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Svetovni dan priložnosti

Svetovni dan voda slavimo 22. marca, takrat se zavedamo, da je voda zelo pomembna in omejena dobrina. Mesec dni pozneje, 22. aprila, pa slavimo svetovni dan Zemlje, ki je namenjen ozaveščanju o stanju okolja. Potem so tu še mnogi drugi svetovni dnevi vezani na prostorske in okoljske teme. Vsi ti dnevi so bolj kot praznovanju namenjeni ozaveščanju javnosti in preizpraševanju delovanja stroke. Glede na stanje okolja postajajo tudi vse bolj pomembna priložnost, da se zavemo hvaležnosti za dobrine in pravice ter naše odgovornosti, da jih ohranimo za zanamce.

Lagodno praznovanje in brezskrbno uživanje sta mimo. Naravne dobrine, njihova kakovost in splošne pravice do njihovega uživanja se krčijo. Spremembe v ustaljenih praksah in pravnih ureditvah nas z majhnimi koraki nazadovanja odnašajo stran od danih in sprejetih privilegijev. Vse te stvari niso samoumevne, do njih smo prišli z roko v roki z napredkom civilizacije in kulture.

Pravica do pitne vode in dejstvo, da so vodni viri javno dobro, sta v Sloveniji zapisana v ustavi. Ni treba poznati predpisov glede pravice do vode v drugih državah, da se lahko zavemo – in se moramo zavedati –, da smo med srečnejšimi narodi, ker nam obilje, kakovost in dostopnost do vode ščiti tudi pravna ureditev. Kot z vsemi drugimi pravicami, ki so enkrat dosežene in celo zapisane v zakonih, se tudi s to dogaja, da se nam zdi tako samoumevna, da se zanjo ni več treba truditi. Ideje o spremembah zakonodaje, ki dajejo več pravic lastnikom zemljišč in investitorjem pred splošno pravico vseh ljudi do te dobrine, so zato prelomnica.

Priložnost za razmislek in ukrepanje. Da ne bomo rekli, se spomnite, ko smo vse to imeli in zdaj smo za vedno izgubili. Nepovratno. Le zakaj? Ker potem bo treba spet vso pot od začetka. Izgubljene pravice povedo o naši družbi več kot pravice, ki jih (še) imamo.

Damjana Gantar,
glavna urednica

World Opportunities Day

World Water Day is celebrated on 22 March to promote the importance of water as a vital and limited resource. Earth Day is celebrated a month later, on 22 April, to raise people's awareness about the state of the environment. There are several other world days related to spatial and environmental issues, whose primary aim is to inform the public and re-examine professional activity rather than hold celebrations. Considering the current state of the environment, they are also becoming an increasingly important opportunity not only to show our gratitude for all the resources and rights we have available, but also to become aware of our responsibility to preserve them for future generations.

Relaxed festivities and carefree enjoyment are now over. Natural resources and their quality, as well as the universal rights to enjoy them, are dwindling. Through small steps backward, changes to established practices and legal regulations are slowly chipping away the privileges we have been given and have enjoyed. All these things should not be taken for granted. We have achieved them hand in hand with the progress of our civilization and culture.

The right to drinking water and the fact that water resources are a public good are inscribed in the Slovenian constitution. I am not familiar with the legal regulations governing the right to water in other countries, but I consider Slovenians among the more fortunate nations because in Slovenia the wealth and quality of water, and access to it, are also protected by law. However, like with all other rights, once they are achieved and even provided for in legal documents, we also seem to take this one for granted to the extent that we feel we no longer have to fight for it. Ideas about changing the law to prioritize the rights of landowners and developers over the universal right to this resource can thus be considered a breaking point.

This is an opportunity to reflect and take action, so that later we do not say: "Do you remember when we had all that, and now we've lost it forever? Irrevocably. Why?" Because we will need to do everything again from the start. The rights we lose say more about our society than the rights we (still) have.

Damjana Gantar,
Editor-in-Chief

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Matej NIKŠIČ

Sodelovanje javnosti v postsocialističnih mestih med stagnacijo in napredkom: primer Zagreba in Ljubljane

Sodelovanje javnosti pri urbanistični preobrazbi glavnega mesta je pomemben dejavnik, ki ga je treba upoštevati pri presoji kakovosti demokracije v postsocialističnih državah. V članku avtorji obravnavajo procese sodelovanja javnosti pri taki preobrazbi v dveh postsocialističnih glavnih mestih: v Zagrebu in Ljubljani. Predstavljeni so izsledki izbranih študij primerov v obeh mestih (park Tabor in soseska BS 7 v Ljubljani ter Meštrovićev paviljon in park Savica v Zagrebu), poleg tega so izpostavljene podobnosti in razlike, ugotovljene na podlagi njihove primerjave. Izsledki raziskave iz let 2018 in 2019 kažejo dokaj nizko stopnjo sodelovanja javnosti v Zagrebu. V Ljubljani je bila navedena stopnja višja in tudi pravna podlaga zanjo je bila močnejša, opazna pa je bila delna odvisnost od političnih in gospodarskih dejavnikov. V obeh mestih je bilo sodelovanje javnosti v najbolj neposredni obliki pri aktivnostih nevladnih organizacij in civilnih pobud. Komunikacija med prebivalci in mestno upravo je bila slaba, kar ni spodbudno vplivalo na sodelovanje.

Ključne besede: sodelovanje, pobude civilne družbe, primerjalna metoda, Zagreb, Ljubljana

1 Uvod

V Jugoslaviji, katere del sta bili tudi Hrvaška in Slovenija, je bilo prostorsko upravljanje odvisno od družbenopolitičnih razmer in je večinoma temeljilo na planiranju in državnem nadzoru. Socialna, gospodarska in prostorska vprašanja so se obravnavala v okviru sistema družbenega planiranja (Burton idr., 1967) ali društvenega plana, kot so mu rekli na Hrvaškem (Čaldarović in Kritovac, 1987). V postsocialističnem obdobju država ni več imela tovrstne vloge pri urejanju prostora. Pozornost se je preusmerila na privatizacijo prostora in nepremičnin, ponovno uporabo in prenovo zemljišč ter novo opredelitev vlog načrtovalskih ustanov (Bertaud in Renaud, 1997; Golubchikov, 2004; Dimitrovska Andrews idr., 2007; Hirt, 2012; Sýkora in Stanilov, 2014; Svirčić Gotovac in Kerbler, 2019; Zlatar Gamberožić, 2019). Tržno usmerjeno gospodarstvo je po drugi strani razkrilo pomanjkanje skupnega interesa in vizije v urbanizmu. V urbanistični in javni politiki se je uveljavil pristop gospodarskega liberalizma, ki je povzročil (in še naprej povzroča) neenakomeren razvoj mest in gospodarsko neenakost (Offe, 1997; Jaakson, 2000; Nikšič in Sezer, 2017). Posledično so se privlačna mestna območja spremenila v velika gradbišča, dobički od raznih naložb strmo naraščajo, manj privlačna območja pa stagnirajo (Nikšič, 2014; Patti in Polyak, 2017). Državno tiranijo je nadomestila tržna prevlada (Häussermann in Kapphan, 2004: 26), s katero se je hkrati začela komercializacija mestnega prostora. V razmerah, v katerih so se glavne aktivnosti v mestnem razvoju preusmerile od načrtovanih izboljšav po vsem mestu k dobičkonosnim posegom na ugodnih lokacijah, je treba proučiti vlogo javnosti v razvojnem procesu. V članku avtorji zato najprej opredelijo sodelovanje javnosti pri urbanističnem odločanju, pri čemer se osredotočijo na dve postsocialistični glavni mesti: Zagreb in Ljubljano.

V postsocialističnih mestih so tržno povpraševanje in zasebni interesi precej pomembnejši od načrtovalskega procesa. Tudi javne naložbe se bolj osredotočajo na tiste dejavnosti in projekte, ki lahko izboljšajo privlačnost mesta z vidika njegove dobičkonosnosti kot pa splošno kakovost življenja njegovih prebivalcev (Stanilov, 2007; Sykora, 2007; Patti in Polyak, 2017). Prehod iz socializma je bil v urbanizmu zaznamovan z zanemarjanjem družbene razsežnosti prebivanja v mestih in tamkajšnjih stanovanj ter strateškega in dolgoročnega urbanističnega načrtovanja. Značilnosti tržnega gospodarstva, ki so se pojavljale od devetdesetih let 20. stoletja (privatizacija, krčenje javnega prostora, globalni finančni sistem), vplivajo na odnose med deležniki v okviru urbanističnega načrtovanja oziroma na njihove vloge in pristojnosti. V zahodnoevropskih državah se uporabljajo izrazi, kot so visoka stopnja sodelovanja javnosti, visoki pravni standardi in uspešna javno-zasebna partnerstva, države nekdanje Jugoslavije pa se v urbanizmu spopadajo z omejitvami v pravnem sistemu in nezadostnim sodelovanjem javnosti pri odločanju. Razloga za dokaj počasen prehod v večini držav nekdanje Jugoslavije sta zagotovo vojna v devetdesetih letih 20. stoletja ter izoliranost od evropskih in svetovnih smeri razvoja (Beyea idr., 2009). Prehod je bil hitrejši v nekdanjih socialističnih državah, ki so zgodaj začele aktivnosti za pridružitev Evropski uniji, na primer v Sloveniji.

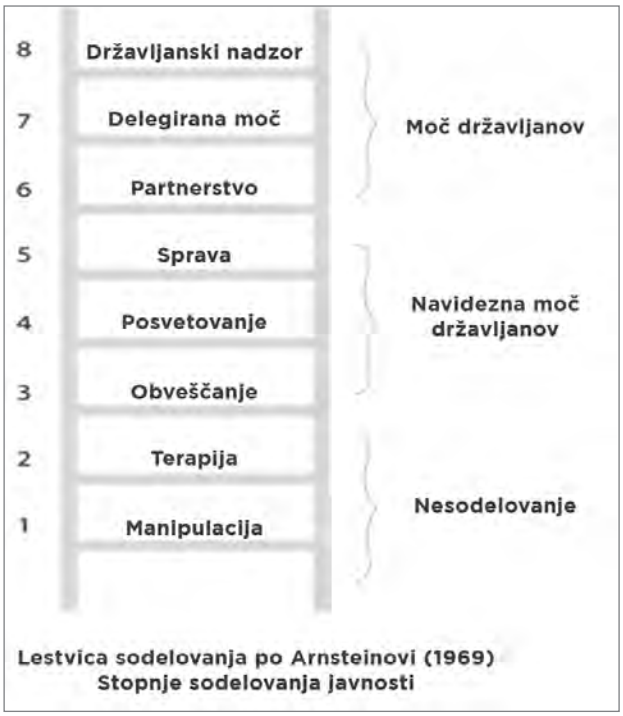
V primerjavi z drugimi nekdanjimi jugoslovanskimi državami je prehod v Sloveniji potekal dokaj gladko, in sicer zaradi nekaterih prednosti, ki jih je država imela že na začetku: njena vojna za neodvisnost je bila kratka, Evropski uniji pa se je pridružila razmeroma hitro in sprejela njene urbanistične programe. Poleg tega so ji bila kmalu na razpolago sredstva EU in ta sredstva je izkoristila za številne urbanistične projekte, za katere so dale pobudo in jih podprle politične in upravne strukture mest (Zlatar Gamberožić, 2019). Hrvaška je po razglasitvi neodvisnosti in okrepitvi privatizacije v devetdesetih letih prejšnjega stoletja doživela številne prostorske preobrazbe, v prostorski razvoj pa se je vključilo tržno gospodarstvo.

Na Hrvaškem načrtovalski proces v glavnem določajo generalni urbanistični plani na ravni mest, Prostorska razvojna strategija in Urbanistični program Republike Hrvaške ter v primeru Zagreba tudi prostorski načrt mesta Zagreb. V skladu s členi 99–108 generalnega urbanističnega plana mesta Zagreb je treba pri oblikovanju in izvedbi načrtovalskega procesa sprejeti ustrezne urbanistične razvojne načrte, izvesti javne razpise, pripraviti študije in zagotoviti sodelovanje javnosti. Javni razpisi so obvezni za urejanje javnih prostorov (trgov in parkov), generalni plan pa omogoča tudi razvoj mestnih projektov in določa postopek njihove izvedbe. Generalni urbanistični plan se skupaj s spremembami in dopolnitvami pošlje zagrebški mestni skupščini v odobritev. Sodelovanje javnosti je omogočeno v obliki predstavitev, predhodnih razprav o prostorskih načrtih ter javnih posvetovanj o osnutkih prostorskih načrtov in rezultatih javnih razpisov (Grad Zagreb, 2016).

V skladu z Zakonom o urejanju prostora (v nadaljevanju: ZUrep-2; Ur. l. RS, št. 61/17) so za urejanje prostora v Sloveniji pristojne država in občine. Prostorski akti se delijo na strateške in izvedbene akte. Prvi določajo glavno usmeritev prihodnjega razvoja in njegova glavna načela, drugi pa se nanašajo na posamezno območje in so pravno zavezujoči. Pri pripravi strateških načrtov javnost običajno sodeluje prek javnih posvetov, pri pripravi in sprejetju izvedbenih aktov pa je zahtevano njeno aktivnejše sodelovanje – med drugim je treba sodelovanje javnosti že v pripravljalni fazi določiti z načrtom vključevanja javnosti (ZUrep-2, 2017; ESPON, 2018).

2 Sodelovanje javnosti kot del urbanističnega načrtovanja

V skladu z lestvico sodelovanja javnosti, ki jo je vpeljala Sherry R. Arnstein (1969, slika 1), lahko sodelovanje javnosti pri urbanističnem načrtovanju sega vse od manipulacije (najnižja raven) do državljanskega nadzora (najvišja raven). Na najnižjih ravneh (nesodelovanje) ljudje nimajo vpliva na odločanje, hkrati pa se jih z manipulacijo prepriča, da se vse dela v njihovo dobro. Predlagani načrt je najboljši in cilj je doseči javno podporo z obveščanjem javnosti. Na ravni pasivnega ali navideznega sodelovanja je javnost obveščena o urbanističnih projektih, ki potekajo, vendar nima možnosti, da vanje poseže. Šele na stopnji sprave lahko javnost predstavi svoja mnenja, vendar odločevalci niso zavezani, da bi jih tudi upoštevali. Na stopnji partnerstva in delegiranja moči v tretjem sklopu lestvice je moč porazdeljena med ljudi in odločevalce. Na najvišji stopnji (državljanski nadzor) lahko prebivalci dajo pobudo za urbanistične projekte in s tem oblikujejo svoje bivalno okolje brez posrednikov in lastnih virov financiranja. Lahko vplivajo na urbanistično politiko in so enakovredni udeleženci v celotnem načrtovalskem procesu.



Slika 1: Lestvica sodelovanja javnosti po Sherry R. Arnstein (vir: internet 1)

Njeno lestvico so pozneje upoštevali tudi številni drugi avtorji. Anokye (2013) na primer poleg tega obravnava dva pristopa k sodelovanju, transformativnega in instrumentalnega, pri čemer je možna tudi kombinacija obeh. Transformativni pristop ustreza stopnji nesodelovanja po Arnsteinovi, instrumentalni pa stopnji državljanskega nadzora. Večina sistemov sodelovanja vključuje kombinacijo obeh pristopov, kar pomeni, da je javnost seznanjena s posveti, v njih občasno sodeluje in je obveščena o odločitvah mestne uprave. To pa še ne pomeni, da v procesu tudi resnično sodeluje in ima moč spreminjanja političnih odločitev. Gre torej za obliko instrumentalnega pristopa, ki vključuje pretok informacij od zgoraj navzdol, akterjem pa ne daje večjega vpliva (Anokye, 2013: 82). Soglasje še vedno ni doseženo, pri tem pa je možen konflikt med vpletenima stranema. Kot navajajo Hordijk idr. (2015), je navedeni pristop povezan z oslabljeno vlogo države in državljanov, pri čemer zadnje opisujejo kot stranke ali potrošnike, ki ne morejo vplivati na odločitve in jih lahko samo upoštevajo, ko so sprejete, saj jih ni več mogoče spremeniti. Transformativni pristop, pri katerem komunikacija poteka od spodaj navzgor, pa vključuje višjo raven sodelovanja, na kateri je javnost aktivneje vključena v odločanje.

2.1 Sodelovanje javnosti v Zagrebu

Hrvaška je postala članica Evropske unije leta 2013. Čeprav si prizadeva svoj pravni sistem uskladiti z evropskim in je sprejela že številne dokumente, ki v duhu evropske politike podpirajo večjo kohezijo, decentralizacijo, horizontalno upravljanje in večji pomen sodelovanja javnosti pri razvoju mest, ji vse to v praksi ne uspeva najbolje. V skladu s hrvaškim pravom je sodelovanje javnosti omejeno na javni dostop do osnutkov prostorskih načrtov, vendar je ta dostop mogoč samo od 15 do 30 dni. Med tem časom lahko državljani predlagajo spremembe in dopolnitve.

Med javnimi posveti ima javnost pravico sodelovati pri oblikovanju in sprejemanju prostorskih načrtov ter predstaviti svoje predloge ali pripombe. Gre za model sodelovanja od zgoraj navzdol, pri katerem o prostorskih spremembah odloča vlada, upošteva pa se le malo vprašanj, na katera opozorijo prebivalci (npr. glede zasebnega zemljišča na ureditvenem območju). Javnost ima zelo malo vpliva na spremembe, ki jih uvajajo prostorski načrti, in na preureditev (največkrat javnega) prostora. Javni interes je razglašen za pomembnega in dragocenega, vendar je javnost k sodelovanju pozvana samo uradno ali še to ne in tudi če javnost predstavi svoje predloge, ni nujno, da se ti upoštevajo. Zadnjih nekaj desetletij so mestne oblasti pogosto izvajale projekte, s katerimi se javnost ni strinjala in zaradi katerih se je javni prostor skrčil. Zanimivo je, da se kljub pridružitvi Hrvaške Evropski uniji generalni urbanistični plan mesta Zagreb od leta 2007 ni kaj dosti spreminjal, vseskozi pa se prilagaja tržnim potrebam gospodarskih in političnih akterjev. Sodelovanje med strokovnjaki in politiki ni zadostno, obrambo javnega interesa pa so prevzele nevladne organizacije in razne civilne pobude, ki so se v zadnjih desetletjih močno

razmahnile. Ob načrtovani neželeni ali neustrezni prenovi ulic in trgov so bili organizirani množični protesti proti tovrstnim spremembam. Oblasti so se kljub temu redko odpovedale svojim projektom in so jih uspešno izpeljale. Nevladne organizacije so postale pomemben akter v sodelovanju javnosti, saj si prizadevajo vzpostaviti komunikacijo med političnimi akterji in javnostjo ter javnost vključiti v načrtovalski proces, da lahko izrazi svoja mnenja. Kljub nedvomno opaznejši vlogi civilne družbe Bežovan in Zrinščak (2006: 8) opozarjata, da je še vedno bolj reaktivna kot proaktivna, njene organizacije pa še vedno ne prispevajo specifičnega družbenega kapitala. Državljani imajo v okviru zakona nekatere možnosti, da predstavijo svoje predloge ali se pritožijo, in sicer lahko to storijo na občnih zborih. Odločitve, sprejete na teh zborih, so zavezujoče za lokalni ali okrajni svet, ne pa tudi za mestno skupščino (internet 2; člen 127–129). Navedeno je primer izključevanja prebivalcev iz odločanja in neupoštevanja njihovih mnenj v sklepnih fazah projektov, kar je podobno že omenjenemu instrumentalnemu pristopu, povezanemu z zmanjšano vlogo države in javnosti, ki je zato zelo pasivna. To se ujema tudi z nižjimi ravnmi sodelovanja javnosti na lestvici Arnsteinove (obveščanje, terapija in manipulacija). Eden izmed razlogov za to je lahko tudi, da prebivalci ne želijo biti vključeni v sodelovanje. Trenutno nekateri vidiki lokalne samouprave niso preveč spodbudni za prebivalce, ki se zavedajo svojih omejitev, nepomembnosti in postranskosti pri reševanju vsakdanjih težav skupnosti (Rešetar, 2009; Toš idr., 2012). Pri prostorskih preureditvah v tovrstnem enosmernem procesu je pogosta manipulacija, katere namen je okrepiti politično moč vodilnih struktur, zlasti vlogo župana in njegovega kabineta. Zanimivo je, da daje župan v javnosti vtis, da želi izboljšati kakovost življenja prebivalcev ter prisluhniti njihovim željam in potrebam, vendar zaradi sodelovanja z investitorji tega nikoli ne uresniči. Pri odločanju sodelujejo samo vodilne elite kot izbrani in vplivnejši sloj prebivalstva, kar vodi v elitno prevlado, ki zavira sodelovanje (Silver idr., 2010) ali vključenost večine prebivalstva.

2.2 Sodelovanje javnosti v Ljubljani

Uradna podlaga za sodelovanje javnosti pri okoljskem in prostorskem razvoju je Aarhuška konvencija (ZN/ECE, 1998), ki jo je Slovenija ratificirala leta 2004 ob pridružitvi Evropski uniji in jo postopno vključila v nacionalno zakonodajo, med drugim tudi v ZUrep-2. Načelo sodelovanja javnosti je v tem zakonu opredeljeno v 11. členu, ki določa, da morajo pristojni organi omogočiti zgodnje in učinkovito sodelovanje javnosti pri odločanju in sprejemanju prostorskih aktov ter pri zadevah urejanja prostora na splošno. Vsakdo ima pravico do vpogleda v prostorske akte in vso dokumentacijo, povezano z njihovo pripravo in sprejemanjem v skladu s tem zakonom in zakonom, ki ureja dostop do informacij javnega značaja. Vsakdo ima pravico dajati pobude, predloge, pripombe in mnenja na prostorske akte, do katerih se mora organ v postopku njihove priprave opredeliti in o tem obvestiti javnost. ZUrep-2 poleg tega predvideva poseben pravni status za nevladne organizacije, ki imajo aktiven status delovanja v javnem interesu na področju prostora, varstva okolja, ohranjanja narave ali varstva kulturne dediščine – njihov pravni interes na tem področju se šteje za izkazanega po zakonu. V 85. členu zakon določa, da je treba zagotoviti načrt sodelovanja javnosti pri pripravi prostorske dokumentacije, v 111. členu pa dodatno opredeljuje postopke za pripravo občinskih prostorskih načrtov ter predvideva izvedbo javnih posvetov, delavnic ali drugih načinov sodelovanja z javnostjo.

Kvac idr. (2015) opozarjajo, da je ena izmed glavnih ovir pri izvedbi sodelovalnih praks pasivno ali zgolj formalno uresničevanje zakonodajnih zahtev po sodelovalnih pristopih. Načrtovalski organi le redko upoštevajo pripombe in zamisli, ki jih javnost poda na javnih posvetovanjih, ne glede na to, kako dobro so utemeljene. Poleg tega postopki, ki jih opredeljuje zakon, ne zagotavljajo popolne podpore tovrstnim praksam; na primer ustanove lahko temeljito spremenijo prvotni načrt, ki je bil predmet javne razprave, končni načrt pa kljub pomembnim spremembam ni znova poslan v javno obravnavo. Zato poskušajo civilne pobude in nevladne organizacije uveljavljati tovrstne prakse na področju urejanja prostora s svojimi aktivnostmi, ki temeljijo na pristopu od spodaj navzgor (Nikšič idr., 2018). Poleg tovrstnih konkretnih aktivnosti se osredotočajo tudi na krepitev zmogljivosti javnosti, pri čemer izdajajo priporočila in navodila, ki lokalne prostorske organe spodbujajo k vključevanju javnosti v urejanje prostora, ob tem pa prebivalce usmerjajo, kako naj v teh zapletenih postopkih proaktivno sodelujejo in izrazijo svoje mnenje. Tovrstni dokumenti so pomembno mehko orodje, ki deležnike vodi skozi zapletene postopke in jim pokaže najprimernejša orodja in tehnike, ki jih lahko uporabijo.

Ko je pred dvajsetimi leti Mestna občina Ljubljana (2002) začela pripravljati novo prostorsko zasnovo mesta (prvo v postsocialističnem obdobju), je takratna mestna uprava razumela potrebo po pravem sodelovalnem pristopu, saj je želela oblikovati dobro premišljeno zasnovo, ki bi izražala želje najrazličnejših lokalnih deležnikov. Poleg zakonsko zavezujočih postopkov, ki so zahtevali, da se v načrtovanje vključi širša javnost, so bili izvedeni zelo številne strokovne študije, posvetovanja z raznimi interesnimi skupinami in tematske delavnice za prebivalce. Na podlagi navedenega so bili izdani številne publikacije in dokumenti, ki so izražali želje in zamisli širše javnosti, ki brez obsežne uporabe sodelovalnih orodij ne bi bile razkrite. Rezultati obsežnih sodelovalnih aktivnosti pa niso bili vedno vključeni v pravno zavezujočo prostorsko dokumentacijo, zato so bile navedene aktivnosti ob spremembi političnih razmer v mestu le delno uspešne. Leta 2006 je vodenje mesta prevzela

nova mestna uprava s svojo razvojno vizijo, ki je temeljila na pristopu od zgoraj navzdol in se ni vedno skladala s cilji, opredeljenimi v začetni (sodelovalni) fazi (Koželj, 2009). Trenutna mestna uprava izvaja vse zakonsko zavezujoče faze javnega posvetovanja (npr. ob vsaki spremembi in dopolnitvi prostorskega načrta), vendar sodelovanje javnosti v najbolj neposredni obliki še vedno poteka na ravni aktivnosti civilne družbe. Po različnih ljubljanskih soseskah se ljudje organizirajo v skupine, katerih aktivnosti večinoma temeljijo na prostovoljnem delu in osebni zavzetosti, saj prejmejo le malo javne finančne podpore (Nikšič, 2018; internet 3). Dve tovrstni pobudi sta predstavljeni v nadaljevanju.

3 Metode

Članek temelji na izsledkih dvostranskega raziskovalnega projekta z naslovom Urbana revitalizacija mestnega središča na primeru Ljubljane: primerjava z mestnim središčem Zagreba (2018–2019). Pri proučevanju urbane revitalizacije v obeh mestih je bila uporabljena primerjalna metoda, na podlagi katere so bile ugotovljene podobnosti, skupne značilnosti in razlike (Žugaj idr., 2006). Terenska raziskava, ki je v letih 2018 in 2019 potekala v Zagrebu in Ljubljani, je temeljila na štirih študijah primera (po dve v vsakem mestu). Kot izpostavljajo Burnham idr. (2006), primerjalna metoda omogoča, da se informacije umestijo v kontekst, ki se proučuje in interpretira, kar je še zlasti pomembno ob pridobljenih novih informacijah, ki jih je treba povezati s prejšnjimi izsledki. Projekt je poleg tega vključeval poskus primerjave dveh podobnih držav iz iste regije (Dogan, 2009: 23), v tem primeru Hrvaške in Slovenije. Primerjalna metoda v družboslovju omogoča objektivnejše razumevanje proučevanega družbenega pojava, njegovo umestitev in klasifikacijo ter oblikovanje sklepov (preverjanje hipoteze) in napovedi (Hague idr., 2001; Reason in Bradbury, 2001). Kot navajata Denzin in Linkoln (1994), študije primera omogočajo podrobnejše razumevanje družbenih procesov na podlagi analize enega ali več primerov. So empirične raziskave sodobnih pojavov v njihovem realnem kontekstu, ki temeljijo na različnih virih dokazov. Ker se osredotočajo na konkretne primere, omogočajo poglobljeno razumevanje izbranega pojava glede na njegovo prostorsko ali drugo umeščenost (Ritchie in Lewis, 2003; Yin, 2003).

Cilj raziskave je bil na podlagi izbranih primerov predstaviti razlike v procesu sodelovanja javnosti in s primerjalno metodo opredeliti konkretne in problematične vidike vzpostavljanja in izvajanja tega procesa. Primerjava je temeljila na naslednjih raziskovalnih vprašanjih: kako so se prebivalci in civilni sektor odzvali in aktivirali, ali je bil na podlagi posredovanja ali odziva civilne družbe začetni projektni načrt spremenjen ter kateri model sodelovanja javnosti po Arnsteinovi in drugih avtorjih (npr. instrumentalni, transformativni ali mešani) je bil uporabljen v primeru Ljubljane in kateri v primeru Zagreba. Pri primerjalni analizi je bil vsak primer proučen posebej glede na časovni potek dogodkov od začetka vsakega projekta ter vključitve in aktivacije javnosti do končnega rezultata (tj. reakcije ali v nekaterih primerih akcije civilnih akterjev). Najprej sta se med seboj primerjala oba primera v vsaki državi, nato pa še vsi štirje primeri skupaj, s poudarkom na vlogi civilnih akterjev v vsakem primeru, na podlagi česar so bili določeni modeli sodelovanja za vsako državo. Omenjeni štiri primeri (park Tabor in soseska BS 7 v Ljubljani ter Meštrovićev paviljon in park Savica v Zagrebu) so bili izbrani zato, ker dobro ponazarjajo proces sodelovanja različnih zainteresiranih strani (strokovnih, političnih in civilnih krogov) v obeh mestih. So najrazločnejši primeri razlik med obema državama z vidika pristopa k prostorskemu načrtovanju (tj. od spodaj navzgor proti od zgoraj navzdol). Modeli, uporabljeni v obeh mestih, so povezani z že omenjenimi hipotezami o instrumentalnem, transformativnem in mešanem pristopu (Anokye, 2013) k sodelovanju javnosti, na podlagi katerih lahko razvrstimo analizirane primere.

4 Rezultati

4.1 Prvi primer sodelovanja od spodaj navzgor: park Tabor v Ljubljani

Park Tabor je lokalni park v vzhodnem delu Ljubljane, 10 minut hoje od Prešernovega trga. Na tem odprtem javnem prostoru, ki meri približno 1,2 ha, ima svoje površine tudi Športno društvo Tabor. Čeprav je zeleno središče širše soseske, je bil dolga leta zanemarjen in zapuščen, ljudje pa se v njem ponoči niso radi zadrževali, saj je bil neurejen in slabo osvetljen. Leta 2010 se je kulturno društvo Prostorož, ki se zavzema za izboljšanje javnega mestnega prostora in večjo vključenost javnosti, odločilo izkoristiti njegov potencial (internet 3). Eden izmed njegovih ciljev je bil spodbuditi lokalne prebivalce, da aktivno sodelujejo pri načrtovanju in izvedbi revitalizacije parka, ki je temeljila na uporabi minimalnih finančnih sredstev in manjših prostorskih izboljšavah, ki bi ustvarile priložnosti za druženje, igro in rekreacijo na prostem v prijetnem okolju. Na podlagi raziskave potenciala in težav območja (Cerar in Peterlin, 2010) ter številnih delavnic za spodbujanje sodelovanja je nastal program raznih aktivnosti, ki se je izvajal med letoma 2010 in 2014. Cilji aktivnosti so bili manjše prostorske izboljšave, s katerimi bi prostor postal prijetnejši, sprememba prometnega režima in dajanje prednosti pešcem in kolesarjem ter ustvarjanje priložnosti za druženje lokalnih prebivalcev in obiskovalcev. Društvo Prostorož je usklajevalo aktivnosti organizacij, ki so v parku prostovoljno prirejale dogodke, zasnovalo urbano opremo parka in načrtovalo spremembe prometnega režima.

Slika 2: Park Tabor maja 2011: razne aktivnosti v parku (foto: Matej Nikšič)

Slika 3: Sodelovalne aktivnosti na premalo izkoriščenem javnem prostoru v soseski BS 7 (foto: Tomaž Zupan)

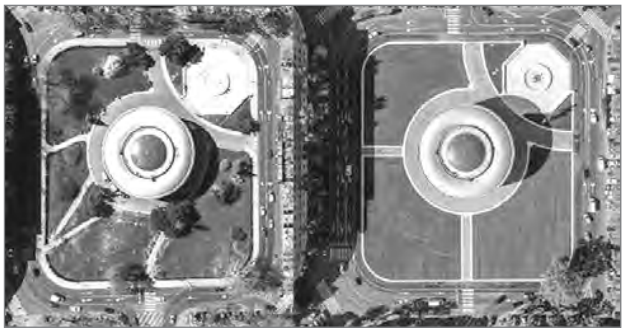
Čeprav je revitalizacija parka Tabor (slika 2) značilen primer pristopa od spodaj navzgor, je projekt od mestne občine prejel tudi nekaj finančne podpore, kar je kulturnemu društvu omogočilo vsaj koordinacijo aktivnosti. Oddelki mestne uprave so bili pripravljeni pomagati in hkrati dovolj prilagodljivi, da so izdali potrebna dovoljenja. Sodelovanje med Prostorožem in oddelki mestne uprave je lahko zgled za podobne sodelovalne prakse v drugih delih mesta. Navedeno bi bil pomemben korak k revitalizaciji podobnih predmestnih javnih prostorov brez večjih finančnih vložkov (Bugarič, 2018). Med projektom so vsi vpleteni dobili boljši vpogled v organizacijo in mehanizme delovanja oddelkov mestne uprave, hkrati pa so ugotovili, da je z vidika sodelovanja javnosti še veliko možnosti za izboljšave. Ko so pobudniki posameznih projektov svoje predloge izrazili v javnosti, ne glede na to, kako dobronamerni so bili, so bili pogosto razumljeni kot kritika mestne uprave, zaradi česar so jim umaknili podporo pri projektu in nekaterih aktivnostih (Human Cities Archives, 2017).

4.1.1 Soseska BS 7 v Ljubljani

Drug zanimiv primer, iz katerega se lahko veliko naučimo, je soseska BS 7 v severnem delu Ljubljane, ki je v javnosti poznana tudi pod imenom Ruski car. Je ena največjih stanovanjskih sosesk v slovenski prestolnici, zgrajena v sedemdesetih letih 20. stoletja, z velikim osrednjim trgom, imenovanim Bratovševa ploščad. V socialističnem obdobju je bila ploščad prostor druženja, danes pa je to območje dokaj neizkoriščeno, saj ga ljudje večinoma uporabljajo samo za prehajanje z ene na drugo stran soseske. Zaradi dotrajanosti gradbenih materialov in nezadostnega vzdrževanja v zadnjih desetletjih je v slabem stanju, a ploščad do zdaj še ni bila prenovljena, predvsem zaradi neurejenega lastništva (poleg tega, da je osrednji odprt javni prostor v soseski, so tam tudi zasebne podzemne garaže). Skupina lokalnih prebivalcev je v okviru pobude Skupaj na ploščad (slika 3) zato začela izvajati nekatere nove aktivnosti, da bi pokazala, da ima območje velik potencial, in posledično vse lastnike (tj. lastnike podzemnih zasebnih garaž, upravnike bližnjih stanovanjskih blokov in mestno občino) spodbudila, da privolijo v prenovo ploščadi in zanjo zagotovijo finančna sredstva. Vsako leto pobuda prostovoljno organizira razne aktivnosti za lokalne prebivalce (in skupaj z njimi), katerih namen je oživiti sosesko (npr. ulični kino, zelenjavne tržnice in delavnice izdelave uličnega pohištva). Območje in sodelovanje tamkajšnjih prebivalcev sta pritegnila mednarodno pozornost ekipe projekta Humana mesta (Human Cities) v okviru programa Evropske unije Ustvarjalna Evropa (Franc idr. 2018), katerega cilj je okrepiti sodelovalne aktivnosti lokalnih prebivalcev z eksperimentalno uporabo raznih sodelovalnih orodij. Med letoma 2014 in 2018 so bili organizirani številni dogodki in aktivnosti, kot so vodeni sprehodi po soseski, okrogle mize, pikniki, risarske delavnice in delavnice izdelovanja maket, intervjuji, spletni fotografski natečaji in ulične razstave, da bi lokalne prebivalce spodbudili k druženju na ploščadi in k temu, da združijo moči in se skupaj odločijo, kako naj bi potekala njena temeljita prenova (Nikšič idr., 2018). Tudi ko je mestna uprava končno prepoznala pomen projekta in zanj ponudila finančno pomoč, je prizadevanja za prenovo zaviralo dejstvo, da se lokalna skupnost ni mogla sporazumeti glede stroškov projekta in prihodnje podobe ploščadi. Primer kaže, da lahko kljub široki podpori (stanovalcev, občine ter domačih in mednarodnih strokovnjakov) nesposobnost deležnikov, da se uskladijo, prepreči še tako dobronamerna sodelovalna prizadevanja. Kljub temu so tovrstne aktivnosti pomembne za krepitev zmogljivosti lokalnih prebivalcev, da sodelujejo pri urbani prenovi, ki se lahko začne šele, ko se glavni akterji sporazumejo glede pravične razdelitve projektnih stroškov.

4.2 Pristop od zgoraj navzdol ali reakcionistični aktivistični pristop k sodelovanju javnosti v Zagrebu: Meštrovićev paviljon

Prenova Meštrovićevega paviljona (slika 4) sredi Trga žrtev fašizma v središču Zagreba je bila prva faza projekta z naslovom Center odličnosti za spodbujanje pešačenja. Paviljon je primer kulturnega in umetniškega spomenika ter priljubljenega javnega prostora, zaradi česar so prebivalci tudi budno spremljali njegovo prenovo. Študija primera, izvedena med letoma 2018 in 2019, je pokazala, da so se prebivalci na prenovo negativno odzvali in so jo poskušali ustaviti. Povsem na začetku je bilo okoli paviljona odstranjeno vse rastlinje, da bi lahko začeli načrtovano prenovo. Največji protest lokalnih in drugih prebivalcev je sledil potem, ko so izvajalci posekali magnolijo, zaradi česar je območje postalo golo in sterilno. Izvedli so kampanjo Vrnite magnolijo, ta pobuda pa je trajala šest mesecev. Celoten projekt je bil slabo predstavljen javnosti, zahtevani postopki pa niso bili izvedeni ali so jih zaobšli, poleg tega mnenja strokovnjakov, ki so poskušali vplivati na izvedbo projekta, niso bila upoštevana. Civilna pobuda je zahtevala zaustavitev del, javno posvetovanje, zaščito rastlinja, vrnitev magnolije in konstruktivnejšo razpravo pred dokončanjem projekta. Svoje prošnje in pozive je poslala pristojnim mestnim in državnim ustanovam. Kljub vsem aktivnostim in čedalje večjemu odporu raznih civilnih pobud od pristojnih ni bilo odziva in prva faza projekta je bila uspešno dokončana.



Slika 4: Meštrovićev paviljon pred prenovo in po njej v letih 2017 in 2018 (vir: Dobrić, 2018)

Slika 5: Protest proti gradnji cerkve v parku Savica leta 2017 (vir: HINA, 2016)

Med načrtovanjem so bili predvideni drenaža zelenih površin, zamenjava poškodovanega stopnišča okrog paviljona, položitev novih granitnih tlakovcev in kamnitih robnikov ter namestitev novih klopi, košev za smeti in stojal za kolesa. Brez javnega natečaja in posvetovanja pa se je zdelo, da je bil projekt plod županovega avtokratskega vodenja in manipulacije, ki sta skupnosti in strokovnjakom preprečevala, da bi sodelovali pri odločanju. Poleg tega sta bila brez posebnega razmisleka spremenjena zaščiteni kulturni spomenik in njegova zgodovinska identiteta. Kljub vsemu se je iz opisanega projekta urbane prenove na koncu vendarle izcimilo nekaj dobrega. Pobuda Vrnite magnolijo je dosegla, da je mestna uprava obljubila, da ne bo nikoli več stvari urejala tako, kot jih je na navedenem trgu (Sviržić Gotovac in Zlatar Gamberožić, 2020). Opisani primer jasno kaže, da so pri krčenju javnih in zelenih površin v Zagrebu nevladne organizacije postale edini posrednik med prebivalci in mestno upravo ter edini akter, ki se odziva na samovoljne ukrepe mestne uprave.

4.2.2 Park Savica v Zagrebu

V primeru parka Savica (2013–2018) je bila poglavitna gradnja cerkve v mestnem parku. Lokalna župnija je oddala prošnjo za izdajo lokacijskega dovoljenja, o čemer pa ni obvestila nobenega od lastnikov sosednjih parcel. V kataster je bila nepojasnjeno vnesena neobstoječa cesta med načrtovanim gradbiščem in sosednjo stavbo. Lokalni prebivalci so s tem izgubili pravico do pritožbe, zato so sprožili kampanjo Varujmo naš park (slika 5), ta kampanja je trajala pet let. Organizirali so jo predvsem zaradi nepreglednih razpisnih postopkov in ker bi se zaradi projekta skrčila površina parka. Cerkev bi zavzemala 1.600 m^2, kar je skoraj tretjina skupne površine parka. Ljudje, ki so se pridružili pobudi, so stalno poudarjali, da ne nasprotujejo gradnji cerkve, ampak izbrani lokaciji gradnje. Prebivalci, ki so pomagali zbirati podpise v podporo pobudi, so se poimenovali »prebivalci, ki smo za gradnjo cerkve, a ne v našem parku«. V skladu z vsemi postopki so poslali dopise pristojnim mestnim službam in županu. Združenji hrvaških arhitektov in krajinskih arhitektov sta podprli prebivalce in projektu nasprotovali. Naposled je ministrstvo za gradbeništvo in prostorsko ureditev razveljavilo dovoljenje, ki ga je leta 2016 izdala mestna občina Zagreb, med drugim zaradi velikosti projekta, ki ni bila v skladu z generalnim urbanističnim planom, in ker niso bili izvedeni ustrezni postopki javnega naročanja.

Primera Meštrovićevega paviljona in parka Savica sta podobna z vidika njunih začetnih faz in odziva prebivalcev. Razlikujeta pa se v poznejši fazi, ko je bilo v primeru parka po večletnih prizadevanjih civilne družbe lokacijsko dovoljenje razveljavljeno. Oba primera dokazujeta, da lahko ob podpori strokovnjakov civilne pobude zaustavijo samovoljno ravnanje politike.

Nista ravno zgled za to, kako naj bi civilna družba sodelovala pri odločanju, ponazarjata pa, kako se lahko javnost ozavešča in spodbudi k temu, da postane aktivna.

5 Razprava

Primerjalna analiza Meštrovićevega paviljona in parka Savica v Zagrebu je pokazala, da je bilo obema projektoma skupno dvoje: neupoštevanje mnenja javnosti in strokovnjakov ter vztrajno prizadevanje mestne uprave, da izpelje prvotna načrta kljub številnim nejasnim ali nepopolnim pravnim postopkom. Prebivalci so projektoma nasprotovali tako, da so izvedli bolj ali manj uspešne pobude. Primera iz Ljubljane izpostavljata pomen aktivnega državljanstva, pri čemer proaktivni prebivalci lahko prispevajo in želijo prispevati k drugačnemu dojemanju in preoblikovanju svojega bivalnega okolja. Po drugi strani pa jasno kažeta nestabilnost sodelovalnih praks in njihovo odvisnost od politične in finančne podpore. Dokler je navedena podpora zagotovljena, je večja verjetnost, da bo sodelovanje med akterji ali organizacijami, ki delujejo po pristopu od spodaj navzgor, in tistimi, ki delujejo po pristopu od zgoraj navzdol, privedla do tega, da bo rezultat najboljši za vse. Da bi lahko to dosegli, so poleg pravno zavezujočih podlag za sodelovanje javnosti potrebni zaupanje, sposobnost sodelovanja in dialog med vsemi pomembnimi partnerji. V primeru parka Tabor se je močno pokazalo plodno sodelovanje med lokalnimi akterji, v primeru soseske BS 7 pa se je izkazalo, da ima lahko sodelovalni pristop omejen vpliv, če je med akterji preveč trenj.

Kot je razvidno iz primerov v Ljubljani in Zagrebu, sodelovanje javnosti pri urbanističnem načrtovanju ter prenovi in zaščiti javnih prostorov še vedno ostaja razmeroma šibko. Podobno je tudi v drugih južnoevropskih mestih zadovoljstvo prebivalcev z ulicami ali stavbami nizko (Emerson in Smiley, 2018: 166), kar je lahko posledica šibkega sodelovanja javnosti pri urejanju prostora in njenega manjšega vpliva na javne prostore. V Zagrebu je vključenost javnosti omejena na proteste proti posameznim urbanističnim projektom in jo lahko opišemo kot primer reakcionističnega aktivizma, ki se lahko pogosto spremeni v pasivno sprejemanje obstoječega stanja. V Ljubljani lokalne skupnosti vzpostavljajo veliko bolj enakovrednejša partnerstva z lokalnimi oblastmi, ko se odloča o njihovem vsakdanjem življenju in okolju. Poleg tega vsi vpleteni akterji kažejo močno predanost svojim nalogam. Premislek o vlogi in vplivu lokalne skupnosti je ključen v urbanizmu postsocialističnih držav (Hlaváček idr., 2016). Sodelovanje javnosti je treba okrepiti, da so lahko prebivalci v celoti vključeni v odločanje o svojem ožjem bivalnem okolju.

6 Sklep

V primerjavi s primeroma iz Zagreba primera iz Ljubljane kažeta višjo raven sodelovanja javnosti, poleg tega je izrazito še, da je skupnost bolj vključena v vodenje načrtovanja (Svirčić Gotovac in Kerbler, 2019). Navedeno še zlasti velja za park Tabor, kjer so civilne pobude in lokalni prebivalci v sodelovanju z mestno upravo organizirali ulične prireditve in park spremenili v prijeten prostor druženja. Poleg tega so v Ljubljani aktivnosti civilne družbe bolj proaktivne kot v Zagrebu, kjer se večinoma reaktivne. Namesto protestov proti prostorskim posegom, vsiljenim od zgoraj, se civilne pobude v Ljubljani večinoma osredotočajo na izboljšanje potenciala posameznih mestnih okolij in krepitev sodelovanja med deležniki. Ljubljana torej kaže premik od postsocialističnega enosmernega instrumentalnega modela k transformativnemu pristopu, Zagreb pa ostaja pri instrumentalnem pristopu. Pri parku Savica v Zagrebu so opazne tudi značilnosti mešanega modela, saj so prebivalci zaustavili gradnjo cerkve ter zahtevali večjo vključenost v odločanje in upoštevanje njihovih potreb (kar spada k transformativnemu pristopu). Ker proces vseeno ni bil dvosmeren, gre v prvi vrsti za primer instrumentalnega sodelovanja javnosti.

Ljubljanski model lahko ob močnejši politični podpori postane še uspešnejši. Trenutno je politična podpora dokaj šibka in nestabilna, saj mestna uprava gibanja civilne družbe še vedno noče v celoti sprejeti kot enakovrednega partnerja pri odločanju in še vedno dojema njene dobronamerne kritike kot grožnjo. Podobna težava je opazna v Zagrebu, kjer ni resničnega sodelovanja javnosti, ampak je to samo v obliki odziva na že obstoječe razmere, komunikacija z mestno upravo pa je več kot očitno nezadostna. Hipoteza, da je za Ljubljano značilna višja raven sodelovanja javnosti pri zadevah, ki se nanašajo na kakovost življenja in okolja, kot za Zagreb, je bila tako potrjena. Še vedno pa je v obeh mestih veliko možnosti za izboljšave, predvsem zaradi nezmožnosti lokalnih akterjev (strokovnjakov, prebivalcev in oblasti), da se uskladijo in stopijo skupaj, kar z vidika sodelovanja javnosti ostaja velik izziv. Potrebni so spremembe pravnega okvira, večje ozaveščanje prebivalcev o njihovih pravicah in odprtost za nove prakse od spodaj navzgor v skladu s priporočili EU, na podlagi česar bi sodelovanje javnosti postalo in ostalo stalnica pri urejanju prostora, urbanistična politika pa bi upoštevala javne potrebe.

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Matjaž URŠIČ

Izgubljeni potenciali kreativne urbane regeneracije – primer prestrukturiranja območja nekdanje Tobačne tovarne v Ljubljani[1]

Urbane kreativne dejavnosti so bile v tranzicijskem obdobju intenzivnih prostorskih in gospodarskih sprememb v Sloveniji pogosto predstavljene kot pomemben razvojni dejavnik, ki bo omogočil reurbanizacijo in revitalizacijo številnih območij opuščenih industrijskih dejavnosti. Pogosto so bili to razmeroma spontani, nenačrtovani procesi prostorskega in gospodarskega razvoja degradiranih območij, pri čemer so razni kreativni posamezniki in skupine po načelu od spodaj navzgor izvajali postopne revitalizacije nekdanjih industrijskih območij. Članek analizira vlogo kreativnih dejavnosti pri revitalizaciji degradiranih območij na podlagi razvoja mehkih (družbenih) dejavnikov ali socialnih mrež ali omrežij. Pri tem izpostavlja težavo, da lokalni organi in državni institucionalni akterji ne zaznavajo kreativnih socialnih mrež, nimajo ustreznega pristopa do njih ali jih premalo upoštevajo pri razvoju teh območij. Na podlagi polstrukturiranih intervjujev je predstavljen primer nekdanje Tobačne tovarne kot vzorčni primer postopnega kopičenja socialnega kapitala, vezanega na socialne mreže, ki pa se ob procesih novega gospodarsko-prostorskega prestrukturiranja območja dojema kot nepotreben element prenove.

Ključne besede: kreativne dejavnosti, socialna omrežja, degradirana območja, Tobačna tovarna

1 Uvod

Kmalu po osamosvojitvi Slovenije so se okrepile urbane politike, povezane z razvojem kreativnega sektorja. Z uvedbo tržnega gospodarstva v navezavi na obsežne sistemske spremembe politik prostorskega načrtovanja, katerih namen je bil zlasti spodbuditi hiter gospodarski razvoj, je bil kreativni sektor opredeljen kot eden izmed ključnih spodbujevalcev prostorsko-gospodarskega razvoja Slovenije v tranzicijskem obdobju (Bole, 2008; Ravbar, 2011). To ni bilo naključno (Zelena knjiga – Izkoriščanje potenciala kulturnih in ustvarjalnih industrij (Evropska komisija, 2010); Regionalni razvojni program Ljubljanske urbane regije 2007–2013 (Regionalna razvojna agencija Ljubljanske urbane regije, 2007); Priporočila 9. razvojne skupine za kreativne industrije za povečanje konkurenčnosti Slovenije (Služba vlade Republike Slovenije za razvoj, 2008)), saj je izhajalo iz razmeroma uspešnih razvojnih modelov drugih gospodarsko razvitih držav (glej Department for culture, media and sport, 2001; Ministry of Economy, Trade and Industry, 2012; Creative Canada Policy Framework, 2017). Pri tem naj bi kreativne dejavnosti, pogosto imenovane tudi kreativno gospodarstvo in kreativne industrije, tvorile dragoceno orodje za razvoj drugih gospodarskih panog in pomagale pri nadomestitvi izgubljenih delovnih mest v tradicionalnih industrijskih in storitvenih sektorjih (Howkins, 2001; Hesmondhalgh, 2002). Pri povzemanju in poskusih uvajanja tujih modelov politik kreativne urbane regeneracije, ki temelji na povezovanju razvoja kreativnega sektorja in specifičnih urbanih lokacij, so bili v Sloveniji pogosto razvojna neskladja in zapleti pri zastavljenih razvojnih strategijah.

Prenašanje urbanih politik iz enega okolja v drugo namreč ni le preprost »mehaničen postopek replikacije«, kot sta ugotovila Peck in Theodore (2015: 25), temveč je neločljivo povezan z »mutacijami urbanih politik« (Peck in Theodore, 2015), ki se odzivajo in prilagajajo na lokalne posebnosti. Čeprav se zdijo nekateri razvojni modeli kreativnih mestnih politik na prvi pogled privlačni in napredni, jih ni mogoče prenesti v nov družbenogospodarski kontekst brez stranskih učinkov mutacij politik (Peck, 2011). Clark s sodelavci (2015) je navedel, da bi morala biti primerna prispodoba za vsako uvajanje novih politik prevod, ne nedotaknjen prenos, zaradi intenzivnih dialoških, včasih celo konfliktnih procesov preobrazbe, ki so neločljivi od poskusov uvajanja sistemskih novosti v lokalno okolje. Pri tem je treba poudariti, da večina kritičnih analiz uvažanja kreativnih urbanih politik ne kritizira uporabe koncepta kreativne urbane regeneracije ali kreativnega mesta, temveč se osredotoča na problematično uporabo ali neselektivno uporabo teh konceptov v nekem okolju. Vprašanje iz tega članka torej ni usmerjeno v koristnost uporabe kreativnih mestnih politik, temveč v način, kako se te uporabljajo in uresničujejo v prostoru.

V Sloveniji so bile v preteklosti zaradi različnih razlogov (npr. lokalnih političnih razmerij, gospodarskih transformacij, neutrjenih institucionalnih struktur) značilne nepremišljene uporabe politik kreativne urbane regeneracije. Kljub različnim strateškim dokumentom, ki so v tem obdobju nastali in med drugim obravnavali tudi politike kreativne urbane regeneracije (npr. Zelena knjiga – Izkoriščanje potenciala kulturnih in ustvarjalnih industrij, Strategija razvoja kulture v Mestni občini Ljubljana 2012–2015, dokumenta Strategija razvoja kulture v Mestni občini Ljubljana za obdobji 2016-2019 in 2020–2023 (z usmeritvami do leta 2027), dokumenti Regionalni razvojni program Ljubljanske urbane regije za obdobja 2007–2013, 2014-2020 in 2021-2027, Unija inovacij itd.), so bili zaradi neupoštevanja ali nerazumevanja posebnosti kreativnih ekosistemov (Jeffcutt, 2004; Cohendet idr., 2010; Rivas, 2011) v slovenskih mestih izvedeni prostorski posegi, ki so zmanjševali ali v celoti prezrli in zanikali nekatere oblike socialnih kreativnih potencialov in njihov doprinos k razvoju družbenogospodarskega sistema in kakovosti življenja v Sloveniji.

Članek se osredotoča na primer prestrukturiranja nekdanje Tobačne tovarne v Ljubljani, ki je paradigmatski primer procesov spreminjanja ali ukinjanja prostorov začasne kreativne rabe brez upoštevanja vrednosti mehkih, nesnovnih, neformalnih oblik kreativnih potencialov, ki izhajajo iz družbenogospodarskih dejavnosti, ki so se v vmesnem času začele izvajati na tem območju. Nekdanja Tobačna tovarna je bila ena izmed središčnih točk koncentracije kreativnih dejavnosti za mikro podjetja v ljubljanski regiji (Žaucer idr., 2012; Uršič, 2016; Kozina in Bole, 2018). Ob prodaji večjega dela območja zasebnim vlagateljem leta 2019 so se morala ta mikro podjetja prestrukturirati, spremeniti lokacijo ali prenehati poslovati. Cilj članka je analizirati in izpostaviti problematiko nepremišljenega ukinjanja delovanja pomembnega dela ene izmed največjih koncentracij kreativnih dejavnosti v mestu. Pri tem poudarjamo, da delovanje kreativnega ekosistema, kot je nekdanja Tobačna tovarna, temelji prav na t. i. mehkih dejavnikih (Murphy in Redmont, 2008; Martin-Brelot idr., 2010) in načelih socialnih omrežij (Shaw idr., 2016; Boessen idr., 2018), ki so premalo obravnavani v slovenskih strateških prostorskih dokumentih v zvezi s kreativnostjo. Pri tem bomo preverjali hipotezo, ali je socialna omrežja, ki izhajajo iz kreativnosti in so zaznamovana z lokacijo, ob procesih temeljite transformacije območja sploh mogoče zavarovati s preprosto fizično preselitvijo kreativnih akterjev na drugo lokacijo v mestu ali regiji. Ta članek uporablja izraz socialno omrežje v kontekstu, ki se nanaša na družbeno-prostorska ali skupnostna socialna omrežja, ne na digitalna socialna omrežja. Analiza učinkov prestrukturiranja nekdanje Tobačne tovarne na delovanje kreativnega ekosistema bo prikazana na podlagi analize podatkov, zajetih v okviru longitudinalne študije projekta Urbano izobraževanje v živo (Urban Education Live), ki je potekala v obdobju 2017-2020.

Pri tem bo posebna pozornost namenjena prav problematiki prezrtega vpliva mehkih (družbenih) dejavnikov pri tvorjenju, delovanju in dolgoročnem razvoju kreativnega ekosistema mesta in širše regije.

2 Socialna omrežja in razvoj urbanih kreativnih dejavnosti v dolgoročni perspektivi

Mehki (družbeni) dejavniki so običajno kontekstualni elementi, ki prispevajo k izboljšanju družbenih vidikov delovanja v zadevnem okolju (Murphy in Redmont, 2008; Martin-Brelot, idr., 2010; Musterd in Gritsai, 2013). Trdi (fizični) dejavniki se večinoma osredotočajo na razpoložljivost zadevnih virov, dejavniki mehke lokacije pa se nanašajo na izboljšanje splošne kakovosti življenja ali posameznikovega življenjskega sloga. V raziskavi bomo socialna omrežja vključili kot del mehkih privlačnih dejavnikov zaradi njihove funkcionalne vloge katalizatorja družbene angažiranosti ali družabnosti na proučevani lokaciji. Problematika nerazumevanja vpliva mehkih (družbenih) elementov na kreativni ekosistem je pravzaprav problematika spodbujanja ali zaviranja razvoja miljeja (Meusburger, 2009) v katerega so vpeti kreativni akterji. Če kreativni ekosistem lahko opredelimo kot »okolje, ki prek specializiranih načinov izmenjave, interakcije in komuniciranja med ljudmi in njihovim gospodarskim, socialnim in kulturnim kapitalom podpira kreativne dejavnosti« (Rivas, 2011: 4), se lahko kreativni milje razume kot njegov ključni sestavni del in vključuje mikro -socialni kontekst, ki zajema ljudi in njihov odnos do družbenokulturnega sistema, okolja in lokalne skupnosti (Uršič in Imai, 2020: 8). Kreativni milje s tega vidika dopolnjuje tradicionalne dele kreativnega ekosistema, kot so kreativni razredi, kreativna produkcija, kreativne lokacije, kreativne industrije (gospodarstvo) (Pratt, 2004; Florida idr., 2006; Poljak Istenič, 2017), in vanj integrira dele lokalno značilnega znanja, ki se zdi na prvi pogled nepomembno, vsakdanje in ločeno od kreativnih ekonomij. S poudarjanjem pomena kreativnega miljeja poskušamo opozoriti na pomen vzpostavljanja kreativnega sistema od spodaj navzgor, tj. iz lokalnih skupnosti prek kreativnih posameznikov in skupin do kreativnih ekonomij (Colomb in Novy, 2018). V številnih študijah (Giaccardi in Fischer, 2008; Sailer, 2011; Fischer, 2013) se namreč opaža, da je socialna kreativnost (Montuouri in Purser, 1997; Long in Pang, 2015; Petrović-Šteger, 2018; Vodopivec, 2018) pogosto prezrt del študij razvoja kreativnih dejavnosti, pri čemer se socialna kreativnost izkorišča za potrebe krepitve kulturne atraktivnosti in tržne vrednosti območja. Pri tem se socialni in kulturni kapital uporabljata v obliki marginalnih ali premostitvenih gentrifikatorjev (Smith, 1996: 105), ki se uporabljajo za trenutne potrebe razvoja območja, brez premisleka o dolgoročnem razvoju območja.

Kratkoročnost kreativnih urbanih politik pogosto temelji na razvojnih perspektivah, ki se vežejo zlasti na proizvod ali rezultat, kar zasenči pomen tega, kar Briskman (1980: 98) imenuje ustreznost notranjih povezav med temi izdelki in kontekstom, iz katerega izhajajo (glej tudi Poljak Istenič, 2015: 34). Pri osredotočenosti na končni proizvod je proces, v katerem je ta nastal, postavljen v sekundarni plan, okolje. Meusburger (2009) ter Wierenga in van Bruggen (1998) to umanjkanje konteksta v analizah kreativnih dejavnosti lepo prikažejo z analizo kreativnosti glede na časovni potek. V zvezi s tem je kreativnost kot lastnost ali vhodna spremenljivka ločena od kreativnosti kot procesa in od spremenljivke kot dosežka ali izhodnega rezultata (Wierenga in van Bruggen, 1998: 84). Psihologa True (1966) in Klausmeier (1961) podobno ločujeta med kreativno sposobnostjo (ang. *creative ability*) in kreativno zmogljivostjo (ang. *creative capacity*). Obe kategoriji se opirata na časovni potek postopka, pri čemer sposobnost pomeni moč, da se neko dejanje izvede zdaj, zmogljivost pa se nanaša na to, kaj bi se lahko dolgoročno izvedlo z zorenjem (nabiranje izkušenj, kumulativnih učinkov), izobraževanjem in interakcijo med komponentami tega ekosistema.

V članku se torej osredotočamo na kreativno zmogljivost, v okviru katere posamezna mestna območja v dolgoročni perspektivi delujejo kot »neformalni, kolektivni odprti prostori, ki lahko absorbirajo in rekombinirajo umetnost in kulturo, kar vodi k novostim in regeneraciji« (Lazzaretti, 2012). Za razumevanje mehkih (družbenih) vidikov kreativne zmogljivosti je pomembno upoštevanje pomena socialnih omrežij na območjih, ki so podvržena urbani prenovi. Socialna omrežja imajo pomembno vlogo pri oblikovanju in vzdrževanju prostorskih skupnosti in so eden ključnih elementov socialnega kapitala (Bourdieu, 1986; Putnam, 1995, 2000; Filipović, 2007), ki nastaja na podlagi »socialnih omrežij, norm recipročnosti in zaupanja ter pozitivnih posledic, ki jih ima ta kapital za posameznika in družbeni sistem« (Iglič, 2001: 186). Socialna omrežja v tem kontekstu opredeljujemo kot obstojno dinamično fizično in družbeno interakcijo v okvirih zadevnega prostora, ki nas zanima (Shaw idr., 2016; Boessen idr,. 2018). Še posebej so pomembna za delovanje kreativnih skupnosti ali ekosistemov, saj ti ekosistemi temeljijo prav na intenzivni komunikaciji in medsebojni izmenjavi informacij med uporabniki. V kreativnem ekosistemu so socialna omrežja ključna oblika socialnega kapitala, brez katere druge oblike kapitala težko pridejo do izraza ali veljajo za precej manj pomembne. To je razvidno iz številnih raziskav (Gottlieb, 1994; Landry in Bianchini, 1995; Scott, 2000; Florida, 2002, 2005), v katerih je prisotnost ustreznih socialnih omrežij označena kot pomembnejši dejavnik za razvoj kreativnih ekosistemov v odnosu do drugih dejavnikov, kot so finančna sredstva, tehnična infrastruktura, fizične značilnosti prostorov. V primeru visoko ustvarjalnih posameznikov gre pogosto za specializirane oblike

dejavnosti, pri katerih je materialna preskrbljenost pomemben element ustvarjanja ugodnih razmer za razvoj kreativnih industrij, vendar pa ni nujno tudi odločilni dejavnik za kreativno grozdenje (Scott, 2000; Bell in Jayne, 2001; Perrons, 2004) ali razraščanje in generacijski razvoj družbenogospodarskih dejavnosti na lokaciji. Izjemno pomembni so torej tudi drugi elementi na območju, saj le kombinacija ugodnih razmer, ki omogočajo osebnostni in znanstveni razvoj posameznika, lahko zagotovi uspešne temelje za dolgoročno delovanje kreativnih gospodarstev.

Ustrezne razmere za razvoj kreativnih industrij pravzaprav tvorijo raznovrstni na videz manj pomembni dejavniki, med katerimi so najbolj pogosto prezrta zlasti socialna omrežja, ki imajo nadvse pomemben učinek v prostoru in ustvarjajo ustrezno klimo ali milje za kreativna podjetja in ustvarjalne posameznike (Kozina in Clifton, 2019; Poljak Istenič, 2019). Pri tem velja omeniti, da so se številni poskusi razvijanja kreativnih območij, ki so temeljila na fizični prenovi in so manj vključevala vidike socialnih omrežij, izkazali za problematične in manj uspešne (Chase in Crawford, 1999; Harvey, 2000; Nyseth, 2012). Socialna omrežja so neločljiv in občutljiv del vsakega kreativnega ekosistema ter se odzivajo na zadevne prostorske spremembe in jih prenašajo na raven skupnosti. Delujejo kot prefinjena mreža senzorjev na terenu in hitro zaznajo najmanjše spremembe v organizaciji in delovanju na nekaterih prostorih. Te procese zaznavanja in prenašanja na raven skupnosti je mogoče opazovati pri številnih projektih prenove nekdanjih mestnih območij, na katerih se izvajajo hitre, nenadne spremembe, ki čez noč spreminjajo življenjske vzorce, servise in strukturo družbenih skupin v celotnih mestnih četrtih, kar se naknadno kaže v delovanju celotnega mesta. Z analizo nekdanjega območja Tobačne tovarne v Ljubljani bomo na praktičnem primeru prikazali, kako pomembna so pravzaprav socialna omrežja za delovanje kreativnega ekosistema Ljubljane, in poskušali opredeliti številne problematične vidike, ki so se pojavili ob prestrukturiranju območja in kažejo na pomanjkljivo kreativno zmogljivost Ljubljane, ki zavira bolj trajnosten razvoj mesta in širše regije.

3 Analiza prestrukturiranja območja nekdanje Tobačne tovarne in kreativnega ekosistema

3.1 Opis lokacije in uporabljena metodologija

Prvi del tovarniškega kompleksa nekdanje Tobačne tovarne v Ljubljani je bil zgrajen med letoma 1871 in 1890 ter je v Ljubljani med železniško progo Ljubljana–Trst, Tivolsko in Tržaško cesto ter Oražnovo ulico. Razvoj območja se je začel konec leta 1870, ko je ljubljanski občinski svet območje brezplačno odstopil industrijskemu razvoju tobačne industrije (Tobačna

Slika 1: Območje nekdanje Tobačne tovarne leta 2018 (foto: Urban Jeriha)

Ljubljana, 2019). Po desetletjih pestrega industrijskega razvoja območja so bile leta 1991 izvedene prve ključne spremembe v lastniški strukturi tovarniškega kompleksa, posledica pa je bilo postopno opuščanje proizvodnje tobačnih izdelkov. Leta 1991 se je začela postopna privatizacija območja (izvedli sta jo družbi Reemtsma Cigarettenfabriken GmbH in SEITA, Société Nationale D'exploitation Industrielle des Tabacs et Allumettes), ta pa se je leta 2002 nadaljevala z večinskim lastniškim vstopom družbe Imperial Tobacco. Sledilo je postopno opuščanje proizvodnih dejavnosti Tobačne Ljubljana, te dejavnosti so se popolnoma ustavile leta 2004. Skladno z zaprtjem proizvodnje so se začele tudi razprave o prihodnji namembnosti prostorov. Pri tem so prostore za začasno rabo namenili raznovrstnim dejavnostim: prostore so med drugim zasedli Upravna enota Ljubljana, tobačni muzej, galerija, kreativni center Poligon, zagonsko podjetje Zavod Hekovnik, oblikovalski in arhitekturni studii, številne nevladne organizacij in umetniške ustanove (npr. umetniška platforma Cirkulacija 2), razni administrativni servisi ter številne druge ustanove, društva in razna podjetja, povezana s kreativnimi dejavnosti (slika 1).

V okviru raziskave Creative Cities (European Regional Development Fund, Regionalna razvojna agencija Ljubljanske urbane regije, Inštitut za politike prostora, 2011; Inštitut za ekonomska raziskovanja, 2012) je bilo zaznano, da je bilo omenjeno območje po številu malih kreativnih podjetij med najbolj propulzivnimi območji v državi z vidika njihove številčnosti in heterogenosti (Žaucer idr., 2012). Po podatkih, ki so bili zajeti iz baz standardnih klasifikacij dejavnosti (SURS, 2011), je območje Tobačne vključevalo več kot 400 mikro podjetij s povprečno dvema do tremi zaposlenimi. Celotno območje Tobačne je bilo leta 2019 prodano zasebnemu vlagatelju, ki je spremenil pogoje delovanja večine dosedanjih najemnikov prostorov. Pri tem je iz intervjujev z nekdanjimi uporabniki razvidno, da je novi lastnik leta 2019 nenadno postavil precej težje pogoje najema prostorov, saj se je izrazito zvišala najemnina, zaradi česar so se uporabniki množično izselili z območja

tedaj nekdanje Tobačne. Pri tem se porajajo številna vprašanja, povezana z njenimi nekdanjimi uporabniki, njihovimi funkcijami in vplivom, ki jih ima ukinitev območja na delovanje širšega kreativnega ekosistema Ljubljane.

Navedena vprašanja bomo poskušali obravnavati z analizo socialnih omrežij na območju nekdanje Tobačne tovarne. Analiza socialnih omrežij bo s tega vidika ključno orodje za prepoznavanje povezav med pomembnimi akterji in prostori. Pri tem bomo poskušali prikazati pomen prepoznavanja in povezovanja socialnih interakcij z območjem Tobačne, kar naj bi pripomoglo k premisleku in okrepitvi zavedanja glede kontekstov, v katerih se porajajo potencialni dogovori, spori, pogajanja, nerazumevanje, odnosi moči in odgovornosti (Genz in Lucas-Drogan 2019: 2). Podatki so bili zbrani s polstrukturiranimi intervjuji z uporabniki prostorov. Tako smo v dveh fazah longitudinalne raziskave Urban Education Live izvedli 61 intervjujev. Najprej smo med aprilom in avgustom 2018 izvedli 31 intervjujev z različnimi skupinami deležnikov, nato pa smo januarjem in aprilom 2020 pridobili še dodatnih 30 intervjujev (N = 61). Intervjuvanje je potekalo po naključnem vzorcu intervjuvancev, ki kot uporabniki prostorov delujejo v okviru različnih dejavnosti v Tobačni. Skupine deležnikov pa smo uteževali po načelu enakomerne geografske porazdelitve po celotnem območju (glede na različne zgradbe na območju Tobačne). Pri tem so bile v analizo vključene najrazličnejše skupine deležnikov, ki segajo od zaposlenih v kreativnih podjetjih, javnih ustanovah, nevladnih organizacijah do zavodov, inštitutov ipd. Razen redkih posameznikov Tobačna nima prebivalcev in je kot taka zlasti mešano poslovno-obrtno-kulturno območje. Največja skupina intervjuvancev so bili zato zaposleni v kreativnih podjetjih, ki so tudi ključni deležniki na območju Tobačne. Intervjuji so bili strukturirani na način, ki naj bi omogočal analizo nekaterih elementov socialnih mrež v navezavi na prostore v območju Tobačne. Prav zaradi tega kombiniranja družbeno-prostorske analize je bilo treba raziskavo podkrepiti tudi z drugimi metodami, poleg intervjujev. Kot podpora intervjujem je bila zato uporabljena kombinacija več kvalitativnih metod (opazovanje z udeležbo, terensko opazovanje, kognitivno kartiranje itd.), to pa naj bi podalo verodostojne obrise povezav med prostori in njihovimi pomeni za različne akterje.

