Forests for cities, forests for people
Perspectives on urban forest governance

27-28 September 2012, Zagreb, Croatia

Programme and Book of abstracts
IUFRO Conference

Forest for cities, forests for people
Perspectives on urban forest governance

hosted by the Croatian Forest Research Institute
in collaboration with IUFRO’s unit on Urban Forestry and the FOPER project (European Forest Institute)

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Welcoming Words

Dear participants,

We welcome you cordially to the conference “Forests for cities, forests for people: perspectives on urban forest governance” organised by Croatian Forest Research Institute together with IUFRO unit 6.07.00 on Urban Forestry and FOPER project of the European Forest Institute. Taking into consideration constantly growing population in urban areas all around the world, and all what comes with it, we cannot but to agree that urban forests are our urban future.

Urban forests provide many environmental, social and economic benefits and contribute to quality of life of people in urban areas. Therefore the way how we treat them and how we make decisions about them becomes very important. And governance is about making decisions.

The idea for the conference came from the on going South East European regional project FORCITY- “Citizens and urban forest governance in SEE: case studies in selected cities” that addresses urban forest governance and satisfaction of citizens with their urban forests.

We hope that this conference will provide us all with interesting presentations and fruitful discussions from which we will learn something new. And governance is about learning too.

City of Zagreb has a long tradition of caring for urban forests and green space, and some of which we are proudly going to show you during our field trip.

We would like to thank Croatian Chamber of Forestry and Wood Technology Engineers, Croatian Forestry Society, Zagreb Tourist Board and Zagreb Fair for their support in preparing this event.

Enjoy the conference, but also make new friends and business contacts and most of all have a pleasant stay in Zagreb!

On behalf of organizers

Dijana Vuletić
Silvija Krajter
General Information

Accommodation
The venue of the conference is Hotel International **** - (www.hotel-international.hr/), Zagreb, Croatia. Special discount is arranged at the hotel for the accommodation of the participants.
Access to the internet is available at the Hotel via WLan free of charge.

Registration desk
The registration desk at the Foyer of the “Adriatic” Hotel conference room will be open on Thursday (27 September) from 7:30 - 9:00 h and from 8:00 - 9:00 h on Friday (28 September). Each participant receives a conference bag with conference materials. The service at the registration desk provides you with the latest news of the conference programme and supports with useful information during your stay.

Lunches and Coffee Breaks
Coffee breaks are included (served at the Foyer) as well as the lunch in the hotel restaurant. Exceptionally, conference dinner will be held in downtown Zagreb at the ‘Republica” restaurant on Thursday at 20:00 h.

Publishing opportunities for authors
Authors presenting at the conference are encouraged to prepare and submit full papers to SEEFOR (in English only) or to Radovi (in Croatian or English) journals. Both journals are indexed in CAB Abstracts database. Papers submitted either to SEEFOR or Radovi should be prepared according to the Instructions for authors which can be found at: www.sumins.hr/seefor for SEEFOR, or at: www.sumins.hr/radovi/index.html for Radovi. Deadline for submitting papers is 1st December 2012.

Social Programme
Thursday, 27 September, 20:00 h
Dinner at the ‘Republica” restaurant
Adress: Square Ban Josip Jelačić 9 (downtown Zagreb)

Friday, 28 September, 13:30 h
Field trip – The Green Horseshoe of Zagreb
The Green Horseshoe of Zagreb

Zagreb is a green city. The most impressive of the city’s green escapes is what is known as Lenucijeva Potkova or Lenuci’s Horseshoe, a series of parks and tree-lined squares that run from Zagreb’s main station, up to the city’s main square and loop around in the shape of a horseshoe.

A forward thinking urban planner by the name of Lenuci came along at the end of 19th century and was instrumental in creating the so-called Green Horseshoe or Lenuci’s Horseshoe. If you look at the map, you'll see an unmistakable green U-shape that explains the name, famous both for the green spaces and the architecture inside of it. The west leg is comprised of three squares: Trg Maršala Tita with the Baroque and unmistakably yellow Croatian National Theatre; Mažuranićev trg and Marulićev trg with beautiful art nouveau buildings, and the State Archives. The southern leg is entirely comprised of the wonderful Botanical gardens. This glorious return to nature is home to over 10,000 plant species, numerous park benches, lily pads galore and ducks that quack. The east leg is also made up of three squares: Trg kralja Tomislava with its Art Pavilion, Strossmayerov trg with the Gallery of Arts and Sciences and finally the glorious Zrinjevac with its exquisite Music Pavilion. This group of squares is worshipped by locals, tourists and animals of all types.
Conference Programme

DAY 1  (Thursday, 27 September 2012)

07:30 - 08:30  Registration
08:30 - 09:00  Welcome addresses
09:00 - 10:00  Key note addresses
  Margaret SHANNON; EFI FOPER Coordinator; Faculty of Forest and Environmental Science, University of Freiburg, Germany
  Maureen McDonough; Michigan State University, USA
  Cecil C. KONIJNENDIJK; Forest & Landscape, University of Copenhagen, Denmark

SESSION 1

10:00 - 10:20  Can everybody win? - The recent development of concepts on urban forest governance in Slovenia
  Robert HOSTNIK; Slovenia Forest Service, Unit Celje, Slovenia

10:20 - 10:40  Urban forest governance in California (USA) cities: Legal, fiscal and political aspects of the private-public interaction in managing urban trees
  Igor LAČAN; Portland State University, Portland, OR, USA

10:40 - 11:10  Coffee break

SESSION 2

11:10 - 11:30  Green structure under pressure - Handling conflicts in the compact city
  Inger-Lise SAGLIE, Kine Halvoren THORÉN; Department of Landscape Architecture and Spatial Planning, Norwegian University of Life Sciences, Norway
Conference Programme

11:30 - 11:50  Addressing climate change adaptation in urban forests of Belgrade
Ivana GUDURIĆ; MSc of European Forestry student, The European Forest Institute Central-East European Regional Office (EFICEEC), Vienna, Austria
Bernhard WOLFSLEHNER; The European Forest Institute Central-East European Regional Office (EFICEEC), Vienna, Austria,
Jelena TOMIĆEVIĆ; Department of Landscape Architecture and Horticulture, Faculty of Forestry, Belgrade, Serbia

11:50 - 12:10  Problems and suggested solutions in urban forests management in Turkey
Erdogan ATMİŞ; University of Bartın, Faculty of Forest, Bartın, Turkey
H. Batuhan GÜNŞEN; University of Bartın, Faculty of Engineering, Bartın, Turkey
Cengiz YÜCEDAĞ; ECORYS Research and Consulting, Ankara, Turkey
Wietze LISE; AF Mercados EMI, Ankara, Turkey

12:15 - 13:30  Poster announcements (for explanation please proceed to Instructions for Authors at: http://www.sumins.hr:8080/IUFRO2012/#)

13:30 - 15:00  Lunch
Conference Programme

SESSION 3

15:00 - 15:20  Stakeholders participation in governing urban forests
Nataša LOVRIĆ, Marko LOVRIĆ; Croatian Forest Research Institute, Jastrebarsko, Croatia

15:20 - 15:40  Communication and governance agenda in urban forestry planning in Macedonia Case study: Urban forestry in municipality Skopje
Makedonka STOJANOVSKA; Faculty of Forestry, University St. “Kiril and Metodij”, Skopje, Macedonia
Aneta BLADEVSKA, Vaska NEDANOVSKA, Biljana STOJANOVIA; FOPER II, Faculty of Forestry, University St. “Kiril and Metodij”, Skopje, Macedonia

15:40 - 16:00  The application of landscape ecological principles and frameworks in strategic planning for comprehensive urban green space plans
Mehrdad Ghodskhah DARYAEI; Department of Forestry, Faculty of Natural Resources, University of Guilan, Rasht, Iran

16:00 - 16:20  Public involvement in decision-making for management of protected area Vrelo Bosne
Alisa POLIĆ; Faculty of Forestry, University of Sarajevo, Bosnia and Herzegovina
Cecil C. KONIJNENDIJK; Forest & Landscape, University of Copenhagen, Denmark

16:20 - 16:50  Coffee break
Conference Programme

SESSION 4

16:50 - 17:05  Private, urban green space for ecological sustainability and livelihood security: Changing scenarios from an Indian city
Kulbhushan BALOONI, Kausik GANGOPADHYAY; Indian Institute of Management Kozhikode, Kerala, India
B. Mohan KUMAR; College of Forestry, Kerala Agricultural University, India

17:05 - 17:20  Urban forest assessment for Pristina: Using the Chicago Model
Richard INCE; InterSilva, Somerset, UK

17:20 - 17:35  Residential landscape plans compared to current inventory up to 14 years after redevelopment
David C. CHojNACKY, John McGEE; Department of Forest Resources and Conservation, Virginia Polytechnic Institute and State University (Virginia Tech); Falls Church/Blacksburg, USA

17:35 - 17:50  Drinking water resources in the urban forests of the Ljubljana city
Urša VILHAR, Špela PLANINŠEK, Andreja FERREIRA; Gozdarski inštitut Slovenije, Ljubljana, Slovenia

17:55 - 18:45  Panel discussion

20:00 -  Conference dinner
DAY 2  (Friday, 28 September 2012)

SESSION 1

09:00 - 09:20  Garden city for all?: Unearthing the sustainability discourse of Singapore  
Natalie Marie GULSRUD; Danish Center for Forest, Landscape and Planning, University of Copenhagen, Frederiksberg, Denmark  
Can Seng OOI; Copenhagen Business School, Department of International Economics and Management, Frederiksberg, Denmark

09:20 - 09:40  Telford New Town, the forest city revisited - lessons for the future of urbanism  
Alan SIMSON; The Leeds School of Art, Architecture + Design, Leeds Metropolitan University, Leeds, UK

09:40 - 09:55  Historical role of urban forests in socio-political power relation in the city of Banja Luka  
Doni BLAGOJEVIĆ; European Forest Institute, FOPER II, Varaždin, Croatia

09:55 - 10:10  Relations among green spaces, perceived restorativeness and resident’s well being  
Giuseppe CARRUS; University of Roma Tre – Department of Cultural and Educational Studies, Italy; CIRPA - Center for Inter-University Research on Environmental Psychology, Italy  
Massimiliano SCOPELLITI, Libera Università Maria Ss. Assunta (LUMSA), Italy; CIRPA - Center for Inter-University Research on Environmental Psychology, Italy; CIRPA - Center for Inter-University Research on Environmental Psychology, Italy  
Maria Grazia AGRIMI, Luigi PORTOGHESI; Tuscia University, Italy
Conference Programme

Francesco FERRINI, Fabio SALBITANO; University of Florence, Italy
Raffaele LAFORTEZZA, Giuseppe COLANGELO, Giovanni SANESI; University of Bari, Italy
Paolo SEMENZATO; University of Padua, Italy

10:10 - 10:30 Coffee break

SESSION 2

10:30 - 10:45 The use of Turkey's forest resources for the purpose of tourism and recreation
Yalçın KUVAN; Department of Forest Policy and Administration, Faculty of Forestry, Istanbul University, Istanbul, Turkey

10:45 - 11:00 Recreation needs and its development in forests in Lithuania
Edvardas RIEPŠAS, Remigijus ŽALKAUSKAS; Faculty of Forestry and Ecology, Lithuanian University of Agriculture, Kaunas distr., Lithuania
Ausrine ARMAITIENE; Department of Recreation and Tourism, Klaipeda University, Klaipeda, Lithuania

11:00 - 11:15 Planning in urban forestry based on visitors' demands - case study Vrelo Bosne
Amila BRAJIĆ, Dženan BEČIROVIĆ, Senka MUTABDŽIJA, Bruno MARIĆ, Mersudin AVDIBEGOVIĆ; Faculty of Forestry, University of Sarajevo, Bosnia and Herzegovina

11:15 - 11:30 Visitors' perception of urban forests towards recreation use: Case study Park forest Vodno – Skopje
Biljana STOJANOVA, Makedonka STOJANOVSKA; Faculty of Forestry, University St. “Kiril and Metodij”, Skopje, Macedonia
Maureen McDONOUGH; Michigan State University, USA
Conference Programme

11:30 - 11:45 Contingency valuation of Croatian arboretum Opeka
   Stjepan POSAVEC, Karlo BELJAN, Nina HERCEG; Faculty of Forestry, University of Zagreb, Zagreb, Croatia

11:45 - 12:15 Wrap up session (review of the conference, lessons learnt, closing addresses)

