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**SPECTRA**

Planning Studies

Central European Journal  
of Spatial and Landscape  
Planning

1

2016



 **SPECTRA**  
Centre of Excellence



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**Publisher:** STU Bratislava,  
SPECTRA Centre of Excellence EU

**Layout and Printing:** ROAD Bratislava, 2016

ISSN 1338-0370

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THIS ISSUE WAS SUPPORTED BY:

THIS CONTRIBUTION IS THE RESULT OF THE PROJECT IMPLEMENTATION: SPECTRA+ NO. 26240120002 "CENTRE OF EXCELLENCE FOR THE DEVELOPMENT OF SETTLEMENT INFRASTRUCTURE OF KNOWLEDGE ECONOMY" SUPPORTED BY THE RESEARCH & DEVELOPMENT OPERATIONAL PROGRAMME FUNDED BY THE ERDF



## MY FIRST ACADEMIC PAPER

The success or failure of publishing in academic journals largely depends on the art of conceptualisation and critical argumentation, originality and science marketing. In particular essential are: (i) considerable contribution to the knowledge and literature review (ii) critical discussion, (iii) logic of arguments and clear methodology, (iv) finally style of writing is well organised. ALL this has to fit into the 8 000 words at maximum. Impact factor papers are considered to be the only publication category with measurable quality comparable across disciplines. Demand for quality of papers in impact factor journal rise with increased competition.

This special issue is result of PhD course for methodology of interdisciplinary research, collaborative work and paper writing developed by CETIP Network ([www.cetip-network.eu](http://www.cetip-network.eu)) team inspired by the book *WORKING together* (A. Pottete, M. Janssen, E. Ostrom, 2010) under the collaboration with Centre for Institutional Diversity Arizona State University and SPECTRA Centre of

excellence. Main objective of the course is to integrate new Slovak research generation into the international research community and competitive publication practice.

Since formation in 2010, over 50 PhD students from spatial planning (Slovak University of Technology), environmental management (Faculty of Natural Sciences UK) and management (Faculty of Management UK) attended the course. Papers collected in this volume are produced in academic year 2015-16. With special thanks to co-authors of the course, teachers and supporters in particular: Veronika Chobotova- Gežik, Urban Kovač, Michal Maco, Stanka Brnkaláková, Eva Streberova, Veronika Poklembova, Mari Shyoia, Martin Kuruc, Martin Špacek, Alfred Kaiser, Maroš Finka, Maria Kozova, Jiřina Jílková, Lenka Sláviková.

To the memory of Lin Ostrom to her work and personality.

Bratislava October, 2016

**Tatiana Kluvánková**

*Course supervisor and main editor*





Michal Varga

## SMART COMMUNITY AS A SOLUTION FOR SPATIAL PLANNERS?

*The position of young spatial planners is uncertain and their community has to face several challenges. The concept of smart communities and communication technology, discussed in this paper, offer the potential solution for their survival and finding their position in rural and urban development.*

### Introduction

Spatial planning is a quite new field of study at the Slovak University of Technology and the position of spatial planner's community, predominantly consisting of young students, is unclear. They are facing three main challenges. The first one is that the profession of spatial planner as such is still not accepted formally in Slovakia and development of municipalities is in the hands of architects because spatial planners are not qualified to create a land use plan.

The second challenge that underpins uncertain role of young spatial planners is an obsolete Development and Building Law (Law no. 50/1976 Coll.) which does not allow graduates to make land plans without additional official permission ("the stamp"). This results in a situation, in which urban development or land use plans are conducted by the architects, and spatial planners have not yet found their own space in planning development. Students after graduation are unable to create community as a whole and to build or tighten their position; instead, they are losing their community's member base. The last challenge is the unawareness of local government. Students produce number of valuable and inspirational projects during their studies, of which considerable part is able to bring added value to the selected area. However, the implementation process is complicated since the local government, that would need such assistance, mostly does not even know that these projects exist. It is evident there is a need and urgency for cooperation with young students studying spatial planning to improve urban and rural development.

In spite of this is a long-term challenge in terms of spatial planning, the students do not necessarily have to wait for a legislative solution. In order for the spatial planners to find their position in spatial development, it is necessary to think about creating their own community with common interests and goals.

The main aim of this research is to help the spatial planners to find ways to strengthen their position through creating a community where the members will have a space to present their work to crucial actors and communicate among themselves. Such community that is able to learn from its own members can be called "Self-learning community". The term "community of spatial planners" in Slovakia contains more or less only the students of spatial planning nowadays. For that reason our goal is at the beginning to find the best way how to create successful community already during studies of spatial planning.

In the first part of the paper, the concept of smart community is discussed and followed by a discourse of the power of communication technology.

In the part "Each for own but all together" examined the principles important for creation of a communication platform between relevant actors. The paper is closed by conclusions.

### The concept of Smart Community as a solution for spatial planners?

In spite of spatial planners does not find their position in spatial development, they create the community with common interests and goals. The term community is defined as a group of people sharing a similar interest and includes some or all of the common elements such as geography, history, interests, goals, culture, economic and social fabric (Johnson, 1996). If we look at this definition of community basically it means that students of spatial planning create such community. However they have problem with losing their members after student's graduation. And that is also the reason why there is a need to move forward to solve this problem.

There is a question how can we transfer community of spatial planners into a smart community? The term "smart community" is generic and gives direct association towards optimal positive and sustainable development of a town, city or region, but not just for urban space. The concept of Smart Community was firstly used in 1993 in Silicon Valley, California, when the area experienced a recession that was deeper than the national economic downturn, and predicted to last longer. Today the concept of Smart Community is widely used. The Smart Communities phenomenon is global in the sense that it exists all over the world, as well as local since it is often based on local initiatives. "Smart Community" is defined as a community ranging from a neighborhood to a nationwide community of common or shared interest, whose members, organizations and governing institutions are working in partnership to use information and communication technologies to transform their circumstances in significant ways. (Johnson, 1998).

"Smart Communities" are also defined as communities with a vision of the future that involve harnessing the power of the Internet and other ICT technologies in new and innovative ways to empower their residents, institutions,



community groups and businesses. (ASCS, 2016). Other research defines the concept of “smart community” as a community in which government, business, and residents understand the potential of information technology, and make a conscious decision to use that technology to transform life and work in their region in significant and positive ways. (Willson, 1997)

Lindskog (2004) interprets the “smart community” concept in a holistic view and tries to incorporate all the possible aspects and parts involved, outgoing from a geographically limited area such as a town, city or region and their citizens. This concept sets the community and citizens’ needs in focus.

In another point of view, smart community can be roughly understood as a group of connected (social) objects that interact with each other over ubiquitous networks and deliver smart services to possibly all members (Xia & Ma, 2011).

As one can see in this article, originally the meaning of the smart community concept was deeper than the national economic downturn, and predicted to last longer. But essentially we can say that the main difference between selected individual authors is just in the scale, in which they understand, use and present the term “smart community”. For example, Johnson (1998) defines and presents smart community in a wide nation context, which seems like a complete contradiction to the definition of authors Xia & Ma (2011) that understand smart community as a group of connected social object. However, the former is just an evolutionary predecessor of the latter. Other authors (ASCS, 2016; Lindskog, 2004; Wilson, 1997) are in line with Johnson (1998). Their approach sets the term is not just on the national, but also regional scale. To summarize, we can agree with several authors (ASCS, 2016; Lindskog, 2004; Wilson, 1997), since this regional view of smart community concept is more valuable and relevant for our research than the extreme scales of understanding of the term (Johnson, 1998; Xia & MA, 2011).

Development of smart communities requires the creation of efficient communication infrastructure that could connect their members and contribute to build a professional partnership. In regard to the effectiveness, we need to suggest a way of propagating. A method which is available at the present, but not adequately used.

### **The power of communication technology**

Telecommunication has been identified as the infrastructure of the future (Cairncross, 1997) and it brings the opportunity for smart community development. But community needs to learn how to develop content and application online (Albert, 2005). It needs to learn how to plan for future infrastructure and how to encourage clustering and networking using online resources

(Gurstein,2000). When computer networks link people as well as hardware, then social networks are formed (Wellman,1996).

The development of smart communities requires infrastructure, online applications, innovations. It must involve and meet the needs of users (Albert,2005). Smart communities are networks of people responsible for changing a community, creating economic development and improving quality of life using telecommunication infrastructures. They are self-directed because they are groups of people who are responsible for a whole product or process (Ataran and Nguyen,1999; Hickman and Creighton-Zollar, 1998). New telecommunication application requires more than physical resources to be deemed as a smart or an intelligent initiative. It demands new methodological changes from each organization offering its services. It means, if an organization wants to offer innovative applications, it may need to encourage brainstorming and form linkages between various organizations and users. It may need multiple partnership to deliver and market new services on a community network. Communities may need to eliminate weaknesses in order to communicate effectively and to realize efficiencies (Albert, 2005)

However the community needs to realize that the future starts today. Even if we do not call it “telecommunication” as Cairncross (1997) but straightforward “the internet service”. The current penetration of information and communication technologies in all areas of our lives make a huge increase of information in digital form. This was confirmed by a research conducted in the years 2000-2003 at the School of Information Management and Systems at the University of California at Berkeley, US, where they did regular research to monitor the amount of information that is published on the Internet yearly. The re-search of Layman (2003) shows that more and more information is produced exclusively in digital form every day. The result of this research is surprising because already in 2003 the printed content was only 0.003% of all the published content. This means that one sentence in the print media accounted for 30,000 sentences is published digitally. The study noted that in 2003 nearly 5 hexa-bytes of new information were produced. For illustration, digitalizing all of the existing books in the library of the US Congress would represent about 136 terabytes of information. The digital information published in 2003 thus equals to the size of 37,000 such libraries (Layman, 2003).