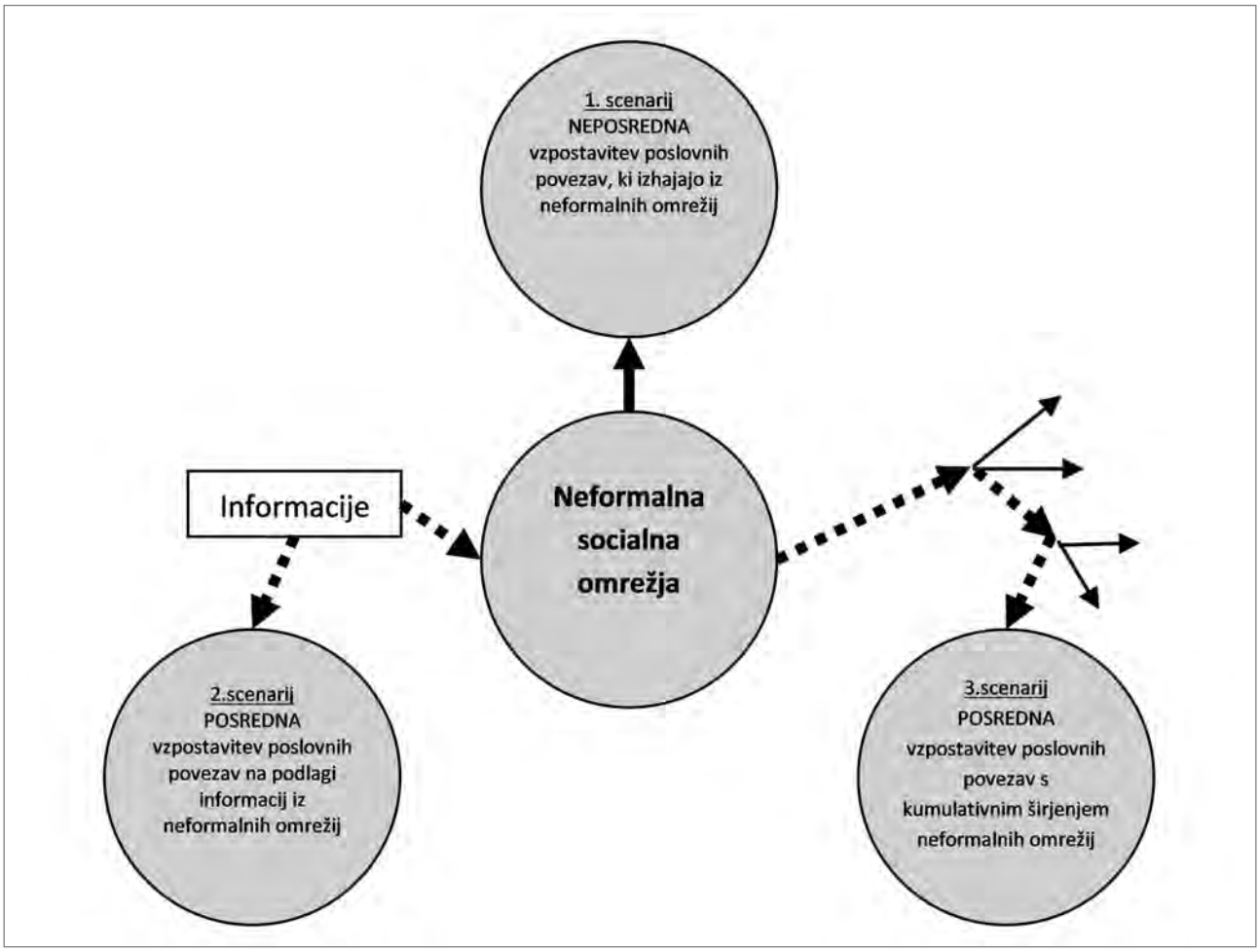
3.2 Analiza sprememb v delovanju socialnih mrež na območju Tobačne

Analiza socialnih omrežij je prikazana na podlagi časovnega vidika: upoštevani so vplivi na socialne mreže v različnih obdobjih na območju nekdanje Tobačne tovarne. Vpogled v dogajanje v različnih obdobjih nam omogoča longitudinalna raziskava, ki po posameznih fazah prikaže večplastne spremembe socialnih omrežij. Za analizo smo uporabili podatke iz nekaterih sklopov odprtih vprašanj iz polstrukturiranih intervjujev, ki smo jih kvalitativno analizirali na podlagi temeljne analize besedil. Uporabili smo pragmatično analizo besedila (Verschueren, 1995), pri čemer smo po pregledu besedila in z razvrščanjem odgovorov po posameznih kategorijah pojasnjevali analizirane dimenzije socialnih omrežij. Iz analiz podatkov raziskave Urban Education Live lahko ekstrapoliramo več značilnosti socialnih omrežij kreativnega ekosistema na širši kontekst delovanja celotnega kreativnega sistema Ljubljane in širše regije (z upoštevanjem specifičnih razlik (glede na kontekst, strukturo deležnikov, geografsko razporeditev)). Z drugimi besedami, v nadaljevanju bo na primeru nekdanje Tobačne tovarne predstavljenih nekaj značilnosti povezav med socialnimi omrežji, razvojem socialnega kapitala in delovanjem kreativnih ekosistemov, ki so ključni elementi (gradniko) razvoja kreativnih dejavnosti na širšem območju Slovenije. Način upoštevanja teh značilnosti in elementov vpliva na kratkoročnost ali dolgoročnost kreativnih zmogljivosti nekega mesta, regije ali države. V okviru omenjene raziskave so bili v obdobju 2017-2020 na območju nekdanje Tobačne tovarne ugotovljene značilnosti in spremembe delovanja kreativnih socialnih omrežij, kot sledi v nadaljevanju.

3.2.1 Grozdenje kreativnih dejavnosti na podlagi formalnih in neformalnih mrež

Intervjuvanci na območju nekdanje Tobačne tovarne imajo na splošno zelo razvejana socialna omrežja. Pri nadaljnji analizi se je izkazalo, da formalne mreže, opredeljene kot delovne, projektne, pogodbene povezave (odnos naročnik - izvajalec), pomembno vplivajo na razvoj kreativnih dejavnosti, vendar so sočasno močno odvisne od neformalnih mrež, ki izhajajo iz prijateljskih vezi in se kažejo z druženjem, preživljanjem prostega časa med odmori, kosili, sprehodi, odmorom za kavo ipd. Omeniti velja, da intervjuvancev nismo spraševali po vseh oblikah socialnih stikov, temveč le po tistih najpogostejših, jedrnih stikih, s katerimi povezave vzpostavljajo najpogosteje, kar v praksi pomeni, da je stik vzpostavljen večkrat na teden. V povprečju je vsak intervjuvanec navedel pet jedrnih stikov ali oseb na neformalni ravni in dva stika na formalni ravni. Od tega je bil v povprečju en stik član tako formalnih kot neformalnih mrež, tj. hkrati prijatelj, sodelavec in poslovni partner.

Dopolnjevanje med formalnimi (delovnimi) in neformalnimi (prijateljskimi) povezavami je v intervjujih razvidno zlasti v kontekstu časovnega poteka, ki kaže na postopno prehajanje posameznih neformalnih stikov v formalne stike in obratno. Gre torej za fleksibilno obliko povezovanja med akterji, poslovnimi subjekti, uporabniki, ki jim je skupna enotna lokacijska pripadnost glede uporabe zadevnih prostorov. Intervjuji so namreč pokazali, da se je večina stikov izoblikovala postopno z uporabo raznih mikro lokacij na območju nekdanje Tobačne



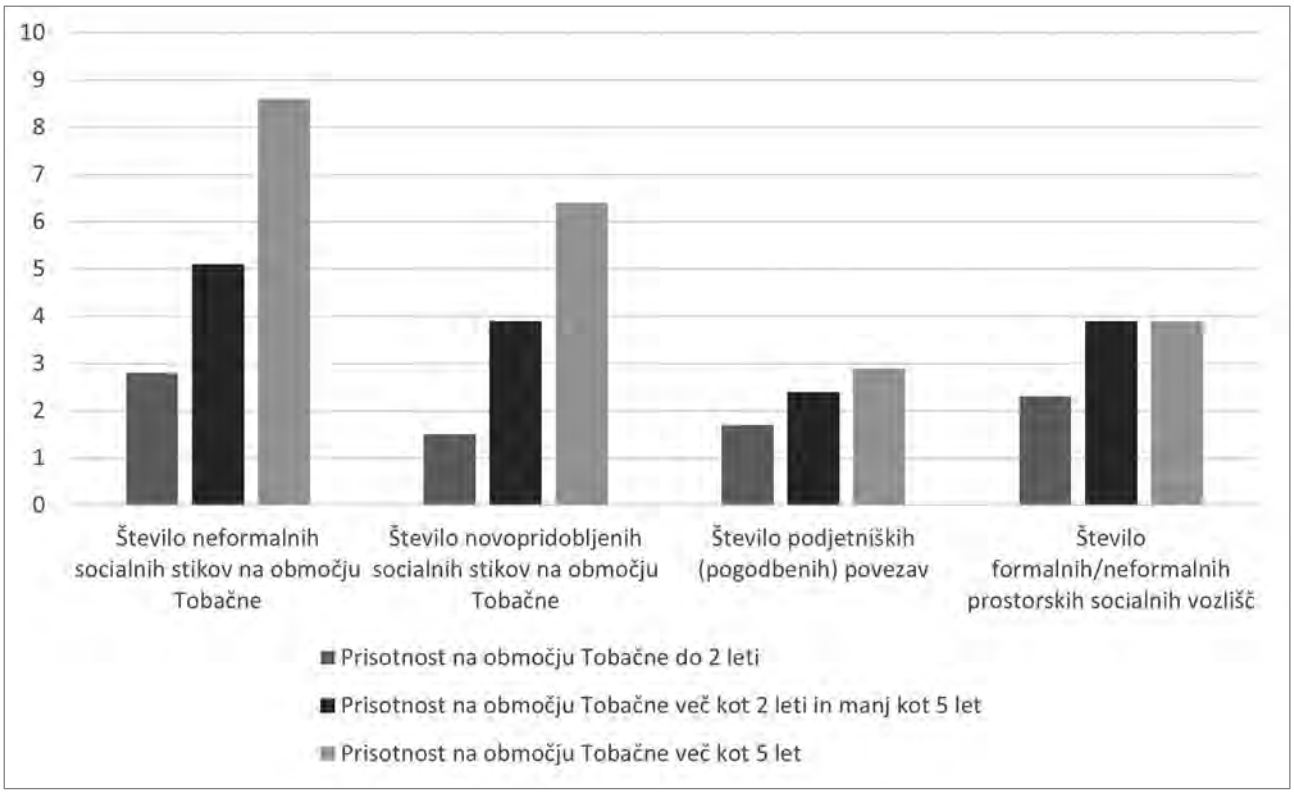
Slika 2: Prikaz scenarijev grozdenja kreativnih dejavnosti na podlagi neformalnih mrež (ilustracija: Matjaž Uršič)

tovarne (odprte javne površine, hodniki, balkoni, lokali, restavracije ipd.), pri čemer so se izmenjevali stiki in informacije. Omeniti velja zlasti večjo številčnost neformalnih stikov, kar je razumljivo, saj smo med formalne stike šteli le povezave zunaj neposrednega delovnega okolja intervjuvanca. Med formalne stike so bile torej štete le povezave z drugimi podjetji ali zaposlenimi na območju Tobačne zunaj intervjuvančevega delovnega prostora. Obe vrsti stikov kažeta na razvejan podjetniški ali kreativni ekosistem, v katerem se podjetja in posamezniki priložnostno povezujejo, sodelujejo in v katerem poteka grozdenje podjetij na podlagi stalnega prepletanja formalnih in neformalnih stikov.

V intervjujih je poudarjen pomen neformalnih stikov za grozdenje kreativnih dejavnosti, saj imajo ti izjemno pomembno vlogo za osnovne komunikacijske kanale in poglabljajo ali vzpostavljajo medosebne odnose, pri čemer se zaradi večje stopnje zaupanja med kreativnimi posamezniki krepi izmenjava tacitnih (prikritih) informacij glede delovanja kreativnega ekosistema. Gre za način posrednega vplivanja na oblikovanje kreativnega ekosistema, ki v nasprotju z neposrednimi vplivi lahko ostane izvzet, neopažen v analizah poslovnega okolja (slika 2). Z drugimi besedami, čeprav neformalne mreže morda ne pripeljejo do neposrednih poslovnih povezav, je iz intervjujev razvidno, da ta omrežja prenašajo informacije, ki omogočajo posredno vzpostavljanje ekonomskih transakcij ali pa prek postopnega kumulativnega (po načelu snežne kepe) širjenja razvejanosti neformalnih stikov prav tako posredno privedejo tudi do postopnega širjenja poslovnih mrež znotraj kreativnega ekosistema nekdanje Tobačne tovarne.

3.2.2 Vpliv časovnega vidika na številčnost in razvejanost povezav v socialnih omrežjih na območju Tobačne

Podobno kot v drugih analizah socialnih omrežij (Filipović, 2007; Gibbons idr., 2018; Ye in Liu, 2018) so tudi podatki v naši raziskavi Urban Education Live nakazali na izjemno pomembno vlogo spremenljivke trajanja procesa. Trajanje nekaterih procesov, vezanih na posamezne lokacije (socialna vozlišča),



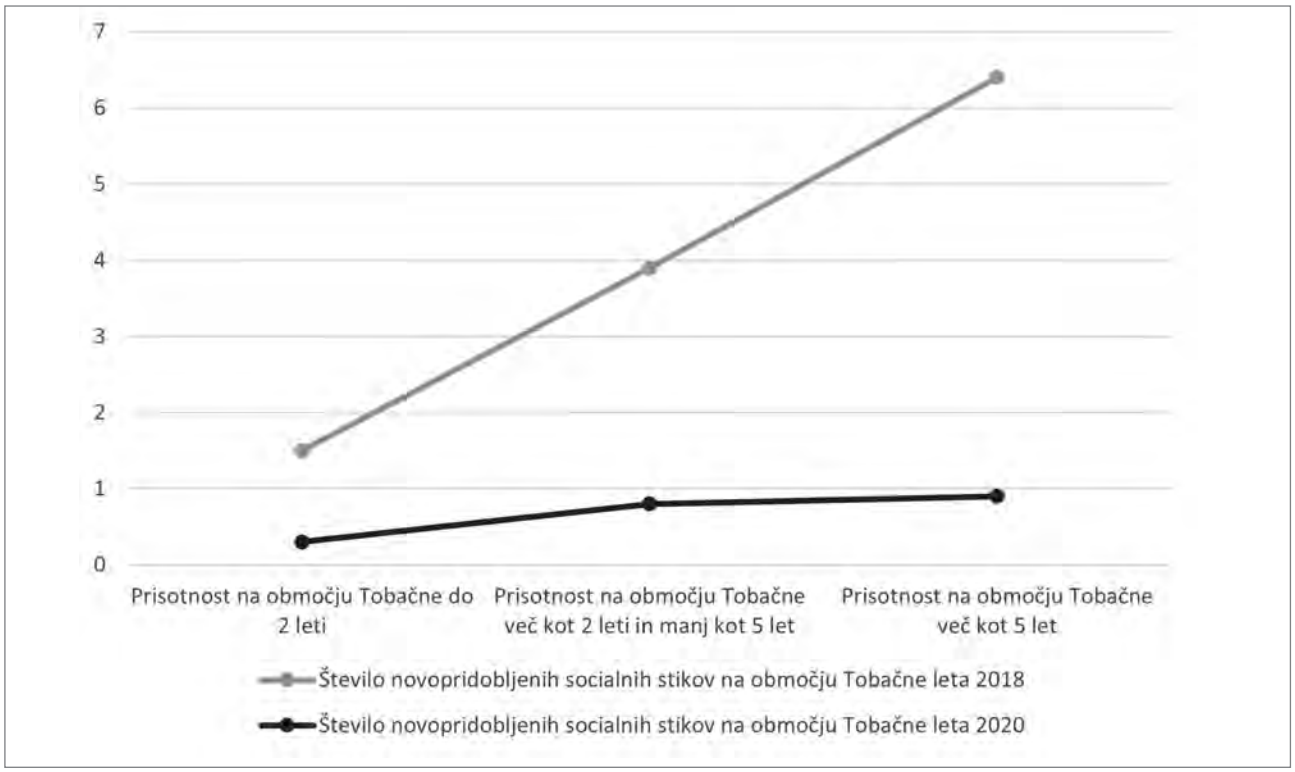
Slika 3: Naraščanje številčnosti in prostorske razvejanosti različnih oblik socialnih omrežij glede na število let prisotnosti na območju Tobačne (vir: Urban Education Live, 2019, 2020)

je v tem pogledu vplivalo na to, kako številčne in razvejene so posameznikove mreže. Podatki so pokazali, da število let, ki jih je intervjuvanec preživel na območju Tobačne, močno vpliva na intenzivnost ali globino omenjenih socialnih omrežij. Več let na območju je tako pomenilo tudi večjo številčno in prostorsko razvejanost posameznikovih neformalnih in formalnih mrež na območju Tobačne (slika 3).

Eksponencialno s povečevanjem števila let na območju Tobačne se je na mentalnih zemljevidih (Lynch, 1990) intervjuvancev oblikovalo tudi več prostorov ali socialnih vozlišč za formalna in neformalna druženja na območju Tobačne (kot najbolj priljubljena socialna vozlišča so bile navedene zlasti restavracije, lokali in vhodni prostori pred ključnimi stavbami). Z vidika izpostavljanja pomena socialnih mrež za kreativno grozdenje je treba omeniti, da je raziskava pokazala, da je število let prisotnosti posameznika na območju Tobačne vplivalo tudi na pridobivanje novih formalnih socialnih stikov na območju Tobačne, ki so se uresničevali v različnih oblikah podjetniških (pogodbenih) sodelovanj. Skladno z leti prisotnosti na območju je torej naraščalo tudi število podjetniških (pogodbenih) povezav. V povprečju so intervjuvanci v obdobju delovanja na območju Tobačne pridobili 3,5 novega stika. Ob nadaljnjih vprašanjih glede globine teh stikov so navedli, da so jim ob različnih dogodkih pomoč v povprečju nudili trije jedrni stiki s seznama ključnih oseb, ki so jih navedli, kar dodatno potrjuje moč socialnih omrežij, ki so se v obdobju prisotnosti na območju Tobačne stkala med njenimi uporabniki.

3.2.3 Vpliv zmanjševanja obsega socialnih omrežij na socialni kapital

Analiza formalnih in neformalnih stikov, ki smo jo dopolnili s časovno spremenljivko, je pokazala, kako se je na območju nekdanje Tobačne tovarne postopoma kopičil socialni kapital, ki se je prek socialnih omrežij med drugim izražal tudi v obliki raznih kreativnih dejavnosti, podjetij in poslovnih stikov. Pri tem je treba poudariti, da je socialni kapital, ki se je nabral na tej lokaciji, prepleten z lokalnostjo, tj. lokalnim ustrojem tako na fizični, kulturni kot družbeni ravni. Gre za načelo družbene produkcije prostora (Lefebvre, 1991, 299-346), pri čemer je prostor kot fizična kategorija neločljiv od družbene ustrojenosti prostora. Lefebvre pri tem opozarja na ključen pomen časovnega vidika produkcije prostora, saj to pomeni, da čez čas na podlagi specifičnih načinov uporabe (prostorskih praks, predstavitev prostora, prostorov reprezentacije, kolektivne izkušnje) nastane nov prostor, ki se izmika preprostim opredelitvam fizičnega blaga z estetsko vrednostjo. Če produkcija prostora temelji zgolj na fizičnem spreminjanju prostora in ob tem izključuje druge oblike (socialnih) vrednosti, ki so nastale na območju, se poenostavlja proces prostorskega razvoja, kar vpliva na zmanjševanje obsega socialnega kapitala in socialne-

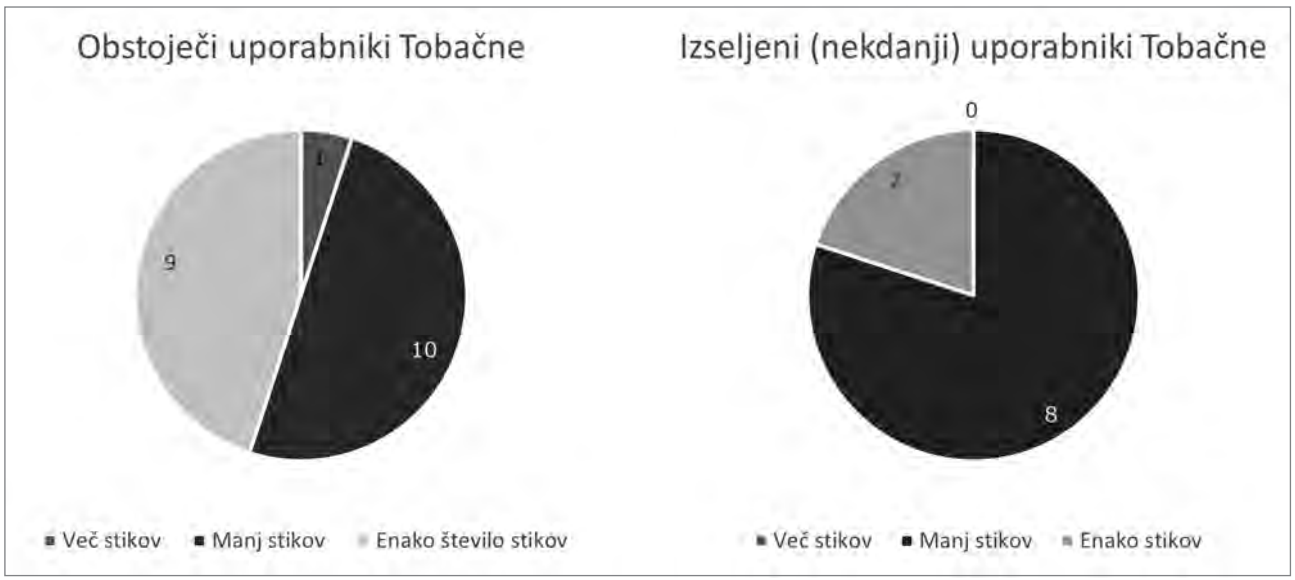


Slika 4: Primerjava naraščanja novih socialnih stikov med letoma 2018 in 2020 (vir: Urban Education Live, 2019, 2020)

ga omrežja. To smo v kontekstu prestrukturiranja nekdanje Tobačne tovarne zaznali ob primerjavi podatkov intervjujev iz obdobja pred prodajo (leta 2018) in po njej (2020) ter posledično ustavitvi večjega dela tobačne za kreativne dejavnosti. Po prodaji večine območja nekdanje Tobačne tovarne je za kreativne dejavnosti ostala le še stavba na Tržaški 2, pri čemer je prestrukturiranje območja pokazalo na naglo zmanjševanje obsega socialnih omrežij v vseh analiziranih dimenzijah formalnih, neformalnih mrež in poslovnih (pogodbenih) povezav. V primerjalnem obdobju 2018-2020 se je na primer indeks na novo vzpostavljenih socialnih povezav zmanjšal s povprečja štirih povezav na približno eno novo povezavo (slika 4).

Podatki torej kažejo, da je zaprtje večine socialnih vozlišč na območju močno vplivalo na obseg širitve socialnih omrežij. Zavrtje razvoja socialnih omrežij na območju, ki je podvrženo popolni funkcionalni ali storitveni, dejavnostni transformaciji, je lahko označeno kot logična posledica procesa prostorske preobrazbe, vendar je ob tem treba opozoriti na problematičnost krčenja socialnih omrežij, ki poteka skladno s selitvijo posameznih kreativnih akterjev na druge lokacije v mestu. Z drugimi besedami, čeprav so kreativni akterji, ki so ostali ali so se preselili z območja nekdanje Tobačne tovarne, navedli, da so vzpostavili nove stike v manjšem obsegu kot prejšnja leta, so obenem pojasnili, da se je zmanjšal obseg, tj. prakticirajo se povezave v okviru obstoječe socialne mreže formalnih in neformalnih stikov po prestrukturiranju območja. Ob vprašanju, ali je ukinitev dela območja vplivala na frekventnost srečevanja, sodelovanja, druženja z drugimi uporabniki Tobačne, so zdajšnje in nekdanje skupine uporabnikov Tobačne odgovorile pritrdilno (slika 5).

Longitudinalna analiza je omogočila primerjavo modifikacij socialnih omrežij med zdajšnjimi in nekdanjimi uporabniki Tobačne, ki so se morali po spremembi lastništva območja izseliti z lokacije. Med 30 intervjuji, ki so bili opravljeni leta 2020, je bila teh približno ena tretjina. Ta skupina intervjuvancev je bila zaradi primerjalne možnosti z letom 2018 še posebej zanimiva, saj izrazito zmanjšanje njihovega socialnega omrežja, ki je bilo vezano na nekdanjo Tobačno tovarno, kaže na nezmožnost ali težavnost njihovega ohranjanja v razmerah spontanega (tržnega) razvoja kreativnih dejavnosti. Čeprav socialna omrežja delujejo na podlagi nesnovnih povezav in niso neposredno povezana s fizičnimi parametri, tj. ne slonijo na materializiranih (vidnih) osnovah, podatki kažejo, da poskus njihovega ločevanja (selitve, iztrganja) iz lokalnega (skupnostnega) konteksta ali miljeja, močno vpliva na njihov obseg in funkcionalnost. Gre torej za družbeno produkcijo prostora, pri čemer se z ukinjanjem kreativnih mrež na njihovi izvorni lokaciji, kjer so se prek dolgoročnega (večletnega) procesa izoblikovali kompleksni komunikacijski in produkcijski odnosi med kreativnimi akterji, krči obseg kreativnega ekosistema. Ključna izguba poleg izgubljenega nesnovnega, socialnega kapitala za mesto v tem smislu je prav čas, ki bo potreben za razvoj novih



Slika 5: Ali se po prodaji območja več ali manj družite, videvate, sodelujete z drugimi uporabniki Tobačne – primerjava med zdajšnjimi in odseljenimi kreativnimi akterji na območju nekdanje Tobačne tovarne, 2020 (N = 30) (vir: Urban Education Live, 2019, 2020)

podobnih kreativnih mrež na drugih lokacijah v mestu. Pri tem lahko zgolj domnevamo koliko finančnih sredstev in let bo potrebnih za vzpostavitev novih podobnih vozliščnih točk in obnovo socialnih omrežij na ravni kreativnega ekosistema malih podjetij, ki imajo z vidika dostopnosti do primernih prostorskih zmožnosti že tako velik primanjkljaj zaradi drugih učinkov tržnega gospodarstva ali urbano-razvojnih ekonomskih politik, ki temeljijo na kratkoročnih maksimizacijah kapitalskih učinkov.

4 Razprava

Primer nekdanje Tobačne tovarne kaže na specifične razmere za kreativne dejavnosti v Sloveniji. V tem smislu gre za spontan razvoj kreativnih dejavnosti, ki poteka na podlagi prepuščanja toku tržnih razmer. Kot prednostni dejavnik vzpostavljanja kreativnih vozlišč ali miljeja v teh razmerah izstopata bližina čim večjega trga ali velikost agregirane populacije in geografska umestitev v infrastrukturno, zgodovinsko, upravno središče regije (Kozina 2010). S tega vidika se razporeditev kreativnih dejavnosti v Mestni občini Ljubljana in ljubljanski urbani regiji približuje ideji osrednjih krajev (Christaller, 1966; Logan in Molotch, 1987; Cigale, 2002; Burger in Meijers, 2012), za katere je značilno kopičenje virov in potencialov zgolj na lokacijah, ki imajo veliko gospodarsko moč in ustrezno število prebivalcev.

Na podlagi teh značilnosti se je postopno oblikoval kreativni ekosistem Tobačne, v katerem so bile razmere v nekem obdobju naklonjene tem procesom (sorazmerna bližina središča mesta, dostop do razmeroma ugodnih najemnih prostorov, hitro kopičenje podobnih kreativnih dejavnosti in akterjev ipd.). Problem takšnega spontanega razvoja kreativnih dejavnosti malih podjetij, pri čemer se s povezovanjem akterjev, specifičnih lokacijskih značilnosti in mehkih (socialnih) dejavnikov oblikujejo kreativni miljeji, je v možnosti nenadnih sprememb pogojev, ki po navadi pomenijo tudi hitre prelome v delovanju tovrstnih kreativnih miljejev. Ob primeru nenadnih sprememb tržnih razmer v sistemu osrednjih lokacij, ki temeljijo na hierarhičnih odnosih med gospodarsko močnejšimi in šibkejšimi akterji, se lahko na posameznih lokacijah kreativni ekosistem popolnoma razgradi. Pri tem so šibkejši akterji, čeprav opravljajo pomembno vlogo v smislu vzdrževanja socialnega kapitala na kreativnih območjih, preprosto izrinjeni z lokacij. V tej hierarhični ureditvi zaradi izrinjanja šibkejših oblik kreativnih akterjev se postopno izvaja homogenizacija dejavnosti in se razvijajo zgolj posamezne vrste kreativnih akterjev, posledično je prostorska razporeditev kreativnih dejavnosti neenakomerna. Vse to vpliva na manjšo funkcionalno heterogenost kreativnih ekosistemov, saj so najuspešnejši tiste panoge, podjetja in akterji, ki imajo hiter dostop do velikega trga in zaledja, iz katerega črpajo potrebne človeške vire. Pri tem izboru, profiliaciji kreativnih akterjev glede na sposobnost hitrega odzivanja na trenutne gospodarske razmere gre za t. i. entropično razsežnost družbenogospodarskega sistema (Kirn, 2008). V entropičnem družbeno-gospodarskem sistemu se energije ali akterji in podjetja, povezana z razvojem kreativnih dejavnosti, zbirajo na zadevnih lokacijah, vendar ob tem obstaja nevarnost, da se bodo po nekem obdobju zaradi slabe finančne podlage, premajhnih spodbud iz okolja ali nezmožnosti nadgradnje svojih dejavnosti zaradi omejenih prostorskih, socialnih, človeških virov ti potenciali ali zametki potencialno uspešnih kreativnih dejavnosti razpršili ali bodo celo opustili dejavnost.

5 Sklep

V uvodnem delu članka je bilo izpostavljena hipoteza, da lokalni organi in državni institucionalni akterji niso zmožni zaznati pomena mehkih (socialnih) dejavnikov za delovanje kreativnih ekosistemov. Pri tem smo na podlagi raziskovalnih podatkov potrdili predpostavko in prikazali, kako pomembni so mehki dejavniki za oblikovanje in vzdrževanje kreativnega ekosistema. Neločljivost mehkih (socialnih) elementov od kreativne produkcije smo dokazovali na podlagi analize povezovanja formalnih in neformalnih socialnih omrežij, pri čemer so zlasti neformalna omrežja imela vlogo pomembne komunikacijske platforme za vzpostavljanje ustreznega kreativnega miljeja in grozdenje kreativnih dejavnosti. Podatki kažejo tudi na izjemen pomen časovnega vidika pri razvoju kreativnih dejavnosti. Ločevanje med kratkoročnimi in dolgoročnimi učinki kopičenja socialnih stikov se med drugim zrcali tudi v uspešnosti delovanja kreativnega ekosistema. Ne nazadnje, ohranjanje heterogenosti kreativnih akterjev na območju kreativnih dejavnosti je nujen pogoj za dolgoročno uspešno delovanje kreativnega ekosistema, saj kreativnih socialnih mrež ni mogoče prestavljati z ene lokacijo na drugo brez škodljivih stranskih učinkov. Ti se kažejo v izgubi nakopičenega socialnega kapitala (kreativnih mrež), časa in finančnih sredstev, ki so potrebni za postopno vzpostavljanje podobnih kreativnih miljejev.

Pomanjkljivosti kratkovidnih politik spontanega tržnega razvoja urbanih kreativnih dejavnosti se kažejo v izmeničnih ciklih nenehnega ugašanja in ponovnih poskusih ustvarjanja kreativnih socialnih omrežij, kar dolgoročno lahko vodi k postopnemu usihanju moči nesnovnih oblik vrednosti in socialnega kapitala. Pri tem se odpirajo pomembna vprašanja, do katere mere naj se urbane politike sploh vpletajo v načrtovanje kreativnih miljejev, ki temeljijo na združevanju elementov, ki jih formalni sistem prostorskega načrtovanja težko nadzira. Ob tem je treba poudariti, da se verjetno vsaka urbana politika, ki poskuša neposredno usmerjati ali načrtovati oblikovanje kreativnosti samo od zgoraj navzdol, spoprijema s konflikti. Oblikovanje kreativnih ekosistemov vključuje kompleksne, delno neobvladljive spremenljivke in dejavnike, zaradi katerih je natančno načrtovanje nepredvidljivo in neučinkovito. Zaradi tega je treba pozornost pri oblikovanju urbanih kreativnih politik preusmeriti na povečanje sposobnosti merjenja, analize, zaznavanja elementov od spodaj navzgor, ki so bili do sedaj neupravičeno podcenjeni v analizi kreativnih dejavnosti (Colomb in Novy, 2018). V tem kontekstu je primer prenove nekdanje Tobačne tovarne zgleden primer neprimernega pristopa, ki opozarja na vprašanje merjenja nekaterih nematerialnih vrednosti posameznih območij. Podoben primer vprašljive, nezadostne analize pomena socialnih omrežij za delovanje družbenogospodarskega sistema Ljubljane bi lahko ponazorili še z drugimi primeri, ki niso bili posebej obravnavani v tem članku (npr. območje Tovarne Rog, območje Metelkove). Olsson (1999) in Bianchini (1999) na primer omenjata, da ni enotne metode merjenja nematerialnih vrednosti, kar povzroča izjemne spore in napetosti ter v prostorsko načrtovanje vnaša velike težave. Pri tem na politični ravni nastajajo velika neskladja med posameznimi strokami glede potrebe merjenja tovrstnih elementov. Problem kreativnih urbanih politik v Sloveniji torej ni v nesposobnosti načrtovanja tovrstnih dejavnosti, temveč nezmožnosti sistematičnega zaznavanja in dopuščanja delovanja nujnih elementov, ki so potrebni za vzdrževanje, ohranjanje, razvoj tovrstnih dejavnosti. Scott (2014: 569) tako ugotavlja, da morajo oblasti, preden se izvede katera koli sprememba kreativne politike, pridobiti podroben družbenozgodovinski vpogled in razumeti posebnosti lokalnega urbanega razvoja, da se lahko vpletejo v oblikovanje lokalnih vzorcev iznajdljivosti in domišljije. Izogibanje institucionalnih akterjev nujno potrebni predhodni analizi lokalnih razmer povzroči neupravičeno poenostavljeno razmišljanje (Scott, 2014: 574) in vzbuja dvom, kar pogosto vodi v zagovor regresivnih urbanih politik.

V slovenskem posttranzicijskem obdobju na področju razvoja urbane kreativnosti prevladuje predvsem produkcijski pristop (Hall in Robertson, 2001: 19), ki izraža zaskrbljenost politik glede produkcije in kapitalizacije kreativnosti. To se zrcali tudi v dokumentih, ki poskušajo območje Tobačne vključevati v tovrstne razvojne sheme (glej npr. Mestna občina Ljubljana, 2012, 2016, 2020). Ta pristop ne ocenjuje ustrezno dolgoročne vloge in vpliva kreativnosti na mesto v sedanjih razmerah postmodernih, globaliziranih okolij. S tega vidika bodo morali prihodnji pristopi h kreativni urbani regeneraciji razviti mehanizme, ki zaznavajo spremembe v subtilni strukturi kreativnega ekosistema in so sposobni združiti kulturno, socialno in ekonomsko vrednost ustvarjalnosti v eno celoto. Namen članka je bil narediti bolj vidne in razumljive vsaj nekatere prezrte vidike kreativnosti ter izpostaviti njihova pomen in vlogo v kreativnem ekosistemu. Poskušali smo pokazati, da na Ljubljano dolgoročno lahko pomembno vplivajo včasih manj opazne mikrospremembe na lokalni ravni, pri čemer je gotovo, da bo treba izdelati nove modele vrednotenja dragocenih družbeno-kulturnih elementov, krajev in prostorov mesta. Tega postopka ni mogoče izvesti v kratkem času, saj zahteva prelom z obstoječim prostorskim načrtovanjem. Ta produkcijski pristop k prostorskemu načrtovanju je sestavljen iz nizov idej, miselnih modelov in predvsem sistema vrednot, ki so vgrajeni v delovanje, življenje in vsakodnevno organizacijo ustanov, skupnosti in vsakodnevnih uporabnikov mesta, regije in države. Prekinitev tega je mukotrpen in dolgotrajen postopek. Razvoj dolgoročnih kreativnih zmogljivosti Ljubljane temelji torej na kvalitativnem preskoku, ki epistemsko pomeni novo družbe-

no-prostorsko paradigmo ali paradigmatični premik (Kuhn, 1970: 85), v katerega so zajeti sistemi gospodarskega, urbanega in zlasti socialnega razvoja.

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Opombe

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Vodarski pogled na uvajanje modro-zelene infrastrukture v mestih

Modro-zelena infrastruktura (MZI) so naravni in polnaravni (zato zelena) decentralizirani sistemi, namenjeni upravljanju padavinskih voda (zato modra) v mestih, ki hkrati opravljajo zelo raznovrstne ekosistemske storitve. Razen v nekaj tujih mestih, kjer so že sprejeli strategije za njihovo sistematično uvedbo, je uvajanje MZI omejeno na zgolj posamezne osamljene primere. To še posebej velja za Slovenijo, kjer uporaba MZI še ni postala pravilo. Zaradi utečenih prostorskonačrtovalskih praks imamo v slovenskih mestih zadosten delež razmeroma enakomerno razporejenih zelenih površin, ki pa niso načrtovane po načelih MZI, zato njihova večfunkcionalnost z vidika voda ni izkoriščena. Ker upravljanje mestnega prostora in pripadajočih prvin spada pod okrilje več strok, nas je zanimala predvsem povezava med prostorskim načrtovanjem in upravljanjem voda v mednarodnih strateških dokumentih in v slovenski zakonodaji. Na podlagi pregledane literature smo lahko sklenili, da je tovrstna povezava predvsem na mednarodni ravni, na nacionalni ravni pa je že šibkejša in je delovanje predvsem na izvedbeni ravni vezano na posamezne sektorje. V nadaljevanju so predstavljeni štirje primeri sistemskega uvajanja MZI v tujini: v Rotterdamu, Københavnnavnu, v izbranih kitajskih mestih in v Filadelfiji, tem je skupno povezovanje med prostorskim načrtovanjem in upravljanjem voda pri načrtovanju MZI. Rezultati analize stanja so bili izhodišče za oblikovanje priporočil, s katerimi je mogoče preseči sektorsko upravljanje mestnega prostora in doseči celovitejše upravljanje voda v (slovenskih) mestih.

Ključne besede: vodarstvo, prostorsko načrtovanje, urbana odvodnja, modro-zelena infrastruktura, podnebne spremembe

1 Uvod

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 (Krajnc, 2019). Tudi za Slovenijo se po projekcijah podnebnih sprememb napoveduje, da lahko do sredine stoletja pričakujemo večje število ekstremnih vremenskih dogodkov: hudo vročino poleti, večjo 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 (Dolinar idr., 2014). 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 idr., 2020). V praksi deležniki pogosto delujejo samostojno in nepovezano, kar se vse bolj kaže kot ena izmed največjih ovir v upravljanju vode v mestih (Globevnik in Simoneti, 2020). Pri tem še posebej izstopajo vsebine, ki se šele uvajajo in (v Sloveniji) še nimajo ustaljenih načrtovalskih in upravljavskih pristopov, kot je na primer *modro-zelena infrastruktura* (v nadaljevanju: MZI) (Ravnikar in Goličnik Marušić, 2019).

Ključno za reševanje izzivov, ki jih mestom prinašajo podnebne spremembe, je obvladovanje *urbanega vodnega kroga*, kar je poleg vodne infrastrukture neposredno povezano tudi z (ne)utrjenimi mestnimi površinami in njihovim zaledjem. Zato ima pri prostorskem načrtovanju upravljanje voda vse večji pomen (Serrao-Neumann idr., 2017). Cilj je čim boljše posnemanje naravnega površinskega odtoka, ki je bil značilen za območje pred posegom v prostor. Nove ureditve pa z utrjevanjem površin v mestu zahtevajo širjenje tako imenovane *sive infrastrukture,* kot imenujemo gospodarsko javno infrastrukturo. Padavinskih voda v upravljanju in urejanju mest ne smemo obravnavati le kot odpadek, ki ga je treba čim hitreje odvesti v kanalizacijski sistem. Takšno ravnanje namreč dodatno obremenjuje okolje in spodbuja linearno, namesto krožnega in trajnostno naravnanega upravljanja vodnih virov v mestu. Pri tem se izkaže, da je za upravljanje (vodnih) virov kritična povezava med urbanističnim načrtovanjem in trajnostnim razvojem (Agudelo-Vera idr., 2011).

S člankom želimo opozoriti na problematiko upravljanja voda v mestih, ki je lahko uspešno le v interdisciplinarnem povezovanju pristojnih iz vseh strok (vodarji, prostorski načrtovalci, urbanisti, arhitekti in krajinski arhitekti, gradbeniki, geografi, sociologi idr.), ki sodelujejo pri načrtovanju MZI in gospodarske javne infrastrukture, ter v medsektorskem povezovanju na ravni upravljanja mest. V nadaljevanju je najprej predstavljeno trenutno stanje upravljanja voda v mestih in posledice, ki jih prinašajo podnebne spremembe. Prikazani so tudi tuji primeri dobrih praks in priložnosti za izboljšanje upravljanja voda v mestih, ki jih omogoča MZI. Cilj prispevka je opozoriti tudi na nujno povezanost med prostorskim načrtovanjem in upravljanjem voda na strateški in izvedbeni ravni.

2 Metodološki pristop

V skladu z namenom in cilji prispevka smo izdelali primerjalno analizo dokumentov, na katerih temelji pristop upravljanja voda v slovenskih mestih. Zajeli smo tako mednarodno kot nacionalno raven s področja urejanja prostora in upravljanja voda. V nadaljevanju smo proučili izbrane primere tujih praks, ki prikazujejo, kako lahko z ustreznim načrtovanjem in umeščanjem MZI v prostor rešujemo probleme (npr. poplave, onesnaževanje vodnih teles, urbani vročinski otoki) in hkrati ustvarjamo možnosti za dodatne ekosistemske storitve, npr. krepitev biotske raznovrstnosti, zmanjševanje onesnaženja, blaženje pojava vročinskih otokov. Ugotovitve obeh analiz smo nato medsebojno primerjali, predstavili rezultate in podali priporočila za celovitejše, medsektorsko usklajeno upravljanje voda v slovenskih mestih.

3 Urbani vodni krog in modro-zelena infrastruktura

3.1 Razvoj urbanega vodnega kroga

Širjenje mest in urbanizacija povečujeta delež neprepustnih površin, to v kombinaciji s tradicionalnim načinom urbane odvodnje (tj. z uporabo sive infrastrukture) (Bacchin idr., 2014) povzroči spremembe v naravnem hidrološkem krogu. Te spremembe se kažejo v manjši infiltraciji in evapotranspiraciji ter povečanem površinskem odtoku (Butler idr., 2018). Iz tega izhaja neposredna povezava med zgodovino razvoja mestnega prostora in lokalnega vodnega kroga, pri čemer so se sčasoma spreminjali tudi koncepti upravljanja voda v mestih. Ti so sledili pričakovanjem družbe in razvoju novih pristopov in tehnologij, s katerimi so različne stroke reševale nastajajoče družbene težave (npr. bolezni, kot sta kolera in tifus, pomanjkanje pitne vode, poplave). Novi koncepti in strokovne rešitve so se med njihovim izvajanjem tako močno uveljavili, da so prešli tudi v zakonodajni okvir. Razvoj klasične zdravstvene hidrotehnike, ki se ukvarja z upravljanjem voda v mestih, za varovanje človekovega zdravja, je od antike do preloma tega tisočletja povzel Panjan (2005). Zanjo so značilne predvsem tri vodarske storitve: vodooskrba, odvajanje odpadnih voda in zaščita mest pred poplavami. Z rastjo družbenoekonomskega življenjskega standarda ter krepitvijo okoljske ozaveščenosti in pretečih podnebnih sprememb se v družbi krepi zavedanje,

Preglednica 1: Razvoj pristopov upravljanja voda v mestih

Faza	Pristop upravljanja	Družbenopolitični vzroki/okoliščine	Vodarska storitev
1	Vodooskrbno mesto	Oskrba s pitno vodo	Vodooskrbni sistemi
2	Kanalizacijsko mesto	Zaščita javnega zdravja	Kanalizacijski sistemi
3	Drenirano mesto	Zaščita pred poplavami	Odvodnja, kanaliziranje
4	Mesto vodnih teles	Zaščita okolja, družbene vrednosti	Upravljanje točkovnih in razpršenih virov onesnaženja
5	Vodno krožno mesto	Omejenost naravnih virov	Raznovrstni, namenu ustrezni vodni viri in njihovo ohranjanje, spodbujanje zaščite vodnih teles
6	Vodno občutljivo mesto	Medgeneracijski kapital, odpornost proti podnebnim spremembam	Prilagodljiva večfunkcionalna infrastruktura, načrtovanje na vodo občutljivih urbanih ureditev

Vir: Brown idr. (2009)

da tovrstni linearni sistemi na okolje prenašajo eksternalije in dolgoročno niso vzdržni. Zato evropska direktiva o vodni politiki (Evropski parlament in Svet EU, 2000) in nacionalna zakonodaja z Zakonom o vodah (Ur. l. RS, št. 67/02) postavljata omejitve in regulatorni okvir za dosego dobrega ekološkega in kemijskega stanja vodnih teles. Sprejeti zakonodajni okvir kljub temu še vedno temelji na nadgradnji obstoječih linearnih sistemov (tj. izgradnja čistilnih naprav) in ne sledi sodobnim konceptom upravljanja voda, ki temeljijo na pristopih, značilnih za krožno gospodarstvo: zapiranje snovnih tokov, ponovna uporaba, obnova naravnih virov, uporaba virov različnih kakovosti glede na njihov namen itd. Z vidika nastajajočih sprememb je Brown s sodelavci (2009) zgodovinski razvoj obstoječih in predlaganih konceptov upravljanja voda v mestih razdelil na šest faz, v okviru katerih je ciljno stanje vodno občutljivo mesto (Preglednica 1). Na splošno je večina slovenskih in evropskih mest v četrti fazi (t. i. mesto vodnih teles), z vključenimi prejšnjimi pristopi, ki zagotavljajo vodooskrbo, odvajanje odpadnih voda in zaščito pred poplavami, ter delnim izpolnjevanjem vodarskih storitev, ki so značilne za peto in šesto fazo.

Četrta faza, imenovana *mesto vodnih teles*, obravnava predvsem kakovost vodnih teles v mestih in njihovo vključevanje v del urbanega življenja, saj prinašajo mnoge koristi (npr. možnosti za rekreacijo in preživljanje prostega časa, povečujejo vrednost okoliških nepremičnin, tvorijo zeleni sistem mesta), ki prispevajo tudi k izboljšanju javnega zdravja. Čeprav se je v zadnjih desetletjih močno izboljšalo stanje kakovosti voda, predvsem zaradi zapiranja industrijske proizvodnje ter izgradnje industrijskih in komunalnih čistilnih naprav, grožnjo še vedno predstavljajo tako razpršeni kot točkovni viri onesnaženja. Tipični primeri točkovnega nekontroliranega vira so razbremenilniki mešanih kanalizacijskih sistemov. Razpršenih virov onesnaženja ne moremo obvladovati s centraliziranimi sistemi, zato je potrebna uvedba decentraliziranih pristopov in tehnologij, za kar pa je nujna tudi prilagoditev poslovnega modela upravljanja vode v mestih, skupaj s financiranjem in prenosom odgovornosti.

Peta faza, *vodno krožno mesto*, izhaja iz zavedanja, da so vodni viri količinsko in kakovostno omejeni. Zato prepoznava uporabo tudi drugih manj kakovostnih ali alternativnih vodnih virov (npr. padavinske vode, odpadne padavinske in komunalne odpadne vode) za zadovoljitev potreb, za katere voda ni potrebna. Ker je voda medij za prenos hranil, mineralov in energije, ta faza obravnava tudi njihovo pridobivanje ali obnovo iz odpadne vode, ki tako postane nov vir. Ta pristop zahteva tudi vključevanje drugih sektorjev (npr. kmetijstvo, prehrana, energetika) in prilagajanje njihove infrastrukture.

Šesta faza pomeni *vodno občutljivo mesto*, katerega razvoj spodbujajo podnebne spremembe in želja, da bi bila mesta čim bolj odporna proti tem spremembam, ter medgeneracijski prenos vrednosti, ki jo ima voda (tj. količinsko in kakovostno ohranjaje vodnih virov za prihodnje rodove). Čeprav je to vrsta upravljanja, predstavlja predvsem vizijo razvoja skupnosti in njenega trajnostnega odnosa do okolja in prostora. Zanjo je značilno, da so uporabljene tehnologije, infrastruktura in raba prostora v mestih raznovrstne in prilagodljive ter načrtovane na način, da krepijo trajnostne prakse in družbeni kapital. Pri tem ima pomembno vlogo povezava med družbo in tehnologijami. V takih okoliščinah bi se razmerje med vodarsko stroko in družbo (t. i. družbena pogodba) stalno spreminjalo in bi bil zanj potreben prilagodljiv institucionalen okvir.

Z vsako nadaljnjo fazo se upravljanje voda v mestih navezuje na čedalje več vključenih sektorjev, saj so vsi naravi elementi (voda, prst, zrak, živa bitja) med seboj povezani. To je na načelni ravni jasno in znano, vendar smo s pretirano segmentacijo upravljanja naravnih virov na podsisteme, ki izhajajo iz posameznih strok, izgubili holistični pristop k upravljanju. Za uveljavljanje novih celovitih konceptov upravljanja voda sta zato nujna povezovanje in sodelovanje z drugimi strokami, ki delujejo v mestnem prostoru. Tovrstno povezovanje se ponekod že uveljavlja z novimi pristopi k načrtovanju urbanega razvoja (Hung idr., 2012), ki ne iščejo več le tehnoloških rešitev, temveč se čedalje bolj približujejo zapiranju zanke v urbanem vodnem krogu tudi z uporabo MZI (Bacchin idr., 2014). Zelena infrastruktura namreč povečuje vrednost odprtih javnih

površin in njihovega prispevka z ekosistemskimi storitvami v mestih, modra infrastruktura pa upravlja padavinske vode. Obe skupaj v sodobnem urbanističnem načrtovanju predstavljata bistveno kompleksnejše koristi. Opredelitev MZI kot interdisciplinarnega pristopa k urejanju mest je zato ključno za njeno razumevanje in uvedbo v prostorskonačrtovalski praksi.

3.2 Modro-zelena infrastruktura

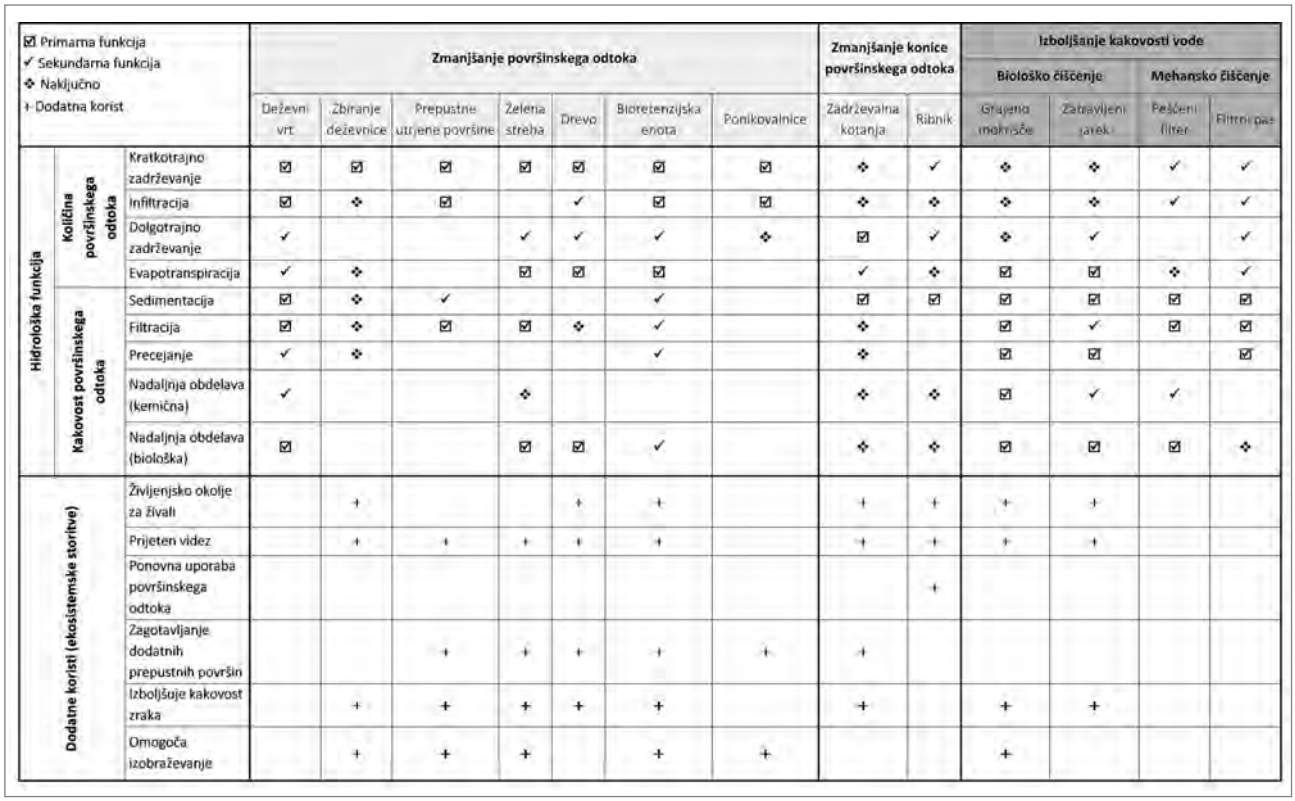
Modro-zeleno infrastrukturo lahko opredelimo kot naravne in polnaravne (zato zelena) decentralizirane sisteme, namenjene upravljanju padavinskih voda (zato modra) v mestih, ki hkrati opravljajo širok nabor ekosistemskih storitev (Liao idr., 2017; Lamond in Everett, 2019). Njihova osnovna filozofija je posnemanje naravnih hidroloških procesov (tj. zadrževanje, infiltracija, evapo(transpi)racija), katerih cilj je upravljanje padavinskih voda na mestu nastanka in preprečiti njeno mešanje s komunalno odpadno vodo. Ti ukrepi v Sloveniji še nimajo enotnega izraza, vsi prevodi izrazov v nadaljevanju so zato le poskus uskladitve s slovensko terminologijo, niso pa še uveljavljeni v strokovni literaturi niti praksi, v angleščini pa se uporablja kar nekaj sorodnih izrazov in konceptov, ki temeljijo pretežno na podobnih procesih in tehnologijah. Tako se v Združenem kraljestvu najpogosteje uporablja izraz Sustainable Urban Drainage Systems (SUDS, trajnostni sistemi urbane odvodnje) (Woods Ballard idr., 2015), v ZDA se uporabljajo izrazi Low impact development (LID, posegi/gradnja z majhnim okoljskim vplivom), Best management practice (BMP, najboljša upravljavska praksa) in Stormwater control measures (ukrepi za obvladovanje padavinskih voda), v Avstraliji pa izraz Water sensitive urban design (WSUD, vodi prilagojeno urbanistično načrtovanje) (Fletcher idr., 2015). Med seboj se razlikujejo predvsem v obsegu obravnavanega območja, kot so posamezno zemljišče, ulica, soseska, mestna četrt, mesto in celo večji regionalni sistemi. V zadnjem času se je začel pogosto uporabljati tudi izraz Nature-based solutions (sonaravne ali na naravi temelječe rešitve), ki zajema raznovrstne tehnologije, ki temeljijo na naravnih procesih ali jih posnemajo, so stroškovno učinkovite ter hkrati prinašajo okoljske, družbene in gospodarske koristi ter krepijo odpornost (Langergraber idr., 2020). Te rešitve prek sistemskih posegov, ki so lokalno prilagojeni in učinkoviti z vidika rabe virov, prinašajo mestom in pokrajinam več narave ter naravnih elementov in procesov (Evropska komisija, 2020). Poudariti želimo, da gre za koncepte, ki temeljijo predvsem na istih tehnologijah in imajo iste cilje, ker pa so se sočasno razvijali na različnih koncih sveta in izhajajo iz raznovrstnih strok, so poimenovani drugače. Iz predstavljenih opredelitev je razvidno, da je treba MZI razumeti precej širše kot zgolj enega izmed pristopov k upravljanju voda. Gre za pristop, ki prinaša izboljšave ne le na področju upravljanja voda, temveč tudi na številnih drugih področjih, kot so podnebne spremembe, kmetijstvo, gozdarstvo, urbanistično načrtovanje, varstvo narave, preprečevanje nesreč in celo na področju regionalnega razvoja. Gre torej za izrazito interdisciplinaren koncept, ki pa v slovenski praksi še ni polno zaživel. Elementi MZI v urbanem prostoru najpogosteje predstavljajo del zelenih površin in tako v prostorsko načrtovalskem kontekstu tvorijo del zelenega sistema naselja ali zelene infrastrukture, kot jo uvaja Strategija prostorskega razvoja Slovenije do 2050 (Ministrstvo za okolje in prostor, 2020a).

Tudi v drugih državah, razen v nekaj izjemah, kot sta Združeno kraljestvo in Nizozemska, dodatne koristi, ki jih nudi MZI, žal še niso bile ustrezno predstavljene nacionalnim in lokalnim oblastem, upravljavcem gospodarske javne infrastrukture, prostorskim načrtovalcem in javnosti. V nasprotju s tradicionalnim pristopom, ki temelji na odvajanju in zadrževanju vode v kanalizacijskem sistemu, za tovrstne sisteme še niso uveljavljeni smernice in programska orodja, namenjeni odločevalcem. Posledično so dodatne koristi MZI lahko prezrte, saj so merila ocenjevanja različic več rešitev nejasna, poleg tega dolgoročno delovanje teh sistemov za deležnike pomeni negotovost ali tveganje. Čeprav nekatera modelska orodja že vključujejo module za modeliranje MZI z vidika hidravlike in kakovosti vode, področje dodatnih koristi, kot so dodana vrednost (angl. amenity), biotska raznovrstnost ter dolgoročni vidiki stroškov in koristi, v ta orodja ni vključeno zadovoljivo (Chow idr., 2014). Nekatera programska orodja, kot je E^{2}STORMED (Morales-Torres idr., 2016) pa omogočajo celovito vrednotenje posameznih ukrepov z vsemi koristmi, ki jih prinašajo, vendar uporabljajo preprostejše hidrološko-hidravlične modele, zato je za ustrezno obravnavo priporočena uporaba rezultatov iz kompleksnejših modelov (Radinja idr., 2019).

Na sliki 1 so navedeni elementi MZI glede na njihov osnovni namen: zmanjševanje površinskega odtoka, zmanjševanje konice pretoka ali izboljšanje kakovosti vode. Hkrati je navedeno, s katerim postopkom (npr. zadrževanje, infiltracija, evapotranspiracija) in koliko ukrep dosega posamezen namen in katere ekosistemske storitve omogoča.

4 Celostni pristop k upravljanju voda v mestih

Pri uveljavljanju novih konceptov in praks so zelo pomembni mednarodni in nacionalni strateški dokumenti, ki usmerjajo razvoj nekega področja. Glede na namen in cilje prispevka nas je zanimalo predvsem, koliko sta področji prostorskega načrtovanja in vode v mestih povezani, saj je treba za izvedbo MZI predvideti zadostne površine mestnega prostora. Tovrstna povezava je na mednarodni ravni močno zastopana in spodbujena (preglednica 2), v slovenski zakonodaji pa jo lahko zasledimo zgolj delno (preglednica 3). Opazimo lahko, da Slo-



☑ Primarna funkcija ✓ Sekundarna funkcija ❖ Naključno + Dodatna korist			Zmanjšanje površinskega odtoka							Zmanjšanje konice površinskega odtoka		Izboljšanje kakovosti vode			
												Biološko čiščenje		Mehansko čiščenje	
			Deževni vrt	Zbiranje deževnice	Prepustne utrjene površine	Zelenja streha	Drevo	Bioretenzijska enota	Ponikovalnice	Zadrževalna kotanja	Ribnik	Grajena mokrišče	Zatravljeni jarek	Peščeni filter	Filtrni pas
Hidrološka funkcija	Količina površinskega odtoka	Kratkotrajno zadrževanje	☑	☑	☑	☑	☑	☑	☑	❖	✓	❖	❖	✓	✓
		Infiltracija	☑	❖	☑		✓	☑	☑	❖	❖	❖	❖	✓	✓
		Dolgotrajno zadrževanje	✓			✓	✓	✓	❖	☑	✓	❖	✓		✓
		Evapotranspiracija	✓	❖		☑	☑	☑		✓	❖	☑	☑	❖	✓
	Kakovost površinskega odtoka	Sedimentacija	☑	❖	✓			✓		☑	☑	☑	☑	☑	☑
		Filtracija	☑	❖	☑	☑	❖	✓		❖		☑	✓	☑	☑
		Precejanje	✓	❖				✓		❖		☑	☑		☑
		Nadaljnja obdelava (kemična)	✓			❖				❖	❖	☑	✓	✓	
		Nadaljnja obdelava (biološka)	☑			☑	☑	✓		❖	❖	☑	☑	☑	❖
Dodatne koristi (ekosistemske storitve)		Življenjsko okolje za živali		+			+	+		+	+	+	+		
		Prijeten videz		+	+	+	+	+		+	+	+	+		
		Ponovna uporaba površinskega odtoka									+				
		Zagotavljanje dodatnih prepustnih površin			+	+	+	+	+	+					
		Izboljšuje kakovost zraka		+	+	+	+	+		+		+	+		
		Omogoča izobraževanje		+	+	+		+	+			+			

Slika 1: Elementi modro-zelene infrastrukture ter njene funkcije in koristi (povzeto po Collett idr., 2013)

venija v nacionalno zakonodajo še ni v celoti prenesla priporočil iz mednarodnih dokumentov, zato je ta povezava šibkejša, saj sta zastopana le ponikanje padavinskih voda in načrtovanje zelenih površin (preglednica 3). V Sloveniji tudi (še) ni veljavnih standardov in uveljavljene prakse za načrtovanje MZI niti za urejeno ponikanje padavinskih voda (Radinja idr., 2017).

MZI je način, kako uskladiti posege v prostor (potrebe in razvoj) in doseči nekatere cilje urejanja prostora, ki jih določa Zakon o urejanju prostora (Ur. l. RS, št. 61/2017):

- z večfunkcionalnostjo MZI varuje prostor kot omejeno naravno dobrino, saj zagotavlja racionalnejšo rabo prostora,
- omogoča kakovostne življenjske razmere in zdravo življenjsko okolje, saj povečuje biotsko raznovrstnost,
- prispeva h krepitvi in varovanju zdravja ljudi, saj izboljšuje kakovost zraka in znižuje raven hrupa,
- varuje okolje, saj zmanjšuje onesnaževanje (npr. razbremenilniki),
- prispeva k prilagajanju na podnebne spremembe,
- ustvarja razmere za zmanjševanje in preprečevanje naravnih in drugih nesreč, saj zmanjšuje verjetnost za poplave in hladi okolico.

Prostorsko načrtovanje in urbanizem imata v Sloveniji že dolgo tradicijo načrtovanja zelenih sistemov (npr. Zeleni sistem Ljubljane; Kučan, 1994), kar se kaže tako v prostorskih dokumentih kot v prostoru. Na to kažejo tudi ureditve slovenskih mest in študije, ki so se ukvarjale s proučevanjem odprtega javnega prostora v slovenskih mestih (npr. Vertelj Nared, 2014; Volgemut, 2020). Kljub temu lahko ugotovimo, da prostorsko načrtovanje v Sloveniji obravnava področje upravljanja voda v mestih predvsem posredno, z zagotavljanjem zelenih površin ali sistemov (preglednica 3), kar pozitivno vpliva na urbano odvodnjo, saj sta zanje značilna manjši in upočasnjen površinski odtok glede na utrjene površine ter infiltracijska sposobnost. Vendar zelene površine (še) niso bile načrtovane z aktivno funkcijo zadrževanja in ponikovanja padavinskih voda (tj. ne prevzemajo tudi površinskega odtoka s sosednjih utrjenih površin), zato se to izvaja pasivno ali naključno (Ministrstvo za okolje in prostor, 2020b). Z vidika funkcionalnosti je zato treba zelene površine nadgraditi z elementi MZI, ki bodo zagotovili dodatne ekosistemske storitve, kot so odpornost prostora proti podnebnim spremembam, ohranjanje biotske raznovrstnosti, boljše delovanje ekosistemov in zagotavljanje drugih koristi za prebivalstvo in gospodarstvo, zlasti za javno zdravje in kakovost bivanja ter ohranjanje virov. Tako bodo zeleni sistemi naselij zagotovili razširjen nabor okoljskih in ekoloških funkcij ter tvorili zeleno infrastrukturo, kot jo uvaja predlog nove Strategije prostorskega razvoja Slovenije do 2050 (Ministrstvo za okolje in prostor, 2020a). Ta zeleno infrastrukturo na regionalni ravni opredeli kot zeleni sistemi regij, na lokalni

Preglednica 2: Prostorsko načrtovanje in upravljanje voda v mestih na mednarodni ravni

PROSTORSKO NAČRTOVANJE	VODA V MESTIH
1. Urbana agenda EU – Amsterdamski pakt (EK, 2016)	1. Cilji trajnostnega razvoja ZN (OZN, 2015)
Prednostne teme med drugim zajemajo: prilagajanje na podnebne spremembe (vključno z rešitvami zelene infrastrukture), trajnostno rabo prostora in sonaravne rešitve, kakovost zraka.	– cilj 6: Vsem zagotoviti dostop do vode in sanitarne ureditve ter poskrbeti za trajnostno gospodarjenje z vodnimi viri; – cilj 11: Poskrbeti za odprta, varna, vzdržljiva in trajnostna mesta in naselja.
2. Nova urbana agenda (Ministrstvo za okolje in prostor, 2017)	2. Načela za pametno ravnanje z vodo v mestih (IWA, 2017)
Zavezi za okoljsko trajnosten in prožen urbani razvoj, ki sta kar najbolj povezani z vodo: 72. Zavezujemo se izvajati dolgoročne postopke urbanističnega in prostorskega načrtovanja ter prakse prostorskega razvoja, ki vključujejo celostno načrtovanje in upravljanje vodnih virov, ob upoštevanju mestno-podeželskih območij na lokalni in regionalni ravni in ob sodelovanju pomembnih deležnikov in skupnosti. 73. Zavezujemo se spodbujati varovanje in vzdržno rabo vode z obnavljanjem vodnih virov na urbanih, primestnih in podeželskih območjih, z zmanjševanjem količine odpadnih voda in njihovim čiščenjem, zmanjševanjem vodnih izgub, spodbujanjem ponovne rabe vode in povečevanjem zbiranja in zadrževanja vode ter obnavljanja podzemne vode ob upoštevanju vodnega kroga.	Načelo 2) Ustrezno urbanistično načrtovanje: – načrtovanje in izvajanje prostorskih načrtov, ki omogočajo regenerativne vodne storitve; – načrtovanje urbanih območij, ki zmanjšujejo poplavna tveganja. Povečanje odpornosti mesta proti poplavnim tveganjem z načrtovanjem območij, ki bodo ob poplavi poplavljena, z uporabo trajnostnih sistemov urbane odvodnje; – povečanje prijetnosti mest za življenje v njih z odprtimi vodnimi površinami. Od zelene infrastrukture ob cestah (deževni vrtovi, ozelenjeni jarki) do modro-zelenih koridorjev s priložnostmi za rekreacijo, z vključujočimi javnimi prostori, ter za gospodarski razvoj, ki ustvarjajo večnamenske prostore in infrastrukturo; – uvedba in uporaba takšnih gradbenih materialov (za strehe, fasade, ceste in urbano pohištvo), ki preprečujejo oddajanje onesnažil, kadar so izpostavljeni soncu ali dežju.