12:15 - 13:30 Lunch

13:30 - FIELD TRIP - The Green Horseshoe of Zagreb
1) Wood decay fungi of the genus *Phellinus* in urban area and national parks
Sanja Novak AGBABA, Nevenka ĆELIPIROVIĆ; Croatian Forest Research Institute, Jastrebarsko, Croatia
Monika KARIJA VLAHOVIĆ; DNA Laboratory, Department of Forensic Medicine and Criminology, School of Medicine, University of Zagreb, Croatia

2) Objectivity in aesthetic evaluation of urban green
Vesna ANASTASIEVIĆ, Nebojša ANASTASIEVIĆ; Faculty of Forestry, University of Belgrade, Belgrade, Serbia

3) The structure and monitoring of poplar trees in urban green areas of Novi Sad
Siniša ANDRAŠEV; Institute of Lowland Forestry and Environment, University of Novi Sad, Novi Sad, Serbia
Martin BOBINAC; Faculty of Forestry, University of Belgrade, Belgrade, Serbia

4) Historical and cultural significance of a discovery of one hundred year old common horse chestnut tree (*Aesculus hippocastanum* L., var. *Baumannii* Schn.) in a street tree row at Erdevik (Serbia)
Martin BOBINAC, Andrijana BAUER; Faculty of Forestry, University of Belgrade, Belgrade, Serbia
Siniša ANDRAŠEV; Institute of Lowland Forestry and Environment, University of Novi Sad, Novi Sad, Serbia
Đuro JORGIĆ; Šid, Serbia
Niko STANKOVIĆ; PE NP Fruška Gora, Serbia

5) Urban trees - the use in phytoremediation of heavy metals pollution
Lukrecija BUTORAC, Katarina HANČEVIĆ, Goran JELIĆ, Tomislav RADIĆ, Vlado TOPIĆ, Irena BOGDANOVIĆ; Institute for Adriatic Crops and Karst Reclamation, Split, Croatia
Tamara JAKOVLJEVIĆ, Ivan SELETKOVIĆ, Nenad POTOČIĆ; Croatian Forest Research Institute, Jastrebarsko, Croatia

6) Multifunctional urban forest planning for urban open and green space systems: City of Bartin, Turkey
Bülent CENGIZ, Canan CENGIZ; Department of Landscape Architecture, Faculty of Forestry, Bartin University, Bartin, Turkey
7) Valorisation of natural resources of forest edges for recreational function in the urban forest Kosutnjak, city of Belgrade
   Milijana CVEJIĆ; Institute of Forestry, University of Belgrade, Belgrade, Serbia
   Jelena TOMIĆEVIĆ, Milan MEDAREVIĆ; Faculty of Forestry, University of Belgrade, Belgrade, Serbia

8) Thermic attenuation on concrete sidewalk under urban trees. Case study: Santa Marta – Colombia.
   Carlos DEVIA; Facultad de Estudios Ambientales y Rurales, Pontificia Universidad Javeriana, Bogotá, Colombia
   Andrés TORRES; Facultad de Ingeniería, director Grupo de investigación Ciencia e Ingeniería del Agua y el Ambiente. Pontificia Universidad Javeriana, Bogotá, Colombia

9) Results overview of a survey carried out door-to-door in the area of Liman Park in Novi Sad: What do inhabitants think of urban forests and public urban greenery?
   Vanja GRMUŠA; graduated in Landscape Architecture, Faculty of Agriculture, University of Novi Sad, Novi Sad, Serbia

10) Urban forestry and public involvement in Kosovo
    Sami KRYEZIU; NGO “Agro-Vet Development” Fushë Kosovë

11) The attitudes of the citizens of Novi Sad on urban forests and urban green based on the analysis results of four focus groups
    Andrea KULIĆ; Landscape Architecture, Faculty of Agriculture, University of Novi Sad, Novi Sad, Serbia

12) ICP Vegetation moss survey of urban forests in Zagreb
    Vladimir KUŠAN, Zdravko ŠPIRIĆ; OIKON – Institute for Applied Ecology, Zagreb, Croatia
    Marina FRONTASYEVA; Frank Laboratory of Neutron Physics, Joint Institute for Nuclear Research, Dubna, Moscow Region, Russia
    Trajče STAFILOV; Institute of Chemistry, Faculty of Natural Sciences and Mathematics, University St. “Kiril and Metodij”, Skopje, Macedonia

13) Liman Park - What do direct users think of using this segment of urban forests and public urban greenery of Novi Sad?
    Dragana LAKIĆ; Landscape Architecture, Faculty of Agriculture, University of Novi Sad, Novi Sad, Serbia
14) Urban forests and greening in Republic fo Serbia - legal and institutional aspects
   Nenad LUKIĆ; Faculty of Agriculture, University of Novi Sad, Novi Sad, Serbia

15) Constrains for ornamental trees observed in Portugal
   Luís Miguel P. MARTINS; Univ. Trás-os-Montes e Alto Douro, Vila Real, Portugal

16) Insect pests in urban forests of Zagreb
   Dinka MATOŠEVIĆ; Croatian Forest Research Institute, Jastrebarsko, Croatia

17) The role of fungi in Holm oak (Quercus ilex L.) crown dieback in Croatia
   Marno MILOTIĆ, Lea BARIĆ, Danko DIMINIĆ; Faculty of Forestry, University of Zagreb, Zagreb, Croatia

18) Invasive plants in urban forests - case study of Belgrade
   Dragica OBRATOV-PETKOVIĆ, Ivana BJEDOV, Jelena TOMIĆEVIĆ, Marija NEŠIĆ; Faculty of Forestry, University of Belgrade, Belgrade, Serbia
   Verica STOJANOVIĆ; Institute for Nature conservation of Serbia, Belgrade, Serbia

19) Horse chestnut (Aesculus hippocastaneum L.) urban habitat - some phenotypic and morphological characteristics
   Fran POŠTENJAK, Karmelo POŠTENJAK; Matije Gupca 6, Jastrebarsko, Croatia

20) The attitudes of the citizens of Novi Sad towards urban forests and urban greenery - The interview results
   Bojana SAVČIĆ, Milota KAREDELIS; Faculty of Agriculture, University of Novi Sad, Novi Sad, Serbia

21) Urban forest and urban greenery in the Republic of Serbia in the context of professional and scientific literature
   Biljana STOJKOVIĆ; Faculty of Agriculture, University of Novi Sad, Novi Sad, Serbia
22) Green areas and woody plant inventory in urban landscape in Lithuania
   Lina STRAIGYTĖ, Remigijus ŽALKAUSKAS; Faculty of Forestry and Ecology, Lithuanian University of Agriculture, Kaunas distr., Lithuania

23) Biological-ecological and spatial evaluation of the park Hellenbach in Marija Bistrica
   Željko ŠPANJOL, Damir BARČIĆ, Roman ROSAVEC, Faculty of Forestry, University of Zagreb, Zagreb, Croatia
   Marijana MILJAS, Na vodi 19, 20 233 Trsteno, Croatia

24) Rearranging the green area around the Dr. Victor Babes Clinical Hospital for infectious diseases and lung diseases study in Timișoara, with the purpose of ensuring a healthy urban microclimate
   Alina TENCE-COSTANTINESCU, Florian BORLEA, Cornelia HERNEA; Faculty of Agriculture, Banat University of Agricultural Sciences and Veterinary Medicine, Timișoara, Romania

25) The first discovery of citrus longhorn beetle (CLB) - Anoplophora chinensis in Croatia and Phytosanitary measures applied in the prevention of its establishment
   Andrija VUKADIN; Institute for Plant Protection Zagreb, Croatia
   Boris HRAŠOVEC; Faculty of forestry, University of Zagreb, Croatia

26) An early snowstorm and the overall health of an urban forests
   Charles A. WADE; Department of Biology, C.S. Mott Community College, Flint, USA
   James J. KIELBASO; Department of Forestry, Michigan State University, East Lansing, USA
Governance for the 22nd Century: Anticipating Surprise and Planning for Uncertainty through Collective Learning

Margaret A. SHANNON

EFI FOPER Coordinator and Professor in Honor, Faculty of Forest and Environmental Science, University of Freiburg, Germany

Governance can be recognized when the principles and practices of governing create greater democratic and transparent processes for adaptive and iterative, cross-sectoral and multi-level, policymaking and policy implementation. Building the capacity for adaptive and iterative processes requires creating new capacity for monitoring and evaluation of processes and results that lead to social learning and adaptation to change – and anticipating uncertainty and surprise!

Government administrative management was designed to create stability and certainty. While there is still need for short-term predictability, it is an illusion to expect certainty and stability. Governance institutions emerged as the nature of the problems changed – global climate change, sustainability, and how urban forests and green infrastructure can create healthy cities – and the capacity of any one policy actor was insufficient to either create or carry out new solutions. Governance principles are intended to create new institutions with new policy making and implementation capacity in order to anticipate surprises and plan for uncertainty through social collective learning.

Governance institutions create social learning and the capacity to embrace change and uncertainty as opportunities for imagining new solutions.

Prof. Dr. Margaret A. Shannon is the Coordinator of the EFI FOPER Project in Southeast Europe. FOPER is a capacity building project in forest policy and education funded by the Finnish Ministry for Foreign Affairs and administered through EFI. She is also a Professor-in-Honor and Guest Professor at the Faculty of Forest and Environmental Sciences, Albert-Ludwigs University, Freiburg, Germany and Adjunct Professor in the Rural Futures Institute, University of New England, Armidale, Australia.

Dr. Shannon’s research interests have followed the evolution of participatory processes in forest and natural resource policy, planning and management into new modes of governance. Her early work documented the transformative organizational change through learning in the US Forest
Service as a result of participatory planning and collaborative management. She was an active participant in the EU COST Action E-19 on “National forest programmes in the EU context’ and an advisor to the EU research on ‘New modes of governance in sustainable forest management’ that explored the research questions raised in the COST action. She was one of the organizers for the USFS Committee of Scientists Report “Sustaining the People’s Lands” providing the scientific policy analysis for a new NFMA planning rule based upon participatory governance, collaborative planning and management, and a landscape approach to planning.

She served as the Chair of the SAF Working Group on Policy, Economics and Law for over 10 years. Since 2005, she has served as the Chair of the IUFRO Working Group on Forest Policy and Governance and is currently a Deputy for the new IUFRO Division 9 on Forest Policy and Economics. Since 1980, she has also served on the steering and program committees for several US conferences on forestry education and organized the first conference on Women in Natural Resources in 1985.
Urban and community forest governance in the United States: from town forests to community forests

Maureen McDonough

Michigan State University, Michigan, USA
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The governance history of urban and community forests in the United States is complex. In the 1800’s, town forests in New England were established in response to the realization that forest resources were not inexhaustible. At the time, the federal government was focused on national forest resources and so private forest associations arose to establish and govern town forests. Later, local and state governments entered the picture and began passing ordinances to regulate urban tree planting and tree preservation. The establishment by a private citizen of Arbor Day in 1872 encouraged civic organizations to be involved in urban tree planting and many did. However, governance of the urban and community forest continued to be in the hands of formal government units. The U.S. federal government became involved in the 1970’s when laws were passed directing federal agencies to assist the states in managing urban forests. However, this kept the governance of urban forest in the realm of formal government units at federal agencies worked with state agencies who worked with local units of government.

A governance shift began in the 1990’s with the rise of many nongovernmental organizations focused on urban forests. Part of the impetus for the shift was the introduction of the term “urban and community forests” in federal legislation. This opened up opportunities for governance by and including civic organizations. Simultaneously most natural resource management in the United States began to experiment with collaborative resource management. This has resulted in a complex mosaic of people, organizations and agencies that govern urban and community forests in the U.S.

Dr. Maureen H. McDonough is professor and extension specialist in the Department of Forestry at Michigan State University with adjunct appointments in the Department of Sociology and the Michigan State Museum. Her research and extension interests include community-driven forestry and increasing the diversity of voices in natural resource decision making. She has worked on community forestry projects in Thailand,
Keynotes

Vietnam, the Dominican Republic, Taiwan, Jamaica and China as well as in urban and rural communities in the U.S. including Detroit. Dr. McDonough has developed a model for the US Forest Service to use in reaching out to underrepresented groups, evaluated the role of community collaboration in stewardship contracting for the USDA Forest Service and the Bureau of Land Management and identified barriers to increased public participation in the Michigan Department of Natural Resources (MDNR). Since 2010, she has been teaching in the Forest Policy and Economic Education and Research program in Southeast Europe (http://www.foper.org/).
Urban forestry in Europe: towards collaborative governance

Cecil C. KONIJNENDIJK

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Governance has been defined in many different ways, for example as any effort to coordinate human action towards goals. One way of conceptualizing governance is through a continuum ranging from ‘governance by government’, to ‘governance with government’, to ‘governance without government’. While the first describes the dominance of hierarchical political action, the last describes political decision-making processes primarily relying on non-hierarchical forms of steering in the absence of a higher central instance and participation of government.

