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TRAJNOSTNO OBLIKOVANJE KVALITETNEGA BIVALNEGA OKOLJA, POROČILO O DELU

SUSTAINABLE PLANNING FOR THE QUALITY LIVING SPACE, RESEARCH REPORT

PROGRAM ARRS št. P5-0068, 2013-2017

Vsebina

Vsebina raziskovalnega programa je bila razdeljena na tri vsebinsko različne tematske sklope:

A) Razvoj sodobnih konceptov arhitekture in urbanizma, vezanih na specifično arhitekturnega prostora in kulturno dediščino v Sloveniji. Raziskave v tem sklopu so predvsem povezovale in razvijale arhitekturno in urbanistično teorijo, pri čemer so bile v prvem letu raziskav v glavnem razdeljene na naslednje vsebine: a) poglobljanje poznavanje specifik arhitekturnega prostora v Sloveniji, b) spodbujanje razvoja kritičnega odnosa do naravne in kulturne dediščine, c) razvoj teoretskih interpretacij preteklosti za izzive sodobnosti in d) razvoj sodobnih konceptov projektiranja, ki temelji na trajnostni rabi, racionalnosti, varnosti in prepoznavnosti prostora. Posebno pozornost smo posvetili slovenski specifični razvoja metode reflektivnega projektiranja, ki združuje vse štiri navedene aspekte. Gre za razvoj arhitekturne prakse kot raziskovalnega laboratorija, za katerega je potrebno razviti metode eksplikacije oblikovalskega znanja, inherentnega v oblikovalskem procesu. Identifikacija spoznanj o prostorski inteligenci in o oblikovalskem delovanju v specifičnih socio-prostorskih kontekstih, ter metod, ki to eksplikacijo omogočajo, poteka v okviru konzorcija partnerjev projekta ADAPT-r, v katerega je programska skupina vpeta. Vloga programske skupine je v transformaciji in integraciji globalne metode v trans-regionalni prostor, z identifikacijo in upoštevanjem arhitekturne raziskovalne tradicije našega kulturnega okolja.

B) Raziskave, vezane na projektiranje in tehnologijo trajnostnih nizkoenergijskih hiš so bile vezane predvsem na zahteve Pravilnika o učinkoviti rabi energije v stavbah (Ur. l. RS 31/2010), ki zahteva gradnjo skoraj ničenergijskih stavb vseh javnih objektov že v nekaj letih. S povečevanjem debeline izolacije pa se pojavljajo številni problemi vezani na konstrukcijsko odpornost stikov vertikalnih in horizontalnih nosilnih elementov sklopov, ki se v praksi rešuje stihijsko brez pravih teoretičnih raziskav, predlagani koncepti pa pogosto podrejajo konstrukcijsko varnost drugim zahtevam podrejenim energetski učinkovitosti toplotnega ovoja stavbe. Popolnoma odrinjen problem pri tem predstavlja potresna varnost vseh objektov, ki so v Slovenijo prineseni iz drugih okolij, ki potresno niso ogrožena. V tem pogledu naše delo nadaljuje raziskave zaključenega raziskovalnega projekta ARRS iz prejšnjih let, v okviru dela na raziskovalnem programu P50068 pa smo izvedli bistveno natančnejše simulacije obnašanja konstrukcij na toplotni izolaciji, ki so temeljile na nelinearnem modelu zgornje konstrukcije, nelinearnem modelu toplotne izolacije in temeljnih tal (vertikalne in strižne vzmeti) ter dinamični analizi za različne potresne zapise značilne za Slovenijo. Ugotovili smo, da pri vgradnji toplotne izolacije pod temeljno ploščo pri močnem potresu lahko pride do stiskanja izolacije, zmanjšanja toplotnih karakteristik in nagibanja

Content

The proposed research program is divided in three thematically different parts:

A) Development of contemporary concepts of architecture and urban design in relation to the specific of Slovene architecture and protection of architectural and cultural heritage. Research in this section was focused in the following fields: a) indepth knowledge of Slovenian architectural characteristics, b) development of a critical creativity preserving natural and cultural heritage, c) development of theoretical interpretations of the past for the challenges of the future and d) development of contemporary concepts of rationality, security and space recognition. Special attention has been given to the development of the reflective design method, considering the Slovenian specifics. All four of the above aspects were considered. The method treats architectural practice as a research laboratory for which new procedures of design know-how, inherent in the design process, need to be considered. The identification of knowledge regarding spatial intelligence and design procedures for specific socio-spatial contexts takes place in a form of a consortium of the project ADAPT-r in which the research group is also included. The role of our research group is in transforming and integrating the global method into a trans-regional space with identification and implementation of the existing architectural research tradition.

B) Research related to design, technology and detailing of sustainable low energy houses were based on the Efficient energy in buildings guidelines (PURES, Ur. l. RS 31/2010). The guidelines impose a nearly zero energy building concept for all public buildings after 2018 and for all new buildings after 2020. Construction practice has already responded to these demands by increasing the thickness of the thermal insulation layer of building envelopes. It is obvious in these cases that the main component governing the overall building dimensions is not the loadbearing structure anymore. The initial design concepts of low energy structures originate from Northern Europe, where the seismic activity is low. Such buildings have therefore not been designed to withstand higher seismic loadings that are for instance typical for Slovenia. In this sense our work in the research group continues the research of the ARRS research project from previous years. In the scope of work performed in the research programme P50068 we have carried out detailed simulations of the behaviour of low-energy buildings that are founded on a layer of thermal insulation. The computer simulations are based on nonlinear behaviour of the superstructure and on a nonlinear model of the insulation layer, including soil conditions. Actual earthquake records have been used that simulate realistic

objekta. Poleg tega lahko pride tudi do povečanja potresnih vplivov na zgornjo konstrukcijo. Oboje je mogoče preveriti z ustreznim statičnim računom pri potresni obtežbi, v naših raziskovalnih in strokovnih člankih pa je točno opisano v katerih primerih in za kakšne stavbe je ta natančnejši račun potresne obtežbe potreben in v katerih ne, kot je tudi opisan predlagan računski statični model, ki ga mora uporabiti projektant v praksi. Navedeni rezultati se že prenašajo v prakso v obliki strokovnih izobraževanj za gradnjo pasivnih hiš, ki jih s sodelavci in partnerji iz gospodarstva organiziramo na FA. V tem tehnološkem sklopu raziskav je bila razvita tudi enostavna metoda za vrednotenje trajnostnih zasnov energijsko učinkovitih družinskih hiš. Ugotavljamo, da imajo stavbe negativne vplive na okolje v celotnem življenjskem ciklusu, torej od faze pridobivanja surovin ter proizvodnje gradiv in polizdelkov, do prodaje, vgradnje in uporabe do končne faze odstranitve, ko stavba odsluži svojemu namenu. Trenutna zakonodaja omejuje v glavnem rabo energije in emisije v obratovanju, manj pa ostale parametre, ki prav tako definirajo zasnovo sodobne trajnostne stavbe. Preverjanje trajnostne zasnove stavbe je smiselno že v začetnih fazah projektiranja, ko je še mogoče vplivati na rezultat. Rezultat raziskave je enostavna metoda, s pomočjo katere se z izbranimi petimi indikatorji ocenjuje kakovost trajnostnih zasnov. Področja ocenjevanja se nanašajo na energijsko učinkovitost, rabo primarne energije, emisije CO₂, stroške ter na doseženo bivalno ugodje. Ocenjevanje s pomočjo indikatorjev poteka po treh načinih objektivnega in subjektivnega ponderiranja, s čimer se v skupno oceno vključijo vidiki neodvisnosti presojevalca ter vidiki nacionalnih in uporabniških zahtev.

C) Raziskave metod dialoga in izobraževanja o trajnostnem prostorskem razvoju v arhitekturi in urbanizmu. Ta sklop je obravnaval arhitekturno in urbanistično izobraževanje, ter med-disciplinarno in medgeneracijsko sodelovanje v procesu oblikovanja prostora. Cilj raziskav je bil v tem sklopu usmerjen predvsem v razvoj organizacijskega, med-disciplinarnega in medgeneracijskega dialoga o trajnostnem prostorskem razvoju. Med rezultati prvega leta izpostavimo razvoj novega sistema vizualnih digitalnih orodij za sodelovanje in izobraževanje javnosti v prostorskem načrtovanju (DSO). Sistem je razdeljen na več sklopov in sestavljen iz posameznih vizualnih digitalnih orodij, ki se med seboj dopolnjujejo ter tvorijo celoto: informiranje, komuniciranje, sodelovanje in izobraževanje. Povezava med sistemom arhitekturnega in urbanističnega načrtovanja s sistemom vseživljenjskega učenja je bila preverjena z razvojem novega sistema vizualnih digitalnih orodij za sodelovanje in izobraževanje javnosti v prostorskem načrtovanju (DSO).