Preglednica 3: Prostorsko načrtovanje in upravljanje voda v mestih na nacionalni ravni

PROSTORSKO NAČRTOVANJE	VODA V MESTIH
1. Strategija prostorskega razvoja Slovenije (MOP, 2004)	1. Strategija razvoja Slovenije 2030 (SVRK, 2017)
Na urbano odvodnjo se navezuje v dveh točkah: – pri razvoju mest in naselij: »… Z vidika varnosti naj bo v naseljih čim več zelenih površin zaradi izravnave velikih temperaturnih ekstremov ter omogočanja postopnega odvajanja padavinskih voda«; – pri odvajanju in čiščenju odpadnih in padavinskih voda: padavinske in odpadne vode se odvajajo ločeno, kjer je to ekonomsko upravičeno in tehnično možno. Padavinske vode se čim dlje zadržijo na mestu, kamor so padle, zaledne vode pa se površinsko odvajajo mimo naselij do najbližjega površinskega odvodnika.	Cilj 9: Trajnostno upravljanje naravnih virov bomo dosegli z: a) uvajanjem ekosistemskega načina upravljanja naravnih virov in s preseganjem sektorskega načina razmišljanja, med drugim s pravočasnim usklajevanjem nacionalnih in čezmejnih interesov na presečnih področjih voda – hrana – energija – ekosistemi, ki se bodo v prihodnosti spreminjali in prilagajali tudi zaradi posledic podnebnih sprememb; b) učinkovitim upravljanjem površinskih in podzemnih voda, obalnih in morskih virov ter z doseganjem njihovega dobrega stanja.
2. Strategija varstva in razvoja zelene infrastrukture v ljubljanski urbani regiji (RRA LUR, 2019)	2. Zakon o vodah (ZV-1, Ur. l. RS, št. 67/2002)
Cilj 1: Izboljšano stanje okolja Posebno skrb je treba nameniti upravljanju voda (ponikanje, zadrževanje vode, poplavna varnost) in načrtovanju rešitev, ki zadostijo več funkcijam hkrati (retencijske površine so hkrati privlačne za prostočasne dejavnosti in lahko ugodno vplivajo na mikroklimo). Cilj 4: Blaženje podnebnih sprememb in prilagoditve nanje. Pomembna sta obvladovanje obeh ekstremov, povezanih z vodo (pomanjkanje vode in poplave), in povezanost z drugimi dejavnostmi, na primer s kmetijstvom. Z urejanjem zelene infrastrukture oziroma s prostorskimi ukrepi v urbanih območjih je treba omiliti posledice tako ekstremnih padavin kot ekstremnih temperatur.	Zakon predpisuje, da je varstvo pred škodljivim delovanjem padavinskih voda v ureditvenih območjih naselji naloga lokalne skupnosti, kar zajema zlasti ukrepe za zmanjševanje odtoka padavinskih voda z urbanih površin in ukrepe za omejevanje izlitja komunalnih in padavinskih voda. V odlokih lokalnih skupnosti je običajno predpisano ponikanje padavinskih voda, kjer je to mogoče in dopustno, če to ni mogoče, je treba čim bolj zmanjšati odtok padavinskih voda v javno kanalizacijo, z zadrževanjem ali njeno ponovno uporabo (Odlok o odvajanju in čiščenju komunalne in padavinske odpadne vode v Mestni občini Ljubljana, Ur. l. RS, št. 9/2018).

PROSTORSKO NAČRTOVANJE	VODA V MESTIH
3. Zakon o urejanju prostora (ZUreP-2, Ur. l. RS, št. 61/2017)	3. Uredba o emisiji snovi in toplote pri odvajanju odpadnih voda v vode in javno kanalizacijo (Ur. l. RS, št. 64/2012), Uredba o emisiji snovi pri odvajanju padavinske vode z javnih cest (Ur. l. RS, št. 47/2005)
Zakon opredeljuje zelene sisteme kot načrtovani sistem varstva in razvoja zelenih površin na poselitvenih območjih ter drugih zelenih in ustvarjenih struktur v prostoru, ki se nanje navezujejo. Namen urejanja prostora (2. člen) je doseganje trajnostnega prostorskega razvoja s celovito obravnavo, usklajevanjem in upravljanjem njegovih družbenih, okoljskih in gospodarskih vidikov, tako da se kot cilj urejanja prostora med drugim prispeva k prilagajanju na podnebne spremembe ter se ustvarjajo razmere za zmanjševanje in preprečevanje naravnih ali drugih nesreč.	Uredbi podrobneje določata, pod katerimi pogoji se padavinske odpadne vode (ne)smejo odvajati (ne)posredno v podzemne vode, neposredno v stoječe/tekoče celinske vode ali v morje. Omejitve so pogojene z vrsto površine, s katere padavinske vode odtekajo, vodovarstvenimi pasovi ali vrsto vodonosnika, ki ga cesta prečka.
4. Uredba o prostorskem redu Slovenije (Ur. l. RS, št. 122/2004)	4. Uredba o metodologiji za oblikovanje cen storitev obveznih občinskih gospodarskih javnih služb varstva okolja (Ur. l. RS, št. 87/2012)
– Pri načrtovanju sistemov oskrbe z vodo se kot vir tehnološke vode, vode za gašenje ali druge vode, ki ni namenjena pitju, čim bolj uporabijo manj kakovostni vodni viri (52. člen). – Padavinske vode s streh in teras objektov morajo prek ponikovalnih naprav, ponikovalnih jarkov ali ponikovalnega drenažnega cevovoda praviloma ponikati v okviru gradbene parcele, v skladu s predpisi s področja varstva okolja.	Uredba določa, da je treba stroške odvajanja in čiščenja padavinskih voda s streh obračunati na ločeni postavki. Tako so občani obveščeni in motivirani, da padavinske vode zadržijo na svoji parceli in posledično zmanjšajo dotok teh voda v javno kanalizacijo.

pa kot zeleni sistem naselij, s čimer jo vsebinsko izenači z do zdaj uveljavljenim načrtovanjem zelenih sistemov.

Tudi slovenska zakonodaja na področju voda ne predpisuje uporabe elementov MZI, vendar te tudi ne prepoveduje, saj priporoča izvedbo ukrepov za zmanjšanje površinskega odtoka, zadrževanja ali ponikanje (preglednica 3). Zato jo lahko ob upoštevanju vseh značilnosti lokalnega prostora in področne zakonodaje začnemo uvajati že danes, kar potrjujejo tudi primeri uspešno izvedenih ukrepov MZI v Sloveniji (Ramšak in Oberžan, 2017; Klemen idr., 2020). Klemnova je s sodelavci (2020) ugotovila, da se ob pripravi prostorskih aktov praviloma ne izdelujejo strokovne podlage za ukrepe upravljanja padavinskih voda, kar vodi v nadaljnjo uporabo obstoječega koncepta upravljanja voda, z le redkimi izjemami uvajanja MZI v občinske prostorske načrte. K sistemskim ukrepom »*sodelovanja med institucijami, krepitve strateškega načrtovanja, upoštevanja strokovnih rešitev*« poziva tudi Strategija varstva in razvoja zelene infrastrukture v Ljubljanski urbani regiji (RRA LUR, 2019), ki poudarja, da je celovito in vključujoče upravljanje prepoznano kot ključni dejavnik za ohranjanje koristi in za sprostitev potencialnih koristi zelene infrastrukture (Regionalna razvojna agencija LUR, 2019, str. 33). Hkrati omenjena strategija opominja, da je treba zeleno infrastrukturo načrtovati z zavedanjem, da gre za sistem, ki presega zgolj določanje namenske rabe v prostoru.

V Sloveniji so se nekatera mesta z uvajanjem MZI (npr. zelene strehe, obveznega zadrževanja/ponikanja padavinskih voda) že usmerila v uveljavitev ciljnega stanja: vodno občutljivo mesto, kot je predlagal Brown (2009). Manjka pa celovit sistemski pristop (tj. omenjeni fleksibilni institucionalni okvir), saj ni ustrezne povezave z drugimi deležniki, ki (so)oblikujejo mestni prostor (arhitekti, urbanisti, prostorski načrtovalci). V nadaljevanju so predstavljeni nekateri primeri tujih mest, ki so take strategije/pristope upravljanja že sprejela in jih tudi izvajajo.

5 Primeri dobrih praks

Izbrali smo štiri primere sistemskega uvajanja MZI na mestni ali nacionalni ravni z Danske, Nizozemske, Kitajske in iz ZDA. Z njihovo geografsko zastopanostjo želimo poudariti, da gre pri uvajanju MZI, cilj česar je upravljanje urbanega vodnega kroga, za svetovni trend, ki nakazuje prihodnji razvoj na tem področju. Vsem primerom je skupno povezovanje med vodarskim in prostorsko načrtovalskim sektorjem, cilj pa je celovito načrtovanje MZI.

5.1 København: prilagajanje na ekstremne padavinske dogodke

Danski meteorološki inštitut opredeljuje padavinski dogodek kot ekstremen, kadar v 30 minutah pade več kot 15 mm padavin (Danish Meteorological Institute, 2019). Leta 2011 pa

je v København padlo v 90 minutah 136 mm padavin, kar statistično pomeni dogodek, ki se zgodi zgolj enkrat v dva tisoč letih. Mesto je posledično utrpelo ogromno škode. Več kot 30 % lastnikov objektov v mestu je vložilo zahtevke za zavarovalnino, skupna škoda pa je presegla 800 milijonov EUR (Arnbjerg-Nielsen idr., 2015). Kot odziv na ta in nekaj manj intenzivnih padavinskih dogodkov je mesto sprejelo načrt prilagajanja na podnebne spremembe Climate Adaptation Plan (The City of Copenhagen, 2011) in nato še načrt prilagajanja na nalive Cloudburst Management Plan (The City of Copenhagen, 2012), za izvajanje katerega bodo namenili približno pol milijarde evrov.

Slika 2 prikazuje šeststopenjski pristop za izbiro najustreznejše rešitve za obvladovanje nalivov:

- v prvem koraku je mestna uprava na podlagi podatkov in analiz trenutnega stanja opredelila in razvrstila območja v mestu, glede na to, kako jih nalivi ogrožajo;
- v drugem koraku so z uporabo hidrološko-hidravličnih modelov, ki so vključevali površinski odtok in kanalizacijski sistem, določili urbana porečja in njihovo poplavno ogroženost;
- v tretjem koraku so ovrednotili poplavne škode za trenutno stanje, skupaj s posrednimi stroški in vplivom podnebnih sprememb. Te znašajo med 55 in 80 milijoni EUR/leto od danes do leta 2110;
- v četrtem koraku so razvili katalog tipskih modro-zelenih elementov (tj. Cloudburst Toolkit) za obvladovanje nalivov (npr. zelena cesta, urbani potok, zadrževalni bulvar), ki so bili podlaga za razvoj ambicioznega načrta prilagajanja na prihodnje ekstremne nalive. Sledili so arhitekturno in krajinsko načrtovanje ter vizualizacija predlaganih rešitev in preverjanje njihove robustnosti;
- peti korak vključuje vse deležnike, ki nato sooblikujejo in s svojimi pogledi nadgradijo predlagane rešitve. Tako načrtovanje je iterativen proces, ki vodi k boljšim rešitvam in zagotavlja njihovo kakovost;
- v zadnjem koraku pa se predlagane alternativne rešitve finančno ovrednotijo in na podlagi analize stroškov in koristi se izbere najustreznejša rešitev.

Slika 2: Københavnski pristop za obvladovanje nalivov (povzeto po Ramboll, 2016)

5.2 Rotterdam

Rotterdam je največje evropsko pristanišče in je nastalo v delti rek Ren in Meuse, voda pa ga ogroža s štirih strani: morje, vodotoki, podtalnica in padavinske vode. Zaradi izjemne izpostavljenosti mesta in pretečih posledic podnebnih sprememb je mesto sprejelo strategijo prilagajanja na podnebne spremembe (Rotterdam Climate Initiative, 2013). Strategija temelji na konceptu, ki združuje premagovanje težav, povezanih z vodo, ter priložnosti za transformacijo urbanega prostora in družbenogospodarski razvoj. Temelj za načrtovanje ukrepov so rezultati hidrološko-hidravličnih modelov, s katerimi je določena poplavna ogroženost posameznih območij v mestu, in to zaradi morja, rek ali ekstremnih padavin. Pri spopadanju s temi je kot glavni ukrep predvidena MZI, ki mora padavinske vode zadržati na mestu, kjer padejo, in upočasniti njihov odtok. Posebna pozornost je pri načrtovanju "vodoodpornega" mesta namenjena individualni obravnavi posamezne lokacije, pri čemer pri načrtovanju ukrepov sodelujejo vodni odbori, urbanisti, mestna uprava in drugi deležniki. Ozaveščanje in aktivno vključevanje javnosti sta spodbujena z aktivnim in ciljno usmerjenim komuniciranjem.

5.3 Kitajska spužvasta mesta

Kitajska vlada je zaradi težav v urbanem vodnem krogu (poplave in onesnaževanje vodnih teles), nastalih zaradi hitre urbanizacije kitajskih mest, razvila koncept t. i. *spužvastih mest* (angl. Sponge city). Vanj so leta 2014 vključili 30 mest po državi, vključno z megamesti, kot so Peking, Šanghaj, Tiandžin in Šendžen, ki so pilotna območja, iz katerih se bodo lahko dobre prakse in regulatorni okvir prenesli na druga mesta (Chan idr., 2018). Koncept *spužvastih mest* temelji na MZI in uveljavljanju šestih procesov pri upravljanju padavinskih voda v mestih: infiltraciji, upočasnitvi toka, zadrževanju, čiščenju, uporabi in odvajanju. Aktivnosti uvajanja koncepta v mesta se osredotočajo predvsem na ukrepe, ki so: 1) gradnja spužvastih stavb (npr. zelene strehe, deževni vrtovi), 2) gradnja spužvastih cest, pločnikov in trgov z uporabo prepustnih materialov, 3) gradnja spužvastih parkov in zelenih površin (npr. deževni vrtovi, poglobljeni travniki, grajena mokrišča), 4) zaščita in remediacija naravnih vodnih teles (npr. širitev mokrišč, vzdrževanja in ponovna uvedba naravnih rečnih tokov), 5) izboljšanje povezljivosti urbanih vodnih sistemov, ki omogoča njihovo neprekinjenost, 6) nadgradnja obstoječih sistemov odvodnje na način, da zagotavljajo zaščito pred poplavami in odvajanje presežnih količin vode, 7) gradnja ločenih sistemov za padavinske in komunalne odpadne vode (Liu idr., 2017). Dosedanji izsledki pri načrtovanju in delovanju MZI omogočajo prenos znanja iz pilotnih mest v druga mesta, ki bodo lahko pristopila k hitrejšemu uvajanju MZI in boljšemu načrtovanju (Yin idr., 2021).

5.4 Združene države Amerike: koncept MZI za obvladovanje odpadnih voda

Razbremenilniki so elementi v mešanem kanalizacijskem sistemu, ki v času padavin presežne količine mešanice padavinskih in komunalnih odpadnih voda odvajajo neposredno v odvodnik ter tako ščitijo kanalizacijski sistem in posredno mesto pred poplavami. Hkrati so grožnja za okolje, saj čeprav je ta razredčena, še vedno odvajajo neočiščeno odpadno vodo v vodna telesa. Mesto Filadelfija se je na podlagi zahteve Ameriške okoljske agencije po vzpostavitvi dolgoročnega načrta za obvladovanje delovanja razbremenilnikov (United States Congress, 2002) odločilo za alternativni pristop. Namesto gradnje dodatne sive infrastrukture (npr. podzemni zadrževalniki, kolektorji) so se odločili za celovito uvajanje MZI. Nastal je 25-letni načrt z naslovom Zeleno mesto, čiste vode (Philadelphia Water Department, 2011). Izračunali so, da bo načrt po 45 letih mestu vrnil več koristi in dodane vrednosti, kot bo znašal vložek. Z načrtom so na podlagi strukturiranega informiranja in ozaveščanja vseh deležnikov dosegli, da meščani mestne ulice dojemajo drugače in sami vidijo priložnosti, kako se lahko do tedaj neprepustne površine spremenijo v vegetativno bujna območja, ki zadržujejo in čistijo padavinske odpadne vode ter jih nadzorovano odvajajo.

Uvedbi načrta je sledila priprava obsežnega priročnika z navodili, ki potencialnim investitorjem pred posegi v prostor omogoča preprosto seznanitev z vsemi potrebnimi zahtevami, ki jih mora projekt zagotoviti, da bo ustrezno obravnaval upravljanje voda na območju urejanja (Philadelphia Water Department, 2014). Mesto je na podlagi hidrološko-hidravličnih značilnosti razdeljeno na podobmočja, s podanimi značilnostmi (npr. poplavna območja, tip kanalizacijskega sistema), na podlagi katerih lahko investitor ob uporabi priročnika določi splošne zahteve po upravljanju voda (npr. 100-odstotno ponikanje, delno zadrževanje in čiščenje padavinskih voda).

Kljub pozitivnemu napredku, ki ga je načrt prinesel, raziskovalci po nekem času ugotavljajo, da zasledovanje zgolj enega cilja ob uvajanju MZI (tj. zadrževanje velikih količin vode) lahko privede do sistemskega uvajanja omejenega nabora ukrepov MZI, ki omogočajo zgolj omejene koristi (Spahr idr., 2020). Zato so Spahr in sodelavci (2020) sklenili, da morajo mesta, če želijo doseči ekosistemske storitve, ki jih omogočajo rastline (tj. čiščenje zraka, zmanjševanje hrupa in učinka toplotnih otokov, prijeten videz, javno zdravje), bolj posegati po tovrstni MZI.

5.5 Primerjava primerov dobrih praks

Za oba proučevana evropska primera so bile glavni povod za spremembo paradigme v upravljanju urbanih voda preteče podnebne spremembe in napoved vedno pogostejših in intenzivnejših padavin, ki bodo povzročale poplave. Na drugi strani je bil povod za primera iz Kitajske in ZDA kakovost vodnih teles ali negativen vpliv urbanizacije nanje. Vsem primerom je skupno spoznanje, da siva infrastruktura ne more ponuditi rešitev za vse nastale in porajajoče se težave in da ne prinaša ekosistemskih koristi. Kot primerno rešitev so predstavljena mesta opredelila večfunkcionalno MZI, skladno s pristopom vodno občutljivih mest (preglednica 1), ki je bila ustrezno vključena v strateške dokumente, v katerih so opredeljeni tudi cilji (preglednica 4). Pomembno je, da so za sprejete strategije predvidena tudi javna sredstva, ki se usmerijo v doseganje zastavljenih ciljev. Menimo, da je uspešnost predstavljenih mest pri uvajanju MZI pogojena tudi z razvojem ustreznih smernic in načrtovalskih orodij, ki mestnim načrtovalcem omogočajo strokovno pomoč. Poleg tega jim je skupno tudi, da se v prostorsko načrtovanje vključuje upravljanje voda, pri čemer se z uporabo hidrološko-hidravličnih modelov: 1) opredelijo (trenutne in potencialne) kritične točke poplavne ogroženosti v urbanem prostoru ter se s simulacijami ovrednoti vpliv posa-

Preglednica 4: Primerjava primerov dobrih praks iz tujine

	København, Danska	Rotterdam, Nizozemska	30 pilotnih kitajskih mest	Filadelfija, ZDA
Povod	Poplave, podnebne spremembe	Poplave, podnebne spremembe	Onesnaženost vodnega okolja, poplave	Onesnaženost vodnega okolja – problem razbremenilnikov
Ime in leto sprejetja programa	Copenhagen Climate Adaptation Plan, 2011; Cloudburst Management Plan, 2012	Rotterdam Climate Change Adaptation Strategy, 2013	Sponge City Programme, 2014	Green City, Clean Waters, 2011
Cilj	1) Preprečiti odtok z več kot 1/3 utrjenih površin v kanalizacijski sistem 2) Ob 100-letnem nalivu največ 10 cm vode na površju (preprečevanje poplav).	Popolna odpornost mesta proti podnebnim spremembam do leta 2025.	Do leta 2030 naj bi se na 80 % urbanih območjih najmanj 70 % padavin infiltriralo ali znova uporabilo.	V 25 letih preprečiti odtok z več kot 1/3 utrjenih površin v kanalizacijski sistem.
Razvite smernice in načrtovalska orodja kot odziv na zaznane težave	1) Copenhagen Cloudburst Formula (smernice za strateško načrtovanje MZI), 2) Copenhagen Cloudburst Toolkit (katalog tipskih elementov MZI).	1) Interactive Climate atlas (atlas prikazuje predvidene posledice podnebnih sprememb za posamezno lokacijo ob različnih scenarijih), 2) Climate adaptation barometer (orodje za oblikovanje strategije prilagajanja na podnebne spremembe in sledenje njenemu izvajanju), 3) Climate adaptation toolbox (načrtovalsko orodje, ki zajema potencialne prilagoditvene ukrepe na različnih ravneh urejanja prostora).	1) Code of the Design of Urban Green Space (zakon, usklajen s smernicami za spužvasta mesta, s poudarkom na usklajenem pristopu za načrtovanje urbanih zelenih površin), 2) Code for Design of Urban Road Engineering (zakon, usklajen s smernicami za spužvasta mesta, vsebuje poglavje o MZI), 3) Assessment Standard for Sponge City Effects (tehnični standard za vrednotenje učinkov spužvastih mest).	1) Stormwater Management Guidance Manual (smernice za načrtovanje MZI, katalog tipskih elementov MZI), 2) A Homeowner's Guide to Stormwater Management (priporočila gospodinjstvom za upravljanje padavinskih voda).

meznih scenarijev MZI na urbani vodni krog, ter 2) ovrednoti vpliv MZI na kakovost urbanega površinskega odtoka in posledično ekološko stanje odvodnikov (vodnih teles).

6 Sklepne ugotovitve

Z upravljanjem mestnega prostora in pripadajočih prvin se ukvarja več strok. V članku smo predstavili trenutno stanje in izzive upravljanja voda v mestih v tujini in Sloveniji. Povezovanje med upravljanjem voda in prostorskim načrtovanjem je močno zastopano in spodbujeno v mednarodnih strateških dokumentih, v slovensko zakonodajo pa to povezovanje še ni v celoti preneseno. Zato je za slovenska mesta značilno sektorsko delovanje na področjih upravljanja voda in prostorskega načrtovanja.

Iz predstavljenih primerov dobrih praks upravljanja voda v mestih lahko sklenemo, da je ponekod sistemsko uvajanje MZI postalo že uveljavljen, ne več alternativen pristop urejanja mest. V Sloveniji tovrstnih primerov sistemskega uvajanja MZI še ne poznamo, obstaja pa zanje velik potencial, saj imamo v slovenskih mestih zadosten delež razmeroma enakomerno razporejenih zelenih površin (javnih in zasebnih), kar je posledica že utečenih prostorsko načrtovalskih praks (Ministrstvo za okolje in prostor, 2020b). Ker trenutno zelene površine niso načrtovanje po načelih MZI, njihova večfunkcionalnost, ki bi jo dosegli s prevzemanjem površinskega odtoka z okoliških utrjenih površin, ni (dovolj) izkoriščena. Tako ostaja v mestih velik potencial zelenih površin, ki bi lahko omogočale dodatne nad- ali podzemne retenzijske površine, s katerimi bi razbremenili kanalizacijski sistem in ohranili padavine v naravnem vodnem krogu. Predstavljeni primeri dobrih praks kažejo, da lahko prav izvedba mnogih decentraliziranih ukrepov močno izboljša vodno bilanco kanalizacijskega sistema ter zmanjša verjetnost preplavitve kanalizacijskega sistema in posledično mestnih površin.

Prikazani primeri dobrih praks kažejo, da sta pri načrtovanju MZI ključna interdisciplinarno sodelovanje več strok in medsektorsko usklajeno delovanje na načrtovalski in operativni ravni. Z vidika upravljanja urbanega vodnega kroga pa je

poglavitno, da se v prostorsko načrtovanje vključi tudi izdelava strokovnih podlag trajnostnega upravljanja vodnih virov in prilagajanja na podnebne spremembe. Za načrtovalsko in izvedbeno raven je izjemno pomembna izdelava smernic in tehničnih priročnikov za načrtovanje in dimenzioniranje MZI.

Sklenemo lahko, da kljub posameznim prizadevanjem v Sloveniji MZI še vedno ni prepoznana kot učinkovit koncept za celovito urejanje urbanega vodnega kroga. To zahteva njegovo celovito obravnavo, ki vključuje modeliranje, načrtovanje in dimenzioniranje najprimernejših ukrepov. Kljub temu prav ta prizadevanja kažejo na čedalje večje zavedanje o pomenu MZI in zahtevi po njenem sistematičnem vključevanju v zakonodajni okvir, ki bo zagotavljal ustrezno vključevanje ključnih deležnikov, interdisciplinarno sodelovanje strok in medresorsko usklajeno načrtovanje, pri čemer bi bil cilj teh prizadevanj celovito upravljanje voda v mestih.

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Sistematična preureditev mestnih ulic: prilagajanje podnebnim spremembam z večfunkcionalnimi podnebno odzivnimi uličnimi vrtovi

Uvedba zelene infrastrukture je uveljavljen pristop k blaženju učinkov toplotnih otokov in poplav na mestnih območjih, saj lahko vpliva na pomembno znižanje lokalne temperature v mestu in zmanjšanje nevarnosti poplav. V članku je ulična krajina prepoznana kot pomembno območje posegov za prilagajanje podnebnim spremembam, pri čemer ti posegi temeljijo na zeleni infrastrukturi, ki omogoča prijetnejše okolje za človekovo aktivnost in mobilnost v mestih, hkrati pa je pomemben blažilec toplote. Avtorji predlagajo rešitev, ki združuje nekatere ključne prvine, ki bi bile lahko podlaga vsem prihodnjim oblikovalskim posegom v javni prostor (ulično krajino), in spodbuja ureditev mestnega okolja, ki se resnično odziva na podnebne spremembe. Te prvine vključujejo omejitev neprepustnih površin samo na nujna območja, decentralizirano gospodarjenje z vodo na podlagi deževnih vrtov, nezahtevno vzdrževanje, estetske zasaditve, ki krepijo biotsko raznovrstnost, in senzorsko spremljanje parametrov toplotnega udobja za izboljšanje ukrepov. Rešitev vključuje uporabo poceni senzorjev za zbiranje podatkov o toplotnem udobju, na podlagi katerih se lahko določijo območja mestnih toplotnih otokov. Predlagano je tudi odločevalsko orodje, ki temelji na geografskem informacijskem sistemu (GIS) in zbira podatke, kot so temperatura, stopnja prekritosti površja in poplavno tveganje ter podatki, ki se nanašajo na lokacijo komunalne infrastrukture, promet in prostorsko ureditev. Opisana je poskusna uporaba predlagane metodologije v okviru trajnega projekta prilagoditve podnebnim spremembam, ki ga financira avstrijska vlada.

Ključne besede: javni prostor, podnebne spremembe, gospodarjenje s padavinsko vodo, ulično odvodnjavanje, senzorska tehnologija in digitalizacija

1 Uvod

Kako obvladovati vplive podnebnih sprememb na mestnih območjih je izziv, s katerim se nenehno spopadajo mesta po vsej Evropi in drugje po svetu. Odločevalci proučujejo nepredvidljive vremenske razmere, ki povzročajo mestne toplotne otoke in poplave ter posledično družbeno-gospodarsko škodo. Vplive podnebnih sprememb v mestih krepita gosta pozidava in širjenje neprepustnih površin, ki zadržujejo toploto in hkrati preprečujejo naravno kroženje vode. Navedeno zlasti v mestnih središčih zmanjšuje toplotno udobje, poleg tega povečuje obremenjenost kanalizacijskega omrežja, zaradi česar se zlasti ob močnem deževju odpadna voda izliva v naravne vodotoke in jih onesnažuje.

Pri obvladovanju podnebnih sprememb posegi, ki temeljijo na zeleni infrastrukturi, omogočajo trajnosten način blaženja teh sprememb in izboljšajo mikroklimo v mestih. Ozelenjevanje mest je postal priljubljen izraz v povezavi z bivalno prijaznejšimi mesti 21. stoletja, vendar je bilo pri sistematizaciji in optimizaciji tovrstnih posegov za izboljšanje dolgoročne učinkovitosti in donosnosti naložb narejenega le malo napredka. Navedeno je deloma posledica večplastnosti in kompleksnosti obravnavane problematike, ki zahteva usklajeno sodelovanje številnih deležnikov, zlasti pri uporabi načrtovalskih orodij in procesov.

V članku avtorji predlagajo večfunkcionalen pristop, ki omogoča oblikovanje dobre prakse za bolj sistematično vključevanje zelene infrastrukture v mestno tkivo. Posebna pozornost je namenjena dejavnikom, ki povzročajo učinek mestnega toplotnega otoka, pri čemer se problematična območja določijo z mobilnimi senzorji. Neprepustne vodoravne mestne površine brez zaznane prometne funkcije (mrtva območja) se izberejo za preureditev z zeleno infrastrukturo v obliki deževnih vrtov, ki so prepoznani kot pomembna urbanistična prvina. Predstavljeni pristop zagotavlja neposreden in trajnosten način spopadanja z vzroki za nastanek mestnih toplotnih otokov, hkrati pa spodbuja pozitivnejši in neposrednejši človeški stik z naravo ter izboljšuje biotsko raznovrstnost mestnega okolja.

Da bi dosegli predlagano raven večfunkcionalnosti, je bil ustanovljen raziskovalni konzorcij v obliki delovne skupine, ki združuje strokovnjake z različnih področij (krajinsko načrtovanje, hidrologija, urbanistično in prostorsko načrtovanje, prometno načrtovanje, informatika in ekologija). Z aktivno uporabo multidisciplinarnega pristopa k oblikovanju ukrepov izboljšav je cilj delovne skupine razviti zares trajnostne rešitve za spopadanje s podnebnimi spremembami. Njeno delo je inovativno v smislu uporabe večfunkcionalnega pristopa k ureditvi mestne zelene infrastrukture ter multidisciplinarnega razvoja in uporabe predstavljene metode.

1.1 Pomen uličnega prostora

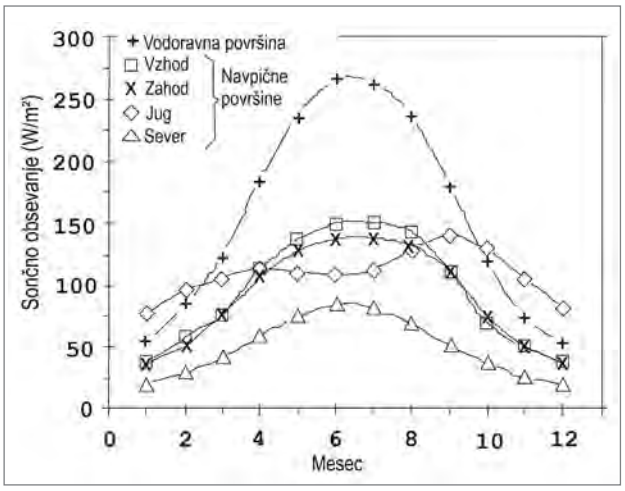
Na območjih, ki so najbolj izpostavljena učinkom mestnega toplotnega otoka in poplavam zaradi močnih nalivov, je običajno obseg mogočih ukrepov najbolj omejen. Zlasti v mestnih središčih, kjer je čedalje manj razpoložljivega prostora, saj se ta vztrajno krči, je velik delež neprepustnih površin, zaradi česar prst izgublja svojo naravno funkcijo, površine pa se ne morejo naravno ohlajati. Čeprav je zelena infrastruktura trajnostna oblika blaženja podnebnih sprememb, je zanjo potrebnega zelo veliko prostora. Oblikovalci morajo zato ulični prostor natančno proučiti ter določiti in prerazporediti najpomembnejše funkcije na njem. Ugotoviti morajo, kje so ukrepi najbolj potrebni in katera vrsta zelene infrastrukture je najprimernejša za posamezno območje. Mesta želijo povečati pozitivne učinke zelenih naložb in zmanjšati njihove negativne vidike, kar zahteva primerna odločevalska orodja in spodbujanje večfunkcionalnosti (Monteiro idr., 2020).

O možnostih vertikalnega ozelenjevanja fasad, s katerimi se prihrani prostor, kot načinu prilagajanja podnebnim spremembam v mestih je bilo opravljenih že veliko raziskav, kljub ugotovljenim prednostim pa ima takšno ozelenjevanje tudi nekatere pomanjkljivosti (Manso idr., 2015). V izoblikovani mestni strukturi, v kateri je staro mestno jedro zaščiteno z odloki, v skladu s katerimi se morata ohranjati njegova kulturna dediščina in identiteta, so možnosti za ureditev zelene infrastrukture, kot so vertikalni ali strešni vrtovi, omejene (Pansinger in Förster, 2018). Dokler ne bo razvita primerna tehnologija, ki bo v skladu z zahtevami po ohranjanju zgodovinskih objektov in območij, so potrebni drugačni pristopi. Pregled literature kaže, da se odpornost proti podnebnim spremembam večinoma dosega z večjimi sistemi, na ravni stavb pa se to področje šele razvija (Kristl idr., 2020). Raziskave kažejo, da lahko s kvadratnega metra zelene strehe izhlapita po dva litra vode na dan, poleg tega lahko enaka površina zelene strehe zadrži 10 g prašnih delcev in absorbira 375 g CO_2 na leto. Zelene strehe delujejo tudi kot zvočna izolacija, ki zmanjšuje ulični hrup, in prispevajo k energijski varčnosti objektov (Willenbrock, 2020). Bolj zeleno mestno okolje je prijetnejše in povečuje kakovost urbanih ambientov (Kozamernik idr., 2020). Čedalje večje spodbujanje aktivne mobilnosti in kakovostnega javnega prostora v zadnjem času (Markvica idr., 2020) zahteva ponoven premislek o ureditvi uličnega prostora. Pešci in kolesarji okolje doživljajo dosti bolj živo kot vozniki ali uporabniki javnih prevoznih sredstev. Zgradba ulične krajine se opisuje kot pomemben dejavnik privlačnosti mest in njihove prijetnosti za bivanje (Gehl, 2015). Visoke temperature (mestni toplotni otok) ljudi odvračajo od aktivne mobilnosti in slabšajo kakovost javnega prostora. V prihodnje je treba poskrbeti, da so mesta zanimiva in privlačna, hkrati pa morajo prispevati k blaženju vplivov podnebnih sprememb.

1.2 Dajanje prednosti večfunkcionalnim zelenim posegom na tleh

Toplotni zemljevidi mest kažejo, da so vodoravne površine na mestnih območjih (slika 1), kot so strehe in ceste, pogosto najbolj izpostavljene sončnemu obsevanju in imajo pomembno vlogo pri zadrževanju toplote v mestu. V zadnjem času se gradnja zelenih streh spodbuja z raznimi subvencijami (internet 1), ki pa ne upoštevajo lokacije ali lokalnih razmer. Poleg tega tovrstna zelena infrastruktura trenutno ni primerna za dvokapnice ali strehe stavb, ki spadajo v zaščiteno kulturno dediščino. Enako velja za vertikalno ozelenjevanje. Dodatna ovira je, da je za takšne ukrepe potrebna zasebna finančna pobuda. Zasebni lastniki se za naložbe v zeleno infrastrukturo odločajo predvsem, kadar jim to prinaša finančne prednosti. V zvezi s tem se zastavlja vprašanje, ali takšen pristop zagotavlja optimalne in učinkovite naložbe v zeleno infrastrukturo kot ukrep blaženja vplivov podnebnih sprememb. Zakaj občine ne sprejmejo ustrezne politike za reševanje te problematike? Te namreč upravljajo ceste in mnoga parkirišča, ki zadržujejo velik del toplote v mestih. Izvajanje ukrepov blaženja vplivov podnebnih sprememb na občinskih ulicah posledično ni tako zapleteno kot ozelenjevanje zasebnih stavb. Hkrati ulice omogočajo mobilnost vseh v mestu, tudi pešcev in kolesarjev. Ureditev ulic je zelo pomembna tudi za privlačnost mest z vidika človeškega merila (Gehl, 2015). Mestni toplotni otoki dodatno zmanjšujejo privlačnost mestnih območij, zato je nujno, da se z njimi spoprimemo tam, kjer se pojavijo: v uličnem prostoru. Glavni cilj mora biti zmanjšanje asfaltnih in betonskih površin, ki zadržujejo toploto, hkrati pa je treba omogočiti zadostno mobilnost in bivalno kakovost na teh območjih ter izboljšati njihovo trajnostnost. Na podlagi navedenega lahko oblikujemo pametnejša, bolj zelena in bolj zdrava mesta, ki jih odlikuje ravnovesje med energijsko porabo in funkcijo, okoljem in estetiko ter tehnologijo in naravo, v katerih so ljudje in njihove potrebe v ospredju ter za katera je značilna prostorska preobrazba nekdanjih dvodimenzionalnih ulic (Pansinger, 2018). Zato je smiselno, da se v začetni fazi izvajanja ukrepov prilagajanja podnebnim spremembam daje prednost temu delu mestnega tkiva.

Mestni prostor je torej treba na novo proučiti in prepoznati možnosti, ki so bile prej morebiti prezrte. Na mestnih območjih poleg pomanjkanja prostora številni dejavniki, kot so čedalje večja prekritost tal, gost promet in podzemna infrastruktura, ovirajo ureditev obsežnejših zelenih površin. Posledično se veča potreba po manjših in prožnejših rešitvah (npr. parkletih ali mobilnih drevesih) kot posebnih oblikah zelene urbane akupunkture. Manjši posegi lahko torej v mestnem prostoru omogočijo nov pretok energije med zelenimi in pozidanimi območji v mestu, ki sestavljajo tako imenovano dvojno otočje (Christiaanse, 2018: 45).



Slika 1: Skupno sončno obsevanje na vodoravnih in navpičnih površinah z različno usmeritvijo v Istanbulu (vir: Kaynakli, 2011)

V trenutnem diskurzu o skrb vzbujajoči krnitvi biotske raznovrstnosti po vsem svetu (IPBES, 2019) bi bilo treba kakovostne zelene mestne površine prepoznati kot sredstvo za izboljšanje dejanske biotske raznovrstnosti v mestih in za to, da se prebivalce pritegne k ukrepanju, zlasti z večjim izpostavljanjem problema. Navedeno se lahko doseže tako, da se posebna pozornost nameni tudi kakovosti zelene infrastrukture, ne samo njeni količini. V poročilu organizacije IPBES (2019) je izpostavljen pomen naravnih rešitev, zdravih mestnih okolij, izboljšanega dostopa do zelenih površin in ekološke povezanosti mestnih prostorov. Mešane zasaditve avtohtonih rastlinskih vrst imajo lahko v nasprotju s trenutno prevladujočo monokulturno urbano zasaditvijo močan in dolgotrajen pozitiven vpliv na urbano ekologijo, saj so odpornejše proti boleznim, poleg tega je zanje potrebnih manj gnojil in pesticidov (Isbell idr., 2017). Zato se lahko tudi žuželke in drugi opraševalci nemoteno vrnejo v urbano okolje in omogočajo vpogled v delovanje narave. Izkušnje kažejo, da mešane zasaditve močno povečajo raznovrstnost žuželk (Mody idr., 2020), kar lahko opazi tudi javnost. S tovrstno zeleno infrastrukturo lahko torej javnost ozaveščamo o tem, da biotska raznovrstnost ne zagotavlja samo preživetja človeške rase, ampak tudi prijetno bivalno okolje v mestih.

2 Metoda

V prejšnjem poglavju so bile opisane prvine, ki jih je treba vključiti v sistem podnebno odzivnih uličnih vrtov, pri čemer je treba odločitve o tem, kako in kje umestiti katero zeleno infrastrukturo, formalizirati v okviru sistematiziranega postopka (Koc idr., 2018). Potrebe po prostoru (npr. za promet, ljudi in storitve) se morajo izražati v strukturi in vsebini podatkov ter ne nazadnje v končnem orodju. Pri odločanju o nujnosti zelenega prostorskega posega je treba upoštevati izvedljivost

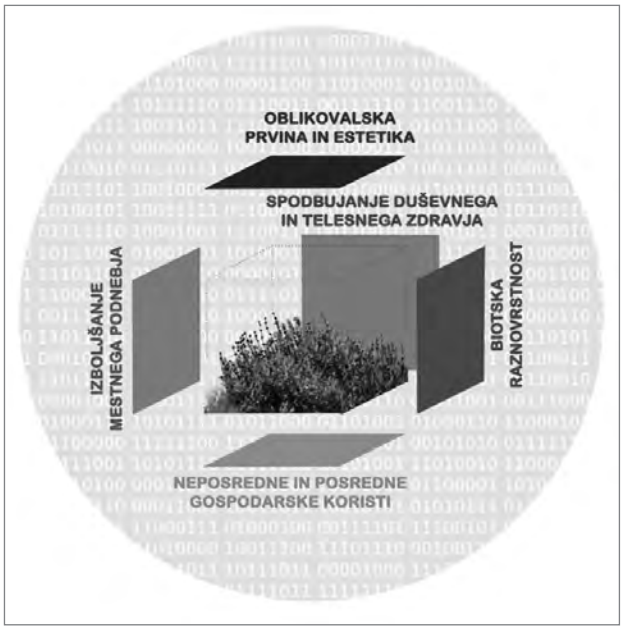
izbranih ukrepov. Nekateri uradi in mesta so izdelali orodja, ki omogočajo izbor pilotnih projektov na podlagi sodelovanja skupnosti ali prikaz skupnih koristi zelenih prostorskih posegov (internet 2). Navedeni pristopi upoštevajo dva ali tri vidike ali funkcije, ne omogočajo pa objektivnega izbora posegov na podlagi lokalnih razmer in prostorskega okvira, v katerem naj bi se izvajali.

Trenutno se podatki o toplotnem udobju zbirajo predvsem z daljinskim zaznavanjem, infrardečimi letalskimi posnetki in/ali satelitskimi posnetki (Xuexiu idr., 2020), za uspešno rešitev pri zbiranju podatkov o temperaturah v mestih pa so se izkazali tudi brezpilotni letalniki (Soto-Estrada idr., 2017). Zbrani podatkovni nizi se uporabljajo za izdelavo in kalibracijo urbanih podnebnih modelov. Ti pristopi imajo nekatere pomanjkljivosti. Letalski posnetki, tudi tisti, narejeni z brezpilotnimi letalniki, omogočajo samo prikaz razmer v danem trenutku, lokalno podnebje pa se nenehno spreminja. Navedena metoda torej ne upošteva te dinamike. Podatki o spreminjanju temperaturnih razmer v daljših obdobjih bi omogočili bolj dodelan pristop k uvajanju ukrepov in spremljanje njihovih vplivov. Izhodišče takšnega pristopa je petdimenzionalni model, iz katerega so razvidni vsestranskost zelenih površin ter sedanje in prihodnje potrebe mestnih prebivalcev (slika 2). Model temelji na načelih urejanja zelene infrastrukture, ki so jih predstavili Monteiro idr. (2020).

Na podlagi navedenega modela je bil razvita sistematična in ponovljiva metoda, imenovana podnebno odzivni ulični vrtovi, katere glavni cilj je izboljšati proces in končni rezultat urejanja zelene infrastrukture na mestnih območjih. Avtorji so določili in združili glavne prvine sistema podnebno odzivnih uličnih vrtov, da bi zagotovili čim višjo stopnjo večfunkcionalnosti. Predlagana metoda bi bila lahko izhodišče za prihodnje oblikovalske posege, pri katerih bi bili ukrepi prilagajanja podnebnim spremembam vključeni v oblikovanje javnega prostora. S tem bi se poleg upoštevanja estetskih vidikov zagotovila čim večja funkcionalnost izvedenih posegov, zlasti pri preureditvi obstoječega mestnega tkiva in pri novogradnjah.

Postopek, ki omogoča doseganje zgoraj navedenega cilja, vključuje naslednje faze:

- urbanistična analiza in določanje območij, primernih za ukrepanje, v obstoječi in načrtovani prostorski ureditvi na podlagi podatkov GIS, letalskih posnetkov in prostorskih aktov;
- razvoj cenovno ugodne metode za zbiranje podatkov o toplotnem udobju (podatki o lokalnih temperaturah in vlagi), na podlagi katerih se določi, kje so potrebni ukrepi, ki temeljijo na uporabi zelene infrastrukture, za prilagajanje podnebnim spremembam. Ti podatki so tudi del vhodnih podatkov za odločevalsko orodje, ki temelji na GIS, poleg tega omogočajo spremljanje učinkovitosti posegov po njihovi izvedbi;
- oblikovanje odločevalskega orodja na podlagi modela ocene primernosti, ki temelji na obstoječi tehnologiji ter združuje predhodne podatkovne nize (npr. karte komunalne infrastrukture, podatke o gostoti prometa, vegetacijske karte, zakonodajo in prostorske modele) in dodatno zbrane podatke (npr. o toplotnem udobju); izdelano orodje podpira odločanje o uvedbi podnebno odzivnih vrtov v ulično krajino;
- določitev in vključitev glavnih prvin blaženja učinkov podnebnih sprememb, kot so ozelenitev cestnih površin, kjer je to primerno in nujno, vpeljava decentraliziranega gospodarjenja s površinskimi vodami in zasaditev kakovostnih avtohtonih rastlinskih vrst, ki niso zahtevne za vzdrževanje, podpirajo biotsko raznovrstnost in prispevajo k lepšemu mestnemu okolju.



Slika 2: Petdimenzionalni model (vir: avtorji)

Načrtna ozelenitev neprepustnih površin ali sprememba obstoječih zelenih površin v podnebno odzivne ulične vrtove ima več funkcij in pozitivnih vplivov: površje se naravno ohlaja, poskrbljeno je za trajnostno gospodarjenje s padavinsko vodo in ulično odvodnjavanje, izboljšata se vidna in zvočna podoba ulice, javni prostor postane ljudem bolj všeč, poveča pa se tudi biotska raznovrstnost območja. S stalnim merjenjem temperature zraka, vlage in količine padavin s senzorsko tehnologijo, razvito posebej v ta namen, se lahko pozitivni vplivi podnebno odzivnih uličnih vrtov na bližnjo okolico tudi kvantitativno preverjajo, omenjeni podatki pa so ves čas dostopni v namensko razviti aplikaciji.

3 Rezultati

V nadaljevanju so predstavljeni naslednji rezultati:

- razvoj primernih senzorjev in aplikacije za zbiranje in širjenje podatkov o toplotnem udobju; – izdelava modela za oblikovanje odločevalskega orodja, ki temelji na GIS;
- opredelitev računalniško podprte metode vključevanja gospodarjenja s površinskimi vodami;
- določitev oblikovalskih meril za ustrezno zasaditev rastlin in uporabo prsti, prilagojenih izmenjavanju sušnih obdobij in občasnih poplav ter zahtevnim urbanim pogojem (npr. onesnaženim površinskim vodam);
- zagotovitev poskusne izvedbe opisanega večfunkcionalnega pristopa na mestnem območju;
- izdelava splošnega zemljevida območij z izrazitim tveganjem za pregrevanje in poplavljanje ter vključitev zemljevida v prostorske akte.

3.1 Razvoj senzorjev za zbiranje podatkov o toplotnem udobju

Pri razvoju senzorjev so avtorji proučevali možnosti za neprekinjeno in dolgoročno zbiranje podatkov o temperaturah. Z vidika stroškov se je vzpostavitev obsežne mreže senzorjev za zbiranje podatkov o temperaturah in vlagi izkazala za neprimerno. Namesto tega so avtorji predlagali uporabo manjšega števila mobilnih senzorjev z GPS-sledilniki, ki omogočajo zbiranje podatkov na širšem območju. Senzorji bi se namestili na motorna kolesa pismonoš ali drugih dostavljavcev, kar bi omogočilo redno zbiranje podatkov po celotnem mestu. Na svoja kolesa bi jih lahko namestili tudi prebivalci, kar bi zagotovilo dodaten vir podatkov, hkrati pa bi se med ljudmi povečalo zavedanje o podnebnih vplivih (slika 3).

Trenutni prototip mobilnih senzorjev zbira podatke o temperaturi in vlažnosti zraka, ki sta pomembna kazalnika toplotnega udobja na mestnih območjih (slika 4). Vgrajen ventilator omogoča enakomerno izmenjavo zraka z okolico in poveča natančnost merjenja. Meritve klasičnih senzorjev, ki so neposredno izpostavljeni soncu, namreč ne pokažejo pravilne temperature v izbranem prostoru. Podatki se prenašajo prek mobilnega telefonskega omrežja z uporabo tehnologije NB-IoT, ki je bila razvita za energijsko varčen prenos podatkov. Senzorji, ki jih napajajo baterije, lahko tako neprekinjeno zbirajo in prenašajo podatke v daljšem obdobju. Storitev NB-IoT je pri večini ponudnikov na voljo po ugodnih cenah. Prvi prototipi se že uporabljajo, podatki pa se urejajo v posebni aplikaciji (climapp), ki se lahko naloži na vsak pametni telefon. Rezultati so prikazani na prosto dostopnih spletnih uličnih zemljevidih, na katerih

Slika 3: (a) Senzorji NB-IoT, nameščeni na motorna ali navadna kolesa, sestavljajo mobilno omrežje za neprekinjeno in poceni zbiranje podatkov o toplotnem udobju v javnem prostoru; (b) senzorji NB-IoT se lahko uporabljajo na katerem koli kolesu; (c) temperaturne razlike v razponu 2–3 °C, označene na cestnem zemljevidu v temno in svetlo sivih odtenkih (vir: avtorji)

Slika 4: Prototip senzorja, ki omogoča mobilno zbiranje podatkov o lokalnem podnebju (vir: avtorji)

1. faza analize

Kje je zelena infrastruktura potrebna?

– določanje MTO na podlagi podatkov o toplotnem udobju

– ocena verjetnosti hudourniških poplav

2. faza analize

Kje je ureditev zelene infrastrukture tehnično mogoča in primerna?

– hidrološka analiza

– karta komunalne infrastrukture

– register dreves in druge vegetacije

– usmeritev cest (proti severu ali jugu)

– razmerje med višino stavb in širino ulic

– stopnja prekritosti tal

Analiza prekrivanja obteženih slojev za določanje primernosti lokacije

Slika 5: GIS-orodje za presojo primernosti območij za umeščanje večfunkcionalnih uličnih vrtov v mestni prostor (vir: avtorji)

so z različno barvo označene temperaturne razlike v uličnem omrežju (zelena = hladno, rdeča/oranžna = vroče). Ta metoda omogoča poceni ter neprekinjeno in zanesljivo pridobivanje podatkov o toplotnem udobju, s katerimi se lahko posodablja omenjeno GIS-orodje.

3.2 Model GIS-orodja za presojo primernosti

Mestna območja so zelo kompleksni sistemi, s svojo rastjo in večjo gostoto pa postajajo še kompleksnejši. Za obvladovanje te kompleksnosti je bilo treba razviti metode, ki omogočajo ustrezno obdelavo zanesljivih in dodelanih prostorskih podatkov, ki se sproti posodabljajo. Posledično se čedalje bolj uporabljajo GIS, ki so bili razviti prav za obvladovanje kompleksnosti prostorskih podatkov in omogočajo obveščeno odločanje na vseh področjih urejanja mestnega prostora. GIS so pomembni zato, ker na enem mestu združujejo ogromne količine podatkov, potrebnih za uravnoteženo določanje prednostnih nalog in reševanje raznih problemov, tudi za optimizacijo uvajanja novih zelenih površin. GIS so se že izkazali za uporabne pri določanju primernih lokacij za urejanje deževnih vrtov (Fuskova, 2017).

Poenostavljen diagram na sliki 5 prikazuje predlagani model, ki združuje različne obstoječe podatke (npr. karto komunalne infrastrukture, podatke o razmerju med višino stavb in širino ulic, stopnji neprepustnosti in prometnih tokovih ter standarde, ki se nanašajo na dimenzioniranje cest) in dodatne podatke o toplotnem udobju, pridobljene z omenjenimi senzorji. Potem ko se zberejo ustrezni podatki, se izvede analiza prekrivanja obteženih kriterijev, s katero se na podlagi izbranih lastnosti določijo območja, primerna za ureditev zelenih površin kot ukrep odzivanja na podnebne spremembe. S to metodo lahko urbanisti ugotovijo, kje so ukrepi potrebni in kje jih je mogoče izvesti. Poleg tega omogoča sprejemanje usklajenih in informiranih odločitev o ukrepih, povezanih z urejanjem zelenih površin, kar zagotavlja večjo učinkovitost izvedenih posegov, večjo donosnost naložb in večjo preglednost postopkov.

3.3 Vključitev podatkov, potrebnih za decentralizirano gospodarjenje s padavinsko vodo

Spremembe v vodnem krogu so med ključnimi posledicami čedalje večje neprepustnosti površin (Shuster idr., 2005). Ozelenjevanje neprepustnih mestnih površin omogoča, da se prst znova aktivira in hladi okolico z evapotranspiracijo, ki blaži učinke mestnega toplotnega otoka. Poleg tega zmanjšuje vplive hudih nalivov, ki so prav tako posledica podnebnih sprememb. Ocena hidroloških procesov se nekoliko razlikuje od narave drugih vhodnih podatkov za odločevalsko orodje, saj je treba na primer najprej izračunati vpliv padavin na urbani sistem. Vrsta izračuna je močno odvisna od proučevanega območja in njegove prostorske zgradbe ter od cilja raziskave. Za oceno vodne bilance mestnega območja (Sprung idr., 2017) zadostujejo preprosta orodja, za oceno časovnega in prostorskega poteka mestnih poplav pa so potrebna napredna simulacijska orodja (Krebs idr., 2014a). Cilj raziskave je poleg tega neposredno povezan s potrebnimi podatki in pogosto je treba za hidrološko presojo pred namestitvijo zelene infrastrukture in po njej uporabiti razna orodja za presojo (Krebs idr., 2013, Krebs idr., 2014b, Leimgruber idr., 2019). Rezultati opravljenih izračunov (npr. zemljevidi poplavnih območij) se nato uporabijo kot vhodni podatki za odločevalsko orodje, na podlagi katerih se določijo najboljše lokacije in sestava tal za ureditev podnebno odzivnih uličnih vrtov.

3.4 Izbor primernih zasaditev za podnebno odzivne vrtove

Niso vse zelene površine ustvarjene enako (Wood idr., 2018). V mestnem okolju ima pomembno vlogo tudi kakovost zelenih prostorov, ne samo njihova količina. Zelena infrastruktura v mestih mora izpolnjevati več meril, povezanih z zasaditvami v javnem prostoru. Mestne zasaditve morajo biti privlačne na pogled in se morajo biti sposobne prilagajati zahtevnim podnebnim in drugim razmeram (visoke ali nizke temperature, promet, odpadki, prebivalci in hišni ljubljenčki), hkrati pa morajo biti čim manj zahtevne za vzdrževanje, da oddelkom mestne uprave, ki imajo za ta namen malo finančnih sredstev, ne povzročajo še več stroškov. Vse našteto je zelo težko zagotoviti, zaradi česar so v preteklosti prevladovale monokulturne zasaditve, ki pa ne morejo več izpolnjevati zahtev sodobnih mestnih zelenih površin.

Na podlagi petdimenzionalnega modela, predstavljenega na sliki 2, imajo podnebno odzivni ulični vrtovi naslednje glavne funkcije:

- hlajenje in zagotavljanje sence;
- omogočanje decentraliziranega gospodarjenja s površinskimi vodami;
- krepitev biotske raznovrstnosti v mestu;
- izboljšanje zdravja in počutja ljudi.

Zasaditve, ki lahko izpolnjujejo večino zgornjih meril, se zgledujejo po t. i. gramoznih vrtovih, na katere je širšo javnost najprej opozorila britanska vrtnarka Beth Chatto (2000). Ta je na enem najbolj sušnih območij Anglije brez urejenega namakanja ter s siromašno in zelo prepustno prstjo poskušala urediti vrt. To ji je tudi uspelo: ustvarila je slikovit vrt z bogato in privlačno mešanico rastlin, ki so odporne proti suši in jih ni treba nikoli zalivati. Njeno metodo posnemajo v številnih vrtovih po vsem svetu, čedalje bolj pa se prepoznavajo tudi njene prednosti pri

zasaditvah v javnem prostoru (Fallast, 2018; slika 6). Razne rastlinske združbe v javnem prostoru so ponavljajoča se tema del številnih avtorjev (npr. Hitchmough, 2017, in Dunnett, 2019). Zlasti Dunnett (2019) je dokazal, da se estetika in večja funkcionalnost, dosežena z zajetjem in zadrževanjem padavinske vode, nikakor ne izključujeta. Privlačno in za vzdrževanje nezahtevno alternativo klasičnim tratam je predstavil Smith (2019). Zahteva uporabo nizkih ali pritlikavih rastlinskih vrst (npr. pritlikave kamilice) ter združuje hortikulturno prakso in ekologijo. Končni rezultat je trata brez trave, ki je ni treba kositi ali gnojiti. Na podlagi navedenih metod je bil izdelan seznam rastlin, ki izpolnjujejo glavne omenjene funkcije in vključujejo avtohtone vrste, kjer je to primerno. Seznam je podlaga za oblikovanje podnebno odzivnih uličnih vrtov ter je namenjen izvedbi in spremljanju v začetnih študijah primera. Vsi zainteresirani ga lahko dobijo pri avtorjih, in to na podlagi pisne prošnje.

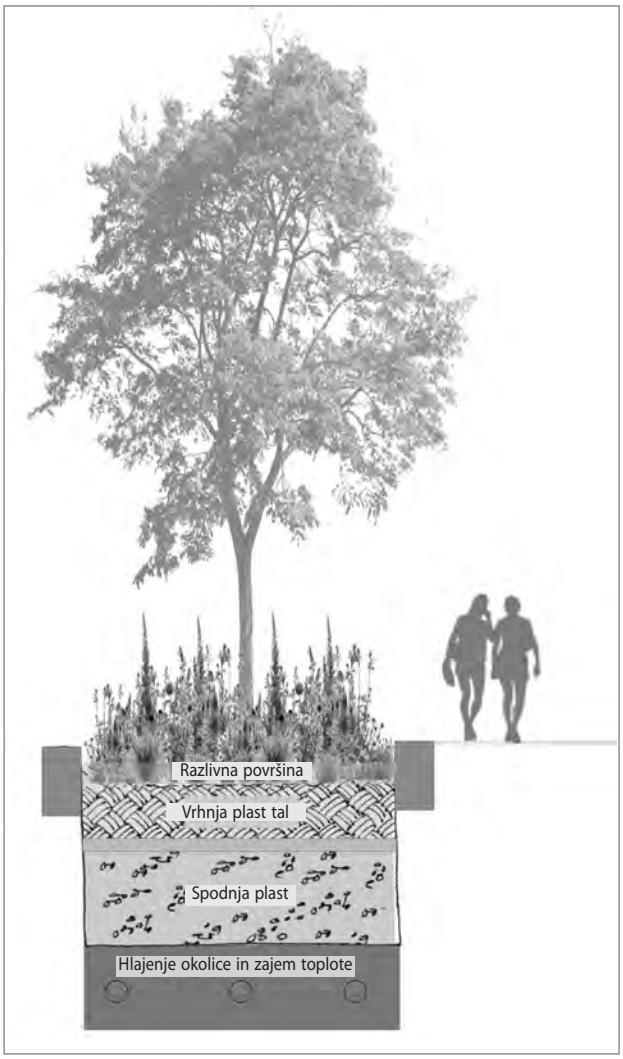
Zaradi visoko prepustne zgradbe tal (razmerje peska in rodovitne zemlje je 50 : 50) je tovrstna zasaditev idealna za sisteme za gospodarjenje s padavinsko vodo (deževne vrtove). Ena glavnih prednosti deževnih vrtov, bogatih z rastlinskimi vrstami, je ta, da zaradi koreninskega sistema lahko ohrani porozno zgradbo tal in s tem omogoča prosto odtekanje vode skozi plasti. Zaradi samouravnalne zmožnosti takšnih rastlinskih združb so deževni vrtovi nezahtevni za vzdrževanje in posledično cenejši. Zeleni prostori, bogati z rastlinskimi vrstami, krepijo biotsko raznovrstnost na vseh ravneh, so privlačni ter izboljšujejo zdravje in počutje mestnih prebivalcev (slika 7).

3.5 Poskusna uporaba sistema podnebno odzivnih uličnih vrtov

Omenjena metoda se trenutno uporablja v okviru raziskovalnega projekta KLAR (nem. *Klima Anpassungsregionen*), ki poteka v občini Wolfsberg na avstrijskem Koroškem. Izbrana je bila zato, ker se ujema s ciljem projekta, tj. razviti in izvajati metode za obvladovanje vplivov podnebnih sprememb na mestnih območjih. Z interdisciplinarno analizo, ki jo je poleti 2020 opravila delovna skupina, je bilo v neposredni bližini glavne železniške postaje v Wolfsbergu izbrano območje, na katerem bi lahko metodo učinkovito izvedli v okviru pilotnega projekta. Območje ima velik delež neprepustnih površin (95 %), zaradi temperatur, ki so med najvišjimi v okrožju, pa je izpostavljeno učinkom mestnega toplotnega otoka. Hkrati je območje pred železniško postajo pomembno prometno vozlišče in poslovno središče, ki bo z načrtovanim dokončanjem nove železniške proge Koralm leta 2025 postalo še pomembnejše. Izvedba pilotnega projekta je načrtovana v letu 2021.

Nameščeno bo omrežje stacionarnih mobilnih senzorjev, ki bodo merili toplotno udobje pred izvedbo ukrepov in po

Slika 6: Zahteve sodobnih mestnih zasaditev: visoka estetska vrednost, biotska raznovrstnost in nezahtevno vzdrževanje (vir: avtorji)



Slika 7: V gramoznih vrtovih so tla dobro prepustna, kar omogoča hitro odtekanje površinske vode (vir: avtorji)

njej. Začetna faza projekta temelji na preobrazbi že obstoječe zelene površine tik pred vhodom v železniško postajo v približno 200 m^2 velik deževni vrt. Območje, izbrano za ureditev deževnega vrta, bo nekoliko spremenjeno, da bo lahko površinska voda odtekala v na novo urejena tla. Obstoječa monokulturna zasaditev bo zamenjana z mešanico trajnic in trave, pri čemer bodo uporabljene primerne avtohtone vrste, odporne proti suši in občasnemu poplavljanju. Cilj je ohraniti sprejemljiv estetski videz ob hkratnem zagotavljanju čim večje biotske raznovrstnosti v mestnem okolju. Če bo izvedeni poseg uspešen, bo razširjen še na druga območja. Med izvajanjem projekta se bodo poleg tega spremljali tudi učinki nove prostorske ureditve (znižanje temperatur in sprejetost v javnosti).

4 Razprava in naslednji koraki

Začetni rezultati so prvi korak v razvoju metode in dajejo trdno podlago za nadaljnji napredek. Jasno je, da je potrebnega še veliko dela za razvoj širše uporabnega sistema. Predvideni naslednji koraki so predstavljeni v nadaljevanju.

Senzorji se lahko uporabljajo kot stacionarne ali mobilne enote. To v primerjavi s trenutno uveljavljenimi modeli, ki uporabljajo letalske posnetke ali posnetke, narejene z brezpilotnimi letalniki, omogočajo največjo prožnost pri cenovno ugodnem rednem zbiranju podatkov o toplotnem udobju (Soto-Estrada idr., 2017). Glavna prednost predstavljenega sistema je ta, da zagotavlja neprekinjen dotok podatkov, kar omogoča celovitejši vpogled v spreminjajoče se lokalne podnebne razmere. Izkazalo se je, da potreba po namestitvi dodatne naprave na kolo ovira bolj razširjeno uporabo. Dodatna pomanjkljivost je, da trenutni modul ni odporen proti vremenskim vplivom, kar onemogoča njegovo stalno namestitev. Prihodnji razvoj se mora torej osredotočiti na vključitev senzorja med dodatke za kolesa, kot je na primer zvonec, ali pa njegovo integracijo v okvir kolesa. Ob nizki ravni napolnjenosti baterije je bila opažena manjša izguba podatkov, zato je v prihodnje načrtovan razvoj modula na sončne celice, ki bo omogočal neprekinjeno uporabo brez polnjenja. Upravi avstrijske Štajerske je bila poslana prošnja za subvencioniranje razvoja takšnega modula, ki je trenutno v fazi pregleda. Podatki so za zdaj prikazani na prosto dostopnih spletnih uličnih zemljevidih. Naslednji korak v razvoju modula bo zagotovitev natančnejšega ogleda ali zumiranja na ulično krajino za določitev točnega izvora meritev, kar pa zahteva bolj dodelan pristop k oblikovanju informacij.

Osnovni model GIS-orodja za odločanje je že oblikovan in bo preizkušen v naslednjem koraku. Izziv bo združevanje heterogenih podatkov številnih deležnikov v koherenten model. Podatki o toplotnem udobju, zbrani z mobilnimi ali stacionarnimi senzorji, ne bodo težava, saj se lahko zahtevam orodja prilagodijo že pri viru.

Standardizirana oblika zasaditve je bila izbrana na podlagi zahtev o estetskem videzu, biotski raznovrstnosti in odpornosti ter na podlagi izsledkov o rastlinah za gramozne vrtove, ki niso zahtevne za vzdrževanje, in tehnologije deževnih vrtov. V naslednjem koraku se bo preverjala primernost rastlinskih združb za uporabo na ulici. Terensko preverjanje bo potekalo dve do tri rastne sezone, da se lahko rastline dobro ukoreninijo. Proučevali se bodo odpornost rastlin proti daljšim obdobjem izpostavljenosti visokim temperaturam in pomanjkanju padavin, pogostost potreb po vzdrževalnih posegih, odziv na onesnaženje površinske vode zaradi prometa in zimskega posipanja ulic s soljo ter privlačnost zasaditve in njena posledična sprejetost med ljudmi. Načrtovana je tudi ekološka presoja vplivov na biotsko raznovrstnost na izbranem območju (tj. raznolikost in število opraševalnih žuželk). Na podlagi dobljenih rezultatov bo način zasaditve ustrezno izboljšan.

Sodobna hidrološka in hidrodinamična simulacijska orodja omogočajo oblikovanje in proučevanje decentraliziranih naravi prijaznih strategij gospodarjenja s padavinskimi vodami na različnih mestnih ravneh, od manjših deževnih vrtov do strategij na ravni celotnega mesta. Pomemben dejavnik je čedalje večja razpoložljivost prostorskih in hidrometeoroloških podatkov, na podlagi katerih se lahko ovrednotita učinkovitost in uspešnost strategij gospodarjenja s padavinskimi vodami. Rezultati hidrološke in hidrodinamične simulacije so se izkazali za ključne vhodne podatke za odločevalsko orodje GIS.

V okviru poskusnega projekta v mestecu Wolfsberg so bili podnebno odzivni ulični vrtovi prvič opredeljeni kot način vključevanja občutno širše funkcionalnosti v neposredno odzivanje na razne izzive, ki jih mestu povzročajo podnebne spremembe, kot je to običajno pri večini obstoječe zelene mestne infrastrukture. Zato je smiselno, da se pojem vrt v pomenu vidne zasaditve kot estetske in hladilne prvine razširi tudi na nevidni prispevek podzemnih plasti, ki so oblikovane tako, da opravljajo raznovrstne pomembne funkcije v mestnem okolju. Poleg tega podnebno odzivni ulični vrtovi ozaveščajo ljudi o pomenu zelene infrastrukture z vidika dolgoročnega zagotavljanja biotske raznovrstnosti ter telesnega in duševnega zdravja. So pravi mestni zeleni sistem (Wallace, 1990), ki deluje na vseh ravneh.

Pomemben vidik spremljanja učinkov izvedenega posega je tudi določitev ravni javne sprejetosti tovrstne večfunkcionalne zelene infrastrukture in ugotavljanje, ali dodatna funkcionalnost, ki omogoča neposredno prilagajanje na podnebne spremembe, lahko vpliva na večjo javno podporo. Ureditev podnebno odzivnih uličnih vrtov ustvarja dodano vrednost različnim vidikom sedanjega in prihodnjega mestnega življenja. Na podlagi integriranih načel urejanja zelene infrastrukture (Monteiro idr., 2020) predstavljeni pristop omogoča optimal-

no in trajnostno uporabo virov, kot sta prostor in voda, saj razbremenjuje mestne sisteme za ravnanje z odpadno vodo, kar zmanjšuje neposredne stroške in ščiti naravne vodotoke. Ponuja samouravnalno in za vzdrževanje nezahtevno rešitev blaženja vplivov podnebnih sprememb, pri čemer z uporabo zasaditev, prilagojenih razmeram na izbranem območju in bogatih z rastlinskimi vrstami, povečuje biotsko raznovrstnost v mestu (Mody idr., 2020). Prostorska preureditev ulice z vključitvijo zelene infrastrukture v tej obliki lahko krepi tudi psihološko počutje na podlagi uporabe načel hortikulturne terapije v javnem prostoru (Ulrich, 1984; Kaplan in Kaplan, 1989) in spodbuja aktivno mobilnost (hojo in kolesarjenje) v privlačnejšem okolju, ki ga ustvarjajo nove zelene površine (Fallast, 2017; Dunnett, 2019). Poleg tega javnemu prostoru omogoča, da ustvari svojo identiteto (Pansinger, 2019).

Navedeni pristop dokazuje še, da velika mesta ne potrebujejo vedno samo velikih projektov. Pogosto prav manjši projekti, kot so urbane akupunkture, povzročajo pomembne spremembe in omogočajo inovacije (slika 8).

5 Sklep

Večfunkcionalni podnebno odzivni ulični vrtovi so namenjeni predvsem preureditvi ulične krajine (tj. javnega prostora). V začetni fazi naj bi se urejali zlasti na asfaltnih območjih cest, ki niso namenjena motoriziranemu prometu (tj. v mrtvih conah brez posebne prometne funkcije), da bi jih javnost čim lažje sprejela. Pomemben del procesa je tudi ozaveščanje ljudi o tem, da cest ne bi smeli dojemati samo kot cestno povezavo, ampak bi jih morali razumeti in uporabljati kot javni prostor in temeljno dobrino mestnih ekosistemov.

