

2nd International Conference on Urban Planning - ICUP2018

Publisher

Faculty of Civil Engineering and Architecture, University of Nis

For Publisher

Dean

Petar Mitkovic, PhD

Editor

Petar Mitkovic, PhD

Co-Editors

Milena Dinic Brankovic, PhD Milan Tanic, PhD Aleksandra Miric, PhD Vuk Milosevic, PhD

Text formatting, prepress and cover

Milan Brzakovic Sanja Jankovic Vojislav Nikolic

ISBN 978-86-88601-36-8

Circulation

150 copies

Printing

Grafika Galeb Nis

2nd International Conference on Urban Planning - ICUP2018

Organized by

Faculty of Civil Engineering and Architecture, University of Nis Urban Planning Cluster, Nis







Sub-organizers

Serbian Chamber of Engineers and Institute for nature conservation of Serbia







1st International Conference on Urban Planning ICUP2016 was successfully held in Niš, Serbia on 18th and 19th November 2016. Main topics of the Conference were: *Urban theory and practice; Development and planning problems; Links between planning, building and land; Urban regeneration; Land readjustment; Interaction between the natural environment and urban areas.* Conference gathered together a large number of professors, researchers and many professionals working in practice. As a result of the Conference, Conference Book of Proceedings was published with 41 scientific papers. During the Conference, round tables were organized where all participants could discuss the current issues in the field of urban planning and design. Urban planning process was contemplated on by professionals and researchers from both theory and practice. Different points of view and topics related to urban design, planning and its implementation, urban landscape, public–private partnership and smart cities were developed and discussed.

During two days, 10 Keynote speakers from different parts of the world gave lectures which were open for all participants. Keynote speakers and their affiliations at the time of the ICUP2016 Conference included: **Dr Ali A. Alraouf**, head of Capacity Building, training, research and development unit at Ministry of Municipality and Environment (MME) Qatar; **Prof. Dr Zorica Nedović-Budić**, Professor at Chair of spatial planning in the School of Architecture, Planning and Environmental Policy at University College Dublin, Ireland; **Dr Alessandro Busa**, Center for Metropolitan Studies at the Technical University of Berlin, Germany; **Dr Hossam Samir Ibrahim**, working with municipal government of Qatar and consultation firms in Regional and Urban planning projects in Egypt, UK, Qatar, and Kingdom of Saudi Arabia; Prof. **Dr Francesco Rotondo**, Associate professor of Urban planning and design at the Polytechnic University of Bari, Italy; **Dr Cristian Suau**, funding director of STUDIO POP, Scotland; **Dr Demetrio Muñoz Gielen**, IHS Institute for Housing and Urban Development Study of the Erasmus University in Rotterdam, Netherlands; **Dr Kosta Mathéy**, lecturer at different Universities in Germany, Cuba, Algeria and Egypt; Prof. **Dr Derya Oktay**, Dean of the Faculty of Architecture at Ondokuz Mayıs University, Samsun, Turkey; and **Dr Teo Keang Sood**, Professor of Law in the Faculty of Law at the National University of Singapore.

Thanks to different experiences and to different scientific and research fields of keynote speakers and participants, Conference themes were analyzed from different points of view, which resulted in interdisciplinary and comprehensive approach of complex urban planning issues. Beside professors and researchers at the Conference, numerous professionals were present. Therefore, one of the conclusions was that cooperation between science/research and professional practice is necessary in order to adopt and implement innovative solutions and to create and plan human friendly spaces according to anthropometric scale. Niš as the "host city" of the conference was an excellent research polygon for discussion, because it represents an example of the city with complex urban structure. It includes rich heritage areas but also new developing areas, thus providing a very attractive and vibrant ambient. Thus, the next conclusion was that inherited sites and built heritage can be used as a tool for city branding and can also help to improve development by learning on past mistakes and achievements. The following conclusion found that cities must be observed as the home to all residents, which must actively participate in its development and planning process, in order to present their real needs and to stop illegal constructions. Finally, it was concluded that public-private partnerships must be encouraged and promoted because it is not possible to develop and implement projects without mutual cooperation. By developing public-private partnership it is possible to achieve community wellbeing through encouraging investors to develop public spaces and community facilities.

SCIENTIFIC PROGRAM COMMITTEE

Petar Mitkovic, Phd, Chairman, Faculty of Civil Engineering and Architecture, University of Nis, Serbia

Milan Tanic, Phd, Faculty of Civil Engineering and Architecture, University of Nis, Urban Planning Cluster, Serbia

Milena Dinic Brankovic, Phd, Faculty of Civil Engineering and Architecture, University of Nis, Serbia

Vuk Milosevic, Phd, Faculty of Civil Engineering and Architecture, University of Nis, Urban Planning Cluster, Serbia

Aleksandra Miric, Phd, Urban Planning Cluster, Serbia

Goran Jovanovic, Phd, Faculty of Civil Engineering and Architecture, University of Nis, Serbia

Aleksandar Kekovic, Phd, Faculty of Civil Engineering and Architecture, University of Nis, Serbia

Ljiljana Vasilevska, Phd, Faculty of Civil Engineering and Architecture, University of Nis, Serbia

Danica Stankovic, Phd, Faculty of Civil Engineering and Architecture, University of Nis, Serbia

Ivana Bogdanovic-Protic, Phd, Faculty of Civil Engineering and Architecture,

Zoran Radosavljevic, Phd, Ministry of Construction, Transport and Infrastructure

Dejan Milenkovic, Phd, Faculty of Political Sciences, University of Belgrade, Serbia

Jelena Zivkovic, Phd, Faculty of Architecture, University of Belgrade, Serbia

Aleksandra Djukic, Phd, Faculty of Architecture, University of Belgrade, Serbia

Milica Bajic Brkovic, Phd, Faculty of Architecture, University of Belgrade, Serbia

Aida Nayer, Phd, Effat University, Department of Architecture, Saudi Arabia

Mila Pucar, Phd, Institute of Architecture and Urban & Spatial Planning of Serbia