Poročilo sestoji iz skupnega dela, ki opisuje potek in nekatere izbrane znanstvene in družbeno ekonomske dosežke dela na programu in sedmih individualnih delov, ki opisujejo raziskovalno delo udeleženca posameznika. Individualni prispevki predloženega poročila vključujejo:

- 1) Izzivi in priložnosti arhitekture modernizma (Tadeja Zupančič)
- 2) Raziskovanje poselitvenih vzorcev in 'mreženje' v prostoru (Alenka Fikfak),
- 3) Obalne preobrazbe (Lučka Ažman Momirski)
- 4) Sredozemska terasirana pokrajina: spremembe v rabi tal (Lučka Ažman Momirski)
- 5) Metode in orodja za ocenjevanje trajnostnih enodružinskih hiš (Martina Zbašnik-Senegačnik)

seismic characteristic that are typical for Slovenia. It has been found out that by inserting a layer of thermal insulation under the foundation slab in a seismic event with a high magnitude, can lead to inelastic deformations of the insulation layer, thus reducing its insulation properties. Several research and professional papers that we have published in the scope of the programme describe in detail in which cases and for what types of buildings a more detailed seismic analysis is needed. A refined mathematical model for construction practice was also developed and is described in the aforementioned papers. The results have already been transferred to construction practice in the form of seminars on passive house construction that are organised in cooperation with partners from the industry. In this technological scope of research a new, simplified method for the valorisation of sustainable design concepts of family houses was developed. The results show that buildings produce a negative impact on the environment in their life-cycle – from the phase of raw material production, fabrication of materials and semi-manufactured elements to the marketing, usage and final removal after the building finished working life. The legislation is mainly focused to the energy consumption and emissions produced during the normal usage of the building, while energy consumption in other life cycles is often neglected. The results of conducted study is a simple method which uses five selected indicators to verify the sustainability of design of particular building structure. The areas to be evaluated are energy efficiency, use of primary energy, CO₂ emissions, costs, and the level of living comfort achieved. The evaluation using these indicators is carried out using three subjective and objective weighting methods, such that the final evaluation includes the viewpoints of an independent evaluator and the points of view of both the user and the state.

C) *Research related to dialog methods and education in sustainable spatial development in architecture and urbanism. This section analysed the architectural and urban education and interdisciplinary and multigenerational cooperation in the process of spatial development. The goal of the research was aimed in the development of organisational, interdisciplinary and multigenerational dialogue aimed at sustainable spatial planning. From the results obtained in the first year we want to highlight the development of a new digital tool for cooperation and education of general public in spatial planning (DSO). The system is divided into multiple sections and comprises from specific visual digital tools which complement each other and form a uniform system for: information, communication, cooperation and education. The connection between architectural and urban planning with the system of lifelong learning was also investigated with the development of DSO.*

This report comprises of a common part that describes the procedures and some selected scientific and socio-economic achievements of the programme. Seven individual contributions by programme members are also included, representing their individual research work. The following topics are presented:

- 1) *Challenges and opportunities of modernist architecture (Tadeja Zupančič)*

- 6) Spremembe testa miselne rotacije (Domen Kušar)
- 7) Dialog in izobraževanje o prostorskih trajnostnih vprašanjih v arhitekturi in urbanizmu (Matevž Juvančič).

Doseženi cilji in rezultati raziskovalnega projekta

Rezultati dela na programu se ne kažejo samo v obliki znanstvenih člankov, temveč tudi v velikem številu objavljenih strokovnih člankov, monografij, delov monografij, delavnic, seminarjev, izobraževanj in izdanih knjig, ki so razvidni iz bibliografije celotne skupine.

Sodelavci / Participants

Vojko Kilar (vodja projekta), Martina Zbašnik-Senegačnik, David Koren, Domen Kušar, Tomaž Slak, Tadeja Zupančič, Lucija Ažman-Momirski, Simon Petrovčič, Srečko Vratuša, Edo Wallner, Boris Azinovič – mladi raziskovalec (UL-FA) Tatjana Isaković (UL-FGG) Milan Kuhta, Simon Šilih, Erika Kozem (UM-FG) Samo Gostič, Mihael Mirtič (Gradbeni Inštitut ZRMK d.o.o.)

Nekateri izbrani rezultati pri katerih so sodelovali člani programske skupine / Selected bibliographical results

Znanstveni članki / Scientific papers

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- SVETINA, Matija, ISTENIČ STARČIČ, Andreja, JUVANČIČ, Matevž, NOVLJAN, Tomaž, ŠUBIC KOVAČ, Maruška, VEROVŠEK, Špela, ZUPANČIČ-STROJAN, Tadeja. How children come to understand sustainable development: a contribution to educational agenda. V: Sustainable development, Jul./Aug. 2013, vol. 21, iss. 4, str. 260-269.
- KILAR, Vojko, KOREN, David, BOKAN-BOSILJKOV, Violeta. Evaluation of the performance of extruded polystyrene boards : implications for their application in earthquake engineering. V: Polymer testing, 2014, letn. 40, str. 234-244.
- SLAK, Tomaž, CEROVŠEK, Tomo, ZUPANČIČ-STROJAN, Tadeja, KILAR, Vojko. A comparative study of model-based framework for the AEC competency evaluation of building tenders. V: Tehnics technologies education management, vol. 8, no. 1, str. 449-463.
- PRAZNIK, Miha, BUTALA, Vincenc, ZBAŠNIK-SENEGAČNIK, Martina. A simple method for evaluating the sustainable design of energy efficient family houses. V: Strojniški vestnik, Jun. 2014, vol. 60, no. 6, str. 425-436.
- AZINOVIČ, Boris, KOREN, David, KILAR, Vojko. Principles of energy efficient construction and their influence on the seismic resistance of light-weight buildings. V: The open civil engineering journal, 2014, vol. 8, str. 105-116.
- ČEFERIN, Petra. Što to radi arhitektura? = What (in the world) is architecture doing? Oris, 2013, god. 15, br. 83, str. 110-123.
- KOMAC, Blaž, ZORN, Matija, KUŠAR, Domen. Uporaba evidence vrednosti nepremičnin za ocenjevanje škode zaradi naravnih nesreč v Sloveniji = Use of the real estate register for assessing property damage caused by natural disasters in Slovenia. V: Ujma, ISSN 0353-085X, 2013, št. 27, str. 153-158.
- FIKFAK, Alenka. Quality of architectural education at the Faculty of Architecture of the University of Ljubljana. V: Journal of architecture and urbanism, 2013, vol. 37, iss. 4, str. 257-267.

- 2) *Researching settlement patterns and spatial 'networking'* (Alenka Fikfak)
- 3) *Waterfront redevelopment* (Lučka Ažman Momirski)
- 4) *Mediterranean terraced landscapes: Land use changes* (Lučka Ažman Momirski)
- 5) *Methods and tools for evaluation of sustainable single-family houses* (Martina Zbašnik-Senegačnik)
- 6) *Changes of Mental rotating test* (Domen Kušar)
- 7) *Dialogue and education about spatial sustainable issues in architecture and urban design* (Matevž Juvančič).

Achieved goals and research results

Research results are not only presented in research papers, but also in professional papers, monographs, parts of monographs, workshops, seminars which are presented in the bibliography of the entire research programme group.

Nekateri drugi pomembni rezultati programske skupine / Other important works

- AŽMAN MOMIRSKI, Lučka, AŽMAN MOMIRSKI, Lučka (urednik), BERČIČ, Tomaž (urednik), 1975- KOCIPER, Gašper (urednik). Obalne preobrazbe : Izola vzhod. 1. izd. Ljubljana: FA, 2013. 80 str.
- ČEFERIN, Petra. Non-serving architecture. V: Status Quo Vadis : die Zukunft der Architektur als Prognose und Programm = a prospectus on the future of architecture, (Um Bau, ISSN 0256-2529, 26). Salzburg: Verlag Anton Pustet, cop. 2013, [Bd.] 26, str. 43-53.
- FIKFAK, Alenka. Domačija v Goriških Brdih : razvoj domačije preko individualne tipske hiše v sodoben kmetijski kompleks. V: ZULJAN KUMAR, Danila (ur.), GOMIRŠEK, Tanja (ur.). Brda in Brici : o ljudeh, zgodovini, jeziku, besedni umetnosti, stavbarstvu in rastlinstvu Brd. Občina Brda, 2013, str. 57-72.
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- ZUPANČIČ-STROJAN, Tadeja, JUVANČIČ, Matevž. Management vision development guidelines : managing ATRIUM vision and network structure. V: ZUPANČIČ-STROJAN, Tadeja (ur.), et al. Manual of wise management, preservation, reuse and economic valorisation of architecture of totalitarian regimes of the 20th century. Forli: Municipality; Ljubljana: FA, 2013, str. 143-146.