From results of this study is evident that the digital world is large and is growing exponentially. In 2013, a study by EMC Corporation found out, that the amount of newly generated data increased to 4.4 zettabytes, and it is expected that in 2020, the volume level of 44 zettabytes will be reached (EMC, 2014). If we will try to relate this number to the digital equivalent of the US Congress’ library, we would find out, that it amounts to as much as 3,000 x10<sup>8</sup> of such libraries (WOLFRAMALPHA,2015). This number is inconceivable to illustrate. So if the digital

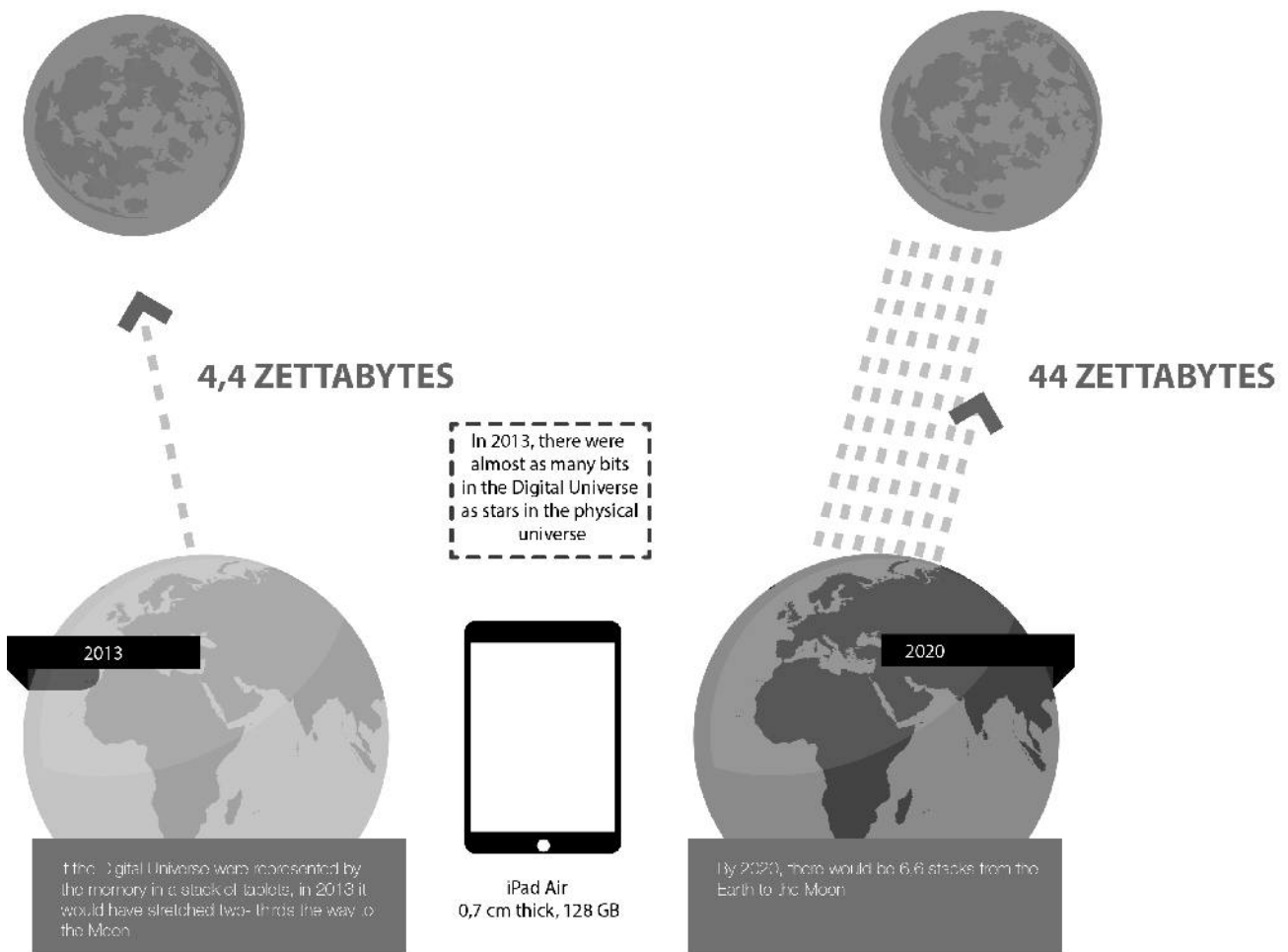


Figure 1: The Digital Universe Is Huge –And Growing Exponentially alebo Volume of data transferred over the Internet  
(source: ECM, 2014)

uni-verse is represented by the memory in a stack of tablets, in 2013 it would have stretched two-thirds the way to the Moon. If we did the same in 2020, there would be 6,6 stacks from the Earth to the Moon. (Figure 1) (EMC,2014).

All current figures speak of great opportunities, especially the colossal pressure of information that we can offer the digital space and also new offers. Of course, these enormous numbers refer to the web site. In 1998-2002 O’Neill and Bennet (2003) state in their study that in June 2002 it was publicly available nearly 1.4 billion Web addresses while in 1993 there were only 130 Internet domains, and in 1996 about 230,000 domains (Gray, 1996). Currently, the number of domains is growing at 5 new addresses per second, which represent a value of about 920,540,000 domains in March, 26, 2015 (Internetlivestats,2015). The same is about the users of the Internet itself, whose growth has noticeably slowed down but have constituted a nearly 40.4% of the population and about 3 billion users in July 2014. These statistics clearly show that the Internet is now the most important communication, information, business and marketing medium through which it is possible to reach more than 42% of the world population (Figure 2).

At this point it is important to realize that to create a homepage it is not enough to control the basic programming language such as HTML. It is also necessary to realize that the sole creation of some homepage will not create successful smart community. Such homepage has to have added value and be user friendly. It also requires functionality, reliability and especially "progressive enhancement" site as the gold standard approach to web design (Gustafson, 2011).

### Each for own but all together

The principle “each for own but all together” is the aim of our research with the goal to create a platform for vivid interaction. But proposal of the platform is not to imitate someone work, but rather we need to find the way, how we could combine the strengths of someone work that has been already done, with complementary manner of other users inside the community. The key point of this system is, that we do not need perfect imitation, but we are looking for meaningful interaction (French,2012).



Figure 2: Internet coverage (source: INTERNETLIVESTATS,2015)

To design adequate platform that meets the requirements of community, these three basic principles have to be fulfilled – Model perfection, not imperfection; Offer inclusive assistance; Provide transparent assistance (Richter, 2015). These principles were formulated originally for human-computer system. In our study these principles are understood slightly different because this study that is based on partnership between human users or institutions. “Model perfection, not imperfection” means that designers of the system should take the interaction of partners as what they are. In another words, we are seeking for a system without unnecessary bases that would simulate human imperfections, forgetfulness and misrepresentations which can move whole community forward. This requires having the ability to exchange in-formation in terms that users can understand and interpret.

“Offer inclusive assistance” means that system should not simply assist user in their task – it should involve him in the decision making process. Participation in decision making is important to keep user engaged and lead to resistant and support between human users. It enables reaction to failures, since the user is able to identify the stage of decision process where other user failed. And should lead to users self-learning process.

“Provide transparent assistance” - transparency of learning processes should be ensured through design and operation. It’s to be necessary transparent at all times, provide the admin and users with ability to verify the decision and possibly check the work which was already done and shared based on which the user work have been taken. This is very important for safety of user work. Based on these principles we will try to develop simple but efficient user friendly online system that will meet the

specific requirements and needs of users. This system will create space for presentation of community members which will lead to functional network that will connect planners and support self-learning and should contribute in creating successful smart community.

## Conclusions

Whether are the spatial planners a community today will depend on arguments discussed in this paper. Nowadays we already know that the most of the smart communities or similar initiatives on the local level started from a crisis situation and deep necessity for change (Lindskog, 2004). The power of internet grows exponentially and it is expected, that until 2020 the amount of communication will increase tenfold. So there is a need to accept these requirements of community and focused to the future.

It is important to have on the mind that every community, not only smart community is unique because every requirements and characteristics are based on the community itself. One common denominator is, that successful smart communities are the result of a coalition of business, education, government and individual users. (Lindskog, 2004) We must have in mind, that an important prerequisite of being called a Smart Community is collaboration and cooperation especially between the private and public sectors. Today there aren’t any strict rules for building a successful smart community, it can be from the top down, or bottom up. What is essential for it to function is an active involvement from every sector or users





of the community. Just that principle can create creative synergy, which will lead to faster progress upon every individual's project. It is also necessary to involve informed and trained critical mass for transformation of how the entire community is able to carry out its work.

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Iveta Štecová

## ECOSYSTEM SERVICES TO MITIGATE CLIMATE CHANGE IN CITIES

*Climate change is the growing problem especially in the urban environment. Cities today have been witnessing increased impacts on climate change including disasters such as flooding, water stresses in summer, intense rainfall-induced landslides and strong typhoons. Mainstreaming ecosystem services into spatial planning in cities can bring a numerous benefits for quality of life in cities because microclimatic function of green infrastructure can mitigate the negative impact of climate change in cities. This research indent to identify the concept of green infrastructure and what it can actually bring to the city. First, it is necessary to determine the possible impacts of climate change in urban areas and than define green infrastructure and its benefits known as ecosystem services. This article focuses on negative impact of climate change and which ways can green infrastructure help to a better life in the urban areas.*

### Impact of climate change to urban environment

There is currently up to 75% of Europeans living in an urban environment according to the Ministry of environment and in Slovakia this number is around 56.5%. Cities for citizens provide a wide range of functions and services such as education, jobs and culture and they are also known as the engine of regional development. But the fast expanding of the cities with permanently increasing concentration of population brings the great pressure on the balance of the environment. Under the pressure of economic activities the traffic is increasing and the biodiversity and fragmentation of natural environment is losing.

The basic causes of climate change, according to scientists from the world are increasing anthropogenic greenhouse gas concentration that greatly affects climate change and increases average temperature since the mid-20th (IPCC, 2007). The term global change means “the long-term deviation climatic parameters of the earth for example in temperatures, wind speed, rainfall from the average which characterized our planet Earth around the 20th century” (Kräuchi, 1993). Human activities are supporting global climate change mainly by increasing concentrations of CO<sub>2</sub>, which generates the greenhouse effect. The greenhouse effect is a warming of the earth’s surface and lower atmosphere caused by substances such as carbon dioxide and water vapour which let the sun’s energy through to the ground but impede the passage of energy from the earth back into space (Treut & Somerville, 2007).

Climate change and global warming is a growing problem for urban life. Climate change has negative impact on urban environment as flooding, overgrowth of mosquitoes, and soil erosion and landslides. Generally says the climate change including increasing temperature and extremely rainfall has impact on people health (McMichael, et al, 2003) (Patz, et al, 2005). For example, it is believed that an estimated 15 000 deaths occurring in France where the result of heat waves in 2003 (BBC, 2003). Climate change also can influence on water quality and availability of drinking water (Fouillet, et al, 2006).