Dragana Ostojic, Phd, Institute for nature conservation, Serbia

Demetrio Muñoz Gielen, Phd, IHS Institute for Housing and Urban Development Study of the Erasmus University in Rotterdam, Netherlands

Ali A. Alraouf, Phd, Head of CB, Development, CB and Research Unit-QNMP, Research and Training, Ministry of urban planning, Doha, Qatar

Derya Oktay, Phd, Dean, Faculty of Architecture, Ondokuz Mayıs University, Samsun, Turkey

Marcus Collier, Phd, School of Natural Sciences, Trinity College, Dublin

Margaretha Breil, Phd, CMCC on strategies for climate change, Venezia

ORGANIZING COMMITTEE

Slavisa Kondic, Chairman, Urban Planning Cluster, Faculty of Civil Engineering and Architecture, University of Nis, Serbia

Tanja Obradovic, Faculty of Civil Engineering and Architecture, University of Nis, Serbia

Miljana Ignjatovic, Urban Planning Cluster, Serbia

Vojislav Nikolic, Urban Planning Cluster, Faculty of Civil Engineering and Architecture, University of Nis, Serbia

Aleksandra Miric, PhD, Urban Planning Cluster

Milica Igic, Faculty of Civil Engineering and Architecture, University of Nis, Serbia

Milan Brzakovic, Urban Planning Cluster

Biserka Jovanovic, Urban Planning Cluster

Jasmina Tamburic, Faculty of Civil Engineering and Architecture, University of Nis, Serbia

Sanja Jankovic, Faculty of Civil Engineering and Architecture, University of Nis, Serbia

Marija Marinkovic, Urban Planning Cluster

Natasa Panic, Institute for nature conservation, Serbia

Danko Jovic, Institute for nature conservation, Serbia

Dragana Nedeljkovic, Institute for nature conservation, Serbia

Jovana Selmic, Institute for nature conservation, Serbia

Milijana Petkovic Kostic, Serbian Chamber of Engineers

FOREWORD

It is with great pleasure that I present to you the following Proceedings of the Second International Conference on Urban Planning ICUP2018, held in Nis on November 14-17, 2018. This is the second conference organized by the Faculty of Civil Engineering and Architecture, University of Nis and Urban Planning Cluster, with the aim of bringing together scholars, researchers and students from all areas of Urban Planning. The ICUP conference explores a broad spectrum of Urban and Spatial Planning issues from both theory and practice. The main topic of this year's Conference is Nature - Urban Planning - Architecture.

These topics are discussed in more than 40 conference papers from various study areas and diverse places in the world, and therefore provide a valuable insight into contemporary urban policies and approaches. They also make good grounds for discussion at the conference and a good basis for further research. The authors are professors, researchers, PhD students and planning professionals. We are especially proud of our keynote speakers and the members of our Scientific Program Committee, who are eminent experts in their fields from all over the world.

We considered that it is very important and responsible that a group of connoisseurs gathered in order to contribute to integrate sustainable principles into urban design and fostering the principles of nature protection. The set of messages presented in this publication represents a contribution to the extremely important debate about the introduction of nature in the urban environment. Some of researches, whose results are presented in this proceeding, bring to our attention that the quality of urban life in ever-growing cities depends on the ecological principles applied in urban areas, from the symbiotic connections between green and gray surfaces and the sustainable use and renewal of natural resources. The crucial mechanisms of supporting sustainable and healthy lifestyle, principles of protection of inherited natural resources, are exposed. Historical and contemporary examples of good practice have been considered, which have improved the quality of life, both in the family micro-space of residential houses and in urban cores of the metropolis. We hope that this knowledge base will become an inspiration to professionals and public to improve the standard of living on the local as well as at the international level; to compete in treating quarters belonging to citizens, cities that develop in accordance with nature and state policies that contribute to the protection of the planet.

Urban structure is a complex and multidimensional system that is prone to change. Therefore, it requires to be closely monitored by continuous research, which brings up some entirely new issues or sheds new light on the old ones. Given the importance of the planning topics elaborated at the conference and numerous questions that are raised here, we firmly believe that it is our task to continue exploring this matter. Hence, we are proud that the ICUP conference establishes itself as a traditional manifestation of the University of Nis. I take this opportunity to thank all of the authors and co-authors of papers, reviewers, keynote speakers, members of the Scientific Program Committee, as well as teachers and associates engaged in the technical preparation of these Proceedings.

And finally, I am pleased to invite all authors from the academic and research community to participate and give their scientific and professional contributions to the future Conferences, for the benefit of all of us.

Petar Mitkovic, PhD, Full professor

Faculty of Civil Engineering and Architecture, University of Nis Chairman of the Scientific Program Committee