Prispevki sodelavcev v okviru projekta

Tadeja Zupančič
IZZIVI IN PRILOŽNOSTI ARHITEKTURE
MODERNIZMA

CHALLENGES AND OPPORTUNITIES OF MODERNIST
ARCHITECTURE

POVZETEK

Programska skupina Fakultete za arhitekturo se intenzivno povezuje v mednarodne raziskovalne tokove. V pričujočem prispevku izpostavljam rezultate razprav v programski skupini, ki so posledica sodelovanja v evropskem SEE projektu ATRIUM – 'Architecture of Totalitarian Regimes of the 20th century in Urban Management'. Ideja evropske kulturne poti, razvita kot eden ključnih rezultatov omenjenega projekta, je v programski skupini sprožila diskusijo o priložnostih, ki jih ta ideja ponuja za zaščito in razvoj arhitekture modernizma na Slovenskem, še posebej v luči kulturne dimenzije trajnostnega prostorskega razvoja. Kulturna pot v tem primeru povezuje tako bolj ali manj zapuščene kot tudi drugače 'problematične' prostore, bolj ali manj obremenjene z mnogoterostjo zgodovinskega spomina jugovzhodne Evrope. Po drugi strani pa se problem zaščite in razvoja povojne modernistične arhitekturne dediščine v Sloveniji kaže v pomanjkanju sredstev za obnovo, kar izhaja med drugim tudi iz pomanjkanja zavedanja o možnostih, ki jih ponuja kulturni turizem (slika 1).

V programski skupini smo torej razvili kritično-refleksivno raven omenjenega projekta, ki jo je izzvala priprava priročnika za upravljanje z obravnavano dediščino dvajsetega stoletja [Zupančič, T. et.al. – eds., 2013]. Prvi rezultati refleksije so bili objavljeni v reviji 'Architecture & Urbanism' [Ifko, S., Juvančič, M., Zupančič, T., 2013], kjer smo slovensko povojno modernistično dediščino obravnavali kot turistični produkt. Rezultati druge faze razmisleka pa so predstavljeni v reviji 'Architecture & Science' [Zupančič, T., 2014]. Tokrat je izhodišče razmisleka sama ideja kulturne poti. Kaj se zgodi s splošnim, idealiziranim konceptom ob soočenju s tako občutljivim socio-prostorskim kontekstom? Odgovor smo poiskali v specifikaciji uveljavljenih splošnih kriterijev za opredelitev kulturne poti. Rezultati nadgrajujejo sistem spremljanja in vrednotenja kulturne poti, razvit v projektu ATRIUM, in sicer tako, da postaja kontekst kulturne poti nova priložnost za razvoj dediščine slovenskega modernizma.

UPORABNOST REZULTATOV

Rezultati sodijo k prvemu ključnemu cilju programa: prispevajo k razvoju sodobnih zasnov arhitekture in urbanizma, ki izhajajo iz posebnosti slovenske kulturne dediščine. Usmerjeni so torej k poglobljenemu poznavanju specifik arhitekturnega prostora v Sloveniji in k razvoju kritično- kreativne raziskovalne projektantske praske.

KLJUČNE BESEDE

arhitektura, modernizem, urbanistično oblikovanje, upravljanje mesta

SUMMARY

The programme members collaborate in diverse international research consortia. This contribution is intended to emphasize the research discourse arising from the interaction of the program framework with the recently finished European SEE project ATRIUM – Architecture of Totalitarian Regimes of the 20th century in Urban Management. The concept of a European cultural route, developed as the main result of the project mentioned, is discussed in the programme group as one of potentials to protect and develop the modernist cultural heritage. The new European cultural route is developed from the abandoned and problematic places, more or less intensively associated with the diverse notions of totalitarian regimes of the 20th century in the South-Eastern Europe. The problem of the post-war modernist architectural heritage is addressed, facing the lack of resources for its renewal, deriving from the lack of awareness of the above-mentioned potentials (figure 1).

The reflective meta-level to the project mentioned, developed in the programme, is challenged especially by the preparation of one of the key project deliverables: the Manual of wise management, preservation, reuse and economic valorisation of architecture of totalitarian regimes of the 20th century [Zupančič, T. et.al. – eds., 2013]. The first results of this reflection were published in the journal "Architecture & Urbanism" [Ifko, S., Juvančič, M., Zupančič, T., 2013], where the Slovenian post-war modernist architectural heritage was interpreted as a tourist product. The second stage of the development of this meta-level is presented in the magazine 'Architecture & Science' [Zupančič, T., 2014]. It is focused to the specification of the concept of the European cultural route. What happens to the general concept when faced with such sensitive challenges? The general criteria to develop a cultural route are taken as starting points for their re-interpretation within the sensitive context discussed. As a result, the key starting points for the monitoring and the evaluation system of the ATRIUM cultural route are upgraded and the cultural-route context as the opportunity for modernist architecture discussed.

ISSUES AND THEIR SIGNIFICANCE

The results fit to the following program key topic: the development of contemporary concepts in architecture and urban design based on particularities of cultural heritage in Slovenia. Directed towards the in-depth knowledge of Slovenian architectural characteristics, they challenge critical creativity in design practice research interpretations.

KEY WORDS

architecture, modernism, urban design, urban management

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Slika 1: V mesto vtkane modernistične sledi 'revolucije' v Ljubljani (E. Ravnikar s sodelavci, 1960-1984, foto: T.Z.)

Figure 1: Modernist traces of 'revolution' in Ljubljana, interwoven with the city and its life (E. Ravnikar with collaborators, 1960-1984, photo: T.Z.)

Alenka Fikfak

RAZISKOVANJE POSELITVENIH VZORCEV IN 'MREŽENJE' V PROSTORU

RESEARCHING SETTLEMENT PATTERNS AND SPATIAL 'NETWORKING'

POVZETEK

Številne študije o stanju in trendih prostorskega razvoja nudijo podporo razvoju politik v smeri uresničevanja ciljev teritorialne kohezije in skladnega razvoja ozemlja Evrope. Po drugi strani pa se v prostoru srečujemo z vprašanji vpliva globalizacije, socialnih in demografskih sprememb, ki nenadzorovano spreminjajo želje in potrebe prebivalcev in obiskovalcev. Zato je tudi v raziskovanju vse večji poudarek na oblikovanju scenarijev prostočasnih dejavnosti, rekreacije in turizma ter možnosti prilagajanja teh programov vse bolj spreminjajočemu povpraševanju. Vedno bolj se opušča tradicionalna organizacija poselitvene strukture na podeželju, ki se prilagaja sodobnemu načinu življenja, drugačnim poselitvenim strukturam, družbenim in demografskim spremembam [Mrak et al., 2013]. Prostorski posegi so vse bolj usmerjeni v trajnostno naravnane, bolj etične in odgovorne koncepte, ki ne vključujejo samo vprašanja varovanja okolja, ampak tudi kulturne, ekonomske in politične vidike trajnosti.

Raziskovanje in razumevanje raznolikosti poselitvenih vzorcev (slika 2) za nadaljnji razvoj, s poudarkom na trajnosti razvoja, je proces, ki se ne osredotoča samo na gospodarski razvoj, temveč vključuje uravnotežen ekološki in družbeno-socialni razvoj. Izpostavljena je misel, da sodobna družba gradi na občutku za skupnost in skupne dolžnosti, torej socialni kapital kot 'življenjskost' družbe danes. Pri zagotavljanju socialne vzdržnosti (več zaupanja in sodelovanja, manj neenakosti) ne gre le za zagotavljanje, da se ohranja sedanja oblika, temveč se zagotavlja stalno izboljšanje tudi z gradnjo novih oblik skupnosti. Le ob zavedanju vsestranskih vplivov med človekom, tehnologijo, grajenim okoljem in naravnimi potenciali, z dobrim poznavanjem vseh dejavnikov in aktivnim delovanjem, je mogoče graditi kakovostno bivalno okolje ter obenem upoštevati načela trajnostnega razvoja [Čok et al., 2013]. Zato iskanje

SUMMARY

Policy development towards the realization of the objectives of territorial cohesion and coherent development of the European territory is supported by many studies exploring the situation and trends of spatial development. On the other hand, we are confronted with the impacts of globalisation, social, and demographic changes that uncontrollably affect the desires and needs of inhabitants and visitors. Hence, research, too, should devote more attention to scenario building related to leisure activities, recreation and tourism, and the possibility of adapting these programmes to the increasingly changing demands. The traditional settlement structure organisation in rural areas is increasingly being abandoned; it is adapting to the contemporary way of live, different settlement structures, social and demographic changes [Mrak et al., 2013]. Spatial interventions are increasingly focused on sustainable and ethical concepts, and concepts of accountability that address not only environmental protection, but also cultural, economic and political aspects of sustainability.