Decision-making in urban forestry, encompassing the governance, planning and management of woodland and other tree resources in urban areas, has since its emergence in the 1960s been dominated by ‘governance by government’ approaches. Especially local authorities have been in charge of urban green space, primarily through their parks and sometimes also forestry departments. However, early approaches to urban forestry did recognise its social-inclusiveness and the need to broaden the base of decision makers to also comprise local residents.

In Europe, governance aspects of urban forestry have had only limited attention from the scientific community so far, in spite of major changes driven by for example emerging political discourses, the call for more public involvement, and government reforms. A review of literature and cases shows that new forms and modes of governance are being set up to improve decision-making about urban woodland, urban trees, and other green spaces. European urban forest governance has especially during recent years seen a shift in the relations between state, market and civil society, with ‘governance with government’ becoming a more common model for strategic decision making. In some cases, there are examples of ‘governance without government’, through the work of NGOs, local residents and sometimes businesses. New forms of governance include, for example, park trusts in the UK, multi-actor governance through institutions such as national urban parks in the Nordic countries, and various public involvement initiatives. This contribution looks at these developments and cases, drawing lessons for the future of urban forest governance.
Keynotes

Cecil C. Konijnendijk is a professor of green space management at the University of Copenhagen, as well as a guest professor of management of outdoor green areas at the Swedish University of Agricultural Sciences. Cecil is also editor-in-chief of the scientific journal Urban Forestry & Urban Greening and author of a wide range of publications, including two books on urban forestry in Europe.
Problems and Suggested Solutions in Urban Forests Management of Turkey

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From the 1950s onwards the population in cities in Turkey began to increase. Today, 75% of population is living in cities and urban conglomerates. Public expectations from forest resources have changed together with the migration of people from rural to urban centers. Due to rapid urbanization, the expectations from green areas and forests in and near cities increased and changed for people living in the vicinity of cities. Following the world-wide trend in providing special attention to urban forests and to meet the demand and expectations from urban forests, the General Directorate of Forestry (OGM) began to deal with urban forestry from 2003 onwards.

Urban forestry in Turkey lacks a legal and administrative basis, due to the spontaneous start of the OGM to work on urban forestry. In addition, central directives were launched all of a sudden to establish urban forests in all provinces. The problems that arose from the poor planning and selection of urban forest locations and the insufficient funding for attracting the right personnel has been evaluated by various authors. It was stated that urban forest remained mainly a concept and it was not part of the planning process and related legal regulations; the criteria for establishing urban forests was insufficient; the basic needs and demands of those living in the city were not considered; uncertainties among authorities were in the way to resolve the debate among relevant institutions.

Within the framework of highlights mentioned above, this study aims to determine the problems of urban forests in Turkey and to develop resolution suggestions for these problems. The main focus in the current study is urban forests of Turkey. A detailed literature study relating to urban forests has initially been undertaken both at the national and the
international level. Furthermore, interviews were done with experts and academicians working in the field of urban forestry. In total, 37 variables were derived from the literature study and interviews.

These studies were conducted from the beginning of May until the end of October in 2010. According to OGM, there were more than 93 urban forests in Turkey in 2011. Taking into account that some urban forests are inactive, whereas other urban forests have insufficient information, this study has been able to collect a sufficient amount of information for only 52 of the active urban forests. Data were assembled from Forest Regional Directorates through OGM. For this purpose, OGM sent a data collection form created by us to each of 27 Forest Regional Directorates. And then, the filled forms were sent back to us.

In conclusion, the obtained variables were analyzed through various methods. Results from analyses were evaluated under the headings named "General Results, Physical Structure, Infrastructure, Management and Services".

**Keywords:** Urban Forest, Urban Forestry, Recreation, Urbanization, Management, Planning
Private, Urban Green Spaces for Ecological Sustainability and Livelihood Security: Changing Scenarios from an Indian City

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Urban green spaces in a developing country context are relatively scarce and facing challenges in view of rapid urbanization. Private, urban green spaces, even though constitute the core of urban sustainability, have received far less attention compared to those under public domain. This study assessed the change in homegarden, a form of private green space with multistoried vegetation abound in tropical regions, in the city of Kozhikode located in the Indian state of Kerala. We assessed the dynamics of homegardens of 150 households located in three different neighborhoods in the city of Kozhikode and evaluated them vis-à-vis households’ multi-dimensional socioeconomic and demographic characteristics during the last decade. The study revealed an all-round decline in the floristic elements of homegardens signifying a loss of urban sustainability. In spite of this, the floristic structure of small landholders has tilted towards food items – an indication of efficiency of homegardens in complementing livelihood sustainability. The study highlights the need to examine various dimensions of similar multifunctional land use systems under private domain across diverse urban contexts to understand the true potential of homegardens.

It is not uncommon to study the stake of the State in case of a public good; private green spaces provide similar environmental services as public green spaces, a case where substantial non-priced benefits of green spaces are externalized. In case of a decentralized system of governance, the State may provide economic incentives to the owners of private, urban green spaces in the form of subsidies by taxing non-friendly economic activities. This is theoretically possible in a resource rich economy, but hard to implement in case of a developing country like India, where urban land prices are skyrocketing implying a growing amount of subsidy from the public exchequer to sustain private, urban green spaces. In fact this may not be an economically prudent decision. In this context, we note that environmental governance has evolved as a major policy tool during the last two decades to achieve environmental sustainability and also the State
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and urban planners are increasingly depending on the citizens’ participation. Therefore, existing community neighborhood groups or similar new organizational units hold potential to take the cause of promotion and conservation of private, urban green spaces in their self-interest and societal interest at large.
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**Historical role of urban forests in sociopolitical power relation in city of Banja Luka**

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Throughout the history, specific interaction between rulers and citizens of Banja Luka has been established through urban forest landscapes. In the 2nd half of 19th century, Austro-Hungarian occupier established first planned urban forestry landscapes, and nowadays, the political elite is also continuing to establish new and modify the existing urban forestry landscapes to exert their power over people. This paper explores use of urban forests as mean for communication between the rulers and political elite on one side, and, citizens on the other. It analyses, both historical and contemporary, role of urban forests as a tool for expression of power. The function of urban forests as a powerscape is lying on the emotions and values they create in human beings. The paper tries to explore and identify these emotion and values and to provide examples on how they influence citizens behavior. Furthermore, the paper analyzes whether different sociopolitical environment influence the powerscape function of urban forests.

**Keywords:** urban forest, power, landscape, political elite, powerscape, values, emotions, sociopolitical environment
Planning in urban forestry based on visitors’ demands – case study "Vrelo Bosne"

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Complex "Vrelo Bosne" is one of the oldest and most important urban landscapes in the capital city of Bosnia – Herzegovina. It takes an important place in the national cultural-historical heritage, providing evidence of continuity of life in this area, from the prehistorically period to present time. To the certain extent, it is also a symbol of Sarajevo citizens’ lifestyle. Since 2006, it has been officially proclaimed as a protected area in the category of natural monument.

Understanding of visitors’ demands is important preconditions for achieving the goals of both, protection of the area and providing various services expected by urban population. Besides, the concept of governance in nature resource management strongly advocates involvement of civil society in planning and managing of urban forests in the cities.

This paper deals with visitors’ demands towards urban forest "Vrelo Bosne". An appropriate field research has been conducted in the period July 2009 – May 2010 covering 300 randomly selected visitors. The results point out to different clusters of visitors based on their demands and socio-demographical characteristics as well as visitors` dissatisfaction with current managing practice in this area. Based on characteristics of these clusters, some visual proposals are developed in order to redesign management plan of the natural monument "Vrelo Bosne" according to identified visitors´ demands.

**Keywords**: urban forests, planning, visitors´ demands, "Vrelo Bosne"
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Relations among green spaces, perceived restorativeness and residents’ well being

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Research on restorative environments has frequently compared the restorative potential of natural and built environments, and showed a higher impact of the former on human psychological functioning and well being. In addition to the psychological outcomes of being in contact with restorative environments, the process and mechanisms leading to restoration in nature are a relevant issue for psychological research in this field. The role of biodiversity might also be important in this respect: it is arguable that biodiversity richness is a relevant feature positively related to the restorative potential of natural settings.

In a first study, five typologies of urban and peri-urban green spaces in Italy were identified, ranging from a minimum of biodiversity and a maximum of man-made elements to a maximum of biodiversity and a minimum of man-made elements: an urban plaza with green elements, an urban park, a pinewood, a botanic garden, a peri-urban natural protected area.

A convenience sample (N = 696) was contacted in four different Italian cities. Self-reported measures of individual’s experience in the environment (length and frequency of visits, activities performed, perceived restorativeness, affective qualities of the place, perceived well being during and after the visits) were taken through a paper and pencil questionnaire. The relationship between individual exposure to green
spaces and perceived well being, as well as the mediating role of perceived restorativeness and affective qualities upon this relation was tested. Results showed that perceived restorative properties are the highest in the peri-urban green areas, and significantly increasing as a function of biodiversity levels. Results also confirmed that frequency and duration of visits positively predict self-reported well being, and as expected, this relation is mediated by perceived restorativeness and positive affective qualities of the settings.

In a second study, we aimed at replicating these findings through a laboratory experiment. Subjects (N = 178) from the same four cities were presented with pictures taken from the same five settings of study 1. In addition, measures of also other possible psychological correlates were also taken (e.g., pro-environmental values, attitudes, connectedness to nature, place attachment). To check for the role of familiarity, subjects were also asked to assess pictures taken from five similar settings located in a different city. Results confirmed the pattern emerged in the first field study, and showed also the role of the other social psychological factors considered. The theoretical and practical implications are discussed.

**Keywords:** restorative environments, biodiversity, well being, perceived restorativeness
Because of the important roles trees play in Chesapeake Bay restoration, federal and state mandates to improve Bay health have prompted local government standards to maintain and increase the tree canopy cover in cities. In the City of Falls Church, within the greater Washington DC area in the Chesapeake Bay watershed, each residential redevelopment is required to retain or plant enough trees for 20% canopy cover within 10 years. This ordinance is administered by the City Arborist, who has two years during site redevelopment to influence tree canopy cover on private land through the city-approved redevelopment plan. Implementation guidelines are vague, with little scientific information available about how long it takes for various tree arrangements to reach 20% cover. This presentation discusses a preliminary sample for a City of Falls Church study to assess tree growth goals of previous redevelopment plans and compare them to current tree inventory. GIS techniques used to characterize the redevelopment plans will be described, along with the field inventory data collected for comparison to the initial tree canopy information given in the plans. Data from the full study will be used to calculate the change in tree canopy cover, and to build canopy cover and survival projection models that can project tree canopy cover into the future. Our models are intended to give urban forest managers better knowledge of how redevelopment plan practices impact the tree canopy, and can potentially improve urban forest management of residential redevelopment. Also, the widely used i-Tree software (http://www.itreetools.org/) will be discussed in context of our study objectives for possible application.
The application of landscape ecological principles and frameworks in strategic planning for comprehensive urban green space plans

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The landscape ecological design frameworks and the current conceptual models in landscape ecology, especially the holism thoughts composed of trans-disciplinary environmental sciences are studied to present the trajectories in strategic planning for comprehensive urban green space plans with landscape ecology approach. The fundamental characteristics and the constructing elements of landscape in ecological studies are represented, followed by the introduction of the outcomes of a landscape ecological approach in comprehensive urban green space plants. The results are composed in suggestions and considerations regarding strategic planning for urban green space, based on landscape ecological general principles and its relationship with urban green space environmental planning and design with emphasis on using ecological infrastructure concept in comprehensive urban green space plans.

Keywords: landscape ecology, planning, green infrastructure, design
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Adressing climate change adaptation in urban forests of Belgrade

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Human influence on the change of climate is becoming more apparent in recent years. It is especially present in urban areas that are becoming highly vulnerable to future threats. Protection and adaptation of all natural resources in urban areas becoming urgent need. Urban forests are one of them, as they are primarily important for keeping city dwellers in touch with nature and natural processes; and their well-being.

Serbia has experienced major political and social changes in recent decades. After a period of great unrest during the Yugoslav Wars, a political change in the year 2000 was the starting point for a period of gradual recovery and stabilization. This was the reason why in many domains national policies are lacking. Climate change has become important issue in many sectors in recent years. Forestry, and therefore urban forestry, is in its initial stage of this process.