CONTENTS

FROM DOHA TO NIS: NATURE-BASED URBAN DEVELOPMENT TOWARDS JUST, RESILIENT AND INCLUSIVE WATERFRONTS

Ali A. Alraout	11
BRINGING NATURE INTO THE CITY	
Margaretha Breil	25
URBAN-BY-NATURE: TOWARDS A HOLISTIC CONCEPT OF HEALTH AND THE DIMINUTION OF	
ENVIRONMENTAL EXTERNALITIES	
Jorg Sieweke	33
URBAN DESIGN AND URBAN PLANNING AS COMMUNICATIVE PROCESSES FOR SUSTAINABLE	
PLACES	20
Tatjana Mrdjenovic	39
THE POLICY FRAMEWORK AND	
THE ACTIVE MOBILITY IN BULGARIA	
Boriana Nozharova, Peter Nikolov	53
THE IMPACT OF THE PREFABRICATED INDUSTRIALIZED SYSTEM OF CONSTRUCTION ON THE	
SPATIAL ORGANIZATION OF COLLECTIVE HOUSING BUILT BETWEEN 1970 – 1980. IN NIS	62
Vladana Petrovic, Goran Jovanovic, Branislava Stoiljkovic, Milica Zivkovic	63
GREEN INFRASTRUCTURE IN BELGRADE AS (RE) GENERATIVE SPACE OF BIOPHILIA: THE CASE STUDY	
OF BLOCKS 45, 70 AND SAVAMALA	74
Ivan Simic, Vladimir Mihajlov, Marija Cvetkovic	71
TESTING GREENING POTENTIAL WITH GREEN ROOFTOPS OF INDUSTRIAL BUILDINGS	
Ljiljana Jevremovic, Branko Turnsek, Marina Jordanovic, Milanka Vasic, Ana Stanojevic, Isidora	01
Djordjevic THE MANAGE OF FLOATING HOUSING TO FAMILIPONIMENT	81
THE IMPACT OF FLOATING HOUSING TO ENVIRONMENT	90
Sanja Jankovic, Goran Jovanovic, Vladan Nikolic	89
POTENTIAL OF THE SOUTH SERBIA IN RENEWABLE ENERGY SOURCES AND THEIR EXPLOITATION	
Marina Jordanovic, Ljiljana Jevremovic, Milanka Vasic, Branko Turnsek, Ana Stanojevic, Isidora Djordjevic	97
INTERCONNECTION BETWEEN URBAN-BASED FACTORS AND FLEXIBLE HOUSING POTENTIALS	
Milica Zivkovic, Slavisa Kondic, Milan Tanic, Vladana Petrovic	105
BRINGING NATURE INTO URBAN AREAS THROUGH IMPLEMENTATION OF MODERN STORMWATER	103
MANAGEMENT APPROACHES: EXAMPLES FROM VIENNA'S NEIGHBOURHOODS	
	113
Ljiljana Vasilevska, Magdalena Vasilevska CITIES ADAPTATION TO THE CLIMATE CHANGE BY USING GREEN BUILDING PRINCIPLES	113
	121
Mila Pucar, Marina Nenkovic-Riznic, Borjan Brankov, Snezana Petrovic, Milena Stojkovic HOME BETWEEN THE HOUSE AND THE CITY - ARCHITECTURAL CONCEPT THAT USES URBAN	121
PATTERN FOR HOUSING DESIGN	
Hristina Krstic, Mila Cvetkovic, Goran Jovanovic, Vladana Petrovic, Sanja Spasic DJordjevic	131
URBAN-ARCHITECTURAL ANALYSIS OF STUDENT DORMITORIES IN NIS	
Hristina Krstic, Dusan Randjelovic, Miomir Vasov	141
NEW URBAN FORMS AS A RESPONSE TO CLIMATE CHANGE – THE CASE OF WATER SQUARE	
BENTHEMPLEIN IN ROTTERDAM	
Magdalena Vasilevska	149
BIOPHILIA IN URBAN PLANNING AND ARCHITECTURAL DESIGN- MODERN EXPERIENCES AND	
PATTERN OF APPLICATION IN SERBIA	
Danica Stankovic, Milan Tanic, Aleksandra Cvetanovic, Aleksandra Kostic, Vojislav Nikolic, Bojan	
Stankovic	155
DETERMINATION OF CLIMATE CHARACTERISTICS AS A DOMINANT PARAMETER IN BUILDING	
DESIGN - CASE STUDY THE CITY OF NIS	
Dusan Randjelovic, Miomir Vasov, Hristina Krstic, Aleksandra Curcic, Jelena Stevanovic	163
QUALITY CRITERIA OF URBAN OPEN SPACES IN HIGH - RISE RESIDENTIAL COMPLEXES IN THE	
PROCESS OF URBAN REGENERATION	
Ivana Bogdanovic Protic, Petar Mitkovic, Milena Dinic Brankovic, Milica Ljubenovic	171
ARCHITECTURAL AND DESIGN REORGANIZATION OF THE RESIDENTIAL YARD IN THE MASS	
BUILDING UP OF VOLGOGRAD IN THE 80-S OF THE 20TH CENTURY	
Valentina Serebryanaya	179
A STRATEGIC POINT - GEOGRAPHICAL ASPECTS IN THE DEVELOPMENT OF THE CITY OF ZALĂU	
Alexandra Cuibus	187
· · · · · · · · · · · · · · · · · ·	