Research and understanding of the diversity of settlement patterns (figure 2) for further development, with an emphasis on sustainable development, is a process that focuses not only on economic development, but it also includes balanced ecological and social development. Notably, the modern society builds on the sense of community and collective duty, i.e. social capital as the 'vitality' of the society today. Ensuring social sustainability (more trust and participation, less inequality) is thus not only a matter of ensuring that the current situation is preserved, but to continuously provide improvements, also by building new types of community. It is only by acknowledging the different interactions between man, technology, the built environment and natural potentials, with good knowledge of all factors and action, that we can build a good quality living environment, and consider the principles of sustainable development at the same time [Čok et al., 2013].

koncepta stavbe zahteva celovito obravnavo sistema stavbe, njenih interakcij z okoljem in uporabnikom. Glede na velik delež in kakovost obstoječega stavbnega fonda mora koncept stavbe naslavljaliti novogradnje in obstoječe stavbe oziroma njihove prenovе. Potreba po razvoju koncepta stavbe izhaja tudi iz nujnosti prilaganja na podnebne spremembe in spremljajoče pojave ter probleme, povezane z njimi.

UPORABNOST REZULTATOV

Ob raziskovanju sodobnih prostorskih konceptov smo ugotavljali, da je na ravni načrtovanja širšega prostora možna vzpostavitev sistemov 'mreženja', ki ne slonijo več na klasični morfologiji in tipologiji vzorcev. Kot aplikativni primer navajamo idejo o nujni nadgradnji obstoječega sistema gorske arhitekture in vzpostavitvi povezanosti med posameznimi točkami poselitvenih vzorcev z umestitvijo centralne enote [Čerpes et al., 2014].

KLJUČNE BESEDE

prostočasne dejavnosti, poselitveni vzorec, trajnostni razvoj, bivalno okolje, stavba

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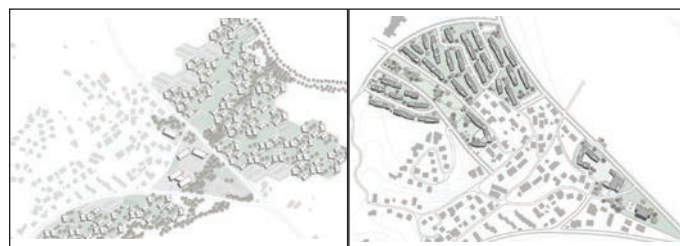
In order to find a rethink the concept of the building we should first comprehensively examine the system of the building, and its interactions with the environment and users. With regard to the high proportion and quality of the existing building stock, the concept of the building must address both new buildings and the existing ones, or their renovations. The need to develop the concept of the building emerges from the necessity to adapt to climate change and associated phenomena, and the problems related to these changes.

ISSUES AND THEIR SIGNIFICANCE

While researching contemporary spatial concepts we found that in the context of broader spatial planning, it is possible to set up 'networking' systems that are no longer based on conventional morphology and pattern typology. An example of application is the idea about the necessary upgrade of the existing system of alpine architecture, thus providing connectivity between the individual points of settlement patterns, along with introducing a central unit in the system [Čerpes et al., 2014].

KEY WORDS

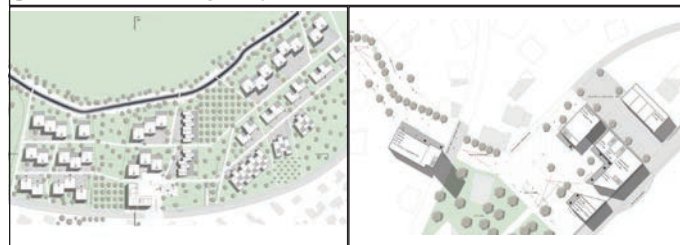
leisure activities, settlement pattern, sustainable development, living environment, building



Slika 2 a, b: Vključevanje novega poselitvenega vzorca v obstoječo strukturo.



Slika 2 c, d: Novi poselitveni vzorci, ki vključujejo sodobne motive prostočasnih in drugih dejavnosti.



Slika 2 e, f: Prepletanje različnih vzorcev, ki ustvarijo 'navidezni' kaos.

Slika 2: Raziskovanje poselitvenih vzorcev [Gabrijelčič et al., 2014].

Figure 2: Figure 2: Research in settlement patterns [Gabrijelčič et al., 2014].

Lučka Ažman Momirski OBALNE PREOBRAZBE

WATERFRONT REDEVELOPMENT

POVZETEK

Obalni pas je izjemna lokacija, kjer se stikata dve prostorski prvini: kopno in vodna površina morja, reke ali jezera. Stik urbane strukture in vodne površine je rob ('... temeljna prvina, ki določi obliko celote ...' / Košir, 2006, str. 246/) in ločnica ('... ki določi prostor kot binom: znotraj in zunaj.' / Košir, 2006, str. 246/). Velik del svetovnega prebivalstva prebiva na obalnih območjih: v oddaljenosti 50 kilometrov od obale živi v Evropi 29,1% prebivalstva, v Aziji 27,1%, v Afriki 18,1%, v severni Ameriki 31,5%, v Južni Ameriki 24,4% in v Avstraliji z Oceanijo 79%. Preobrazbe obalnih ali rečnih robov so od leta 1980 dalje med najzanimivejšimi pojavi urbanih preobrazb. Odnos med pristaniščem in mestom, lociranima na obalnem pasu, se je postopoma spreminjal v nekaj fazah: najprej sta bila oba združena v celoto, kasneje sta se razdružila in sobivala drug ob drugem, v tretjem koraku je sledila funkcionalna in formalna ločitev obeh pojavov. V obdobju omrežij se ponovno združita. Pristaniško infrastrukturo, kot so pomoli in ladjedelnice, je potrebno prepoznati kot infrastrukturo, ki je neločljivo povezana z rabo in razvojem obalnih območij in ki bi jo bilo mogoče razvrstiti med območja imenovana bluefields. Razvoj, ki se nanaša, in ki povečuje od vode odvisne in zaradi vode okrepljene rabe, je mogoče obravnavati kot razvoj vodnih zemljišč. Pinch (2002) predlaga načrtovanje obalnih območij s stališča vodnih površin v nasprotju s prevladujočim kopenskim vidikom. Resnična preobrazba degradiranih urbanih obmorskih območij bo mogoča samo z medsebojnim delovanjem javnih in zasebnih vlaganj, kar postavlja pod vprašaj tudi prostorsko in programsko prevelike spremembe na obalnih območjih. Izboljšanje kakovosti javnega prostora in programi, pomembni za družbeno rast, kot so izobraževanje in raziskovanje, ustvarjajo priložnosti za nizkstroškovno industrijo, male podjetnike in za mlade ljudi, generatorji območja pa postanejo stanovalci, ki tu bivajo vse dni v letu. K inovativnim prostorskim rešitvam prispeva upoštevanje naravne in kulturne dediščine. Vzporedno in enakovredno z razvojnimi projekti se z naravovarstvenimi ukrepi ohranja celovitost morskega in obalnega ekosistema ter biotska raznovrstnost.

Strateška načela za razvoj nekdanjih pristaniških območij se lahko oblikujejo podobno kot v primeru severnega dela pristanišča v Københavnu na Danskem. Preobrazbo urbanega waterfronta pa je potrebno obravnavati kot del celotnega urbanega sestava in ne samo kot poudarek ali ločen razvojni pojav.