Climate change is resulting in more frequency of extreme weather in urban environment, which can increase the heat and also heat islands, water scarcity or torrential rains with poor water infiltration into the soil because cities weren’t prepared for such climate change. We can see the negative trends in cities just in city structure. Pressure of economic and other interests it is decreasing natural elements what means that green places are smaller. The quality of life in cities is closely related to the quality of the environment helped by green infrastructure. Accurate definition of green infrastructure described David C. Rouse (2013) –The term of “green infrastructure” are factors that combine natural (green) and built (grey) environment and make life more pleasant in cities. These include for example parks, green roofs, green walls, tree cover in urban areas and more. (David & Ignacio, 2013). The microclimatic function of green infrastructure is important for cities because it can mitigate the negative impact on climate change. The most important climatic characteristics are the ambient air temperature; the increasing trend of this temperature in cities causes significant problems especially on the health of people and on the damage of property. The proper spatial planning with the city adaptation to climate change included can mitigate negative consequences and enhancing of quality of the life in cities (Bowler, et al, 2010).

The paper aims to demonstrate the value of green infrastructure in the adaptation of urban areas to climate change. We assume that ecosystem service approach helps to highlight the necessity of incorporation of design principles for green infrastructure in spatial planning. To achieve this we first analyse the possible effects of climate change in urban environments, then we define ecosystem services in cities and highlight the importance of green infrastructure for creation of regulatory ecosystem service in cities. Lastly we explore green infrastructure as adaptation measure for climate change and emphasize the importance of integration of design principles for green infrastructure in spatial planning.

This paper consists of four chapters. After introducing the concept of ecosystem services and discussion about the major problems of climate change in urban areas, definitions and categories of ecosystem services are described in the first chapter.



The next chapter describes the importance of green infrastructure as provider of ecosystem services contributing to climate change mitigation and is followed by examination of possible adaptation measures combined with modern design of greenery. In conclusion issues of climate change in cities and possible directions for further research are summarized.

### The ecosystem services in cities

The cities are dependent on healthy natural environment that continuously provide a wide range of benefits. These benefits to society from natural ecosystem are called ecosystem services. The ecosystem services are by-product of natural ecological processes from healthy ecosystems. These services provide the necessary biological conditions for our existence. Ecosystem services are benefits for people from healthy ecosystems and it has a direct impact on the level of human's life. Healthy ecosystems are foundation for sustainable cities. They are affecting human well-being and the most of economic activities. (TEEB, 2011)

Ecosystem services in the Millennium synthesis report are defined as goods and services, which are necessary to maintain the prosperity of human society and future economic and social development. They are divided in four basic groups of ecosystem services: supporting, provision, regulatory and cultural (Figure 1) (MEA, 2005). This article focuses on regulatory ecosystem services in the city, especially climate regulation. Regulating ecosystem services are defined as the benefits gained from the regulation of ecosystem processes for example climate regulation, natural hazard regulation, disease regulation, water purification, food regulating, waste management, pollination, pest control or water purification.

It is necessary to mention that the green areas in cities aren't only use as a regulating ecosystem services but it can be used also as cultural and provisioning ecosystem services too. Cultural ecosystem services are non-material benefits that people receive from ecosystems such as aesthetic, recreational, spiritual, educational, and others. Walking and sports in green space are suitable form for physical exercise or rest. The role of green areas having at mental and physical health for citizens is begins to recognize, although the value of this role is difficult to measure. Ecosystems and biodiversity are important role for tourism. It can bring benefits for economic and it is important income for many countries. Cultural and ecotourism can also help to education about importance of biodiversity and healthy environment. Provisioning ecosystem services are the products gained from ecosystems such as wood, drinking water, medicinal resources, wood and fibre and others. Ecosystems are providing the conditions for growing food.

Food usually is made from agricultural, marine or freshwater ecosystems but as well as urban gardens can produce food for the people too (TEEB, 2011). For example, according to Altieri (1999), urban gardens in Cuba in 1996 was produce 8,500 tons of agricultural production and 7.5 million eggs, 660 tons of meat (Altieri, 1999).

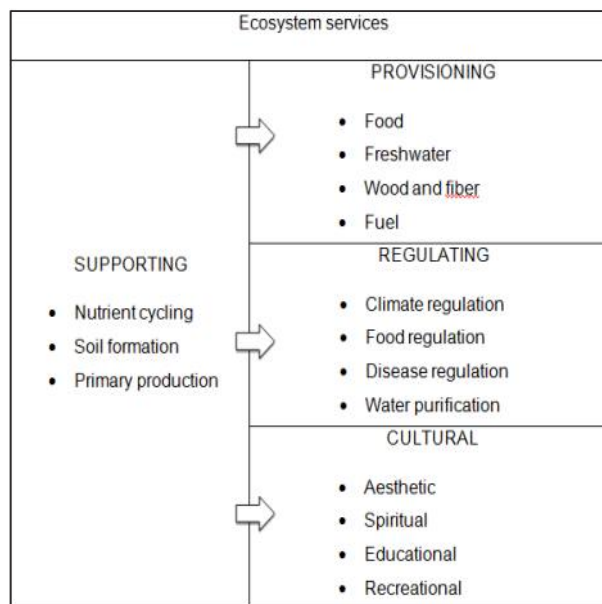


Figure 1: **Categories of ecosystem services** Ecosystem services  
Source: Millennium Ecosystem Assessment (2005)

### The importance of is green infrastructure in cities. The mitigation of negative impact of climate change.

The largest potential source of ecosystem services in the city are: urban forests, natural and artificial wetlands, waterways, green roofs, facades and walls, city parks and gardens (AEA, 2008). These green areas are the "ecosystem infrastructure or green infrastructure" in urban environment. This infrastructure was created naturally or artificially and its main aim is to encourage the emergence of natural ecosystems in urban environment (AEA, 2008).

Trees provide ecosystem services such as rainwater harvesting, they clean air, reduce urban heat islands, reduce wind speed, provide shade and more. For example, one adult deciduous tree with a diameter of 2.7 meters can produce enough oxygen for one person for one year and this tree can isolate at about 1 tonne of CO2 per year (AEA, 2008). Urban forests or local forests also have the ability to retain clean water. Therefore to preserve forests can be good political strategy in providing clean water for population, what is the provisioning ecosystem services (TEEB, 2011).



As well as urban forests, green roofs and walls have high added value as ecosystem services for the city too. Green roofs can bring a wide range of ecosystem services such as: production of oxygen, reduce air pollution, reduce heat islands in cities, securing the environment for insects and birds to support biodiversity, improve water quality, reduce flooding consistently torrential rain, increasing the thermal performance of the building, opportunity for urban agriculture (EFB, 2015).

Green walls and facades have been used as climbers for over past centuries. Today's vertical plants use steel cables with irrigation system in containers. This can lead to high of up to 25 meters of climbers plants if it is achieved the good selection of suitable plants and also depending on climate zone. This method of cultivation can provide added benefits of ecosystem services from green walls. The ecosystem services generated by green walls or facades include: the production of oxygen, reduce air pollution, safeguard the environment for insects and birds which promotes biodiversity, protection of buildings before torrential rain, cool buildings, improve water quality (Livingroofs, 2016).

### Adaptation measures

Climate change in form of high temperature will have a serious impact on urban environment in future. The increasing of global concentration of CO<sub>2</sub> and other gas emissions was 270 – 280 µmol mol between half 18th century and 21st century and in 2010 the concentration is 390 µmol mol, what means the increase of 35% (Marek, a iní, 2011). According to IPCC (2013) the temperature has been increased about 0.76 °C since 1850 and in Europe it was more than 1 °C. Only the burning of fossil fuels and consequence of technological production processes releases 21.3 billion tons of CO<sub>2</sub> into air what represents the release of 40 000 tons of CO<sub>2</sub> for one minute (IPCC, 2013) (EIA, 2004). The trend of increasing of tropical nights and days (tropical nights and days means that the minimum temperature is 30°C during the day and 20°C during the night) is probable in the future. It is awaiting that increase of tropical days and nights between 2021 and 2050 will be at about 50% more as it happened in years between 1961 and 2000 (UrbanAdapt, 2015). IPCC (2007) predicted if we continue in the scenario, the temperature will increase by 4, 8 °C by the year 2100.

The impact of high temperature on human health is becoming one of the most serious problems especially in large urban areas because there is an effect called heat island. It means that over temperature will be higher than around area. If cities want to adapt to climate change they have to accept suitable adaptation measures. According to IPCC (2007), the adaptation of climate change in cities is defined as the change of nature and human systems as the reaction on impact or expected impact on climate change. This is the ability to adapt of urban environment to climate change in the way that the potential damage is mitigated

and the opportunities are used and consequences are solved. The intensity of urban heat islands in cities is related to the amount of buildings in that area.

Risk of heat islands is low moisture in city, use of impermeable material and the use of dark roofs on buildings, which Gertland called the „heat trap“ (Gartland, 2008). Green infrastructure is more seen as a suitable adaptation measures for cities (Sussams, Sheate, & Eales, 2015). In terms of mitigating heat islands they are suitable for surfaces that have the ability to bind and release water. For example: wetlands, soil and vegetation (Pötz & Bleuze, 2012). These types of surfaces help cooling the environment, so in the case of heat there is primarily released water from these surfaces. The surplus of water is consumed in the process of vaporescence and therefore there is not an excessive absorption of sunlight by the surface. An urban heat island is a city or metropolitan area that is significantly warmer than its surrounding rural areas due to human activities. In order to minimize heat islands, the green infrastructure with these surfaces has the ability to catch, store and slowly release water.

Therefore green infrastructure helps to cool down the environment - primarily by evapotranspiration, increasing of moisture and a surplus of solar radiation absorption. Examples of these green infrastructure are parks, forest parks, green roofs, green walls, rain gardens, etc. These surfaces are not only cooling down the environment but they are also useful for flood risk reduction and have an important recreational and aesthetic function.

Microclimate function of vegetation favourably influences air moisture in the city (for example an adult birch tree can evaporate 7000 liters of water in the vegetation period and increase the moisture by 5-7% on average), decrease of temperatures amplitudes (e.g. urban parks decrease temperatures by 1 °C) on average in comparison to streets and provide shade. Engleback (2009) defined green infrastructure as a complex of multi-functional environmental design solution (Engleback, 2009). Greenery in cities has a significant influence on noise reduction, dust catchment, pollution reduction and reduction of wind speeds. One square meter of green area in cities can strain up to 20g of dust particles per one vegetation period (UrbanAdapt, 2015; Marek, et al, 2011). According to European environmental agency there are three main advantages of green infrastructure namely: mitigation of urban heat island in cities, flood risk management and supporting the ecosystem resistance (CCA, 2011).