VULNERABILITY OF THE TRADITIONAL HOUSE AND ITS IMMEDIATE YARD AREA IN CITY CENTERS OF THE CITIES OF SOUTH SERBIA

Ana Momcilovic – Petronijevic, Olivera Nikolic, Aleksandra Miric	197
THE DREAM ABOUT GREEN CITIES - THE URBAN HERITAGE OF FUNCTIONALISM, BIALYSTOK -	
MOSAIC OF SPATIAL URBAN FORMS	
Michał P. Chodorowski	205
CONTRIBUTION OF PUBLIC-PRIVATE PARTNERSHIP TO THE DEVELOPMENT OF THE ENERGY	
EFFICIENCY MARKET	
Andrijana Jovanovic	215
WALKABILITY IN HISTORIC URBAN FABRICS AND ITS ROLE IN URBAN PLANNING AND DESIGN	
Mahtab Baghaiepoor, Mostafa Behzadfar	221
APPLICABILITY OF THEORETICAL APPROACHES OF URBAN SHRINKAGE TO SMALL TOWNS	
Milica Ljubenovic, Ivana Bogdanovic-Protic, Mihailo Mitkovic, Milica Igic, Jelena DJekic	227
RAISING CITIZEN AWARENESS THROUGH PROMOTING BENEFITS OF SMALL URBAN STREAMS	
REVITALIZATION	
Dr Aleksandra DJukic, Visnja Sretovic Brkovic	235
THE DOT-TO-DOT© COMMUNITY STATION:	
REPLICATION FOR SOCIAL INNOVATION & URBAN REACTIVATION IN EUROPEAN CITIES	
Dr. Cristian Suau, Laura Petruskeviciute, Aleksandra Til	245
GREEN ROOFS AS A MODEL OF RE-USING FLAT ROOFS	
Danijela Milanovic, Danijela Djuric-Mijovic, Jelena Savic	263
ROLE OF LOCAL AUTHORITIES AND CITIZENS IN URBAN PLANNING OF MICRO PUBLIC SPACES	
Dejan Milenkovic	271
CONCEPTUALISING MULTIFUNCTIONALITY OF PUBLIC OPEN SPACES FOR SUSTAINABLE URBAN	
DEVELOPMENT	
Jelena Zivkovic, Milica Milojevic, Ana Nikezic, Ksenija Lalovic	281
GREENING AS AN APPROACH FOR URBAN RENEWAL OF SHRINKING CITIES	
Aleksandra DJukic, Tijana M. Vujicic, Branislav Antonic	291
MODERN HOSPITALS IN THEIR NATURAL ENVIRONMENT	
Olivera Nikolic, Aleksandar Kekovic, Vladan Nikolic, Ana Momcilovic Petronijevic	299
SUSTAINABLE PLANNING IN PROTECTED NATURAL AREAS - CASE STUDY OF VLASINA LAKE	
Biserka Mitrovic, Jelena Maric, Tamara Vukovic	307
TEACHING SUSTAINABILITY: CONCEPT OF SMEDEREVO AS A HEALTHY CITY	
Biserka Mitrovic, Tamara Vukovic	315
INDUSTRIAL HERITAGE THROUGH CITY OF NIS' SPATIAL PLAN -VALUATION AND RECOGNITION	
WITH RECOMMENDATIONS ON INTEGRATION OF RENEWABLE ENERGY SOURCES	
Aleksandar Jovanovic, Milena Jovanovic	323
SPATIAL PLANNING AS A LAND-USE AND BUILDING REGULATION TOOL FOR PROTECTED NATURAL	
AREAS IN SERBIA	
Marijana Pantic, Sasa Milijic, Jelena Zivanovic Miljkovic	331
STORMWATER MANAGEMENT: JEDDAH WADI'S POTENTIALS	
Aida Nayer, Oula Chikha	339
BIOSWALES AS ELEMENTS OF GREEN INFRASTRUCTURE – FOREIGN PRACTICE AND POSSIBILITIES	
OF USE IN THE DISTRICT OF THE CITY OF NIS, SERBIA	
Milena Dinic-Brankovic, Petar Mitkovic, Ivana Bogdanovic-Protic, Milica Igic, Jelena DJekic	347
REVITALIZATION OF DEVASTATED RURAL AREAS IN THE REGION OF SOUTHERN AND EASTERN	
SERBIA: A REVIEW OF EXISTING DEVELOPMENT PATTERNS, POTENTIALS AND PLANNING POLICIES	
Milica Igic, Petar Mitkovic, Milena Dinic Brankovic, Jelena DJekic, Milica Ljubenovic, Mihailo	
Mitkovic	357
THE TREATMENT OF GREENERY IN URBAN PLANNING DOCUMENTS: RESIDENTIAL AREAS IN NIS,	
SERBIA	
Slavisa Kondic, Tanja Obradovic, Milica Zivkovic, Milan Tanic, Vojislav Nikolic	365
VARIABLE SCALES OF ARCHITECTURE – FROM OBJECT TO THE TERRITORY: NOTES FOR THE	
MANIFEST	
Natasa Jankovic, Ksenija Pantovic	373
THE DESIGN OF SCHOOL GROUNDS GREENERY: INTERNAL AND EXTERNAL INFLUENCING FACTORS	
Milan Tanic, Danica Stankovic, Milica Zivkovic, Vojislav Nikolic, Slavisa Kondic	379



RAISING CITIZEN AWARENESS THROUGH PROMOTING BENEFITS OF SMALL URBAN STREAMS REVITALIZATION

Dr Aleksandra Đukić

University of Belgrade, Faculty of Architecture, Serbia *PhD., Associate Professor, adjukic@afrodita.rcub.bg.ac.rs*

Višnja Sretović Brković

University of Belgrade, Faculty of Architecture Research Assistant, <u>visnja sretovic@yahoo.com</u>

ABSTRACT

Revitalization of urban streams is becoming an increasingly prominent topic in Serbia mainly because of the apparent problems with the urban streams – floods, pollution, and neglect of surrounding areas. A number of projects advocating contemporary approach to revitalization of river beds, riparian areas and surrounding zones were proposed but were not entirely successful.

While the expert community is well aware of the problems regarding the urban streams, citizens know very little about it or about the opportunity to turn the streams once thought as a problem into attractive and valuable urban spaces. Therefore, in order to achieve broad citizen participation that is necessary to successfully implement projects of urban stream revitalization, the public needs to be educated and informed about the importance of the streams. Such projects can have many benefits for city life, not only ecological but also social and economic. Promoting the benefits is a good way to gain the interest of the public. However, exactly what benefits are brought to forefront depends on the project, context, local culture, and target groups.

This paper will explore how much are citizens of Belgrade informed about its urban streams. Are they aware of the role and potential benefits of the streams? We will discuss which of the benefits should be emphasized and promoted most in order to achieve the broadest participation of citizens in the projects concerning the revitalization of Belgrade's urban streams.

Keywords: small urban streams; raising awareness citizens; project benefits; Belgrade

1. INTRODUCTION

The citizen participation plays an essential role in the revitalization of small watercourses in city areas. Most river-restoration projects in which the general public was included in the planning processes and execution were successfully implemented and integrated into the environment. (URBEM, 2005). Apart from the successful implementation, the participation in the process of urban revitalization could bring more socially sustainable solutions. (Sun, 2015)

Including citizens in the early phase of the process of small urban stream revitalization presents the most efficient way to reach an overall accepted solution. In order to support involvement at an early stage of the planning process, it is necessary to inform the citizens about the significance of the city's streams, the importance of solving existing problems, as well as about the potentials offered by the streams. (URBEM, 2005) Providing access to that information during the early stages of the project is most commonly achieved by presenting the citizens with all of the benefits they will have from the revitalization of streams. The choice of these benefits is vital because the engagement of the citizens will largely depend on these choices, including to which degree the project will attract them, as well as whether the suggested benefits and/or topics will interest the citizens to participate in further processes.

