uses and land covers that demonstrate a dynamic interplay between urbanization pressures and the imprints of nature. GI plays an important role in enhancing the ecological, social, and economic resilience of a peri-urban landscape (O'Brien et al., 2017). This article presents a method that helps identify and spatially locate various elements of GI based on the provision potential of CES at the landscape scale. Based on the predefined classification of CES and themes integrating land use, land cover, and protection regime classes, spatial data with the knowledge of various experts are discussed.

This assessment generated novel insights into the spatial distribution of areas regarding their potential to provide the CES and cause the disservices studied, respectively, in three case study cities. The results demonstrated spatial patches of low provision potential, where improvements are required to strengthen the GI network and thus enhance the multifunctionality of the peri-urban landscape. This was particularly relevant for Kranj and Koper. The CES mapping demonstrated the low CES provision potential of large patches of urbanized land, particularly land earmarked for exclusive use, such as industry, logistics, transportation infrastructure, and public infrastructure. The results showed that, to support GI planning and peri-urban multifunctionality and to avoid land-use conflicts caused by social demands for (C)ES, the establishment of mosaic landscapes combining different land uses on a small scale may strengthen the provision of CES in peri-urban landscapes, as discussed by Stürck and Verburg (2017). Note that the patchwork of cultural landscapes, including interwoven land uses and land covers such as arable fields, meadows, and forest patches, is widely acknowledged to be valuable and emblematic of Slovenian national identity (Golobič & Lestan, 2016). This sentiment is also reiterated in the OPNs of all three case studies.

Favourable potential provision was most frequently assigned to green and blue spaces, such as forests, water, and designated green spaces, which was also confirmed by Navara and Vedamuthu (2022) and creates the possibility to form archetypes for land-use evaluations (Karrasch et al., 2019). These spaces often have a multifunctional role in the peri-urban landscape.

The preservation and enhancement of forested and water areas should be promoted, owing to their high potential for CES provision. For this purpose, unitary policies and integrated tools and regulations that go beyond sectoral decisions are required (Filyushkina et al., 2022; Gottero et al., 2023). Only then can the development of multifunctional areas be made possible and support for GI planning be integrated to reduce competition over space and resources.

This study provides important insights for designing future policies with a direct impact on CES to enhance sustainable management of areas with high CES provision potential and improve areas with low relevance to providing CES. In particular, the municipal spatial plans and forthcoming regional spatial plans, as foreseen by the national Spatial Management Act (Sln. *Zakon o urejanju prostora*, Ur. l. RS, no. 199/2021), are particularly important. The results indicate that areas of low CES potential can be explored for peri-urban development with due concern for other planning requirements and demands. In particular, the peri-urban landscape, characterized by its high multifunctionality, requires not only conservation efforts but also strategic allocation for future urban expansion. The study is a foundational resource for broader assessments of ecosystems and their services, facilitating the identification of land suitable for future development based on its ES potential, which has already been tested in certain studies (e.g., Zhang & Muñoz Ramírez, 2019; Navara & Vedamuthu, 2022). The diverse array of themes offers spatially explicit indicators of meaningful locations for various CES. Spatial planners and managers play a pivotal role in shaping and nurturing these meaningful places by enhancing accessibility and permitting specific uses, thereby improving their development potential and promoting pro-environmental behaviour (Žlender & Gemin, 2020, 2023; Gottwald et al., 2021). They should thus work closely with local departments and the public to avoid isolated planning and implementation decisions, as has already been proposed by certain scholars (e.g., McDonald et al., 2005; Zhang & Muñoz Ramírez, 2019; Spyra et al., 2021).