According to research Browler et al (2010) which was aimed to detect temperatures in urban environment, he found that green parks are colder 0.94 °C than grey street during the day. Gill, et al (2007) confirmed the results of this research and added, that if the cities had 10% more green places it could lower the maximum surface temperature by 2.2 to 2.5 °C (Gill, Handley, & Pauleit, 2007). On the other hand Pataki et al, 2011 concludes, that city forests are probably much more important in reducing the impact of





the climate changes that the growth of the green infrastructure in the cities (Pataki, et al, 2011). Green infrastructure in the cities was designed as one of the approaches to mitigate the impact of the climate changes. Most of the studies points to the fact that using the green places in the cities has favourable impact on lowering the air temperature. Parks are 0,94°C colder during the day than the grey street in a city (Bowler, Buyung-Ali, Knight, & Pullin, 2010). During the never-ending tropical days the pavement on the street can reach up to 50°C (which is in the contrary to surfaces that can bind and evaporate the water) what is more than a few tens of degrees higher (UrbanAdapt, 2015). Today's understanding of architecture and spatial planning as potential for mitigation of climate change is often poor.

People or architects didn't lead to imagine that architecture may also serve the purpose for improving the quality of city life, not only as a business or residential area. Climbing plants in buildings was considered only as accessories to the building. Expansion of green walls and facades in urban environment have a large potential in solving problems related to climate change. Torrential rains and heat islands are growing problem for urban life. Green infrastructure in urban environment will be important to reducing the impact of climate change and for resilience cities. (EFB, 2015)

Potential of climbing plants on buildings is great. Climbers plants located on the sunny side of buildings can reduce daily fluctuation in temperature during the summer days up to 50%. The percentage of effectiveness is subject of total area of climbers. (Köhler, at al, 1993; 2008). Together with the insulating effect of temperature variation on surface of the wall can be reduce from the range of -10 to 60 °C to temperature with range of 5 to 30 °C (Peck & Callaghan , 1999). Reducing of solar heating from sunny side of the buildings also contributes to the reduction of heat islands in cities. As was already mentioned above all the green plants can absorb CO2 emissions. Use of green spaces on buildings can help to minimize the consequences or global warming (EFB, 2015).

In winter, evergreen climbing plants have also great importance. This plants provide isolation by creating so-called "air pillow" between the wall of building and plants. This help to reduce impact of cold wind on buildings by up to 75%, which can help to reduce heating of buildings by up to 25% (Peck & Callaghan , 1999). In winter, the height of percentage is affected by thickness plants, which increases the insulating effect (EFB, 2015).

Green walls and green roofs have also other benefits for building or city life such as regulating ecosystem services. These plants protect the building from impact of heavy rains, the hail, eventually captures water from torrential rains. It has been demonstrated, that the use of green places in architecture is also very effective to trapping dust. Even according to several studies, the climbing plants are also effective to trapping heavy metals such as lead or cadmium, so this plants can reduce their concentration.

For example, in Italy in the Cascine Park has been demonstrated that parks in cities can significantly help to cleaner air. This park is able to annually reduce air pollutants by 72.4 kg per hectare. (Paoletti, Bardelli, Giovannini, & Pecchioli, 2011). There is also evidence that climbing plants can also reduce noise levels in buildings. For these reasons the use of green spaces in buildings could have an important role in the resistance cities (Köhler, at al, 1993; 2008). Using green plants in architecture offers a very elegant solution of urban problems related to increasing temperatures, torrential rain, the concentration of CO2, pollutants and dust, with more efficient heating or cooling buildings, with gusty winds, high noise levels and local and regional biodiversity target. Climbers plants have advantage that it doesn't use space in the horizontal direction (whixh take up little space) but uses vertical space, which not be utilized and would be lifeless. Green walls and roofs also provide a place for wildlife (EFB, 2015).

## Conclusions

It is expected that cities will be significantly affected by the impact of climate change. Three-quarters of Europe's population live in urban environment, therefore cities are often vulnerable and cities aren't ready to manifestations of climate change, such as heat waves, water shortages, droughts, or floods. The increasing risk associated of climate change in urban areas increase cities vulnerability and it can have widespread negative impact to quality of city life or on the national economy, ecosystem and natural capital. Currently solutions are dominated technical, structural and economic development of adaptation to climate change but it should be taken into account that the ecosystem approach can be a significant role in the adaptation of social-ecological systems to climate change.

## Acknowledgement

This contribution is supported from VEGA grant no. 2/0038/14 titled "*Adaptation strategies to natural and social disturbances in the forest landscape*".

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Katarína Mackovičová

## IS INDUSTRIAL HERITAGE PART OF TERRITORIAL CAPITAL?

*Territorial capital is becoming an important part of territorial policy in the present. For the first time, it was mentioned in 2001 by the Organisation for Economic Co-operation and Development in Territorial Outlook (OECD). This relatively new terminology is defined as a measuring tool, which includes tangible and intangible factors. Each territory is disparate and it can include different factors of territorial capital. The aim of this research is to confirm the status and importance of industrial heritage in the frame of territorial capital. The industrial heritage is one of the elements of the tangible factors of territorial capital. In the present, industrial heritage creates the identity of a contact area and city.*

*It has an important place in the territory and is an essential component of disposable capacities in the territory, which can be economically expressed and used for the further development of the city/region. The industrial heritage includes not only tangible capacities but also intangible values. Their volumes and surfaces present an economic potential for a development. Although a lot of spaces of the industrial heritage have such potential, many of these objects are abandoned or intended to be destroyed without acceptance of their significant values. This paper presents a part of the research realized in the frame of the doctoral thesis that confirmed that the industrial heritage is a part of the territorial capital. The presence of industrial heritage can increase an attractiveness of contact sites for tourism as well as for business activities and then it can increase the territorial capital. The outcome is to include them among the purpose of activation for development and enrichment of the contact area.*

### Introduction

Territorial capital is a relatively new terminology, which was introduced in 2001 by the Organisation for Economic Co-operation and Development (OECD). In the present, this is a key element of the regional policy. It is defined as the measuring tool with many intangible and tangible factors, which are acting in the territory. Each territory is unique and includes various factors of territorial capital. It is interacting with the factors of different nature. Territorial capital does not have the same structure and the same effect in each territory (Camagni, 2008; György, 2012).

The industrial heritage is essential elements of the territory and our history. It plays an important role for the development of the city/territory. The industrial heritage confirms the identity of a locality or region whereby it enriches and fortifies the components of development potential. It can also enrich and increase the new development purposes or plans. Many of the historic industrial sites have stopped authentic function from different reasons. The first reason was the loss of status as an important factor in the life of the city or region that was even more underlined by its continuing abandonment or partial use. These areas contain extensive surfaces and volumes, which can be used for other different functions than the original function (Kráľová, 2011). These are the factors that can be expressed verbally but also economically and they are presenting disposable territorial capital. Often many of these sites are destroyed without acceptance its significant values and potentials. Their spaces are intended for the purpose of new buildings. However, there are a few good examples of revitalization or an adaptation of the industrial heritage for new functions in Slovakia. It is important to show that this heritage is a part of the development potential. Experience shows an importance of the choice of new function for the progress of the territory. A new function would follow the original function or use its realities.

OECD (2001) is followed by many other authors (Camagni, 2008; György, 2012; Constantine, 2013; Perruca, 2013; Cascio, 2013; Balázs, 2014) who focused their research on the issue of the new function's importance. Studies, mostly from Hungary and Italy, show that the primarily researched territories are focused not only on a theoretical framework but also on empirical research investigating the intangible part of territorial capital.

The aim of this paper is to show the industrial heritage as a part of territorial capital. The other aim is to investigate the dimension of the concept of territorial capital. Simultaneously it answers the question "What are the most significant tangible and intangible factors of territorial capital in the branch of industrial heritage, especially of historic Danube's harbours in Slovakia?" This study is a part of a dissertation theme with the same name – "Industrial heritage as a part of the territorial capital."

The paper has four parts. First, they are definitions of the basic terms – territorial capital, cultural heritage and industrial heritage. Second part it reviews the extant literature relevant to territorial capital. Then the research methodology is presented and techniques data analyses are discussed. Next, the findings are discussed and summarised. The paper is concluded by discussion of theoretical and managerial implications and directions for future research.

### Territorial capital, cultural heritage, industrial heritage

In 2001, the concept of territorial capital was mentioned for the first time in a regional policy context, proposed by the Organisation for Economic Co-operation and Development (OECD). The OECD described its major and





basic definition. Territorial capital is a specific capital distinguished from other areas and is determined by many factors.

According to Camagni (2008) the territorial capital is the set of factors of different nature which characterize territories. As Camagni (2008) states territorial capital emerges as a new, fruitful concept, embracing a wide variety of territorial assets of different natures and different origins. He described concept of territorial capital and its theoretical taxonomy and how it can help for regional growth in his studies. Authors György and Tamás (2012) describe it as a measuring tool, which examines tangible and intangible factors. The definition of the territorial capital can be summarized as a tool for measuring and analysing of tangible and intangible factors in the territory. These elements are different, depending on the environment under examination.

**Cultural heritage**, as a part of territorial capital, is a type of living developed by a community and passed on from generation to generation. Culture heritage is tangible (e.g. buildings, monuments, artefacts) and intangible (e.g. traditions, performing arts, habits) (ICOMOS, 2002). The cultural heritage may be defined as the entire corpus of material signs - either artistic or symbolic - handed on by the past of each culture. The cultural heritage gives each particular place its recognizable features and is the storehouse of human experience. The preservation and the presentation of the cultural heritage are therefore a cornerstone of any cultural policy (Jokilehto, 2005).

**Industrial heritage**, a specific part of the cultural heritage, is a document of the times past, technology development (know-how) and social life. Industrial heritage creates an important part and the identity of the city, which contains tangible, intangible values as well as immovable and movable elements (ICOMOS, TICCIH, 2011). The International Committee for the Conservation of the Industrial Heritage (2003) defines the industrial heritage as “the evidence of activities, which had and continues to have profound historical consequences. The industrial heritage consists of the remains of industrial culture, which have historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transport and all its infrastructure, as well as places used for social activities related to industry such as housing, religious worship or education.”

### Intangible and tangible factors of the territorial capital

OECD (2001) differentiates three kinds of capital types in their theory: tangible, intangible and untraded interdependences factors.

Tangible factors are area’s geographical location, size, factor of production endowment, climate, traditions, natural resources, equality of life or the agglomeration economies provided by its cities, but may also include its business incubators and industrial districts or other business networks that reduce transaction costs. Untraded interdependences can be characterized as unwritten tradition, understanding, customs and informal rules and milieu. The last category is intangible factors that are represented by the combination of institutions, rules, practices, producers, researchers and policy-makers that make a certain creativity and innovation possible, written laws and the institution system. These three categories cannot be separated from each other, they can be separated only on a theoretical level, and in reality they mutually determine each other. The sum and combination of these three parts give the value of territorial capital (OECD, 2001).