Cilj pristopa, predstavljenega v članku, je zato ponuditi inovativno rešitev na podlagi oblikovanja sistematičnega postopka izvajanja zelenih posegov v javnem mestnem prostoru z uporabo:

- orodja za oceno primernosti, ki temelji na GIS in združuje vse podatke, potrebne za izbor lokacije in vrste zelene infrastrukture;
- večfunkcionalnega pristopa ter interdisciplinarne in transdisciplinarne metode izvajanja ukrepov za blaženje vplivov podnebnih sprememb;
- mobilnih senzorjev z GPS-sledenjem za zbiranje podatkov o mikroklimi, ki se nato vnesejo v orodje za presojo primernosti, kar omogoča poceni in neprekinjeno spremljanje dinamičnih mestnih mikroklim; navedeno se razlikuje od trenutnega ad hoc pristopa k uvajanju zelenih prostorov v mestno okolje kot načina obvladovanja vplivov podnebnih sprememb;
- prožnega sistema, ki zadovoljuje potrebe že izoblikovanega mestnega tkiva, ki je pogosto podrejeno strogim prostorskim predpisom in prostorsko omejeno; navedeni sistem ponuja prožne in učinkovite zelene posege (zelene akupunkture), ki lahko na ustrezen način pozitivno vplivajo na lokalne podnebne razmere.

Slika 8: (a) Prostor pred glavno železniško postajo v Wolfsbergu; (b) prikaz istega prostora, preurejenega v večfunkcionalen podnebno odziven ulični vrt (vir: avtorji)

Večfunkcionalni podnebno odzivni ulični vrtovi so prenosljiva metoda preureditve manjših mestnih območij, ki ponuja nov pristop k barvam, teksturam, globini in funkcionalnosti ter prvine mestnih območij, kot so toplota, padavine, prah in hrup, preoblikuje v novo obliko zelenega.

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Mesta kot kraji in teme raziskav: kartiranje raziskovalnih grozdov po znanstvenih področjih

V znanstvenih člankih se mesta običajno pojavljajo kot teme (predmeti ali akterji) ali kraji (območja, destinacije, lokacije in prostori) raziskav. Proučevanje splošnejših vzorcev je redkejše, saj se raziskave običajno osredotočajo na posamezna mesta. Avtorja z znanstvenim kartiranjem, ki temelji na podatkih bibliografske zbirke Scopus in programskem orodju za vizualizacijo Vosviewer, proučujeta objave, povezane z raziskavami mest, v znanstvenih revijah in na različnih tematskih področjih, da bi ugotovila, kako se različne funkcije mest odražajo v znanstvenih revijah. Za modele uporabita primerljiva glavna mesta držav članic Evropske unije (Berlin, Madrid, Rim in Varšavo). Izsledki kažejo zelo podobne vzorce pri vseh mestih, pri čemer so najpogostejše objave v nacionalnih in regionalnih revijah. Večina raziskav poteka na treh glavnih znanstvenih področjih: 1. v družboslovju in humanistiki, 2. v medicini in 3. v naravoslovju (okoljske vede, vede o Zemlji in drugih planetih ter biotehniške in biološke vede). Prvotno so prevladovale raziskave s področja medicine, v zadnjem času pa so najpogostejše družboslovne študije. Čeprav ugotovljena razmerja med znanstvenimi področji temeljijo na različnih revijah, so primerljiva za vsa mesta, na njihovi podlagi pa se lahko presojajo mesta podobne velikosti. Raziskava je bila opravljena tik pred izbruhom pandemije koronavirusne bolezni (covid-19), na podlagi njenih izsledkov pa bi lahko primerjali raziskovalne vzorce pred pandemijo in po njej, saj se bodo lahko raziskave, povezane z mesti, zaradi pandemije v prihodnosti spremenile.

Ključne besede: mesta, znanstveno kartiranje, raziskovalna področja, bibliometrija, vizualizacija

1 Uvod

V znanstvenih člankih imajo mesta pomembno vlogo. Običajno se pojavljajo v različnih kontekstih: kot del proučevanega področja (npr. kulture, geografije, zgodovine, medicine ali urbanizma), kot kraji ali tipološko opredeljena območja (npr. prestolnice, azijska mesta ali pametna mesta) ali v metaforičnem smislu (npr. mesto kot laboratorij, omrežje, podjetje, učilnica ali platforma). Tako so lahko tema raziskav, pri čemer lahko nastopajo kot akterji, znamke, študije primera, primeri, gonila, eksperimenti, dejavniki, orodja itd. ali pa se pojavljajo kot kraji, v zvezi s katerimi poteka posamezna raziskava (destinacije, lokacije, kraji dogajanja, prizorišča, prostori itd.).

Namen članka ni teoretizirati o tem, kako se mesta znanstveno proučujejo. V okviru idejnega ozadja empirične raziskave, predstavljene v članku, avtorja zgolj predpostavljata, da se čedalje večja kompleksnost prepletanja družbenih, prostorskih, okoljskih in tehnoloških dejavnikov kaže tako v heterogenosti analiz kot v poskusih njihovega združevanja. Navedeno velja zlasti za urbanistične in regionalne raziskave konkretnih, splošnih in primerjalnih značilnosti urbanega (Hočevar, 2005; Cox in Evenhuis, 2020). Meje med obravnavo predmeta, subjekta in teme so lahko zelo zabrisane. Tako se lahko na primer zelo heterogeni živi akterji v mestu, kot so načrtovalci, politiki, umetniki, podjetniki, raziskovalci in mediji, obravnavajo skupaj z neživimi prvinami, kot so zemljišča, muzeji, tovarne, publikacije in raziskave. Tako subjekti kot predmeti mesta ali v mestu, ne glede na naslov avtorjeve ustanove, vplivajo na oblikovanje mreže funkcij ali povezav in s tem delujejo kot akterji. Za grobo ponazoritev tovrstnega prepletanja se avtorja naslanjata na raziskovalne poglede, ki temeljijo na epistemološkem izhodišču teorije akterjev in omrežij (ang. *Actor-Network Theory*), v okviru katere se analizirajo povezave med entitetami in njihovimi sestavnimi deli (Latour, 2005; Brenner idr., 2011; Gutzmer, 2016). Človeški in nečloveški akterji ali aktanti delujejo skupaj, kar se izraža v zunanjih povezavah.

Po drugi strani se mnogi empirični članki osredotočajo na posamezna mesta, pri čemer obravnavajo točno določene teme, kot so kulturne dejavnosti, gospodarstvo, okolje, hrana in prehrana, zdravje in bolezni, zgodovina, onesnaževanje, turizem, promet, mestno gozdarstvo in morfologija mest. Številne raziskave se osredotočajo na konkretna mesta ali skupine mest istega tipa, z mestom kot območjem proučevanja pa se ukvarja bolj malo raziskav, če pa že, je obravnava dvoumna. Izraz »laboratorij« se na primer uporablja za mesto kot kraj raziskave, hkrati pa tudi za vrsto terenske raziskave (Karvonen in Heur, 2014). Po mestih se lahko imenujejo celo raziskovalne paradigme, kot je na primer čikaška šola (urbane) sociologije (Gieryn, 2006; Guggenheim, 2012). V okviru teorije akterjev in omrežij se mesto kot laboratorij pojavlja kot aktant, naj gre za metaforo ali konkretno in resnično območje. Pametna mesta in trajnostnost mest se kot teme proučujejo tudi s kvantitativnimi bibliometričnimi metodami (Ingwersen in Serrano-López, 2018; Wang idr., 2019; Marvuglia idr., 2020), vendar ne na podlagi konkretnih mest. Kadi (2019) je v raziskavo vključil vse evropske prestolnice in se osredotočil na njihovo gentrifikacijo. Berlin, Rim in Madrid (predmeti raziskave v tem članku) so bili proučeni v kontekstu zgodovine (Therborn, 2002; Gomez idr., 2018) in znamčenja mest (de Rosa idr., 2019) ter v raziskavi deleža znanstvenih objav v največjih svetovnih urbanih aglomeracijah (Grossetti idr., 2014). Raziskovalna področja, povezana z mesti, so določali Nunes in sodelavci (2019), ki so za to uporabili sistem Web of Science.

Mesta se kot glavne teme raziskav najpogosteje obravnavajo v družboslovju, na tem področju so bile s primerjalnimi študijami razvite številne kvantitativne in kvalitativne primerjalne metode (Ward, 2010), s katerimi se v primerjalnih raziskavah (Robinson, 2011) včasih poskušajo uravnotežiti številne razlike (npr. v bogastvu, geografski legi in političnih sistemih). Mesta se poleg tega proučujejo v vedah o življenju, kot so vede o rastlinah in okoljske vede (npr. Berlin; Sukopp, 2008), ali v okviru raziskav o podnebnih razmerah (Lamb idr., 2019). Področja urbanističnih raziskav, ki jih je v študiji prepoznala Raynorjeva (2019), so bila ožja in izčrpnejša (vključevala so tudi okoljske dejavnike in naravne vire), vendar so navedene raziskave temeljile samo na avstralskih mestih. Obsežnejše primerjave mest so redke. V informatiki (npr. v bibliometriji in znanstvenem kartiranju) se mesta najpogosteje obravnavajo v smislu določanja naslova avtorjeve ustanove in metropolitanskih enot, regij, držav itd. (Bartol in Hočevar 2005; Frenken idr., 2009; Matthiessen idr., 2010). Maisonobe in sodelavci (2017) so proučevali svetovna mesta v kontekstu znanstvenih objav in znanstvenih področij. Bornmann in de Moya-Anegon (2019) sta nemška mesta proučevala z vidika koncentracije znanstvenih dejavnosti. Raziskovalci so poleg tega proučevali znanstveno sodelovanje med mesti in ustanovami (Leydesdorff in Persson, 2010) in število objav po posameznih mestih o različnih temah, kot je globalizacija mest (Kanai idr., 2018). Različni konteksti mest, obravnavani v knjigi *The Rise of the Network Society* (Castells, 1996), so bili analizirani z metodami merjenja znanosti (Zhen idr., 2020).

Posamezne teme se pogosto kartirajo z uporabo programskih orodij za vizualizacijo (npr. Vosviewer, CitNetExplorer, CiteSpace ali Pajek). Hajdukova (2017) je na ta način proučevala mestno logistiko. Z vizualizacijo so bili prikazani grozdi različnih idejnih šol pri proučevanju razmerij med mesti (Peris idr., 2018). Mesta kot primarna območja znanja so bila analizirana tudi z vidika produkcije intelektualne lastnine ali patentov (Kogler idr., 2018). V raziskavah s področja

medicine in javnega zdravja so bila mesta proučena z vidika staranja prebivalstva (de Oliveira idr., 2019; Xiang idr., 2020). Različne bibliografske prvine v publikacijah (država, revija, besede v naslovih, avtorske ključne besede itd.) so bile vizualizirane na področju okoljskih ved (ekološke infrastrukture mest; Sun idr., 2020). Xing in Brimblecombe (2020) sta izraze, povezane z drevesi in parki v mestu, kartirala v obliki grozdov. Nekateri raziskovalci so analizirali pogostost proučevanja ustvarjalnih mest v vodilnih znanstvenih publikacijah (Rodrigues in Franco, 2020), drugi so pri analizi uporabljali ključne besede člankov, kot so »urbano«, »mesto« ali »mesta« (Kirby, 2012). Mogoči so tudi pristopi, ki temeljijo na masovnih podatkih, vendar je treba te podatke interpretirati na podlagi ustreznega znanja (Zook idr., 2019).

V članku so mesta proučena in primerjana z vidika funkcij, ki jih imajo na različnih področjih znanstvenih objav. Dodaten razlog za raziskavo je bil izbruh pandemije koronavirusne bolezni (covid-19), vendar v raziskavi (še) niso upoštevani citati, povezani s covidom, saj je od izbruha preteklo še premalo časa (manj kot leto). Namesto tega je cilj proučiti raziskovalne vzorce pred pandemijo, na podlagi česar bi se lahko v prihodnje izvedle kompleksnejše primerjalne študije. Številne dosedanje kvantitativne raziskave v povezavi z mesti so se osredotočale predvsem na mesto kot kraj ali naslov avtorjeve ustanove, kar pa o mestu in njegovih funkcijah ne pove prav veliko. Namen raziskave, predstavljene v tem članku, je proučiti mesto kot območje raziskave ali kot raziskovalno temo ali pa oboje hkrati. Posledično avtorja ne proučujeta mesta kot kraj, naveden kot naslov avtorja v bibliografiji, ampak kot akter. Primerjata podobna mesta v več državah, da bi ugotovila vzporednice, ki morebiti presegajo domnevne razlike med njimi. Njuna hipoteza je, da čeprav proučevana mesta spadajo v zelo različne geografske in jezikovne kontekste in so se skozi zgodovino različno razvijala, so teme raziskav, povezane z njimi, zelo podobne. Predpostavljata, da se to ne kaže samo v izbiri kanalov znanstvenih objav in podobnem razmerju med objavami v nacionalnih in mednarodnih znanstvenih revijah, ampak tudi v temah, ki jih raziskovalci proučujejo. Navedeno hipotezo preverjata z analizo bibliografskih in besedilnih podatkov.

Izhodišče za raziskavo so bibliografski podatki (vzorci rasti v več desetletjih, naslovi revij, jeziki, soavtorstvo in država/naslov avtorjeve ustanove), pri čemer se lahko osnovni vzorci podobnosti presojajo na podlagi podatkov o založnikih. Navedeno je treba dopolniti s presojo porazdelitve po posameznih raziskovalnih področjih. V tem pogledu je predhodna pilotna analiza pokazala premik k družboslovju in humanistiki, ki je značilen za vsa proučevana mesta.

Dogajanje na posameznih znanstvenih področjih lahko natančneje določimo z uporabo naprednih vizualizacijskih programskih orodij, s katerimi oblikujemo zemljevide na podlagi besedilnih podatkov. Avtorja tako določita značilne grozde raziskovalnih tem in morebitne medsebojne povezave ter razvoj skozi čas, na podlagi katerega podkrepita predhodne izsledke, pridobljene na podlagi bibliografskih podatkov. Ugotovljeni vzorci so zelo podobni pri vseh mestih, ne glede na morebitne zelo različne poti objavljanja (tj. različne revije).

2 Gradivo in metoda

Predhodna pilotna analiza je razkrila pomemben delež člankov, povezanih z mesti, v nacionalnih in regionalnih znanstvenih revijah (tudi v nacionalnih jezikih). Zato sta avtorja za raziskavo raje izbrala podatkovno zbirko Scopus namesto zbirke Web of Science (WOS), čeprav je bil v osrednjo zbirko WOS pred kratkim vključen indeks ESCI (ang. *Emerging Sources Citation Index*), ki podpira razvoj regionalnih in specializiranih založb. Za vizualizacijo in grozdenje sta avtorja uporabila programsko orodje Vosviewer. Analiza je vključevala vse članke, objavljene do vključno leta 2019 (ukaz v Scopusu: pubyear < 2020). Analiza besedilnih podatkov je obsegala povzetke člankov. Polje z naslovom ni bilo uporabljeno, saj vsebuje tako prevedeni naslov (v angleščini) kot naslov v izvirnem jeziku, pri čemer besede iz izvirnih naslovov popačijo vizualizacijo. Pri iskanju v Scopusu sta uporabljala angleški jezik.

Predmet raziskave so bila izbrana evropska mesta. Zaradi zelo različnih velikosti mest je bilo smiselno primerjati ne samo mesta enake velikosti, ampak tudi večja mesta, ki imajo običajno več povezav (Levinson, 2012). Da bi vizualizacije lahko razkrile uporabne grozde, je potrebno tudi zadostno število bibliografskih zapisov. Pregledana so bila večja mesta s približno milijon prebivalci ali več. London, Pariz in Moskva so bili izločeni, saj so precej večji in bi bilo zato bolje, da se primerjajo posebej. Težava je bila tudi dvoumnost: ali se ime res nanaša na izbrano mesto ali morda samo na pojav, postopek ali pojem, poimenovan po tem mestu? Po svetu je na primer najmanj 15 mest z imenom *Berlin* ali *Rome* (Pouliquen idr., 2006). Zagato sta avtorja rešila tako, da sta v iskalni niz skupaj z imenom mesta vključila tudi ime ustrezne države (tako v samostalniški kot pridevniški obliki). Zgodi pa se lahko, da celoten članek opisuje neko mesto, njegov povzetek (ali ključne besede) pa ne vključujejo imena države, kar je omejitev. Postopek vključevanja imen držav se vseeno dosledno uporablja, saj so imena držav nedvoumna (Volz idr., 2007) in povečajo natančnost iskanja (Overell in Rüger, 2008).

Po enakih načelih sta avtorja primerjala tudi največja ali glavna mesta v Evropski uniji: Amsterdam, Atene, Berlin, Bruselj, Budimpešto, Bukarešto, Dunaj, København, Madrid, Prago, Rim, Stockholm in Varšavo. Tako sta pri iskanju za vsako mesto navedla tudi ustrezno ime države v samostalniški in pridev-

Preglednica 1: Ime mesta v naslovu v preseku z imenom pripadajoče države in število zapisov

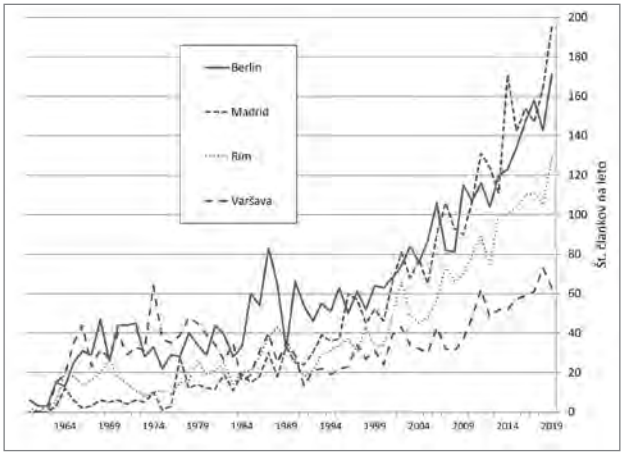
Mesto (v naslovu)	Skupaj	Država (kot sam. ali prid. v naslovu, povzetku ali ključnih besedah)	Mesto IN država
Berlin	11.747	*Germany* ALI *German*	3.778
Madrid	4.868	*Spain* ALI *Spanish* ALI *Spaniard*	2.954
Rome	7.249	*Italy* ALI *Italian*	2.411
Warsaw	3.065	*Poland* ALI *Polish* ALI *Pole*	2.071

niški obliki. Običajno sta bila dva izraza dovolj, izjeme pa so bile na primer pri Nizozemski in Danski (*Holland, Dutch, Netherlands*; *Denmark, Danish, Dane*). Na koncu sta izbrala vsa (glavna) mesta, za katera sta v preseku z državo našla več kot 2.000 znanstvenih člankov ali preglednih znanstvenih člankov.

Mesta, ki so ustrezala iskalnim merilom, so bila Berlin, Madrid, Rim (*Rome*) in Varšava (*Warsaw*; preglednica 1). Njihovi demografski podatki tukaj niso navedeni, ker so na razpolago v številnih podatkovnih virih (npr. internet 1). Na podlagi različnih tipologij mest (mesta kot upravne enote, funkcionalna urbana območja, metropolitanska območja itd.) imajo Berlin, Madrid in Rim dokaj primerljive demografske podatke in so podobne velikosti (odvisno od tipologije), Varšava pa je nekoliko manjša. Navedena mesta so bila podobno razvrščena tudi v drugih raziskavah (npr. Csomos, 2017; Hanna in Rowley, 2019).

V preglednici 1 so poleg številk, pomembnih za raziskavo (mesto IN država), navedene tudi vse pojavitve imen mest (drugi stolpec: Skupaj). *Berlin* se na primer pojavi v naslovu 11.700 člankov, *Rome* pa v naslovu 7.200 člankov. Pri imenih *Madrid* in *Warsaw* je delež manjši. Ime *Berlin* ima pogosto zgolj figurativno zgodovinsko ali politično konotacijo – na primer v besedni zvezi *Berlin wall* (Berlinski zid), ime *Rome* pa se pogosto nanaša na antiko. Zato pri iskanju ne zadostuje zgolj navedba imena mesta, saj je lahko uporabljeno metonimično ali pa ima lahko več pomenov.

Avtorja sta poleg tega proučila tudi večja mesta, ki niso glavna mesta. Pri Münchnu in Hamburgu sta odkrila dobrih 1.000 člankov, pri Milanu pa približno 1.270. Za izvirno italijansko obliko imena *Milano* sta našla še dodatne zapise, pri čemer se zdi, da se izvirna oblika imena tudi mednarodno čedalje bolj uveljavlja. Navedeno pa ne velja za Rim (*Roma*), saj se v angleščini izraz *Roma* uporablja izključno za ime etnične skupine. Za Barcelono, ki se pogosto pojavlja v znanstvenih publikacijah, sta našla skoraj 2.500 člankov (v iskalnem ukazu sta uporabila tudi samostalnik *Catalonia* in pridevnik *Catalan*), vendar jo v končno raziskavo nista vključila, ker sta v njej upoštevala samo eno mesto za vsako državo. Raje sta izbrala Madrid, saj je bil kot prestolnica bolj primerljiv z drugimi tremi glavnimi mesti.



Slika 1: Letna rast števila člankov, ki se nanašajo na proučevana mesta (ilustracija: avtorja)

3 Rezultati in razprava

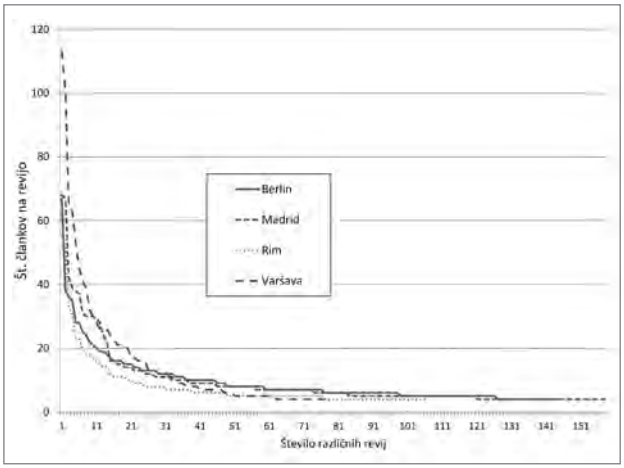
3.1 Letna rast števila člankov

Število člankov narašča enakomerno z določenimi nihanji (slika 1). Pred letom 1960 je bilo člankov, povezanih s proučevanimi mesti, malo. Najbolj je naraslo število člankov, ki se nanašajo na Madrid. Varšava in Berlin kažeta na začetku podoben trend rasti, nato se pri Varšavi pojavi upad, pri Berlinu pa porast, stanje pa se pri obeh stabilizira (navzgor) šele na začetku devetdesetih let 20. stoletja, kar je najverjetneje posledica političnih sprememb v Srednji in Vzhodni Evropi.

Nekoč razdeljeni Berlin se pojavlja v člankih, objavljenih v obeh nekdanjih nemških državah: v Zvezni republiki Nemčiji (Zahodni Nemčiji) in Nemški demokratični republiki (Vzhodni Nemčiji). Ker je v Scopusu malo podatkov o državah ali so ti pomanjkljivi (obravnavano v nadaljevanju), natančnega kraja izdaje ni mogoče določiti. Kot je razvidno iz naslovov revij (preglednica 2), visoko število člankov sredi osemdesetih let 20. stoletja ni posledica posebnih dogodkov, saj jih večina spada na področje medicine. Podobno velja za Varšavo, pri čemer je še vedno nizko število člankov v zadnjem desetletju najverjetneje posledica gospodarskih razmer in

Preglednica 2: Število člankov v prvih petih revijah

Mesto in revije	Število člankov
Berlin	
Zeitschrift für ärztliche Fortbildung	67
Gesundheitswesen	38
Berliner und Münchener tierärztliche Wochenschrift	36
Deutsche Gesundheitswesen	35
Geburtshilfe und Frauenheilkunde	28
Madrid	
Estudios geograficos	68
Revista espanola de salud publica	67
Boletin geologico y minero	42
Enfermedades infecciosas y microbiologia clinica	39
Revista clinica espanola	38
Rome	
Nuovi annali d igiene e microbiologia	55
Annali di igiene medicina preventiva e di comunità	53
Annali dell'istituto superiore di sanità	33
Medicina nei secoli	31
Atmospheric environment	23
Warsaw	
Przeglad epidemiologiczny	113
Roczniki panstwowego zakladu higieny	101
Archiwum historii medycyny	64
Polski tygodnik lekarski	63
Przeglad lekarski	53



Slika 2: Obratno sorazmerno padajoče število različnih revij in člankov na revijo (ilustracija: avtorja)

manjšega proračuna, ki ga imajo raziskovalni inštituti na voljo za raziskave in razvoj v državah v tranziciji (Odrobina, 2016).

3.2 Revije in članki

Podatki, predstavljeni v nadaljevanju, se nanašajo na vse članke v Scopusu, objavljene do vključno leta 2019 (ukaz: pubyear < 2020). Pri revijah se kažejo močni nacionalni vzorci. Pri prvih petih revijah glede na število objavljenih člankov o posameznih mestih jih ima večina naslov v izvirnem jeziku, čeprav mnoge objavljajo tudi članke v angleščini. Poleg tega jih večina spada na področje medicine (preglednica 2). Naslovi revij v preglednici 2 so navedeni tako kot v Scopusu.

Na sliki 2 so prikazane revije, v katerih so bili objavljeni vsaj štirje članki o proučevanih mestih. Pet glavnih revij (preglednica 2) je na začetku (na levi strani) osi x. Število člankov na revijo hitro pada. Dolg rep revij, v katerih so bili objavljeni trije, dva ali samo en članek, ni prikazan. Tovrstni obratno sorazmerni vzorci so zelo podobni pri vseh mestih in jasno kažejo značilnosti potenčnih zakonov, odkriti pa so bili tudi pri drugih procesih, odvisnih od skalirnih funkcij velikosti mesta (Bettencourt idr., 2007).

Preglednica 3: Štiri proučevana mesta kot območja ali teme raziskav v naslovih člankov, naslov avtorjeve ustanove in jezik člankov

		Št. člankov		Št. člankov		Št. člankov		Št. člankov
Območje/tema	Berlin	3.778	Madrid	2.954	Rim	2.411	Varšava	2.071
Naslov avtorjeve ustanove	Nemčija	1.817	Španija	2.239	Italija	1.315	Poljska	972
	Berlin	*1.479*	*Madrid*	*1.943*	*Rome/Roma*	*1.190*	*Warsaw/Warsz.*	*907*
	ZDA	271	ZDA	160	ZDA	185	ZDA	72
	ZK	186	ZK	98	ZK	137	ZK	40
	Francija	55	Francija	60	Francija	65	Nemčija	38
	Kanada	51	Nemčija	38	Nemčija	50	Francija	15
	Nizozemska	49	Italija	38	Španija	38	Italija	9
	Švica	47	Portugalska	23	Avstralija	26	Nizozemska	9
	Avstrija	40	Kanada	17	Nizozemska	21	Belgija	8
	Italija	34	Mehika	16	Kanada	19	Rusija	8
	Avstralija	32	Avstralija	15	Belgija	17	Češka	6
Jezik	nemščina	1.772	španščina	1.326	italijanščina	609	poljščina	1.206
	angleščina	1.876	angleščina	1.678	angleščina	1.648	angleščina	799
	angleščina leta 1995	*0,41 %*	*angleščina leta 1995*	*0,43 %*	*angleščina leta 1995*	*0,71 %*	*angleščina leta 1995*	*0,59 %*
	angleščina leta 2019	*0,79 %*	*angleščina leta 2019*	*0,69 %*	*angleščina leta 2019*	*0,94 %*	*angleščina leta 2019*	*0,86 %*

Avtorja sta preverila tudi vzorce pri citiranju. Revije iz iste jezikovne skupine dokaj pogosto citirajo podobne revije. Vpliv geografske lege in oddaljenosti na pretok znanja so potrdile tudi druge raziskave (Pan idr., 2012; Abramo idr., 2020). Avtorja sta predvidevala, da je to posledica proučevane teme: mesto se je pojavilo v naslovu članka in je bilo zato pomembno v točno določenem geografskem kontekstu. Vprašanje pa je, ali je bila zastopanost revij enakomerna čez vsa leta.

3.3 Država in mesto kot naslov avtorjeve ustanove ter jezik člankov

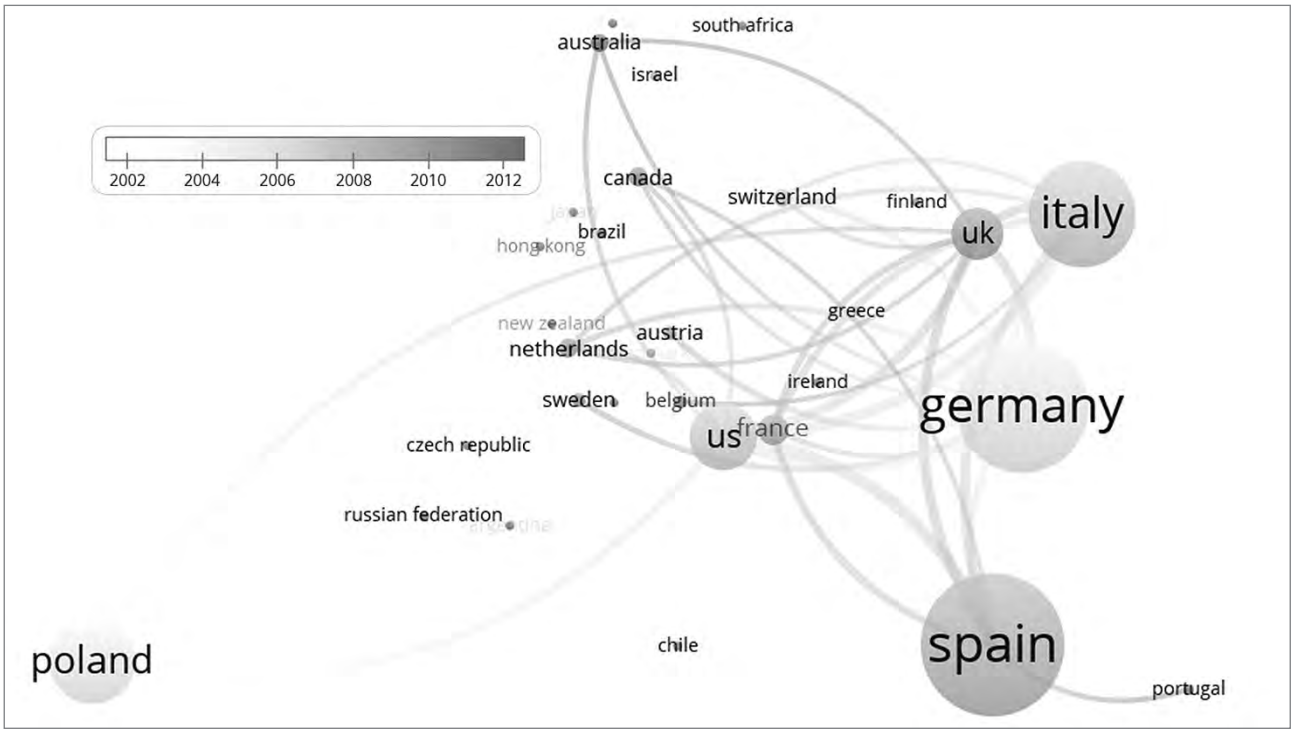
Avtorji približno polovice člankov so prihajali iz države, v kateri je posamezno proučevano mesto (preglednica 3). Poleg tega so 80–90 % člankov, objavljenih v teh državah, napisali avtorji, ki so prihajali iz proučevanega mesta. Kljub temu so povsod na drugem in tretjem mestu avtorji iz ZDA in Velike Britanije. Podobna prevlada ameriških in britanskih avtorjev je bila ugotovljena tudi v nekaterih drugih raziskavah (Okorie idr., 2014). Večina člankov je bila objavljena v nacionalnih revijah, vendar se v zadnjem času čedalje več člankov objavlja v tujih revijah. Kljub temu nacionalne revije še vedno zasedajo prvo mesto. Delež nacionalnih jezikov pada, saj povsod prevladuje angleščina.

Informacije o državi, iz katere prihaja avtor, niso navedene v vseh člankih. Številke za Poljsko bi morale biti precej višje. Za mnoge izmed 1.206 člankov v poljščini namreč država izdaje ni znana. Navedene omejitve so bile ugotovljene tudi za WOS (Liu idr., 2018), vendar so v Scopusu precej opaznejše, zlasti pri starejših dokumentih. Izpustitev imena države je precej večja težava kot pa izpustitev podatka o jeziku (Jacsó, 2009). Avtorja sta poleg tega ugotovila pomanjkljivosti pri podatkih o mestu kot naslovu avtorjeve ustanove. Z iskalnim ukazom *affiliation-city* (naslov avtorjeve ustanove-mesto) nista mogla pravilno določiti mesta, zato sta morala namesto tega uporabiti ukaz *affiliation*, ki vrne celoten naslov.

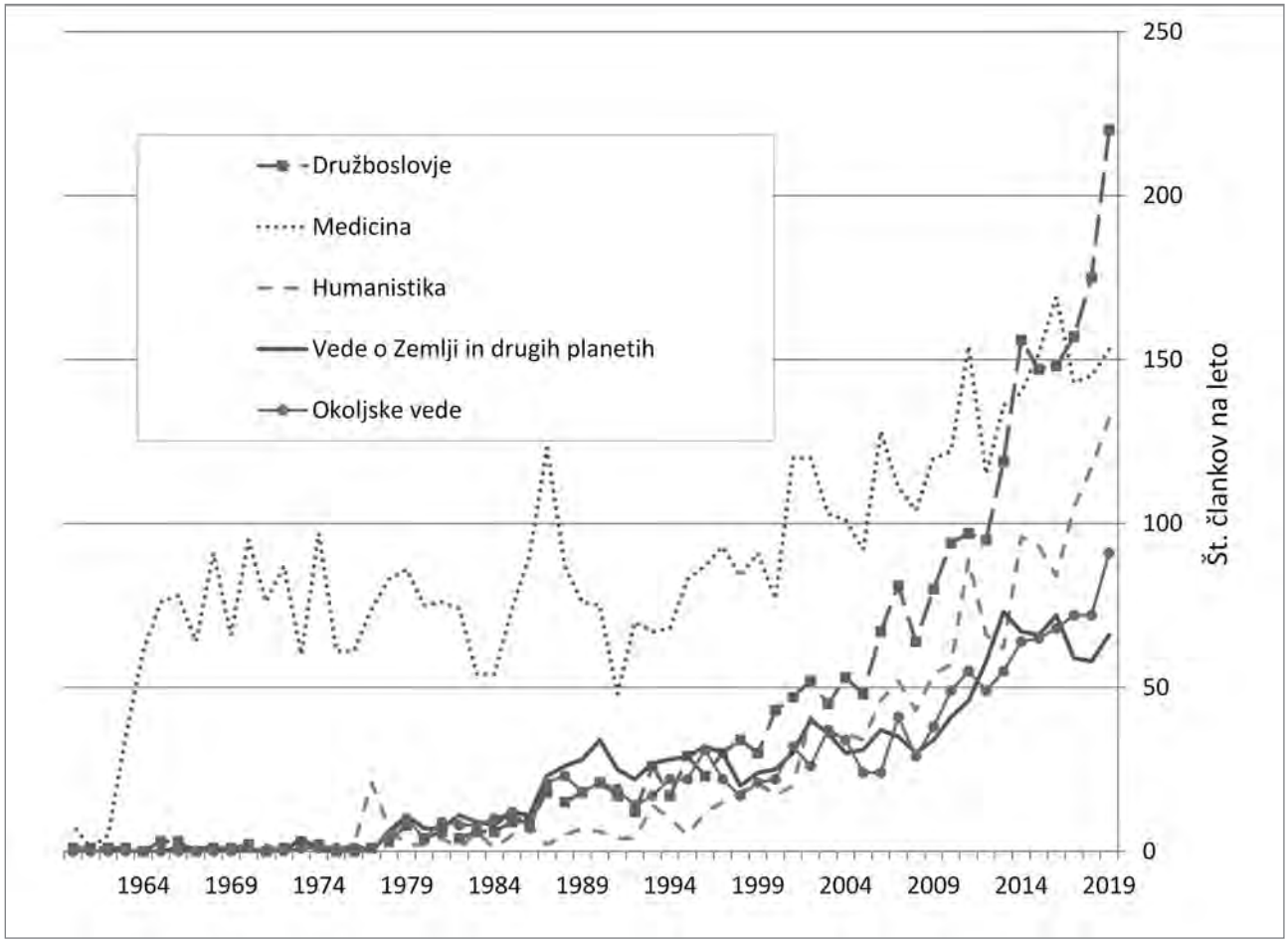
Soavtorske povezave niso zelo močne (slika 3). Šibke soavtorske povezave med evropskimi državami so odkrili tudi Jokić in sodelavci (2019). Kljub temu so ZDA in Združeno kraljestvo (ZK) podobno povezani z vsemi državami, kar pomeni, da se prikaz ujema s številkami v preglednici 3. Članki iz Španije so v povprečju novejši (označeni s temnejšimi odtenki), iz Poljske pa starejši (svetlejši odtenki), kar se ujema s podatki na sliki 1. Za Nemčijo sta morala avtorja izdelati tezaver, da sta lahko povezala različne variante. Tako sta v iskalno polje »država« vključila tudi izraze *ddr* (*Deutsche Demokratische Republik*), *frg* (*Federal Republic of Germany)* in *west ger* (*West Germany)*.

3.4 Tematska področja

Avtorja sta želela ugotoviti, kako se letna rast števila člankov (slika 1) kaže na različnih raziskovalnih področjih. Za različna znanstvena področja so namreč značilni različni vzorci objav, zato sta tudi revije kartirala v okviru 27 tematskih področij v Scopusu. Vzorci razpršenosti so bili neverjetno



Slika 3: Soavtorstvo člankov glede na državo avtorjeve ustanove (ilustracija: avtorja)



Slika 4: Rast števila člankov glede na tematska področja v Scopusu (ilustracija: avtorja)

podobni, saj je bilo vseh pet prvih kategorij pri vseh mestih enakih. Prevladuje medicina, sledi pa ji družboslovje. Podatkov o raziskovalnih področjih ne smemo preveč posploševati, saj lahko revija spada na več področij ali na drugačna področja, kot bi bilo pričakovati (Hočevar in Bartol, 2016). Slika 4 na podlagi letne rasti razkriva podrobne vzorce: pri vseh mestih je medicino prehitelo družboslovje. Čedalje pomembnejša postaja tudi humanistika. Pri tem je treba upoštevati tudi posebnosti objavljanja na temeljnih in strateških znanstvenih področjih (van Rijnsoever in Hessels, 2011), na razlike med posameznimi področji pa lahko pomembno vplivajo tudi nacionalne raziskovalne in razvojne politike (Cugmas idr., 2019).

3.5 Grozdi in časovni razpon sorodnih raziskovalnih tem

Zadnji in glavni del raziskave je temeljil na besedilnih podatkih (izrazih in povzetkih), pridobljenih iz člankov o štirih proučevanih mestih. Izrazi (besede in samostalniške besedne zveze) so bili razvrščeni v grozde glede na sorodnost, ugotovljeno s programskim orodjem (iz analize so bili izključeni izrazi iz strukturiranih povzetkov in beseda *city* (mesto), saj se pojavlja v skoraj vsakem povzetku).

Prva slika pri vsakem mestu prikazuje grozde sorodnih ali povezanih izrazov, ki se nanašajo na raziskovalna področja in teme. Krogi s povezanimi izrazi so v vsakem grozdu različno obarvani (z različnimi odtenki). Druga slika (časovni razpon raziskovalnih tem) prikazuje iste izraze s časovnega vidika. Temnejši ko je krog, novejše je povprečno leto objave. Velikost kroga nakazuje pomembnost izraza. Jakost povezav v grozdih in med njimi je prikazana s črtami. Prikazani izrazi dajejo splošno predstavo o raziskovalnih poudarkih in pristopih. Vsak zemljevid vsebuje več deset tisoč izrazov, zato so prikazani samo izbrani elementi (da se izognemo prekrivanju), ki običajno vključujejo izraze z najmanj deset pojavitvami.

Uporaba istih načel pri izdelavi vseh zemljevidov omogoča primerjavo na isti podlagi. Število izrazov se med mesti spreminja, odvisno od števila člankov in terminologije, ki se uporablja izključno za posamezno mesto. Grozdi, časovni razpon povprečij in število izrazov so bili določeni z algoritmi, ki so predstavljeni v priročniku za uporabo programskega orodja (van Eck in Waltman, 2019). Grozdi (tj. tematska področja) so bili interpretirani na podlagi sheme kategorizacije tematskih področij v Scopusu. Vsi zemljevidi temeljijo na člankih v podatkovni bazi Scopus, objavljeni do vključno leta 2019 (ukaz: pubyear < 2020).

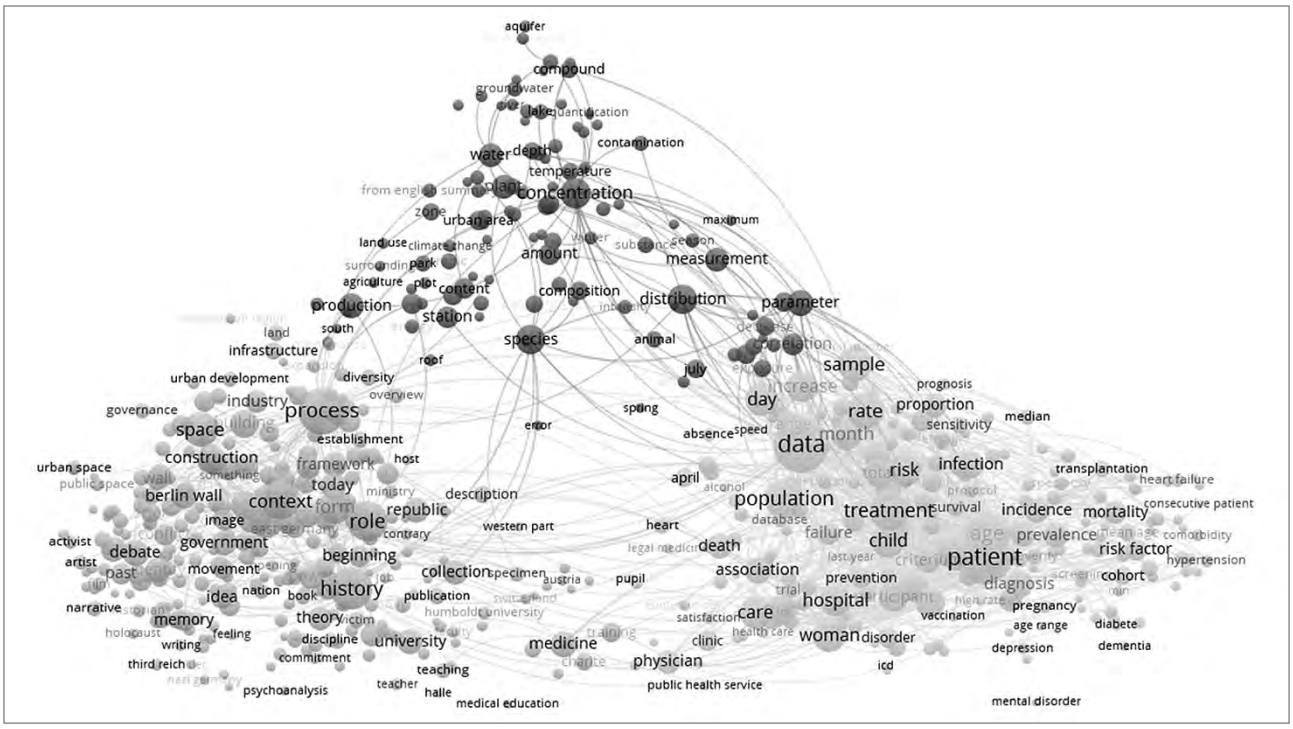
3.5.1 Berlin

S programskim orodjem je bilo določenih 47.000 izrazov, ki se v 3.778 člankih pojavijo najmanj desetkrat (sliki 5 in 6). Prikazani so samo najpomembnejši izrazi, pri čemer so opazni trije vsebinski grozdi. Največji grozd (na desni) se nanaša na medicino in raziskave s tega področja. Kot je razvidno s slike 4, je bila medicina močno zastopana zlasti v zgodnejšem obdobju, zato so na sliki 6 na nekaterih mestih vidni poudarki svetlejše barve. Slika 6 dopolnjuje sliko 5 z vidika časovnega razvoja. Splošnejši izrazi so pogostejši, kar je označeno z večjimi krogi. Na desni strani so opazne teme, ki postajajo pomembnejše šele v zadnjem času (temnejši odtenki), zato so manj številčne (manjši krogi).

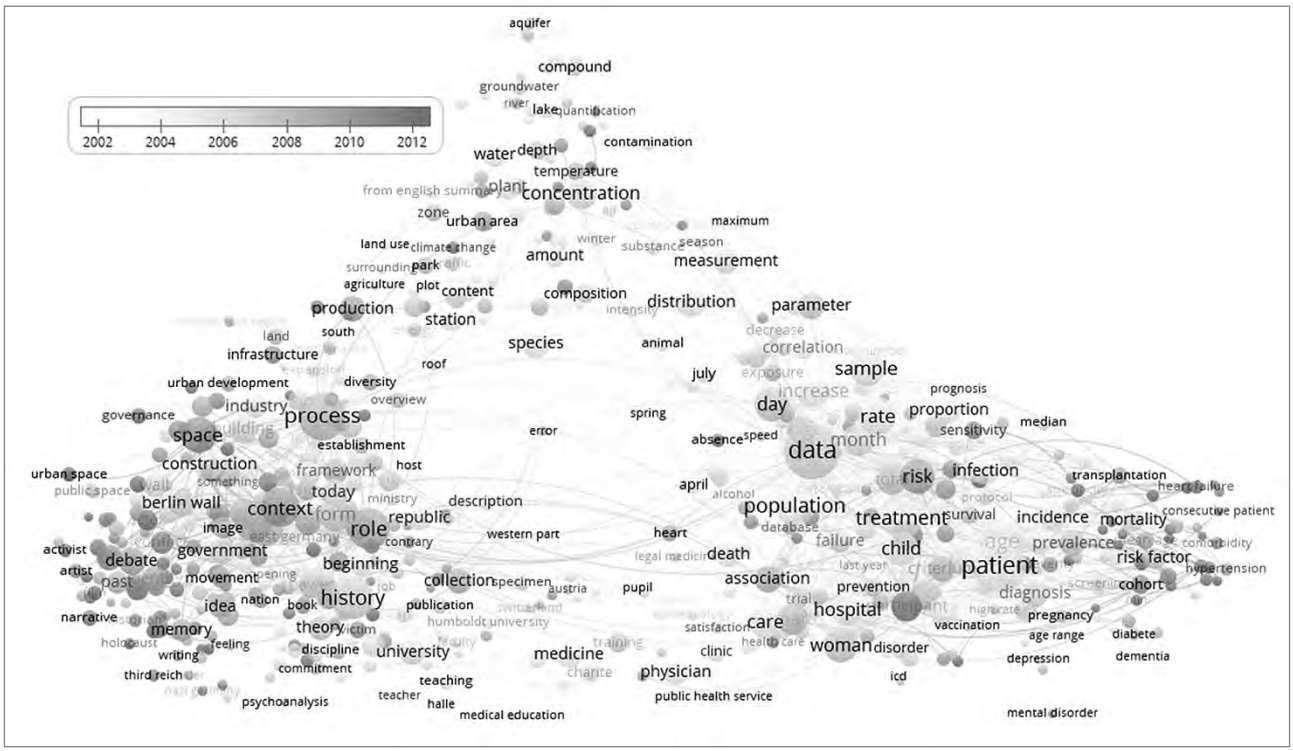
Spodnji levi grozd na obeh slikah vključuje teme, ki se nanašajo zlasti na družboslovje (*social sciences*) ter na humanistiko (*arts and humanities*), gospodarstvo (*business*), ekonomijo (*economics*) in podobna področja. Čeprav so navedena tematska področja v Scopusu obravnavana ločeno, je jasno, da so njihove raziskave med seboj povezane (glede na položaj v grozdu). Ker postaja družboslovje v zadnjem času čedalje pomembnejše, je pričakovati, da se bo grozd še povečal. Najnovejši izrazi (temnejši odtenki) so jasno razvidni ter vključujejo besede in besedne zveze, kot so *activist* (aktivist), *debate* (razprava), *urban space* (mestni prostor) in *urban development* (razvoj mest). Najnovejši izrazi v tem kontekstu so označeni s krogci, ki se prekrivajo, zato niso vidni (npr. *gentrification*). Obstajajo tudi povezave med različnimi grozdi, npr. na sredini spodaj (na obeh slikah) lahko opazimo izraza *medical education* (medicinsko izobraževanje) in *public health service* (javno zdravstvo), ki nakazujeta povezavo med medicino in družboslovjem (interdisciplinarnost).

Zgornji (manjši) grozd se nanaša na področje okoljskih ved (*Environmental science*), temu pa sledijo vede o Zemlji in drugih planetih (*Earth and planetary sciences*), tehnika (*Engineering*), biotehniške in biološke vede (*Agricultural and biological sciences*) itd. Najpogostejši izrazi so *agriculture* (kmetijstvo), *contamination* (onesnaženje), *species* (vrste) in *water* (voda).

Berlin se pojavlja v različnih kontekstih, pri čemer se v naslovih člankov poudarja kot nekaj, npr. kot študija primera, primer, prestolnica, model, letovišče, lokacija, destinacija, virtualno središče, območje, ustvarjalno polje, nekdanja meja, naravni in družbenoekonomski sistem itd. Tovrstni članki običajno spadajo na področje družboslovja in humanistike, v njih pa se lahko Berlin pojavlja tudi v metaforičnem smislu. V drugih (pogostejših) člankih Berlin nastopa kot dejanski kraj raziskave: poleti v Berlinu, mikrogeografska analiza Berlina itd.



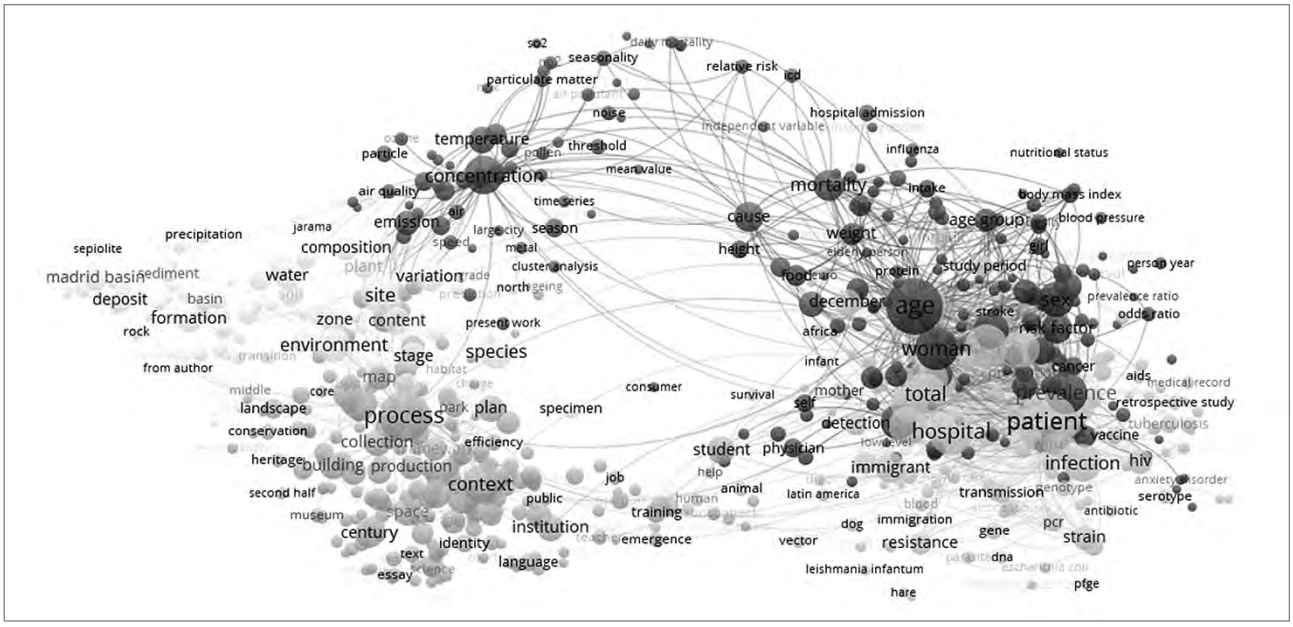
Slika 5: Grozdi med seboj povezanih raziskovalnih področij in tem (Berlin) (ilustracija: avtorja)



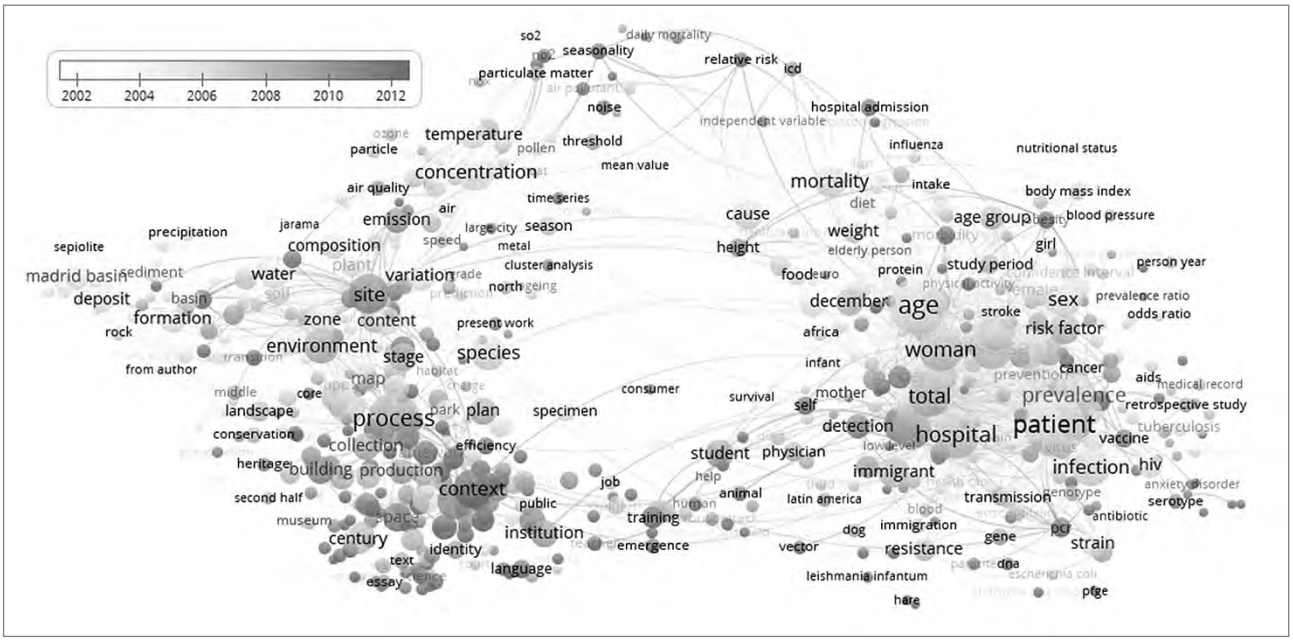
Slika 6: Časovni razpon raziskovalnih tem (Berlin) (ilustracija: avtorja)

3.5.2 Madrid

Zemljevida za Madrid temeljita na 2.954 člankih in 47.000 izrazih (podobno kot pri Berlinu). S programom je bilo določenih pet grozdov (slika 7), med katerimi se dva, ki sta med seboj povezana, nanašata na medicino (desna stran zemljevida). Spodnji medicinski grozd se nanaša na epidemiologijo in mikrobiologijo, saj vključuje izraze, kot sta *disease* (bolezen) in *infection* (okužba). Zgornji medicinski grozd je bolj raznovrsten, saj vključuje zelo različne izraze, npr. *age* (starost), *man* (moški), *woman* (ženska), *blood pressure* (krvni tlak), *diet* (prehrana) in *food* (hrana). Kot pri Berlinu so izobraževalne



Slika 7: Grozdi med seboj povezanih raziskovalnih področij in tem (Madrid) (ilustracija: avtorja)



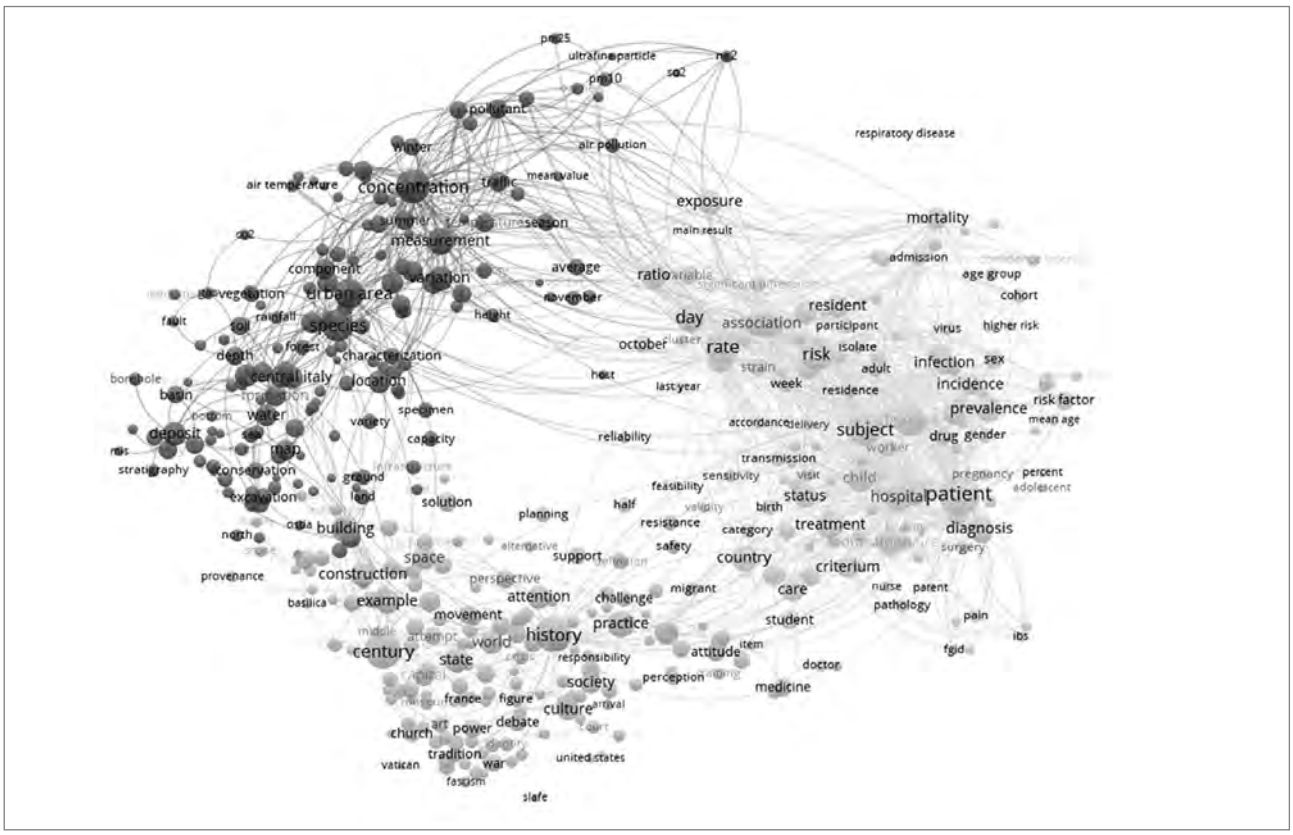
Slika 8: Časovni razpon raziskovalnih tem (Madrid) (ilustracija: avtorja)

teme na področju medicine povezane z družboslovjem (na sredini spodaj). Družboslovje (spodaj levo) je tudi v tem primeru močneje zastopano zlasti v novejšem času (spodaj levo) in se povezuje s humanistiko. Zgornja leva grozda se nanašata na vede o Zemlji in drugih planetih, okoljske vede ter na biotehniške in biološke vede in tehniko. Skrajni levi grozd je bližje družboslovnemu grozdu pod njim in v povprečju vključuje najstarejše teme (svetli odtenki; slika 8). Opazimo lahko tudi gost podgrozd geoloških tem. Okoljske in biološke teme so obravnavane predvsem v novejšem času. Zgornji grozd je povezan z okoljem in onesnaževanjem ter z zgornjim medicinskim grozdom, kar kaže vpliv zdravja na prebivalce mest.

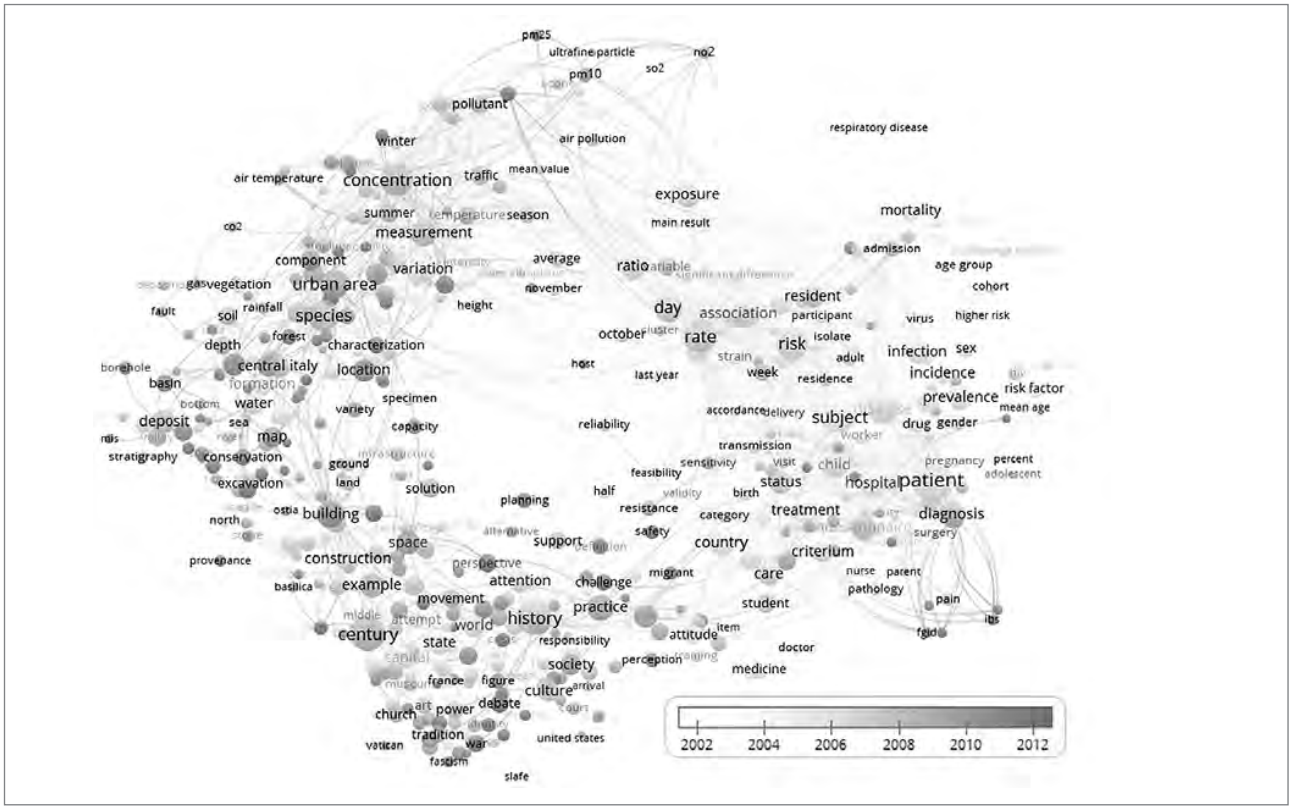
Madrid se v člankih pojavlja kot študija primera, ključni dejavnik trajnostne mobilnosti, osvobojeno mesto, komunikacijski ekosistem ter trgovska in finančna ustanova ter kot kraj raziskav (Brezdomske priseljenke v Madridu, Epidemiologija in etiologija ... v Madridu, 3D-modeliranje pretoka podtalnice v madridskem vodonosniku).

3.5.3 Rim

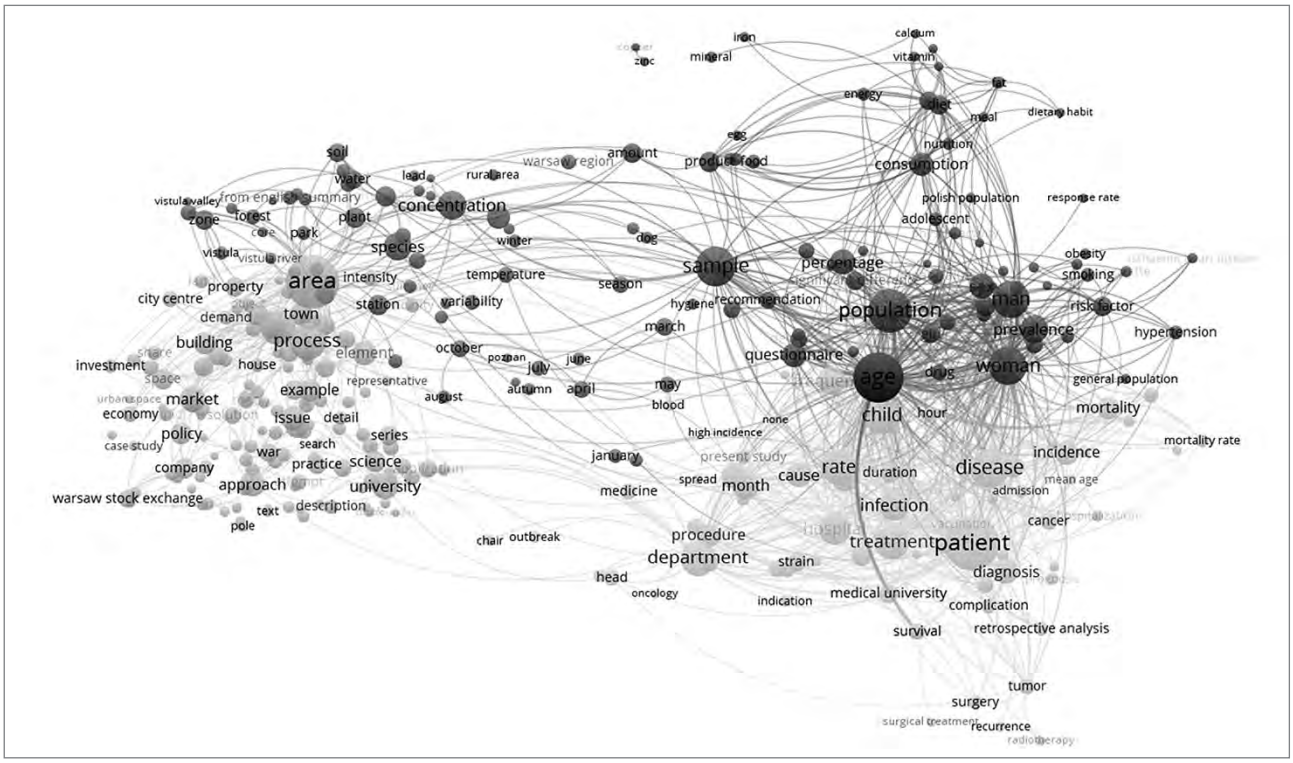
V povezavi z Rimom je bilo najdenih 2.411 člankov. Zemljevida temeljita na 38.500 izrazih, razdeljenih v tri grozde (slika 9), ki imajo podobno zgradbo kot pri Berlinu. Tudi v tem primeru



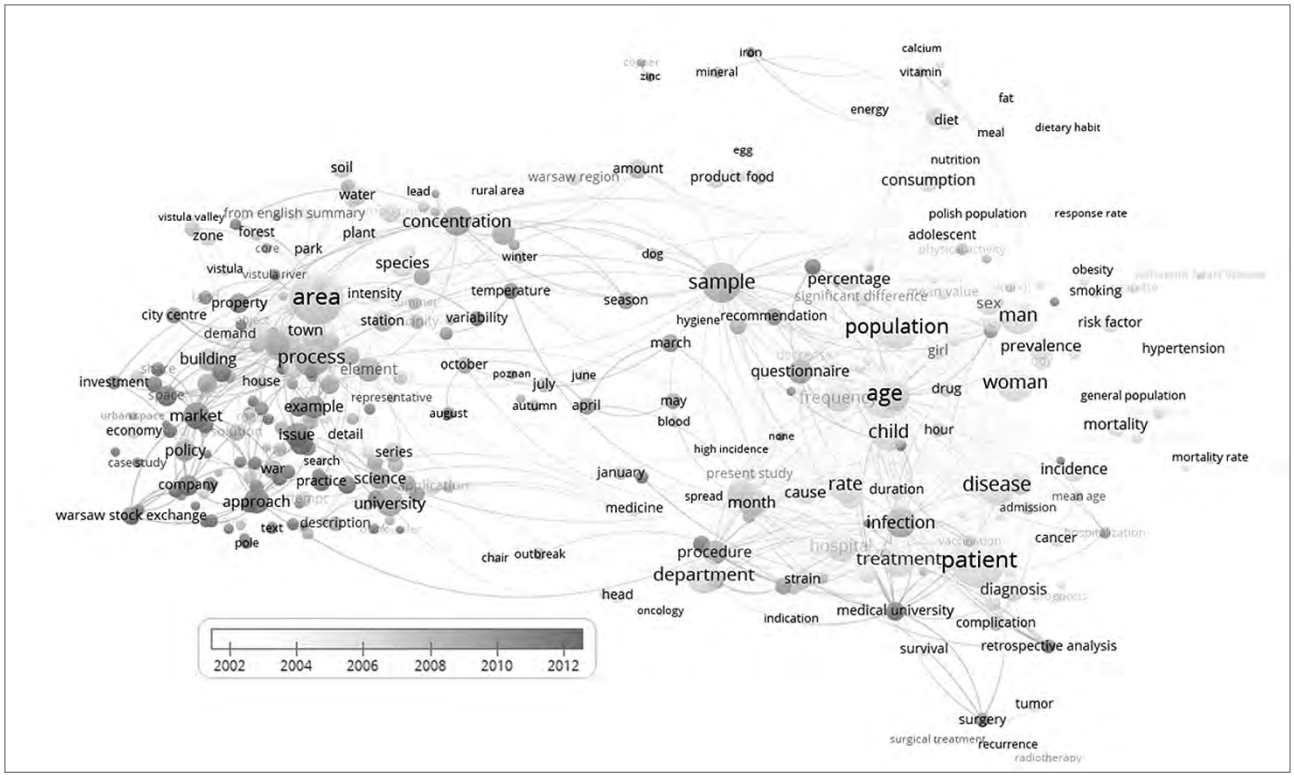
Slika 9: Grozdi med seboj povezanih raziskovalnih področij in tem (Rim) (ilustracija: avtorja)



Slika 10: Časovni razpon raziskovalnih tem (Rim) (ilustracija: avtorja)



Slika 11: Grozdi med seboj povezanih raziskovalnih področij in tem (Varšava) (ilustracija: avtorja)



Slika 12: Časovni razpon raziskovalnih tem (Varšava) (ilustracija: avtorja)

je medicina prevladovala v zgodnejšem obdobju (desni grozd svetlejših odtenkov, slika 10). Spodnji levi grozd (družboslovje in humanistika) je novejši in kaže prepletanje z medicino na področju izobraževanja. Tudi pri Rimu je zgornji levi grozd močno povezan z vedami o Zemlji in drugih planetih ter okoljskimi vedami, pri čemer so izrazi, kot sta *conservation* (ohranjanje) in *excavation* (izkopavanje), bližje družboslovju in humanistiki. Na vrhu so teme, povezane s podnebjem in onesnaževanjem, ki se približujejo medicini.