The research presented in this text is part of a larger one, about the prospect of citizen participation in the revitalization of small watercourses in Belgrade. This text will present a part of the research on the appropriate

topics and benefits that can be used to raise awareness of the importance of streams. The aim of this section is to obtain guidelines for further research on the knowledge of Belgrade's citizens about streams, about their interest in participating, and benefits that will be significant in promoting the stream revitalization projects in Belgrade.

2. THE BENEFITS OF REVITALIZED URBAN STREAMS

Modern projects aim to create sustainable spaces, and the benefits they bring can be classified according to environmental, social and economic sustainability goals. The most important topics are:

- Restoration of historical areas,
- Return to nature,
- Regeneration of industrial heritage,
- Recreation and water sports,
- Walking and socializing,
- Culture and manifestations,
- Entertainment and swimming in the water,
- Raising the real estate value of the area,
- Reduction of pollution, and
- Reduction of flood risks.

Each of these topics brings a number of benefits which can be presented to the citizens in order to spark their interest in projects of the revitalization of small urban watercourses.

The choice of topics and benefits to be used in the project promotion depends on many factors, primarily, the goals of the project, which are closely related to the natural and social context of the project. Considering the she socio-political context, it is viewed in a broader sense, therefore when selecting the possible benefits, a number of factors have to be considered, of which the most important are the level of development of the civil society, the culture of participation and civic activism, topics that were promoted in previous cases, the habits of citizens and cultural attitudes towards streams. Therefore, the choice of benefits will vary from one culture to another.

For example, in Germany, at the centre of the Emscher River Restoration Project were ecological topics of restoring a "dead" river, reducing the pollution in the river, natural channel design, the return of flora and fauna. These topic was followed by four more topics: (2) Emscher Landscape Park and a network of new parks, (3) regeneration of zones used for processing of ore, a project known as "Working in Park", (4) regeneration of industrial heritage buildings and (5) new urban development projects - residential areas and accompanying activities. (Shaw, 2002) In Emscher's case, ecology was the main thematic unit from which benefits were selected.

Germany is a country with a developed civil society and a long tradition of participation. Participation represents a part of the formal system, while at the same time, forms of informal participation are developed as well. (Heldt & Budryte, 2016) During the Emscher River regeneration, informing citizens began long before the start of a major regional project. Informing the public and raising awareness began with numerous NGOs and social groups, which played a major role in raising awareness about the importance of the environment. At that time, the ecological topics in Germany were very current. (Salian & Anton, 2011)

Although the reduction of the river pollution was a dominant topic throughout the entire project, research showed that this was not the most popular one within the Emscher regions (the project included 81 kilometres of the river's length). For example, a survey conducted in the town of Dinslaken, where Emscher confluences with River Rhine, showed that the main topic of interest to the citizens was nature-based recreation on the riverbanks, rather than the purification of the river. This was conditioned by the lower level of pollution in that area, so the citizens were more interested in local issues rather than the large revitalization movement of Emscher. (Heldt & Budryte, 2016)

Unlike the European example, in Seoul, South Korea, the main topics selected for promoting the project of the revitalization of the Cheonggyecheon Stream were strengthening national and natural - fostering historical heritage and culture and returning to nature. This was conditioned by Seoul's socio-political context.

South Korea is in a transition process, at the turning point between two influences: the traditional authoritative and the penetration of the Western system of values. Seoul does not have such a developed civil society compared to Germany and, unlike in Emscher, informing the citizens' starts with the promotion of a major project - a top-down approach. The project is part of a political campaign for the election of the mayor of Seoul. The only information that the citizens had about the revitalization of the stream before the beginning of the project, was created on the basis of a successful revitalization of the small Yangjae stream in the elite part of Seoul.

Despite that the Cheonggyecheon River was previously converted into a sewage canal so that cleaning of the stream was the primary goal, the topic of ecology and pollution was not promoted. Citizens of Seoul were more interested in the idea of creating a network of parks (a return to nature), as well as the restoration of cultural heritage through the glorification of the national heritage, since the Cheonggyecheon River is located in the historic central Seoul region and is rich in cultural heritage. (Lah, 2011) Therefore, these were the issues which helped bring the topic closer to the citizens and spark interest in the project.

Even though there were similarities in goals when it comes to the revitalization projects of rivers Emscher and Cheonggyecheon, the choice of various topics and benefits in the promotion demonstrates the relevance and significance of other factors, such as cultural attitudes of citizens, and the topics which are popular among the citizens.

In the following paragraphs, we will present the results of the pilot survey about the Belgrade citizen's knowledge of local streams, and guidelines for the selection of topics and benefits that culturally correspond to the views of Belgrade's citizens.

3. THE CASE OF BELGRADE'S STREAMS

Belgrade is interwoven with a complex web of small rivers and streams. Today, unfortunately, the majority of them are piped underground, and disappeared in the process of rapid urbanization. (Ćorović & Blagojević, 2012) The existing unregulated or inappropriately regulated urban streams in Belgrade are faced with problems of pollution, flooding and sewage overflows, land erosion, and aesthetics. Streams in Belgrade, are often neglected and do not look attractive, therefore influencing their surroundings in a negative way. Most commonly, these are inaccessible areas, so the streams are invisible, hidden within thick and dense unruly vegetation. (Brković, 2014)

The interest in Belgrade's streams has been growing in recent years among experts, and a couple of revitalization projects offering contemporary solutions were proposed. However, it is crucial to inform the public about the significance of Belgrade's streams, so the revitalization projects can be successfully implemented. Keeping in mind that the streams are in inaccessible areas, and essentially invisible, some of Belgrade's population has never heard of them since they've never even seen them. For the moment, there is no research available which would be able to present to what degree Belgrade's population is informed on the small urban watercourses. In the following text, the results of the pilot survey about the knowledge on urban streams in Belgrade and the possibility of their revitalization will be presented, which can serve as an introduction for the preparation of a larger research project, using a representative sample of the citizens.