UPORABNOST REZULTATOV

Preobrazbe obalnih ali rečnih robov so med najbolj pomembnimi arhitekturnimi in urbanističnimi projekti konec 20. in v začetku 21. stoletja ter predstavljajo enega izmed osrednjih vprašanj evropske prostorske razvojne politike. S preučevanjem primerov obalnih območij so bile raziskane njihove prednosti in priložnosti ter ranljivosti in tveganja. Ugotovitve raziskave so izhodišča za poglobljeno, celovito in vsestransko predvidevanje obalnih preobrazb v prostoru severovzhodnega dela nekdanjega izolskega otoka. Lokacija, kjer so zavarovana območja naravne in kulturne dediščine ter deloma delujoča in deloma opuščena industrijska dejavnost,

SUMMARY

The coastal belt is an exceptional location, where two spatial elements come together: the mainland and the waters of the sea, rivers, or lakes. The contact between the urban structure and the water is an edge ('the basic element that defines the shape of the whole'; Košir 2006: 246) and a dividing line ('that defines a space as a binomial: outside and inside'; Košir 2006, 246). The majority of the world's population lives in coastal areas: in Europe, 29.1% of people live within 50 km of the coast, in Asia 27.1%, in Africa 18.1%, in North America 31.5%, in South America 24.4%, and in Australia and Oceania 79%. Coastal or river waterfront redevelopment has been among the most interesting features of urban renewal since 1980. The relationship between the ports and the cities located in the coastal belt gradually changed: at first both the port and the city were united into a whole, later they were separated and existed one next to the other, and in the third stage they were functionally and formally separated. They come together again in the network age. Port's infrastructure, such as piers and boatyards, need to be acknowledged as inextricably related to the use and development of waterfronts and could be reclassified as bluefield sites. The development which relates and enhances water-dependant and water-enhancing uses can be considered as a bluefield development. Pinch (2002) suggested planning of waterfronts from water based perspective in contrast to prevalent land based perspective. A true transformation of the degraded waterfront urban area is only possible through cooperation between public and private investors, which also brings into question the overly extensive changes in the former port's area in terms of space and the activities there. Improved quality of public space and activities important for social growth such as research and education create opportunities for low-cost industry, small business owners, and young people, and the year-round residents become the generators of the area's development. Taking into account natural and cultural heritage contributes to innovative spatial solutions. Through nature-conservation measures, the integrity of the marine and coastal ecosystems and biodiversity are preserved in parallel to and equally with the development projects. The strategic principles for the former ports area's development can be designed similarly to those in the northern part of the port of Copenhagen. The waterfront urban renewal should be treated as part of the entire urban composition and not only as a special feature or a separate development phenomenon.

ISSUES AND THEIR SIGNIFICANCE

Waterfront redevelopment has been part of the most important architectural and urban-planning projects since the 1980s, representing a central issue in EU spatial-planning policy. Various coastal areas were studied in terms of their strengths, weaknesses, opportunities, and threats. The findings of this study provide the basis for detailed, comprehensive, and versatile prediction of coastal transformations in the northeastern part of what used to be Izola Island. The location—with its protected

je namreč pod velikim kapitalskim pritiskom. Slovenski in tuji vlagatelji si prizadevajo, da bi dobili dovoljenje za izgradnjo otokov v Viližanskem zalivu in velikega turističnega naselja na obalnem območju. Če bi načrt uresničili, bi Izola popolnoma spremenila podobo in postala največje slovensko obmorsko turistično središče.

KLJUČNE BESEDE

obalne preobrazbe, vodna zemljišča, razvoj vodnih zemljišč, pristanišče, mesto

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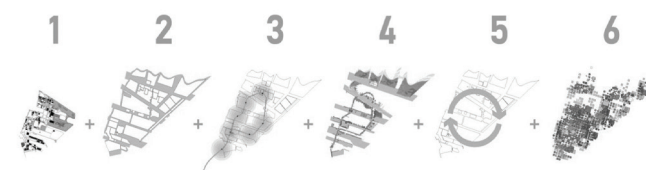
Slika 4: Območje severnega dela pristanišča (Nordhavn) v Københavnu, Danska (BY&HAVN).

Figure 4: The north area of the port (Nordhavn) in Copenhagen, Denmark (BY&HAVN).

natural and cultural heritage sites and industrial activity, some of which remains in operation and some partially abandoned—is under great capital pressure. Slovenian and foreign investors are seeking permission to build three islands in the Viližan Bay and a large tourist resort along the coast. If this plan were implemented, Izola would be entirely different; it would become the largest Slovenian seaside resort.

KEY WORDS

waterfront redevelopment, bluefields, bluefield development, port, city



Slika 3: Šest strateških principov za razvoj severnega dela pristanišča v Københavnu na Danskem: otoki in kanali, identiteta in zgodovinski razvoj, mesto 'petih minut', 'plavo' in 'zeleno' mesto, nizkoogljično mesto in pametna mreža (BY&HAVN).

Figure 3: Six strategic principles for the development of the north area of the port in Copenhagen, Denmark: islands, canals, identity and historic development, the 'five-minute city', 'blue' and 'green' city, low carbon city and intelligent grid (BY&HAVN).



Slika 5: Vizija mesta prihodnosti za 40.000 ljudi in 40.000 delovnih mest v severnem delu pristanišča v Københavnu, Danska (BY&HAVN).

Figure 5: The vision of the city in the future for 40,000 inhabitants providing jobs in the north area of the port in Copenhagen, Denmark (BY&HAVN).

Lučka Ažman Momirski

SREDOZEMSKA TERASIRANA POKRAJINA: SPREMEMBE V RABI TAL

POVZETEK

Doslej so bile objavljene številne razprave, ki obravnavajo spreminjanje rabe tal v zadnjih 200 letih na ozemlju srednje Evrope. Osnovni vir vseh teh študij je franciscejski kataster, ki je bil izdelan v prvi polovici 19. stoletja na območju nekdanjega Avstrijskega cesarstva. V nekaterih raziskavah je pregledno prikazano spreminjanje rabe tal na območju celotnih sedanjih držav ali regij, najpogosteje so bile obravnavane Češka, Slovenija in Avstrija. V pričujoči študiji so raziskani vzorčni primeri iz sredozemskih pokrajin, za katere so značilna terasirana pobočja, s terasami pa so povezani posebni dejavniki sprememb rabe tal. Kot vzorčen primer je izbrana tudi vas Ostrožno Brdo, ki leži že na prehodu med sredozemskim

MEDITERRANEAN TERRACED LANDSCAPES: LAND USE CHANGES

SUMMARY

A considerable number of papers have already been published on land use changes in the past 200 years on the territory of Central Europe. All these studies basically draw on the Franciscan Cadastre, made in the first half of the 19th century for the area of the then Austrian Empire. Some of them clearly present land use changes in the area of entire states or regions of today; the most often studied countries are Bohemia, Slovenia and Austria. Land use changes in the current research were studied on terraced terrains which predominantly mark the image of the Mediterranean landscape. Special factors of land-use changes are related exactly to terraces. The village Ostrožno Brdo,

in dinarskim svetom. Na rabo tal obravnavanega območja so pomembno vplivale politične spremembe, saj je bilo slednje po propadu Avstro-Ogrske sestavni del treh različnih držav. Območje teras v Ostrožnem Brdu obsega 10 % oziroma 93,6 ha zemljišč. Značilna prvina brkinskih teras je dolžina terasne ploskve oziroma celotne terase: običajno so terase dolge približno 150 metrov, medtem ko so na najbolj pokrajinsko izrazitih območjih terasne dolžine tudi preko 300 metrov. Teraso, predvsem pa njihove brežine, so v slabih 200 letih ostale povsem enakih oblik, torej enakih dolžin in širin terasnih ploskev ter enakih višin in širin terasnih brežin. Izrazito prepoznaven proces sprememb rabe tal v celotni katastrski občini je ogozdovanje. Danes je pokrovnost z gozdom kar 82%. Tudi na terasah se je delež gozda povečal iz 1% na 8%, ta podatek pa prikazuje zaraščanje kulturnih teras. Zaradi sprememb v demografiji se je v času od franciscejskega katastra do danes več kot štirikrat zmanjšala zemljiška kategorija travinja, pa tudi njiv in vrtov je danes le še 2%. Sadovnjaki na terasah so pomembna zemljiška kategorija, saj zajema 12% delež. Dobri dve tretjini terasne rabe tal so v preteklosti obsegale njive in vrtovi, ki imajo v sodobnosti malenkost manjši delež kot sadovnjaki. Poleg sadovnjakov in gozda se je skoraj trikrat povečal delež travinja. Pomemben podatek za rabo je tudi osončenje teras, saj je največ teras orientiranih na sever. Tudi v Ostrožnem Brdu na razporeditev teras vplivajo predvsem reliefne razmere, zaradi katerih so terase na severnem pobočju dobro osvetljene, za izbor kmetijskih kultur pa je odločilna tudi nadmorska višina.