Camagni (2008) divided potential sources of territorial capital to more detailed categories and classes. He has created three-by-three matrix (tab.1), which contains two major dimensions – rivalry and materiality. Each dimension has its own classes. The dimension rivalry has classes as public goods, private goods and an intermediate class of club goods and impure public goods. The second dimension materiality has classes as tangible goods, intangible goods and an intermediate class of mixed hard-soft goods. This matrix represents large traditional classes of sources of territorial capital. This classification is more specific than from OECD and has more accurate examples in given categories.

Tangible factors contain cultural heritage in this classification according to Camagni (2008). This is the first proof that the cultural heritage is a part of the territorial capital. The intangible factors are human, social and relational capital. Human capital is defined as a set of skills, competencies and abilities, which make the individual capable of establishing and increasing his welfare (Balázs, 2014). Presence of human capital is constantly mentioned nowadays as a fundamental capital asset to the disposal of territories in order to compete in the international arena, both strengthening local activities and attracting foreign ones (Camagni, 2008). Social capital can be defined as a set of norms and values which govern interactions among people, the institutions where they are incorporated, and the overall cohesion of society. In short, social capital is the ‘glue’ holding societies together (Camagni, 2012). Relational capital facilitates collective learning and knowledge production in many ways.

This capital is characterized by three main channels. The first is the reduction of the uncertainty characterizing the production of knowledge. The second is represented by collective learning, dynamic and cumulative process of knowledge production. The last one is a factor which involves ex-ante coordination among economic agents facilitating collective action (Camagni, 2012).

Tóth (2011) has created only two categories (tangible and intangible factors) of the territorial capital in his



|                |                                           |                                                                                                                                        |                                                                                                                                                                                          |                                                                                                                                           |
|----------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Rivalry</b> | <b>High rivalry</b><br>(private goods)    | <u>Private fixed capital stock</u><br><br><u>Pecuniary externalities (hard)</u><br><br><u>Toll goods (excludab.)</u><br><i>c</i>       | <u>Relational private services operating on:</u><br>- external linkages for firms<br>- transfer of R&D results<br><u>University spin-offs</u><br><i>i</i>                                | <u>Human capital:</u><br>- entrepreneurship<br>- creativity<br>- private know-how<br><u>Pecuniary externalities (soft)</u><br><i>f</i>    |
|                | (club goods)<br><br>(impure public goods) | <u>Proprietary networks</u><br><br><u>Collective goods:</u><br>- landscape<br>- cultural heritage<br>(private "ensembles")<br><i>b</i> | <u>Cooperation networks:</u><br>- strategic alliances in R&D and knowledge<br>- p/p partnerships in services and schemes<br><u>Governance on land and cultural resources</u><br><i>h</i> | <u>Relational capital:</u><br>- associationism<br>- cooperation capability<br>- collective action capability<br>- collective competencies |
|                | (public goods)<br><br><b>Low rivalry</b>  | <u>Resources:</u><br>- natural<br>- cultural (punctual)<br><br><u>Social overhead capital:</u><br>- infrastructure<br><i>a</i>         | <u>Agencies for R&amp;D transcoding</u><br><br><u>Receptivity enhancing tools</u><br><u>Connectivity</u><br><u>Agglomeration and district economies</u><br><i>g</i>                      | <u>Social capital (civiness):</u><br>- institutions<br>- behavioural models, values<br>- trust, reputation<br><i>d</i>                    |
|                | <b>Tangible goods (hard)</b>              | <b>Mixed goods (hard + soft)</b>                                                                                                       | <b>Intangible goods (soft)</b>                                                                                                                                                           |                                                                                                                                           |

### Materiality

Tab. 1: **Matrix three-by-three according to Camagni**  
(source: Camagni, 2008)

research. Tangible factors are produced capital, financial capital and investment capital. The intangible factors are characterized by intellectual capital, human capital, psychic capital, creativity capital, knowledge capital, organizational capital, relational, cultural capital and social capital. This author put cultural capital to the intangible factors, which contains incorporated form, objective form and institutionalized form. He explains that the importance of this category is increasing, because this intangible capital can be converted into economic capital. These categorizations of authors (OECD, 2001; Camagni, 2008; Tóth, 2011, 2014) are from economical view of territorial capital. Therefore this research is purposed on other architectural view of territorial capital.

György and Tamás (2012) compared several studies about territorial capital (OECD, 2001; Camagni, 2008; Tóth, 2011). This comparison is mainly about dividing categories and factors of capital. They also have confirmed the

importance of the territorial capital, because only tangible factors and economically more easily measured variables were searched in the territory before its introduction. However, values of the territories are depended on intangible factors as well. Camagni (2013) and Perrucca (2013) examined Italian provinces. While Camagni (2013) focused on details in immaterial components – intangible territorial capital in Italian territory. Perrucca (2013) analysed Italian land NUTS 3 regions between 1999 and 2008. The factors – culture heritage is mentioned in this research, but only marginally. Constantin, Grosu and Iosin (2013) added part about swot analysis, which was created to reveal the impact of territorial capital and territorial cohesion policy on services of general interest in the context of global competition. Many of the factors of the territorial capital mentioned above can lead to productivity gains and therefore generate growth (OECD, 2001). It confirms that territorial capital is an essential tool of territory policy.



The issue of territorial capital is a new theory of territory policies as was confirmed in reviewed studies (Camagni, 2008; György, 2012; Consantine, 2013; Perruca, 2013; Cascio, 2013; Tóth, 2011). Studies of authors are focused mainly on theoretical background of territorial capital and practical part mainly from the territory – Italia and Hungary. They were focused on broadly part of the country. Further observation of the industrial heritage as part of the territorial capital was missing in the studies. Industrial heritage as component of the territorial capital was mentioned only marginally. Also, the territorial capital was described from economical point of view. Linking with other part (architecture) of capital is missing in these studies. The aim of this research is to focus on this part of territorial capital.

Historic harbours have potential for development of sites for future urban progress. The harbours are located in a proximate contact with the historic centre of the city. Furthermore such localization is a desirable feature, because position with the historical centre is a good prerequisite for the development of a tourism, which is a stimulating factor for the use of passenger shipping. On the other hand, this location is not profitable for the development of port activities and transshipment of commodities (Ministry of transport, 2010).

The initial industrial activity is moved to a more modern part of the harbour in most cases. These spaces are far from urban historic centres. Abandoned spaces and buildings are created by this process. These areas include not only tangible but also intangible values and potential for their further development, which can be described as the territorial capital.

The industrial heritage, specifically harbours contain tangible elements – surfaces and volumes of buildings, existing transport and technical infrastructure. Each one of the components can be economically expressed. At the same time, it offers variable elements, which document industrial harbour activity (e.g. cranes, anchors, pontoons). These elements complement the industrial character after the operation. They can create interesting space with synergy of the old and new fragments. Also they contain intangible values (locality name, important personalities, historically important events...).

## Methodology

The first phase of research methodology has started with literature review of available foreign literature about territorial capital. The authors of examined studies and territories are from countries of Hungary and Italy. This part of the research provides an important comparison of theoretical background of territorial capital. The second part of the research methodology consists of collecting data of archival and field research case studies with the aim to define the most significant tangible and intangible

factors of historic Danube's harbours in Slovakia considered as a part of the territorial capital. Examined harbours are situated in the cities Bratislava, Komárno and Štúrovo on the Danube River. The research is focused on archival research in the city Bratislava (State Archives, Bratislava City Archives Monuments Board, Slovak National Archive) in the first part. The largest collections of archival data are in archives of company Dunaj plavba containing a collection of 400 boxes. This company is the owner of Danube's harbours in Slovakia. About 30 boxes were examined for this research. They obtained architectural and urban building plans of the whole harbour, economic reports or other documents. 50 photos of the Bratislava's harbour and 10 photos of the Komárno's harbour in Monuments Board were also examined.

The data was collected over an eight month period during October and December 2014, December to January 2016 and March to June 2016. The collected data are historic facts (years, buildings, architects, important events), staff reward, volumes and surfaces of the buildings, budget for the construction of individual buildings. This data provides a historical and economic context of these industrial sites. The summary of basic factors of the harbour's territorial capital was gained by research and analyse of data. Data was concentrated to the chart with dividing on basic categories – tangible and intangible factors.

## Results

The territorial capital is an important part of the territorial policy from 2001. It is also important to mention that territorial capital is a set of assets of different nature, which characterizes territories and thus each area has different factors that can be examined (Camagni, 2013).

Based on critical literature review the role of industrial heritage was examined as a part of the territorial capital. The research confirmed that cultural/industrial heritage is as a part of the territorial capital because it is considered as a factor of the tangible assets in the category collective goods (Camagni, 2008) and is also examined in studies analysing the territorial capital (Perruca, 2013).

Perruca (2013) researched Italian land NUTS 3 regions between 1999 and 2008. One of the analysed elements was a cultural heritage. This research describe the cultural heritage as part of the territorial capital. It is important confirmation of position of industrial heritage (which is part of the cultural heritage) in the territorial capital.

Tangible and intangible factors in this study were analysed and reviewed from several authors (OECD 2001, Camagni 2008, Tóth 2011, Tóth 2014). If we look at the dividing, each author (OECD, Camagni, Balázs) created their own dividing. It can be divided into two basic dimensions: intangible factors and tangible factors.





| Intangible factors     | Author | Tangible factors                                            | Author |
|------------------------|--------|-------------------------------------------------------------|--------|
| Human capital          | C, T   | Private fixed-capital                                       | C      |
| Social capital         | C, T   | Pecuniary externalities (hard)                              | C      |
| Relational capital     | C      | Toll goods (excludability)                                  | C      |
| Intellectual capital   | T      | Proprietary networks                                        | C      |
| Psychic capital        | T      | Collective goods (landscape, cultural heritage)             | C      |
| Creativity capital     | T      | Resources (natural, cultural)                               | C      |
| Knowledge capital      | T      | Social overhead capital (infrastructure)                    | C      |
| Organizational capital | T      | Geographical location                                       | O      |
| Cultural capital       | T      | Size                                                        | O      |
| Institutions           | O      | Factor of production endowment                              | O      |
| Rules                  | O      | Climate                                                     | O      |
| Practices              | O      | Traditions                                                  | O      |
| Producers              | O      | Equality of life                                            | O      |
| Researchers            | O      | Business incubators, industrial district, business networks | O      |
| Policy-makers          | O      | Agglomeration economies                                     | O      |
|                        |        | Produced capital                                            | T      |
|                        |        | Financial capital                                           | T      |
|                        |        | Investment capital                                          | T      |

Tab. 2: Summary of the tangible and intangible factors according to three authors – Tóth, 2011, 2014 (T), Camagni, 2008 (C), OECD, 2001 (O),  
(source: author)

This chart summarized elements of tangible and intangible factors of the territorial capital according to three the most important authors about territorial capital - OECD (2001), Camagni (2008) and Tóth (2011, 2014). These elements are from economical point of view of each author. Industrial heritage can be evaluated as entity but its individual components too. The important parts of the industrial heritage are historic harbours. The objectives of the research are Danube's harbours in Slovakia.