4. SURVEY ANALYSIS AND CONCLUSION

The territory coverage used for the survey looked at streams in areas in which the respondents reside or stay longer, and coincides with the territory of the official Belgrade General Plan. The research is focused on urban streams and the pilot survey was conducted on a sample of 117 citizens. It was conducted online and all respondents are legal adults (older than 18 years) and have been residing or staying in Belgrade for a long period of time.

The survey is composed of two parts. The first part consists of five questions, where the first three inquire about the knowledge of the respondents on streams in Belgrade, and the other two of the condition these streams are currently in. The aim was to determine how well the citizens are informed about the role of streams in the city. The second part of the survey examines citizens' awareness of the potential benefits of stream revitalization and explores the potentials of future solutions which are most significant to them.

4.1. Understanding streams - analysis of results and discussion

In the first questions, the respondents were asked to mark several stream names in Belgrade which they have heard of. As per the authors of the survey, the fourteen streams that were selected for the survey were the most well-known, all flow on the surface and are, territorially speaking, part of the General Plan of Belgrade. The respondents also had the possibility to add the names of other streams they may have heard of. Out of the total number of respondents, most of them heard of Topčider River, (85.5% of the respondents), while 58.2% of respondents have heard of the Mirijevo stream. Following that, streams such as Slanci, Rakovica, Banjica, and Avala, as well as Ostružnica River were marked by 38-42% of the respondents. The other most frequented streams from the respondents are now flowing streams that were part of the former Belgrade and ran through the city's central zone, for example, Čubura or Bulbuler, but are in the process of urbanization and enclosed in pipes.

	Ger	ıder	Age						Education			
Sample	Male	Female	18-24	25-34	35-44	45-54	55-64	65-74	74+	Primary	Secondary	Higher
Number	43	70	5	30	52	15	8	3	0	1	11	101
%	62.1	37.9	4.3	29.1	44.4	12.8	6.8	2.6	0	0.9	9.4	89.7

Table 1: General data on respondents, part 1

Table 2:	General	data	οn	resno	ndents	part	2

	Municipality									
Sample	Voždovac	Vračar	Zemun	Zvezdara	Novi Beograd	Palilula	Rakovica	Savski venac	Stari grad	Čukarica
Number	18	11	3	16	10	5	5	6	2	17
%	19.35	11.8	3.22	17.2	10.7	5.4	5.4	6.4	2.15	18.3

The interesting question is what makes these streams familiar to citizens? Topčider River is one of the largest and mostly regulated. It has historical value and was an important element of the old Belgrade, especially during the time of Prince Miloš. Likewise, it is part of the highly visited Topčider Park of the same name, and visible to citizens. In addition, it is often mentioned in the press because of pollution, leakage, and displacement of the flow. The Mirijevo stream flows through a densely populated part of Belgrade and is also often mentioned in the press due to regulations and a large quantity of waste and pollution. Other marked streams, as well as Topčider River, pass along some of Belgrade's sights or public spaces (parks, forests, picnic grounds, monasteries), so citizens have had the opportunity to see them. These streams are also mostly regulated. The interesting question was whether the knowledge of the stream was locally conditioned, i.e. whether the respondents know the streams that flow in the territory of the municipality they live in, but only 42% of the respondents were familiar with the streams from their surroundings. In order to determine what makes a stream known, additional research needs to be carried out.

The second question is related to the number of streams that the respondents had the opportunity to see. The results indicate that this number is significantly different from the number of streams for which the respondent heard of. While 69% of them heard of five to eight streams, only 2.6% of the respondents actually saw more than five streams. The majority of respondents, 61.3% had the opportunity to see up to two streams. This data indicates how many streams are actually invisible and inaccessible. The citizens heard about them, but most did not have the opportunity to access.

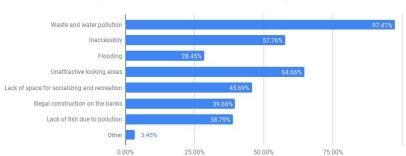
In the third question, when the respondents were asked to name the streams they have seen, the number of streams was reduced even further. The streams seen are most often those which are, according to the survey, the most well-known ones. The most frequent is Topčider River, as stated by 41% of the respondents, followed by Mirijevo stream (21%), Rakovica and Banjica (12%), Avala stream (11%), Kumodraž and Slanci (7%).

Frequently throughout the survey, the respondents stated that they had the opportunity to see more streams, but that they do not know their names, which further points to the invisibility of streams in Belgrade.

4.2. Current state of streams-analysis and discussion

The purpose of the fourth question was to investigate to what degree are citizens aware of the problems which the streams are facing, and which are, based on their perception, the most significant. Nearly all of the respondents, 97.41% said that they consider large quantities of waste and water pollution the biggest issue. Subsequently, 64.66% of respondents stated that the zones were unattractive, ugly looking. Inaccessibly to streams was listed by 57.76% of the respondents. Following that, 45.69% list the lack of space for socializing and recreation as a problem, while 39.66% list illegal construction on the banks. Finally, 38.79% list lack of fish due to pollution in the waters, and 28.45% listed water and flood spills as the most significant issue.

Even though pollution and flooding do present problems that jeopardize the lives of the public, flooding was listed as their least concern. In recent years, Topčider River has experienced flooding, while in the last century, the flooding of Mokroluški Creek lead to several deaths. (Cvejić et al., 2002). Based on that, it has been concluded that a large number of the respondents are not aware of the possible dangers of streams, or that they didn't fully understand the question.



What are the most significant problems the streams are facing?