Analysis of urban forestry related documents, so far, showed very weak integration of climate changes issues. It can be noted that comprehensive and systematic approach to this challenge does not exist. In year 2011 the Assembly of city of Belgrade adopted “Afforestation Strategy for Belgrade”, which is seen as one of the actions in respect to climate change. According to pilot interviews, awareness of managers is present to certain extent. Never the less, institutional and human capacities are one of the most important factors that should be developed and strengthen. Lack of systematic data collection and integrated databases, still weak structure of the urban forestry sector and lack of financial and technological capacity are some of challenges that need to be faced in the process of adaptation to climate change.

The present need is to incorporate adaptation strategies in national urban forestry legislation and management plans as a starting point of an adaptation process. A further objective is to analyze the perception of
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actors in urban forestry towards climate change adaptation in urban forests in the city of Belgrade. The main focus is on the integration of climate changes issues in urban forestry management plans. Through analysis of existing documents and conducting interviews, we aim to access the level of current implementation, as well future trends. In-depth expert interviews are applied for collecting broad information from urban forests managers, and Q-methodology is conducted with experts, in order to study subjectivity towards climate change topic.

**Keywords:** urban forest management, climate change, adaptation strategies, institutional and human capacity
A Garden City for All?: Unearthing the Sustainability Discourse of Singapore

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The overall purpose of the presented study is to better understand how the “green city” sustainability discourse has impacted the policymaking landscape of urban environments by means of examining the city/state of Singapore. In an increasingly global economy, cities are crafting environmentally sustainable profiles to compete for resources such as talent, innovation, and creativity. Being green or environmentally sustainable is seemingly a requirement for the neo-liberal city. Singapore, long known as “the garden city,” has been a leader in this movement since the founding of the city/state in 1965, contributing, in large part, to the city’s success as the economic giant of Southeast Asia. But the term sustainability has been applied in diverse and contradictory ways by urban leaders reflecting the ambiguous and perhaps even empty nature of the word. The study’s main hypothesis is that the discourse of the green city is used by national leaders to craft and implement urban policy contributing to an uneven socio-economic landscape.

Using a political ecology lens, this paper analyzes the use of the term sustainability in the dense and purportedly green city state of Singapore with a specific focus on the green city branding discourse. The paper aims to uncover the meaning(s) of the green city by examining how the sustainability discourse has been applied in the “garden city” branding scheme since the founding of the country in 1965. Discussing how the benefits of this discourse are distributed, the findings of this paper will shed light on the multi-faceted ways in which the term sustainability can be applied in an urban context by a wide array of actors to wield resources and craft divisive public policy. The results call attention to the critical role of urban green spaces in neo-liberal urban governance and shed light on one model of urban green space governance.
Can Everybody Win? The Recent Development of Concepts on Urban Forest Governance in Slovenia

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The presentation deals with the development of the policy, perception and management of the urban forests in Slovenia in the past two decades. The overview of the Slovenian urban forests is presented in the introduction. Although the country has a high share of forests and comparatively a low level of urbanisation, the urban forests are the forests with the most emphasized social functions. On the other hand, the forest share in urban areas is significantly lower than the country’s average.

The recognized but unused cultural potential of the urban forests at the beginning of 1990s as well as the growing economic interests of private (urban) forest owners brought the need for the new approach in the forest planning and management. The development of the adapted urban forest management, which includes different stakeholders and actors, is illustrated by the practical example of the city of Celje, the third largest city in Slovenia. In 1996 the municipality of Celje accepted the initiative of the public Forest Service and started to implement the strategy of the urban forest development which included the protection of the urban forests by the local law, the improvement of the ownership structure with the redemption of private forests, the development of recreational and educational potential, intensive and constant public relations and assuring stable financial resources for the management. During the last fifteen years the concept of the urban forest governance based on close cooperation between the local unit of the Slovenia Forest Service and the municipality of Celje has evolved. Its results are manifested in the new recreational infrastructure, new areas of public urban forests, modern status and legal protection of the urban forests, long-term oriented but prompt forest management for reasonable costs, established monitoring system and also in the growing demands on the urban forests by the citizens as their users. The number of urban forest visitors has tripled in the last fifteen years. The existing governance covers the co-ordination between the Forest Service, the municipality and the local contractors as the main actors of the urban forest management as well as the users' participation and private forest owners as the most important stakeholders. The relations between them are discussed.
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The main challenge in the future development of the urban forest governance in Slovenia is definitely a quest for new innovative approach to winning a combination between the public and private interests in the urban forest areas with a prevailing and scattered private forest ownership. Another one is the establishment of permanent co-operation with local schools for the development of more systematic outdoor environmental education in nearby urban forests.
Urban Forest Assessment for Pristina: Using the Chicago Model

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The urban forest assessment programme, *i-Tree* Eco is being proposed for measuring the urban forest of Pristina, Kosovo. Field application of this inventory programme and the processing of field data will provide a detailed picture of the forest canopy, species composition, size and distribution and other structural and financial values, and in addition will measure stored carbon, carbon sequestration and air pollutants captured by trees. The *i-Tree* assessment can form the basis for development of an urban forest strategy and management plan in the future. The full implementation of this urban forest assessment and planning process will begin to address the demand for needed improvements to the green infrastructure of Pristina and ultimately create a more liveable environment for residents.

An *i-Tree* Eco assessment was implemented in Chicago, USA in 2009. Subsequent to that field exercise and assessment, Chicago undertook a process of reviewing the city’s current programme of urban forest management and then developed an innovative strategy for increasing forest cover within the urban area, and refined the management plan for urban trees. Chicago’s current urban forestry programme is well funded and enthusiastically supported by the current administration and local citizenry.

This paper reviews the scope of the proposed Pristina *i-Tree* inventory and looks at the development of urban forestry, both in Pristina and Chicago and asks whether the Chicago model is an appropriate model for guiding and implementation of urban forestry practices in Kosovo. There is considerable physical contrast in each of the cities in terms of size, social composition, recent history and other factors.

Most importantly, the urban tree experience of each city contrasts significantly. Keeping these variations in mind, it is believed that the Chicago model can still form a basis for development of Pristina’s urban forestry programme.
The use of Turkey’s forest resources for the purpose of tourism and recreation

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Today, there is a global consensus on enhancing the protection and sustaining the multiple economic, social, and ecological functions of the world’s forests. In this context, as a social forest function, provision of opportunities for recreation and tourism has gained increasing importance throughout the world. Similar to many countries, tourism is seen a significant revenue generator for Turkey. Forests, as one of the main components of the natural environment, are a major natural attraction for tourists and play an important role in the relationship between the environment and tourism. Additionally, other components of the environment heavily used by tourism-related development, such as coastal areas and mountains, are generally covered by forests or protected areas under a forest regime. Both mass tourism and nature-based tourism activities require the use of forested areas for individual recreational participation as well as facility development. On the other hand, Turkey is facing increasing pressure on its natural resources from uncontrolled tourism growth aimed at achieving short-term economic benefits. The main objective of this study is to explain the main features of Turkey’s forest resources used for tourism and recreation and to emphasize the problems occurred during the management of these resources. In this direction, the study begins by clarifying the importance of tourism and recreation in forestry and introducing conceptual framework for the use of forests for the purpose of tourism and recreation. The latter sections focus on the classification and characteristics of the country’s forest resources allocated to tourism and recreation-related uses with the explanations about forest-related urban needs.
Urban Forest Governance in California (USA) Cities: Legal, Fiscal, and Political Aspects of the Private-Public Interaction in Managing Urban Trees

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Public trees in US cities are typically managed by a municipal entity such as a city department or agency, although some aspects of management (e.g., responsibility for pruning) may be delegated or assigned to the owner of the private property adjacent to the tree. Additionally, the specifics of such a tree-management arrangement vary by city, with important implications for both the urban trees and the city residents. In California, nearly five hundred cities are home to over thirty million residents and a large population of urban trees (estimated at about eight million). The cities vary greatly in their demographic and physical characteristics (population size, density, climate, etc.) as well as their socioeconomics (residents’ income, political outlook, local government organization, level of civic involvement, etc.). The organization of urban forest management also differs considerably, so that the municipal agencies - even among neighboring cities - often have different levels of arboricultural expertise on city’s staff (vs. consultants or contract arborists), assign different responsibilities and levels of liability for public trees to the adjacent private property owners, and provide differing levels of service in planning, planting, maintaining, and removing the public trees.

In this study I show how, despite the differences in specific aspects of urban forestry among the different municipalities, urban forest governance systems in California cities can be categorized into three types. I term these three (1) the “city’s trees” model, (2) the “shared trees” model, and the (3) “quasi-private trees” model, based on the relative levels of liability, control, and responsibility over the public urban trees retained by the city (vs. assigned to the adjacent private property owner or other non-municipal stakeholder). Using cities throughout California as examples, and with survey data from fifty cities in the San Francisco Bay Area, I demonstrate the advantages and drawbacks of the three differing governance models, and show how they impact urban forest management, focusing on the relation of urban forest governance to the social and political aspects of municipal arboriculture (budgets and funding for urban forestry programs; political support for urban trees and urban forestry
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activities; and civic engagement with both the urban trees and city staff). I conclude by examining the recent trends in urban forestry governance in California (during the current period of contracting municipal budgets), and the rising prominence of two non-traditional stakeholders, the “special districts” and the “non-governmental urban forest organizations” in municipal arboriculture.
Stakeholders participation in governing urban forests

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The stakeholders influence on Nature Park Medvednica spatial planning processes until now had a great impact on the urbanisation and appearance of City of Zagreb. Nature Park Medvednica is an urban forest area next to Zagreb, the capital city of Croatia, and was taken as an illustration process. The process of bringing a spatial plan for Medvednica spans onto tree decision making attempts. This Nature Park struggles for 30 year to hold back the pressure of urbanization. Because of the inexistence of spatial plan, which is required with the Croatian laws, its area was significantly decreased in 2009, by approximately 5000 ha. With that a chance has been given for the city growth but Medvednica’s urban forest is constantly being decreased in its size. This study was conducted in the framework of stakeholder analysis, for which a series of in-depth interviews with stakeholders were performed, and documents concerning the spatial plan were analysed. Description of the past and current spatial planning situation of the NP Medvednica was specified and issues and stakeholders concerning the creation of the spatial plan where identified. The key conflict areas that affect the formulation of spatial plan were methodologically detected by overlapping areas and were examined as such. The level of participation of stakeholders was assessed as well as the influence on participation processes of different stakeholder groups on the formulation of the spatial plan. The data gathered explains the disadvantages of this spatial plan formulation processes and is providing a model which can be implied in governing urban forests decision making processes involving stakeholders. Some changes in exercising citizens and stakeholders participation should be applied in order for Medvednica to be able to pass a spatial plan, that in the end can be seen as a necessity for that urban forest protection.

Keywords: stakeholders participation, urbanisation pressure, governing urban forests, spatial planning
Public involvement in decision-making for management of protected area “Vrelo Bosne”

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Even though urban forests and green spaces play an important part in the lives of its citizens, it’s often the case that these places are not structured and managed in a way which would satisfy the requirements and demands of the citizens which use them. Such is the case in Bosnia and Herzegovina (B&H). Hither, minor attention has been given towards this segment with only the existence of some research regarding socio-sociological aspects and the demands of visitors to the forest and urban forest areas, which has been done in recent years in the capital city, Sarajevo (Avdibegović et al, 2006; Fazlić et al, 2010; Brajić, 2011). However, no study has focused direct attention on policy aspects regarding this aspect in B&H.

The need for investigation this context is growing, as we live in an era of “shifting from government to governance”, where public involvement and collective decision making have a special part. Regarding the creation of regulations referring to the most meaningful urban forests and green spaces, it is most likely that only those policy actors and decision-makers with more power and resources were involved. This statement leads to the assumption that the wishes and preferences of visitors and/or the public were ignored, and that public involvement has not taken place. Therefore this research focuses on the aspect of public involvement, but specifically on the protected area “Vrelo Bosne”.

The data was collected through a methodological triangulation, analyzing of primary and secondary data: in-depth interviews with policy actors and decision-makers who have taken part in the decision-making process for the management of the area of Vrelo Bosne; focus groups, conducted with members of purposefully chosen registered civil organizations; analysis of legislative documents; and the analyst triangulation method.