The harbours are the industrial heritage of Slovakia. Each harbour documents industrial harbour activity on the Danube and technological skills and also the social life of the time. Particularly, this document is of a Winter Harbour, which is the oldest harbour and it is an owner of a several National Cultural Monuments.

This research analysed territorial capital from architectural part of harbour, which can be divided to two basic categories (tangible and intangible factors). It can introduce the most significant elements of the territorial capital of historic harbours.

## Conclusion and discussion

Territorial capital becomes an important key component of territorial policy. It was introduced by the organization OECD in 2001 for the first time. This study has researched the theoretical background of territorial capital and identified the most significant tangible and intangible factors of industrial heritage as a part of territorial capital. Reviewed studies from Italy and Hungary were mostly focused on economical part of the territorial capital of what, while Slovak examples were concentrated on the architectural part of the industrial heritage (historic harbour). The research has confirmed the status of the industrial heritage as the territorial capital by several

| Intangible factors                                                                        | Tangible factors                                                                                                                                         |
|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Size                                                                                      | Buildings (volumes, surfaces),<br>warehouses<br>workshops<br>ship lift<br>administration<br>former accommodation<br>National Cultural Monuments<br>other |
| Geographical location (contact area, water)                                               | transport infrastructure:<br>roads<br>water<br>Technical infrastructure                                                                                  |
| Name<br>- Name of factory/products<br>- good name (psychological effect on the territory) |                                                                                                                                                          |
| Construction budget                                                                       | Existing harbour's machines (anchors, canes, pontoons...)                                                                                                |
| History                                                                                   | Personnel                                                                                                                                                |
| Visit of important person                                                                 |                                                                                                                                                          |
| Events<br>Job opportunities                                                               |                                                                                                                                                          |
| Genius loci                                                                               |                                                                                                                                                          |
| Status: National Cultural Monuments<br>Personnel (earnings)                               |                                                                                                                                                          |
| Function                                                                                  |                                                                                                                                                          |

Tab. 3: Tangible and intangible factors of historic harbours in Slovakia  
(source: author)

studies (Camagni, 2008; Perruca, 2013; Tóth, 2011, 2014). The dividing of the territorial capital can be summarized into two basic categories with the most significant elements – tangible (buildings, technical infrastructure, transport infrastructure, existing harbour's machine, personnel), intangible (size, geographical location, history, name, events, genius loci, status – National Cultural Monuments, personnel, function).

Research limits could consist of a large amount of important data of harbours and only several practical studies of the territorial capital. Much of this data are not yet examined. The data are located in different places (archives, Monuments Board or organizations associated with the harbour activity) which can extend the duration of the examination.

Future research will be focused more on detail by examining individual historical harbours in Slovakia and their tangible and intangible components of territorial capital. This research will provide a comprehensive view of industrial heritage as a development potential.

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Miroslav Beňák

## CONVERSION OF INDUSTRIAL HERITAGE – A CHALLENGE FOR SUSTAINABLE DEVELOPMENT

*With retreating production of factories and with escalating pressure on the redevelopment of post-industrial sites we face new challenges, how to deal with industrial relics. Unused industrial heritage (brownfields) is an issue, which usually causes progressive degradation of heritage itself and locality or site too. Values of both subsequently used to decrease. We must deal with industrial heritage and protection of spectrum of its values, on one hand, with current needs of site and lot of economic and social aspects, on another hand.*

*Conversion, as the functional change of this objects, seems to be a way how to achieve sustainability of industrial heritage and sustainable development of site too. This paper addresses the question: how to approach to the industrial heritage that the values can be sustainably protected and in the same time a natural development of the locality can be allowed? The main objective of this paper is to identify the theoretical background of conversion of industrial heritage in the context of sustainability and sustainable development. The expectation is to overcome both issues of redevelopment and protection of sites with heritage, following the relevant international documents - The Nizhny Tagil charter for the industrial heritage and Territorial agenda of European union 2020.*

### Introduction

Conversion of industrial heritage increasingly resonates in connection to territorial development. The loss of historical heritage, its structure, and values happens more and more times. Abandoned industrial areas usually cause progressive degradation of heritage itself, and site too. Primary, it is caused by the consecutive transformation of society from industry-focused to "post-industrial" informative-focused era. With retreating production of factories and with escalating pressure on the redevelopment of post-industrial sites we face new challenges. On the one hand, the awareness about values of industrial heritage is slowly increasing, what is the reason of rising voice for its conservation. But on the other hand, redevelopment trends and their economic ambitions suppress efforts for conservation and protection of heritage.

Conversion of industrial heritage stands for the important step that can not be neglected and ignored by architects nor implementers of the creation. In spite of it, most of the brownfields with industrial heritage is still perceived through the values of the estate (Zemánková, 2003).

We can see two main approaches related to the topic of conversion of industrial heritage and sustainable development. Both approaches are based on international documents, charts and projects as The international Committee for the Conservation of the Industrial Heritage (TICCIH) and their The Nizhny Tagil Charter for the industrial heritage (TICCIH, 2003), Territorial agenda of European union 2020, project of Cabernet, Cobraman, CircUse (Bergatt & Jackson, 2013).

Re-development and sustainability are included in issues of regeneration of brownfields (Jackson & Bergatt, 2013; Finka & Jamečný, 2010), which is primarily focused on economic, social and other spatial planning issues, while values of industrial heritage are mentioned only marginally. Second "approach" is more monument-

focused. It is based on following the protection and presentation of values of industrial heritage (TICCIH, 2003). There are other issues - the absence of knowledge about values of industrial heritage and specialist focused in and negative public opinion about this heritage (Dvořáková, 2010). Practically, re-development in one hand and protection of preserved structures in the other hand seems to be contradictory.

The main objective of this paper is to identify the theoretical background of conversion of industrial heritage in the context of sustainability. The expectation is to overcome both issues of re-development and protection of sites with heritage, following the new approaches based on identity "brand" of industrial heritage and its potentials.

This paper addresses the question: how to approach to the industrial heritage that the values can be sustainably protected and in the same time a natural development of the locality can be allowed?

Adaptation and conversion of industrial heritage, including its historical technical infrastructure, seem to be a tool to achieve new life for industrial buildings and a step to achieve sustainability of location too, which is supported by many papers (Zemánková, 2003; Králová, 2010, TICCIH, 2003). On the next steps, we analyze issues and approaches related to the redevelopment of industrial areas and synthesize theoretical background from analyzed literature. On the first step, we draw Industrial heritage in the context of brownfield redevelopment issues, describing the duality of approaches. In the part Conversion as the tool of regeneration, we describe the term of conversion of industrial heritage, its genesis across the time and complexity of this approach. The next part is focused on Issues of the interlinking development of brownfields and protection of heritage. On the next part - Industrial heritage in context of sustainable development - Comparison and synthesizes of relevant international charter – The Nizhny Tagil charter for the industrial heritage and Territorial agenda of European Union We compare both this relevant international documents and look for interlinking between them.





## Industrial heritage in context of brownfield redevelopment issues

Industrial heritage is a relic of industrial or proto-industrial era related to the technical development of society. It is represented by building and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transport and all its infrastructure, and places used for social activities related to industry such as housing, religious worship or education too (TICCIH, 2003).

Abandoned industrial heritage usually causes progressive degradation of heritage itself and locality too. Values of both subsequently used to decrease. Now it is a great challenge to achieve sustainability of heritage and site and having regard to the cultural values, sociology, economy, development and etc.

In global, industrial society is gradually turning into post-industrial and knowledge-based society. Social changes as a reduction of the original industrial sector, changes in the management of agriculture caused rising numbers of vacant areas – brownfields. On the other hand, transformation to our urban lifestyle and development of informative and creative industry caused a great pressure to new development (Jackson, Bergatt, 2013).

Unused areas, in spatial planning used to be called as brownfields – represent potential spaces for new development. Reusing is the way to sustainability in the site, what is the main focus of many organisation and projects as Cabernet, Cobraman and CircUse (Jackson, Bergatt, 2013). Regeneration of sites is one of the priorities of current spatial planning in the context of Territorial agenda of European union (TA2020, 2007). This projects and organisation are mainly focused on ecological, socio-economical and socio-cultural aspects of regeneration processes of degraded urban structures – especially industrial areas (Finka, Jamečný, 2010). Territory and soil is a limited resource so there is the need for management of urban structures (Jackson, Bergatt, 2013).

On the other hand, the strengthening requirements to the regeneration of industrial areas and their lucrativeness of estates can cause subversion of industrial heritage, if it is not protected by the government. The worst situation is in those areas where industrial heritage stands at a land of investment interest for the development business (Kráľová, 2010). A lot of negative examples across Czech and Slovak republic draw, that industrial heritage protection is insufficient, what is caused by two main aspects. The first is an absence of specialists focused on industrial heritage and a second is a public opinion about industrial heritage (Dvořáková, 2010). Some solution of these issues can be seen in the international document The Nizhny Tagil charter for the industrial heritage by TICCIH (2003). It is the world organization representing the industrial heritage and is the special adviser to ICOMOS (The International Council on Monuments and Sites) on industrial heritage. Charter

defines values of industrial heritage, the importance of identification, recording and research, legal protection, maintenance and conservation, education and training and at the end presentation and interpretation of industrial heritage.

Preservation of industrial heritage with a spectrum of its cultural, historical and architectural values tends to be confronted with socio-economical, economical, estate issues and others requirements. Papers (Finka, Jamečný, 2010; Jackson, Bergatt, 2013), focused on a regeneration of Brownfields, use to be focused on aspects of sustainable development and values of industrial heritage is mentioned only marginally. Conversion of preserved structures is interlinked with sustainability especially in function or functionality. The use of existing capacities of structures are more ecological and economic (Jackson, Bergatt, 2013). Where is the balance between preservation of industrial heritage consisting of authentic parts and function with economic profit? In comparison between International cultural tourism charter (1999) and Chart of the industrial heritage (2003), it seems that the use of authentic industrial heritage as tourist attraction increase value of locality (Kráľová, 2010). Positive examples of conversions can be found across the Europe and in Slovakia too (Zemánková, 2003, Kráľová, 2010). Social importance, an aspect of accessibility and promotion of heritage, an aspect of public support are aspects related to industrial heritage – its preservation and presentation. They support aspects related to the development of site – usability aspect of the development potential of heritage values, the public aspect of the involvement and cooperation of the local community, and aspect of economic benefit to the home location (Kráľová, 2010). Important is that preserving the historical structures implies the preservation of the place memory (Lakatos, 2013).