Figure 1: Responses on the fourth question

Aside from the mentioned issues, the respondents had the opportunity to list other problems. All respondents listed various forms of pollution, which demonstrates that according to the people surveyed, the biggest concern when it comes to Belgrade's streams is of an ecological nature. What is interesting is that the streams' unattractiveness is recognized as the next problem, and based on that we concluded that the appearance of the stream is very significant in the perception of the respondents. This is confirmed by the responses to the fifth question, in which the respondents were asked to assess the appearance of the streams on the scale from 1 to 5, one being "unsatisfactory appearance" to five being "nicely landscaped streams" and their general impressions of them. The largest percentage of respondents (47.8%) feel that the streams are unsatisfactory, while 42.5% of the respondents choose two on the 1-5 scale. Only 9.7% consider their appearance to be average (3), while none of the respondents rated the streams 4 or 5. The answers to the previous two questions suggest a selection of benefits that need to be promoted.

4.3. Prospects for stream revitalization and the future look of the streams

In the second part of the survey, the respondents were asked about the potential future look of the streams and the areas by which they are surrounded. We presented the respondents with photos and multiple choice questions illustrating various landscaping solutions and asked which one they consider to be the most attractive. In Serbia, there are very few examples of stream regulation using modern methods, therefore, providing the respondents with photos better explained the suggested landscaping solutions. It is interesting that 98.29% of users have opted for contemporary designs, which until now have not yet had the opportunity to see in Serbia, while only 1.71% of respondents opted for concrete stream embankments that are the most common way of regulating small rivers in Serbia. It is important to emphasize that this question dealt only with the appearance of streams. Based on the photographs, 86.32% stated that it is necessary to combine natural channel design and stream channelization, while 11.97% of the respondents chose the natural channel design. The remaining option, in which it was suggested that the stream is piped and placed underground and the land above was used for the development was not selected by any respondent. However, this mode of regulation is

still the most common when it comes to Belgrade streams. This pilot survey unanimously demonstrated that the respondents of Belgrade want to see and visit streams in their surroundings.

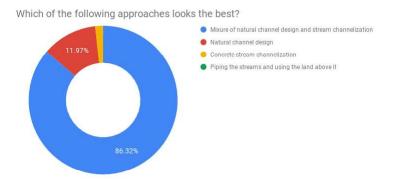
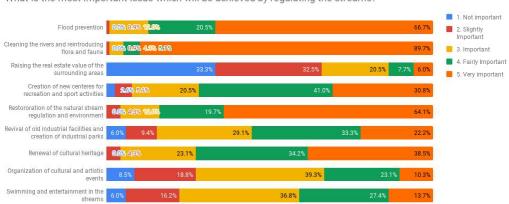


Figure 2: Responses on the sixth question

The seventh and eight question covers what citizens' feel is the most important issue which will be achieved by regulating the streams. These questions were provided to see which of the topics mentioned in the first part of the text are most relevant to the respondents. The choice of topics and benefits is tailored to the case of Belgrade.



What is the most important issue which will be achieved by regulating the streams?

Figure 3: Responses on the seventh question

When asked what is the most important goal to achieve by regulating small watercourses and their banks, most of the respondents chose ecological topics, which are the only ones (from all provided) containing issues that could endanger the lives of the citizens. 89.7% of the respondents think that it is very important to clean the streams of pollution, while other respondents consider it important/of medium importance. When it comes to flood prevention, 66.7% think it is very important, while the rest feels that it is important/of medium importance.

Considering the issues that do not endanger the lives of citizens, in the third place in the poll, another ecological topic was found: restoring the natural regulation of the stream and the natural environment. 64.1% of the respondents said that this is very important, which points to the importance of the natural environment. In the fourth place was the renewal of cultural heritage - the first of the social topics - for which 38.5% think it is very important, followed by sports and recreational activities with 30.8%. The next important topic is the revival of old industrial facilities and transformation into parks and culture, with 22.2% of the respondents that consider it very important. Swimming and entertainment, as well as the organization of cultural and artistic events by the streams, was not considered as very important by the respondents since less than 15% of them choose issues in this category. What the respondents presented as the least important is the economic benefit of raising the real estate value of the environment.

The summarized results of the seventh question point that pollution, which is recognized as the biggest problem in the survey, is the most important topic for Belgrade's surveyed citizens. What is also clear is that

the results of the survey indicate that nature is very important to the citizens of Belgrade and that they seek to return the nature to the city. It can also be noted that the citizens have chosen the benefits of regulating streams based on topics that are traditionally significant in Serbia, such as nature, the restoration of cultural heritage, sport and recreation.

The eighth question was conceived as a complement to the seventh, where the survey respondents were offered photographs of various landscapes that may appear in the small rivers and streams. The idea was to demonstrate and conjure up through the photographs the most significant benefits of revitalizing small urban watercourses. Each picture shows one benefit with a brief description. Respondents were able to mark several responses (at most five). This question excluded the issues that are life-threatening to citizens (such as pollution) and photographs offered some insight about the possible future appearance of the areas.

Most of the respondents (93.2%) selected nature parks, which corresponds to the previous responses. Recreation by the stream, shown in a photo of people bike riding in a natural setting, was in second place, selected by 70.9% of the respondents. In third place is a walkway, selected by 68.4% of the respondents. The fourth and fifth places are split between spaces for socializing and historical parks, selected by 50.4% of the respondents. Public gathering, performances, and open-air concerts, displayed in photographs along with contemporary designed stream banks, was selected by more respondents - 36.8%, followed by two photographs referring to the transformation of the industry into cultural and theme contents. Swimming, water entertainment, and kids' water playgrounds, as in the previous question, were not of interest to the respondents. It is interesting that only 19.7% of the respondents selected restaurants and bars on the coast, which are generally very frequent and popular in Belgrade. We cannot conclude from the survey if this response was because the respondents used in this survey do not like that form of entertainment, or it is difficult to visualize it in the environment of the stream, or the respondents think that there are enough restaurants and bars in Belgrade, but it is an interesting finding.