UPORABNOST REZULTATOV

Podatki za današnje dejansko rabo tal sicer opredeljujejo rabo posamezne parcele bolj natančno kot franciscejski kataster, kljub temu pa ni današnji Interpretacijski ključ za določanje rabe povsem natančen pri upoštevanju terasiranih območij. Pravila za določanje rabe tal na terasnih brežinah v Evidenci dejanske rabe kmetijskih in gozdnih zemljišč (RABA) niso bila oblikovana dosledno. V primeru vinogradov, intenzivnih sadovnjakov in oljčnikov, velja določilo, da so v rabo tal vključene tudi zatravljene brežine, medtem ko v primeru njiv velja določilo, da so v rabo tal vključene brežine teras med njivami, katerih florisna širina ne presega 2 m. V primeru drugih vrst zemljišč bi bilo potrebno v skladu z navodili rabo tal na terasnih brežinah kartirati ločeno. Znanе metodologije kartiranja in evidentiranja terasnih območij in njihove rabe izključevanja dela teras ne omogočajo.

KLJUČNE BESEDE

terasirana pokrajina, raba tal, spremembe rabe tal, franciscejski kataster, Ostrožno Brdo, Sredozemlje

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- AŽMAN MOMIRSKI, L., KLADNIK, D. (2014): Factors in the conservation and decline of cultivated terraces in Slovenia. V: Segundo congreso internacional de terrazas, Cuzco, Perú, 19-22.05.2014, str. 1.

Slika 6: Po prepoznavnosti v naselju Ostrožno Brdo izstopa terasirano območje na severozahodu vasi, ki je tudi največja sklenjena površina kmetijskih zemljišč na terasah (Matevž Lenarčič).

Figure 6: Terraced terrain in Ostrožno Brdo at the northwestern part of the village, representing the largest coherent farming area on terraces (Matevž Lenarčič).

which is located in the transition zone between the Mediterranean and the Dinaric world, was one of the villages selected for the case study. Land use of the studied area was significantly influenced by political changes, since after the collapse of Austria-Hungary, the studied area was, in turn, part of three different states. The terraced area in the cadastral municipality of Ostrožno Brdo accounts for mere 10% of the total area or 93.6 ha of land. A typical feature of the Brkini terraces is the length of terrace platform or the whole terrace; terraces are usually about 150 m long, while in the landscape most expressive areas, terraces are even longer than 300 meters. During almost 200 years the terraces and their slopes have preserved the same forms. Afforestation is an explicitly recognizable process of land-use changes in the entire cadastral municipality. The present forest cover amounts to as much as 82%. The percentage of woodland increased even on terraces, i.e. from 1% to 8%; the data show the overgrowing of cultural terraces. Due to the changes in demography, the land-use category of grassland has decreased more than four times since the Franciscan Cadastre, and also fields and gardens do not exceed 2% today. The present terrace orchards represent an important land category, since they amount up to 12%. In past times, more than two-thirds of terraced land were used for fields and gardens, but their percentage is now slightly lower than that of orchards. In addition to the increase in orchards and woodland, the percentage of grassland also increased, almost three times. Insulation of terraces is important information with regard to land use, since most of the terraces are oriented towards the north. At Ostrožno Brdo landforms mainly influence the distribution of terraces, and altitude above sea level influences the selection of farming cultures.

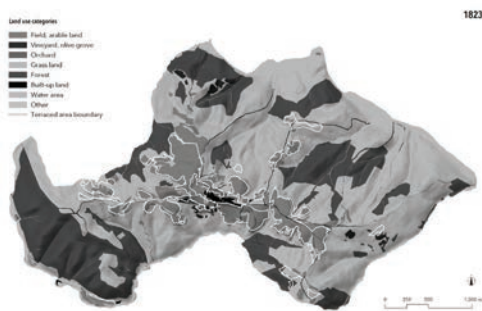
ISSUES AND THEIR SIGNIFICANCE

Though the data on the current actual land use determine the utilisation of individual parcels more precisely than the Franciscan Cadastre did, the present interpretation key for determining the use in terraced areas is not completely accurate. The rules for specifying land use on terrace slopes in the Register of Actual Utilisation of Farming and Woodland have not been formulated consistently. In the case of vineyards, intensive orchards and olive groves, the provision applies that overgrown and grassed terrace slopes are also included in land use, while in the case of fields the provision says that it only relates to terrace slopes with the maximum ground plan width of 2 metres. In the case of other types of utilisation, land use on terrace slopes should be mapped separately in accordance with instructions. With the known methodologies of mapping and inventorying terraced areas and their use, any exclusion of parts of terraces is all but impossible.

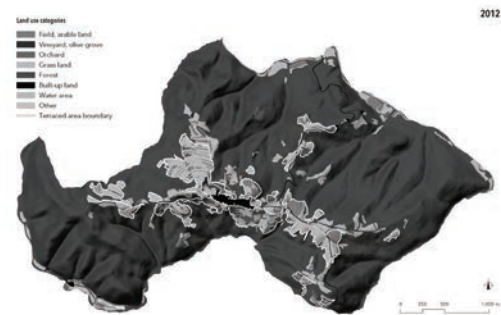
KEY WORDS

terraced landscape, land use, land use changes, Franciscan Cadastre, Ostrožno Brdo, Mediterranean





Slika 7: Raba tal v naselju Ostrožno Brdo v letu 1823 (Arhiv Republike Slovenije, GURS).
Figure 7: Land use in the village Ostrožno Brdo, 1823 (Slovenian National Archive, GURS).



Slika 8: Raba tal v naselju Ostrožno Brdo v letu 2012 (Arhiv Republike Slovenije, GURS).
Figure 8: Land use in the village Ostrožno Brdo, 2012 (Slovenian National Archive, GURS).

Martina Zbašnik-Senegačnik METODE IN ORODJA ZA OCENJEVANJE TRAJNOSTNIH ENODRUŽINSKIH HIŠ

METHODS AND TOOLS FOR EVALUATION OF SUSTAINABLE SINGLE-FAMILY HOUSES

POVZETEK

Stavbe imajo negativne vplive na okolje v celotnem življenjskem ciklusu, torej od faze pridobivanja surovin ter proizvodnje gradiv in polizdelkov, do prodaje, vgradnje in uporabe do končne faze odstranitve, ko stavba odsluži svojemu namenu. Trenutna zakonodaja omejuje v glavnem rabo energije in emisije v obratovanju, manj pa ostale parametre, ki prav tako definirajo zasnovo sodobne trajnostne stavbe. Preverjanje trajnostne zasnove stavbe je smiselno že v začetnih fazah projektiranja, ko je še mogoče vplivati na rezultat.

V raziskavi je bila med drugim izdelana enostavna metoda, s pomočjo katere se z izbranimi petimi indikatorji ocenjuje kakovost trajnostnih zasnov: energijska učinkovitost, raba primarne energije, emisije CO₂, stroški ter na doseženo bivalno ugodje. Ocenjevanje s pomočjo indikatorjev poteka po treh načinih objektivnega in subjektivnega ponderiranja, s čimer se v skupno oceno vključijo vidiki neodvisnosti presojevalca ter vidiki nacionalnih in uporabniških zahtev.

Na osnovi rezultatov, zbranih v raziskavi na velikem statističnem vzorcu enodružinskih pasivnih hiš, je bil izdelan tudi računski model za ocenjevanje energijskih tokov v stavba. V praksi se uporablja veliko število računskih orodij za izračunavanje energijskih tokov. Njihova uporaba prinaša natančne rezultate, zahteva pa vnos velikega števila parametrov v zapletenih računskih postopkih. Vrednost teh parametrov je znana šele na koncu načrtovalskega procesa. Razvita je bila enostavna metoda za ocenjevanje energijske učinkovitosti enodružinske hiše, ki je vključevala čim manjše število parametrov in enostavne računske postopke.

UPORABNOST REZULTATOV

Sodobna stavba mora torej ustrezati številnim zahtevam, zato pa mora biti ustrezno zasnovana. Z enostavnimi metodami in orodji se predvsem zagotovi, da jo uporabijo projektanti v fazi idejnega načrtovanja in s tem takoj na začetku načrtovanja poiščejo najoptimalnejšo zasnovo stavbe.

KLJUČNE BESEDE

energijska učinkovitost, trajnostni koncept, enodružinska hiša, enostavna metoda, enostavno orodje

SUMMARY

Buildings have negative effects on the environment throughout their life cycle, i.e. from the phase of obtaining raw materials and manufacturing materials and components up to the sale, building and use through the final phase of removal when the building is decommissioned. In general, current legislation limits both the use of energy and the emissions allowed during operation, but do not limit the other parameters that define the design of contemporary sustainable buildings. Determining the sustainability of buildings should take place in the planning phase of the project, when it is still possible to influence the outcome.