## Conversion as the tool of regeneration

The term conversion is understood as functional metamorphose – adaptation and completing of the former structure for the new purpose. Conversion of the industrial structures is the main topic of the publication of Zemánková (2003). She points on the identification of functions which are appropriate to be set in the objects of industrial heritage. This book is solving the issue of conversions, mainly regarding architectural use.

Generally, worldwide, approach to the conversions of the industrial heritage went through the certain process, influenced by the attitude to the values of this heritage. From prevailing opinion to absolute demolition followed by land release, through an accidental choice of the typical examples of the industrial architecture by means of heritage protection – without the new use with the exception of museum functions toward a more active way



of use. This relatively new approach, based on active usage of preserved industrial structures as a part of the site, announces the need for connecting of these seemingly opposing tendencies between development and heritage protection. It is influenced by the increase of cultural and historical criteria for conserving of the structural basis of the factory and therefore increasing awareness of industrial heritage values and its important place in the history of habitation. More and more often we discover broad urban projects that deal with visions on big industrial areas.

Conversion serves as meaning for social renewal of the urban structure through the new use of the chosen object. That way created work connects old and new parts, has the positive influence on the existing urban relations and respects context of the city at the same time. When we are dealing with spacious areas, conversion integrates former preserved structure into the urban organism and by this way is creating functional attractivity on the site. The purpose of the conversion is significant in searching and verifying of the adaptability level of the old structures to the new urban or regional functions. They should be inspired and formed from positions of urban values of the former structure.

Similarly as the approaches to industrial heritage, if to preserve or not at all, also the implications on architecture of the objects are varying – from using the buildings without the modification, through preservation of the exterior only and conversion of the interior, to the numerous examples of new use based on principles of connecting former structures with the new. All of these interventions are directly dependent on the function choice, as well as on the externalities, which influences the choice of approach to the objects. Mainly these are different ecological weights and other left-overs of the previous function (Zemánková, 2003).

The new and carefully chosen function represents the new life of the object and its sustainability. From it, the level of the intervention to the preserved structure during the conversion is dependent. Searching of the new function should be coming out from forecasts about the development and needs of the place, followed by a confrontation with urban, technical and architectural offers of the objects. Current needs of the locality are mainly settled in strategic documents as Program of the economic and social development of the outlying locality. Compatibility of the existing building and predicted program are crucial for new sustainable use. Object / site itself and its architecture will be affected with typological, hygienic and safety demands afterward. So, we need specialized views, analysis and conditions evolving from the cultural history of the structure, area, architectural of the building, its uniqueness. Despite these values of heritage, we need broader urban and space relations. In last, we can speak about needs of the site. Based on new function, we must count with structural, technical possibilities and limits of conversions (Zemánková, 2003).

## Issues of interlinking development of brownfields and protection of heritage

When we look to postulates focused to the conversion of industrial heritage, we can have a relatively good overview of possibilities about architectural or urbanistic interventions, but there is an absence of connection with planning and development. Values and connections of industrial heritage in sites are still not well understood. Interlink, between preservation of industrial heritage and development of sites or redevelopment of brownfields, still seems to be untouchable in many aspects. At first, spatial development is focused more on an economy, social and practical spheres (Jackson & Bergatt 2013, Finka & Jamečný, 2010) than on cultural and historical values.

At second, there is a big absence of specialists focused on industrial heritage and, at third, negative public understanding of industrial heritage (Dvořáková, 2010), which threatens cultural aspects of industrial heritage. The solution for interlinking between industrial heritage's cultural aspect and development's economy aspect (or issues) can be seen in cultural tourism (Králková, 2010), new trends in marketing and business.

Good presentation and marketing can eliminate the issue of negative perception of industrial heritage by common society about it. Presentation of industrial identity in rehabilitated sites needs deep knowledge about site and heritage values as a whole. All parts of the area (not all protected by government) are components of identity and genius loci, and in another hand, their structures can be reused and adapted, without loss of their values. This needs more conceptual view about creating a new function and new urban structure and can be held in the master plan of the site.

The conflict between development and preservation and protection of industrial structure in brownfields opens (or represents) question: "why is better to preserve this structure and what is the impact of this preservation for sustainable development?"

Many examples, such as Ostrava or Zlín and lot another examples across whole Europe, shows, that preservation of industrial heritage represents the possibility of development based on tourism. This is the way, how to deal with decreasing production in industrial sites by using their local potential (Králková, 2010). The second aspect describes industrial areas as "potential bringers of historical spaces", which can enrich urban structures of cities (Gojič & Zveledová, 2010).



## Industrial heritage in context of sustainable development

As it was mentioned before, both important keywords of the topic are represented by relevant international documents – The Nizhny Tagil charter for the industrial heritage (TICCIH, 2003) on one hand and Territorial agenda of European union 2020, focused on the term of sustainable development, in another hand. So we have two documents, which one represents approach of protection, conversion and preservation of industrial areas and claims that industrial heritage should be seen as an integral part of cultural heritage in general (TICCIH, 2003). The second document represents approaches, which should be led to the sustainability of development (Territorial agenda of European union 2020), based on environmental aspects.

There is a space, where postulates of both documents cooperate and are based on same things. Industrial heritage is the important part of cultural heritage (TICCIH, 2003) and with the natural heritage, they are parts of the territorial capital and identity (Territorial agenda of European union 2020).

Heritage should be understood as one of the resources, as an integral part of an environment. Its overexploitation (or their destroying in the case of heritage) leads to biodiversity loss, vulnerable natural landscapes and – mainly - cultural heritage (Territorial agenda of European union, 2020). In the context of industrial heritage, we speak about a relatively large spectrum of types of objects – not only plants and machinery but about areas of industrial waste too. In the context of the environment, they should have potential archaeological and ecological values (TICCIH, 2003).

In both charters, there is an importance of protection and qualitative aspects of development in important sites and landscapes. The high value of European urban and rural landscapes should be protected and developed in qualitative terms – especially natural and (in our context) cultural landscapes (Territorial agenda of European union 2020). Industrial heritage is usually an integral part of cultural landscapes in many forms. In most important sites is important protection and preservation of their historical integrity or the authenticity of their industrial structures. Adaptation and reuse are the way of their survival and in a lot of cases may be a cost-effective (TICCIH, 2003).

Unique values of industrial heritage may be preserved, protected and strengthened, which leads to improving regional and local identity (Territorial agenda of European union 2020). There is importance to the authenticity of an industrial site, which is based on preserving functional integrity of objects (TICCIH, 2003) - New uses after adaptation should respect this authenticity by material basis and should be compatible much as possible with the original or principal use (TICCIH, 2003).

Preservation and conversion of industrial heritage have environmental, economic and social assets too, and of this

kind both charter are consistent. Adaptation and usage of industrial objects avoid wasting and contributes to sustainable development. Heritage can have an important role in the economic regeneration of decayed or declining areas and may provide psychological stability for communities facing the sudden end of production and an unemployment (TICCIH, 2003). These cultural assets, ecological values, and environmental quality offer unique development opportunities (Territorial agenda of European union 2020).

There is an importance of managing and connecting ecological, landscapes and cultural values of regions – especially the local, regional management of cultural and natural heritage (Territorial agenda of European union 2020). In the case of Industrial heritage and its protection, it should be integrated into policies for economic development and into regional and national planning (TICCIH, 2003). The protection and enhancement of cultural and natural heritage are important conditions for long-term sustainable development (Territorial agenda of European union 2020).

From a comparison of this documents we can see, that lot of aspects are relatively close to each other, so “duality” in development and heritage protection is not so contradictory as it seems at the first. Figure 1 shows the theoretical framework of this two approaches dealing with heritage protection and development.

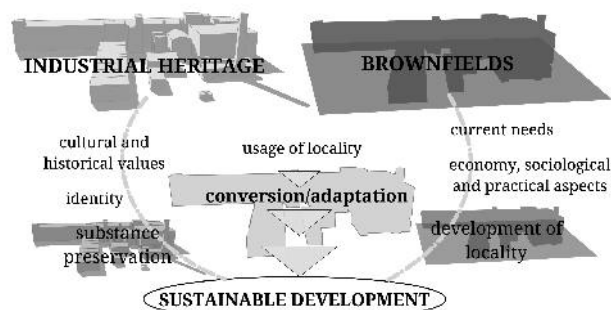


Fig. 1: scheme – theoretical framework conversion of Industrial heritage in context of sustainable development

(source: autor)

## Conclusions

When we are speaking about the approach to conversion or adaptation of industrial heritage which has to lead to sustainable development, it is necessary to search correlation between preserved values and qualities of industrial structure and needs of the locality. Both of them have the specific approach to evaluation. There is a problem with different “language” and priorities. While monument protection and topic of heritage is focused more on cultural values and history, development is about spatial relationships, economic and social aspects, which





influence usability of heritage, new function etc. In principle, aspects of both approaches are not contradictory as it seems at the first sight. From analysis and comparison of relevant documents, which presents both approaches, The Nizhny Tagil charter for the industrial heritage and Territorial agenda of European union 2020, we can see a correlation between their aspects. Cultural values are comparable with natural values and their protection and preservation are important to achieve sustainable development (Territorial agenda of European union 2020).

So, how we can deal with industrial heritage in the context of sustainable development? We can speak about approaches to industrial heritage and development included in the both charters as about the set and subset. Industrial heritage is the important part of cultural heritage (TICCIH, 2003) and cultural heritage with the natural heritage they are parts of the territorial capital and identity (Territorial agenda of European union 2020). It is important to understand cultural heritage (including the industrial heritage too) as the one of "resources", similarly as the natural resources. "Cultural resources" are exhaustible similarly as the natural resources, and in a context of sustainable development, we should treat them with care.