Figure 4: Responses on the eighth question (Image sources: Historical park-www.tripadvisor.ca/LocationPhotoDirectLink-g294472-d550629-i184567977-Topcider_Park-Belgrade.html; Water entertainment- www.expressnews.com/news/local/article/Wading-yes-but-swimming-no-at-new-downtown-12899078.php; Kids' water playground- https://uk.gofundme.com/super-soaker-summer-shelter-party; Walkway - https://www.visitnorway.it/listings/walk-along-the-river-akerselva/44619/; Public performances - www.publicspace.org/works/-/project/j257-renovation-of-promenada; Nature parks - Photo by Atelier Dreiseitl www.thenatureofcities.com/2015/03/17/daylighting-and-restoring-urban-streams-ponds-and-wetlands-can-provide-huge-ecological-and-social-benefits-are-such-restorations-worth-it-what-are-the-pitfalls-how-can-we-demonstrate-these-ben/; Restaurants and bars - www.edimaps.com/riverside-dining-map/; Social spaces - https://ecoempathyproject.wordpress.com/2017/10/25/animating-hydrology-studio-dreiseitls-ecoempathic-approach-to-on-site-water-management/; Cultural and theme parks - https://www.landschaftspark.de/en/leisure-activities/play-areas/; Recreation by the stream - http://visitoxfordtours.com/oxfordcitycountrysidecycletours.html; Open museum - https://www.summeradventure.de/wordpress/die-schoenste-zeche-der-welt-das-unesco-welterbe-zollverein/)

The results of the eighth question are in line with the results of the seventh question - nature, recreation, walking, socializing, and historical values are what attracts the majority of the citizens the most. It is important

to note that citizens did not have the opportunity to see facilities such as industrial parks or children's playgrounds in this environment, so they may not fully understand the advantages and disadvantages of such spaces.

5. CONCLUSION

The results of the pilot survey show that the respondents are aware that there are streams in Belgrade, but that they've had little opportunity to visit them and get to know them more. The most well-known are those in close proximity to some of Belgrade city-sights, or those mentioned in the press. The problems that were listed as the most pressing were pollution, waste, and unattractive landscaping of the area. Most respondents of the survey feel unsatisfied regarding the attractiveness of the streams. When it comes to benefits that should be addressed, it is conclusive that the benefits are reducing pollution and revival of the streams, followed by the return of nature in the city, recreation, walking, socializing, and finally, the preservation of cultural/historical heritage. Aside from the input about informing the citizens and raising awareness, the results of the pilot survey demonstrate which types of projects would be more likely to spark interest among the citizens, and the type of landscaping that should be sought when it comes to stream revitalization.

Regarding the survey, this pilot survey did not include that participants under 18 years of age due to problems of implementation. In the upcoming period, this age group will be included since they present one of the most important and most complex groups which needs to be informed. It is also worth noting that the largest percentage of surveyed are above average educated. Finally, the survey was filled out online by internet users, which narrowed the selected group even further.

It is also noteworthy to mention the citizens' degree of interest for stream revitalization. If citizens live near a stream or river and are directly exposed to pollution or flooding, or will be relocated due to future project, their interest in stream revitalization will be bigger but also different. This pilot survey was conducted for all small streams and rivers in Belgrade in general, and all of the participants are from various municipalities, so their position of residence in relation to the streams and rivers are unknown. It is necessary to conduct a survey for each stream individually and localizing the citizens that will be informed, as a way to ensure more accurate findings. The results of this survey represent input for organizing another survey on a more accurate sample, which would then provide valid research data on the citizens' awareness of the importance of streams.

ACKNOWLEDGEMENTS

Research and writing of this paper was done under the project: Spatial, environmental, energy and social aspects of urban development and climate change – mutual influence; PP1: Climate change as a factor of spatial development of settlements, natural scenery and landscape, project no. TP36035, with funding from the Ministry of Education and Science, Government of the Republic of Serbia.

REFERENCES

- 1. Bae, H., 2011. Urban stream restoration in Korea: Design considerations and residents' willingness to pay. *Urban Forestry & Urban Greening*, 10, pp. 119-126.
- 2. Cvejić, J., Despotović, J., Obratov-Petković, D. & Tutundžić, A., 2002. Kompatibilnost alternativnih rešenja regulacije poplavnih voda i revitalizacija malih gradskih vodotoka. in Inženjerski rizik i hazard u urbanom sistemu Beograda (Eds. V. Zlatanović-Tomašević and B. Božović). Beograd: Udruženje inženjera Beograda i Skupština grada Beograda, pp. 169-174.
- 3. Ćorović, D. and Blagojević, L., 2012. Water, Society and Urbanization in the 19th Century Belgrade: Lessons for Adaptation to the Climate Change. *Spatium*, 28, pp. 53-59.
- 4. Heldt, S. and Budryte, P., 2016. Social pitfalls for river restoration: How public participation uncovers problems with public acceptance. *Environmental Earth Science*, 75(1053), pp. 1-16.
- 5. Lah, T., 2011. The Huge Success of the Cheonggyecheon Restoration Project: What's Left?. in Citizen Participation: Innovative and Alternative Modes for Engaging Citizens. Cases from the United States and South Korea (Eds. M. Holzer, D. Kong and D. Bromberg). Newark: National Center for Public Performance, pp. 97-118.

- 6. The URBEM project., 2005. URBEM-Best Practise Guidance for Citizen Involvement for River Restoration. New Castle: City Council.
- 7. Salian, P. and Anton, B., 2011. The Emscher Region the opportunities of economic transition for leapfrogging urban water management. Freiburg: ICLEI European Secretariat.
- 8. Shaw, R., 2002. The International Building Exibition (IBA) Emscher Park, Germany: A Model for Sustainable Restructuring?. *European Planning Studies*, 10(1), pp. 77-97.
- 9. Sretović Brković, V., 2014. Revitalization of Small Urban Rivers and Streams as a Placemaking Potential. in DAAD Fachkurs Werzeuge und Methoden fuer die urbane Wasserfrontentwicklung (Eds. M. Devetaković & H. Haass).DAAD, pp. 48-53.
- 10. Sun, L., 2015. Public Participation in the Urban Regeneration Process. Liverpool: Thesis at the University of Liverpool.