In a research study, a simplified method using five chosen indicators was elaborated to evaluate the level of sustainability. The areas to be evaluated are energy efficiency, use of primary energy, CO₂ emissions, costs, and the level of living comfort achieved. The evaluation using these indicators is carried out using three subjective and objective weighting methods, such that the final evaluation includes the viewpoints of an independent evaluator and the points of view of both the user and the state.

On the basis of results obtained in a research study conducted on a large statistical sample of Slovenian single-family houses the calculation model was created, which calculate the energy flows in buildings. In practice a number of calculation tools are used to calculate annual energy flows. Their use yields accurate results but requires the input of a large number of parameters in the complex calculation procedures involved. The values of these parameters are usually known only after the planning process of a building has been completed. A simplified evaluation method for energy efficiency in single-family houses has been developed with the aim of using as few building parameters as possible with the simplest calculation procedures possible.

ISSUES AND THEIR SIGNIFICANCE

A contemporary building must answer to a number of demands and therefore must be designed accordingly. The simplicity of the new

REZULTATI

Izvirni znanstveni članki

PRAZNIK, Miha, BUTALA, Vincenc, ZBAŠNIK-SENEGAČNIK, Martina. Simplified evaluation method for energy efficiency in single-family houses using key quality parameters. Energy and buildings, ISSN 0378-7788. [Print ed.], Dec. 2013, vol. 67, str. 489-499.

PRAZNIK, Miha, BUTALA, Vincenc, ZBAŠNIK-SENEGAČNIK, Martina. A simple method for evaluating the sustainable design of energy efficient family houses. Strojniški vestnik, ISSN 0039-2480, Jun. 2014, vol. 60, no. 6, str. 425-436

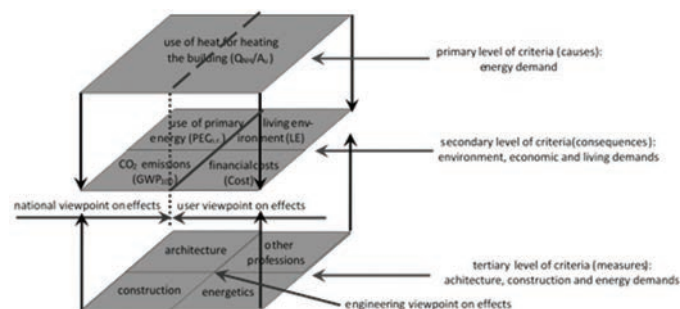
Mentorstvo pri doktoratu

PRAZNIK, Miha. Kvalitativni parametri za energijsko učinkovite enodružinske hiše : doktorska disertacija = Quality parameters for the energy single-family houses : doctoral thesis. [Ljubljana: M. Praznik], 2014. XVII, 171 str.

methods and tools ensures that planners use it in the idea phase so that they seek the most optimal design for the building from the beginning.

KEY WORDS

energy efficiency, sustainable concept, single family house, simplified method, simplified tool



Slika 9: Prikaz prvih dveh nivojev zahtev oz. kriterijev za vrednotenje, s petimi ključnimi indikatorji.

Figure 9: Representation of the first two levels of demand or the criteria for evaluation using 5 key indicator.

Domen Kušar

SPREMEMBE TESTA MISELNE ROTACIJE

POVZETEK

Ena izmed inteligenc, ki med drugim zajema lingvistično, matematično, glasbeno, gibalno itd., je prostorska inteligenca. Sestavni del slednje je prostorska predstava. Ta sposobnost je ključna za vse osebe, vpletene v proces oblikovanja in upravljanja s prostorom. Proučevanje prostorske predstave je relativno mlada disciplina. Za začetnika raziskav s tega področja se smatra Sir Francis Galton, ki je leta 1880 poročal o svojih eksperimentalnih raziskavah na področju miselne predstavljenosti. Hkrati s preučevanjem prostorske predstave so se razvijali tudi različni instrumenti – testi za njeno vrednotenje. Eden izmed standardnih splošno razširjenih testov je test miselne rotacije (Mental rotation test – v nadaljevanju MRT), ki pa je tudi povzržen razvijanju, zlasti na Japonskem. Na Fakulteti za arhitekturo MRT uporabljamo za ugotavljanje prostorske predstave študentov in vrednotimo tudi sam test. Na osnovi rezultatov smo skupaj s kolegi iz Budimpešte predlagali spremembe točkovanja MRT. Rezultati obstoječega sistema točkovanja namreč niso ustrezali pričakovani normalni razporeditvi. S predlagano rešitvijo smo odpravili anomalijo obstoječega testa in to dokazali z rezultati testiranja študentov v Ljubljani in Budimpešti (tabela 1). Rezultati raziskave so bili predstavljeni v članku: Bölcseki, A., Kovács, A. Z., Kušar, D. (2013): New ideas in scoring the Mental rotatin test. V: Ybl Journal of built environment, 2013/1, str.: 59-69 in na znanstvenih konferencah v Innsbrucku ter v Supetru poleti 2014.

UPORABNOST REZULTATOV

MRT je splošno uporabljan test po vsem svetu. Rezultati predlagane spremembe načina ocenjevanja pomenijo novost

CHANGES OF MENTAL ROTATING TEST (MRT)

SUMMARY

Spatial intelligence is one of the human intelligences (other abilities are linguistic, mathematical, musical, physical, etc...). An integral part of spatial intelligence is spatial ability. This ability is crucial for all parties involved in the process of creating and managing space. Spatial ability is a relatively young discipline. For the originator of the research in this area is considered Sir Francis Galtna. He reported about his experimental research in the field of mental visualization in 1880. Parallel with the study of spatial ability, they have also developed various testing instruments. One of the widely used standard test is Mental rotation test (MRT). Nevertheless, it has been developing, especially in Japan. At the Faculty of Architecture, we use MRT to determine the spatial ability of students. At the same time, we also evaluate the test itself. Based on our results, and together with colleagues from Budapest, we proposed changes to the scoring system of MRT. The results of the current scoring system did not fit to the expected normal distribution. We eliminated the anomaly of existing test in proposed the solution. This was proven by the results of students in Ljubljana and Budapest (Table 1).

The survey results were presented in the article: Bölcseki, A., Kovács, AZ, Kušar, D. (2013): New ideas and scoring the Mental rotatin test. In: Ybl the Journal of the built environment, 2013/l, p.: 59-69 and on scientific conferences in Innsbruck and in Supetar on summer of 2014.

ISSUES AND THEIR SIGNIFICANCE

MRT test is widely used around the world. The results of the proposed changes in scoring system means a novelty in this

na tem področju, kar je bilo opaziti po predstavitev rezultatov v Innsbrucku in Supetru. Rezultati raziskave bodo tako pripomogli k optimizaciji MRT. To pa bo vodilo k bolj realnemu ugotavljanju prostorske predstave.

KLJUČNE BESEDE

prostorska predstava, test miselne rotacije

field. This was observed after the presentation in Innsbruck and Supetar. The survey results will also help to optimize the MRT. This will lead to a more real determining of spatial ability.

KEY WORDS

spatial ability, mental rotation test

Slika 10: Rezultati ustreznosti normalni porazdelitvi pri starem in novem sistemu točkovanja.

Figure 10: Normality test by χ^2 distribution at old and new scoring system.

Group of students	Old scoring system		New scoring system	
	Computed χ^2 statistic	Answer to H_0 (at 95% $\chi^2 \approx 52.19$)	Computed χ^2 statistic	Answer to H_0 (at 95% $\chi^2 \approx 52.19$)
Overall – Ybl Faculty of SzLU	71.23	NO	35.50	YES
Men – Ybl Faculty of SzLU	73.25	NO	69.90	NO
Women – Ybl Faculty of SzLU	35.81	NO	20.42	YES
Overall – UL FA	74.61	NO	46.50	YES
Men – UL FA	55.48	NO	47.99	YES
Women – UL FA	68.99	YES	34.37	YES