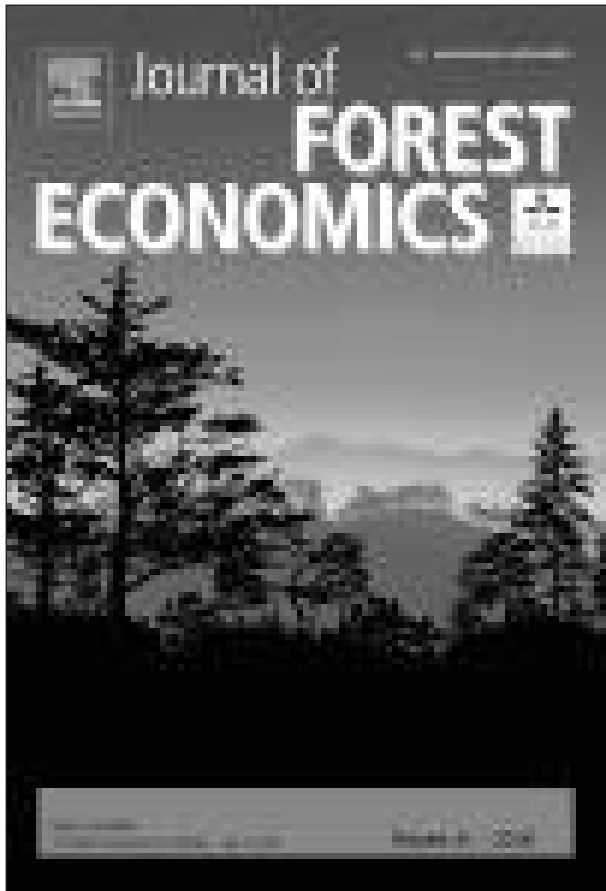
New life and usage of Industrial heritage as the "cultural resource" are as important as its protection. Functional conversion of this kind of heritage may lead to sustainability of heritage and have the positive impact on the site too. The negative side effect of development located in areas of industrial heritage usually leads to destroying values of heritage. It uses to be caused by economic ambitions and profit achievable in relatively short time. This kind of dealing with cultural "resources" is contradictory with principles of sustainable development in . The balance between preservation of industrial heritage and function with economic profit is possible when heritage is used as a tourist attraction – which increases the value of locality. The important fact is that the use of existing capacities of structures is more ecological than completely destroying, it is more environmentally friendly and supporting the sustainability.

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FOREST ECONOMICS 24



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WIDMARK C,  
2016.  
EDITORIAL

Forest is not a typical common pool resource, as the forest is usually privately owned, and goods and services that are derived from the forest can be characterized in different groups. This is adding complexity to forest governance, as interdependence situations occur from the multiple-use of the forest landscape. The goods and services of the forest can be characterized by open or closed access to the resource, and are characterized as typical social dilemmas that occur in management situations, hence illustrating the complication of managing the forest resource (Widmark, 2016). In Europe, rapid changes occur due to climate change, economic development and changing geo-political situations. For these reasons, the 3rd European Meeting of the Association of the Study of Commons (IASC) in Umea Sweden September 2014 addressed the issue of the use of commons in changing society, in particular trends and the effects on the European settings, especially focusing on indigenous traditional use or on local society's use of resources, natural resources in particular. Special issue "From Generation to Generation – the Use of Commons in a Changing Society", published in the Journal of Forest Economics 24, 2016 (IF 1,603) concentrates on those challenges. The three papers contribute to underline and elaborate on the complexity of forest commons governance by discussing:

**(1)** The effect of new resource users and institutions on the robustness of European forest commons: Tatiana Kluvánková, Veronika Gežík. Survival of commons? Institutions for robust forest social – ecological systems Pages 175-185

**(2)** Governance of a forest common regarding absentees and passive stakeholders: Jan Lge Riseth, Hans Trimmervik, Jarle W. Bjerke: 75 years of adaptation: North Scandinavian Sámi reindeer herding between government policies and winter climate variability (1835–2010) Pages 186-204

**(3)** The historical effect of external shock to reindeer husbandry in Scandinavia: Stefan Sandström, Mahesh Poudyal, Solveig Berg Lejon, Gun Lidestav: Absent neighbours and passive shareholders – The issue of residency and involvement in the management of a forest common Pages 205-217

*Stanislava Brnkářáková*



Alfréd Kaiser

## ISEE 2016 THE INTERNATIONAL SOCIETY FOR ECOLOGICAL ECONOMICS



### ISEE

ISEE is a not-for-profit, member-governed, organization for advancing understanding of the connections between ecological, social and economic system for the well-being of nature and people. The organization was founded in 1989. This year's conference of ISEE 2016 was a joint effort between The International Society for Ecological Economics (ISEE) and the Collage of Agriculture, Urban Sustainability and Environmental Sciences (CAUSES). This was the reason why conference was hosted in Washington DC on the campus of the University of the District of Columbia, where Sabine O'Hara who is president of ISEE and also is Dean and Director of CAUSES.

The ISEE conference is organized every two years, so the next will be in Mexico City in 2018. Some very well known speakers were invited, Francis Moore Lappé (Diet for a Small Planet, Author; Right Livelihood Award), Marina Silva (Environmentalist and Brazilian politician; reduced deforestation of the Amazon forest by almost 60 percent), Dr. Gar Alperovitz (National Center for Economic and Security Alternatives, President; Author of critically acclaimed books on atomic bomb and atomic diplomacy). Michelle Obama was also invited, but sadly she wasn't able attend prior to her other duties. The topic of the conference was Transforming the Economy: Sustaining Food, Water, Energy and Justice. International Society for Bio-Physical Economics also joined the conference and they took a significant part in it. Therefore, the conference was divided three main blocks:

- Ecological Economics (EE)
- Bio-physical Economics (BPE)
- Joint (EE/BPE)

We joined the conference on behalf of CE SPECTRA, Slovak University of Technology and Slovak Academy of Science in block of Ecological Economics. Our contribution was presentations of three submitted papers. To present before the audience with so vast and different backgrounds was interesting and exciting.



Figure 1: Colegue during presentation of Carbon Forestry CPR Regime (source: Author)

All of them have been discussed and we acquired thoughtful remarks and comments to our further research. Our presentation "Enhancing the well-being of EU regions through innovative governance models – The carbon forestry CPR regime" was well received and broadly discussed, interesting was the part with rewarding of stakeholders. Economist focused especially to this part and provided us thoughtful ideas. To summarize up the asset of conference, we have to say that we met a lot of experts from different fields and with different backgrounds. It is encouraging when you receive feedback that can help you to go further on the issue of your research and develop more accurate concepts.



Iveta Štecová

## PHD STUDY STAY AT SUMMER SCHOOL OF SUSTAINABILITY AT THE UNIVERSITY OF REIMS, FRANCE



Thanks to Slovak University of Technology in Bratislava and Institute of Forest Ecology SAS I was offered the opportunity to participate in Summer School of Sustainability with the theme The Governance of Socio-Ecological Systems. I had privilege to spend one week in University of Reims in France, where I could develop my dissertation topic, get new information and practice my language skills.

The University of Reims was hosted a Summer School on Governance of Socio-Ecological System (GOSES) what is a rapidly growing issue in many disciplines related to the environment and especially sustainability science. The GOSES Summer School was organized in collaboration with SENSE (Netherlands Research School for Socio economic and Natural Sciences of the Environment). This Summer School aimed at bringing together scholars, which work on the governance of socio-ecological systems at different level (from local to regional to global level) and

from different perspectives including ecology, biology, geography, planning, politician science, international relations and the emerging discipline of sustainability science. All twenty-four participants were PhD or master students. We were divided to three small groups where we worked on research presentations and abstract development.

The GOSES Summer School composed of three modules (sociological approaches, epistemic approaches and integrated approaches which included research seminars, abstract development and methods lab) a fieldtrip and final conference. The aim of the summer school was to extend knowledge and develop interest about governance of socio-ecological systems. This theme has attracted scholars working along the lines of Elinor Ostrom integrated diagnostic approach to analyze the sustainability of a socio-ecological system, so conversations and lectures focused on this direction.





Katarína Mackovičová

## RIJEKA – LISBON – PRAGUE: THREE CONFERENCES ON INDUSTRIAL HERITAGE

Fig. 1: Rijeka, Torpedo factory (source: author)





Fig. 2: Poster presentation, Rijeka (source: author)

7<sup>th</sup> International Industrial Heritage Conference was held in Rijeka in May 19-21, 2016. It was organized by PRO TORPEDO, Society for Promotion and Protection of Rijeka's Industrial Heritage and University of Rijeka, Faculty of Engineering and under the high patronage of the President of the Republic of Croatia. This international conference for industrial heritage is organized every two years. This year, Torpedo History and Heritage was the main theme on the occasion of 150th Anniversary of the Invention of the "Luppis-Whitehead" Torpedo. Fifty participants with oral presentation and twelve participants with poster presentation attended this conference.

My contribution was poster presentation with title "Revitalisation of Harbour Structures through their Cultural Values" with coauthor Martin Dubiny from Faculty of Architecture. Miroslav Beňák, my colleague and also PhD student at Institute of Management presented his contribution "Valley of Ammunition Industry in Slovakia (once and today)". The conference included excursion to closed industrial sites - harbour "3.maj", abandoned torpedo factory and Whitehead's tomb) in memory of industrial history.

Second interesting conference was the 3rd International Congress on Industrial Heritage in June 17-19, 2016 in Lisbon. Main theme was focused on the presentation of practical examples and methodological reflections in the field of re-use of industrial sites, as well as approaches in other subject areas such as Heritage, Archaeology, Museology and Industrial Tourism. The idea was to find a solution for restoration and re-use of the industrial heritage rather than their demolition. Seventy participants attended this congress and presented their solution. My contribution was "Harbours – Perspective of

the Industrial Tourism" in the section Industrial tourism, where an adaptation of building in harbour for new function with increasing of industrial tourism was presented.

World Multidisciplinary Civil Engineering – Architecture – Urban Planning Symposium is a conference which is organized in every year. In 2016, it was organized in June 13 – 17 in Prague where 500 participants from 50 different countries presented their research. Keynote speaker Prof. Dr. Miroslaw J. Skibniewski from University of Maryland (USA) opened the conference. The industrial heritage had its own section "Historic structures of production areas as a development potential." Organizer was Doc. Ing. Eva Králová, PhD. from Faculty of architecture at STU. My presented contribution titled "The ports of Slovakia as territorial potential" introduced three Danube's harbours in Slovakia and their territorial capital.

Main mission presented by three conferences was a need to perceive the industrial heritage as our history to be able to protect it. Each conference tried to show the importance of the industrial heritage and increase the importance and awareness of its protection. Conferences also offered a solution for re-using of the abandoned sites or buildings in their future and provided new knowledge for doctoral research in the field of industrial heritage. Rising importance of industrial heritage has been underlined by The international Committee for the Conservation of the Industrial Heritage (TICCIH) in conferences Rijeka and Lisbon.

### Acknowledgement

Participation in the conferences was supported using funding by Slovak Arts Council.



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