From a legal standpoint, the results of a study done by the Association Alumni of the Centre for Interdisciplinary Postgraduate Studies (ACIPS, 2010) point out that public involvement in B&H is regulated through the Rules of Procedure by the entity and cantonal assemblies, with certain differences among cantons. In the case of the Sarajevo Canton, where the protected area Vrelo Bosne is situated, this process is performed, at least
by placing a Draft Law on the official web site. However, the data collected through focus groups indicates that most of the examinees are not even aware of this, let alone that they may have taken part in the process in any way. What can be considered interesting is the fact that the interviewed persons provided somewhat different answers, which can be an outcome of various reasons. Some of which could be: different interpretation of the importance of this process, the level of involvement and familiarity with the very process for the area of Vrelo Bosne, political reasons which can be connected to disagreements among various involved stakeholders, and so forth.

Therefore, the process of public involvement has the possibility, if properly applied, to overcome many obstacles which arise in urban forestry and green spaces, and also to provide with many advancements.
Contingency valuation of Croatian arboretum Opeka

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Contingent valuation is a survey-based economic technique for the valuation of non-market resources, such as environmental preservation or the impact of contamination. It is also the only approach that can generally be used to include what is usually referred to as the passive use component of the economic value of environmental goods. The aim of the survey is to estimate the amount of money visitors are willing to pay (or willing to accept) to use nature’s resources in the arboretum Opeka in North-West Croatia. Opeka Arboretum is situated in the Vinica municipality in northern Croatia. Located in a large park surrounding a manor, Opeka arboretum, with its 65 hectares is the largest of the three arboretums existing today in Croatia (the others are Trsteno in southern Dalmatia and Lisičine near Voćin in western Slavonia). The arboretum was founded in 1860 by the Count Marko Bombelles. Readiness to pay for visitor’s use of the arboretum has been investigated using the contingency method on a sample of 53 respondents. Research results present high preference for arboretum benefits such as beauty of landscape, cultural and historical significance, recreation and health but low willingness to pay the maximum of 30 euros (220 kuna).

Keywords: contingency valuation, environmental economics, willingness to pay, arboretum Opeka
Recreation needs and its development in forests in Lithuania

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Social survey of recreation needs in forests was carried out in 2007 in Lithuania by interviewing 873 respondents from different districts and social stratum. Results were compared with results of similar social survey done in 1984.

No significant changes of preferences to environmental factors of resting place occurred during 23 years period. Seaside is more popular in summer holidays, forested shorelines and gardens - during the weekends and feasts, living place and neighborhood green areas – in routine days. Forested shorelines are 2-4 time more attractive than unforested ones.

The most significant environmental factors for resting place selection at summer time was recognized: clean water (41-56%), attractive forest (47-50% of resp.), beauty of landscape (42-51%). Clean air as a factor is becoming more important. Objects of cultural and nature heritage, abundance of berries, mushrooms are important while holiday time (36%). The least important is the distance to the resting place at holiday time. There is the tendency of comfort preferences growth: preferences to the rest place close (up to 100 m) water increased by 15% since 1984 (52%). Demand for forest furniture and service is slightly rising.

The reason of visiting the forest is mushrooms (24%), berries (20%) picking, delighting nature (20%; increased by twice since 1984) health promotion (walking and running) (9-11%). Society still enjoys forests without special recreational forest management (52%). In resent years mixed forest stands becoming more attractive. Society enjoys uneven aged, density forest stands of changing spatial structure. The main demand for forest management nowadays is becoming litter treatment (22%).
Green structure under pressure - Handling conflicts in the compact city

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Compact city development has obtained a hegemonic status as a model for sustainable urban development in the Norwegian context as well as internationally. This model may reconcile some dimensions of sustainability concerns such as emissions of CO\textsubscript{2} and urban economic development, but might challenge others such as protection of urban green structure and living quality within the city. When implementing this policy 20 years ago, it was underlined by the government that densification of the urban fabric should not impede on the urban green infrastructure, and the slogan was densification with quality. In this article we will particularly focus on biological diversity as a long term sustainability goal. The aim is to investigate how knowledge of biodiversity is integrated in the planning processes and how this goal has been argued and discussed in urban densification process. Although it cannot be expected that densification will leave no effect on green areas at all, it could be expected that the most valuable areas are identified and protected. In this paper we analyze the processes around one of Oslo’s ten most valuable areas for biodiversity. We will investigate when, by whom and in what way knowledge about biological diversity has been introduced in the decision making processes. The case show that goals related to economic growth are more important than protection of biodiversity even for the top ten most important areas in the urban green structure for the city’s planning and building authorities. Although the development proposal met considerable local opposition among citizens and politicians at the sub level, biodiversity goals was not the main reason for their opposition. Here and now concerns related to view, aesthetic pleasure, local identity and recreational opportunities were their main valuation of the green area. The case also shows that biological knowledge was provided by external experts. Thus expert knowledge promoted by hierarchical government is important. Among planning theorists, expert knowledge promoted by hierarchical government has been heavily as oppressive and inferior to local knowledge and empowerment. However, the case also shows that such local here and now concerns go together with arguments for biodiversity and this indirectly supports the environmental authorities concerns for biodiversity.
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**Telford New Town, the ‘Forest City’ revisited – lessons for the future of urbanism?**

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Trees are a significant aspect of contemporary urbanism. It can be argued that a good city has an abundance of healthy, well-managed trees, whilst a poor city does not. Whilst this is a sweeping generalisation, without a doubt as we move further into the 21st century, the nature of our towns and cities – particularly in the UK - will need to change radically if we want them to provide healthy, happy settings for people, places and investment, and retain their role as the focus of human culture.

Human culture can be defined as the total of the inherited ideas, beliefs, values and knowledge which constitutes the shared basis for social action and, quite clearly, the concept of the urban forest is an integral part of such a vision. It has been argued that urban forestry was ‘invented’ by Jørgensen in Toronto in 1965. Others [particularly the author] have suggested that the roots of an urban forestry philosophy go back much further, and can be traced back to philanthropic industrialists in 19th century Britain, and more particularly to the UK Garden City Movement at the turn of the 20th century. This concept influenced and was adopted by the British New Town Movement, particularly the 3rd generation New Towns of the 1970’ and 1980’s. Interestingly, the concept of the Garden City – somewhat revised for 21st century application - is currently gaining political traction again in the UK as a counter-balance to the concept of the ‘compact city’ which, in some quarters, is criticised as being of limited relevance to 21st century family living.

There were three key highly successful 3rd generation New Towns in the UK – Milton Keynes, Telford and Warrington. Each was run by a Development Corporation, responsible directly to Government, and each developed their own specific approach to designing, implementing and managing their urban forest. On the political demise of the Development Corporations in the early 1990’s, each New Town’s urban forest / public open space was subject to a different form of governance. Milton Keynes’s green structure for example was ceded to a private Parks Trust; most of Warrington’s
green space was taken over by a Community Woodland Partnership, and Telford – rather conventionally – was taken over by Local Government. This paper will re-visit the urban forest of one of these now not-so-new towns – Telford, which was originally dubbed ‘The Forest City’ due to the amount of urban forest that was created. It will investigate whether the original urban forestry strategy, its implementation and formative management ideas have met their cultural, social, urban design, environmental and economic aspirations, how influential the concept of urban forestry has been in the success and development of the town (Telford being the 2nd fastest growing town in the UK at the moment), and how these aspirations have improved or otherwise since the change of governance over 20 years ago. The findings will potentially have great relevance to the current urban forestry / green city debate.
Visitors' perception of urban forests towards recreation use: Case study Park forest Vodno - Skopje

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Park Forest Vodno is the most important green belt for Skopje. It`s area is 4.573 ha and it is the most visited site for recreation of Skopje citizens. Therefore, the study aims to understand the visitors` perception towards its` recreational use. The method used for this research is semi-structured questionnaire which was conducted on-site, in-person contact. Gathered data were analyzed by SPSS.

The findings give an indication with regard to the intensity of use and the range of statements about perceptions associated with recreational use of this Park Forest. The most frequent visitors are living in average 5.3 km away from the Park and they usually come by walking. Spring is the season when they are coming the most frequent together with their friends. They spent approximately 2.8 hours in walking and recreation.

Relevant results from this research can be used by PE “Parks and Greenings” in order to enlarge the recreational activities and to attract visitors who are living farther in the city from one, and to provide them more facilities for visiting this Park Forest during winter and autumn time from the other side.

Keywords: urban forests, perception of urban forests; recreation, urban forest management
Communication and governance agenda in urban forestry planning in Macedonia

Case study: Urban forestry in municipality Skopje

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The traditional use of ‘governance’ and its dictionary entry define it as a synonym for a government. Yet in a growing work on governance there is a redirection in its use and import. Rather governance signifies ‘a change in the meaning of government, referring to a new process of governing; or a changed condition of ordered rule; or a new method by which society is governed’ (Rhodes, 1996).

A key aspect of governance is how citizens, leaders and public institutions relate to each other in order to make change happen. Without communication structures and processes which enable the two-way exchange of information between state and citizens, it is difficult to imagine how states can be responsive to public needs and expectations. Crucially, two-way communication allows citizens to monitor the states’ activities, to enter into dialogue with the state on issues that matter to them, and to influence political outcomes. Many political scientists believe this encourages the development of trust between state and society, and is a foundation of state legitimacy over the long-term.

The relationships between society and nature, including forests are changing, and forestry as structural intervention in forest ecosystems has had to adapt itself to changing societal pressures and demands. Therefore, urban forestry is now firmly established as a key focus of forest policy and management in EU countries. Rising levels of inequality, persistent under-development within deprived urban communities, and the need for viable responses to the pressures of climate change are all seen as problems where urban forestry can make an important and positive contribution.
Green space governance can be described as those efforts to direct human action towards common goals, and more formally as the setting, application and enforcement of generally agreed to rules. Governance takes place at different hierarchical levels, from city policy making and planning to place making and place keeping at the site level. From a tradition of public authority led urban forestry and urban greening (governance by government), a shift has been occurring to shared decision making and involvement of a wide range of actors (governance with government, and in some cases even governance without government). Important changes have also been occurring in terms of discourses (such as the compact vs. the green city) and an increasing focus on green space quality and standards (C. Konijnendijk, Governance in Urban Forestry & Urban Greening).

The goal of this study is to review the communication (participation, transparency and accountability) in governance agenda in urban forestry planning in municipality Skopje.

In order to achieve the goal, the study has following objectives:

- Description of current situation related to governance principles in urban forestry;
- Analyzing participation on stakeholders (NGOs, citizens, local government, foresters, urban planning engineers....) in planning and implementing processes;
- Determining how transparent are local governmental bodies and institution in planning and managing urban forests;
- Defining accountability of relevant authorities for urban forest management in the city.

To ensure these objectives the following research question is set up:

1) How communication is implemented in governance agenda in urban forestry planning?

Governance theory will provide a theoretical framework for the research. This research will be descriptive and explanatory because the study will describe and explain communication process in governance agenda in urban forestry.

For the research purposes the **deductive** approach will be used because the research is based on theory.

Governance is a new concept in urban forestry in our country. Research on this topic has not been done yet and therefore results will provide information how communication is involved in governance agenda in urban forestry; or it will stress the fact are we approaching a new, modern
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way of governance or we still need to work on that field if we want to become a part of European family.

Keywords: urban forest, urban forest governance, participation, transparency, accountability
Drinking water resources in the urban forests of the Ljubljana City

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The importance of conservation of quantity and good quality drinking water from urban and peri-urban forests is of increasing importance. In aquifers the forests with natural vegetation composition and stand structure are best for filtering pollution from neighboring agricultural areas, roads and urban centers, leaking into surface streams and groundwater. In areas, threatened by soil erosion, the forests play important role as soil protection with deep root systems, precipitation interception and stabilizing the movement of soil material.

The city of Ljubljana has two important subsurface water-bodies: aquifer Ljubljansko polje and Ljubljansko Barje aquifer system. Among 102 potential water catchments and springs in the municipality there are 36 located next to forest, 61 on the forest edge and 5 outside the forest. Soil erosion is problematic especially in the eastern parts of the municipality with hilly and mountainous terrains. Guidelines for forest management planning are presented regarding infrastructure construction, infrastructure usage and forest machinery in the urban forests with high level of hydrological and protection function.
Wood decay fungi of the genus *Phellinus* in urban area and national parks

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Fungi of the genus *Phellinus* cause the white rot of the wood. They infect a physiological weakness trees but a healthy trees can be infected also. Different types of hardwood and conifers are their hosts. Visible symptoms of the fertile body (sporocarp) occur on the trunk and branches. The fungal infection causes the loss of mechanical strength of wood and fragility.

The aim of the work is to determine the diversity of species of the genus *Phellinus* in the urban area and the national parks in Croatia.