4.2 Evaluation of the method

One important advantage of the expert-based scoring approach is its ability to incorporate diverse perspectives and knowledge domains in the assessment process. By involving experts from various fields, it was possible to capture a comprehensive understanding of the potential CES associated with different themes. This multidisciplinary approach improved the robustness of the assessment and ensured that a wide range of factors influencing CES provision were considered. Furthermore, this approach makes possible a systematic and transparent evaluation of various CES, allowing a comparison of different land-use options in terms of their potential to deliver cultural benefits. This approach also facilitated evidence-based decision-making in GI planning because stakeholders can weigh the relative importance of CES when prioritizing land-use strategies. Moreover, the method offers flexibility in adapting to local contexts and priorities, making it suitable for application in diverse subregional settings. By tailoring the set of themes to specific geographic, socioeconomic, and cultural conditions, the method can provide tailored insights that resonate with local stakeholders and decisionmakers. The innovation lies in the fact that the spatial analysis was based on a grid and allowed the presence of multiple themes in one grid cell. The summed value indicates the interrelation of individual themes. Owing to the complexity of spatial patterns in a peri-urban landscape of Slovenia, such an approach was considered more relevant in assessing CES and disservices in the peri-urban landscape than the assessment of individual land uses and land covers, as suggested by Burkhard et al. (2009). However, their method widely relies on the use of the CORINE database, which has been criticized for its lack of complexity (Zhang & Muñoz Ramírez, 2019). Focusing on landscape complexity is particularly important not only because peri-urban landscapes were inspected in this study but also for the whole of Slovenia, given the finely structured land uses and land covers across the entire territory of the country.

Furthermore, this approach is extremely useful for acquiring rapid overviews in complex systems, such as in peri-urban landscapes. In particular, there is potential for using this method in spatial planning for providing quick and objective insights into the state of the inspected peri-urban landscape in terms of its cultural ecosystem (dis)service distribution, as well as the monitoring phase of landscape management. This is a transparent method such that all score matrices and map layers based on them can be examined both together and separately; moreover, the assessments behind the results can always be tracked back. However, only the first identification of various spaces is provided, and additional research might determine the types of GI that should be planned and designed in different areas and investigate how to best provide an approach to sustainable development and the management of land resources. To make the research more comprehensive, combining quantitative and qualitative data is recommended, in addition to including various views in the assessment process. This approach can also be combined with other approaches common to spatial planning, such as suitability assessments, as shown in Martínez-Martínez et al.'s (2022) study. This combination of methods can be implemented in the initial stage of a planning project to identify areas with the highest suitability for a desired activity with lower intervention in CES.

Although the expert-based scoring approach has clear advantages, it is not without limitations. The subjective nature of

expert judgement and the potential for bias must be acknowledged (Müller et al., 2020); moreover, efforts should be made to reduce these risks through a transparent methodology and rigorous validation processes. In the case at hand, the group was biased because most experts were researchers in spatial planning or environmental studies, and decisionmakers at the local level and representatives of the general public were not asked to participate in the survey owing to the nature of the research project. The inclusion of locals is particularly relevant when working on a small scale, where people are more directly impacted by planning decisions (Kopperoinen et al., 2014; Navara & Vedamuthu, 2022). Furthermore, the datasets used for compiling the themes may be selected differently, and the reliability is always questionable. Moreover, the scores always remain somewhat subjective because they draw on broad theoretical principles rather than precise quantitative associations within the given context (Zhang & Muñoz Ramírez, 2019). In this evaluation of the method, the categorization of themes with the experts and, in repeating the method, needs to be completed before scoring. This may reveal additional themes characteristic of peri-urban landscapes. Not all themes equally support the CES categories investigated. However, by incorporating more detailed assessments of specific land-cover types, management regimes, landscape features, points of interest, and other elements, the evaluation of CES can be improved (Karrasch et al., 2019). However, this evaluation underscores the capacity of the expert-based scoring approach to capture evidence of CES potential and causes of disservices.

5 Conclusion

The proposed expert-based scoring approach proved to be a valuable tool for assessing the potential provision of CES and the potential to cause disservices across different themes. This method offers practical benefits for informed GI planning at the landscape level, not only relative to designated green spaces, such as urban parks or natural reserves, but also to potential areas, such as bare or brownfield sites. It thus aids in evaluating the advantages and disadvantages involved in the assessment and planning of GI. By harnessing experts' knowledge and providing a systematic framework for assessment, this method can contribute to more informed and inclusive decision-making processes for landscape planning and management.

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