V člankih je Rim obravnavan kot okno opazovanj, celovita urbana izkušnja, oder, vir, španski Avignon, prestolnica, spominska pokrajina in destinacija ter kot kraj raziskav (Zloraba drog v Rimu, Omrežje pametnih domov v Rimu, Kombinirane magnetske, kemijske ... analize ... v antropičnem kontekstu Rima, Proces urbane regeneracije ... v predmestju Rima).

3.5.4 Varšava

Z Varšavo je bilo povezanih 2.071 člankov, najpomembnejših 24.000 izrazov pa je bilo kartiranih v štiri grozde (slika 11). Medicinske teme so v dveh medsebojno povezanih grozdih. Spodnji desni grozd se nanaša na primer na epidemiologijo, saj vključuje izraze, kot sta *disease* (bolezen) in *infection* (okužba). Grozda na levi strani sta med seboj nekoliko povezana. Veliko izrazov, povezanih z obema grozdoma, vključuje splošno besedo *area* (območje). Spodnji levi grozd se nanaša na novejše raziskave (temnejši odtenki, slika 12), ki tudi v tem primeru spadajo na področje družboslovja in humanistike. Zgornji levi (manjši) grozd kaže povezave z vedami o Zemlji in drugih planetih, okoljskimi vedami ter kmetijskimi in biološkimi vedami. Tovrstne teme so v povprečju starejše (svetlejši odtenki) kot pa teme, prikazane levo spodaj. Tudi medicinske teme so bile v povprečju obravnavane v zgodnejšem obdobju, kar se ujema z že omenjeno domnevo, da skupni podatki v preglednici 3 ne kažejo več trenutnega stanja raziskav.

V člankih v Scopusu se Varšava pojavlja kot središče dnevnih migrantov, vozlišče zračnega prometa, primer, upravni sedež in endemično žarišče ter kot kraj raziskav (Lokalne institucije kulture ... v Varšavi, Kratkoročni vplivi prašnih delcev ... v aglomeraciji Varšave, Postmoderna arhitektura v socializmu ... cerkev ... v varšavskem predelu).

3.6 Primerjava proučevanih mest

Cilj raziskave ni bil presojati in primerjati mest na podlagi naslova avtorjeve ustanove, ampak jih proučiti kot predmete (teme) in območja (lokacije) raziskav z namenom kartiranja različnih funkcij, ki jih opravljajo heterogeni akterji mest in so razvidne iz znanstvenih revij.

Raziskava je temeljila na analizi vloge štirih evropskih prestolnic (Berlina, Madrida, Rima in Varšave), ki so v novejšem obdobju doživele nekatere spremembe, ki bi lahko vplivale tudi na razvoj znanosti. Obravnavana mesta spadajo v različne geografske in jezikovne kontekste (zahodno in južno Sredozemlje ter Srednja in Vzhodna Evropa), vendar so teme v člankih o vseh omenjenih presenetljivo podobne. Navedeno se ujema s postavljeno hipotezo o podobnem razvoju znanstvenih področij v vseh mestih. Ugotovljeni grozdi raziskovalnih tem jasno kažejo podobne poudarke in podobne raziskovalne trende skozi čas, pri katerih je vidno čedalje večje zanimanje za družbena vprašanja, povezana z mesti.

Analiza je vključevala besedilne podatke (razvoj znanstvenih področij) in bibliografske podatke (razpršenost v publikacijah). Za vsa štiri mesta so pomembne nacionalne in regionalne revije. V razvrstitvi najpomembnejših mednarodnih revij se morda zdijo tovrstne revije manj pomembne, vendar so lahko še vedno pomembno sredstvo za predstavljanje izsledkov o posameznih mestih. Navedeni izsledki lahko dopolnjujejo mednarodne raziskave, ki se osredotočajo na splošne ugotovitve in lahko temeljijo na prispevkih več avtorjev, pri čemer so doprinos posameznega avtorja in lokalne teme manj jasni. Podobnosti se kažejo tudi pri soavtorstvu in državi avtorjeve ustanove. Večino člankov objavijo avtorji iz proučevanega mesta, mednarodno sodelovanje pa je najmočnejše med avtorji iz Združenega kraljestva, ZDA in Francije. Tudi v tem pogledu so vzorci zelo podobni v vseh štirih mestih.

4 Sklep

Izsledki raziskave kažejo, da raziskave, ki se osredotočajo na mesta, potekajo v štirih dokaj jasno razpoznavnih grozdih raziskovalnih področij. V preteklosti je prevladovala medicina, ki zdaj stagnira, njeno mesto pa je prevzelo družboslovje. Tudi humanistika je postala precej pomembnejša, teme s področja okoljskih ved ter ved o Zemlji in drugih planetih pa dosegajo manj dinamično, a še vedno enakomerno rast. Znanstvene revije so od nekdaj imele pomembno vlogo v vedah o življenju in na podobnih področjih, v njih pa v zadnjem času čedalje več objavljajo tudi družboslovci. Rezultatov, ki se nanašajo na različna znanstvena področja, med seboj ne moremo neposredno primerjati, saj na značilnosti objav na posameznih področjih vplivajo številni dejavniki.

Ker so vzorci objav za vsa štiri mesta tako podobni, lahko domnevamo, da enako velja tudi za mnoga druga mesta. S tega vidika bi lahko v prihodnje primerjali mesta različnih velikosti. Pri tem se zastavlja vprašanje, kateri bodo prihodnji poudarki in teme raziskav v mestih. V raziskavi, predstavljeni v tem članku, sta avtorja obravnavala stanja raziskav konec leta 2019 – tik pred zdravstveno krizo, ki jo je povzročila pandemija koronavirusne bolezni. Pandemija je prizadela mnoga mesta, čeprav ne vsa enako. Pri tem imajo lahko nacionalne in regionalne znanstvene revije pomembno vlogo. Povezave med raziskovalci lahko spodbudijo različne in bolj inovativne trende v interdisciplinarnem sodelovanju (npr. med družboslovjem in medicino ter tudi drugimi vedami). Prava interdisciplinarnost je bila do zdaj šibka, ustvarijo pa se lahko nove povezave, čemur je treba v prihodnje nameniti še več pozornosti.

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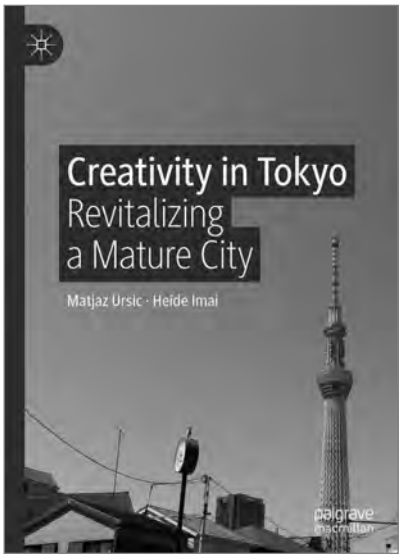
Klemen SENICA

Mesto na prelomnici



Naslov: *Creativity in Tokyo: revitalizing a mature city*
Avtorja: Matjaž Uršič in Heide Imai
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Tokio. Večmilijonsko mesto, ki je v nekih drugih – danes se zdi precej davnih – predkoronskih časih veljalo za svetovno kulinarično in še kakšno prestolnico ter zato za krajši ali daljši čas privabljalo številne posameznike z vseh koncev tako Japonske kot širnega sveta. In hkrati je tudi velemesto, ki se zaradi nenehnih (novo)gradenj spreminja tako bliskovito, da njegova predrugačena podoba nemalokrat preseneti celo lokalno prebivalstvo, kadar utegne skreniti z uhojenih poti vsakdana. Kako se na hitre spremembe in dejstvo, da Tokio v tekmi za svetovno finančno prestolnico preplavljajo tako imenovani neprostori, (kreativno) odzivajo njegovi prebivalci, si v svoji monografiji *Creativity in Tokyo: Revitalizing a mature city* prizadevata odgovoriti prostorski sociolog Matjaž Uršič in kulturologinja Heide Imai.

Delo je sestavljeno iz devetih poglavij, pri čemer se v novodobnem duhu znanstvenih monografij lahko vsako pravzaprav bere kot samostojna sklenjena celota, na kar namiguje tudi navajanje literature neposredno na koncu vsake enote. Prvo poglavje poda teoretično in metodološko izhodišče raziskave, v katerem si avtorja zastavita precej zahteven analitični cilj (str. 7): »Povezati poskušava pristopa od spodaj navzgor (lokalna skupnost) in od zgoraj navzdol (ustvarjalni razred) ter tako pridobiti celovitejši, čeprav še vedno delni vpogled v to, kako se ustvarjalnost oblikuje v Tokiu.« V proučevanju ustvarjalnosti se ne osredotočita na učinek ali ustvarjalni proizvod, temveč proces, ki spodbuja ali ovira ustvarjalnost v mestih (str. 6). Omenjeni analitični pristop kombinirata z etnografsko metodo opazovanja z udeležbo, polstrukturiranimi intervjuji in pripovedovanjem, kar prinaša svež pogled na nedavni urbani razvoj Tokia.

V drugem poglavju najprej izpostavita pereča družbena vprašanja sodobne Japonske, ki z gospodarskega vidika še vedno stopa na mestu po poku prenapihnjenih nepremičninskega in borznega balona v začetku devetdesetih letih minulega stoletja. Posledično se tako država kot mesto spoprijemata z upadanjem rodnosti, staranjem prebivalstva, pomanjkanjem delovne sile itn. Pri tem avtorja opozarjata, da tokijskih ustvarjalnih ekosistemov ne moremo v celoti pojasniti s teorijami mednarodnih vozlišč, saj prve opredeljujejo nekatere lokalne značilnosti. Ena od teh posebnosti je tudi dejstvo, da se Japonska kljub precejšnjemu vlaganju v razvoj inovativnih tehnologij vedno bolj spoprijema s težavo, kako proizvode njihovi kakovosti navkljub prodati na svetovnem trgu.

V tretjem poglavju se Uršič in Imai med drugim dotakneta tudi relokacije znamenite pokrite ribje tržnice Cukidži, nekoč priljubljene turistične destinacije, ki je bila hkrati tudi kulturna institucija, saj je bila simbolno, zgodovinsko in družbeno eden najpomembnejših lokalnih trgovskih prostorov v mestu« (str. 62). A ker je bila za tokijski predel Ginza, kjer je bil omenjeni del tržnice, izvedena temeljita preobrazba (beri: gentrifikacija), se je bil osrednji, znamenitejši del tržnice prisiljen umakniti na otok Tojosu v tokijskem zalivu, kar pa se ni zgodilo brez nasprotovanja dela lokalnega prebivalstva.

V četrtem poglavju avtorja načneta vprašanje prekarnosti, resda brez širšega kritičnega preizpraševanja neoliberalnega ekonomskega modela, ki vlada na Japonskem od začetka novega tisočletja, kar je dediščina obsežnih strukturnih reform vlad Džuničira Koizumija in njegove političnoekonomske filozofije No pain, no gain, ki številnim mladim ustvarjalcem še danes odreka socialno in finančno varnost ter jih posledično sili v negotove oblike zaposlitve. Kljub temu Uršič in Imai izpostavljata, da uradni diskurz, ki zagovarja potrebo po zaposlitveni fleksibilnosti sodobnega ustvarjalca, dejansko mistificira prijetne plati fleksibilne zaposlitve, pri tem pa zanemarja ali prezre stransko škodo, ki se kaže v prekarizaciji delovnih pogojev in življenjskih razmer manjših ustvarjalcev (str. 91). Čeprav se od daleč zdi, da japonsko gospodarstvo sestavljajo pretežno multinacionalke, je dejanska po-

doba drugačna. Bliskovit gospodarski razvoj in prodor na tuje trge predvsem v avtomobilski in elektrotehnični industriji v drugi polovici 20. stoletja so poleg zunanjih dejavnikov omogočila tudi in predvsem mala in srednje velika podjetja, ki pa so v zadnjih dveh desetletjih precej bolj podvržena nevidni roki trga, kot so bila še nedavno.

Sledijo štiri poglavja (od petega do osmega), v katerih avtorja podrobneje predstavita izbrane tokijske soseske (npr. Ičigajo, Okačimači in Koendži), v katerih sta v zadnjem desetletju opravljala svojo terensko raziskavo. Pri tem sta še posebej zanimiva primera sosesk Hikifune in Kjodžima, v katerih so bile v zadnjih letih izvedene številne spremembe, a v nekaterih predelih še vedno ohranjata duh nekih drugih časov, časov obdobja Showa (1926–1989). Kjodžima je bila eno redkih območij Tokia, ki so v srditem ameriškem bombardiranju mesta ob koncu druge svetovne vojne ostala nepoškodovana. Posledično je še veliko stavb lesenih, kar v potresno intenzivnem Tokiu povzroča sive lase upravljavcem tako na lokalni kot na mestni ravni. Kakor koli, okrožje je med letoma 2008 in 2018 privabilo številne mlade umetnike, podjetnike in druge, ki so prenovili in preuredili stavbe za svoje ustvarjalne potrebe. Avtorjema je uspelo z intervjuji prikazati živahen utrip območja, na katerem zelo raznovrstni ustvarjalci v najširšem pomenu besede, zbrani z vseh vetrov, med njimi so tudi Nejaponci, iščejo svoj ustvarjalni prostor pod soncem. Ena od njih je tudi Norvežanka Britt, ki skupaj z Yamato-sanom ustvarja jukate iz džinsa, primerne za oba spola. Po besedah intervjuvancev prodaja cveti ...

Ob tem se zastavlja vprašanje, ali bi lahko tokijske primere dobrih praks, ki jih navajata avtorja (npr. str. 126), prenesli tudi pod Alpe. Nedvomno, namesto da mestna središča tudi največjih slovenskih mest obiskovalca pozdravijo z opustelimi izložbami, polepljenimi s scefranimi listi »Oddamo v najem«, bi si lahko lokalne politične elite prizadevale za njihovo oživitev z nudenjem opuščenih prostorov za simbolično najemnino ustvarjalcem, umetnikom, mladim podjetnikom itn. Ti mestnim središčem ne bi le vdahnili nove (umetniške) podobe, kar bi vsaj del lokalnega prebivalstva zagotovo pozdravil z navdušenjem, oživela podoba mestnih središč bi postopoma tudi začela privabljati obiskovalce in turiste od blizu in daleč, kar bi pozitivno vplivalo tako na lokalno kot nacionalno gospodarstvo. Kot poudarjata avtorja, takšna oživitev opustelih mestnih predelov praviloma spodbudi tudi vračanje uveljavljenih trgovskih verig, ki so v Sloveniji zdaj največkrat zgoščene v velikih trgovskih centrih na obrobju mest, in še koga nazaj v mestna središča. Znanja in ustvarjalnih idej je v Sloveniji zagotovo dovolj, največja ovira za uresničitev omenjenega predloga je kampanilizem pripravljavcev mestnih politik, ki so nagnjeni k uresničevanju "fontanskih" ponudb za oživljanje mestnih središč. A takšne instantne rešitve, nastale brez razprave s širšo lokalno skupnostjo in brez domišljene povezave z drugimi kraji in akterji vsaj na regionalni ravni, dolgoročno le redko prinesejo dodano vrednost k (turistični) ponudbi mest.

Kljub hvalevrednemu osredotočanju na običajnega prebivalca Tokia ima ta monografija tudi prgišče šibkih točk. Že v uvodu (str. 1–2) zmoti cehovsko neizogibna, a pretirano apologetska avtorefleksija, ki bralca napeljuje na misel, da sta avtorja v nekem trenutku pisanja monografije (za hip) podlegla tezi, da lahko le Japonci razumejo in nepristransko razlagajo japonsko kulturo. A kot dokazujejo številne antropološke in sociološke študije, objavljene od devetdesetih let minulega stoletja, Japonska ni kulturno monolitna entiteta, zato bi lahko tudi kakšen domač raziskovalec podlegel ideološki razlagi urbane ustvarjalnosti v Tokiu oziroma pridobil nekonvencionalen pogled na zastavljeno raziskovalno vprašanje. Ne nazadnje, na globaliziranem akademskem polju tudi domači raziskovalci praviloma uporabljajo zahodnjaške teoretične pristope za pojasnjevanje tipičnih prvin japonske kulture. Ali bi avtorja čutila nujo po preizpraševanju lastne tujosti, če bi pisala o urbani ustvarjalnosti v nekem drugem svetovnem mestu, na primer v Londonu?

Poleg tega nekoliko zmoti tokiocentričnost monografije, ki je v skladu z njenim naslovom v celoti gledano razumljiva, vendarle bi nekoliko širša analitična slika monografiji prej koristila kot škodila. Tokio je res ogromna in gosto poseljena postmoderna prestolnica, a vendar je napačna trditev, da ima 38 milijonov prebivalcev (str. 22). Sama upravna enota, uradno imenovana metropola Tokio, ki jo sestavlja 23 mestnih občin oziroma kujev, ima uradno 14 milijonov prebivalcev, širše območje Tokia pa jih ima po zadnjih podatkih res blizu navedene številke. A v to območje spada, na primer, tudi sosednja Jokohama, drugo največje mesto na Japonskem, ki pa upravno že spada v prefekturo Kanagava. Uršič in Imai se v svojih terenskih raziskavah osredotočita samo na soseske, ki so pod jurisdikcijo tokijske metropolitanske uprave. Ob tem se zdi, da so raznovrstni problemi Tokia (str. 23) vendarle manjši kot problemi številnih drugih mest v provinci in japonskega podeželja na splošno, pri čemer se slednje spoprijema z izrazito depopulacijo, saj se predvsem mlajše prebivalstvo v iskanju boljših izobraževalnih in zaposlitvenih možnosti praviloma seli prav v prestolnico in druga velemesta na pacifiški obali Japonske. Že bežen obisk notranjosti še ene sosednje tokijske prefekture, in sicer Saitame, razkrije večplastne družbene in gospodarske posledice omenjenega negativnega trenda, ki ga je epidemija koronavirusa nekoliko zaustavila, a je še prehitro trditi, da tudi preobrnila.

Omenjenemu navkljub je monografija *Creativity in Tokyo* nadvse koristno in zanimivo branje tako za prostorske

sociologe in antropologe kot urbaniste, arhitekte ter japonologe, saj pomaga razumeti spremenljivo urbanistično podobo glavnega mesta Japonske.

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Biografija

Dr. Matjaž Uršič je izredni profesor na Oddelku za sociologijo in znanstveni svetnik na Centru za prostorsko sociologijo Fakultete za družbene vede Univerze v Ljubljani. Delal je na več vzhodnoazijskih univerzah, tudi na Metropolitanski univerzi v Tokiu, Univerzi v Seulu, Univerzi Soongsil in Nacionalni univerzi Cheng Kung. Vključen je v razne mednarodne raziskovalne in razvojne programe za revitalizacijo in spremembo vloge urbanih središč, kot so npr. H2020, RISE, Joint Research Program NRF, Smart Urban Futures ERA-NET in ERFD.

Dr. Heide Imai je izredna profesorica na Fakulteti za medkulturne komunikacije Univerze Senšu na Japonskem. Poučevala je na univerzah na Japonskem, v Veliki Britaniji in Nemčiji. Trenutno sodeluje pri več raziskovalnih projektih o urbanih vprašanjih in politikah na Japonskem, v Južni Koreji in na Kitajskem. Med njene številne znanstvene objave sodita tudi Tokyo Roji (Routledge, 2017) in Asian Alleyways (z M. Gibert-Flutre; Amsterdam University Press, 2019).

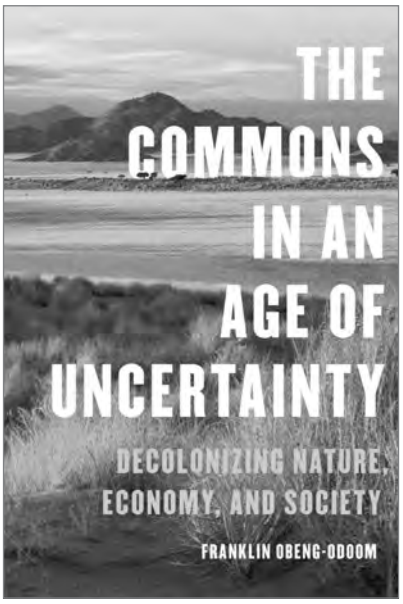
Informacije o knjigi

Spletna stran:
https://link.springer.com/book/10.1007/978-981-15-6687-5

Domen ŽALAC

S skupninstvom proti družbeno-ekološki krizi

Naslov: *The commons in an age of uncertainty: Decolonizing nature, economy, and society*
Avtor: Franklin ObengOdoom
Izdajatelj: University of Toronto Press
Kraj in leto izida: Toronto, 2021
Število strani: 264 + i-xv



Franklin Obeng-Odoom je knjigo Skupno dobro v času negotovosti (The Commons in an Age of Uncertainty) začrtal v obliki akcijskega načrta za reševanje politične ekonomije današnjega časa v smislu preoblikovanja ekološko-politične ekonomije prihodnosti. V ospredju izpeljane študije knjige je pregled dveh idejnih šol, in sicer Conventional Wisdom in Western Left Consensus, tema nasproti pa je postavil Radical Alternative.

Obeng-Odoom trdi, da okoljske krize ni mogoče misliti brez politične ekonomije. Akcijski načrt je zato podrobno razdelil v sklope kategorizacij narave in družbe. S svojo dolgoletno raziskavo, ki jo je upodobil v omenjeni knjigi, se postavlja na presečišče delovanja družboslovnih in naravoslovnih znanosti. Združil ju je v konkretno izhodišče, in sicer kot smernice za skupnostno organiziranje in opredelitev lastniških razmerij v okviru mest, tehnologij, nafte in vode za boj proti družbeno-ekološki krizi, ki je posledica neoliberalizacije zasebne lastniške pravice nad zemljo, njenimi viri in produkti človeškega dela. Zagovarja tezo, da je današnja obravnava narave in okolja posledica ekonomskega in političnega imperativa rasti, ki je v zadnjih desetletjih stremela k radikalnemu izčrpavanju okoljskih virov na podlagi dihotomnega razumevanja javne in zasebne lastnine.

V začetnem delu knjige je avtor navedel metodološko-dialektično analizo zgodovinskega in ontološkega prikaza temeljev koncepta skupnostne lastnine kot eno prvotnih kategorizacij lastnine, med katerimi je zasebna lastnina le ena izmed nižjih okoljsko netrajnostnih kategorij lastninjenja. Posledica prevlade pojma zasebne lastnine v javnem diskurzu se kaže v prevladujoči zasebni lastnini, ki je postala predvsem privilegij ozkega kroga posameznikov in transnacionalnih korporativnih organizacij, ki ne delujejo v skladu s potrebami širše družbe. Neodgovorno in nepravično ravnanje z naravo in njenimi viri vodi v stanje očitne družbeno-ekološke krize na svetovni ravni. Razlogi za to so naraščajoča družbena neenakost, vse številnejše in obsežnejše migracije na različnih ravneh, globalno segrevanje, prostorska segregacija prebivalstva in degradacija urbanega bivalnega okolja v urbanih slumih. Vsi našteti pojavi nazorno nakazujejo okoljske, družbene, politične in ekonomske negotovosti, s katerimi se spoprijema današnja družba. Kljub temu je avtor poudaril, da čas negotovosti ni nov pojav, s katerim bi se danes spoprijemali prvič. Spremenjena sta predvsem predstava in doživljanje negotovosti, vse bolj atomizirana na posameznika in njegovo razmerje med lastnim obstojem in vplivom, ki ga ima na prostor in okolje, v katerem živi. S humanistično-družboslovnega vidika so to negotovosti v obliki različnih strahov in emocij ter pesimistične drže do prihodnosti. Avtor je poudaril prepletena ontološka pristopa, ki vplivata na trenutni diskurz o skupnostnih virih in skupnostnem dobru, ki jih obravnavata že v uvodu omenjeni paradigmi Western Left Consensus in Conventional Wisdom.

Avtor za zgodovinsko izhodišče negotovosti upošteva prvo polovico dvajsetega stoletja – obdobje postopne reorganizacije industrijskega kapitalizma in organizacijskih enot transnacionalnih korporativnih organizacij, ki sta posledično tudi danes največji vir negotovosti za ekosistem in družbo. Omenjena reorganizacija se odvija v okviru politične ekonomije, v kateri organizacijske enote transnacionalnih korporativnih organizacij delujejo avtonomno od družbe. Sprejete odločitve in dejanja teh organizacij vplivajo na degradacijo in rekonfiguracijo okolja in prostora. Med drugim se avtor navezuje na J. K. Galbraitha, intelektualnega predstavni-

ka postkejnezianizma in intelektualnega ustanovnega predstavnika idejne šole Conventional Wisdom. Ob tem, ko izhaja iz Galbraithovega dela, avtor vpelje analizo politične ekonomije s poudarkom na političnem in kulturnem miljeju in z umeščanjem lastne zapuščine afriškega odnosa do skupninstva. Razumevanje političnega in kulturnega miljeja je nujen sestavni element poglobljenega uvida v vsebino družbenega življenja, posameznika in družbe.

Obeng-Odoom je predstavil akcijski načrt, in sicer z rekonceptualizacijo prezrtega koncepta skupnostnega dobra (The Commons) in skupninstva. Med bolj opaznimi avtorji, ki jih je uporabil za konceptualizacijo razvoja javnega dobra in skupnih virov, je Nobelova nagrajenka za ekonomijo E. Ostrom, ki predstavlja razvojno nasledstvo idejne šole Conventional Wisdom. Ostromova je uvedla pojem Common Pool Resources, ki ga je Obeng-Odoom opredelil kot potreben urbani koncept trajnostnega upravljanja združitve skupnega dobra in skupnih virov v obliko materialne in nematerialne lastnine brez institucionalnega nadzora ali potrebe po privatizirani regulativi. Gre se za emancipacijo skupnosti, ki naj bi javno dobro in skupne vire avtonomno in trajnostno upravljala sama. Pri tem je odprl vprašanje racionalnega delovanja skupnosti in njene vloge pri obravnavanju ekoloških izzivov.

Vprašanja osrednjega pomena pri idejni šoli Western Left Consensus se nanašajo na oblikovanje skupninstva ter na to, kdo in kako bi bil primeren za upravljanje skupnega dobra. Govorimo o konsenzualnem pristopu, temelječem predvsem na antikapitalističnih, antirasističnih in antipatriarhalnih vrednotah, ki vplivajo na odnos in razmerje med zemljo (naravnimi viri), pravicami (socialna varnost, državljanske pravice, človekove pravice) ter politično in zakonodajno javno upravo.

Za razvoj skupninskega upravljanja javnih virov in skupnega dobra je avtor predlagal tretjo smer razmišljanja, in sicer Radical Alternative, katere namera je rešitev ali dekolonizacija zgodovinskega oblikovanja družbenih odnosov na globalnem jugu v razmerju z globalnim severom, s čimer je odprl vprašanje prednosti in pomanjkljivosti paradigmatskih diskurzov idejnih šol Conventional Wisdom in Western Left Consensus. Radical Alternative v najboljšem primeru pomeni vizijo ali, bolje rečeno, retrospektivo možnega alternativnega prestrukturiranja dosedanjih lastniških odnosov do skupnih virov in javnega dobra na podlagi rekonceptualizacije pojma zemljišča, lastniških pravic ter posedovanja materialnih ali nematerialnih dobrin, ki niso povezana s procesom kapitalističnega poblagovljenja vseh razsežnosti okolja in prostora.

Zanimiv prispevek k urbanističnim študijam, poleg celostne obravnave ekološko-družbene krize, prinaša drugi del knjige, ki temelji na razvoju prezrte afriške teorije skupninstva v urbanem okolju, s poudarkom na pravici do nekontaminiranega in zdravega skupnostnega prostora. S tem odpira tudi vprašanje pravične rabe energijskih virov za mobilnost in industrijske dejavnosti v urbaniziranih središčih, ki onesnažujeta okolje. Problem onesnaženosti izvira iz neučinkovite rabe energijskih in drugih materialnih virov, ki posredno vplivajo na degradacijo okolja. V nekaterih afriških državah že samo onesnaženost s plastičnimi odpadki pomeni tudi do 10 odstotkov deleža vseh odpadkov - zato je tudi logična avtorjeva opredelitev naftnih derivatov kot družbeno-ekološke snovi, ki ima okoljske in družbene razsežnosti, saj ti derivati neposredno in posredno vplivajo na zdravje okolja in posameznika. Avtor je izpostavil še primer marketizacije izvažanja odpadkov držav globalnega severa v države globalnega juga. Avtor začrtane teoretične paradigme stalno poskuša nazorno prikazati z njihovimi strukturnimi omejitvami – te pa presega z empirično podprtimi primeri, ki jih oblikuje v smislu diskurza radikalne alternative.

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Franklin Obeng-Odoom je izredni profesor za študije globalnega razvoja na helsinškem inštitutu za trajnostne študije Univerze v Helsinkih. Njegovo raziskovalno in pedagoško delo se osredotočata na politično ekonomijo razvoja, urbano in regionalno ekonomijo, naravne vire in okolje. Z navedenih področij je objavil šest samostojnih knjig, med drugim *Property, Institutions, and Social Stratification in Africa* (Cambridge University Press, 2020), *The Commons in an Age of Uncertainty: Decolonizing Nature, Economy, and Society* (University of Toronto Press, 2021) in *Global Migration Beyond Limits: Ecology, Economics, and Political Economy* (Oxford University Press, 2022).

Informacije o knjigi

https://utorontopress.com/us/the-commons-in-an-age-of-uncertainty-2

Nika MUROVEC
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Izzivi upravljanja in financiranja kulturne dediščine: projekt ForHeritage

Opuščene in zanemarjene zgodovinske stavbe so skupna značilnost mnogih srednjeevropskih mest. To problematiko je prepoznal tudi teritorialni program sodelovanja Interreg Srednja Evropa, ki je propadanje kulturne dediščine opredelil kot enega glavnih izzivov, s katerimi se je treba spoprijeti tudi v okviru programa. V sklopu programa Srednja Evropa se odvija tudi projekt ForHeritage – Odličnost za celostno upravljanje dediščine v Srednji Evropi. V tem projektu sodeluje osem partnerjev iz štirih držav (te so Poljska, Italija, Hrvaška in Slovenija). Slovenska partnerja v projektu sta Regionalna razvojna agencija Ljubljanske urbane regije in Inštitut za ekonomska raziskovanja. Cilj partnerstva je združiti in nadgraditi rezultate prejšnjih projektov, ki jih je financirala EU (kot so Forget Heritage, Restaura, IFISE, CLIC), ter jih pripeljati do izvedbene faze, da bi spodbudili celostni pristop v različnih fazah upravljanja dediščine – pri načrtovanju, izvajanju in financiranju.

Rezultati raziskav, zbrani v okviru omenjenih projektov, in različne druge izkušnje kažejo, da so nezadostna sredstva za prenovo in oživitev glavna ovira za učinkovito upravljanje kulturne dediščine (npr. ForgetHeritage, Restaura). Finančna udeležba zasebnega sektorja je zelo majhna, inovativnih finančnih instrumentov pa v sektorju kulturne dediščine skoraj ni. Druga večja ovira je pomanjkanje veščin in zmogljivosti, zlasti na področju financ, upravljanja in poslovnega načrtovanja (Restaura). Ne nazadnje, očitno tudi ni dovolj sodelovanja javnih subjektov z zasebnim sektorjem in vključenosti vseh ustreznih akterjev (državljanov, združenj, fundacij, institucij, zasebnih izvajalcev ...) v projekte oživljanja kulturne dediščine. ForHeritage obravnava vse omenjene vidike problematike. Projekt temelji na obstoječih orodjih in izkušnjah ter poskuša rezultate vpeljati tudi v prakso sodelujočih regij in širše. Na podlagi znanja in dokumentov, ki so nastali v okviru preteklih projektov, je bila pripravljena zbirka orodij za upravljanje kulturne dediščine. Zbirka obsega nabor šestih novih, jedrnatih in v prakso usmerjenih orodij, ki se osredotočajo na različne vidike upravljanja kulturne dediščine.

Prvo izmed orodij je Dobro/sodelovalno upravljanje kulturne dediščine: Kako vključiti javnost (https://www.interreg-central.eu/Content.Node/D.T1.2.1-GG-and-PG.pdf). Da bi lahko uspešno in učinkovito upravljali kulturno dediščino, je namreč ključna kakovostna interakcija med deležniki. Pri načrtovanju upravljanja, strategij ali projektov kulturne dediščine se je nujno pogovarjati in prisluhniti različnim potrebam. Namen orodja je ponuditi osnovne informacije za podporo upravljavcem kulturne dediščine in drugim akterjem, ki sodelujejo pri upravljanju in načrtovanju na področju kulturne dediščine, da bi lahko svoje delo opravljali v skladu s sodelovalnimi metodami. Orodje zagotavlja praktične informacije po posameznih korakih (opredelitev deležnikov, analiza deležnikov, načrtovanje komunikacije, vzpostavitev dolgoročnih platform za sodelovanje), ki lahko pomagajo pri izbiri metod, ki bodo uporabljene pri sodelovanju z deležniki.

Orodje Finančni instrumenti in inovativne finančne sheme za kulturno dediščino (https://www.interreg-central.eu/Content.Node/D.T1.2.4-Financial-instruments.pdf) ponuja pregled, praktične primere in nasvete o tem, kako se lahko inovativne oblike financiranja, poleg nepovratnih sredstev, uporabljajo za ohranjanje projektov kulturne dediščine. Valorizacija kulturne dediščine je draga in pomeni finančni izziv. Poleg tega ohranjanje in obnova zgradb ustvarjala le del celotnih stroškov ohranjanja kulturne dediščine, saj je velik del stroškov povezan z izvajanjem programa. Ena najtežjih odločitev, s katero se srečujejo tisti, ki zasnujejo projekte obnove kulturne dediščine, je, kako jih financirati (tj. kateri so najučinkovitejši finančni instrumenti in kdo so najboljši ponudniki sredstev). Ta težava je posledica tudi pomanjkanja informacij o takšnih instrumentih in navdihujočih študij primerov.

Uporaba pristopov javno-zasebnega sodelovanja pri oživljanju kulturne dediščine (https://www.interreg-central.eu/Content.Node/D.T1.2.3-PPC.pdf) je orodje, ki predstavlja obstoječe oblike javno-zasebnega sodelovanja, njihovo uporabo in priporočila o tem, kako bi lahko javni in zasebni sektor uspešno sodelovala pri oživljanju kulturne dediščine. Evropske države so bile sorazmerno uspešne pri vključevanju dediščine s spremembo dojemanja družbene in

gospodarske vrednosti dediščine ter njene vloge pri trajnostnem razvoju. Zaradi zmanjševanja javnih sredstev in nujnosti interdisciplinarnega pristopa pri oživljanju kulturne dediščine je treba poiskati nove vire financiranja (npr. zasebni kapital, fundacije itd.) in nove načine javno-zasebnega sodelovanja.

Ocena učinkov projektov kulturne dediščine (https://www.interreg-central.eu/Content.Node/D.T1.2.6-Impact-assessment.pdf) predstavlja praktične smernice o tem, kako pristopiti k ocenjevanju učinkov projektov kulturne dediščine. Tako kot je okolje naravni kapital, je dediščina kulturni kapital: naložbe v dediščino imajo pozitiven donos. Ocena učinkov je poskus ugotovitve, koliko ukrep vpliva na zadevne spremembe v družbi. Poleg tega so cilji tudi upravljanje in nadzor ustvarjanja vpliva ter njegova optimizacija glede na stroške. Merjenje učinka je ključno za privabljanje vlagateljev, saj le tako lahko ocenijo učinek svojih naložb in spremljajo neprestano izboljševanje organizacije. Ocenjevanje in merjenje učinkov sta zato predmet razprav za opredelitev standardnih metodologij na mednarodni ravni.

Orodje Prenosljivi elementi pilotnih projektov oživljanja kulturne dediščine (https://www.interreg-central.eu/Content.Node/D.T1.2.2-Pilot-projects.pdf) povzema izkušnje 12 izvedenih pilotnih aktivnosti v okviru projektov Forget Heritage in Restaura, oba projekta sta se ukvarjala z oživitvijo kulturne dediščine. Namen tega orodja je zagotoviti preglednejše informacije o dobrih praksah in priporočilih, ki izhajajo iz njih. Priporočila so pri tem razdeljena na tista, ki so uporabna splošno pri vseh pilotnih projektih in v vseh fazah razvoja projekta, ter na tista, ki so uporabna zgolj v neki fazi življenjskega cikla projekta ali v specifičnem kontekstu, ki je jasno opredeljen. Cilj je torej olajšati postopek preizkušanja vsem, ki se bodo s podobnimi pilotnimi projekti ukvarjali v prihodnosti, jim pomagati izogniti se zadevnim napakam ter omogočiti uspešnejše in učinkovitejše izvajanje njihovih pilotnih aktivnosti.

Slika 1: Fotografije lokacij pilotnih projektov (vir: Domača stran projekta ForHeritage)

Orodje Kako organizirati uspešno usposabljanje za izboljšanje upravljanja v sektorju kulturne dediščine (https://www.interreg-central.eu/Content.Node/D.T1.2.5-CH-training.pdf) pa vsebuje praktične informacije in nekaj namigov v zvezi z organizacijo izobraževanj za (boljše) upravljanje kulturne dediščine za različne ciljne skupine (uslužbenci javne uprave, upravljavci kulturne dediščine). Zaradi hitrega razvoja in sprememb na skoraj vseh področjih našega življenja - na gospodarskem, družbenem, kulturnem in političnem – je vseživljenjsko učenje temelj za uspešno kariero. Strokovnjaki morajo nenehno razvijati svoje kompetence: tiste mehke, povezane s timskim delom, načrtovanjem in organizacijo, sposobnostjo prilagajanja zunanjim spremembam, veščinami reševanja problemov in mreženjem, ter tiste, povezane s področjem dejavnosti.

Vsa opisana orodja so še vedno osnutki, saj bodo končne različice pripravljene šele po koncu obsežnega revizijskega procesa. Revizije temeljijo na povratnih informacijah različnih zainteresiranih strani ter na rezultatih preizkušanja in potrjevanja orodij v praksi, ki bo izvedeno v okviru štirih pilotnih projektov. Pilotna lokacija na Poljskem je Grad pomeranskih vojvod v Szczecinu (fotografija št. 1), pri čemer bo poudarek aktivnosti na analizi in nadaljnjem razvoju dejavnosti z uporabo različnih virov financiranja. V Italiji se bodo pilotne aktivnosti odvijale v palači Santa Croce v mestu Cuneo (fotografija št. 2), kjer je treba vzpostaviti sodelovalni postopek za določitev prihodnje vsebine in preizkusiti možnosti za izvajanje sheme javno-zasebnega sodelovanja. Na Hrvaškem (Reka) bo glavni izziv, kako vključiti vse različne deležnike in obstoječe vodstvo v sinergijski proces upravljanja in financiranja celotnega kompleksa Benčić (fotografija št. 3), ki ga sestavljajo tako že uveljavljene institucije (na primer Mestni muzej Reka, Muzej moderne in sodobne umetnosti ali Otroška hiša), načrtovane prenove za znane dejavnosti (kot je mestna knjižnica) kot še neznane dejavnosti. Slovenski pilotni projekt je Vodnikova domačija (fotografija št. 4), kjer bodo glavne aktivnosti usmerjene v raziskovanje možnosti pridobivanja dodatnih zasebnih finančnih sredstev.

Poleg pilotnih aktivnosti in izdelave končne različice nabora orodij (ter njegovega prevoda v nacionalne jezike) bodo prihodnje projektne aktivnosti osredotočene na prenos nabora orodij ForHeritage za celostni pristop k upravljanju na širšem teritorialnem območju v sodelovalnem procesu prilagajanja pristopa posameznemu kontekstu. Da bi zapolnili vrzel lokalnih, regionalnih in nacionalnih akterjev v zmogljivosti za izkoriščanje različnih virov financiranja za oživitev opuščenih stavb kulturne dediščine, bo organiziranih več izobraževanj in delavnic. Upravljavci stavb kulturne dediščine in odločevalci bodo lahko pridobili znanja o tem, kako v projektih kulturne dediščine pridobiti dodatna finančna sredstva (iskanje novih zasebnih virov, vzpostavitev inovativnih finančnih instrumentov) in uporabiti integriran pristop upravljanja. S tem želi projekt prispevati k pereči problematiki propadanja stavb kulturne dediščine.

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https://www.interreg-central.eu/Content.Node/ForHeritage.html
Informacije o pilotnih projektih:
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Public participation in post-communist cities between stagnation and progress: The examples of Zagreb and Ljubljana

Public participation in the urban transformation of capital cities is an important factor to consider when assessing the quality of democracy in post-communist countries. This study examines participatory processes in two capital cities, Zagreb (Croatia) and Ljubljana (Slovenia). The cases studied are summarized, and similarities and differences are pointed out using the comparative method (Tabor Park and the BS 7 neighbourhood in Ljubljana, and the Meštrović Pavilion and Savica Park in Zagreb). Findings from 2018 and 2019 showed a rather low level of public participation in Zagreb. In Ljubljana, the level of public participation was higher and the legal basis for it stronger, although there was a certain amount of dependence on political and economic factors. In both cities, public participation in its most direct form was present at the level of NGO and civil initiative activities. Residents' communication with the city administration was poor and did not facilitate the participation process.

Keywords: participation process, civil society initiatives, comparative method, Zagreb, Ljubljana

1 Introduction

In the former Yugoslavia, which both Croatia and Slovenia were part of, spatial management was conditioned by the socio-political context, and it was largely based on planning and state control. Social, economic, and spatial development issues were addressed comprehensively within the social planning system (Slovenian: *sistem družbenega planiranja*, Burton et al. 1967; Croatian: *društveni plan*, Čaldarović & Kritovac, 1987). In the post-communist period, the state's role in spatial management ceased. The focus shifted to the privatization of space and real estate, land reuse and redevelopment, and redefinition of the roles of planning institutions (Bertaud and Renaud, 1997; Golubchikov, 2004; Dimitrovska Andrews et al., 2007; Hirt, 2012; Sýkora & Stanilov, 2014; Sviršić Gotovac & Kerbler, 2019; Zlatar Gamberožić, 2019). However, the market-oriented economy revealed a lack of common interest and vision in urban planning. Instead, a certain laissez-faire approach or economic liberalism was embraced in urban planning and public policies, which created (and continues to create) uneven urban development and economic inequality (Offe, 1997; Jaakson, 2000; Nikšič & Sezer, 2017). As a result, attractive city locations have become large building sites, profits on various investments have soared, and less-attractive locations have stagnated (Nikšič, 2014; Patti & Polyak, 2017). "The tyranny of the state" has been replaced by "the tyranny of the market" (Häussermann & Kapphan, 2004: 26), which is the beginning of the commercialization process of urban space. In the situation in which the main activities of urban development have shifted from planned improvements across the city to economically driven interventions in certain favourable locations, the role of the public in the development process must be addressed. This article first defines the public participation process as part of the decision-making process in spatial and urban planning in the post-communist context. It uses the cases of two post-communist capital cities, Zagreb and Ljubljana.

In the post-communist city, market demands and private interests are much more relevant than planning as a process. Even public investments are focused on the sectors and projects that can improve the attractiveness of the city for profit rather than improve the general quality of life for its residents (Stanilov, 2007; Sykora, 2007; Patti & Polyak, 2017). The urban planning transition from communism to post-communism has been marked by neglect of the social dimension of urban living and housing, and of strategic and long-term urban planning. The market economy characteristics present since the 1990s (privatization, reduction of public space, and the global financial system) influence the relations among the stakeholders in the urban planning processes; specifically, their roles and powers. Western countries use terms such as *high levels of citizen participation*, *high legal standards*, and *successful public-private partnerships*. In urban planning, the countries of the former Yugoslavia are struggling with limitations in the legal system and insufficient public participation in the decision-making processes. However, the reasons for the rather slow transition in most parts of the former Yugoslavia certainly lie in the conflict of the 1990s and the break with and isolation from European and global trends (Beyea et al., 2009). The transition process was faster in the ex-communist countries that started EU accession activities earlier, such as Slovenia.

The transition process in Slovenia has been rather smooth in comparison with the rest of the former Yugoslavia due to some initial advantages: Slovenia fought a brief war of independence, and it joined the EU relatively quickly and immediately adopted its urban planning programmes. EU funding also soon became available and provided for a number of urban projects that were initiated and supported by city political and administrative structures (Zlatar Gamberožić, 2019). Croatia saw many spatial transformations emerge after declaring independence and strengthening of the privatization process in the 1990s, and the involvement of the market economy in spatial development.

In Croatia, the planning process is primarily determined by the Master Plan (Croatian: *generalni urbanistički plan*) at the level of urban centres (Zagreb and other cities), the Spatial Development Strategy and Spatial Planning Programme of the Republic of Croatia, and the Spatial Plan of the City of Zagreb. According to the plan, in the process of planning and plan implementation there is an obligation to adopt urban development plans, conduct public tenders, prepare studies, and allow public participation (Master Plan, Articles 99–108). Public tender is obligatory for public spaces (squares and parks), and the Master Plan allows the development of city projects and determines the procedure for implementing them. The Master Plan and its amendments and supplements are sent to the Zagreb City Assembly for adoption. Participation of the public is provided by holding exhibitions and preliminary discussions on spatial plans, and by providing public access to draft spatial plans and the results of public tenders (Grad Zagreb, 2016).

According to the Spatial Planning Act (Sln. *Zakon o urejanju prostora*, 2017; hereinafter: ZUreP-2), the authority for spatial planning in Slovenia is held at the national and local (municipal) levels. The hierarchy of spatial planning acts is divided into strategic documents and implementation acts. The strategic documents define the main direction of future development and its main principles, and the implementation acts are locality-specific and are legally binding. Public participation in preparing the strategic plans is more often in the form of public

consultations, but more active forms of public involvement are required for preparing and adopting the implementation acts; among other things, the public participation process has to be decided in the form of a public participation plan (Slovenian: *načrt vključevanja javnosti*) in the preparation phases (ZUrep-2, 2017; ESPON, 2018).

2 The participation process as part of the urban planning process

As described in Arnstein's Ladder of Citizen Participation (Arnstein, 1969, Figure 1), public participation in urban planning can vary from the lowest level of participation (manipulation) to the highest (control). At the lowest levels (nonparticipation) and the first phase, not only do people have no influence on decision-making, but they are manipulated into believing that everything is done in their best interest. The proposed plan is the best, and the task of participation is to achieve public support through public relations. In the second phase of passive participation (tokenism), they receive information about urban projects as they happen, without any possibility of intervening. Only placation allows members of the public to advise or plan ad infinitum, but it retains the right for power holders to judge the legitimacy or feasibility of the advice. Under citizen control (partnership and delegation), power is redistributed through negotiation between the public and power holders. The highest level and the final phase of participation implies that residents can initiate urban projects and thus design their own living space with no intermediaries or source of funds. At this level they can control urban policy and be an equal member of the entire planning process.

Many authors later followed Arnstein's scheme. For example, Anokye (2013) also describes various paths to participation: the higher level is the transformative approach, and the lower one is the instrumental approach, and there is also a combination between the two of them. The transformative approach is equivalent to Arnstein's citizen control and the instrumental approach is the equivalent of her nonparticipation. Most participation systems are in the mixed model, implying that residents know about or have occasionally participated in some kind of consultations, and they are in a certain way informed about the decisions that city authorities will implement. Nevertheless, this does not mean that they have really participated in the process and that they will be empowered to change political decisions. This approach is therefore instrumental in a way, employing methods that involve *top-down* information flows and not strengthening the actors (Anokye, 2013: 82). This approach still does not involve agreement, nor consensus, with a potential conflict constantly present between the sides involved. According to Hordijk et al. (2015), this approach

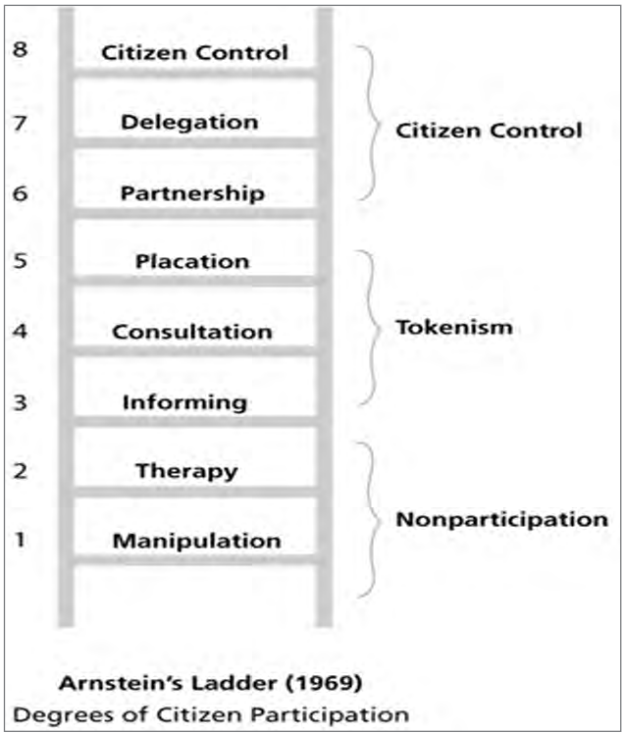

Figure 1: Arnstein's Ladder of Citizen Participation (source: Internet 1).

is related to the diminished roles of the state and its citizens, referring to them as clients or consumers that cannot influence the process of making decisions but can only adhere to them because they are unchangeable. The transformative approach uses bottom-up communication and represents a higher level of participation, in which stronger public involvement can be expected.

2.1 Participation in Zagreb

Although Croatia joined the EU in 2013 and has strived to adapt its legal system to that of the EU, and although a number of bills have been introduced seeking better cohesion, decentralisation, horizontal governance, and increasing importance of the participation process in urban development, not much of this can be found in practice. Hence, under Croatian law, public participation has been reduced to public access to draft spatial plans, which can last from thirty days to only fifteen days (to suggest changes and amendments).

During public consultation, members of the public have the right to participate in the process of drawing up and passing spatial plans and to offer their proposals or comments. This is a top-down model of participation in which spatial changes are decided by the government and only minor issues raised by residents are considered (e.g., a private plot of land within the planning zone). The public has very little influence on changes in spatial plans, and ultimately on the conversion of space, most

often public space. Public interest is declared to be important and valuable, but collaboration with the public is formal or lacking, and its proposals are not necessarily accepted. In the last few decades, city authorities have often started projects that were rejected by the public and have resulted in the shrinkage of public space. It is interesting that, regardless of EU accession, the Master Plan for Zagreb has not fundamentally changed since 2007 and has been modified for years depending on market needs (of economic and political actors). There has been a lack of professional and political collaboration, and non-governmental organizations (NGOs) and various civil initiatives, which have flourished during recent decades as a civil society sector, have taken a stand in defence of public interest. When city streets and squares were subjected to unwanted or inadequate renewal, protests and large-scale demonstrations were held to prevent such changes. However, the authorities have rarely given up on their projects and have managed to see them through. Still, the NGO sector has become an important actor in public participation that is striving to establish communication between political forces and the public, and involve residents in the process so that they can express their interests. Despite its undoubtedly greater visibility, Bežovan and Zrinščak (2006: 8) emphasize that "civil society is still more reactive than proactive, and civil society organizations still do not appear as specific 'generators' of social capital."

There are some legal options for people to present their proposals or complain (at local public meetings). A decision made at a local public meeting is mandatory for the local committee council or city district council, but it is not binding for the city assembly (Internet 2, Articles 127–129), which is an example of how the public can be excluded from the procedure and how residents' voices are not taken into account in the final phases of projects. Such an approach can be connected with the instrumental approach mentioned above, which is related to the reduced role of the state and the general public, who is therefore very passive. It can also be connected with Arnstein and the lower participation ladder – that is, non-participation (informing, therapy, and manipulation). It could also explain why residents express a certain degree of unwillingness to take part in the participatory process. Currently, some aspects of local self-government are not encouraging for residents; they are aware of their limitations, irrelevance, and marginality when it comes to solving problems of daily life in a community (Rešetar, 2009; Toš, 2012). In this one-way process, there is frequent manipulation with certain conversions of space and strengthening of political power, especially the role of the mayor's office. It is interesting that the mayor gives an impression in public discourse of an actor interested in improving people's quality of life and meeting their desires and needs; however, due to collaboration with investors, such endeavours are never carried out. Only the dominant elites participate in the decision-making process as the chosen and more influential part of the population, thus leading to "elite capture", which distorts the advancement of participation (Silver et al., 2010) or the involvement of the majority of residents.

2.2 Participation in Ljubljana

The formal basis for public participation in environmental and spatial development processes is the Aarhus Convention (UNECE, 1998), which was ratified by Slovenia in 2004, the year that it joined the EU, and after this it was integrated into national legislation, including ZUrep-2 (2017; hereinafter: the Act). The principle of public participation is defined in Article 11 of the Act. It provides that the competent authorities should facilitate early and effective participation by the public in decision-making and adoption of spatial planning documents, and in spatial planning matters in general. Everyone should be given the right of access to spatial planning documents and all documentation related to their preparation and adoption in accordance with the Act and the law governing access to public information. Everyone has the right to submit initiatives, proposals, comments, and opinions on spatial planning documents, to which the body must position itself in their preparation and inform the public thereof. The Act also foresees a special legal status for non-governmental organizations (NGOs) that are active in the public interest in spatial planning, environmental protection, nature conservation, or the protection of cultural heritage; their legal interest in spatial development is considered manifest by the Act itself. In addition, Article 85 of the Act requires establishing a public participation plan for preparing spatial documentation. Article 111 additionally defines the procedures for producing local or municipal plans and it foresees public consultations, workshops, or other means of public engagement.

However, Kvac et al. (2015) point out that one of the main obstacles for the full implementation of participatory practices is a passive, formal-only implementation of the demands for participatory approaches as defined by legislation. The comments and ideas from the public that are collected during public consultations are rarely taken into serious consideration by planning authorities, no matter how well they are argued. The procedures defined by the law are also not fully supportive of participatory practices; for example, when institutions make major changes to the initial publicly discussed plan, the final plan may be considerably different but it does not go into public hearings and discussions once more. Therefore, the civil initiative groups and non-governmental organizations push the participatory practices in spatial planning further through their own bottom-up activities (Nikšič et al., 2018). In addition to such concrete activities, they also work on capacity building, providing recommendations and instructions that

encourage the authorities at the local level of spatial planning to include the public in the spatial planning processes and, on the other hand, guide the people on how to be proactive and raise their voice within rather complicated procedures. These documents are an important "soft" tool that guides stakeholders through complex processes by showcasing the most appropriate tools and techniques to be used.

When the City of Ljubljana started preparing its new (first post-communist) spatial plan twenty years ago (Mestna občina Ljubljana, 2002), the city authorities understood the need for a truly participatory approach to obtain a well-considered and consensual plan that would reflect the aspirations of the widest range of local stakeholders. Numerous expert studies were carried out, consultations with various interest groups were conducted, and thematic workshops with residents were held in addition to the legally binding procedures that demanded the inclusion of the general public in the planning process. This resulted in a number of publications and documents that reflected the aspirations and ideas of the general public that would not have been revealed without the extensive use of the participatory tools. The results of these extensive participatory activities did not, however, always find their way into the legally binding planning documentation and were therefore only partly successful because the political situation in the city changed. The new authorities that came into power in 2006 had their own development visions, which were explicitly top-down driven and not always in accordance with the objectives identified in the initial (participatory) stage (Koželj, 2009). The current local government, however, fully implements the legally binding formal steps of public consultation (e.g., every time the amendments and the additions to the spatial plan are made). Nevertheless, participation in its most direct form is still happening at the level of grassroots activities. Groups of self-organized residents are active in various neighbourhoods of Ljubljana, and their activities are largely based on volunteer work and enthusiasm because they receive very little support from public budgets (Nikšič, 2018; Internet 3). Two such initiatives (Tabor Park and the BS 7 neighbourhood) are described in this article.

3 Methods

This article is based on the results of the bilateral project Urban Revitalization of the City Centre: A Comparison between Ljubljana and Zagreb (2018–2019). The comparative method was applied to study urban revitalization in the two cities, examining their similarities, common characteristics, and differences (Žugaj et al., 2006). Field research was conducted in 2018 and 2019 in Zagreb and Ljubljana on four case studies, two in Zagreb and two in Ljubljana. As Burnham et al. (2008) point out, the comparative method makes it possible to put information into a context to be assessed and interpreted, which is especially important when new information appears and needs to be connected with previous knowledge. An attempt was also made to show a binary comparison between two similar countries that are most often part of the same regional context (Dogan, 2009: 23); in this case, Croatia and Slovenia. The comparative method in the social sciences permits a more objective understanding of a social phenomenon, its contextualization and classification, and formulation of conclusions (hypothesis testing) and predictions (Hague et al., 2001; Reason & Bradbury, 2001). According to Denzin and Linkoln (1994), case studies provide a deeper understanding of social processes by analysing a case or several cases. They represent an empirical inquiry that investigates a contemporary phenomenon within its real-life context and relies on multiple sources of evidence. Case studies as concrete examples can offer an in-depth and contextualized understanding of a certain phenomenon (Ritchie & Lewis, 2003; Yin, 2003).

The aim of the research was to present differences in the participation process through the selected cases and through the comparative method to define concrete and problematic moments in establishing and implementing public participation. The aims of the research can be summed up at several levels of comparison: 1) How did the public and the civil sector react and how did they activate themselves? 2) Was there a change in the preliminary project plan due to the intervention or reaction of the civil sector? and 3) Which participation model according to Arnstein and other authors was applied in the case of Ljubljana, and which in the case of Zagreb (instrumental, transformative, or combined)? The comparative analysis examined each case separately through the chronology of events from the beginning of each project through the involvement and activation of the public to the final result: the reaction or, in some cases, action of civil actors. The comparison between the cases took place at two levels: a) a comparison of two cases in each country separately, and b) a comparison of all four cases in Slovenia and Croatia with an emphasis on participatory models, examining the role of civil actors in each case to show participatory models for each country. The four examples studied (Tabor Park and the BS 7 neighbourhood in Ljubljana, and the Meštrović Pavilion and Savica Park in Zagreb) were selected because they represent the participation process of various interested sides (professional, political, and civil circles) in both cities. They are the most vivid and prominent examples of the differences between these two countries in the top-down versus bottom-up planning processes. These models are related to the hypotheses on the instrumental, transformative, and combined approaches (Anokye, 2013) in the participation process, according to which the cases analysed can be positioned.

4 Results

4.1 First example of bottom-up participation: Tabor Park in Ljubljana

Tabor Park (Sln. *Park Tabor*) is a local park in the east part of the city, which can be reached in a ten-minute walk from Prešeren Square, the main square in Ljubljana. The Tabor Sports Society grounds are part of this open area, which measures about 1.2 hectares. Although it is the green centre of a wider neighbourhood, it has been neglected and abandoned for many years, and people were reluctant to linger at night because of bad maintenance and poor lighting. In 2010 Prostorož, a cultural association seeking to improve urban public space and public participation, decided to explore the potential of the space (Internet 3). One of the missions was to encourage local residents to actively participate in the planning and implementation phases of the park redesign, using minimum financial means and making small-scale improvements to the space in order to encourage socializing, playing, and working out in the open air and pleasant environment. Based on research on the potential and problems of the area (Cerar & Peterlin, 2010) and a series of participatory workshops, a programme of various activities was set up and carried out from 2010 to 2014. The aims of the activities were threefold: to introduce small spatial improvements to make the place welcoming and enjoyable, to change the traffic regime and prioritize non-motorized traffic, and to create opportunities for locals and visitors to socialize. Prostorož coordinated the activities of volunteer organizations, decided on the outdoor park equipment, and made plans for the changed traffic regime.

Although Tabor Park (Figure 2) is a representative case of a bottom-up approach, it was also given some basic financial support by the local authorities, which at least allowed the cultural association to operate its coordinating activities. The municipal departments were cooperative and flexible enough to issue the necessary permits. The collaboration between Prostorož and the municipal departments had the potential for setting up similar participatory practices in other parts of the city. This would be an important step toward revitalization of similar suburban public spaces without large investments (Bugarič, 2018). Along the way, those involved with Tabor Park obtained better insight into the structure and operational mechanisms of the municipal departments and indicated there was still room for improvement in terms of participatory practice. No matter how well-meaning their suggestions might have been, once publicly expressed they were often interpreted as criticism of the city authorities, which resulted in withdrawal of support not only for the specific project but also for other activities by the initiators (Human Cities Archives, 2017).

Figure 2: Tabor Park in May 2011: various activities in the park (photo: Matej Nikšič).

4.1.1 The BS 7 neighbourhood in Ljubljana

Another interesting case study with important lessons to learn is the BS 7 neighbourhood (Sln. *soseska BS 7*) on the northern outskirts of Ljubljana, known also as the Russian Tsar neighbourhood (Sln. *soseska Ruski car*). This is one of the largest housing developments in the Slovenian capital, built in the 1970s with a large open central area named Bratovž Square (Sln. *Bratovševa ploščad*). In the communist period this was a place for socializing, but today it is a rather underused transitory area. It is in physically bad shape due to the effects of age on the building materials and insufficient maintenance in the past decades. Because of its unclear ownership (in addition to being a central open public space, it also accommodates private underground parking facilities), no renewal has started. A group of local residents (the initiative *Skupaj na ploščad!* 'Together onto the Square!') (Figure 3) have therefore started some new activities to show the great potential that the place holds and thus hopefully encourage all owners (of underground parking facilities, of the nearby blocks of flats, and the municipality) to agree and invest in its redesign. Each year the initiative voluntarily organizes various activities for and with the local residents to bring life into the neighbourhood, such as a street cinema, vegetable markets, or street furniture workshops. The area and public participation have attracted the international attention of the Human Cities activities within the EU's Creative Europe programme (Franc et al. 2018), which aims to empower local residents in their bottom-up activities through experimental use of various participation tools. From 2014 to 2018, many on-site events were held, such as neighbourhood walks, roundtables, neighbourhood picnics, drawing and model-making workshops, interviews, online photo competitions, and street exhibitions to encourage the locals not only to start socializing in the square, but to join forces and decide together about the comprehensive regeneration of the place (Nikšič et al., 2018). Even when the city administration eventually

Figure 3: Participatory activities in the underused public space in the BS 7 neighbourhood (photo: Tomaž Zupan).

recognized the importance of the project and offered financial support for it, disagreement in the local community about the project costs and the future design of the place blocked the regeneration endeavours. This case shows that, even when there is a wide support (among the residents, the municipality, and local and international expertise), the inability of all stakeholders to find a common language can prevent the best-intended participatory endeavours from bearing fruit. However, such activities are an important contribution in terms of capacity building for participatory urban (re)development, which can only start when the major players have reached an agreement on the fair share of investment costs.

4.2 A top-down or reactionist activism approach to the participatory process in Zagreb: The Meštrović Pavilion

The renovation of the Meštrović Pavilion (Cro. *Meštrovićev paviljon*; Figure 4) in the middle of Victims of Fascism Square (Cro. *Trg žrtava fašizma*) in central Zagreb was announced as the first stage of the project named the Pedestrian Centre of Excellence. The pavilion is an example of a cultural and artistic monument and a public space favoured by the residents, because of which they monitored the intervention intensively. The case study analysis from 2018 and 2019 showed that residents' reaction was negative and they tried to stop the project. At the very beginning, the area around the pavilion were stripped of all its greenery in order to proceed with the planned renewal. The strongest protest was staged by local residents and others after a magnolia tree was removed, leaving the space bare and sterile, far from meeting human needs. The campaign Bring Back the Magnolia Tree (Cro. *Vratite magnoliju*) was launched, which lasted for six months. Because the entire project was poorly presented to the public, regular procedures were violated or sidestepped, and experts

Figure 4: The Meštrović Pavilion before and after the renovation in 2017 and in 2018 (source: Dobrić, 2018).

from broader professional and independent circles, who were attempting to influence the project implementation with their knowledge, were ignored. The initiative demanded suspension of the work, public consultation, protection of plant life, the return of the magnolia tree, and a more constructive discussion prior to finalizing the project. They sent their requests and appeals to city and state government institutions. In spite of all these activities and the growing resistance by civil initiative groups, there was no reaction from the authorities and the first stage of the project was completed.

The planning stage included the installation of new horticultural drainage, the replacement of damaged stairs encircling the pavilion, laying new granite paving slabs and stone curbs, and new benches, garbage bins, public bicycle racks. However, without a public tender and consultation, the project appeared to be the result of the mayor's autocratic rule and manipulative methods that prevented the community and relevant professionals from participating in decision-making. Protected cultural heritage and its historical identity was also altered and modified without much consideration. In the end, something good came out of this urban renewal attempt. The initiative Bring Back the Magnolia Tree made the authorities promise to never again do things the way they were done in this square (Sviršić Gotovac & Zlatar Gamberožić, 2020). This case clearly shows that, in matters of shrinking public and green space in Zagreb, non-governmental organizations have become the only mediator between the residents and the government and the only response to arbitrary governmental action.

4.2.2 Savica Park in Zagreb

The case of Savica Park (Cro. *Park Savica*; 2013–2018) was about building a church in a local park. The local parish submitted a request for the location permit, but none of the owners of the adjacent land were notified about this. Under unclear circumstances, a non-existing "road" was entered in the cadastre between the building site and a neighbouring build-

Figure 5: Protest against building a church in Savica Park in 2017 (source: HINA, 2016).

ing. The local residents thereby lost the right to complain and then decided to launch the campaign Save Our Park (Cro. *Čuvamo naš park*; Figure 5), which lasted for five years. It was organized primarily because the tendering procedures were non-transparent and the entire project would reduce the park area. The church building was to take up 1,600 square metres, almost one-third of the total park area. The people that joined the initiative constantly emphasized they were not against the church building but against the location selected. The residents involved in collecting the signatures to support the initiative called themselves "residents that approve of the church but not in our park". They sent letters to the relevant city offices and the mayor himself, following all procedures. The Society of Architects and the Croatian Association of Landscape Architects sided with the public and opposed the project. Finally, the Ministry of Construction and Spatial Planning revoked the permit issued by the City of Zagreb in 2016. The reasons cited, among others, were the size of the project, which was not in line with the Master Plan, and the absence of public tender procedures.

The examples of the Meštrović Pavilion and Savica Park are similar in their early stages and the public reaction to them. The cases differ, however, at a later stage, when the location permit was revoked for the latter project after several years of civil actions. However, these cases show that civil initiative groups joined by the professionals can become powerful enough to stop arbitrary behaviour in politics. Nonetheless, this is not exactly the way in which civil actors are expected to take part in participatory practices, but it is a way to raise public awareness and make them active.

5 Discussion

The comparative analysis of the Meštrović Pavilion and Savica Park in Zagreb showed that both projects had two things in common: neglect of public and expert opinion, and the city administrative bodies' steady efforts to see the initial plans through in spite of a number of unclear or incomplete legal procedures. The residents opposed the projects by launching various more or less successful initiatives. The case of Ljubljana highlights the importance of active citizenship, which means proactive residents being able and willing to contribute to rethinking and redesigning their living environment. On the other hand, it clearly shows the volatility of the participatory practices and their dependence on the (non)support of the political and financial powers – as long as the support exists, the cooperation between the bottom-up and top-down endeavours will more likely result in a win-win situation. In order to achieve this, in addition to the legally binding participatory framework, trust, cooperation, and dialogue among all relevant partners are needed. Tabor Park showed to a great extent the fruitful cooperation among the local actors, whereas the BS 7 neighbourhood case demonstrated that the participatory approach may have a limited range if there are too many tensions among different actors.

Public participation in urban planning and the renewal and protection of public space still remains relatively low, as can be seen from the examples of Zagreb and Ljubljana. Likewise, cities in southern Europe experience low satisfaction with city streets or buildings (Emerson & Smiley, 2018: 166), which can be related to the reduced participation shown here and the reduced impact of the public in public spaces. In Zagreb, public involvement is reduced to protests against specific urban projects and can be called *reactionist activism*, which in these cases also turns into the status quo situation or the passive acceptance of a given situation. In Ljubljana, local communities form much more equal partnerships with local authorities when decisions are made about their daily life and environment. All the actors concerned also show a great deal of dedication to their respective tasks. Rethinking the role and influence of the local community is vitally important in post-communist urban planning (Hlaváček et al., 2016). The public participation process should be strengthened to allow people to fully take part in decisions about their immediate environment.