A visual inspection of the trees in the urban areas of Zagreb: parks, rows of trees, playgrounds as well as national parks Brijuni and Krka were conducted. Fruiting bodies of fungi were collected. The detection and identification of different *Phellinus* species by morphological and molecular methods were performed.

Six species of fungi genus *Phellinus* in investigated deciduous trees and evergreen trees were detected. The holly oak in Brijuni National Park had the largest infestation with *P. punctatus*. The aleppo pine in Krka National Park had the largest infestation with *P. pini*. In the Zagreb urban area five species of *Phellinus* were detected. *P. punctatus* were not detected.
Objectivity in Aesthetic Evaluation of Urban Green

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The very substance of urban green space functioning can not be objectively evaluated without defining terms such as “beauty”, “decorativeness” or “aesthetic value” of plants. It is essential to objectively grade expression of beauty, regardless of the personal characteristics of surveyors. Classification of plants based upon their visual characteristics must represent responsible and obligatory professional act. Only if landscape architects are able to objectively categorize ornamental plants by classifying their visual features in at least two main groups, (more or less beautiful), landscape engineering approach can be used when choosing individual plants in accordance with the general standards, not just individual preferences. Without universally accepted classification, choice of ornamental species is always quite arbitrary. Also arbitrary are the groups common in the landscape business of today, with pompous names, but no objective values, such as “decorative broadleaves”, “highly decorative conifers”, or “charming brightly flowering perennials”, because they do not show the criteria by which such a grouping was done. While the choice of artificial materials is relatively easily solvable task, because the beauty of these materials is usually measured in comparison to natural materials, the choice of plants is much more difficult, because all plants are natural creation, and indeed there are no ugly plants.

In landscape architectural practice of Serbia today the expression “beauty” relies mainly on two criteria: the vitality rate and ecological, i.e. geographical origin. Species (individuals) who meet one or both conditions are usually considered as highly aesthetic, even though their beauty is itself defined as a property of health status or origin, which are no aesthetic characteristics. Of course, domestic “ordinary” ornamental plants in such categorization are condemned to the status of “second-rate” category, which is, however, contrary to the interests of landscape architecture, environmental standards, and even the very principles of sustainable development. On the other hand, plant species from distant regions (the very attribute “exotic” is typical), are favored only because they are markedly different from native species, although often not “more beautiful” and too often far more environmentally less functional.
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This paper reviews the evaluation of the aesthetic effects that ornamental plants exercise in the largest urban ecosystem of Serbia, as well as many similar ones, used in the classification of European and American landscape architecture of today. It is a simple, easily applicable system of groupings of ornamental plants, formulated as an initial proposal that needs to be upgraded, adjusted, amended and modified. The system itself has undergone a multi-year research, revised and tested in urban conditions of Belgrade on trees as the most important ornamental plants, encompassing more than four thousand trees in parks and alleys that existed or still exist within public green system of Belgrade.
Intensive urbanization in the wider area of Novi Sad after the World War II meant considerable changes in habitats and soil characteristics: because of the unequal terrain and low elevation, it was necessary to raise the terrain in order to prevent negative impact of the Danube on life of inhabitans, especially groundwater. The raise of the terrain on the "safe" elevation was done with sand from the bed of the Danube, in the thickness of 3-5 m, which is an unfavorable due to the technique of filling sand, where organic matter and clay particles is washed, and especially the inability to keep atmospheric water. In such conditions, planting seedlings of any species was doomed to failure. During the sixties of last century so-called "deep planting" was introduced in the commercial poplar plantations, which enable establishment of greenery in the urban area of Novi Sad with poplar trees. Poplar trees were planted in the alleys (line plantings), alone or in small or large groups in urban foreheads: streets, residential blocks, parks, factory circles, in addition to schools, kindergartens and so on. The basic purpose of poplar plantations was the humanization of urban areas and priority role of greenery was to meet more demands in a short time, above all to achieve its sanitary-hygienic role (the elimination of air pollution, improve the microclimate, noise reduction), and then reached aesthetic and visual effect.

Researches were conducted in the urban area of Novi Sad during 2011 year, in parts of city where poplar trees were found. Poplar trees were selected to realistically represent a spatial presence, the type of greenery, as well as the vitality of the trees. The breast height diameter, total height and lenght of crown were measured at each tree. Each tree assessment of vitality (good, medium, poor) and damage was done. In a number of trees wood samples were taken by Presler’s borer at the breast height in order to determine the age category of trees. After drying the samples annual growth rings were counted in the laboratory. In total there is measured and assessed 129 trees, within 66 trees were Lombardy poplar (Populus nigra var. italica) and 63 trees were Hybrid poplar (Populus × euramericana Dode Guinier).
The results showed that the share of trees of good vitality is 49.6%, medium is 32.6%, while that of poor vitality of trees is 17.8%. Mean diameter at breast height ranged between 46-62 cm and were significantly higher in the tree of good vitality in relation to the tree of poor vitality. Mean tree heights ranged from 23 to 29.5 m, are higher in the Lombardy poplar than in the hybrid poplar trees, and the differences between trees of different vitality score statistically not significant. The average age of the Lombardy poplar trees was 42 years and is equal to the tree of all assessments of vitality. The average age of the hybrid poplar trees was 32 years, whereby the tree of good vitality are 29 years and poor tree vitality are 45 years.

The results showed that it was reasonable to introduce poplar trees in the urban area of Novi Sad, however the current state requires intensive monitoring of vitality and health (damage) as a function of maintaining trees in urban conditions of Novi Sad.

Keywords: poplar trees, structure of trees, tree vitality, urban green are, Novi Sad
The discovery of a one hundred year old horse chestnut tree (*Aesculus hippocastanum* L., var. *Baumannii* Schn.) in a street tree row at Erdevik (Serbia) emphasizes an exceptional collecting activity in the area of Srem. The town Erdevik is located on the Fruška Gora hill-slopes in the north-western part of Srem, and it occupies an almost central position in the triangle embracing the administration centres Sremska Mitrovica and Šid in Serbia, and Ilok in Croatia.

As a symbol and a remaining witness of the past time, this unique example of ornamental dendroflora in Serbia is evaluated as a historic and cultural heritage. Although it is presented to the scientific public as an unanticipated present from the past after a century of existing in a street tree row, the historical context makes it possible to evaluate its true cultural value. The story about this unique horse chestnut (*Aesculus hippocastanum* L., var. *Baumannii* Schn.) is actually the story about Erdevik itself and the wider area from the beginning of the 20th century. Although the wider area is characterised by a rich cultural heritage in the development of garden architecture, which comprises various species of the genus *Aesculus*, the finding of a one hundred year old horse chestnut (*Aesculus hippocastanum* L., var. *Baumannii* Schn.) points to an autonomous individual collecting activity.

Common horse chestnut (*Aesculus hippocastanum* L.) is an Arcto-Tertiary endemic species of the southern part of the Balkan Peninsula, with frequent application in European parks and tree rows. According to numerous authors, horse chestnut is one of the most beautiful autochthonous trees in Europe. Its variety *Baumannii* Schn. is especially significant for urban zones, with full flowers (*Flore pleno*) which are sterile, because they do not bear fruit. The variety *Baumannii* Schn. was
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discovered in 1819 in a park in Geneva, as a mutation of the basic species. Altogether three one hundred year old trees were identified at Erdevik and Šid in Serbia.

The aesthetical value of the variety *Baumannii* is indisputable in garden architecture, and the unique finding of a one hundred year old, vital tree with an ideal phenotype and imposing dimensions (diameter at breast height $d_{130} = 100$ cm and tree height $h = 19.0$ m) in a street row at Erdevik is a cultural heritage which should be especially protected, and also reproduced as a unique dendrological value in this region, inherited from the past.

**Keywords:** *Aesculus hippocastanum* L., var. *Baumannii* Schn., street tree row, cultural heritage, Erdevik
In modern times urban pollution is a potentially significant risk to public health. Heavy metals are among the most dangerous substances in the environment and their accumulation is predominantly the result of human activity. In cities, heavy metals can enter the human body by inhalation, digestion, direct contact with skin (Wei and Yang, 2010). Phytoremediation, a practice of removing heavy metals from the air and soil by plants, has been in use for a long time. Plants can absorb various hazardous substances from the air and soil and thereby reduce the residual concentration of these toxicants in the environment. Good phytoremediators are plant species that can withstand high concentrations and are able to accumulate a large amount of pollutants.

Although lichens and mosses are often used as an indicator of pollution by heavy metals, in urban conditions higher plants are much more frequent and can also serve as bioindicators (Tomasevic et al. 2004).

Many studies explore plant species that would be the most suitable for this purpose. This project will investigate the phytoremediation capacity of Hackberry (*Celtis australis* L.), Horse Chestnut (*Aesculus hippocastanum* L.), Thuja (*Thuja occidentalis* L.) and Laurel (*Laurus nobilis* L.).

The phytoremediation ability can be increased by symbiotic mycorrhizal fungi. Mycorrhiza is a kind of symbiosis between microscopic fungi and plant roots, where mycorrhizal fungi provide increased absorption of nutrients to the plant via its roots. In case of phytoremediation this means an increased absorption of heavy metals. (Pongrac et al., 2009; Hildebrandt et al., 2007; Regvar et al., 2003).

The field experiment will be conducted in the traffic area in Split and village area less exposed to urban pollution. The indoor experiment will be conducted in controlled conditions.

In the field experiment the concentration of heavy metals in plants and soil will be determined. This will provide insight into the actual state of
pollution and the obtained results will be used in establishing the indoor experimental part. For comparison, the same analysis will be made in less contaminated surrounding neighborhoods.

Seedlings of chosen woody plant species will be grown in control conditions. While part of the total number of plants will be infected with spores of arbuscular-mycorrhizal fungi, the other part will be grown without these symbionts. Heavy metals: lead (Pb), cadmium (Cd), copper (Cu) and zinc (Zn) will be added to the substrate of every plant except to control. The concentration will correspond to the concentrations in soils in the most polluted parts of the city. Concentrations of heavy metals in soil, plant roots and leaves will be periodically measured and the development of mycorrhizal symbiosis and morphological characteristics of seedlings will be determined.

The results will show how much of the copper, cadmium, lead and zinc from the urban soil can be absorbed by the selected urban trees. They will be compared to assess which of them has the largest capacity in the process of accumulation of these heavy metals. The results will also provide insight into the process of symbiosis with mycorrhizal fungi under this type of pollution in order to evaluate whether the mycorrhizal symbionts increase the possibility of accumulation of heavy metals in the tissue of the observed plants. If these values are distinct, infecting the roots with mycorrhizae will be recommended as an effective means of reducing pollution of heavy metals in urban conditions.
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Multifunctional urban forest planning for urban open and green space systems: City of Bartin, Turkey

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Urban forests are fundamental elements of urban open and green space systems. Urban forests have social, aesthetic, ecological and economic benefits. This study chose Bartin Urban Forest as its case study. Opened to public use in 2011, Bartın Urban Forest was designed with the objective of satisfying the recreation needs of the inhabitants. This study first defined the characteristics of the study area. Second, in line with these characteristics, Bartın Urban Forest was examined according to multifunctional planning criteria. Finally, sustainable development strategies towards the multifunctional planning and management of urban forests within urban open and green space systems were discussed.

Keywords: urban forests, multifunctional landscape planning, urban landscape, sustainable development, Bartın
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Valorisation of natural resources of forest edges for recreational function in the urban forest Kosutnjak, city of Belgrade

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In the forest complexes, retained within the administrative areas of town (urban forest), excursion and recreational function is priority. City residents use the forest for recreation spontaneously, especially if it is close to in habitation. The activity in it can destabilise the delicate forest ecosystem.

In previous research it is investigated the crucial natural equipment, and the ability of forest edges to survive despite the use of its resources for implementation of recreational functions. Analytical testing of the natural resources of forest for recreational function would give a clear picture of critical points in it.

This paper estimates the natural equipment of the edge of forest ecosystem for recreation. We have applied adapted Ruppert method of quantitative-qualitative analyses, which evaluate advantages and limitations of natural resources. The study was carried out on part of urban forest Kosutnjak in Belgrade and the area of 264 ha. We analysed the tree attributes: length of forest edge, way of using the tree-line and applicability of form of development of forest edge.

Valorisation results showing that obtained values of urban forest edge factors are very low. This indicates a low level of its suitability for recreation. It opens the way to solve specific problems of forest edges, giving suggestions for improvements and renewal and improve the overall recreational resources through the implementation of modern tendencies viability and function of forest edges in the urban forest Kosutnjak.
Thermic attenuation on concrete sidewalk under urban trees. Case study: Santa Marta – Colombia.