Matevž Juvančič

DIALOG IN IZOBRAŽEVANJE O PROSTORSKIH TRAJNOSTNIH VPRAŠANJIH V ARHITEKTURI IN URBANIZMU

DIALOGUE AND EDUCATION ABOUT SPATIAL SUSTAINABLE ISSUES IN ARCHITECTURE AND URBAN DESIGN

POVZETEK

Na področju dialoga in izobraževanja o trajnostnem prostorskem razvoju v arhitekturi in urbanizmu, gre izpostaviti nekaj raziskav in iz njih izhajajočih prispevkov ki so v zadnjem času obravnavale med-disciplinarno in medgeneracijsko sodelovanje v procesu oblikovanja prostora. Pri vprašanih vzgoje za trajnostni prostorski razvoj, nas je zanimalo predvsem, kako mlajše generacije razumejo ta pojem in kaj si pod njim predstavljajo, saj slednje postavlja temeljna izhodišča za nadaljnje delovanje na tem področju. Študija [Svetina et al., 2013] prinaša interdisciplinarni pristop k preučevanju razumevanja trajnostnega razvoja grajenih okolij s strani otrok in mladostnikov. Koncept trajnosti implicira zapletene odnose med etičnimi, ekonomskimi, socialnimi, tehničnimi in drugimi lastnostmi. Koncept je težko razumljiv za otroke, ki še nimajo razvitih sposobnosti abstraktnega in večdimenzionalnega mišljenja. Za preverjanje razumevanja trajnostnih konceptov s strani otrok in adolescentov smo razvili in uporabili metodo vizualnega jezika in jo aplicirali na vzorcu preko 2000 sodelujočih, starih od 6 do 19 let. Vsesplošno razumevanje in interpretacijo prostorskih informacij o urbanih okoljih je obravnavalo več prispevkov, ki so se ukvarjali z uvajanjem novega pristopa k razumevanju kompleksnih informacij in delovanja urbanih prostorov s strani ne-strokovne javnosti. Verovšek, Juvančič in Zupančič [2013a] opisujejo koncept modela za interpretacijo kvalitet urbanih prostorov. Cilji modela so trije: prvič, oblikovanje enotnih, veljavnih in uporabnih metod, za ocenjevanje značilnosti oblikovanja prostora; drugič, navesti razvojne lastnosti prostorov, ki bistveno vplivajo na uporabnikovo izkušnjo, ki - kot posledica - izhaja iz preudarnih oblikovalskih rešitev ali pomanjkljivega urbanističnega oblikovanja; tretjič, razviti generični jezik vizualne predstavljivosti urbanih prostorov za komunikacijske namene (slika 10). Model predstavlja identifikacijsko metodo in je namenjen prepoznavanju ključnih informacij oziroma 'zgodbe',

SUMMARY

Several recent studies and scientific contributions have addressed the dialog methods and education in sustainable spatial development in architecture and urbanism, which at the same time also dealt with interdisciplinary and inter-generation communications and lifelong learning on the process of urban design. For education purposes on the topic of sustainable spatial development, we were interested in how the younger generations come to understand this notion. This fundamental understanding will direct further efforts in that segment. The study [Svetina et al, 2013] provides an interdisciplinary account determining how children and adolescents understand urban and architectural aspects of sustainable development. The concept of sustainability implies complex relations between ethical, economic, social, technical and other qualities of our environment. The concept is difficult to understand for children who lack the abilities of abstract reasoning and multi-dimensional thinking. A new measure of sustainability understanding was formed based on pictorial rather than textual format and was applied to a large sample of over 2000 participants aged 6–19 years. The general understanding and interpretation of spatial information on urban environments were addressed by several contributions, which dealt with a novel approach to understanding the complex information and logics of urban spaces by the non-expert public. Verovšek, Juvančič in Zupančič [2013a] propose a model for interpretation of qualities in urban space. The objectives are threefold: first, to form common, valid and applicable measures to assess features of space design, second, to indicate the developmental trait that considerably affect user's spatial experience which – taken as a consequence – derives from either sustainable/prudent or poor design decisions; and third, to generically recreate and visually represent urban spaces for communicative purposes (figure 4).

ki je del določene prostorske danosti. Izbrani izsledki študije so opisani tudi v Verovšek, Juvančič in Zupančič [2013b]. Model sledi izvorni ideji izobraževalnega vmesnika za širšo javnost, ki je udeležena v procesu prostorskega soodločanja, s katerim se je podrobneje ukvarjala doktorska disertacija z naslovom Sistem vizualnih digitalnih orodij za participacijo splošne javnosti pri prostorskem načrtovanju [Jutraž, 2013] pod mentorstvom prof. dr. T. Zupančič.

UPORABNOST REZULTATOV (teoretična, praktična)

Medtem, ko je bil poudarek predvsem na raziskovanju metod dialoga in izobraževanja o trajnostnem prostorskem razvoju v arhitekturi in urbanizmu, pričujoče raziskave posredno prispevajo tudi k rasti prostorsko-kulturne ozaveščenosti prebivalstva, ki dolgoročno prispeva k razvoju sodobnih konceptov arhitekture in urbanizma, vezanih na specifično arhitekturnega prostora in kulturno dediščino v Sloveniji. Od novih teoretičnih dognanj nas rezultati usmerjajo tudi k povsem praktičnim implikacijam, kako nagovarjati posebne starostne, interesne ali drug podobno grupirane podskupine v procesu arhitekturnega in prostorskega načrtovanja. Na primer: raziskava z mladostniki je pokazala, da se razumevanje trajnostnih problematik povečuje s starostjo, zlasti pri mladostnikih, ki živijo oziroma izvirajo v urbanih okoljih. V raziskavi o razumevanju in interpretaciji prostorskih informacij smo dopolnili védenje o tem, kateri elementi prostora so kot nosilci pomena v svoji izkustveni obliki močnejši od drugih, kako generični smejo biti po svoji obliki, kdaj je pozornost gledalca smiselno usmerjati postopno in v katerih točkah in kakšnih okoliščinah je izkustveni vidik prostorskega sporočila smiselno dopolniti ali celo nadomestiti z bolj strnjeno obliko sporočanja. Nova znanja bodo pripomogla, da bodo slikovna gradiva pripravljena tako, da bodo predstavitev sporočilnostno učinkovitejše in hkrati racionalnejše za pripravo v danih okoliščinah.

KLJUČNE BESEDE

trajnostni prostorski razvoj, arhitektura, urbanizem, otroci, ne-strokovna javnost, sporazumevanje, izobraževanje, interpretacija, participacija

REFERENCE

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- SVETINA, M., ISTENIČ STARČIČ, A., JUVANČIČ, M., NOVLJAN, T., ŠUBIC KOVAČ, M., VEROVŠEK, Š., ZUPANČIČ, T. (2013): How children come to understand sustainable development : a contribution to educational agenda. V: Sustainable development, 21, 4: 260-269.
- VEROVŠEK, Š., JUVANČIČ, M., ZUPANČIČ, T. (2013a): Understanding and interpreting urban space (in)formation. V: International journal of architectural computing, 11, 2: 135-155.
- VEROVŠEK, Š., JUVANČIČ, M., ZUPANČIČ, T. (2013b): Vidni jezik za predstavitev interdisciplinarnih vsebin na področju urbanega razvoja : izbrani izsledki študije = Using visual language to represent interdisciplinary content in urban development : selected findings. V: Urbani izziv, 24, 2: 65-77, 144-155.

The model represents an identification method and is intended as a pragmatic instrument for recognizing crucial information, narrative, embedded in spatial scene. The selected results are described also in Verovšek, Juvančič in Zupančič [2013b]. The model is following the initial idea for an educational digital interface for the general public, participating in the process of urban decision-making, which was later addressed by a doctoral thesis [Jutraž, 2013] under the mentorship of prof. dr. T. Zupančič.

ISSUES AND THEIR SIGNIFICANCE

While the research efforts primarily focused on methods and education in sustainable spatial development in architecture and urbanism, the presented studies indirectly contribute to the growth of the spatio-cultural awareness of the inhabitants, which in the long term contribute to the development of sustainable concepts of architecture and urban design in relation to the specific of Slovene architecture and protection of architectural and cultural heritage. From new theoretical findings the results also direct us to the practical implications of how to address special age, interest and other sub-groups in the architectural and urban design process.

For example: the results of the youths study indicated that understanding of sustainability issues increased progressively with age, particularly with adolescents from urban environments. The study on understanding and interpretation of spatial information has added to existing knowledge by ascertaining which elements in space are stronger information carriers than others, how generic they may be, when it makes sense to guide the viewer's attention sequentially, and when and where is it suitable to add to the experiential expression or even replace it with a more compact, abstract form of communication. The gained insights will assist in preparing visual materials in a more effective and economical way under specific circumstances.

KEY WORDS

sustainable spatial development, architecture, urban design, children, non-experts, communication, education, interpretation, participation



Slika 11: Primer slikovnega gradiva v nalogi iz presojanja sporočilnostne moči dodanih informacij v obliki (a) prereza in (b) grafikona (ilustracija: M. Juvančič).

Figure 11: An example of an illustration in the research that surveyed the communication potential of additional information in the form of (a) added section and (b) bar chart (illustration: M. Juvančič)