6 Conclusion

In comparison with Zagreb, the Ljubljana examples show higher levels of public participation and a better community-led planning process (Sviřčić Gotovac & Kerbler, 2019). This is especially true in the case of Tabor Park, where civil initiative groups and local residents worked together with the city administration in organizing street events in the park and making it a pleasant place for people to socialize. The grassroots activities in Ljubljana are also more proactive compared to mainly reactive practices in Zagreb – instead of protesting against the top-down imposed spatial interventions, the civil initiatives in Ljubljana mainly work on enhancing the poten-

tial of certain urban environments and promoting cooperation between different stakeholders. This means that the example of Ljubljana has shown deflection from the post-communist one-way instrumental model and has reached the transformative level, whereas Zagreb has remained at the instrumental level. The mixed model can also occasionally be observed in the example of Savica Park in Zagreb because the residents stopped the building of a church, demanding greater participation and that their needs be taken into account, and so their civil action can also fall within the transformative approach. Nevertheless, because it was not a two-way process, it is primarily an example of instrumental participation.

However, the Ljubljana model can be even more successful once it receives stronger political support, which is currently rather weak and unstable. The local authorities still remain reluctant to fully accept grassroots movements as equal partners in the participatory process, and they may still perceive their well-intended criticism as a threat. The same threat seems to be a problem in Zagreb, where true participation never occurs, but it is only present in the form of a response to an already existing situation, and where communication with the authorities is clearly insufficient. The research hypothesis about Ljubljana having higher levels of public participation in matters of life and environmental quality than Zagreb has thus been confirmed. Still, there is much room for improvement in both cities because of the inability of local actors (experts, residents, and authorities) to find a common language and act together, which remains an ongoing challenge for the participatory process. This calls for changes in the legislative framework, educating the public about its rights, and opening up to new bottom-up practices in accordance with the EU recommendations to ensure that public participation remains a constant in the spatial planning process and that urban policy responds to public needs.

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The lost potential of creative urban regeneration: Restructuring Ljubljana's former tobacco factory

In the transition that saw intense spatial and economic changes in Slovenia, urban creative activities were often regarded as an important development factor allowing the reurbanization and revitalization of several former industrial areas. These were generally relatively spontaneous unplanned processes to spatially and economically develop degraded areas where, following the bottom-up principle, various creative individuals and groups gradually revitalized these areas. This article analyses the role of creative activities in breathing life into degraded areas by looking at the development of soft (social) factors in the form of social networks. It highlights the problem of local authorities and state institutional actors' non-perception of, inappropriate approach to, or insufficient consideration of creative social networks in developing these spaces. Drawing on semi-structured interviews, the case of the former tobacco factory is presented as an example of the accumulation of social capital linked to social networks, within which the area's new economic and spatial restructuring is perceived to be an unnecessary element of the renovation.

Keywords: creative activities, social networks, degraded areas, tobacco factory

1 Introduction

Soon after Slovenia gained its independence, urban policies related to developing the creative sector gained importance. The introduction of a market economy together with large-scale systemic changes to spatial planning policies identified the creative sector as a key driver of spatial and economic development during the transition (Bole, 2008; Ravbar, 2011). Highlighting the creative sector as a vital promoter of spatial and economic development was not accidental (European Commission, 2010; Regionalna razvojna agencija ljubljanske urbane regije, 2007; Služba vlade Republike Slovenije za razvoj, 2008), but relied on relatively successful development models used in other economically developed countries (Internet 2; Ministry of Economy, Trade and Industry, 2012; Internet 1). In so doing, creative activities, often referred to as creative economies and creative industries, are expected to form a valuable tool for developing different industries and helping replace lost jobs in traditional industrial and service sectors (Howkins, 2001; Hesmondhalgh, 2002). While copying and trying to implement foreign models of creative urban regeneration policies in Slovenia, several development discrepancies and complications surfaced.

The transfer of urban policies from one environment to another is not simply a "mechanical process of replication", as Peck and Theodore (2015: 25) found, but is also inextricably linked to "urban policy mutations" (Peck & Theodore, 2015) that respond and adapt to specific local features. Although some development models of creative urban policies seem attractive and advanced at first glance, they cannot be transferred to a new socioeconomic context without the side effects of policy mutations (Peck, 2011). Clarke et al. (2015) believe the appropriate metaphor for any introduction of new policies should be "translation" and not "intact transfer" due to the intense dialogical, sometimes even conflicting, transformation processes, which are simply inseparable from attempts to introduce systemic innovations in local environments. Most critical analyses of "imported" creative urban policies do not criticize the use of the concept of creative urban regeneration or the creative city itself, but focus on the problematic use or nonselective application of these concepts in a particular environment. This article therefore does not focus on the usefulness of applying creative urban policies, but on the way they are applied and realized.

For various reasons (e.g., localism-related political relations, economic transformations, and unconsolidated institutional structures), unreflective uses of creative urban regeneration policies can historically be seen in the Slovenian context. Several strategic documents emerging in this period sought to partly address policies of creative urban regeneration (European Commission, 2010; Mestna občina Ljubljana, 2012, 2016, 2020; Regionalna razvojna agencija ljubljanske urbane regije, 2007, 2014, 2019; Internet 3). Nonetheless, due to disregard or misunderstanding of the special contextual features of "creative ecosystems" (Jeffcutt, 2004; Cohendet et al., 2010; Rivas, 2011) in Slovenian cities, spatial interventions were made that either reduced or completely overlooked, if not denied, certain forms of social creative potential and how they could contribute to the development of the socioeconomic system and quality of life in Slovenia.

This article focuses on the restructuring of the former tobacco factory in Ljubljana, which is a paradigmatic example of post-transition processes of urban change. This questionable transformation could be also described as the closure of spaces of temporary creative use without accounting for the value of soft, intangible, informal forms of creative potential held by the socioeconomic activities that accumulated in the area in the meantime. The former tobacco factory was a central area where creative activities for small businesses were concentrated in the Ljubljana region (Žaucer et al., 2012; Uršič, 2016; Kozina & Bole, 2018), but much of the space was closed down or sold off to private investors in 2019, forcing the creatives to restructure, change their location, or shut down their activities. This article analyses and highlights the unreflective closure of an important part of one of the city's largest concentrations of creative activity. It emphasizes that the operation of a creative ecosystem like the tobacco factory area is based on "soft factors" (Murphy & Redmont, 2008; Martin-Brelot et al., 2010) and the principles of "social networks" (Shaw et al., 2016; Boessen et al., 2018), which are insufficiently discussed in Slovenian political and strategic documents on the topic of creativity. It tests whether social networks in relation to creativity and location during the radical transformation of the area can be protected at all by simply physically relocating creative actors to other locations in the city or region. This article uses the term *social network* to refer to the spatio-social or community-based social networks and not digital social networks. The effects of restructuring the tobacco factory area on the creative ecosystem's operation are presented based on data in the longitudinal project Urban Education Live, which ran from 2017 to 2020. Special attention is paid to the overlooked influence of soft (social) factors in the formation, operation, and long-term development of the creative ecosystem of the city and the broader region.

2 Social networks and the development of urban creative activities from a long-term perspective

Soft (social) factors are typically contextual elements that help improve aspects of social functioning in specific settings (Murphy & Redmont, 2008; Martin-Brelot et al., 2010; Musterd & Gritsai, 2013). Whereas hard (physical) factors mostly depend on the availability of specific resources, soft-location factors refer to improvement in the overall quality of life or personal lifestyles. This research includes social networks as part of soft attractive factors due to their functional role as a catalyst for social engagement or sociability in the study location. The problem of misunderstanding the impact of soft (social) elements on the creative ecosystem is actually a problem of the (non)development of the "milieu" (Meusburger, 2009) in which creative actors are involved. If the creative ecosystem can be defined as "an environment that supports creative activities through specialized ways of exchanging, interacting and communicating between people and their economic, social and cultural capital" (Rivas, 2011: 4), the creative milieu may be perceived as its key component that includes "a micro-social context that encompasses people and their relationship to the socio-cultural system, the environment and the local community" (Uršič & Imai, 2020: 8). From this viewpoint, the creative milieu complements traditional components of the creative ecosystem such as creative classes, creative production, creative locations, and creative industries or economies (Pratt, 2004; Florida et al., 2006; Poljak-Istenič, 2017). It also integrates components of particular or local (contextually) related knowledge, which at first glance seems irrelevant, mundane, and separate from the sphere of creative economies. Stressing the importance of the creative milieu draws attention to the importance of the bottom-up process of establishing a creative system; namely, from local communities through creative individuals and groups to creative economies (Colomb & Novy, 2018). A number of studies (Giaccardi & Fischer, 2008; Sailer, 2011; Fischer, 2013) observe that "social creativity" (Montuouri & Purser, 1997; Long & Pang, 2015; Petrović-Šteger, 2018; Vodopivec, 2018) is an often-overlooked component of studies on the development of creative activities and that social creativity is often exploited to enhance the area's cultural attractiveness and market value. In so doing, social and cultural capital is used in the form of "marginal" or "bridging gentrificators" (Smith, 1996: 105) that serve the current needs of the area's development strategies without considering the area's long-term development.

The short-term nature of creative urban policies is frequently based on development perspectives that particularly relate to a product or result, overshadowing the significance of what Briskman (1980: 98) calls the "appropriateness, the 'internal connection' which exists between these products and the background against which they emerge" [*sic*]" (also see Poljak-Istenič, 2015: 34). By focusing on the final product, the process through which this product came about is placed in the secondary plan. Meusburger (2009) and Wierenga and van Bruggen (1998) nicely illustrate this lack of context in analyses of creative activities by analysing creativity in terms of the time component. Here, creativity as a "trait or input variable" is separated from creativity as a "process" and from a "variable as an achievement or output" (Wierenga & van Bruggen, 1998: 84). The psychologists True (1966) and Klausmeier (1961) similarly distinguish "creative ability" from "creative capacity". Both categories rely on the time dimension, in which ability refers to the power to perform an action now, and performance refers to what could be done in the long run through maturation (gaining experience or cumulative effects), education, and interaction between components in the system.

This article therefore focuses on "creative capacity" (Lazaretti, 2012: 2), whereby in the long run individual urban areas act as "informal, collective open spaces that can absorb and recombine art and culture, leading to innovation and regeneration" (Lazaretti, 2012). To understand the soft (social) aspects of creative capacity, it is important to consider the function of social networks found in areas subject to urban renewal. Social networks play an important role in the formation and maintenance of spatial communities and are a key dimension of social capital (Bourdieu, 1986; Putnam, 1995, 2000; Filipović, 2007), which is formed based on "social networks, the norms of reciprocity, trust and positive consequences that this capital has for the individual and the social system" (Iglič, 2001: 186). In this context, social networks are defined as a process of persistent dynamic physical and social interaction within the framework of a specific space of interest (Shaw et al., 2016; Boessen et al., 2018). Social networks are especially important for the functioning of creative communities and creative ecosystems because they are based on intensive communication, mutual exchange, and the enrichment of information among users. In a creative ecosystem, social networks are a very valuable form of social capital without which other forms of capital have difficulty developing or are regarded as significantly less important. This is evident from a series of studies (Gottlieb, 1994; Landry & Bianchini, 1995; Scott, 2000; Florida, 2002, 2005) in which the presence of relevant social networks is identified as a factor more important for the development of creative industries than other factors such as financial resources, technical infrastructure, or physical characteristics of the premises. With respect to highly creative individuals, material supply is an important element in creating favourable conditions for the development of creative industries, but it is not

necessarily the decisive factor for "creative clustering" (Scott, 2000; Bell & Jayne, 2001; Perrons, 2004), best represented in the growth and generational development of socioeconomic activities on site. This means that other elements in the area are also extremely important given that only a combination of favourable conditions that allow individual social and scientific development can provide good foundations for the long-term operation of creative economies.

The right conditions for the development of creative industries are in fact made up of several seemingly less important factors, among which social networks are the most often overlooked factor, one that importantly contributes to the appropriate "climate" or milieu for creative companies and creative individuals (Kozina & Clifton, 2019; Poljak-Istenič, 2019). A series of attempts to develop creative areas based on physical renewal, and that to a smaller extent incorporated aspects of social networks, have proven problematic and less successful (Chase & Crawford, 1999; Harvey, 2000; Nyseth, 2012). Social networks are an integral and sensitive part of any creative ecosystem, responding to certain spatial changes and translating them to the community level. They act as a refined network of sensors in the field that quickly detect the slightest changes in the organization and operation of specific spaces. These processes can be observed in several projects of redeveloping former urban areas where rapid, sudden changes are underway, changing everyday life patterns, services, and the structure of social groups in entire city districts, which is subsequently reflected in how the entire city functions. This analysis of the tobacco factory area in Ljubljana offers a practical example of the great importance that social networks hold for the operation of the creative ecosystem and identifies problematic aspects that emerged during the area's restructuring.

3 Analysis of restructuring the tobacco factory area and the creative ecosystem

3.1 Description of the location and methodology

The oldest part of the former tobacco factory complex in Ljubljana was built between 1871 and 1890 and is located between the railway line from Ljubljana to Trieste, the main arteries of *Tivolska cesta* (Tivoli Street) and *Tržaška cesta* (Trieste Street), and the side route of *Oražnova ulica* (Oražen Street). The area started to be developed at the end of 1870, when the Ljubljana Municipal Council ceded the area for the industrial development of the tobacco industry without any payment (Tobačna Ljubljana, 2019). After decades of mixed industrial development, in 1991 the first key changes were made to the ownership structure of the factory complex, leading to the gradual ending of tobacco production. The area's gradual privatization (by Reemtsma Cigarettenfabriken GmbH, and SEITA, Société nationale d'exploitation industrielle des tabacs et allumettes) began in 1991 and continued with the majority entry of Imperial Tobacco in 2002. This was followed by the gradual halting of production activities at the company Tobačna Ljubljana, which completely stopped in 2004. As the production was closing down, discussions on the future use of the premises started. The premises were first used for several different activities, including the Tobacco Museum, a gallery, the Poligon Creative Centre, the Hekovnik Institute, design and architectural studios, a number of non-governmental organizations, start-ups and art institutions such as the Cirkulacija 2 Institute, various administrative services such as the Ljubljana Administrative Unit, and a multitude of other institutions, societies, and various companies related to creative activities (Figure 1).

Figure 1: Former tobacco factory area, 2018 (photo: Urban Jeriha).

The Creative Cities survey (Inštitut za politike prostora, 2011; Inštitut za ekonomska raziskovanja, 2012) found that in terms of the number of small creative companies (SMEs) and their heterogeneity this area is among the most dynamic areas in the country (Žaucer et al., 2012). According to data collected from the databases of the standard classification of activities (SURS, 2011), the tobacco factory area included over four hundred small enterprises with an average of two to three employees. In 2019, the entire tobacco factory area was sold off to a private investor, which changed the operating conditions for most tenants of the premises. It is evident from interviews with former users that significantly more difficult conditions for renting premises were introduced in 2019. The increase in rent suddenly proposed or requested by the new owner triggered a wave of users relocating from the tobacco factory area. This raises several questions about the function of the former users, their role, and the impact on the performance of Ljubljana's wider creative ecosystem.

These issues are addressed by analysing the social networks in the tobacco factory area. From this point of view, the analysis provides a key tool for identifying the links between important actors and the use of spaces. This shows the importance of recognizing and connecting social interactions with the tobacco factory area, which should help "reflect, and enhance awareness of a context for agreements, conflicts, negotiations, misunderstandings, power relations and accountabilities" (Genz & Lucas-Drogan, 2019: 2). The data set comprises semi-structured interviews with actors or premise users distributed into two phases of the longitudinal Urban Education Live study. The first phase took place between April and August 2018 and included thirty-one interviews with various stakeholder groups, and the second phase was between January and April 2020, when an additional thirty interviews were obtained (making sixty-one interviews altogether). The interviews were conducted based on a random sample of individuals that work within specific creative activities and act as users of the premises at the tobacco factory site. Stakeholder groups were weighted according to the principle of equal geographical distribution across the area (to reflect the different buildings in the tobacco factory area). A wide range of stakeholder groups was included in the analysis, from employees in creative businesses, public institutions, and non-governmental organizations to various institutes. Except for a few individuals, the tobacco factory area has no residents and is therefore primarily a mixed business/craft/cultural area. The largest group of interviewees was thus employed in creative businesses, which are also key stakeholders in the tobacco factory area. The interviews were structured to permit analysis of certain elements of social networks in relation to the premises in the tobacco factory area. It is precisely because of this combination of socio-spatial analysis that the research needed to be supported by methods other than interviews. To support the interviews, a mix of different qualitative methods (participant observation, field observation, cognitive mapping, etc.) was therefore used, the combination of which was expected to provide a credible outline of the connections between the spaces and their meanings for the various actors.

3.2 Analysis of changes in the operation of social networks in the tobacco factory area

The analysis of the social networks is shown based on the time component – that is, by taking into account the influences on social networks in various time periods in the tobacco factory area. Insight into different time points is provided by longitudinal research that shows the multifaceted transformations that the social networks have gone through in individual phases. The analysis used data from sets of open-ended questions in semi-structured interviews, which were qualitatively analysed using basic text analysis. Pragmatic text analysis (Verschueren, 1995) was used, whereby dimensions of social networks were analysed following a review of the text and classification of the answers by individual categories. From the analysis of the Urban Education Live research data, it was possible to extrapolate several characteristics of the social networks of the creative ecosystem, which can be transferred to the broader context of the entire creative system of Ljubljana and the wider region by considering specific differences (based on the context, stakeholder structure, and geographical distribution). In other words, in the case of the tobacco factory area, selected characteristics of the connections between the social networks, along with the development of the social capital and operation of creative ecosystems, are presented, which are key elements (building blocks) of creative activities in Slovenia's broader area. The mode of operation and important institutional actors' consideration of these characteristics and elements affects either the short- or long-term creative capabilities of a city, region, or country. As part of the Urban Education Live survey, characteristics and changes between 2017 and 2020 in the operation of creative social networks in the tobacco factory area were identified. These are discussed below.

3.2.1 Clustering creative activities through formal and informal networks

The interviewees in the tobacco factory area generally possess quite diverse social networks. Further analysis showed that formal networks, defined as working, project, and contractual connections (a client–contractor relationship), have a significant impact on the development of creative activities and also depend strongly on informal networks based on friendly ties as manifested in socializing, spending free time during breaks, lunches, walks, drinking coffee, and so on. The interviewees were not asked about all forms of social contact, only about the most common, core contacts with which they establish their most frequent connections, which in practice means that a contact is established several times a week. On average, each interviewee listed five core contacts or persons at the informal level and two contacts at the formal level. Of these, on average one contact was a member of both formal and informal networks, being at the same time a friend, colleague, and business partner.

The complementarity between formal (work) and informal (friendly) connections is evident in the interviews, especially when considering the time component, which indicates the gradual transition of individual informal contacts into formal contacts, and vice versa. This is therefore a fluid or flexible form of connection between actors, business entities, and users that have a common location or spatial network that uses specific spaces. The interviews showed that most contacts were gradually formed through the use of various micro-locations in the tobacco factory area (open public areas, corridors, balco-

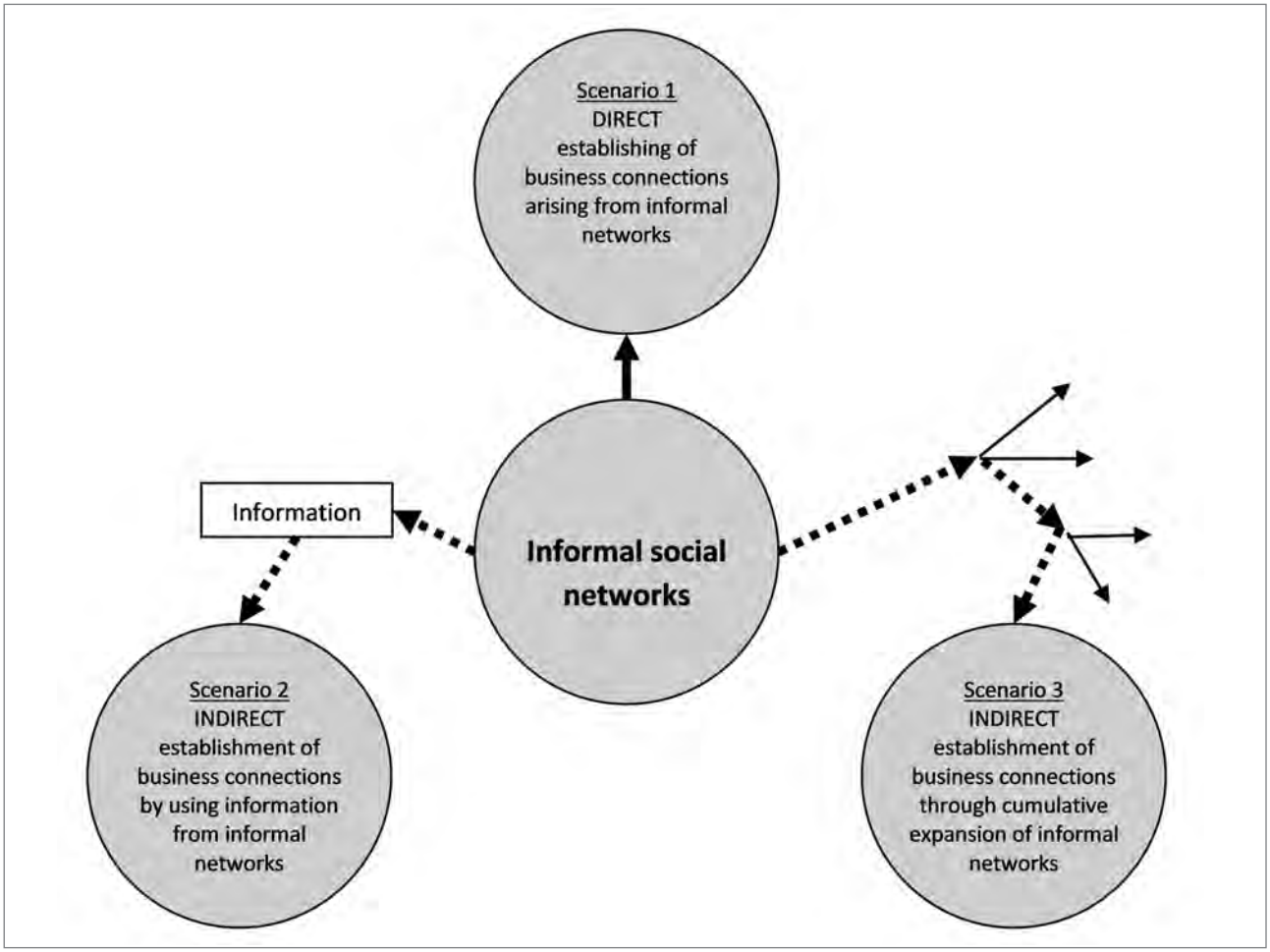

Figure 2: Presentation of clustering scenarios of creative activities based on informal networks (illustration: Matjaž Uršič).

nies, bars, restaurants, etc.), with the exchange of contacts and information. In particular, the increased number of informal contacts is noteworthy, which is understandable given that formal contacts were only considered those occurring outside the interviewee's direct working environment. Therefore, only connections with other companies or employees in the tobacco factory area beyond the interviewee's workspace were considered formal contacts. Both types of contacts indicate a much diverse business and creative ecosystem in which companies and individuals occasionally connect and collaborate, whereas clustering of companies occurs on the basis of the constant intertwining of formal and informal contacts.

The interviews showed the importance of informal contacts in the context of clustering creative activities. Informal contacts play an extremely valuable role and are basic communication channels that strengthen and establish interpersonal relationships and, due to the higher level of trust between creative individuals, also allow greater exchange of tacit information regarding the creative ecosystem's functioning. These are forms of indirect influence on the creation of a creative ecosystem, which, unlike direct influences, can remain excluded or unnoticed in analysis of the business environment (Figure 2). In other words, although informal networks may not result in direct business connections, the interviews show that they transmit information that either facilitates the indirect establishment of economic transactions or allows the gradual cumulative spread (the "snowball" principle) of informal contacts that also indirectly lead to the gradual expansion of business networks within the creative ecosystem of the tobacco factory area.

3.2.1 The time component's influence on the number and range of connections in the social networks of the tobacco factory area

Similar to other analyses of social networks (Filipović, 2007; Gibbons et al., 2018; Ye & Liu, 2018), the data in the Urban Education Live survey indicate the extremely important role of the time length variable, or process duration. In this respect, the duration of certain processes related to individual locations (social nodes) determined how numerous and diversified an individual's networks are. The data show that the number of

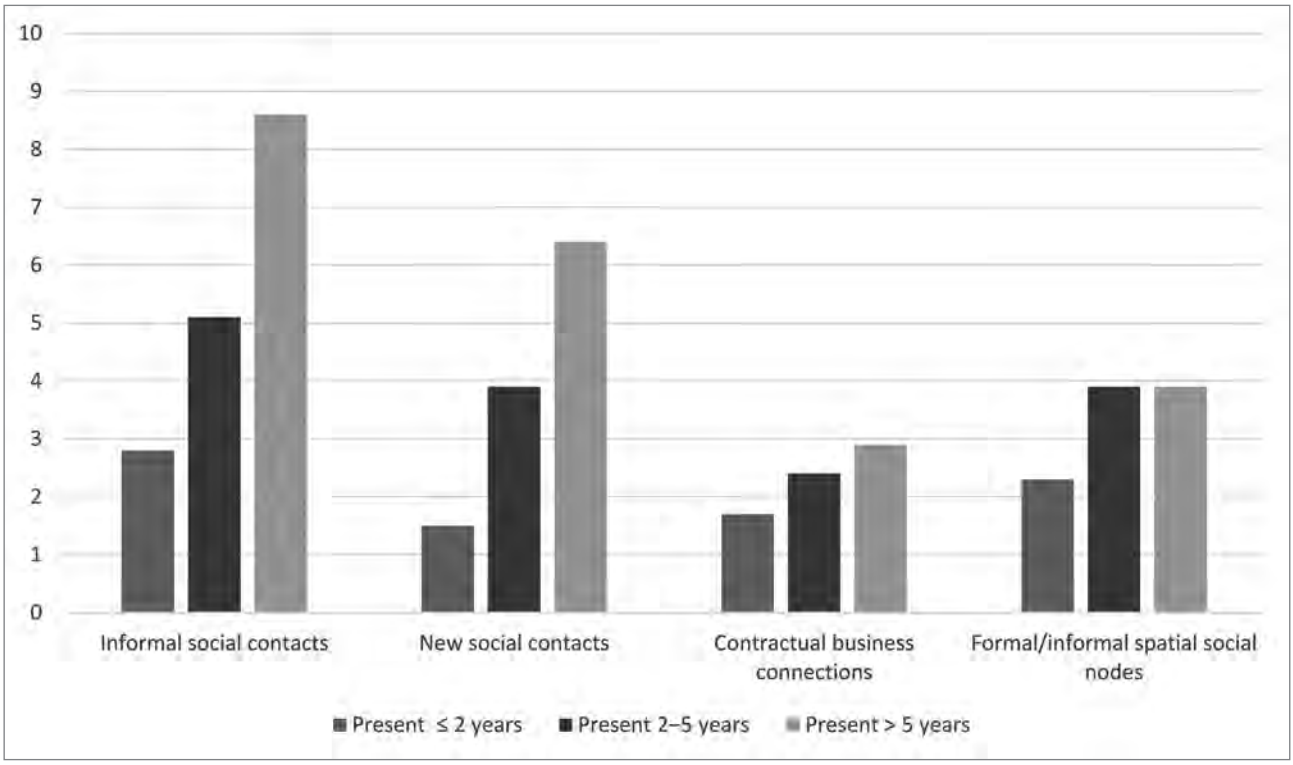

Figure 3: Increasing number and spatial diversification of various forms of social networks by number of years present in the tobacco factory area (source: Urban Education Live, 2019, 2020).

years spent by interviewees in the tobacco factory area strongly influences the intensity or depth of their social networks. A higher number of years in the area thus also corresponds to greater numerical and spatial diversification of an individual's informal and formal networks in the tobacco factory area (Figure 3).

Exponentially, as more years were spent in the tobacco factory area, a larger number of spaces were formed in the interviewees' "mental maps" (Lynch, 1990), including social nodes for formal and informal socializing in the tobacco factory area (the most popular social nodes were restaurants, bars, and entrances in front of the main buildings). Given the importance of social networks for creative clustering, the research showed that the number of years of individual presence in the tobacco factory area also influenced the acquisition of new formal social contacts in that area, which were realized as various forms of contractual business collaboration. As the years present in the area increased, the number of contractual business connections also increased. On average, the interviewees gained 3.5 new contacts while active in the tobacco factory area. When asked about the strength of these contacts, they stated that approximately three core contacts from the list of key people mentioned had assisted or helped them with various events, which further testifies to the strength of the social networks formed among the tobacco factory users.

3.2.1 Reduction in the volume of social networks and the impact on social capital

The analysis of formal and informal contacts in relation to a time variable showed how social capital has gradually accumulated in the tobacco factory area and is materialized in social networks in the form of various creative activities, companies, and business contacts. It should be emphasized that the social capital that has accumulated at this location is intertwined with the locality or local structure at the physical, cultural, and social levels. It may be described as a principle of the "social production of space" (Lefebvre, 1991, 299–346), where space as a physical category becomes inseparable from the social structure of space. Lefebvre draws attention to the great importance of the temporal component of space production because this means that over time, based on specific uses (spatial practices, presentation of space, spaces of representation, and collective experience), a new space emerges that eludes simple definitions of a physical good with an aesthetic value. If the production of a space is based solely on the physical change made to that space and excludes other forms of (social) values that have arisen in the area, the spatial development process becomes simplified, which leads to a reduction of social capital and social networks. This was seen in the context of restructuring the tobacco factory area when comparing the interview data for the period before (in 2018) and after the sale of the area (in 2020), which then led to the closure of the

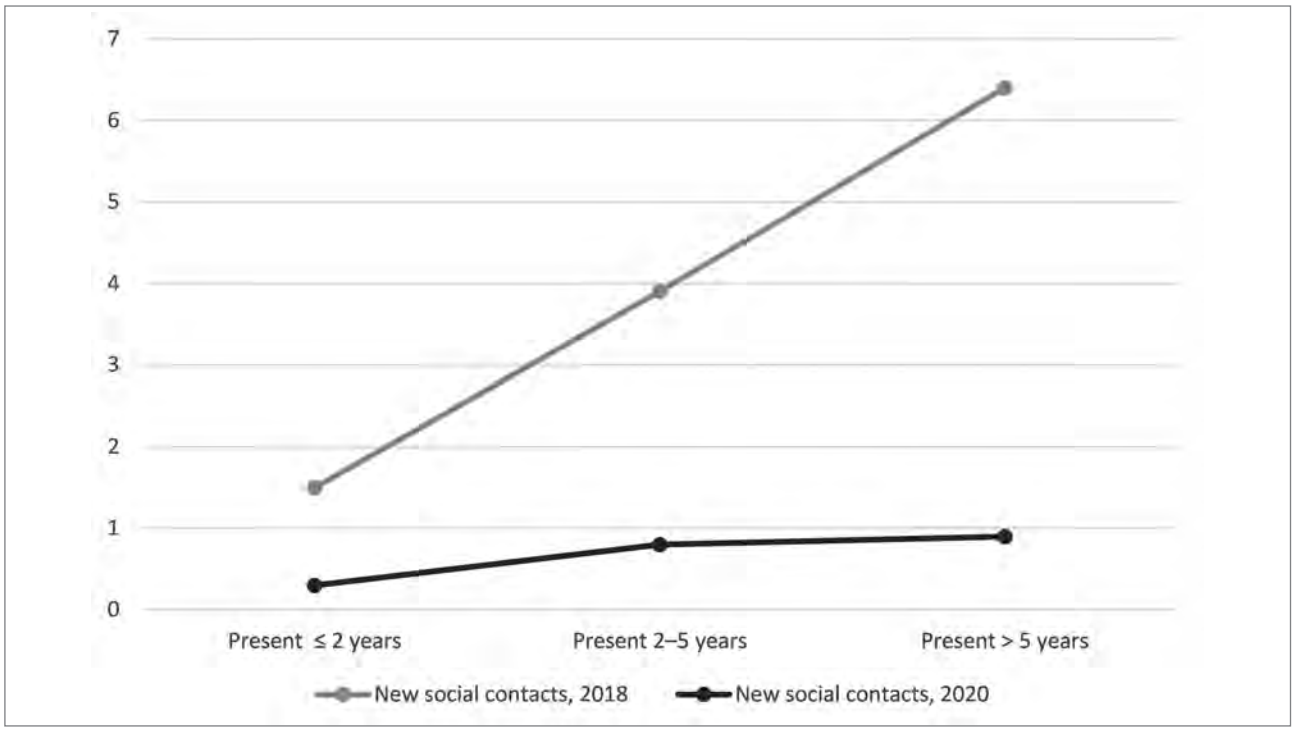

Figure 4: Comparison of growth in new social contacts between 2018 and 2020 (source: Urban Education Live, 2019, 2020).

most creative activities. After the sale of the majority of the area, only the building located at Tržaška 2 remained available for creative activities, which has led to a sharp decrease in the volume of all analysed dimensions of formal and informal networks and business (contractual) connections. For example, in the comparative period from 2018 to 2020, the index of newly established social connections dropped from an average of four connections to about one new connection (Figure 4).

The data thus show that the closure of most social nodes in the area has drastically limited the expansion of the social networks. The prevention of any further development of social networks in the area, which is subject to a full functional, service, and activity restructuring, may be described as a logical consequence of the spatial transformation process, although attention must also be drawn to the general shrinkage of social networks resulting from the forced relocation of certain creative actors at the tobacco factory site to other sites around the city. Namely, even though the creative actors that remained or moved away from the tobacco factory area stated they had established some new contacts but on a smaller scale than in previous years, they also explained there had been a reduction in the volume and frequency of their daily connections in the social networks of formal and informal contacts after the area's restructuring. The current and former groups of tobacco factory users agreed that the area's restructuring had affected the frequency of meeting, cooperating, and socializing with other tobacco factory users (Figure 5).

The longitudinal analysis made it possible to compare the modified social networks of current users of the tobacco factory area and former ones, who had been forced to move away from the location after the change in ownership. Of the thirty people interviewed in 2020, about one-third were part of this group. This group of interviewees was particularly interesting due to the possibility of comparison with 2018 because the marked reduction of their social networks tied to the tobacco factory area indicates the inability or difficulty of maintaining creative social networks during the spontaneous development of creative activities. Although social networks essentially operate based on intangible connections and are not directly related to physical parameters and do not depend on visible bases, the data show that the attempt to separate them (through relocation or eviction) from the local context or milieu has strongly influenced the scope and functionality of the creative networks. This emphasizes the importance of the social production of space, where complex communication and production relations between creative actors are formed following a multi-year process. Obstruction of this process leads to a reduced volume of the creative ecosystem, meaning that additional costs for the city can be identified in the time that has been lost and that will be needed to redevelop similar creative networks in other locations in the city. One can only guess how many economic resources and years it will take to establish similar new hubs and restore social networks in the creative ecosystem of small businesses, which already hold a less privileged position due to the harsh market conditions that demand short-term maximization of capital.

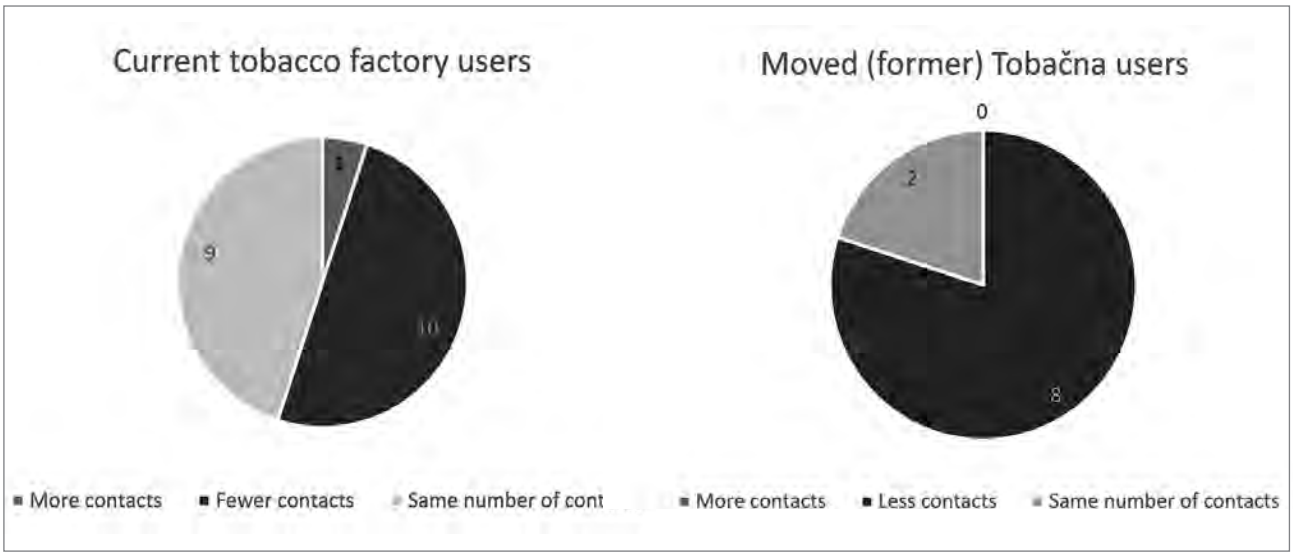

Figure 5: Do you socialize, meet, or cooperate with other tobacco factory users after the sale of the area? Comparison of existing and relocated creative actors in the tobacco factory area, 2020 (n = 30; source: Urban Education Live, 2019, 2020).

4 Discussion

The example of the tobacco factory area shows the specific conditions in which creative activities operate in Slovenia. This context may be described as the spontaneous development of creative activities in a setting of free market conditions. Under these conditions, the priority factor in establishing creative nodes or milieus becomes the proximity of the largest market or the size of the aggregate population and the geographical location of the infrastructural, historical, and administrative centres of the region (Kozina 2010). From this viewpoint, the distribution of creative activities in Ljubljana and its urban region approaches the idea of "central places" (Christaller, 1966; Logan & Molotch, 1987; Cigale, 2002; Burger & Meijers, 2012), as characterized by the accumulation of resources and potential only in locations that provide the greatest economic yield and have an adequate concentration of people.

Building on these characteristics, the tobacco factory creative ecosystem was gradually formed, where conditions in a certain period were favourable to these processes (relative proximity to the city centre, access to relatively affordable rental spaces, rapid accumulation of similar creative activities and actors, etc.). The problem of such a spontaneous development of creative milieus, where actors, small companies, and soft (social) factors converge, lies in the possibility of sudden changes to its operating conditions, which often leads to the rapid disintegration of such creative cores. In the event of sudden changes in market conditions (due to political, economic, or historical events), producing changes in the system of central locations, there may be a complete breakdown of the creative ecosystem in these locations. In such a constellation, creative SMEs may be seen as weaker actors that, despite playing an important role in maintaining social capital in creative areas, are simply pushed out of locations. In this hierarchical arrangement, due to the displacement of weaker forms of creative actors, the homogenization of activities, and development, the concentration of stronger types of creative actors gradually occurs, in turn leading to the uneven spatial distribution of creative activities. This all works to diminish the functional heterogeneity of creative ecosystems because the most successful are those industries, companies, and actors that have quick access to a large market and the surrounding area, from which they draw the necessary human resources. This "selection of the fittest", which leads to profiling creative actors in terms of their ability to respond quickly to current economic conditions, may be described as "the entropic dimension of the socioeconomic system" (Kirn 2008). In an entropic socioeconomic system, the energies or actors and companies involved in the development of creative activities accumulate in certain locations, yet there is a danger that after a certain time period – due to an unsteady, poor economic base, insufficient environmental incentives, or inability to upgrade in the long term because of limited access to basic (bottom-up) spatial, social, and human resources – these creative accumulations start to fade, become dispersed, or even cease to exist.

5 Conclusion

The introduction to this article presented a hypothesis on the inability of local authorities and state institutional actors to perceive the importance of soft (social) factors for the functioning of creative ecosystems. After analysing various research data, that assumption was confirmed and it was shown how

important soft factors are for the design and maintenance of the creative ecosystem. The inseparability of the soft (social) elements from creative production itself was proven based on an analysis of connections between formal and informal social networks. In particular, the informal networks played an important role as a communication platform for establishing an appropriate creative milieu and for clustering creative activities. The data also indicate the extraordinary importance of the time component for the development of creative activities. Divisions between the short- and long-term accumulation of social connections or contacts translate into the performance of the creative ecosystem. Last but not least, maintaining the heterogeneity of actors in creative activities is necessary for the long-term successful operation of a creative ecosystem because creative social networks cannot be moved from one location to another without harmful collateral effects. These are seen in the loss of accumulated social capital (creative networks), as well as in the time and economic resources needed to gradually establish similar creative milieus.

The shortcomings of short-sighted policies of spontaneous market development for urban creative activities are reflected in alternating, repeating cycles between extinction and accumulation attempts of creative social networks, which in the long term may produce a gradual decline in intangible forms of social capital. This raises important questions about the extent to which urban policies should be involved in planning creative milieus, given that it is difficult to control the effects of the formal spatial planning system on the intangible characteristics of spaces. Every urban policy that tries to top-down direct or plan creativity probably inevitably faces conflicts. Creating creative ecosystems involves complex, partially unmanageable variables and factors that make precise urban planning unpredictable and inefficient. As a result, in designing creative policies attention must be shifted to ensuring an increase in the ability to measure, analyse, or detect elements from the bottom up, which so far have been unjustifiably underestimated in the analysis of creative activities (Colomb & Novy, 2018). In this context, the redevelopment of the tobacco factory area is an exemplary case of an inappropriate approach while measuring certain "intangible values" of creative areas. Similar examples of a questionable, insufficient analysis of the importance of social networks for Ljubljana's socioeconomic system can be given by referring to other cases not specifically discussed in this article (e.g., the former Rog Factory or the Metelkova area). Olsson (1999) and Bianchini (1999), for example, mention that there is no single method for measuring intangible values, which causes extreme conflicts and tensions and introduces major problems into spatial planning. At the political level, there are large discrepancies between individual disciplines with regard to the need to measure such elements. The problem of creative urban policies in Slovenia is therefore not the inability to plan such activities, but the inability to systematically detect and allow the operation of elements that are vital for the maintenance, preservation, and development of such activities. Scott (2014: 569) notes here that, before any change is made to creative urban policy, authorities must obtain a detailed socio-historical insight and understanding of the specific features of local urban development prior to engaging in "the shaping of local patterns of ingenuity and imagination". Institutional actors' avoidance of the much-needed prior analysis of local conditions creates an "unjustified dose of simplistic thinking" (Scott, 2014: 574) and triggers scepticism, which often leads to the introduction of regressive urban policies.

In the Slovenian post-transition period, the "productionist approach" (Hall & Robertson, 2001: 19) dominates urban creativity development. Use of this concept reflects the concerns held by authorities regarding economic production and the capitalization of creativity. This is also seen in documents that seek to include the tobacco factory area in such development schemes (see, e.g., Mestna občina Ljubljana, 2012, 2016, 2020). However, this approach does not adequately assess the long-term role and impact of creativity on the city in the current context of postmodern, globalized environments. From this perspective, future approaches to creative urban regeneration will need to develop mechanisms able to detect changes in the subtle structure of the creative ecosystem and to combine the cultural, social, and economic value of creativity into a single whole. This article has drawn attention to and helped explain at least some of the neglected aspects of creativity to highlight their importance and role in the creative ecosystem. In the long run, Ljubljana may be considerably affected by sometimes less noticeable micro-changes at the local level. This should lead to the development of new models of evaluation of valuable sociocultural elements, places, and spaces in the city. Such a process cannot be carried out in a short time because it requires breaking away from the current spatial planning paradigm. This production paradigm in spatial planning consists of a set of ideas, thought models, and, above all, a system of values embedded in the very organization and functioning of institutions, communities, and everyday users of the city, region, and country. Moving away from the current paradigm is a painstaking and time-consuming process. The development of Ljubljana's long-term creative capacities is thus based on a qualitative leap, which may be seen as a new socio-spatial paradigm or "paradigmatic shift" (Kuhn, 1970: 85) that in a holistic mode encompasses systems of economic, urban, and especially social development.

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The water-management aspect of blue-green infrastructure in cities

Blue-green infrastructure (BGI) consists of natural and semi-natural (hence green) decentralized systems for urban stormwater management (hence blue), which, in addition to their primary purpose, provide a variety of shared benefits and ecosystem services. With the exception of a few cities that have adopted strategies for systemic BGI implementation, its use is still sporadic, in the form of isolated best practices, and is absent from Slovenian cities. Due to established spatial planning practices, Slovenian cities have a sufficient amount of relatively evenly distributed green areas, but these are not planned according to BGI principles and therefore their potential for managing stormwater is not utilized (i.e., water-wise multifunctionality). Because urban space management and its associated elements are a multidisciplinary field, we explored the link between spatial planning and water management in international strategic documents and in Slovenian national legislation. Based on a literature review, such connections are promoted at the international level; however, they are not sufficiently integrated in national legislation. Thus, a sectoral approach to water management and urban planning still prevails in Slovenian cities. Four examples of systemic BGI implementation (Rotterdam, Copenhagen, Philadelphia, and Chinese cities) are presented here. They link spatial planning and water management in BGI design and implementation. The results of this analysis were used to develop recommendations on integrating spatial planning and water management that go beyond sectoral urban space management, aiming to facilitate BGI implementation in (Slovenian) cities.

Keywords: water management, spatial planning, urban drainage, blue-green infrastructure, climate change

1 Introduction

Climate change impacts and the current trend of urban development are creating conditions that existing urban infrastructure cannot handle successfully when exposed to extreme events (e.g., extreme precipitation and heat waves; Krajnc, 2019). Climate change projections for Slovenia predict that by mid-century one can expect an increase in the number of extreme weather conditions: severe heat in summer accompanied by greater variability in temperature and precipitation, more heavy precipitation events (cloudbursts), intensification of the hydrological cycle, more frequent flooding, a significant increase in the frequency of summer droughts, and an increase in the number of days with favourable conditions for summer thunderstorms (Dolinar et al., 2014). Adapting or increasing the resilience of cities to extreme events is a complex process that requires the involvement and cooperation of all stakeholders that participate in shaping and managing urban areas (Klemen et al., 2020). In practice, stakeholders often act in professional silos and in a disconnected manner, which is increasingly emerging as one of the greatest barriers to sustainable urban water management (Globevnik & Simoneti, 2020). This is particularly the case for novel management concepts that have recently been introduced, such as BGI. In Slovenia and globally, decision-makers have not yet established suitable planning and management approaches (Ravnikar & Goličnik Marušić, 2019).

The key to addressing the challenges posed to cities by climate change is managing the urban water cycle, which, in addition to water infrastructure, is directly related to (un)paved urban areas and their surrounding countryside. Therefore, the spatial planning process is increasingly important for sustainable water management (Serrao-Neumann et al., 2017). The aim is to mimic as much as possible the natural surface runoff typical for the pre-development period in the area. However, new developments inherently cause more impervious areas, which require the expansion of grey infrastructure for urban drainage purposes (i.e., public utility infrastructure, PUI). In sustainable urban management and urban development, stormwater should not be treated as mere waste, directed to the sewerage system as quickly as possible. Such management acts as an environmental burden and encourages linear rather than circular and sustainable management of urban water resources. In this context, the connection between urban planning and sustainable development turns out to be of great importance for (water) resource management (Agudelo-Vera et al., 2011).

This article draws attention to urban water management, which can only be successful if the integration of all disciplines (water managers, spatial planners, urban planners, architects and landscape architects, civil engineers, geographers, sociologists, etc.) involved in BGI and PUI planning, and cross-sectoral integration at the level of urban governance are ensured. We first outline the current state of urban water management and the consequences of climate change. Then we present examples of best practices and opportunities for improving urban water management with BGI. The article also highlights the necessary connection between spatial planning and water management at the strategic and implementation levels.

2 Method

In line with the aim and objectives of the article, documents on the approach to water management in Slovenian cities were comparatively analysed. We covered documents at the international and national (Slovenian) levels in spatial planning and water management. We then examined selected examples of best practices that demonstrate how suitable planning and spatialization of BGI address existing problems (e.g., flooding, pollution of waterbodies, and urban heat islands) and at the same time create space that provides additional ecosystem services (e.g., promoting biodiversity, reducing pollution, and mitigating urban heat islands). The results of the two analyses were then compared and presented. Recommendations are given for more integrated cross-sectoral coordinated water management in Slovenian cities.

3 The urban water cycle and blue-green infrastructure

3.1 Development of the urban water cycle

The spread of urban areas and urbanization increase the share of impermeable surfaces and leads to changes in the natural water cycle, especially when traditional urban drainage (i.e., the use of grey infrastructure) is used (Bacchin et al., 2014). These changes are reflected in reduced infiltration and evapotranspiration, and in increased surface runoff (Butler et al., 2018). Hence, the local water cycle is influenced by the history of urban development and previous urban water-management approaches. These approaches were shaped by the expectations of society (i.e., cumulative socio-political drivers) and the development of new approaches and technologies that various disciplines used to address emerging social problems (e.g., diseases such as cholera and typhoid, drinking water shortages, and floods). Panjan (2005) summarized the development of sanitary engineering, which deals with the management of water in cities to protect human health, from ancient times to 2000. It is mainly characterized by three water services: water supply, wastewater treatment, and urban flood protection. However,

Table 1: The development of urban water management.

Phase	Water-management approach	Cumulative socio-political drivers	Service delivery functions
1	Water-supply city	Water-supply access and security	Supply hydraulics
2	Sewered city	Public health protection	Separate sewerage schemes
3	Drained city	Flood protection	Drainage, channelization
4	Waterway city	Social amenity, environmental protection	Point and diffuse source pollution management
5	Water-cycle city	Limits on natural resources	Diverse fit-for-purpose sources and conservation, promoting waterway protection
6	Water-sensitive city	Intergenerational equity, resilience to climate change	Adaptive multifunctional infrastructure and urban design reinforcing water-sensitive behaviours

with improving socio-economic conditions, environmental awareness, and imminent climate change impacts, awareness in society is growing that such linear systems place external pressure on the environment and are unsustainable. Therefore, the European Water Framework Directive (Directive 2000/60 /EC of the European Parliament and of the Council of 23 October 2000 Establishing a Framework for Community Action in the Field of Water Policy, 2000) and Slovenian Water Act (Sln. *Zakon o vodah*, 2002) set limits and a regulatory framework for achieving good ecological and chemical status of water bodies. However, the adopted regulatory framework is still based on upgrading existing linear systems (i.e., construction of wastewater treatment plants) and does not yet follow modern concepts of water management based on approaches typical for the circular economy: closure of material flows, reuse, recovery of natural resources, use of resources that are fit for purpose, and so on. Considering the emerging changes, Brown et al. (2009) divided the historical development of existing and proposed urban water-management concepts into six phases, with the target being a water-sensitive city (Table 1). In general, most Slovenian and European cities are in the fourth phase (i.e., a waterway city), encompassing the previous phases, which provide water supply, wastewater treatment, and flood protection. Furthermore, some of the water services typical for the fifth and sixth phases are partially included.

The fourth phase, called a waterway city, focuses on the quality of water bodies in cities and their integration into urban life because they offer many benefits (e.g., recreational and leisure opportunities, amenity, and formation of a green urban system), which contribute to improving public health. Although water quality has improved significantly in recent decades, mainly due to the end of industrial production and the construction of industrial and municipal wastewater treatment plants, diffuse and point sources of pollution still pose a threat. Typical representatives of uncontrolled point source pollution are combined sewerage overflows. Diffuse sources of pollution cannot be controlled by centralized systems and require the introduction of decentralized approaches and technologies. Consequently, the current business model of urban water management needs to be upgraded, including its financing and the transfer of responsibilities.

The fifth phase, the water-circle city, is based on the recognition that water resources are limited in quantity and quality. It therefore recognizes the use of lower-quality water resources (i.e., alternative water sources, such as rainwater, stormwater, and sanitary wastewater) to meet needs that do not require drinking water. Because water is a medium that transfers nutrients, minerals, and energy, this phase also addresses their extraction from wastewater, which consequently becomes a new resource. This approach also requires the involvement of other sectors (e.g., agriculture, food, and energy) and the adaptation of their infrastructure.

The sixth phase is the water-sensitive city. The main driver for development of these cities is climate change impacts and the desire to make cities as resilient as possible, as well as the intergenerational transfer of the value of water (i.e., preserving the quantity and quality of water resources for future generations). Although this phase represents a type of governance, it is primarily a vision of community development and its sustainable attitude toward the environment and space. It is characterized by the diversity and adaptability of technologies, infrastructure, and land use in cities designed to promote sustainable practices and social capital. The link between society and technologies plays an important role. In such a context, the relationship between the water sector and society (i.e., the social contract) would be constantly changing and would require an adaptable and flexible institutional framework.

With each successive phase, urban water management demands involvement of an increasing number of sectors because all natural elements (water, soil, air, and living beings) are interconnected. Although this is well understood in general, the holistic approach toward the management of natural resources

has been lost by its division into subsystems based on individual disciplines. Therefore, integration and cooperation with other disciplines that work in urban development is urgently needed to implement new holistic approaches for water management. Such integration is already establishing itself in some places with new approaches to urban development planning (Hung et al., 2012). These are no longer simply searching for technological solutions but are increasingly moving toward closing the loop in the urban water cycle by using BGI (Bacchin et al., 2014). This is because green infrastructure adds value to public open spaces and their contribution to urban ecosystem services, and blue infrastructure manages stormwater. However, when they are combined, they can provide significantly more complex benefits in contemporary urban planning. Recognising BGI as an interdisciplinary approach for urban planning is therefore crucial for understanding and implementing it in spatial planning practice.

3.2 Blue-green infrastructure

Blue-green infrastructure can be defined as natural and semi-natural (hence green) decentralized systems designed to manage urban stormwater (hence blue), while providing a wide range of ecosystem services (Liao et al., 2017; Lamond & Everett, 2019). Its basic philosophy is to mimic natural hydrological processes (i.e., retention, infiltration, and evapo(transpi)ration) with the aim of managing rainwater locally to prevent generation of runoff and mixing with wastewater. A standard term for these measures has not yet been established in Slovenia or globally. There are a number of related terms and concepts in English that are largely based on similar processes and technologies. For example, in the UK, the most commonly used term is *sustainable urban drainage systems* (SUDS; Woods Ballard et al.). In the US, the terms used are *low-impact development* (LID), *best management practice* (BMP), and *stormwater control measures* (SCM), and in Australia the term used is *water-sensitive urban design* (WSUD; Fletcher et al., 2015). They differ primarily in the scale, such as a single property, a street, a neighbourhood, a district, a city, or even larger regional systems. Recently, the term *nature-based solutions* (NBS) has also become widely used, encompassing a variety of technologies that mimic or are based on natural processes and are cost-effective, while providing environmental, social, and economic benefits while enhancing resilience (Langergraber et al., 2020). These solutions bring more nature and natural features and processes into cities and landscapes through systemic interventions that are locally appropriate and resource-efficient (European Commission, 2020). We would like to emphasize that these concepts are largely based on the same technologies and have the same objectives, but, because they were developed simultaneously in different parts of the world and within different disciplines, they are named differently. Based on the definitions presented, it is clear that BGI should be understood much more broadly and not merely as a water-management approach. Namely, it offers improvements not only in water management, but also in many other areas, such as climate change, agriculture, forestry, urban planning, nature conservation, disaster prevention, and even regional development. It is therefore a highly interdisciplinary approach that has not yet been fully implemented in Slovenian practice. Elements of BGI in urban space are mostly part of green areas and thus, in the spatial planning context, they form part of the green system of a settlement or green infrastructure as introduced by the Spatial Development Strategy of Slovenia by 2050 (Sln. *Strategija prostorskega razvoja Slovenije 2050*; Ministrstvo za okolje in prostor, 2020a).

In other countries, with few exceptions such as the UK and the Netherlands, the additional benefits of BGI have not yet been sufficiently communicated to national and local authorities, PUI managers, spatial planners, and the public. Unlike the traditional approach based on drainage and retention of water in the sewerage system, decision-making guidelines and software tools do not yet exist for such systems. As a result, the shared benefits of BGI may be overlooked because the processes for assessing different solution scenarios are unclear and the long-term operation of these systems is subject to uncertainty or risk for stakeholders. Although some modelling tools already include modules for modelling BGI from hydraulic and water-quality perspectives, the shared benefits, such as amenity, biodiversity, and long-term cost-benefit aspects, are poorly included in these tools (Chow et al., 2014). However, certain software tools, such as E^{2}STORMED (Morales-Torres et al., 2016) allow a comprehensive assessment of individual measures with all their benefits but use simpler hydrological-hydraulic models, and therefore the use of results from more complex models for appropriate treatment is recommended (Radinja et al., 2019).

Figure 1 presents the elements of BGI according to their primary purpose: reducing surface runoff, reducing peak flows, or improving water quality. At the same time, it shows which processes (e.g., retention, infiltration, and evapotranspiration) contribute to the achievement of these purposes and to what extent. Moreover, the shared benefits (i.e., ecosystem services) provided by the elements are indicated.

4 An integrated approach to urban water management

International and national strategic documents that guide the development of a particular field are very important for implementing new concepts and practices. This article explores

☑ Primary function ✓ Secondary function ❖ Incidental + Additional benefit			Runoff reduction							Peak flow reduction		Improved water quality			
												Biological treatment		Physical filtration	
			Rain garden	Rainwater harvesting	Permeable paving	Green roof	Trees	Bioretention cell	Infiltration structure	Detention basins	Ponds	Constructed wetlands	Swales	Sand filter	Filter strips
Hydrologic functions	Stormwater quantity	Retention	☑	☑	☑	☑	☑	☑	☑	❖	✓	❖	❖	✓	✓
		Infiltration	☑	❖	☑		✓	☑	☑	❖	❖	❖	❖	✓	✓
		Detention	✓			✓	✓	✓	❖	☑	✓	❖	✓		✓
		Evapotranspiration	✓	❖		☑	☑	☑		✓	❖	☑	☑	❖	✓
	Stormwater quality	Sedimentation	☑	❖	✓			✓		☑	☑	☑	☑	☑	☑
		Filtration	☑	❖	☑	☑	❖	✓		❖		☑	✓	☑	☑
		Straining	✓	❖				✓		❖		☑	☑		☑
		Extended treatment (chemical)	✓			❖				❖	❖	☑	✓	✓	
		Extended treatment (biological)	☑			☑	☑	✓		❖	❖	☑	☑	☑	❖
Additional benefits (ecosystem services)		Provides wildlife habitat	+				+	+		+	+	+	+		+
		Aesthetic quality	+	+	+	+	+	+		+	+	+	+		+
		Stores runoff for alternative use		+							+				
		Provides additional permeable surfaces			+	+	+	+	+	+					+
		Improves air quality	+		+	+	+	+		+		+	+		+
		Provides educational opportunities	+		+	+		+	+			+			+

Figure 1: Elements of BGI and its functions and benefits (adapted from Collett et al., 2013).

the extent to which spatial planning and urban water management are linked because there is an evident need to provide sufficient urban space for implementing BGI. This link is highly recognized and promoted in international strategic documents (Table 2) and, to some extent, it can be noted in Slovenian legislation as well (Table 3). However, it can also be noted that Slovenia has not yet fully adopted international strategies in its national legislation, and so the link between spatial planning and urban water management is somehow weak. Only rainwater infiltration and green space planning are represented (Table 3). Moreover, there are (still) no valid standards or established practices in Slovenia for BGI planning and stormwater infiltration (Radinja et al., 2017).

BGI represents a way of coordinating spatial interventions (requirements and developments) and achieving some of the spatial planning objectives set out in the Spatial Planning Act (Sln. *Zakon o urejanju prostora*, 2017):

- Protecting space as a limited natural resource by ensuring better land use through multifunctionality;
- Providing quality living conditions and a healthy living environment by enhancing biodiversity;
- Contributing to promoting and protecting human health by improving air quality and reducing noise levels;
- Protecting the environment by reducing pollution (e.g., combined sewer overflows);
- Contributing to climate change adaptation;
- Creating conditions for reducing and preventing natural and other disasters by reducing the likelihood of flooding and by cooling the environment.

In Slovenia, spatial and urban planning have a long tradition of planning green areas and systems (e.g., Kučan, 1994), which is reflected both in spatial planning documents and in the space itself. This is also reflected in the layout of Slovenian cities and in studies of open public spaces in various Slovenian cities (e.g., Vertelj Nared, 2014; Volgemut, 2020). It can be concluded that in the majority of cases spatial planning in Slovenia addresses urban water management only indirectly by providing green areas or systems (Table 3). Nevertheless, these areas have a positive impact on urban drainage because they provide infiltration capacity and both smaller and slower surface runoff compared to paved surfaces. However, green areas have not (yet) been designed with an active function of stormwater retention and infiltration (i.e., they do not absorb surface runoff from adjacent paved surfaces), and so infiltration is provided passively or incidentally (Ministrstvo za okolje in prostor, 2020b). In terms of functionality, green areas should therefore be enhanced with BGI elements that provide additional ecosystem services, such as resilience to climate change, maintaining biodiversity, improving ecosystem functions, and providing other benefits to the population and the economy, particularly for public health, quality of life, and resource conservation. In this way, green systems in settlements will provide an extended set of environmental and ecological functions, thus forming green infrastructure as introduced in the proposal of the Spatial De-

Table 2: Spatial planning and urban water management internationally.

Spatial planning	Urban water
1. Urban Agenda for the EU: The Pact of Amsterdam (EC, 2016)	1. Sustainable Development Goals (UN, 2015)
The priority topics include climate adaptation (including green infrastructure solutions), sustainable land use, nature-based solutions, and air quality.	– Goal 6: Ensure availability and sustainable water management and sanitation for all; – Goal 11: Make cities and human settlements inclusive, safe, resilient, and sustainable.
2. New Urban Agenda: The Quito Declaration (UN, 2017)	2. Principles for Water Wise Cities (IWA, 2017)
Two commitments for environmentally sustainable and resilient urban development that are strongly related to water: 72. We commit ourselves to long-term urban and territorial planning processes and spatial development practices that incorporate integrated water-resource planning and management, considering the urban-rural continuum at the local and territorial scales and including the participation of relevant stakeholders and communities. 73. We commit ourselves to promoting the conservation and sustainable use of water by rehabilitating water resources within urban, peri-urban, and rural areas, reducing and treating wastewater, minimizing water loss, promoting water reuse, and increasing water storage, retention, and recharge, taking the water cycle into consideration.	Level 2) Water-Sensitive Urban Design: – Planning and implementing urban designs that promote regenerative water services. – Designing urban spaces to reduce flood risks. Increasing resilience to flood risks by developing improved drainage solutions integrated within the urban infrastructure design to provide safe flooding spaces. – Enhancing liveability by designing visible water areas in cities. Roadside green infrastructure (rain gardens and bio-swales) and major blue-green corridors as opportunities for social inclusion: recreation, inclusive public spaces, economic development and transportation, multi-purpose spaces, and infrastructure. – Modification and adaptation of urban materials (for roofs, wall surfaces, roads, and urban furniture) to prevent the release of pollutants when exposed to sun and rain.

Table 3: Spatial planning and urban water management in Slovenia.

Spatial planning	Urban water
1. Slovenian Spatial Development Strategy (Sln. *Strategija prostorskega razvoja Slovenije*; Ministrstvo za okolje in prostor, 2004)	1. Slovenian Development Strategy 2030 (Sln. *Strategijo razvoja Slovenije 2030*; Služba Vlade Republike Slovenije za razvoj in evropsko kohezijsko politiko, 2017)
Urban drainage is mentioned twice: – The topic of urban development: "From a safety point of view, settlements should have as much green space as possible to compensate for large temperature extremes and to allow for the gradual drainage of rainwater." – The topic of wastewater and stormwater drainage and treatment: "Stormwater and wastewater shall be discharged separately where this is economically viable and technically feasible. Rainwater should be retained as long as possible at sites where it falls, and surface runoff should be redirected into the nearest water body."	Goal 9: We will achieve sustainable natural resources management by: a) introducing an ecosystem-based approach to managing natural resources and by moving past the sectoral way of thinking, such as via the well-timed harmonization of national and cross-border interests in mixed fields with regard to water, food, and energy ecosystems, which should change and adapt in the future due to the consequences of climate change; b) effectively managing surface water and groundwater, coastal and maritime resources, and achieving their good condition;
2. Strategy for Protection and Development of Green Infrastructure in the Ljubljana Urban Region (Sln. *Strategija varstva in razvoja zelene infrastrukture v Ljubljanski urbani regiji*; RRA LUR, 2019)	2. The Water Act
Goal 1: Improved environmental status Particular attention should be paid to water management (infiltration, water retention, and flood protection) and to designing solutions that provide several functions at the same time (retention areas can be both attractive for leisure activities and have a positive impact on the microclimate). Goal 4: Climate change mitigation and adaptation It is important to manage both water-related extremes (water scarcity and flooding) and the connections with other activities, such as agriculture. Both extreme rainfall and temperatures can be mitigated with green infrastructure or spatial measures in urban areas.	The law stipulates that the protection of urban areas from the harmful effects of rainwater is the responsibility of the local government, which particularly includes measures to reduce surface runoff from urban areas and measures to limit the spills of wastewater and stormwater. Local government decrees usually regulate infiltration of rainwater whenever possible and permissible; however, if this is not possible, it is necessary to minimize the discharge of stormwater into the public sewerage system, either by retaining it or by reusing it (Odlok o odvajanju in čiščenju komunalne in padavinske odpadne vode v Mestni občini Ljubljana, 2018).

Spatial planning	Urban water
3. The Spatial Planning Act	3. Decree on the Emission of Substances and Heat When Discharging Wastewater into Waters and the Public Sewage System (Sln. *Uredba o emisiji snovi in toplote pri odvajanju odpadnih voda v vode in javno kanalizacijo*, 2012), Decree on the Emission of Substances in the Discharge of Stormwater from Public Roads (Sln. *Uredba o emisiji snovi pri odvajanju padavinske vode z javnih cest*, 2005)
The law defines green systems as a planned system for protecting and developing green spaces in urban areas and other green and manmade structures that are linked with them. The purpose of spatial planning (Article 2) is to achieve sustainable spatial development by comprehensively addressing, coordinating, and managing its social, environmental, and economic aspects to achieve spatial-planning objectives (e.g., to contribute to climate change and create conditions for reducing and preventing natural or other disasters).	The decree specifies under which conditions stormwater may (not) be discharged (indirectly) into groundwater, directly into inland water bodies, or into the sea. Restrictions are conditioned by the type of surface from which the stormwater originates, the water protection zones, or the type of aquifer the road crosses.
4. Decree on the Spatial Order of Slovenia (Sln. *Uredba o prostorskem redu Slovenije*, 2004)	4. Decree on the Methodology for Determining Prices of Obligatory Municipal Public Services for Environmental Protection (Sln. *Uredba o metodologiji za oblikovanje cen storitev obveznih občinskih gospodarskih javnih služb varstva okolja*, 2012)
– Planning water-supply systems should rely on lower-quality water sources as much as possible when water is used as a source of process water, fire-fighting water, or other non-potable water (Article 52). – Roof and terrace rainwater should be drained within the building plot by means of soakaways, soakaway trenches, or soakaway drainage pipes, in accordance with the environmental protection regulations.	The decree stipulates that the cost of collecting and treating rainwater from roofs must be billed under a separate heading. This informs and motivates people to retain rainwater on their property and consequently reduces the flow of rainwater into the public sewerage system.

velopment Strategy of Slovenia by 2050 (Ministrstvo za okolje in prostor, 2020a). The proposal defines green infrastructure at the regional level as green systems of regions and at the local level as green systems of settlements, thus paralleling it with the previously established planning of green systems.

Moreover, the Slovenian water legislation does not impose the use of BGI elements, but, at the same time, it does not prohibit their use either because it recommends the implementation of measures for surface runoff reduction, retention, or infiltration (Table 3). Therefore, taking into consideration all the characteristics of the local area and sectoral legislation, the implementation can start immediately, which can be proven by examples of successfully implemented BGI measures in Slovenia (Ramšak & Oberžan, 2017; Klemen et al., 2020). Klemen et al. (2020) also found that expert studies for stormwater management measures are generally not provided during the preparation of spatial planning documents. This leads to the continued use of the existing water management concept, with only a few exceptions of the introduction of BGI in municipal spatial plans. Systemic measures, such as cooperation between institutions, strengthening strategic planning, and considering expert solutions, are also called for in the Strategy for the Protection and Development of Green Infrastructure in the Ljubljana Urban Region (RRA LUR, 2019). The strategy emphasizes that "integrated and inclusive management are identified as key factors in sustaining the benefits and unlocking the potential benefits of green infrastructure" (RRA LUR, 2019: 33). At the same time, the strategy calls for green infrastructure planning beyond simple zoned land use.

In Slovenia, some cities have already moved toward implementing the target proposed by Brown (2009), a water-sensitive city, by introducing BGI (e.g., green roofs, mandatory stormwater retention, and infiltration). However, there is a lack of a comprehensive systemic approach (i.e., the flexible institutional framework mentioned above) because there is no adequate integration with other professionals (architects, urban planners, and spatial planners) involved in designing urban space. Below, we present cities that have already adopted and implemented such management strategies and approaches.

5 Best-practice examples

We have selected four examples of the systemic implementation of BGI at the city or national level from Denmark, the Netherlands, China, and the United States. Their geographical representation is intended to emphasize that the adoption of BGI in managing the urban water cycle is a global trend that

points to future developments in this field. Common to all examples is the integration between water and spatial planning sectors for integrated BGI planning.

5.1 Copenhagen: Adaptation to extreme rainfall events

The Danish Meteorological Institute defines a precipitation event as extreme if more than 15 mm of precipitation falls in 30 minutes (Danish Meteorological Institute, 2019). In 2011, 136 mm of rain fell in 90 minutes in Copenhagen, which is statistically an event that occurs only once every two thousand years (Arnbjerg-Nielsen et al., 2015). As a result, the city suffered enormous damage. More than 30% of real estate owners in the city filed insurance claims, and the total damage exceeded €800 million (Arnbjerg-Nielsen et al., 2015). In response to this and some less intense rainfall events, the city adopted the Climate Adaptation Plan (City of Copenhagen, 2011) and then the Stormwater Management Plan (City of Copenhagen, 2012), which will cost about €500 million to implement.