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Heat islands are a consequence of direct sun light effects over city structures. These structures take sun energy and convert it into heat, generating an increase of average city temperature in comparison with nearby rural areas. Trees can reduce temperature by thermic attenuation depending on the shape of their shadows and other physiologic factors such evapotranspiration and nastic movements. Thermic attenuation by trees as an ecosystem service can range from 0.5°C to 1.4°C. These attenuations increase the service life of urban surface materials. For example, asphalt roads can reach temperatures over 70°C without shadow effect causing a reduction in the life cycle of this kind of surface and inducing other effects such as the release of toxic – mutagenic gases.

The aim of this work was to identify thermic attenuations on concrete sidewalks under six tropical urban trees with different types of shadows (Almendro (*Terminalia catappa*, COMBRETACEAE), Cuji (*Prosopis juliflora* FABACEAE), Mamoncillo (*Melicocca bijuca* SAPINDACEAE), Cañaguate, (*Platymiscium pinnatum*, FABACEAE), Dormilón (*Enterolobium ciclocarpum* FABACEAE)) in Santa Marta City, Colombia (10°12′20″ N, 74°13′33″ W, 10 sea level meter and 31°C temperature). Temperature data was collected at the thermic comfort level (1.5 m) beneath the trees and on the sidewalk at points affected and not affected by the tree’s shadow. Twenty measurements per hour were taken between 8:00 a.m. and 5:00 p.m. over 4 days (March 13 and 26 and April 6 and 7), for a total of 5,720 values.

The average comfort level temperature was 30.3°C and ranged from 30.1°C to 34°C. For the temperature measured at the sidewalk, the average value with shadow effect was 29.8°C and ranged from 26.0°C and 40.7°C, while the average value without shadow effect was 40.8°C and ranged from 40.3°C to 77.2°C.

ANOVA results indicated that *the species* (kind of shadow) shows the greatest influence on entire temperature variability, followed by the hour of the day, the date and the position (with or without shadow). The kind of
shadow is a primary factor for tree services associated with thermic attenuation. Regarding temperature data, the hour of the day shows the greatest influence on the variability of air temperature and the species shows the greatest influence on the variability of surface temperature.

For urban surfaces (sidewalks) we found a range of 50ºC between the lowest value (26ºC under shadow effect) and the highest value (77.2ºC under direct sunlight). The shadows of tree can generate positive effects on heat islands and for the case of asphalt pavements a control on toxic vapours and increase in life cycle durability. Cují, Cañaguate and Dormilón trees have the most translucent shadows most likely due to nictinastic movements and consequently less temperature attenuation. On the other hand, Mamoncillo and Almendro trees have denser shadows and can generate more substantial thermic attenuations. This information suggests that tree physiology can play an important role in temperature attenuation in cities as a result of shadow effects and can be applied as a criterion to select urban trees in tropical cities.

**Keywords**: plant physiology, tropical trees, nastic movement, temperature, shadow
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**Results overview of a survey carried out door-to-door in the area of Liman Park in Novi Sad: what do inhabitants think of urban forests and public urban greenery?**

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Urban forests and public urban greenery are recognized as one of very important and high quality elements of city's environment. This research tries to affirm stated supposition and in that purpose the sample of citizens of Novi Sad is used. Survey is carried out door-to-door in the immediate surroundings of Liman Park, at a distance of 500 meters. Based on collected data and its analysis the following question should be answered: what do inhabitants think of urban forests and public urban greenery?
Urban forestry and public involvement in Kosovo

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The necessity of trees for society in the community and society in general has become a preoccupation for many interest groups in Kosovo.

Since 2010, several activities have been undertaken in order to increasing public awareness of Urban Forestry which have included community involvement, encouraging participation of local authorities, the involvement of schools, all with the aim to increase the awareness for the role and importance of the trees in our cities.

Selected tree species have been utilised in order to absorb as much CO₂, airborne dust and harmful other substances as possible, and among other objectives has been to increase the shade coverage for pedestrians and passing vehicles.

Trees planted were expected to have positive impacts on biodiversity as a result of combining different types of urban trees, and applying different planting methodologies. Planting has been carried out by voluntary groups, contractors and local community groups in different localities.

At the end of these initiatives the sustainability of trees planted and rate of their survival is observed.

Keywords: public involvement, sustainability, species, ownership, results
The attitudes of the citizens of Novi Sad on urban forests and urban green based on the analysis results of four focus groups

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Urban green areas are increasingly gaining the importance in densely populated urban areas such as a city of Novi Sad. To be able to assess the attitudes of the citizens of Novi Sad on urban greenery and urban forests that surround them, the sample was selected from four focus groups. The focus group is a form of qualitative research that involves a group discussion on a particular subject and with which we can infer what the views of the group members have about any particular object, in this case the problem of urban green areas. Data were collected during April 2012 in four associations: Association of Women against Violence, Society of Biology Students, Association of the participants of the armed conflict in former Yugoslavia and the association of English teachers. Based on preliminary analysis we can conclude that the highest percentage of citizens negatively rated green areas in Novi Sad and believe that the city's past had more green areas and was suitable for life.
ICP Vegetation moss survey of urban forests in Zagreb

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Since 2005, Croatia has participated in a moss survey within the framework of the International Cooperative Program on Effects of Air Pollution on Natural Vegetation and Crops with heavy metals in Europe (UNECE ICP Vegetation) http://icpvegetation.ceh.ac.uk. In accordance with the sampling strategy of the European moss survey program, moss samples were collected during summer 2006 and summer/autumn 2010 in Croatia on a nearly regular network 23 x 23 km with additional samples around large urban/industrial areas. In the city of Zagreb, four samples were collected. Two of them were samples from regular network and another two were collected in Zagreb parks: Botanical garden and Maksimir Park. Moss samples were collected in forest areas according to ICP Vegetation protocol. Samples were prepared for analytical measurements and analyzed using INAA, ICP-AES and AAS.

Comparing results for 10 elements (As, Cd, Cr, Cu, Fe, Hg, Mn, Ni, Pb, Zn) collected in Zagreb area, it is clearly seen that concentrations of elements in most cases have the highest values in Botanical garden (center of the city) and lowest in Maksimir Park. Concentrations in natural forests on Medvednica and Vukomericke Gorice are between those two points.

The results of measurements in 2006 and 2010, as well as differences are presented and commented in paper. For more precise results of air pollution, further investigation should be done.

Keywords: biomonitoring, air pollution, forests and parks of Zagreb
Liman Park - What do direct users think of using this segment of urban forests and public urban greenery of Novi Sad?

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Urban green areas represent elements of extreme importance of city's area, especially for citizens as its direct or indirect users. This research focuses on direct users of urban forests and public urban greenery of Novi Sad. Liman Park is chosen as a test sample. Visitors will be surveyed and the data for analysis will be gathered according to the controlled random sampling method in order to determine the attitudes of the citizens in Novi Sad about this park area.
Urban forests and greening in Republic of Serbia - legal and institutional aspects

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Urban forests are very important part of everyday life of people who live in modern urban areas ballasted with transportation systems, industrial pollution and huge population placed in narrow city spaces. It is scientifically proven that human life quality and productivity are directly connected with his surrounding and with the percentage of green areas around him. Main preconditions to gain such life quality and have big enough urban green spaces are to have adequate legal and institutional support. Are we have it in Serbia; in how far are our laws and institutions dedicated to this subject? This research will try to give answers to these broad questions by focusing on legal and institutional aspect of urban forests and greening from the social science perspective. Document analysis and face-to-face interviews are applied as methods of collecting relevant empirical data in order to find out if and which legal documents are addressing urban forests and greening in Serbia. Also, it is of interests to reveal which institutions are in charge of these areas and who claims to have responsibility for their management and protection. This is expected to contribute better understanding of the status of urban forests in Serbia today.
Urban forests play an important role in ecology of human habitats because they filter air, water and sunlight. They provide shelter to animals and recreational area for people. The ornamental trees moderate local climate, slowing wind and shading homes or businesses to conserve energy. They are critical in cooling the urban heat island effect, thus potentially reducing the number of unhealthful ozone days that plague major cities in peak summer months. There are several biotic or abiotic factors that affect the survival of the individual tree or the urban forest. But with a small amount on tree care the number of years required for its benefits exceed several times the costs invested. These reasons demonstrate the importance of establishing management methods in order to facilitate the diagnosis and intervention to obtain healthy trees and full of those benefits.

This work presents the results of several diagnoses carried out in several ornamental trees in five cities from Portugal. One important constraint observed in urban trees is related to deficient Landscape Architecture projects, because several times do not predict the real dimension necessary for roots or crown. On those cities inadequate plantations techniques and also inadequate tree care, were detected.

The reduced space given to roots and the soil compaction are very common. The soil compaction was related to impacts on trees in many ways. Generally, compaction associated physiological dysfunctions cause systemic damage and decline, as well as failures in dealing with additional environmental changes.

The excessive pruning is another common problem observed in result of poor planning or bad choice of the species. The pruning, many times do not respect the proper technical aspects, related to tree physiology. The consequent fungi decay and the impacts related to those cuts on safety or in survival of the tree are discussed in this study.

Related to the several constraints observed on urban trees, this study describes some technical solutions and the results of their implementation.

**Keywords**: diagnosis, urban forests, tree care, soil compaction, excessive pruning
Insect pests can influence health condition and aesthetic value of urban forests and trees. For more than 10 years the data on the insect pests in urban forests, parks and trees in Zagreb have been collected. Over 100 species of insects and mites have been found. The damage observed ranged from defoliation to aestethic damage and molesters. The results have shown that urban forests, parks and avenues are very simplified ecosystems in terms of biodiversity and that insect population dynamics in such circumstances are different from the ones in natural habitats. To make the results of the research of insect pests in urban forests in Zagreb accessible to general public an interactive application „Interactive map of urban forests in Zagreb“ was made.
The role of fungi in holm oak (*Quercus ilex* L.) crown dieback in Croatia

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Holm oak (*Quercus ilex* L.) is one of the most important tree species in the Mediterranean forest vegetation in Croatia. Occurring practically on the whole coastline area its ecological and social importance is unquestionable. In the period 2007 - 2012 research has been carried out in several sites throughout the coast and symptoms of twigs and branches dieback were obtained in various parts of oak crowns. Laboratory analyses revealed several fungal species occurring bark of collected samples, although two turned out to be the most frequent: *Dothiorella iberica* A.J.L. Phillips, J. Luque & A. Alvesand, and *Coryneum depressum* Schmidt. Presence of these fungi on the young and healthy shoots and branches revealed their significant role in observed holm oak dieback.
Invasive plants in urban forests - case study of Belgrade

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Invasive species represent great problem and barrier for conservation of floristic diversity in different habitats. They differ in the degree of aggressiveness. Also, some types of habitats are invaded more easily than other. The disturbed sites are vulnerable, particularly. In that sense the urban areas are of great interest for investigation of invasive plants influence on floristic structure. Serbia is one of the few countries in Europe that has not established a national list of invasive plants.

Belgrade's urban forests, especially those along coastal streams and rivers Sava and Danube are ideal habitats for invasive species spreading due to disrupted coenological relationships. Most urban forests are located near rivers and river flows are recognized as the most important corridors for the spreading of invasive species. The invasive species spreading lead to decrease of the floristic diversity of urban forests. In the same time invasive plants are present in the forest edges. Forest edges are transition zones between different habitats. Forest edges have a different species composition and community structure when compared with forest interiors, a phenomenon known as the “edge effect”. The width of this zone ranges from several meters until several tenth of meter.

In this paper the results of invasive species monitoring of several Belgrade’s urban forest ecosystem are presented. The aim of paper was to establish diversity of invasive species, the degree of invasiveness and got the basis for the formation of a national list of invasive species.

The forest types investigated in Belgrade area are: Salicetum albae inundatum, Populeto Salicetum, Salicetum triandrae, Rubeto-Salicetum albae, Populus x robusta, Populetum nigro-albae, Salicetum albae fragilis, Salici-Populetum, Populetum nigrae, Populetum albae, Sambucetum ebuli, Salicetum albae-amygdalinae and Salicetum albae. Invasive species developed in these forest types can be devoted in two classis. In the first class-high potential of invasiveness are: Acer negundo, Ailanthus altissima, Amorpha fruticosa, Asclepias syriaca and Robinia pseudacacia. In the second class-sporadic invasive species are Phytolacca americana, Parthenocissus quinquefolia, Lycium barbatum and Fraxinus pennsylvanica.
The high potential invasive species described in the forest edges are *Aster lanceolatus*, *Bidens frondosa*, *Echinochloa crus-galli*, *Echinocystis lobata*, *Reynoutria japonica* and potential invasive are *Erigeron annuus*, *Erigeron canadensis*, *Solidago canadensis* and *Xanthium strumarium*.