Figure 2 shows the six-step approach to selecting the most appropriate solution for managing cloudbursts:

- First, the municipality identified and ranked areas within the city according to how vulnerable they are to cloudbursts, based on data and analysis of the current situation.
- In the second step, hydrological-hydraulic models that incorporated both surface runoff and sewerage systems were used to identify urban catchments and their risk of flooding.
- This was followed by assessment of the current state of flood damage, together with indirect costs and climate change impacts. The impacts are estimated at €55 to 80 million per year until 2110.
- The next step was the creation of a BGI elements catalogue (i.e., the Cloudburst Toolkit) for cloudburst management (e.g., a green street, an urban creek, and a retention boulevard), which provided the basis for developing an ambitious adaptation plan for future cloudbursts. This was followed by architectural and landscape design, visualization of proposed solutions, and robustness testing.
- The fifth step involves all stakeholders, who then jointly design and create the proposed solutions. This type of design is an iterative process that leads to better solutions and ensures their quality.
- In the final step, the proposed alternative solutions are evaluated financially, and the most appropriate solution is selected based on a cost-benefit analysis.

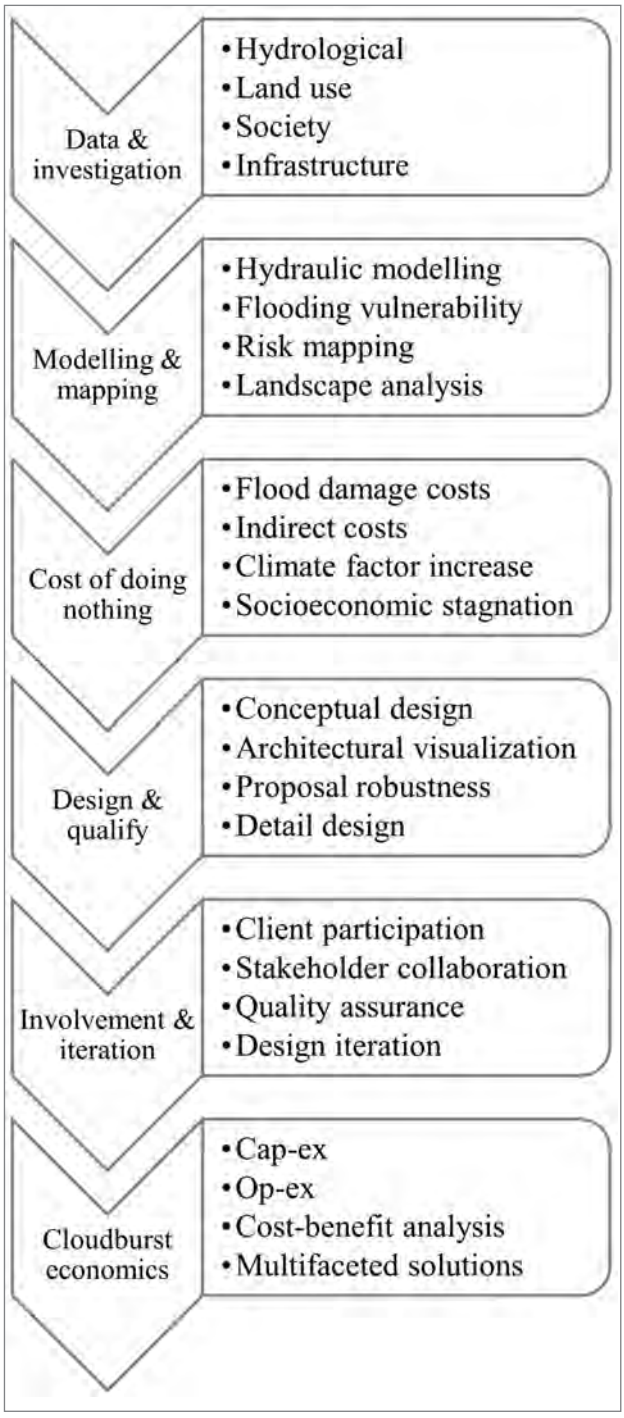

Figure 2: The Copenhagen approach to stormwater management (adapted from Ramboll, 2016).

5.2 Rotterdam

Rotterdam is Europe's largest port, located in the delta of the Rhine and Meuse rivers and threatened by water from four directions: the sea, the rivers, groundwater, and rainwater. Due to its extreme exposure and the ongoing impacts of climate

change, the city has adopted a climate-change adaptation strategy (Rotterdam Climate Initiative, 2013). The strategy is based on an approach that combines overcoming water-related issues with opportunities for urban transformation and socioeconomic development. Action planning is based on the results of hydrological-hydraulic models that determine the risk of flooding of specific areas within the city, whether from the sea, rivers, or extreme rainfall events. For rainfall, the main measure envisaged is BGI, which is designed to retain stormwater at the site and slow its runoff. In designing a water-resilient city, special attention is paid to every individual site, involving water committees, urban planners, a municipal administration, and other stakeholders that help create the measures. Public awareness and active participation are promoted through active and targeted communication.

5.3 Chinese sponge cities

In response to the problems in the urban water cycle (e.g., flooding and pollution of water bodies) that were caused by the rapid urbanisation of Chinese cities, the Chinese government has developed the concept of sponge cities. In 2014, thirty cities across the country, including megacities, such as Beijing, Shanghai, Tianjin, and Shenzhen, were included to serve as pilot areas from which best practices and regulatory frameworks can be transferred to other cities (Chan et al., 2018). The concept of sponge cities is based on BGI and the implementation of six processes in urban stormwater management: infiltration, stagnation, storage, purification, utilisation, and discharge (Liu et al., 2017). The activities that are introducing the concept in cities mainly focus on 1) the construction of sponge buildings (e.g., green roofs and rain gardens), 2) the construction of sponge streets, sidewalks, and squares using permeable materials, 3) the construction of sponge parks and green areas (e.g., rain gardens, sunken green fields, and artificial wetlands), 4) the protection and remediation of natural water bodies (e.g., management of natural waterways, increasing wetlands, etc.), 5) improving the connectivity of urban water systems to allow their continuity, 6) upgrading existing drainage systems to provide flood protection and discharge of excess water, and 7) constructing separate systems for stormwater and wastewater (Liu et al., 2017). The results of the design and performance of BGIs allow the transfer of knowledge from the pilot cities to other cities, which can follow with fast implementation and better planning of BGI (Yin et al., 2021).

5.4 The United States: The BGI concept for wastewater management

Combined sewer overflows are elements in a combined sewerage system that discharge excess stormwater and sanitary wastewater directly into water bodies during rainfall events, therefore protecting the sewerage system and the city from flooding. At the same time, they pose an environmental hazard because, although diluted, they discharge untreated wastewater into water bodies. After a requirement from the U.S. Environmental Protection Agency to establish a long-term plan for the operation of combined sewer overflows (United States Congress, 2002), Philadelphia decided on an alternative approach. Consequently, the decision was made to implement BGI throughout the city, instead of building additional grey infrastructure (e.g., underground storage tanks or collectors). The result is a twenty-five-year plan called Green City, Clean Waters (Philadelphia Water Department, 2011). It was calculated that after forty-five years the plan would return more benefits and added value to the city than the investment. Through structured information and awareness raising of all stakeholders, the plan has resulted in residents now perceiving city streets differently. They now recognize the possibilities for transformation of previously impervious surfaces into green, lush areas that retain, treat, and control stormwater runoff.

The introduction of the plan was followed by the creation of a comprehensive guide that makes it easy for potential developers to become familiar with all the necessary requirements that a project must meet to adequately address water management within the development area (Philadelphia Water Department, 2014). The city is divided into sub-areas based on hydrological-hydraulic characteristics (e.g., floodplain areas and type of sewerage system), which allow developers to determine the general water management requirements (e.g., 100% infiltration, and partial retention and treatment of stormwater) by using the guide.

Despite the positive progress, researchers have found that pursuing only one objective in BGI implementation (i.e., large-scale water retention) can lead to systematic implementation of a limited set of BGI measures that provide only limited benefits (Spahr et al., 2020). Therefore, Spahr (2020) concluded that, if cities want to achieve the ecosystem services provided by plants (i.e., air purification, reduction of noise and the heat island effect, a pleasant appearance, and public health), they will need to increase the use of this type of BGI.

5.5 Comparison of best practices

In both European cases, the main cause for the paradigm shift in urban water management was prevailing climate change impacts and the prediction of more frequent and intense rainfall events that will cause floods. On the other hand, the Chinese and American cases were triggered by the quality of water bodies and the negative impact of urbanization on them. Common to all the examples is the recognition that grey infrastructure

Table 4: Overview of successful foreign practices.

	Copenhagen	Rotterdam	China, thirty pilot cities	Philadelphia
Cause	Floods, climate change	Floods, climate change	Environmental pollution, floods	Environmental pollution: combined sewerage overflows
Name and year of programme adoption	The Copenhagen Climate Adaptation Plan, 2011; The Cloudburst Management Plan, 2012	The Rotterdam Climate Change Adaptation Strategy, 2013	The Sponge City Programme, 2014	Green City, Clean Waters, 2011
Goal	1) Preventing inflow of surface runoff into the sewerage system from more than one-third of the non-impervious area. 2) When a cloudburst with a hundred-year return period occurs, a maximum of 10 cm of surface water (prevention of flooding)	Complete climate change resilience of the city by 2025	By 2030, at least 70% of precipitation will be infiltrated or reused on 80% of urban areas.	The prevention of inflow of surface runoff to sewerage system from more than one-third of the non-impervious area in the next twenty-five years
Developed guidelines and planning tools in response to detected problems	1) The Copenhagen Cloudburst Formula (guidelines for strategic planning of BGI); 2) The Copenhagen Cloudburst Toolkit (catalogue of BGI elements)	1) The Interactive Climate Atlas (the atlas makes it possible to compare the consequences of various climate scenarios for a given location); 2) The Climate Adaptation Barometer (the tool can be used to structure the climate change adaptation strategy and to keep track of the process); 3) The Climate Adaptation Toolbox (the toolbox provides an overview of potential adaptation measures for various spatial scale levels and aims)	1) The Code for Design of Urban Green Space (the code is harmonized with guidelines for sponge cities, with emphasis on an integrated approach for planning urban green areas); 2) The Code for Design of Urban Road Engineering (the code is harmonized with guidelines for sponge cities; it includes a chapter on BGI); 3)The Assessment Standard for Sponge City Effects (technical standards for assessment of sponge city effects)	1) The Stormwater Management Guidance Manual (guidelines for planning BGI, a catalogue of BGI elements); 2) A Homeowner's Guide to Stormwater Management (practical guidelines for homeowners on how to manage stormwater)

can neither provide solutions to all the emerging problems nor deliver ecosystem benefits. The cities presented have identified multifunctional BGIs as an appropriate solution, which is in line with the water-sensitive city approach (Table 1). Furthermore, BGI has been successfully integrated into the cities' strategic documents, which also include well-defined objectives (Table 4). It is important that after adaptation of strategies public funds also be allocated to achieving the set objectives. The success of the cities presented in adopting BGI is also conditioned by the development of professional guidelines and planning tools that provide support to city planners. Moreover, common to all the cases presented is the involvement of the water sector in spatial planning. Water engineers use hydrological-hydraulic models to 1) identify (current and potential) critical points of flood risk in urban areas and assesses the impact of individual BGI scenarios on the urban water cycle through simulations, and 2) assesses the quality impact of BGI on urban surface runoff and consequently on the ecological status of the receiving water bodies.

6 Conclusion

The management of urban space and its associated elements lies in the domain of various disciplines. This article has presented the current state and challenges of urban water management in Slovenia and in some cities globally. The much-needed link between water management and urban planning is encouraged in international strategic documents; however, this link has not been sufficiently adopted in Slovenian national legislation. Thus, a predominantly sectoral approach in water management and urban planning is practiced in Slovenian cities.

Based on the examples of urban water-management best practices presented, it can be concluded that in some cities the systemic introduction of BGI has become an established approach rather than an alternative one in urban planning. This is not the case for Slovenian cities yet, but there is a great potential because Slovenian cities have sufficient well-distributed green areas (public and private), which is a consequence of spatial planning practices already established (Ministrstvo za okolje in prostor, 2020b). Currently green areas are not planned according to BGI principles, and so their multifunctionality, which could be achieved by absorbing surface runoff from surrounding paved areas, is not (sufficiently) utilized. Therefore, a great potential remains for green areas in cities that could provide additional above- or below-ground retention areas to relieve the pressure on the sewerage system and keep precipitation within the natural water cycle. The best-practice examples presented show that the implementation of many decentralized measures can significantly improve the water balance of the sewerage system and reduce the likelihood of their overflow and thus flooding of urban areas.

The best-practice examples analysed show that interdisciplinary cooperation between different disciplines and cross-sectoral coordination at the planning and operational levels are key in BGI planning. From the perspective of the water sector, which primarily manages the urban water cycle, it is essential that spatial planning include expert studies for the sustainable management of water resources and adaptation to climate change. Furthermore, creation of guidelines and technical manuals for planning and dimensioning BGI is also of great importance for the planning and implementation phase.

It can be concluded that, despite individual efforts, in Slovenia BGI is still not recognized as an effective concept for comprehensive management of the urban water cycle. Such management requires a holistic approach, which encompasses modelling, planning, and dimensioning of the most appropriate measures. Nevertheless, these efforts indicate a growing awareness of the importance of BGI and the need for its systematic integration into the legislative framework to ensure adequate involvement of key stakeholders, interdisciplinary cooperation between disciplines, and cross-sectoral coordination for comprehensive urban water management.

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Systematically retrofitting city streets: Meeting the demands of climate change through multifunctional climate-responsive street gardens

The reintroduction of green infrastructure is a recognized approach to mitigating heat islands and flash floods in urban areas. Depending on its type and extent, green infrastructure (GI) can reduce local urban temperatures significantly and at the same time reduce the risk of flooding. This article views the streetscape as an important area of activity for GI-based climate-adaptation interventions for two main reasons: it serves as a conduit for urban human activity and mobility, and it acts as a significant heat store. The approach proposed unites some key elements that can form the basis for all future public-realm (streetscape) design, promoting a truly climate-responsive urban environment. These include reduction of sealing to only essential areas, decentralized water management using rain-garden technology, low maintenance, aesthetic planting supporting biodiversity, and sensor-based monitoring of thermal comfort parameters to optimize measures. It utilizes low-cost sensors for obtaining thermal comfort data to locate urban heat islands. It also proposes a GIS-based decision tool bringing together relevant data sets: temperature, level of surface sealing, and flood risk, as well as aspects such as the location of services, traffic, and urban planning. A pilot application as part of an ongoing Austrian government-funded climate adaptation project is described in which this methodology has been applied.

Keywords: public space, climate change, stormwater management, street drainage, sensor technology and digitization

1 Introduction

Combating the effects of climate change in urban areas is a continuing challenge for cities and towns throughout Europe and the rest of the world. Decision-makers are faced with unpredictable weather situations that cause urban heat islands (UHIs) and flash floods, with an ensuing socioeconomic burden. The climate-change effects are exacerbated by the nature of the urban environment, with high built density and proliferation of impermeable surfaces that not only store heat but disrupt the natural water cycle. This not only results in reduced thermal comfort, particularly in city centres, but also in an increasing burden on sewer networks, often resulting in pollution at times of peak flows, which spill into natural water courses.

In seeking ways to deal with these diametrically opposed climate conditions, green infrastructure interventions are considered a sustainable alternative to ameliorate the problem and improve urban micro-climates. Although "greening our cities" has become a buzzword for more liveable urbanity in the twenty-first century, little progress has been made to systemize and optimize such interventions with the aim of improving their long-term efficacy and return on investment. This may be due in part to the inherent complexity of this multi-layered problem, which demands coordinated interplay between many stakeholders, especially with regard to the rigid planning tools and processes employed.

This article proposes a multifunctional approach that could contribute to best practice for more systematic incorporation of green infrastructure (GI) into the urban fabric. The approach specifically addresses significant UHI contributors by identifying problem areas using mobile sensors. Impermeable horizontal surfaces in the urban space, with no perceivable traffic function (dead zones), are targeted for unsealing and retrofitting with GI based on rain-garden technology in a way that recognizes its importance and function as an urban design element. With this approach, the causes of UHI may be tackled directly and sustainably while simultaneously promoting more positive and direct human interaction with nature and improving biodiversity within the city environment.

To achieve the proposed level of multifunctionality, a research consortium was established as a working group under the name Climate-Responsive Street Garden (ARGE – CRG), drawing its expertise from various fields, including landscape planning, hydrology, urban and spatial planning, traffic planning, IT (sensor and app development), and ecology. By actively pursuing an emphatically multidisciplinary approach to developing improvement measures in combating climate change, we seek to produce truly sustainable solutions for a multifaceted problem. This means innovation in terms of both the multifunctional approach to the resulting urban GI and the transdisciplinary development and application of the method.

1.1 The significance of street space

The scope for action is most restricted in areas often most affected by UHIs and flash floods. Particularly in urban centres, the competition for ever-decreasing urban space means that a large proportion of surfaces are sealed, resulting in the loss of natural soil function and the ability to cool. Although GI is a highly sustainable form of climate-change amelioration, there is not an insignificant need for space. This requires designers to examine the street space more critically to prioritize and reassign function. Where is the need for action most pressing? Which type of green infrastructure should be prioritized where? Against this backdrop, cities and towns wish to maximize the positive effects of the investment and minimize negative aspects, which leads to requirements for appropriate decision tools and the need to promote multifunctionality (Monteiro et al., 2020).

There has been much discussion about the possibilities of space-saving vertical greening of facades as a possible alternative to climate-proof cities. Although they can make a valuable contribution, they do have some drawbacks (Manso et al., 2015). In an established city structure with a historical city centre protected by legislation to retain a specific cultural and identity-creating heritage, the options for green infrastructure such as vertical or roof gardens are diminished (Pansinger & Förster, 2018). Until appropriate technology is developed in keeping with historic preservation requirements, alternative approaches are needed. A literature review shows that climate resilience mainly deals with larger systems, whereas the field is still developing at the building level (Kristl et al., 2020). Significantly, one square meter of green roof area is sufficient to evaporate two litres of water per day and bind ten grams of fine dust per year as well as absorb 375 grams of CO_2. Green roofs also reduce street noise and contribute to energy savings of buildings (Willenbrock, 2020). In addition, a greener urban environment is generally perceived as more pleasant and thus contributes to the quality of the urban ambience (Kozamernik et al., 2020). The drive to promote active mobility and the quality of the public realm in recent times (Markvica et al., 2020) demands a rethink about how street space is organized. Pedestrians and cyclists experience their environment much more acutely than those using public transport or cars. The makeup of the "urban plinth" has been described as an important factor in making towns and cities attractive and liveable (Gehl, 2015). High ambient temperatures (i.e., UHIs) are also likely to dissuade active mobility and affect the quality of public space for healthy and infirm city-dwellers alike. In the

future it is not only necessary to make cities interesting and attractive; they must mitigate climate change as well.

1.2 Prioritizing multifunctional green interventions on the ground

City heat maps show that horizontal surfaces in urban areas (Figure 1) such as roofs and roads are often most exposed to solar energy and contribute significantly to urban heat storage potential. Efforts have been made to increase the uptake of green roof technology with various forms of subsidies (Internet 1). This may support uptake, but it is rather ad hoc in its application. The grants available take no account of location or in-situ ambient conditions, and this type of GI is currently not suitable for retrofitting pitched roofs or those with historical relevance. The same may be said for vertical greening. A further hindrance is that green roofs require private initiative. Decisions by private owners to pay for such measures are primarily influenced by financial considerations. Unless there is a financial imperative or advantage, the uptake for such technology will remain low. It must be asked whether such an approach corresponds to the optimum and effective investment in GI as a climate amelioration measure. Why do municipalities not adopt a policy aimed at "harvesting the low-hanging fruit first"? Roads and many parking areas are generally under municipal control and account for a significant proportion of heat storage in urban areas. Consequently, implementing climate-change measures on municipally owned streets is not as fraught with obstacles as is the case for greening privately owned buildings. At the same time, they are conduits for all urban mobility – including pedestrians and cyclists. Regarding the attractiveness of cities at the human scale, it has been established that the makeup of the "urban plinth" is significant (Gehl, 2015). The occurrence of UHIs is an additional factor for reducing the appeal of urban areas. It is therefore imperative to deal with this aspect where it originates: in the street space. Ultimately, the aim must be to reduce the asphalt and concrete surface (heat storage) in these areas while allowing adequate mobility and quality of life for the urban population, improving liveability and sustainability. This process is an opportunity to make cities smarter, greener, and healthier, where there is a balance between energy and function, environment and aesthetics, and technology and nature, where people and their needs are foregrounded, and where the previous two-dimensional street is transformed (Pansinger, 2018). It is therefore logical to prioritize this part of the urban fabric as an initial step in implementing climate-adaptation measures.

It is therefore necessary to revisit urban space to identify opportunities that may have previously been overlooked. In urban areas a multitude of factors – in addition to lack of available space, also increased ground sealing, high traffic volumes, and

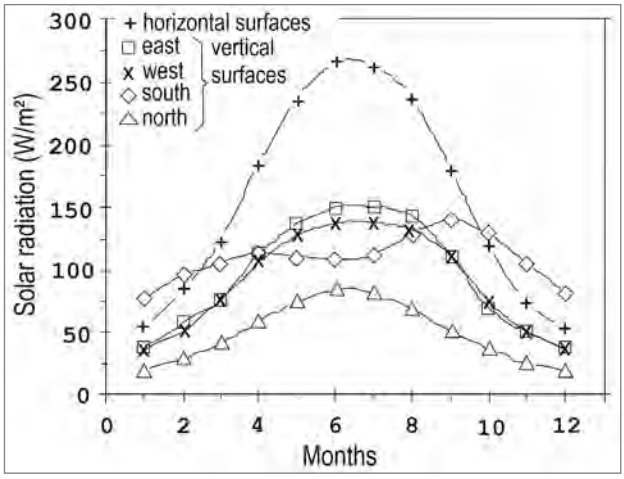

Figure 1: Total solar radiation on horizontal and vertical surfaces with various orientations in Istanbul (source: Kaynakli, 2011).

below-surface services – stand in the way of introducing larger-scale green areas. Consequently, the demand for smaller and more flexible solutions increases (e.g., parklets or mobile trees) constituting a type of "green acupuncture". This translates into small interventions with the potential to release new energy flows within urban space – in line with the concept of a "double archipelago" of disconnected urban islands and isolated green spaces constituting the city (Christiaanse, 2018: 45).

The contribution that high-quality urban green space can make to the intense discourse on the worrying decline in biodiversity (IPBES, 2019) on a global scale should be considered as a vehicle both to improve actual biodiversity in cities and to mobilize citizens by bringing the problem into sharper focus. This can be achieved by paying particular attention to the quality and not just the quantity of green infrastructure. The IPBES report (IPBES, 2019) highlights the importance of "nature-based solutions, healthy urban environments, improved access to green spaces, and ecological connectivity within urban spaces." In contrast to current monoculture-style urban planting, species-rich planting schemes, which draw predominately from native varieties, can have a profound and lasting positive effect on urban ecology. These include increased robustness against disease and a reduced requirement for fertilizers and pesticides (Isbell et al., 2017). Consequently, the knock-on effect is that insects and other pollinators can make an unhindered return, providing insight into the workings of nature. The experience has shown that the adoption of such diverse plantings results in a marked increase in the number and volume of insect varieties (Mody et al., 2020) and this can be noticed by the public. Thus, the opportunity presents itself to promote the message to the public that biodiversity in general is not only the foundation of humanity's continued existence but also underpins a worthwhile living environment in the urban context.

2 Method

The previous section described the elements to be integrated into the climate-responsive street garden system. It has been recognized that decisions about how, where, and what GI intervention to introduce need to be formalized in a systemized procedure (Koc et al., 2018). Competing demands for space (e.g., traffic, people, services, etc.) must be reflected in the data structure and content of the problem space, and ultimately in the resulting tool. The complexity demands making decisions about the necessity of GI interventions based on the viability of implementing the measures. Some agencies and cities have made efforts to generate tools that assist in selecting pilot projects based on community involvement or demonstrate the shared benefits brought about by green interventions (e.g., Internet 2). These approaches consider two or three aspects or functions but fall short of the requirements to make an objective selection based on localized conditions and the spatial framework where the measures are to be implemented.

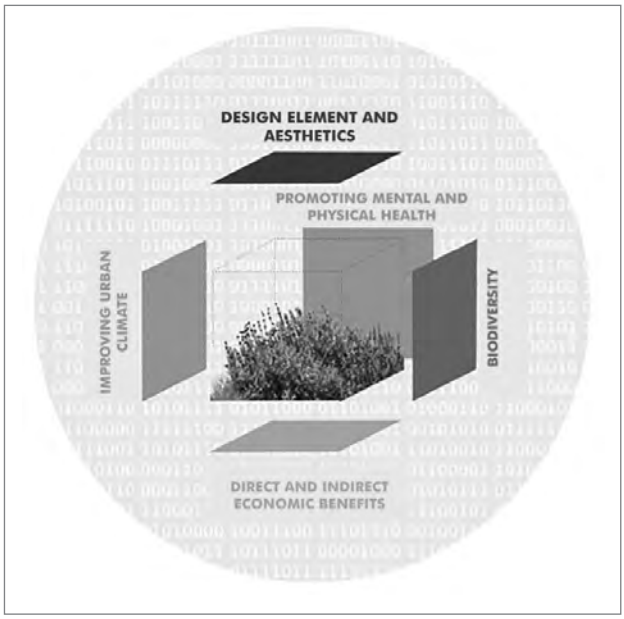

Figure 2: A five-dimensional application model (source: authors).

Currently, thermal comfort data are collected using remote sensing, aerial infrared photography, and/or satellite images (Xuexiu et al., 2020). Drone technology (Soto-Estrada et al., 2017) has also been successfully implemented to collect data related to urban temperature. These data sets are used to generate and calibrate urban climate models. The limitations of these approaches are twofold. Whether carried out using drones or otherwise, aerial photography provides only a snapshot of the situation. Localized climate conditions vary continually over time and situation. The inherent dynamic is not accounted for in this method. The behaviour of thermal conditions over longer periods of time would facilitate a more refined approach to introducing measures and allow monitoring of the effects after introducing those measures. The entry point for this approach is based on a five-dimensional model that demonstrates the versatility of green spaces and reflects the present and future needs of city dwellers (Figure 2). This model reflects the green infrastructure planning principles set out by Monteiro et al. (2020).

Against this background, a systematic and reproducible approach has been developed, referred to in this article as climate-responsive street gardens. The main aim is to optimize the process and result of introducing green infrastructure into urban areas by setting up a systematic and reproducible approach. The core elements of the system are identified and combined to ensure a high degree of multifunctionality. It is hoped that the proposed method will provide the foundation for future design interventions, guaranteeing the inclusion of climate adaptation measures in public realm design. This in turn ensures maximum functionality, in addition to aesthetic considerations, primarily for retrofitting existing urban structure but also for new construction.

The procedure adopted to achieve this aim includes the following aspects:

- Urban planning analysis and the identification of possible fields of action in relation to existing and planned spatial organization based on GIS data, aerial photographs, and planning instruments.
- The development of a low-cost method for collecting thermal comfort data (ambient temperature and humidity). The thermal comfort data will be used to ascertain where GI climate adaptation measures are required and are part of the input for the GIS decision tool. In addition, the data allow continuous post-implementation monitoring of effectiveness.
- The design of a decision tool based on a suitability assessment model that docks onto existing technology and brings together previous data sets (e.g., utility plans, traffic volumes, vegetation maps, legislation, and spatial models) and additional collected data (e.g., thermal data); the tool generated supports decision-making with regard to the introduction of climate-responsive street gardens into the streetscape.
- The identification and incorporation of core elements for climate-change amelioration such as unsealing of road surfaces where appropriate and necessary, integration of decentralized surface-water management systems, and application of high quality, low-maintenance, native planting to promote biodiversity and provide suitable aesthetic value in the urban context.

Figure 3: a) NB-IoT bike-mounted sensors constitute a mobile network collecting thermal comfort data in the public realm with a continual low-cost data supply; b) NB-IoT sensors can be used for every bicycle; c) 2 to 3 °C temperature differences as seen on an open road map (dark grey and light grey; source: authors).

Thus, by deliberately unsealing or converting current green areas into climate-responsive street gardens, several functions are covered: cooling, sustainable rainwater management and street drainage, aesthetic and acoustic enhancement, greater acceptance of public spaces, and an increase in biodiversity. Through continuous measurement and evaluation of the measures with specially developed sensor technology with respect to air temperature, humidity, and precipitation values as well as biodiversity audits, the positive effects of climate-responsive street gardens on the immediate environment are also quantitatively verifiable and can be accessed at any time via the specially developed app.

3 Results

This section presents the following results:

- Developing suitable sensors and an app to collect and disseminate thermal comfort data;
- Generating a model for developing the GIS-based decision tool;
- Defining a computational approach for incorporating surface-water management;
- Establishing design criteria for appropriate planting design and soils adapted to alternate dry periods and periodic flooding as well as challenging urban conditions (e.g., polluted surface water);
- Securing the pilot implementation of this multifunctional approach in an urban setting; and
- A general plan of areas with pronounced heating and flooding risk and incorporating the plan into urban planning instruments.

3.1 Developing sensors to collect thermal comfort data

The approach to developing the sensors examined ways to allow continuous and long-term collection of thermal data. In terms of cost and investment of resources, it was deemed not feasible to install a large network of sensors to collect temperature and humidity. As an alternative, this project proposes implementing a limited number of mobile sensors with GPS trackers, which by their nature can collect data in a wider catchment area. The sensors are to be installed on bikes, either on e-bikes or electric mopeds used by mail carriers, or bike delivery couriers, allowing consistent and wide coverage of city areas. Alternatively, the public could be mobilized to install sensors on their bikes, which would not only provide an additional data source but potentially raise awareness of climate effects (Figure 3).

The current prototype of the mobile sensor collects data for air temperature and humidity, which are important indicators of thermal comfort in urban areas (Fihure 4). A built-in fan allows steady air circulation with the surroundings and increases measuring accuracy. Traditional sensors exposed to direct sunlight supply readings that do not correctly reflect the ambient temperature. Data transfer is carried out using NB-IoT technology via the mobile phone network. NB-IoT was specially developed to deliver data in an energy-saving manner. The battery-operated sensors can therefore continually collect and transfer data over an extended period. Most providers offer this service at a low cost. The first prototypes are already in operation and the data are administrated by a specially designed app (climapp), which can be downloaded onto any smartphone. The results can be viewed on open-source street maps, which show the temperature differential along the street network according to colour (green = cool, red/orange = hot). This approach offers a low-cost alternative to provide a continual and reliable supply of thermal comfort data, which can be used to update the GIS-based assessment tool described above.

3.2 A GIS-based suitability assessment tool model

Urban areas are systems with a great deal of inherent complexity that continually evolves as cities grow and densify. Managing

Figure 4: Prototype of the climapp sensor, which collects mobile data on local climate conditions (source: authors).

this complexity has required the adoption of methods that adequately handle spatial information in a stable manner and ensure that this information remains nuanced and is continually updated. This has consequently seen the rise of geographic information systems (GIS), which have specifically been developed to handle the complexity of the spatial data allowing informed decision-making in planning relating to all areas in the urban context. The importance of GIS lies in its ability to pull together vast amounts of information necessary to balance competing priorities and solve problems, such as optimizing the introduction of new green space, as is the intention of this project. The value of this approach has already been recognized as assisting in pinpointing potential locations for rain gardens (Fuskova, 2017).

The simplified schematic diagram (Figure 5) shows the proposed model, which combines current data sets (services plans, aspect ratio, level of impermeability, traffic flows, standards relating to road dimensioning, etc.) and additional thermal comfort data collected by the specially designed mobile sensors. Following the assembly of the relevant data, the implementation of the multi-criteria weighted overlay analysis allows planners to pinpoint areas deemed suitable for introducing green space as a climate-response measure based on specific attributes already selected. This makes it possible to answer the following questions: Where are the measures required? Where are they possible within the context considered? Adopting such an approach would enable planners to make consistent and informed decisions about introducing green space measures based on rational analysis, thereby guaranteeing efficacy, improved return on investment, and increased transparency.

3.3 Incorporating data for decentralized rainwater management

The change in the hydrological cycle is one of the key impacts of increasing imperviousness (Shuster et al., 2005). On the one hand, unsealing urban surfaces allows reactivation of the soil as a means of cooling the environment by evapotranspiration to ameliorate UHIs. On the other hand, it directly tackles a further consequence of climate change: reducing or precluding the severe effects of extreme rain events. The assessment of urban hydrological processes differs in some ways from the nature of the remaining input data in the decision system because the effect of rainfall, for example, on the urban system must be computed first. The type of computation significantly depends on the area of interest and its spatial structure as well as on the objective. Although rather simple tools are sufficient for assessing the water balance of an urban area (Sprung et al., 2017), advanced simulation tools are required to assess the temporal and spatial development of urban flooding events (Krebs et al., 2014a). The study objective is also directly correlated with the data demand, and often different assessment approaches in terms of tools must be used for hydrological assessments prior to and after the installation of green infrastructure (Krebs et al., 2013, Krebs et al., 2014b, Leimgruber et al., 2019). After this computational pre-processing, the output produced (e.g., flooding maps) is used as input in the decision tool to identify the optimal locations and soil designs for the climate-responsive street gardens implemented.

3.4 Selecting appropriate plantings for climate-responsive gardens

Not all green space is created equal (Wood et al., 2018). The quality and not just the quantity of green space plays a particularly important role in the urban context and in the context of this project. Green infrastructure in cities must comply with several criteria related to the demands of planting in the public realm. These include not just pleasing aesthetics, but also the ability to adapt and remain stable (or attractive) in the face of harsh climate conditions and impacts (e.g., high/low temperatures, traffic, litter, residents, and pets) while at the same time requiring as little maintenance as possible for financially

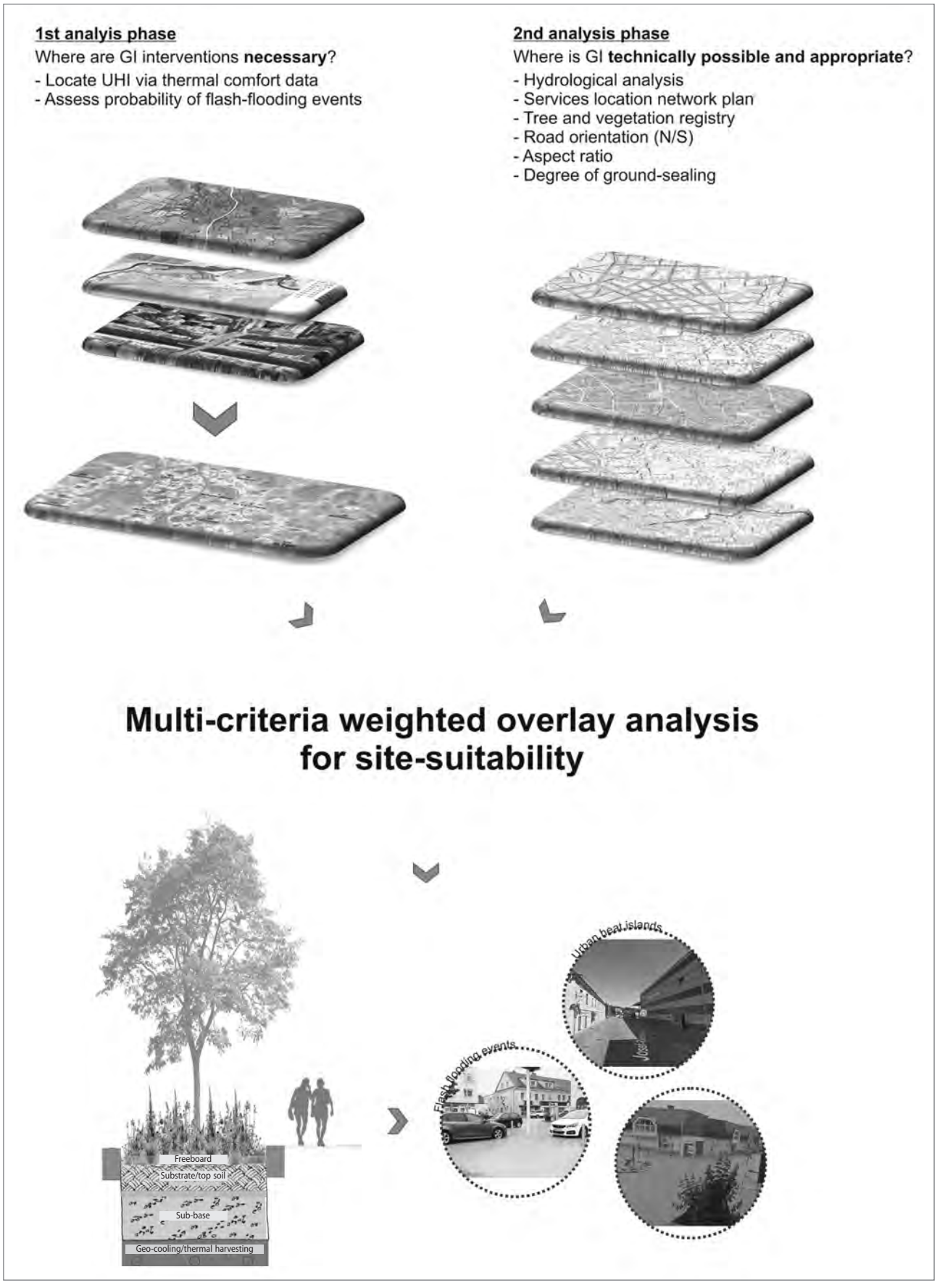

Figure 5: A GIS-based suitability assessment tool for siting multifunctional street gardens in the urban landscape (source: authors).

Figure 6: Requirements of contemporary urban planting: high aesthetics, promoting biodiversity, and low maintenance (source: authors).

stretched municipal departments. This is a tall order that in the past has resulted in the prolific use of monoculture planting regimes, which are no longer in keeping with the future requirements of urban green space.

Based on the five-dimensional model presented in Figure 2, the core functions of climate-responsive street gardens for plantings in the urban context are:

- Providing cooling and shade;
- Allowing decentralized management of surface water;
- Increasing biodiversity in urban flora and fauna; and
- Improving health and wellbeing.

Planting regimes that can meet a large part of the core criteria take their inspiration from "gravel gardens", which were first brought to the attention of a wider audience through the work of the British garden designer and horticulturist Beth Chatto (2000). The gravel gardens were an experiment in setting up a garden in one of the driest parts of England with no irrigation and poor, free-draining soil. The resulting spectacular garden display is renowned for containing a rich and attractive drought-tolerant plant species mix that is never watered. The gravel garden technique has been replicated in many gardens throughout the world, and the benefits for planting in the public realm are starting to be recognized (Fallast, 2018; Figure 6). Diverse plant communities in the urban realm are a recurring theme in the work of Hitchmough (2017) and Dunnett (2019), the latter of whom has particularly demonstrated that aesthetics and increased functionality through rain catchment and retention are by no means mutually exclusive. A further development in urban realm planting is demonstrated by Smith (2019) as an attractive low-maintenance alternative to grassed areas where low-level planting is required; the technique incorporates dwarf varieties of chamomile and other species combining horticultural practice with ecology to create a "grass-free lawn" requiring no mowing or fertilizer. Based on a combination of these planting regimes, a planting list was developed that takes account of the core functions and incorporates native varieties where appropriate. The resulting plant list forms the basis for the planting design of climate-responsive street gardens and is to be implemented and monitored in the pilot case studies. The plant list is available from the authors upon request.

The free-draining nature of the engineered ground matrix (50:50 gravel:soil) make this type of planting ideal for use in rainwater management systems (i.e., rain gardens). One of the main benefits of rain gardens with a rich diversity of planting is the ability, as a result of the rooting system, to retain the porous structure of the soil, thereby allowing free drainage through the layers. The self-regulating nature of such planting communities means that this is a low-maintenance and consequently low-cost alternative. The species-rich planting design promotes biodiversity at all levels and provides green space interventions that delight the senses and contribute to health and wellbeing for city dwellers (Figure 7).

3.5 Pilot application of a climate-responsive street garden system

This approach is currently being used in the framework of the KLAR (Germ. *Klima Anpassungsregionen*) research project by *klima energie fonds* in the municipality of Wolfsberg in Carinthia, Austria. This approach was selected because it corresponds to the aims of the KLAR project: developing and implementing ways to combat the effects of climate change in the urban setting. Based on an interdisciplinary analysis conducted by the CARG working group in the summer of 2020, an area in the immediate vicinity of the main train station in Wolfsberg was identified where this approach could effectively be implemented as a pilot project. Apart from exhibiting a high degree of ground sealing (almost 95%) and prone to the UHI effect with some of the highest temperatures in the district, the forecourt area has an important function as a mobility hub and commercial district that will take on increased significance when the Koralm Railway link is put into operation in 2025. The implementation is planned for 2021.

A network of stationary sensors will be installed to monitor the thermal comfort situation before implementation of the measures and post-implementation. The pilot phase relies on activating existing green space by converting the area directly in front of the train station entrance into a rain garden measuring approximately 200 m^2. The area that has been designated as the rain garden will undergo some modification to allow surface water to drain into the engineered soil. The monoculture planting is to be replaced with a perennial/grass mix of appropriate native species to withstand dry conditions

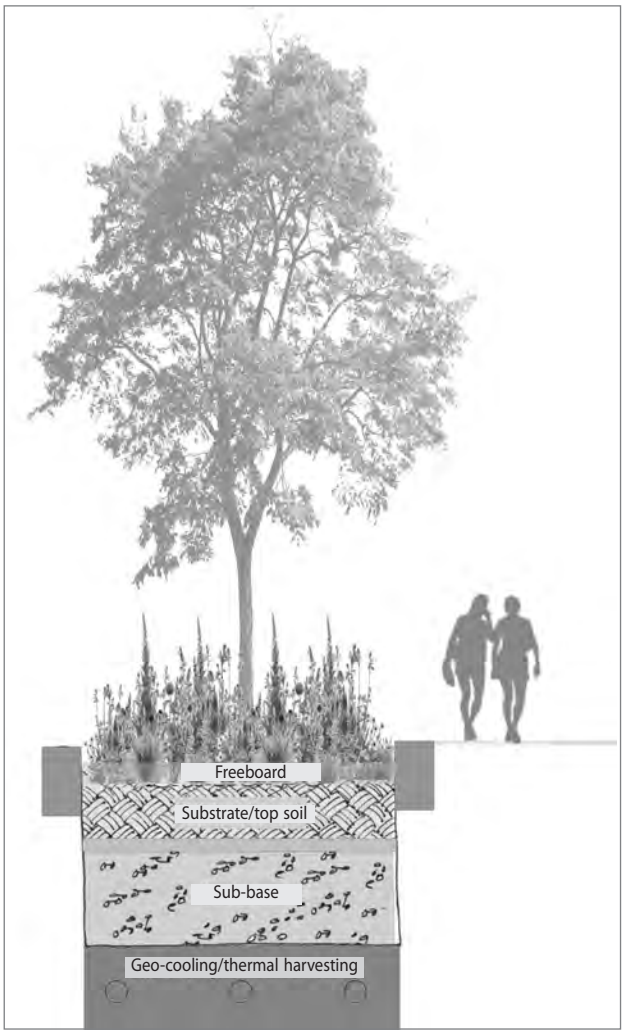

Figure 7: Gravel gardens provide free-draining ground conditions suitable for the quick uptake of surface water (source: authors).

and periodic flooding. The aim is to maintain an acceptable aesthetic while promoting maximum biodiversity in the urban context. If the GI intervention proves successful, it will be extended to other areas. The effects (reduction of temperature and public acceptance for new planting) will be monitored during the project duration.

4 Discussion and next steps

The pilot results represent the first steps in the development of this approach and form a solid basis for further advancement. Clearly there remains a significant amount of work to be done in developing a system that is more widely applicable. The envisaged next steps are also discussed in this section.

The sensors may be used as a stationary unit or as a mobile unit. A mobile unit offers the greatest flexibility in terms of low-cost continuous thermal comfort data collection in comparison to current methods using aerial images from aircraft or drone-mounted cameras (Soto-Estrada et al., 2017). The main advantage of the system presented is a continuous supply of data, which allows a more comprehensive picture of the situation with respect to changing ambient conditions over time. It has been found that the need to mount an extra device onto a bike presents an obstacle to widespread adoption. An additional disadvantage is that the module is currently not weatherproof, which precludes a permanent fixture. Future development is therefore focussing on incorporating the sensor into current bike accessories (such as the bike bell) or integrating it into the bike frame itself. Some loss of data was experienced when the battery charge was low. It is therefore also planned to produce a module powered by solar cells, allowing for continuous off-grid application. An application for grant funding for this development has been submitted to the Styrian government (SFG, *Steirische Forschungsgesellschaft*) and is currently under review. The data can currently be viewed on open-source streets maps. A higher degree of accuracy in terms of being able to zoom in on the streetscape to determine precisely where the measurements originated will be the next development step, requiring a refined information-design approach.

The basic model for the GIS-based decision tool has been established and will be implemented as the next step. The challenge lies in putting together the heterogeneous data sets from the various stakeholders into a coherent model. The thermal comfort data collected via the mobile and stationary sensors does not present this problem, and these data may be adapted at the source to suit the requirements of the tool.

The standardized planting regime was selected based on requirements related to aesthetics, biodiversity, robustness, and knowledge about low-maintenance planting regimes for gravel gardens and rain-garden technology. Field testing the planting communities is the next stage for ascertaining suitability for their function in the urban street setting. The field testing will be carried out over two to three seasons to allow the planting to establish itself. Factors to be assessed include behaviour with respect to prolonged periods of high temperatures and reduced precipitation, the frequency of the requirement for intervention to maintain the planting feature, reaction to surface-water contamination from winter de-icing and traffic pollution, rating of attractiveness, and corresponding public acceptance. An ecological audit is also planned to establish the effects on the level of biodiversity in this area (i.e., the variety and numbers of pollinating insects). The results will be used to optimize the planting regime accordingly.

State-of-the-art hydrologic-hydrodynamic simulation tools allow the design and evaluation of decentralized nature-based

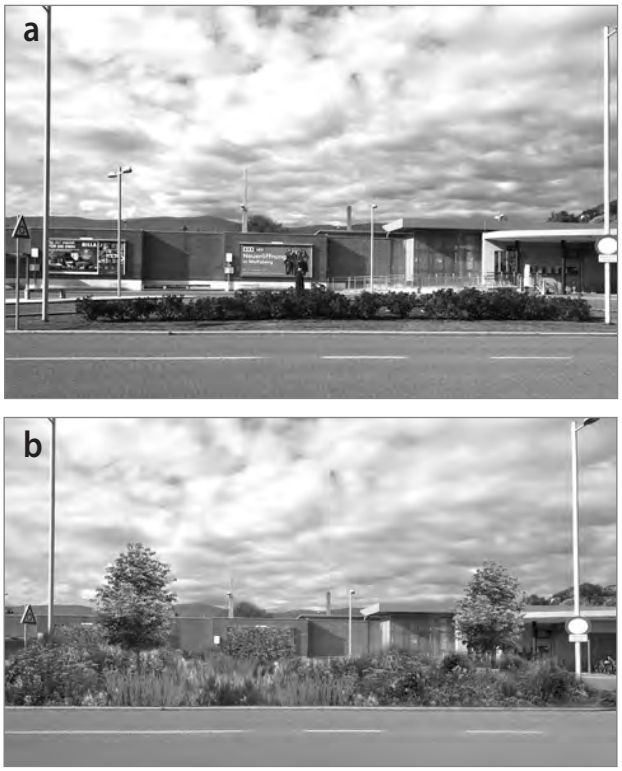

Figure 8: (a) Forecourt of the main railway station in Wolfsberg, (b) Visualization of the forecourt as multifunctional climate-responsive street gardens (source: authors).

stormwater management strategies at various urban scales ranging from small rain gardens to a city-scale strategy. An important aspect is the increasing availability of data, both spatial and hydro-meteorological data, which supports a realistic evaluation of the effectiveness and performance of stormwater management strategies. Thus, hydrologic-hydrodynamic simulation results have provided crucial input for the GIS-based decision tool.

The pilot implementation in the small city of Wolfsberg defined for the first time the term *climate-responsive street gardens* as a move toward incorporating a much wider functionality than is found in most current urban green infrastructure in direct response to the diverse challenges to city life caused by climate change. It is therefore appropriate to extend the meaning of *garden* to include not only visible planting as an aesthetic and cooling element, but also the unseen contribution of subterranean layers, which are specifically engineered to serve a variety of important functions in the urban environment. In addition, climate-responsive street gardens are also an invitation to the public to consider the true value of green infrastructure in terms of ensuring continued biodiversity and the wellbeing of body and mind for the foreseeable future. They are a truly urban "green machine" (Wallace, 1990) at all levels.

An important aspect of the monitoring process following implementation is to establish the level of public acceptance of this type of multifunctional green infrastructure and to ascertain whether the additional functionality that directly addresses climate adaptation could play a role in gaining increased public support. It is considered that the implementation of the climate-responsive street garden approach generates added value to various aspects of present and future urban life. Based on integrated green infrastructure planning principles (Monteiro et al., 2020), the approach allows optimal and sustainable use of resources such as space and water by relieving urban wastewater systems, resulting in reduced direct costs and protection of natural watercourses. It offers a self-regulating, low-maintenance version for climate amelioration while potentially increasing urban biodiversity using site-consistent and species-rich planting (Mody et al., 2020). The spatial reconfiguration of the street space through the inclusion of GI in this form has the potential to promote psychological wellbeing according to the principles of horticultural therapy when applied to the public realm (Ulrich, 1984; Kaplan & Kaplan, 1989) and may encourage increased active mobility (walking and cycling) by offering more attractive routes created by the new greenery (Fallast, 2017; Dunnett, 2019). In addition, it offers identity-creating activation of public space (Pansinger, 2019).

This approach also seeks to demonstrate that it is not always large projects in big cities that are required. Often it is small acupuncture-like measures that can bring about important changes and innovations (Figure 9).

5 Conclusion

Multifunctional climate-responsive street gardens are primarily intended for implementation in the streetscape (i.e., the public realm). In the pilot phase, it is intended to specifically target areas in the road that are asphalted but closed to motorized transport (i.e., "dead" zones with no specific traffic function) for retrofitting to facilitate acceptance by the general public. An important part of the process is also about raising awareness that road space should not only be understood as a traffic connection, but that the street should be perceived and used as a public space and as a fundamental asset for urban ecosystems.

The approach presented therefore aims to innovate by developing a systematic procedure for implementing green interventions in the urban public realm by applying:

- A GIS-based suitability assessment tool that brings together all relevant data required to make decisions about the location and type of green intervention;
- A multifunctional approach and interdisciplinary and transdisciplinary method to implement measures to combat climate change;

- Mobile sensor technology with GPS tracking to gather microclimate data subsequently employed by the suitability assessment tool, which allows low-cost and continued monitoring of dynamic urban microclimates, setting itself apart from the current ad hoc approach to introducing green space into the urban context as a means of combating the effects of climate change; and
- A flexible system that caters to the requirements of an established urban fabric, which is often subject to strict planning regulations and restricted by space, and offers flexible but effective green space interventions ("green acupuncture"), which can positively influence local climate conditions in a sustainable manner.

Multifunctional climate-responsive street gardens are a small-scale transferable measure. This approach rethinks colours, textures, depths, and functionality, thereby reshaping elements such as heat, rain, dust, and noise in urban areas into the "new shape of green".

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Cities as places and topics of studies: Mapping research clusters across disciplines

In research articles, cities usually occur as topics (e.g., subjects or actors) or places of studies (e.g., sites, destinations, locations, or spaces). Investigation of more general patterns is rare because research usually focuses on individual cities. We use science mapping, based on Scopus data and Vosviewer visualization software, to examine city-related research across journals and disciplines (subject areas), and to assess how multiple city functions are reflected in journals. Comparable European Union capital cities (Berlin, Madrid, Rome, and Warsaw) serve as models. The patterns are remarkably similar regardless of the city. National and regional journals are the most common publication venues. Research takes place within three major disciplinary clusters: 1) the social sciences, and arts and humanities, 2) medicine, and 3) natural/technical sciences (environmental, earth and planetary, agricultural, and biological sciences). Medicine shows an early prevalence, and recently the social sciences have been strongly represented in these studies. Although the relationships are based on different journals, they are comparable for all cities and can be used to assess cities of similar size. This study was conducted just before the Covid-19 pandemic, and it can serve as a reference to identify research patterns before and after because the outbreak may bring about changes in future city-related research.

Keywords: cities, science mapping, research fields, bibliometrics, visualization

1 Introduction

Cities feature prominently in research articles. They usually appear in different contexts: first, as an investigative field (e.g., culture, geography, history, medicine, or urban planning) and, second, specific cities as places or typologically defined areas (e.g. capital cities, Asian cities, or smart cities) and also metaphorically (e.g., the city as a lab, network, assemblage, business, classroom, or platform). Therefore, cities can serve as topics for research (e.g., as actors, relations, brands, case studies, examples, engines, experiments, factors, drivers, instruments, etc.), or come about as sites where a particular study has taken place: as a destination, location, locale, setting, site, space, and so on. Our purpose is not to theorize about how cities are studied academically.

In the context of the conceptual background of our empirical study, we merely state that the growing complexity of social, spatial, environmental, and technological intertwining is reflected in both the heterogeneity of analyses and attempts to integrate them. This is especially true for urban and regional studies in the treatment on particular, general, and relational attributes of the urban (Hočevar, 2005; Cox & Evenhuis, 2020). The issue of object/subject/topic/treatment can be blurred. Thus, for example, very heterogeneous "living" actors of the city such as planners, politicians, artists, entrepreneurs, researchers, media, and so on can be treated together with "inanimate" aspects such as land, museums, manufacturing plants, publications, and studies. Both subjects and objects of the city or in the city, regardless of their affiliation, have an agency of a sort to form a network of functions, connections, or assemblage, which can be translated into the actor as a whole. To provide a rough illustration of such an interweaving, we cite research perspectives derived from the epistemological premise of ANT (Actor–Network Theory) and socio-material assemblage concepts analysing relations between entities and their constituent elements (Latour, 2005; Brenner et al., 2011; Gutzmer, 2016). Human and nonhuman actors, so-called actants, function together, which is reflected in external relations.

On the other hand, many empirically oriented articles tend to focus on individual cities where specific issues are addressed: cultural activities, the economy, the environment, food and nutrition, health and disease, history, pollution, tourism, traffic, urban forestry, urban morphology, and so on. Although many articles focus on specific or typologically grouped cities, the work that deals with the city as a research site is less frequent or at least ambiguous when used. For example, the term *laboratory* has been used to refer to the city as a place of research and also to illustrate a type of field research (Karvonen & Heur, 2014). In addition, even research paradigms can be named after cities, such as the Chicago School of (Urban) Sociology (Gieryn, 2006; Guggenheim, 2012). In the context of ANT, the city as a laboratory figures as an actant, whether it is a metaphor or a concrete and actual site. More specifically, smart cities and urban sustainability have also been investigated as topics through quantitative bibliometric methods (Ingwersen & Serrano-López, 2018; Wang et al., 2019; Marvuglia et al., 2020), although not based on specific cities. Kadi (2019) included all European capitals and focused on gentrification. Berlin, Rome, and Madrid (the subjects of our study) were addressed in the context of history by Therborn (2002) and Gómez et al. (2018), in the framework of city branding (de Rosa et al., 2019), and in a study on the share of publications of the world's major agglomerations (Grossetti et al., 2014). Research fields in relation to cities were identified by Nunes et al. (2019), who used the journal classification system of research areas of the Web of Science.

Cities as central themes are most often found in the social sciences, where comparative studies have developed a number of quantitative and qualitative comparative techniques (Ward, 2010), which sometimes also try to balance the many divides (e.g., wealth, geography, and political systems) in comparative research (Robinson, 2011). Cities are also the subject of research in the life sciences; for example, in the plant sciences and environmental science (e.g., the case of Berlin; Sukopp, 2008), or climate research (Lamb et al., 2019). In this respect, the areas of urban research as identified by Raynor (2019) were more inclusive (also involving environmental factors and natural resources) but they were based only on cities in Australia. More comprehensive comparisons of different cities are however rare. In the studies pertaining to information sciences (e.g., bibliometrics and science mapping), cities are most frequently addressed in the sense of tracking affiliation (author's address), as well as metropolitan units, regions, countries, and so on (Bartol & Hocevar, 2005; Frenken et al., 2009; Matthiessen et al., 2010). Maisonobe et al. (2017) investigated global cities in the context of scientific output and scientific disciplines. Bornmann & de Moya-Anegón (2019) examined German cities with regard to the concentration of scientific activities. Also evaluated were scientific cooperation between cities and institutions (Leydesdorff & Persson, 2010) and the output of cities on specific topics, for example, urban globalization (Kanai et al., 2018). Various contexts of cities based on *The Rise of the Network Society* (Castells, 1996) have also been "scientometrically" evaluated (Zhen et al., 2020).

Mapping of specific topics is often carried out using visualization software (e.g., Vosviewer, CitNetExplorer, CiteSpace, and Pajek). Hajduk (2017) investigated city logistics. Visualizations identified clusters of different schools of thought in the relationships between cities (Peris et al., 2018). Cities as

primary sites of knowledge were also assessed for intellectual property output (i.e., patents; Kogler et al., 2018). In a study on medicine and public health, cities were evaluated on issues relevant to the aging of the population (de Oliveira et al., 2019; Xiang et al., 2020). Various bibliographic elements in publications (countries, journals, title words, author keywords, etc.) were visualized in environmental sciences (e.g., cities' ecological infrastructure; Sun et al., 2020). Terms dealing with trees and parks in the city were mapped into clusters by Xing and Brimblecombe (2020). Sometimes, the principal publications were assessed, for example, on the topic of creative cities (Rodrigues & Franco, 2020). Article keywords (*urban*, *city*, or *cities*) were also used (Kirby, 2012). However, big-data approaches are also possible, taking into account the need for informed interpretation (Zook et al., 2019).

We examine and compare cities in the context of the functions as reflected in different areas of publishing. An additional motivation was the onset of the health emergency caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). However, we do not address Covid-related citations (as yet) in relation to urban matters. The time lapsed (less than one year at the time of this study) is still too short. We would rather find out what the line of research was before the crisis in order to provide a basis for possible more complex comparative studies in the future. Many previous quantitative studies that have looked at cities have focused primarily on the city as the site of an author's institution, but this is not very informative for a city in the context of its functions. Our aim, in contrast, is to examine a city as the setting of a study or as a direct research topic, or both. Thus, we do not study a city as a bibliographic "address" but the city as an "actor". We compare equivalent cities in different countries in order to assess parallels that perhaps transcend assumed differences. The hypothesis is that, although the cities considered in this study belong to very different geographical and linguistic contexts and have undergone historical development, the research fronts are quite similar. We assume that this is reflected not only in the choice of academic publication channels and in a similar ratio between national and international journals, but also in the topics investigated by researchers. The hypothesis is examined through the analysis of bibliographic and text data.

The bibliographic data (i.e., growth patterns over several decades, journal titles, languages, co-authorship, and country of affiliation) provide the basis for comparison whereby elementary patterns of similarity can be assessed on the basis of weighing publishers' data. However, these should be complemented by an assessment of distribution along disciplinary lines. Here, our preliminary pilot analysis suggests that there is a shift in emphasis toward the social sciences as well as the arts and humanities that is similar across the cities studied.

Disciplinary development can be more precisely determined by using advanced visualization software to construct maps based on text data. We not only identify distinctive clusters of research topics, and possible interconnections and links, but also detect the development in time that underpins preliminary information from the bibliographic data. Again, these patterns are very similar across cities, regardless of the potentially very different publication venues (e.g., journals).

2 Materials and method

Our preliminary pilot revealed an important share of city-related articles in national and regional journals (also in national languages). Therefore, we chose the Scopus database over Web of Science (WOS) although WOS has recently introduced the ESCI (Emerging Sources Citation Index) in its Core Collection promoting regional and specialty area publishers. Visualization and clustering used Vosviewer software. The analysis covers all articles up to 2019 (Scopus command: pubyear < 2020). Analysis of text data was conducted on the abstracts of the articles. The title field cannot be used because this field contains both the translated title (English) as well as the original title, where the words from the original titles skew visualizations.

The target was selected European cities. Given the very different city size, it only made sense to compare not only equivalent cities but also larger cities, which have usually more connections (Levinson, 2012). In addition, a sufficient number of records are required for the visualizations to reveal applicable clusters. We checked major cities with a population around one million and upward. We excluded London, Paris, and Moscow because these cities are much larger and would thus merit a comparison on their own. Next, there was the challenge of disambiguation: does a name really refer to the city in question or perhaps only denote a phenomenon, procedure, or concept named after the city? For example, there are at least fifteen cities called Berlin or Rome (Pouliquen et al., 2006). The uniform solution was to include both the name of the city and the respective country (both as a noun and adjective) in the retrieval. It is possible that an article is about the city, but the abstract (or keywords) will not include the country name. This is a limitation. However, the procedure of including countries is consistent because the location by country maximizes search precision (Overell & Rüger, 2008) due to the absence of ambiguities (Volz et al., 2007).

We compared, on the same principles, major European Union (capital) cities: Amsterdam (constitutional capital), Athens, Berlin, Brussels, Bucharest, Budapest, Copenhagen, Madrid, Prague, Rome, Stockholm, Vienna, and Warsaw. Accordingly,

Table 1: City name occurring in the title in intersection with the respective country, and the number of records.

TITLE(city)	Total	*TITLE-ABS-KEY(country-n. OR country-a.)*	*TITLE(city) AND TITLE-ABS-KEY(country-n. OR country-a.)*
Berlin	11,747	Germany OR German	3,778
Madrid	4,868	Spain OR Spanish OR Spaniard	2,954
Rome	7,249	Italy OR Italian	2,411
Warsaw	3,065	Poland OR Polish OR Pole	2,071

we coupled each city with the respective country noun (*n.*) and country adjective (*a.*). Two terms were usually enough, with some exceptions (Holland/Dutch/Netherlands, Denmark/Danish/Dane, etc.). Finally, we selected all (capital) cities that returned more than 2,000 articles (*ar*) or review articles (*re*), with the respective city in intersection with the corresponding country. The search statement was thus designed as follows:

(TITLE(city) AND TITLE-ABS-KEY(country-n. OR country-a.) AND DOCTYPE(ar OR re) AND PUBYEAR < 2020

The cities meeting the criteria were Berlin, Madrid, Rome, and Warsaw (Table 1). We do not provide the demographic statistics on these cities because these are available in many data sources (e.g., in Internet 1). According to different urban typologies (cities as local administrative units, functional urban areas, metropolitan regions, etc.), Berlin, Madrid, and Rome are fairly comparable regarding their size and demographics (depending on typology). Warsaw is somewhat smaller. These cities were also ranked very similarly in studies by Csomós (2017) and Hanna and Rowley (2019).

Table 1 also provides the number of all city names (column 2: Total), in addition to the numbers applicable in this study (column 4). For example, there are 11,747 and 7,249 articles with *Berlin* and *Rome* in the title, respectively; for Madrid and Warsaw, this share is lower. Berlin, for example, frequently has only figurative historical and political connotations (e.g., *Berlin Wall*). Rome also carries references to antiquity. Thus, the city name alone is not suitable for retrieval because the names have special uses, such as metonymy or polysemy.

We also examined major non-capital cities. Munich and Hamburg returned just over one thousand articles each, and Milan about 1,270. The endonym *Milano* retrieved additional records. It seems that the endonym has also acquired international use. This is not the case with Rome (Ital. *Roma*) because the term *Roma*, in relation to Italy, invariably refers to the ethnic group. The major metropolis Barcelona, which features prominently in research publications, returned almost 2,500 articles. Here we also included Catalonia/Catalan. However, this city was not included in our study because we limited our study to one city per country. In this respect, Madrid was somewhat more in line with the other three cities, which are also capital cities.

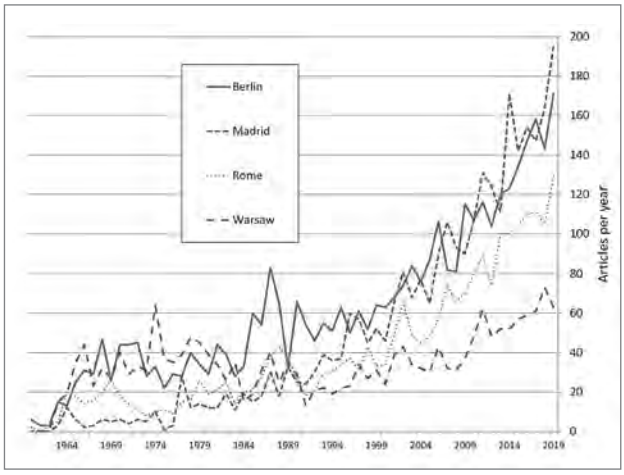

Figure 1: Yearly growth of articles referring to the cities (illustration: authors).

3 Results and discussion

3.1 Yearly growth of articles

The increase in targeted articles has been steady, with some fluctuations (Figure 1). Before 1960, such articles are rare. Articles about Madrid show the most vigorous growth. Warsaw and Berlin present similar trends at first. The steady beginning, and then some decline (Warsaw) or surge (Berlin), only stabilizes (with an upward trend) in the early 1990s, likely on account of "normalization" of political situation in central and eastern Europe.

The once-divided Berlin reflects contributions from both German states: the Federal Republic of Germany (West Germany) and the German Democratic Republic (East Germany). The place of publication cannot be ascertained very precisely given the weak and deficient Scopus inclusion of country data (discussed later in this study). As inferred from journal titles (Table 2), the high counts in mid 1980s are not attributable to special events because most are mapped to the subject area of medicine. Similar applies to Warsaw. The still weak standings of Warsaw in the last decade likely reflect the economic

Table 2: Number of journal articles by top five journals.

City and journals	Articles
Berlin	
Zeitschrift fur arztliche Fortbildung	67
Gesundheitswesen	38
Berliner und Munchener tierarztliche Wochenschrift	36
Deutsche Gesundheitswesen	35
Geburtshilfe und Frauenheilkunde	28
Madrid	
Estudios geograficos	68
Revista espanola de salud publica	67
Boletin geologico y minero	42
Enfermedades infecciosas y microbiologia clinica	39
Revista clinica espanola	38
Rome	
Nuovi annali d'igiene e microbiologia	55
Annali di igiene medicina preventiva e di comunita	53
Annali dell istituto superiore di sanita	33
Medicina nei secoli	31
Atmospheric environment	23
Warsaw	
Przeglad epidemiologiczny	113
Roczniki panstwowego zakladu higieny	101
Archiwum historii medycyny	64
Polski tygodnik lekarski	63
Przeglad lekarski	53

situation and lower research and development funds available to research institutions in transition (Odrobina, 2016).

3.2 Journals and articles

Subsequent records cover all Scopus articles up to 2019 (pub-year < 2020). Journals show strong "national" patterns. Most of the top five journals have an original title in the national language, although many also publish articles in English. In addition, most are mapped to medicine (Table 2). The journal names in Table 2 are spelled out as in Scopus. All consecutive words are lowercased for consistency.

Figure 2 shows journals that each published at least four articles on the subject of our study. The five principal journals (from Table 2) are located at the beginning (left side) of the *x*-axis. The number of articles per journal quickly decreases. The very long tail of journals that published three, two, and one article is not shown. Such inversely proportional patterns are very similar for all cities and exhibit clear characteristics of power laws. Incidentally, such power law patterns were also found in other processes contingent on the scaling functions of city size (Bettencourt et al., 2007).

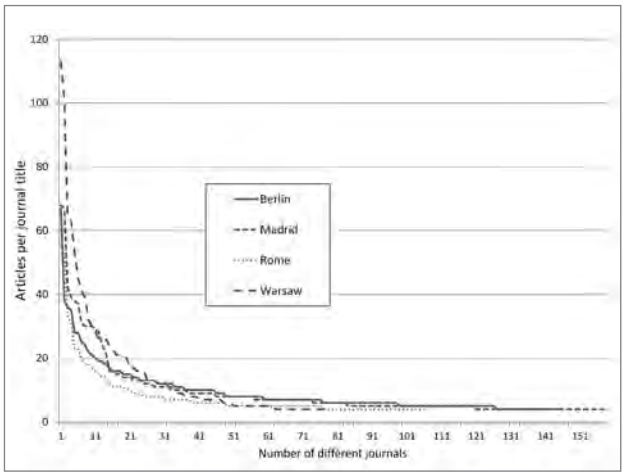

Figure 2: Inversely proportional decreasing number of different journals and articles per journal (illustration: authors).

Table 3: Four cities as sites or topics in article titles, authors' affiliation, language of articles.

		Articles		Articles		Articles		Articles
Site/Topic	Berlin	3,778	Madrid	2,954	Rome	2,411	Warsaw	2,071
Affiliation	Germany	1,817	Spain	2,239	Italy	1,315	Poland	972
	Berlin	*1,479*	*Madrid*	*1,943*	*Rome/Roma*	*1,190*	*Warsaw/Warsz.*	*907*
	US	271	US	160	US	185	US	72
	UK	186	UK	98	UK	137	UK	40
	France	55	France	60	France	65	Germany	38
	Canada	51	Germany	38	Germany	50	France	15
	Netherlands	49	Italy	38	Spain	38	Italy	9
	Switzerland	47	Portugal	23	Australia	26	Netherlands	9
	Austria	40	Canada	17	Netherlands	21	Belgium	8
	Italy	34	Mexico	16	Canada	19	Russian F.	8
	Australia	32	Australia	15	Belgium	17	Czech R.	6
Language	Ger	1,772	Spa	1326	Ita	609	Pol	1,206
	Eng	1,876	Eng	1,678	Eng	1,648	Eng	799
	Eng in 1995	*0.41%*	*Eng in 1995*	*0.43%*	*Eng in 1995*	*0.71%*	*Eng in 1995*	*0.59%*
	Eng in 2019	*0.79%*	*Eng in 2019*	*0.69%*	*Eng in 2019*	*0.94%*	*Eng in 2019*	*0.86%*

We also checked some citation patterns. The journals in the same linguistic group cite similar journals quite strongly. Other studies have also detected effects of geography and distance on knowledge flows (Pan et al., 2012; Abramo et al., 2020). In our case, we assume this to be attributable to the subject addressed: the city featured in the article title and was thus relevant in a specific geographic context. However, has the representation of journals been steady throughout the years?

3.3 Country and city of affiliation, language of articles

Roughly half of all articles were (co)authored from the country of the respective city (Table 3). Moreover, between 80 and 90% of articles from these countries were co-authored by authors from that particular city. However, US and UK authors hold second and third place everywhere. Similar US/UK dominance was also reported in some other studies (Okorie et al., 2014). Although the most important share of all articles was published in national journals, recent attention has shifted toward international publishing, although national journals still hold top place. Shares of national languages have been decreasing, English having by now taken the principal role.

Not all articles are supplied with author-country information. The numbers for Poland should have been much higher. For example, many of the 1,206 Polish-language articles were published from an "undefined" country. Such limitations have also been reported in WOS (Liu et al., 2018), but this seems to be much more considerable in Scopus, especially for older documents. The omission of a county is much more critical than omission of language (Jacsó, 2009). We also detected deficiencies with city data. The affiliation-city field failed to correctly detect the city. Therefore, we needed to employ the complete affiliation field where, for example, Rome was frequently spelled out only in Italian. Warsaw was spelled out in Polish, but in various adjective/noun cases.

Co-authorship links are not very strong (Figure 3). Weak co-authorship between countries in Europe was also detected by Jokić et al. (2019). However, the US and UK are similarly linked with all countries. Visualization is thus in line with the numbers in Table 3. Articles from Spain are, on average, more recent (marked with a darker shade), and from Poland older (marked with a lighter shade), which is also in line with the data in Figure 1. In the case of Germany, we needed to construct a thesaurus in order conflate different variants. In the database country field, there were also *ddr* (Germ. *Deutsche Demokratische Republik*), *frg* (*Federal Republic of Germany*) and *west ger* (*West Germany*).

3.4 Subject areas

Figure 1 presents yearly progress, but we wished to see how this was reflected across the different research fields. Namely, research disciplines possess diverse publication patterns, and therefore journals are mapped to different subject areas. The journals in this study were mapped to twenty-seven Scopus subject areas. The patterns of scatter are remarkably similar, the top five categories being the same for all cities. Medicine is predominant, and the social sciences are ranked second. However, counts of research areas must not be generalized

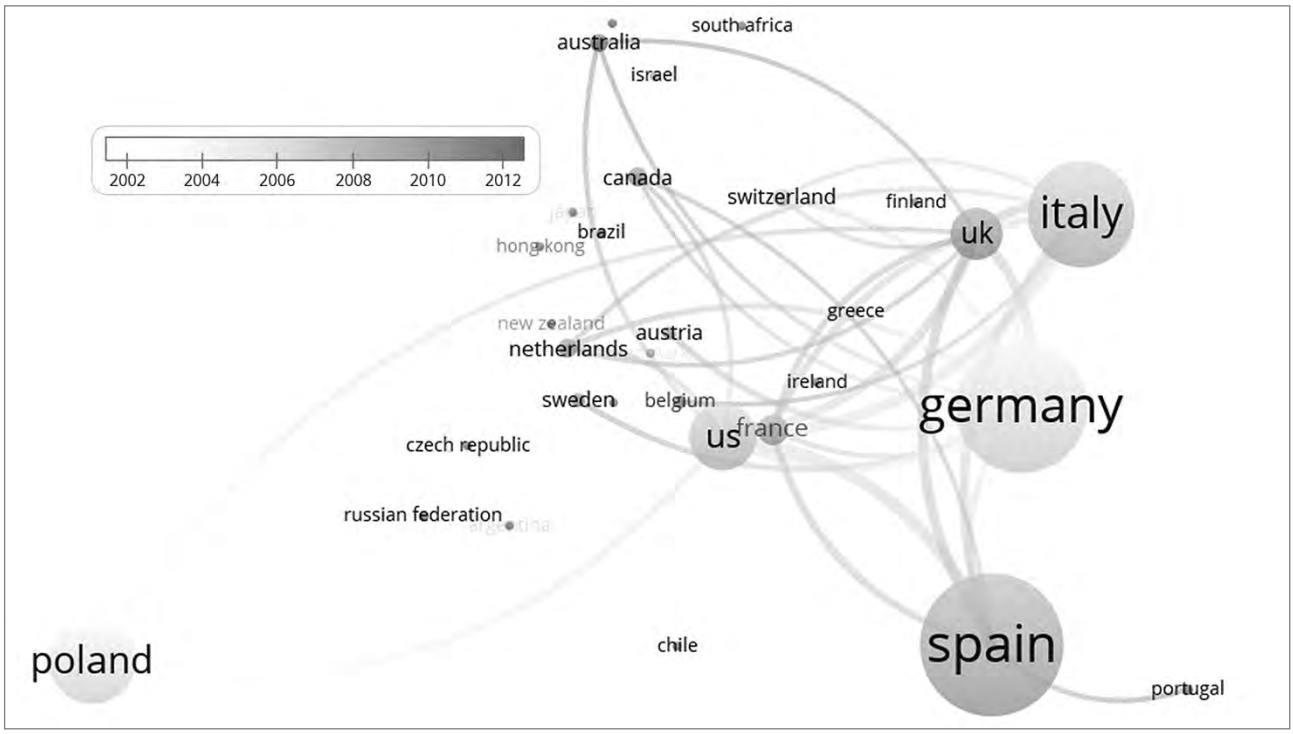

Figure 3: Co-authorship in articles by country of authors' affiliation (illustration: authors).

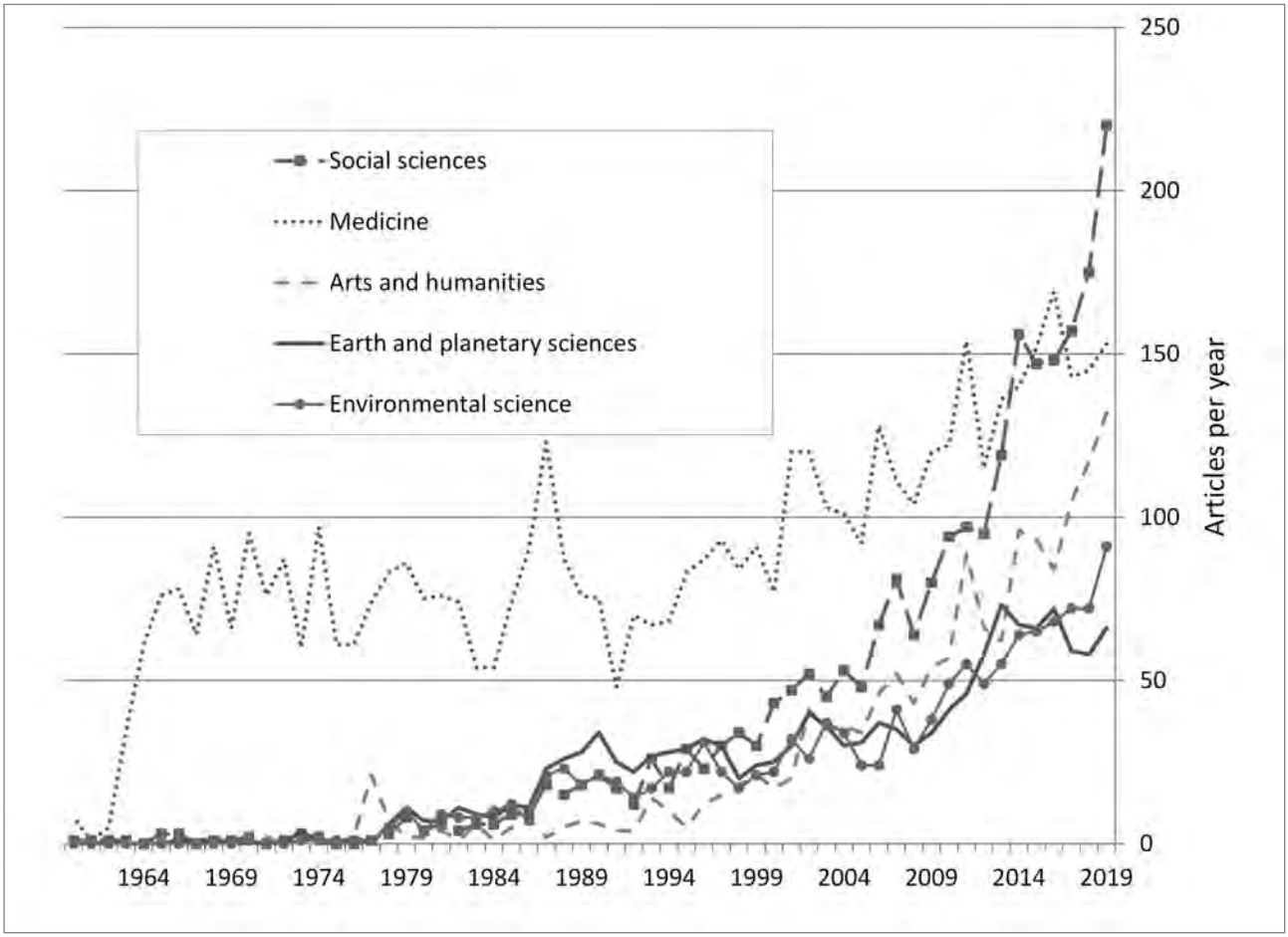

Figure 4: Growth of articles per Scopus subject area (illustration: authors).

too much because one journal can be mapped to several areas or to other areas than what one might expect (Hočevar & Bartol, 2016). Figure 4 (based on yearly growth) reveals detailed patterns: medicine has been overtaken by the social sciences for all cities. The category arts and humanities has also been progressing. Here one also needs to take into account the specifics of publication in "basic" disciplines and "strategic" disciplines (van Rijnsoever & Hessels, 2011). National research and development policies can also play a role in differences among different disciplines (Cugmas et al., 2019).

3.5 Clusters and time scale of related research topics

The last and the principal part of this study is based on text data (terms in abstracts) tackling the content of research taking place in the four cities. The terms (individual words and noun phrases) are arranged into clusters according to relatedness as detected by the software (we excluded terms from structured abstracts as well as the term *city*, which is found in virtually every abstract).

The first figure for each city (Figures 5, 7, 9, and 11) presents clusters of related and interconnected terms indicating research areas and topics. The circles representing associated terms are marked by a distinctive shade for each cluster. The second figure (Figures 6, 8, 10, and 12; the time scale of research topics) shows the same terms, but focuses on development in time. The darker (the more saturated) the circle, the more recent the average year. Circle size indicates the relevance of a term. The strength of links within each cluster and between clusters is shown with lines. These terms provide a general idea of research emphases and approaches. Each map consists of tens of thousands of terms, and so only selected labels are visualized (to avoid overlap), usually terms with at least ten occurrences.

Employing the same principles for all maps facilitates comparison on the same basis. The number of terms varies among the cities, depending on the number of articles as well as city-specific terminology. Identification of clusters, the timescale of averages, and the number of terms are defined by the algorithms explained in the program manual (van Eck & Waltman, 2019). The interpretation of clusters (i.e., research subjects) employs the categorization scheme of Scopus subject areas. All maps are based on articles from the complete Scopus database up to 2019 (pubyear < 2020).

3.5.1 Berlin

The visualization program identified 47,000 terms, which occur at least ten times in 3,778 articles (Figures 5 and 6). Only the most relevant terms are shown. Three different clusters can be noticed. The strongest cluster (on the right) pertains to medicine and related research. As shown in Figure 4 (previous subsection), medicine was especially strong in earlier periods, hence some strong accents of light shades (Figure 6). This figure complements Figure 5 in terms of time tendencies. The more general terms occur more frequently and are thus larger. Topics of more recent importance can be noted to the right (darker shades). Because they are recent, they occur in smaller numbers (hence smaller circles).

The lower left cluster (Figures 5 and 6) presents topics that pertain strongly to the social sciences, as well as arts and humanities, business, economics, and other related areas. Even though these are separate subject areas in Scopus, it is apparent that the research is interlinked, given the position in the cluster. Considering the recent advance of the social sciences, this cluster is expected to grow. The recent accents (darker shades) are obvious, and they include the terms *activist*, *debate*, *urban space*, and *urban development*. The most recent terms in this context are small and overlapping, and thus not visible (e.g., *gentrification*). Links between different clusters also exist. For example, at the bottom centre of Figures 5 and 6 are the terms *medical education* and *public health service*. This is an area of convergence between the medical and social sciences (i.e., interdisciplinarity).

The upper (smaller) cluster is defined by environmental science, followed by Earth and planetary sciences, engineering, agricultural and biological sciences, and so on. Some frequent terms can be highlighted: *agriculture*, *contamination*, *species*, and *water*.

Some contexts in which Berlin is highlighted specifically "as something", as used verbatim in article titles, are the following: *Berlin* as: *a case study*, *an example*, *a capital*, *a model*, *a ... resort*, *a location*, *a destination*, *the virtual centre*, *the site*, *a creative field*, *a relic border*, *a natural and socioeconomic system*, and so on. Such contexts usually pertain to the social sciences and to arts and humanities, and they can also be figurative. In other (more frequent) contexts, Berlin appears as a "matter-of-fact" place of research: "during summer in Berlin," "micro-geographic analysis for Berlin," and so on.

3.5.2 Madrid

The maps are based on 2,954 articles and 47,000 terms (very similar to Berlin). The program identified five clusters (Fig-

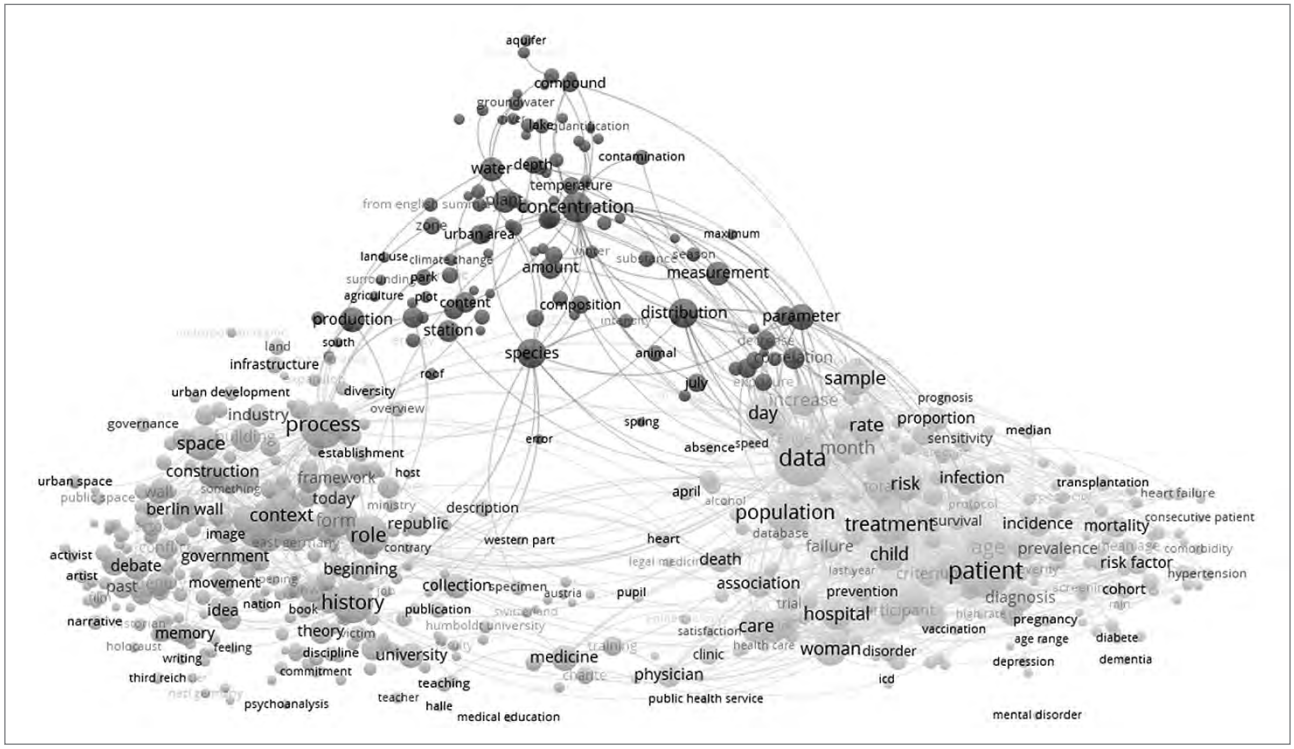

Figure 5: Clusters of interrelated research areas and topics (Berlin) (illustration: authors).

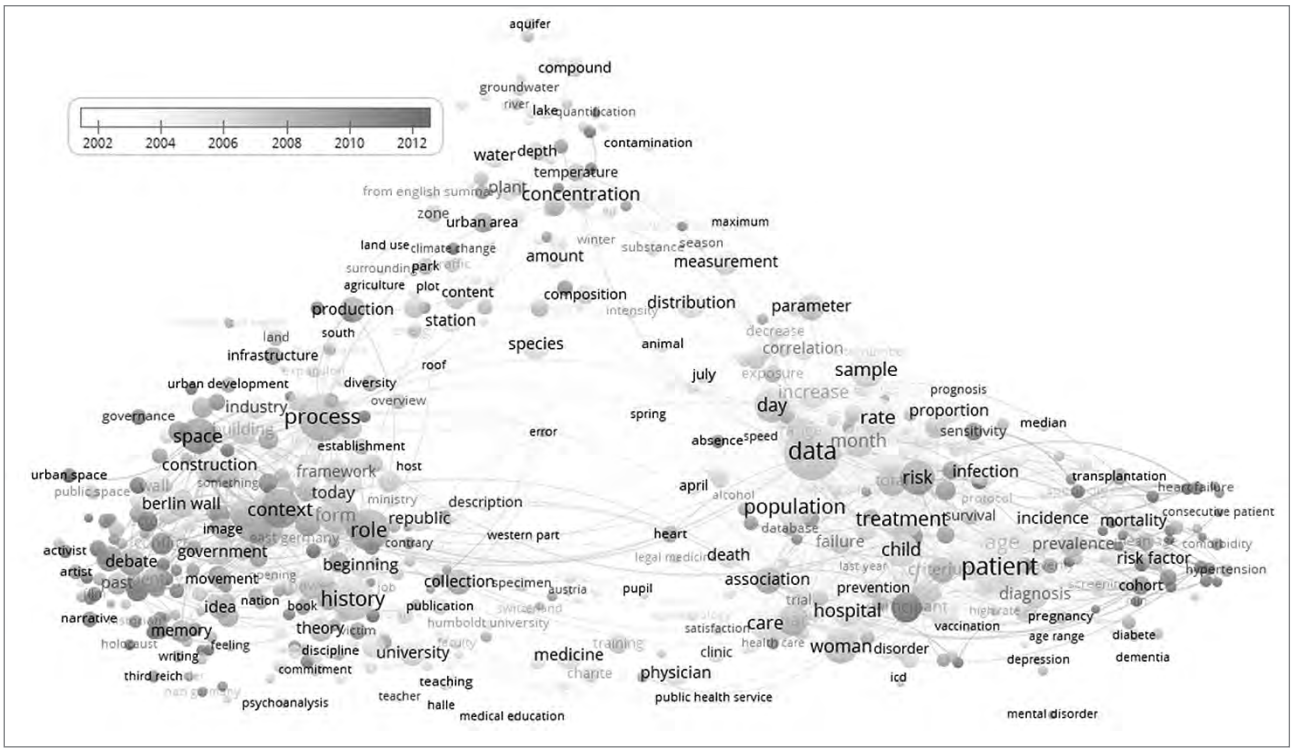

Figure 6: Time scale of research topics (Berlin) (illustration: authors).

ure 7) with two distinguishable (interlinked) clusters related to *Medicine* (right side of the map). The lower medical cluster involves epidemiology, microbiology (*disease, infection ...*). The upper medical cluster is more diverse, involving *age, man, woman ...* and also *blood pressure, diet, food*. Just as at Berlin, the educational issues in *Medicine* show connections with the *Social Sciences* (bottom centre). *Social Sciences* (lower left) are again more recent and connected with *Arts and Humanities*. The two upper left clusters are marked by *Earth and Planetary Sciences*, *Environmental Science*, and also *Agricultural and Biological Sciences* and *Engineering*, in various interconnections. The left-most cluster is located closer to the *Social Sciences*

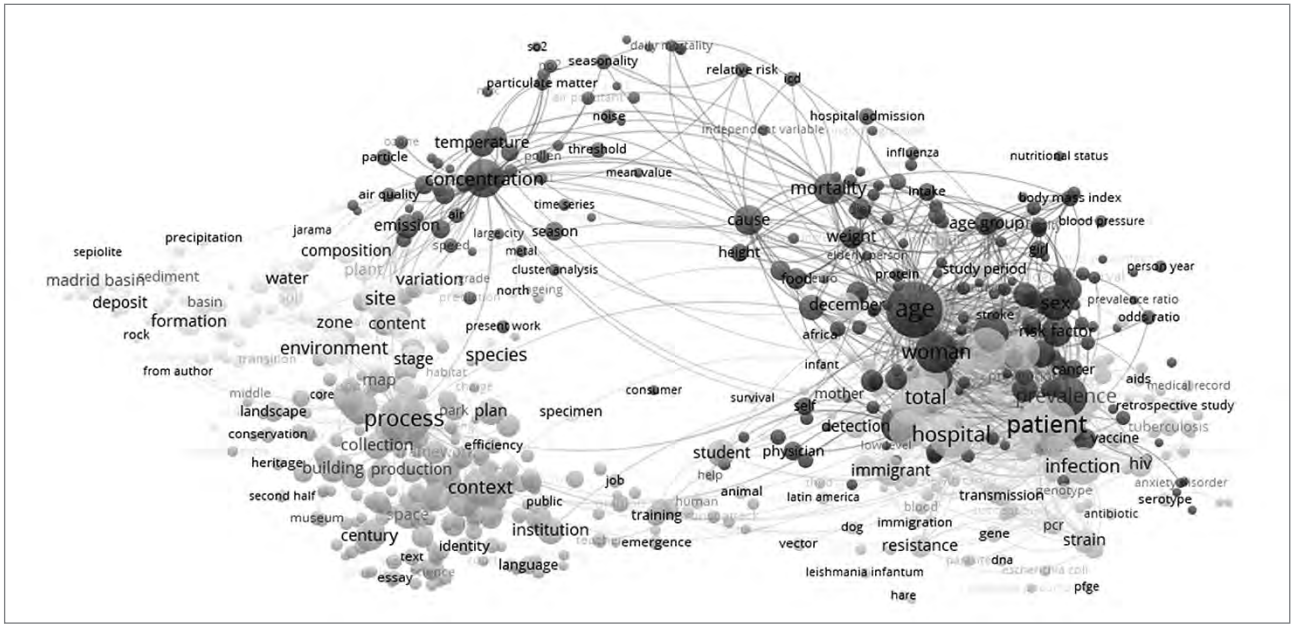

Figure 7: Clusters of interrelated research areas and topics (Madrid) (illustration: authors).

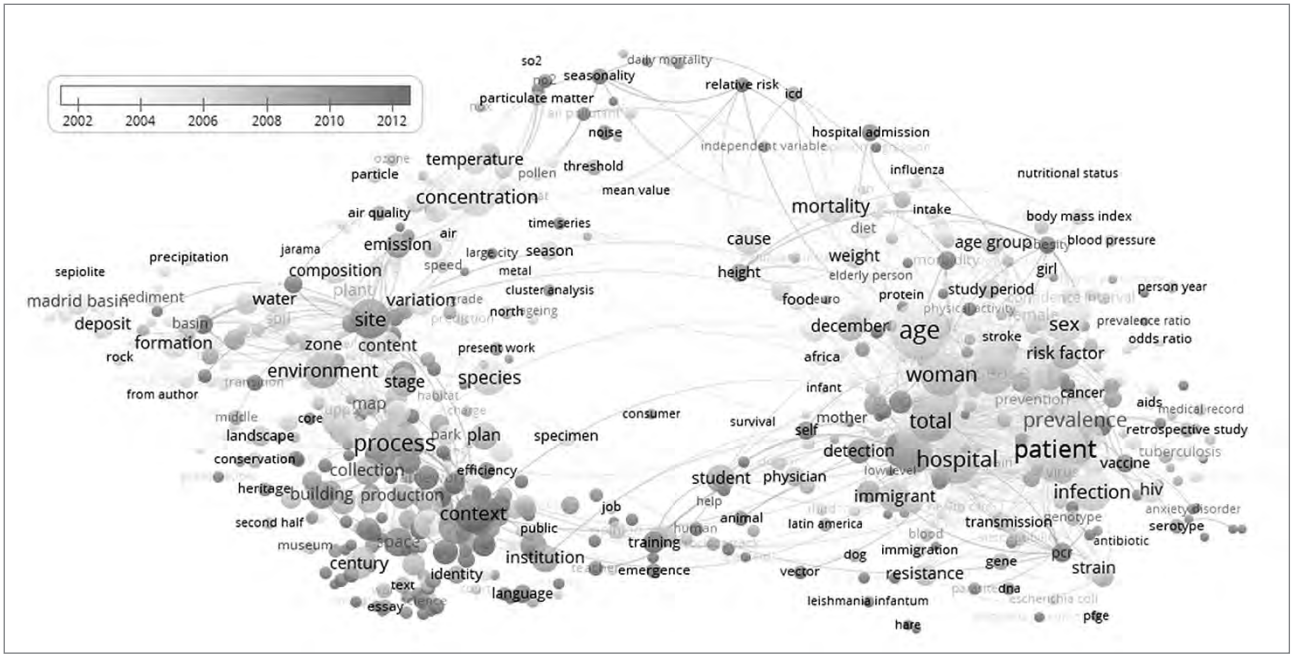

Figure 8: Time scale of research topics (Madrid) (illustration: authors).

below and contains, on average, the oldest topics (light shades, farthest left, Figure 8). We can note a dense "sub-cluster" of geological topics. Related environmental-biological topics are more recent. The upper cluster is linked with environment and pollution. It is also connected with the upper medical cluster reflecting the impact on the health of city dwellers.

In the articles, *Madrid* appears as a case study, an example, a key factor in sustainable mobility, a liberation from, a communication *ecosystem*, *a mercantile and financing institution*, and *a place of research*, as indicated by article titles such as "Women living homeless ... *Madrid*", "Epidemiology and etiology ... *Madrid*", and "3D groundwater flow ... *Madrid* aquifer".

3.5.3 Rome

Rome returned 2,411 articles. The figures are based on 38,500 terms mapped to three different clusters (Figure 9), showing similar structure as the clusters at Berlin. Again, medicine was strong in earlier periods (right cluster, lighter shades, Figure 10). The lower left cluster (social sciences and arts and humanities) is again more recent, showing convergence with medicine in the area of education. Also at Rome, the upper-left

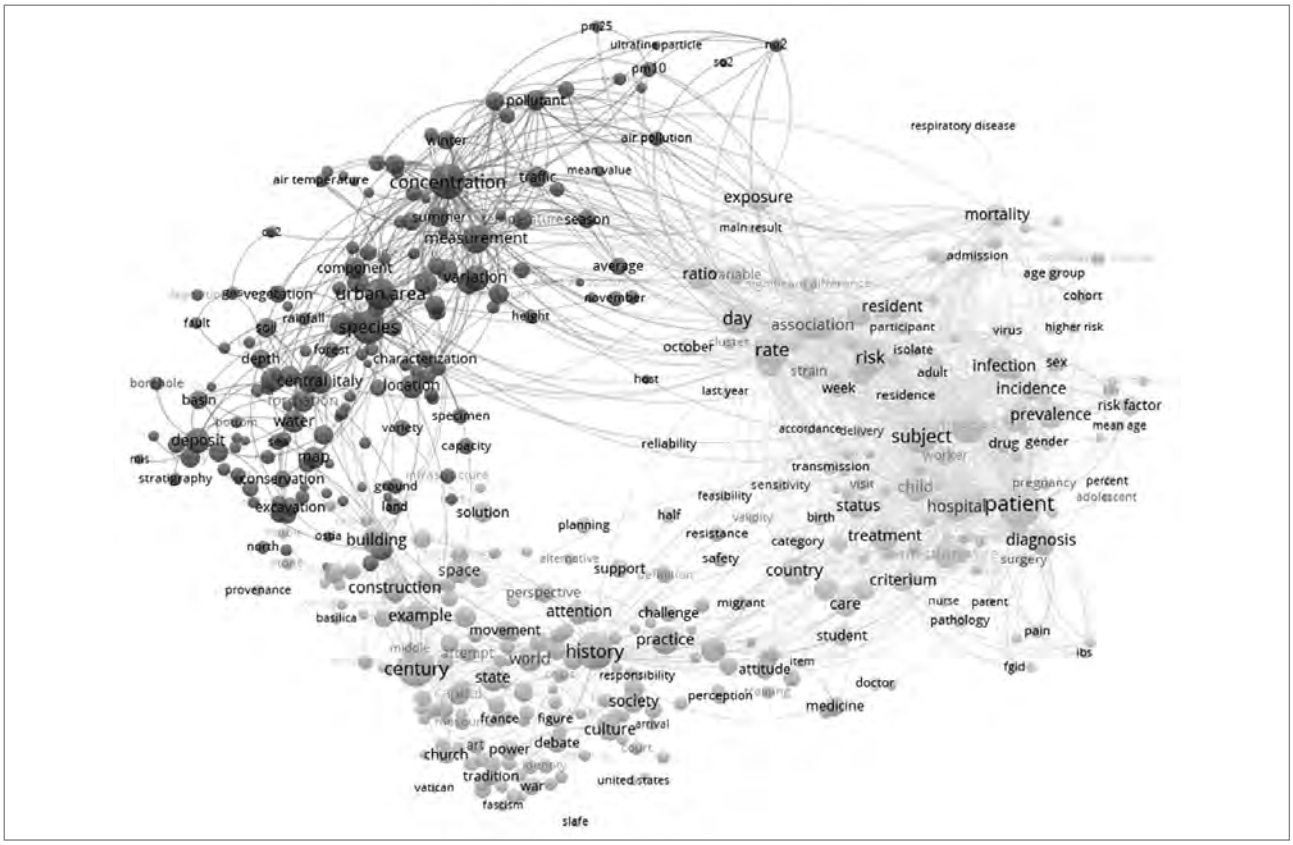

Figure 9: Clusters of interrelated research areas and topics (Rome) (illustration: authors).

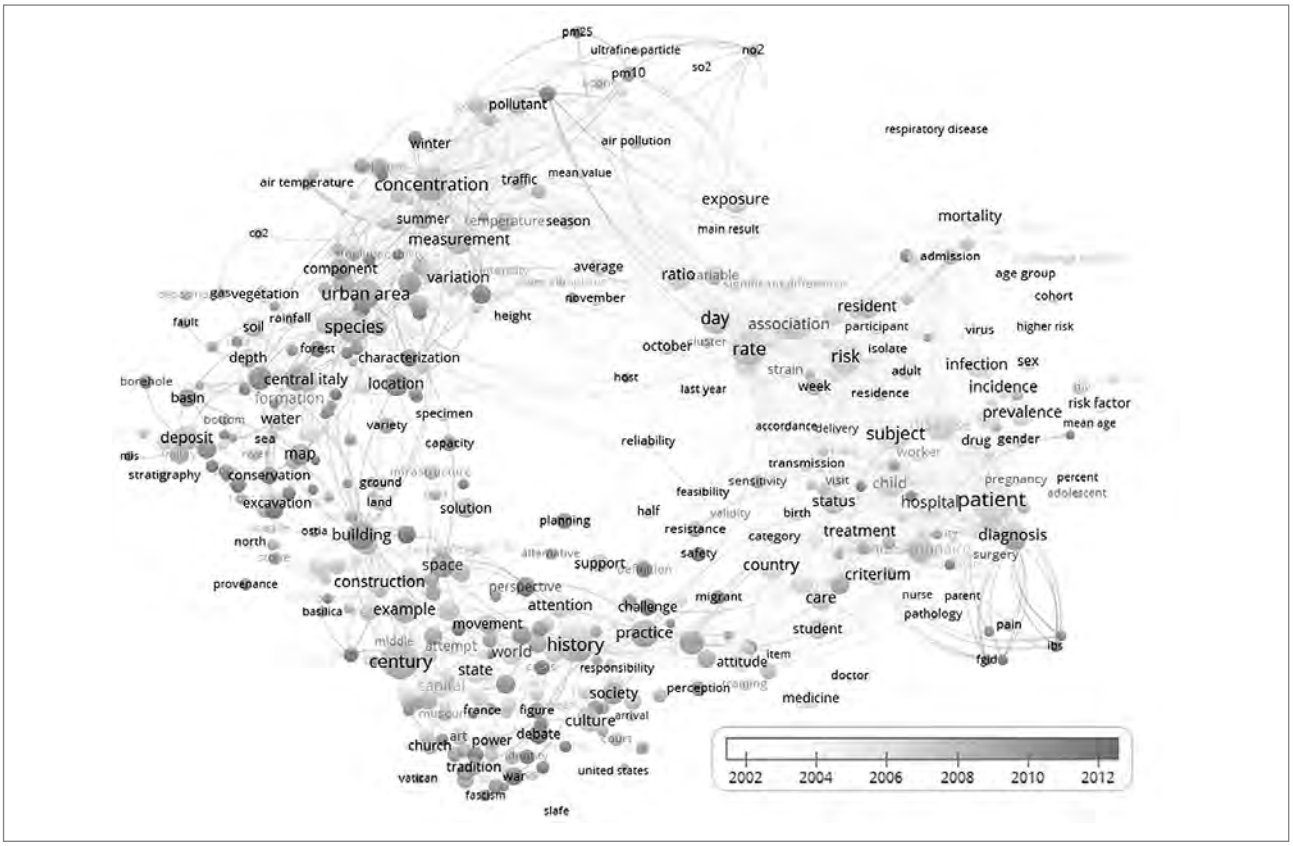

Figure 10: Time scale of research topics (Rome) (illustration: authors).

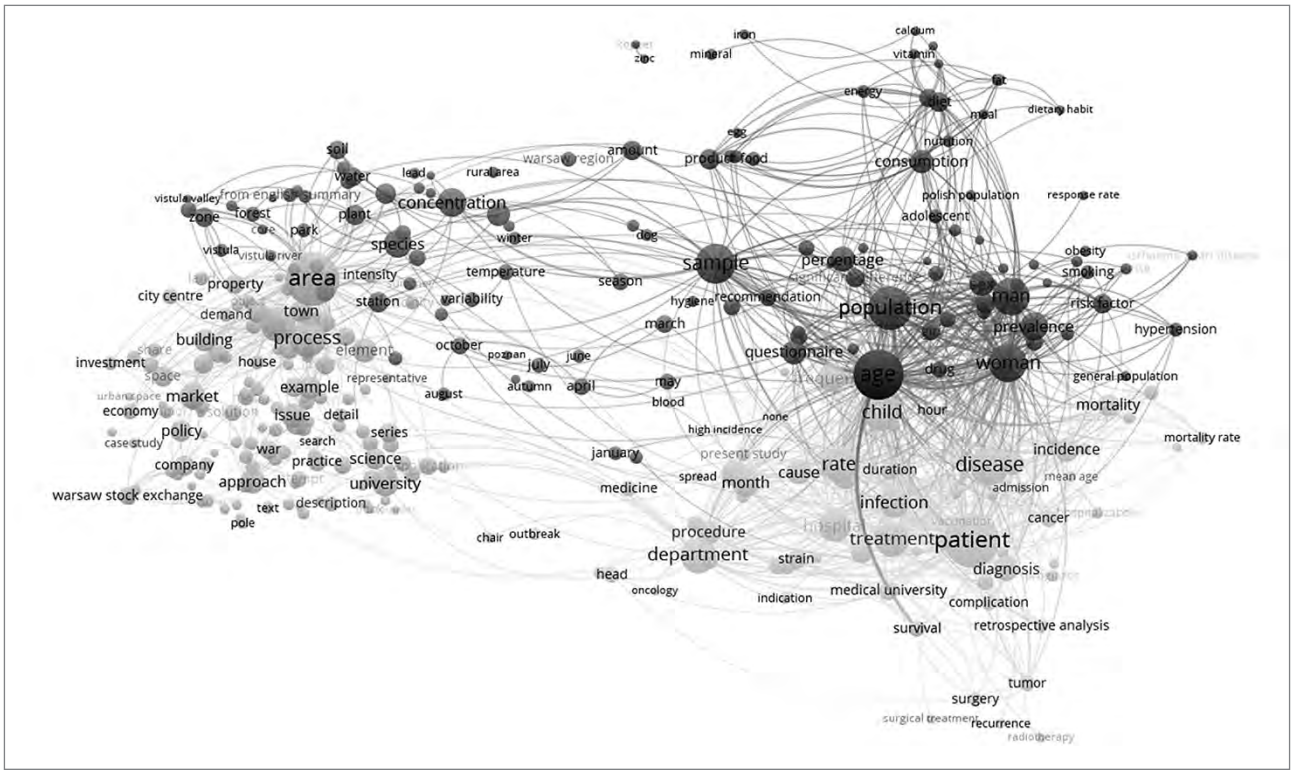

Figure 11: Clusters of interrelated research areas and topics (Warsaw) (illustration: authors).

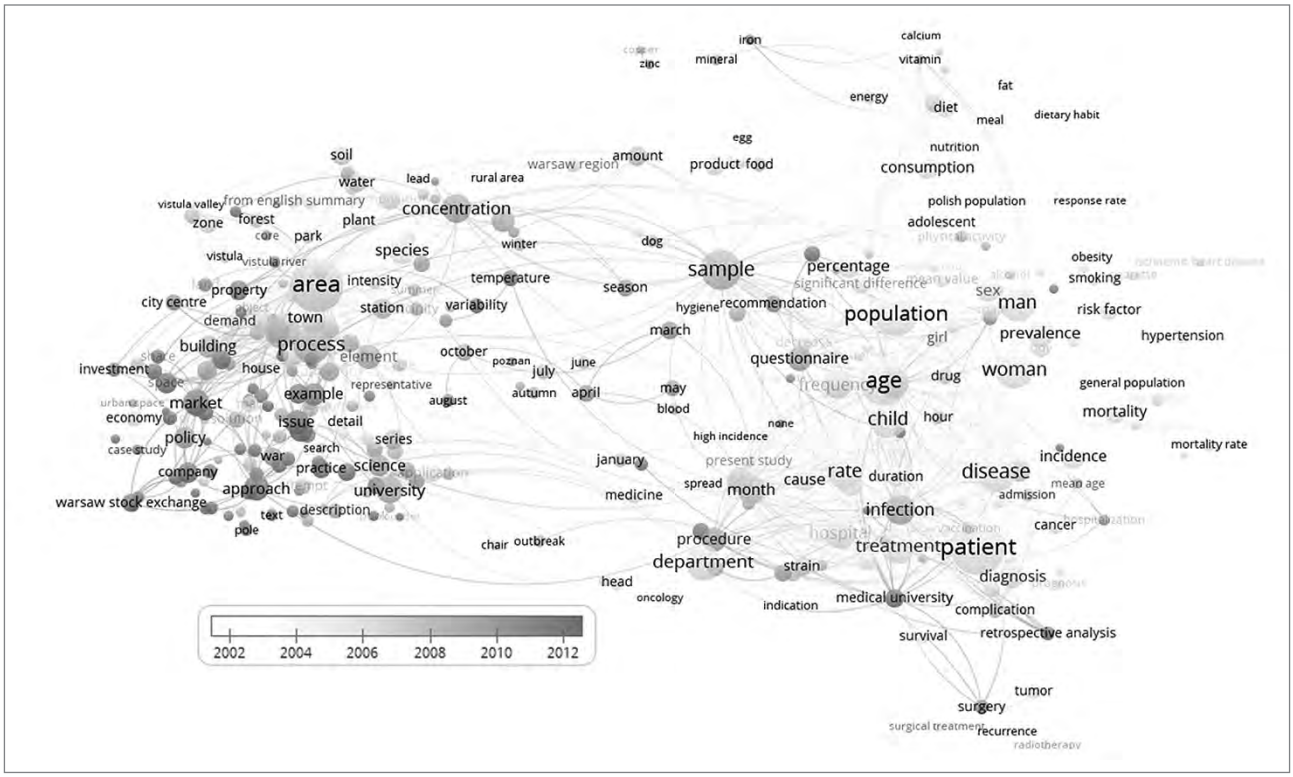

Figure 12: Time scale of research topics (Warsaw) (illustration: authors).

cluster is strongly linked with Earth and planetary sciences and environmental science, with terms such *conservation* and *excavation* located closer to the social sciences and the arts and humanities. At the top, there are topics related to climate and pollution, which lean toward medicine.

In the articles, *Rome* appears as *a window of observation*, *a full urban experience*, *a stage*, *the source*, *"Spanish Avignon"*, *a capital*, *a memorial landscape*, *a destination*, and *a place of research*, as indicated by article titles such as "Recreational drugs ... *Rome*", "... Smart homes network in *Rome*", "Combined magnetic, chemical ... anthropic context in *Rome*", and "Urban regeneration process ... *Rome*".

3.5.4 Warsaw

Warsaw is linked to 2,071 articles. The 24,000 relevant terms are mapped to four clusters (Figure 11). Medical topics are contained in two (interconnected) clusters. The lower-right cluster reflects, for example, epidemiology (with the terms *disease* and *infection*). The two clusters to the left are somewhat interconnected. Many terms revolve around the generic term *area* with links to both clusters. The lower left cluster contains more recent research fronts (darker shades, Figure 12), which can again be labelled as related to the social sciences (and to an extent to the arts and humanities). The upper-left (smaller) cluster shows connections with Earth and planetary sciences, environmental science, and agricultural and biological sciences. These topics are, on average, older (lighter shades) than topics in the lower left. Average medicine-related topics are also discussed early on the time scale. This corroborates our previous assumption that the cumulative data in Table 3 no longer reflect the current situation of research articles.

In the articles found in Scopus, *Warsaw* appears as *a commuting centre*, *an air transport node*, *an example*, *a chief town*, *an endemic focus*, and *a place of research*, as indicated in titles such as "Local institutions of culture as urban ... *Warsaw*", "Short-term impact of PM2.5, PM10 ... *Warsaw*", "Postmodern architecture under socialism ... church in ... *Warsaw*".

3.6 The four cities in perspective

The aim was not to evaluate and compare cities on the basis of an author's affiliation, but to examine cities as objects (topics) and sites (locales) of research in order to map the multiple functions performed by heterogeneous agencies (actors) of a city as reflected in scholarly journals.

The study was based on the evaluation of the role of four capital cities (Berlin, Madrid, Rome, and Warsaw) that have experienced some differences in the more recent historical context. These cities represent specific geographical and linguistic settings, ranging from the western/southern Mediterranean to central/eastern Europe. Nonetheless, the topics covered in the articles are remarkably similar across the four cities, which was our hypothesis about the similarities in disciplinary development. The clusters of topics clearly show not only comparable accents, but also similar research trends over time. The trends show a growing interest in city-related social issues.

The analysis included not only text data (disciplinary development) but also bibliographic data (scattering across publications). National and regional journals are important for all four cities. One might dismiss such journals as less important in the context of high-ranking international journals, but such journals can still provide an important avenue for presenting findings based on specific cities. This can complement research published in international studies that focus on general summaries, possibly with multiple authorship, in which individual contributions and local subject contexts are less clear. Similarities are also reflected in co-authorship and country of affiliation. The majority of articles are published by authors from the respective city. However, international collaboration is strongest with the authors from the UK, US, and France. Again, these patterns are very similar across all four cities.

4 Conclusion

The study found that city-centred research is being conducted in a few fairly well-defined major disciplinary clusters. Whereas medicine, which used to dominate, has stagnated, the social sciences now show the strongest presence. The arts and humanities have also made considerable progress. Less dynamic but steady is the growth of subjects in environmental science, and Earth and planetary sciences. Although journals have always played an important role in life sciences and related disciplines, it seems that journal articles have by now also been fully embraced by the social sciences. The results of different disciplines cannot be directly compared with each other because there are many factors that influence publication behaviour in specific disciplines.

Because the publication patterns are so similar for all four cities studied, our tentative guess is that this could be true for many other cities as well. In this respect, different cities of different sizes could also be compared, which remains to be investigated.

What will the future accents and research priorities in cities be? This study assessed the state of research at the end of 2019, just before the health emergency caused by coronavirus 2 (SARS-CoV-2) or the Covid-19 pandemic. In many cases, cities were particularly affected, although not all in the same way. This is where regional and national journals can play an im-

portant role. The connections and research links may generate different and more innovative trends in interdisciplinary cooperation, perhaps between the social sciences and medicine, and also involving other disciplines. True interdisciplinarity has been weak to date, but it could create new relationships. This needs to be pursued further.

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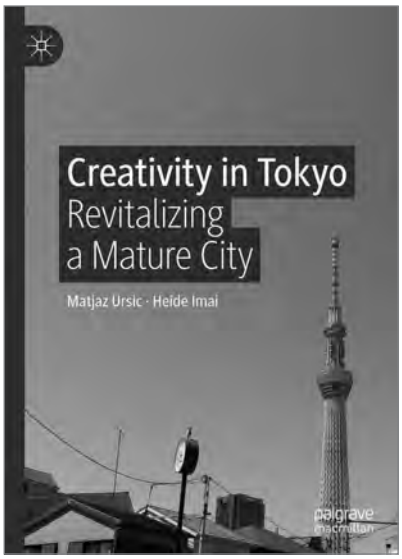
Klemen SENICA

A city at a turning point



Title: *Creativity in Tokyo: Revitalizing a mature city*
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Tokyo is a megacity that, in the seemingly distant pre-Covid-19 era, was globally considered a metropolis of haute cuisine, as well as a global hub in many other respects, thus attracting people from around Japan and the globe for shorter or longer stays. As a result, Tokyo is also a megacity that, due to ongoing development, is changing so rapidly that its transformation often surprises even the locals if or when they manage to get off the beaten track of their everyday lives. In their book *Creativity in Tokyo: Revitalizing a mature city*, the spatial sociologist Matjaž Uršič and the cultural studies scholar Heide Imai discuss how Tokyo residents (creatively) respond to the rapid changes and the fact that, in the race to become a major global financial center, the city is being flooded by non-places.

In the spirit of modern scholarly volumes, each of the book's nine chapters can be read as an independent and complete whole, as implied by the decision to provide references at the end of each chapter. Chapter one presents the theoretical and methodological research premises, the authors articulating their substantial analytical challenge as follows: "We attempt to connect both bottom-up (local community) and top-down (creative class) approaches for a more holistic, albeit still limited, insight into how creativity is formed in Tokyo" (p. 7). In studying creativity, they do not focus on "the output, or the creative product, but rather on the process that either ignites or obstructs urban creativity" (p. 6). They combine this analytical approach with the ethnographic method of participant observation, semi-structured interviews, and narratives, providing fresh insight into Tokyo's recent urban development.

Chapter two first highlights the pressing social issues of contemporary Japan, a country that continues to stagnate economically after the burst of the real estate and stock market bubbles in the early 1990s. As a result, both the country and the city are dealing with a decline in birth rates, population ageing, a labour force shortage, and other issues. In this respect, the authors point out that Tokyo's creative ecosystems cannot be entirely explained with international hub theories as these ecosystems are defined by specific local features. One such special feature is that, despite considerable investment in the development of innovative technologies, Japan has found itself struggling to sell its products in the global market despite their quality.

In chapter three, Uršič and Imai discuss the relocation of the inner Tsukiji Fish Market, a once popular tourist site and a cultural institution that "symbolically, historically, and socially represented one of the most important local consumption spaces in the city" (p. 62). However, because Tokyo's Ginza district, where this market was located, is subject to substantial transformation (i.e., gentrification), the central and best-known part of the market was relocated to Toyosu Island in Tokyo Bay, not without opposition from the locals.

Chapter four raises the issue of precarious work, although without a broader critical examination of the neoliberal economic model, which has predominated in Japan since 2000 and is the legacy of the extensive structural reforms of Junichiro Koizumi's governments and his political-economic philosophy of "no pain, no gain", which still deprives many young creatives of social and economic security and subsequently forces them into insecure forms of employment. Nonetheless, the authors argue that the official discourse that advocates the need for employment flexibility of creatives today actually "mystifies the upsides of flexibilization, while neglecting or ignoring the collateral damage found in the precarization of the working and living conditions of small creative actors" (p. 91). Even though, in the big picture, the Japanese economy seems to be largely composed of multinational corporations, its actual structure is different. In addition to

external factors, the rapid economic development and expansion into foreign markets, especially in the automobile and electrical engineering industries in the second half of the twentieth century, were also or primarily facilitated by small and medium-sized enterprises. Over the past two decades, these have been much more exposed to the "invisible hand of the market" than before.

In chapters five to eight, the authors focus on the Tokyo neighbourhoods (e.g., Ichigaya, Okachimachi, Koenji, etc.) where they have conducted their field research during the past decade. The districts of Hikifune and Kyōjima are particularly interesting, having undergone many changes in recent years, whereas some of their parts still preserve the spirit of times past, specifically the Shōwa period (1926–1989). Kyōjima is one of the few areas in Tokyo that was not destroyed by the heavy American air raids at the end of the Second World War. Hence its many wooden buildings now cause headaches for the municipal and local administrations in this highly earthquake-prone city. Between 2008 and 2018, many young artists and entrepreneurs were drawn to this area, where they started renovating and transforming the old buildings for their creative purposes. Through interviews, the authors succeed in portraying the vibrant life of the area, to which a wide variety of creatives in the broadest sense of the word have moved from around and beyond Japan to pursue their creative ambitions. One of them is a Norwegian woman named Britt, who, together with Yamato-san, designs unisex denim yukata. According to the interviewees, their business is thriving.

The above raises the question of whether the Tokyo-based examples of good practice presented by the authors (e.g., p. 126) can also be applied to Slovenia. Instead of having the centres of even the largest Slovenian cities greeting visitors with vacant display windows covered in tattered "for rent" notices, surely the local political elites could seek to revive vacant spaces by offering them to creatives, artists, young entrepreneurs, and the like, charging only token rents. These would not only lend a new (artistic) character to the city centres, a move at least some of the locals would welcome with great enthusiasm, but also gradually begin attracting visitors and tourists from near and far, with positive implications for both the local and national economies. As highlighted by the authors, such regeneration of derelict urban areas usually also stimulates large chain stores – which in Slovenia tend to be concentrated in large malls on the urban outskirts – as well as others to return to urban centres. Although Slovenia certainly has the knowledge, skills, and creative ideas to achieve this, the parochialism of urban policymakers that gravitate toward flashy but ephemeral urban regeneration solutions seems to be an insurmountable obstacle. However, in the long run, such instant solutions developed without discussion with the wider local community and well-considered links with other places and stakeholders, at least at the regional level, only rarely provide added value to the (tourist) products and services that cities offer.

Despite its laudable focus on ordinary Tokyo residents, this book also has some weaknesses. What stands out in the introduction (pp. 1–2) is excessively apologetic self-reflection – inevitable in this field of study – which leads the reader to believe that, at a certain point in the process of writing the book, the authors (temporarily) yielded to the idea that only the Japanese can understand and objectively interpret Japanese culture. However, as many anthropological and sociological studies published since the 1990s demonstrate, Japan is not a culturally monolithic entity. Therefore even a native researcher might succumb to an ideological explanation of Tokyo's urban creativity or gain unconventional insight into the research question. Ultimately, in the globalized academic community, even native researchers usually employ Western theoretical approaches to explain typical elements of Japanese culture. Would the authors also have felt the need to question their foreignness if they had written about urban creativity in some other global city, such as London?

In addition, what may bother the reader somewhat is the book's Tokyo-centricity – which, on the whole and given the book's title, is understandable, but a somewhat broader analytical perspective would nonetheless have been an advantage. Tokyo is a vast and densely populated post-metropolis, but the claim that it has a population of 38 million (p. 22) is incorrect. The population of the administrative unit itself, officially known as the Tokyo Metropolis, which comprises twenty-three special wards (*tokubetsu-ku*), is officially just under 14 million, whereas the figure provided in the bookis, according to the latest data, roughly the population of greater Tokyo. However, this area also includes neighbouring Yokohama (Japan's second-largest city), an administrative part of the Kanagawa prefecture. In their field research, Uršič and Imai also focus exclusively on the neighbourhoods under the jurisdiction of the Tokyo Metropolitan Government. Moreover, it seems that the myriad of problems Tokyo is facing (p. 23) are nonetheless smaller than those of many other Japanese provincial cities and rural areas in general. The latter are affected by strong depopulation, resulting from the fact that young people in particular are moving to the metropolis and other megacities along Japan's Pacific coast in search of better education and employment opportunities. Even a brief visit to the interior of another nearby prefecture, Saitama, reveals the multi-layered social and economic impacts of this negative trend. Although the Covid-19 pandemic has slightly

halted it, it would be premature to conclude that it has also reversed it.

Despite the above, *Creativity in Tokyo* is highly useful and interesting read for spatial sociologists and anthropologists on the one hand, and for urban planners, architects, and specialists in Japanese studies on the other, helping them understand the fluid urban character of this city.

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Biography

Matjaž Uršič is an associate professor in the Department of Sociology and a research consultant at the Centre for Spatial Sociology, Faculty of Social Sciences, University of Ljubljana. He has worked at several East Asian universities, including Tokyo Metropolitan University, the University of Seoul, Soongsil University, and National Cheng Kung University. He is involved in various international research and development programmes to revitalize and change the role of urban centres, including H2020, RISE, the NRF Joint Research Program, Smart Urban Futures ERA-NET, and ERDF.

Heide Imai is an associate professor in the Faculty of Intercultural Communication, Senshu University, Japan. She has taught at universities in Japan, the UK, and Germany. She is currently engaged in several research projects on urban problems and policies in Japan, Korea, and China. Her publications include *Tokyo Roji* (Routledge, 2017) and *Asian Alleyways* (with Marie Gibert-Flutre; Amsterdam University Press, 2019).

Information about the book
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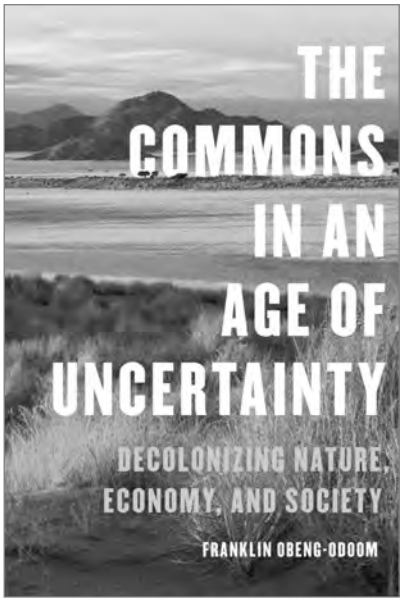
Domen ŽALAC

Fighting the socio-ecological crisis through commoning

Title: *The commons in an age of uncertainty: Decolonizing nature, economy, and society*
Author: Franklin Obeng-Odoom
Publisher: University of Toronto Press
Place and year of publication: Toronto, 2021
Number of pages: 264 + i-xv



Franklin Obeng-Odoom's *The Commons in an age of uncertainty* is conceived as an action plan to save today's political economy along the lines of redefining the ecological and political economy of the future. Placed at the forefront of the study presented in the book is an overview of two schools of thought – Conventional Wisdom (CW) and the Western Left Consensus – which the author contrasts with the Radical Alternative (RA).

According to Obeng-Odoom, environmental crises cannot be conceived of without political economy. Therefore, he divides his action plan into various detailed categorizations of nature and society. Through his many years of research presented in this book, he places himself at the intersection of the social and natural sciences. He combines these into a concrete premise: guidelines for community-based organization and definition of ownership relationships in the context of cities, technologies, oil, and water in order to fight against the socio-ecological crisis resulting from the neoliberalization of private ownership of land, its resources, and manmade products. He defends the thesis that today's treatment of nature and the environment is the result of an economic and political imperative of growth that over the past decades has striven toward radical exploitation of environmental resources based on a dichotomous understanding of public and private property.

The book first offers a methodologically dialectic analysis of the historical and ontological foundations of the concept of the commons as one of the elemental property categorizations, among which private property is merely one of the lower environmentally unsustainable ownership categories. The dominance of the concept of private property in public discourse is reflected in the predominance of private property, which has largely become the privilege of a narrow circle of individuals and transnational corporations (TNCs), which work against the needs of the wider society. Irresponsible and unfair management of the natural environment and its resources leads to a state of an obvious socio-ecological crisis at the global level. The reasons for this include growing social inequality, increasing migrations at various levels, global warming, spatial segregation of the population, and degradation of the urban living environment in urban slums. All these phenomena clearly indicate the environmental, social, political, and economic uncertainties today's society is dealing with. Nonetheless, the author highlights the fact that this uncertainty is not new. It is primarily its conception and experience that are different: they are increasingly atomized into individuals and their relationship between their own existence and the impact this has on the space and environment they live in. From the perspective of the humanities and social sciences, these uncertainties take the form of various anxieties and emotions, and pessimism toward the future. The author highlights two interconnected ontological approaches that influence the current discourse about common resources and the commons, and are covered by the paradigms of the Western Left Consensus (WLF) and Conventional Wisdom (CW) already mentioned above.

The author uses the first half of the twentieth century – that is, the period of gradual reorganization of industrial

capitalism and TNC organizational units, which even today still represent the largest source of uncertainty for the ecosystem and society – as the historical basis of uncertainty. This reorganization takes place in the field of political economy, in which the TNC organizational units operate independently of the society. TNC decisions and actions influence the degradation and reconfiguration of the environment and space. Among other things, the author refers to John Kenneth Galbraith, an intellectual representative of post-Keynesian economics and the conceptual founder of CW. Proceeding from Galbraith's work, the author introduces an analysis of political economy by emphasizing the political and cultural milieu and contextualizing his own inherited African attitude toward commoning. Understanding the political and cultural milieu is crucial for in-depth insight into the "content" of social life, the individual, and society.

As mentioned above, Obeng-Odoom presents an action plan by reconceptualizing the overlooked concept of the commons and commoning. The more notable authors he uses to conceptualize the development of the commons and common resources include the winner of the Nobel Prize in Economics, Elinor Ostrom, who represents a developmental succession of the CW school of thought. Ostrom introduces the concept of Common Pool Resources (CPR), which Obeng-Odoom defines as a necessary urban concept of sustainable management, which combines the commons and common resources into a form of tangible and intangible property without institutional control or the need for privatized regulation. This is about the emancipation of the community, which should manage the commons and common resources on its own in an autonomous and sustainable manner. In this regard, the author raises the issue of a community's rational operation and its role in addressing ecological challenges.

The main WLC issues refer to the establishment of commoning and who would be suitable for managing the commons and how. This is a consensus approach based primarily, if not entirely, on anti-capitalist, antiracist, and antipatriarchal values that affect the relationship between land (natural resources), rights (social protection, civil rights, human rights), and political and legislative governance.

The author proposes a third way of thinking within the context of commoning the management of public resources and the commons: the Radical Alternative (RA), whose purpose is to unravel or "decolonize" the historical development of social relationships in the Global South in relation to the Global North. He thereby raises the issue of advantages and shortfalls of the CW and WLC paradigmatic discourses. At best, the RA is a vision or retrospective of possible alternative restructuring of the ownership of common resources and the commons to date based on reconceptualizing the concept of land, property rights, and possession of tangible or intangible goods that are not connected with the capitalist commodification of all dimensions of the environment and space.

An interesting contribution to urban studies, in addition to a comprehensive examination of the socio-ecological crisis, is provided by the second part of the book, which is based on the development of the overlooked African theory of commoning the urban environment, with emphasis on the right to uncontaminated and healthy community space. This also raises the issue of fair use of energy resources for transport and industry in urban centres that pollute the environment. Pollution originates from the inefficient use of energy and material resources that indirectly lead to environmental degradation. In some African countries, plastic waste alone accounts for up to 10% of all waste; therefore, the author's definition of petroleum products makes sense: socio-ecological substances with environmental and social dimensions that directly and indirectly affect the health of the environment and people. Moreover, the author highlights the example of marketizing the export of waste from the Global North to the Global South. Throughout, Obeng-Odoom seeks to clearly illustrate the theoretical paradigms set through their structural limitations, which he transcends with empirically supported examples that he devises along the lines of the Radical Alternative discourse.

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Biography

Franklin Obeng-Odoom is an associate professor of global development studies at the Helsinki Institute of Sustainability Science at the University of Helsinki in Finland. Obeng-Odoom's research and teaching interests centre on the political economy of development, urban and regional economics, natural resources, and the environment, fields in which he has published six independently authored books; including *Property, Institutions, and Social Stratification in Africa* (Cambridge University Press, 2020), *The Commons in an Age of Uncertainty: Decolonizing Nature, Economy, and Society* (University of Toronto Press, 2021), and *Global Migration Beyond Limits: Ecology, Economics, and Political Economy* (Oxford University Press, 2022).

Information about the book

https://utorontopress.com/us/the-commons-in-an-age-of-uncertainty-2

Nika MUROVEC
Damjan KAVAŠ

Challenges of cultural heritage management and financing: The ForHeritage project

Abandoned and neglected historical buildings are a common feature of many central European cities. The Interreg Central Europe Cooperation Programme has also recognized this issue, and it has identified deterioration of cultural heritage as one of the main challenges to be tackled within the programme. Part of this programme is also the project ForHeritage – Excellence for Integrated Heritage Management in Central Europe. Eight partners from four countries (Poland, Italy, Croatia, and Slovenia) are participating in this project. The Slovenian partners are the Regional Development Agency of the Ljubljana Urban Region and the Institute for Economic Research. The partnership aims to combine and build upon the results of previous EU-funded projects (such as Forget Heritage, Restaura, IFISE, CLIC) and bring them to the implementation phase to foster an integrated approach in various stages of heritage management: planning, implementation, and financing.

The research results gathered in past projects, as well as other experience, point to the fact that insufficient funding for renovation and revitalization is the main obstacle to efficient cultural heritage management (e.g., ForHeritage, Restaura). The financial involvement of the private sector is very low, and innovative financial instruments in cultural heritage are practically non-existent. Another major obstacle is a lack of skills and capacities, especially concerning finance, management, and business planning (Restaura). Last but not least, there is also an evident lack of cooperation of public entities with the private sector and involvement of all relevant actors (the general public, associations, foundations, institutions, private operators, etc.) in cultural heritage revitalization projects.

ForHeritage addresses all these issues. The project builds on previous tools and experiences, pushing the results into the practice of the participating regions and beyond. Based on what was learned and the documents created in previous projects, a toolbox for cultural heritage management has been produced. The toolbox contains a set of six new, concise, and practice-oriented tools that focus on various aspects of cultural heritage management.

The first tool focuses on good participatory governance in cultural heritage, or how to involve the public (https://www.interreg-central.eu/Content.Node/D.T1.2.1-GG-and-PG.pdf). To manage cultural heritage successfully and efficiently, quality interaction between different stakeholders is crucial. All the relevant stakeholders should be talked and listened to in developing any cultural heritage management plan, strategy, or project. The tool aims to provide basic information to support cultural heritage managers and all relevant actors involved in cultural heritage management and planning processes so they can implement participatory governance tools in their work more efficiently. The tool provides practical step-by-step information, which can assist in selecting methods for dealing with stakeholders.

The second tool, financial instruments and innovative financial schemes for cultural heritage (https://www.interreg-central.eu/Content.Node/D.T1.2.4-Financial-instruments.pdf), provides an overview, practical examples, and tips on how innovative financial schemes, beyond grants, can be used to sustain cultural heritage projects. Cultural heritage valorization is expensive and poses an economic challenge. Furthermore, investment in infrastructure (conservation and renovation) is a minor part of the overall cost of preserving cultural heritage because the major part is related to the programme rather than regular operations and maintenance. One of the hardest decisions faced by those that conceive heritage-led regeneration projects is how to finance them (i.e., what the most effective financial instruments are and who the best budget providers are). This difficulty is also due to a lack of information on such instruments and inspirational case studies.

The use of a public–private cooperation approach in cultural heritage revitalization (https://www.interreg-central.eu/Content.Node/D.T1.2.3-PPC.pdf) is the third tool. It presents current forms of public–private cooperation, their use, and recommendations

Figure 1: Photos of pilot sites (source: project homepage).

on how the public and private sectors could successfully cooperate in revitalizing cultural heritage. European countries have been relatively successful in mainstreaming heritage through a shift of perception on the social and economic value of heritage and its role in sustainable development. Due to decreasing public funds and the interdisciplinary approach needed to revitalize cultural heritage, there is a need to find new funding sources (e.g., private capital, foundations, etc.) and to find new forms of public–private cooperation.

The impact assessment of cultural heritage projects (https://www.interreg-central.eu/Content.Node/D.T1.2.6-Impact-assessment.pdf) is the fourth tool, and it presents practical guidelines on approaching impact assessment. Heritage is cultural capital just as the environment is natural capital: heritage investments yield positive returns. The assessment of impact is an attempt to establish the degree to which an action causes certain changes in society. The objective is also management and control of generating an impact, and its optimization in relation to its costs. Impact measurement is essential for attracting investors so that they can assess the impact of their investments and monitor the continuous improvement of the organization. Impact assessment and measurement are therefore highly debated topics at the international level, used for defining standard methodologies.

The fifth tool, transferable elements of cultural heritage revitalization pilot projects (https://www.interreg-central.eu/Content.Node/D.T1.2.2-Pilot-projects.pdf), summarizes the experience of twelve pilot projects carried out as part of the Forget Heritage and Restaura projects, which have also dealt with cultural heritage revitalization. The purpose of this tool is to provide a more transparent overview of good practices and to derive recommendations. There are two types of recommendations: those that are generally applicable in all pilot projects and all stages of project development, and those that are applicable only in a specific stage of the project life cycle or in a specific and clearly specified context. Thereby, the aim is to make the testing process easier for anyone dealing with similar pilot projects in the future, to help avoid certain mistakes, and to allow more successful and effective implementation of pilot activities.

The last tool, focusing on how to organize successful training to improve management in cultural heritage (https://www.interreg-central.eu/Content.Node/D.T1.2.5-CH-training.pdf), contains practical information and some hints about holding training sessions for (better) cultural heritage management for various target groups (i.e., public administration staff, and cultural heritage managers and operators). Rapid development and changes in almost all areas of life – economic, social, cultural, and political – require lifelong learning for a successful career. Professionals need to constantly develop their own skills: not only soft skills related to teamwork, planning and organization, the ability to adapt to external changes, problem-solving, and networking, but also skills related to their own activities.

All the tools described are still drafts because the final versions will be developed only after an extensive revision process. The revisions are based on feedback from various stakeholders and on the results of testing and validating them in practice, which will be carried out as part of four pilot projects. In Poland, the pilot site is the Pomeranian Dukes' Castle (Pol. *Zamek Książąt Pomorskich*) in Szczecin (photo 1 in Figure 1), where the focus will be on analysing and further developing activities based on the use of various funding sources. In Italy, the pilot activities will evolve around Holy Cross Palace (Ital. *Palazzo Santa Croce*) in Cuneo (photo 2 in Figure 1), where a participatory process needs to be established to define future content and opportunities for testing implementation of a public–private cooperation scheme. In Rijeka, Croatia, the main challenge will be how to involve all the different stakeholders and current management in a synergetic process of managing and financing the entire Benčić factory complex (photo 3 in Figure 1), which consists of a mixture of institutions already established (such as the Rijeka City Museum, Museum of

Modern and Contemporary Art, and Children's House) and planned renovations for identified activities (such as the city library) and also future activities. The Vodnik Homestead (photo 4 in Figure 1) is the Slovenian pilot site. Here, the main activities will focus on studying options and acquiring additional private funding.

In addition to the pilot activities and developing the final version of the toolset (and its translation into other languages), future project activities will focus on further implementation of the For-Heritage integrated approach in management from the toolset to additional areas in a participatory process of adaptation to a specific context. Training and several workshops will be carried out to fill the gap in the capacities of local, regional, and national actors to exploit various funding sources for revitalizing neglected cultural heritage sites. Site managers and decision-makers will learn how to acquire additional funds (e.g., finding new private sources and setting up innovative financial instruments) in cultural heritage projects and apply an integrated management approach. The project thereby contributes to resolving the pressing issue of the deterioration of cultural heritage sites.

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Project homepage:
https://www.interreg-central.eu/Content.Node/ForHeritage.html
Information about the pilot activities:
https://www.interreg-central.eu/Content.Node/ForHeritage/Pilot-actions.html

Znanstvena monografija

BIVANJE V STAROSTI

Boštjan KERBLER, Maša FILIPOVIČ HRAST, Richard SENDI

Knjiga daje natančen in strokoven vpogled v bivanje starejših ljudi v Sloveniji. Poudarja izjemen pomen staranja v domačem bivalnem okolju, ki je glede na visoko stopnjo zadovoljstva in navezanosti na dom tudi preferenca starejših ljudi. Opisuje, s kakšnimi težavami in pomanjkljivostmi se starejši ljudje soočajo pri bivanju in kaj si želijo v zvezi s tem.

Priročnik

STANOVANJE V STAROSTI

Barbara ŽELEZNIK, Richard SENDI, Boštjan KERBLER

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Znanstvena monografija Bivanje v starosti in priročnik Stanovanje v starosti sta bila izdana v okviru projekta *Model za staranje starejših v domačem bivalnem okolju v Sloveniji* (J5-8243), ki ga je iz državnega proračuna financirala Javna agencija za raziskovalno dejavnost Republike Slovenije.

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Clapham, D., Kemp, P., in Smith, S. J. (1990): *Housing and social policy.* London, Macmillan.

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Planning act 2008. Statutory Instrument, no. 2260/2009. London.

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