The increasing of number of non-native species and their tremendous costs to the environment and society. Invasions are the result of a very complex set of processes. Many of these processes are economically motivated – including the use of non-native species in various economic activities, habitat change and its fragmentation, liberalized and non-regulated market, booming trade in goods and services, as well as the increasing mobility of both people and things.

**Keywords**: invasive plant, urban forest, forest edge, monitoring of invasive plants
Horse chestnut (*Aesculus hippocastanum* L.) urban habitat- some phenotype and morphohological characteristics

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Horse chestnut (*Aesculus hippocastanum* L.) is a tree which can be found in most urban areas in Panonian, Dinarridean and Mediterranean region. In that areal horse chestnut showed, over the years, to be tenacious to various urban negative influences. In our research we’ve tested trees from smaller towns (Varždin as largest city and Razloge as representant of small urban settlements) wich were randomly selected on most congested streets.

Phenotype of urban horse-chestnut significantly differs from its natural phenotype, and it is transformed with multiple radical pruning what can be seen in following ratios:

- diameter - tree height (average 0.0315),
- trunk heigth - tree heigth (average 0.3150),
- crown heigth - tree heigth (average 0.6644),
- crown width - crown heigth (average 0.7938).

The most significant tree characteristic is its vitality which is graded by leaf area index commonly known as defoliation. On tested trees average defoliation was „1.35“ with lowest value „3 B“ and best value „0“.

Our research also included some yearly shoot caracteristics: average length 315.86 mm diameter 9.03 mm, carring 14.57 leaves and 0.75 flowers. Length of horse-chestnut leaf is 153.84 mm width 63.01 mm, petiole length 116.84 mm diameter 3.10 mm. Flower pedicel average length 115.27 mm, diameter 7.17 mm sideward pedicel 46.66 mm and 4.77 mm. Avereagly yearly shoot carries 11.03 fruits with diameter 42.14 mm that contains 2.17 seeds.

All measured parameters (tree, shoot, leaf and nut) contain significat differences (up to few dosen times) from stgated average values (whom are stated in research results).

**Keywords**: horse chestnut, phenotys, defoliation, shoot, leaf and nut morphological characteristics
The attitudes of the citizens of Novi Sad towards urban forests and urban greenery - The interview results

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Urban forests and urban greenery have great significance for the life and health of citizens. As such they must be considered from a social aspect as well. This research uses a social science approach and it is designed to reveal the attitudes of citizens of Novi Sad towards existing green city spaces by using as an interview method. Direct communication is applied to collect answers to the carefully constructed questionnaire. Data collection is performed on a sample of 350 interviewees, in the entire area of Novi Sad, so that green areas in the city are all equally covered. Randomly selected people from each parts of the city respond to a range of questions, and their answers are processed and analyzed in order to determine their attitudes, opinions and impressions of existing green space in Novi Sad.
Urban forest and urban greenery in the Republic of Serbia in the context of professional and scientific literature

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Through scientific and professional literature published in Serbia, the paper analyzes urban forests and urban greenery role and importance, it also analyzes way of certain scientific fields approach to the problems related to greenery at the urban environments level. With increase of urbanization and cities growth, forest areas are reduced and the urban landscape is degraded. The aim of this paper is to show whether the systems of urban and suburban green areas are in continuous and dynamic interaction with built structures of cities and are they adequately connected with each other in order to create spaces for rest, recreation and healthier social life. Due to low legal regulations and continuous pressure of construction, systems of green areas often transform into parts of built urban areas in which the urban environments conditions new way of approach to the managing and cultivation of urban greenery and urban forests. Today systems of green areas in Serbia represent an organic part of the city, but their development is not sufficiently connected with urban development of cities. Mutual connections of city and nature are in unequal conditions, because of that the subject of this paper is the study of urban and suburban green areas development, their interaction and the way they make the landscape of the city. Furthermore are analyzed the main problems with the greenery in new urban areas and which terminology is used to determine urban forests and urban greenery.

Starting research is based on the analytic approach and data gathering from scientific and professional literature published in Serbia in the past decade. Data gathering was carried out by using key words, snowball method and by browsers of available databases of national magazines and libraries. By further analysis of collected data, in paper are distinguished definitions and most commonly used terms which describe urban forests and urban greenery from the aspect of specific scientific and social fields. The most efficient specialized data bases browsers are distinguished and also the areas within which is the largest number of published papers, studies, journals, newsletters and other literature.

Keywords: urban forest, urban greenery, systems of green areas, urban landscape
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Green areas and woody plant inventory in urban landscape in Lithuania

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Urban greenering design, management and protection regulation was approved in 2008 in Lithuania after the admitting the Law of green spaces. It caused the beginning of inventory of public green spaces and plantings. An inventory public green spaces and plantings in all the major cities of Lithuania will be completed in next year. Survey results highlighted the major green space management problems. Often planted trees growth under power lines, their crown started to seek the power cables. At bocks of flats plantations trees are often found at the wrong place: trees planted too close to buildings, shade windows, roots heave pavers and penetrate into foundations. At the large cities, where land has great commercial value, is found artificially damaged trees with the purpose to dry them and probably install parking spaces. At the smaller towns, where land has no significant commercial value and enough parking spaces for cars, such cases do not occur often. According the inventory the most damaged are street trees. The most common hurts are found on tree stem, rots. Aesculus hippocastanum L. leaves are massively damaged by Cameraria ohridella Deschka& Dimić, Tilia cordata Mill. – by Cercospora microsora Sacc. Tilia cordata is one of the most favorite city trees, but this species susceptible to contamination and damaged appears undecorative, very early ends the growing season. Inventory of green areas showed that there is lack of public parks at smaller towns; some towns do not have them at all. In big cities greenerny located disproportionately – too less public green spaces in centers and sleeping areas. Despite the law regulates the minimum green area landscaping standards, in major cities where is no sufficient area of playgrounds, green areas, violations occur while building new houses.
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Biological-ecological and spatial evaluation of the park Hellenbach in Marija Bistrica

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Gardens are very valuable and rich collection of materials dendrology. In them we find many elements of floral trees and shrubs that have exceptional a park, functionally and spatially-forest-breeding value. In addition, they have a function dendrologic and botanical experimental gardens in which one can explore the acclimatization of certain species, and study the numerous varieties and forms of gardening.

Hellenbach The park was created around the same castle, immediately after its construction, around the mid-19th century. The classic concept recognized by the symmetric composition of the park. Three trails lead from the main road to the castle. The entrance to the castle was the opposite, eastern side. The road access is from the south side of the park and thus separate from the complex. The grounds are approximately 1.4 hectares. In addition to the main road and next to one of three pathways to the avenue which no longer exist. The cadastral map in 1924th year, see the revised composition of the grounds. Missing are the three pathways, as well as vehicular access from the south. A new entry for vehicles and pedestrians from the north, the route a serpentine order to overcome the slope of the terrain. The grounds were expanded to the east, covering much of the previous part of the economic space of the garden.

The exact time of change is not known, but it was certainly the 1860th and 1924th year. The park is now its external appearance and age of several trees, such as: lime, copper beech, horse chestnut, poplar, spruce. Inventory 1978th year there were a total of 263 different plant species, then the inventory 2007th was recorded a total of 619 different plant species, to inventory 2011th was recorded a total of 543 different plant species.

The grounds around the castle enjoys legal protection. Ruling no. 123/1-1961. Institute for Nature Protection of the Croatian People's Republic on 14 7th 1961st few years around the castle Hellenbach in Marija Bistrica is
protected in the category of protected objects of nature as a natural monument - garden architecture, which, according to present current legislation (Law on the Protection of Nature NN 70/05) was a monument of park architecture.

The degree of preservation of the park is significant for the evaluation. Rarely is a park that, in such original look past the time when it booted. During the time a man changes his space conceptually, aesthetically and functionally. It is particularly problematic when a certain historic period gardens neglect and when left to natural development, as is the case for this park. The park of the old, comes the death of existing species, no sanitary arrangement and spread phytopathogen organisms. The park falls into place and advancing native, aggressive species. The park is changing the existing aesthetic and functional concept. When you approach the evaluation of such a park then we developed the core of indigenous vegetation can be a good compositional bioelements future planning.

From these characteristics must come adequate allocation and use of parks in the future. The aim of the paper is based on an analysis of the current situation (inventory), and historical material (matrix) give guidance valuation Hellenbach park around the castle in Marija Bistrica.

**Keywords**: park, evaluation, assessment, plants, garden and architectural elements
Rearranging the green area around the Dr. Victor Babes Clinical Hospital for infectious diseases and lung diseases study in Timișoara, with the purpose of ensuring a healthy urban microclimate

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In the last decades, Timișoara, “town of gardens and parks”, underwent an impressive urban development, its number of inhabitants increasing from 111 000 in 1948 to over 340 000 nowadays. Recent data related to air quality monitoring in Timișoara, showed that the maximum admitted concentration for the indicator suspension powders has been exceeded. The major sources of pollution are: the traffic, the industrial activity in the town, the building sites, the private heating system of the population, as well as the district heating network. Polluted air, containing high quantities of dust combined with irritant gases, toxic substances and cancer causing agents (carcinogens), represents an important aggravating factor for lung diseases, which affect health of individuals and society, both on short and on long term. Increasing the level of urban comfort and ensuring a healthy environment can be achieved through measures of conservation, protection and extension of the existing green areas, as well as designing new ones with the purpose to improve the microclimate. In this context, taking into account the need of having an environment as functional as possible, harmoniously included in the urban environment, in 2002 works were started in order to redesign the green area around the Dr. Victor Babes Clinical Hospital for infectious diseases and lung diseases study in Timișoara – an important public hospital. The unit has a total area of 2.8 hectares, 40% being covered by buildings, while the other 60% is green area with pedestrian alleys. Initially, the green area was established without being based on a landscape design project. The design principles were not taken into consideration, the area was attractive only due to the species which were planted, but as a whole it was not a harmonious and unitary composition. Later, it was aimed at establishing a microclimate able to contribute to the quicker recovery of the patients, through the conservation of the existing plants, cleaning the trees, cutting the dead, withered vegetation, as well as planting ornamental tree and other plant species. The lawn in front of the hospital building has been rearranged mainly by planting ornamental softwood species, which due to the colour...
of their leaves provide contrasts which enhance the esthetic value of the composition. The initial furniture was replaced, new benches were placed in the green area so that the patients could spend time outdoors. During the process of rearranging the area, the principles of landscape design were taken into consideration, which led to the harmonious integration of the new composition in the existing landscape, being functional and bringing unity in diversity. As a result, a new green area was created and an appropriate microclimate was offered to the staff of the hospital, to the patients as well as the visitors, being integrated in the green area system of Timișoara, and contributing to decreasing the environment pollution in the town.

**Keywords:** atmospheric pollution, microclimate, health, design and landscaping green areas, ornamental plants, functionality, harmony and composition unity
The First Discovery of Citrus Longhorn Beetle (CLB) - *Anoplophora chinensis* in Croatia and Phytosanitary Measures Applied in the Prevention of its Establishment

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The first discovery of Citrus Longhorn Beetle (CLB) - *Anoplophora chinensis* (Forster) in Croatia was in the nursery in Turanj, near Zadar, in 2007. The consignment consisted of 600 *Magnolia* sp. plants, 400 *Lagerstroemia* sp. plants and 9200 potted plants of *Acer palmatum* which were imported from PR of China in February 2007. The beetle was discovered half a year later when one dead adult and close to fifty infested plants were found infested with CLB larvae. The survey program started immediately, and phytosanitary inspectors were involved in the new procedures gaining experience with this new pest of Asian origin. In the following years, visual inspection was performed six times per year beginning in May and finishing in October. There were 112 positive samples during the period 2008 - 2010. Although mixed with highly infested batch of maple plants, not a single magnolia plant was found infested with CLB. Roses growing near the imported plants, on the other hand, were found to be infested with CLB. This was the first time that rose plants were recorded as suitable for CLB development.

The phytosanitary measures were performed to prevent spreading of CLB. The measures were as follows: ban on trade of potted plants, ban on dispatch to other locations, monitoring and inspection of the location of the first record at least 6 times per year, burning of all plant material with any symptoms of CLB presence, easily visible or just suspicious. Not a single sign of CLB infestation has been recorded in the area surrounding the quarantine nursery what can be explained by the attractive power of *A. palmatum* plants in a proportionally low population density of the beetles.

The opinion of the authors is that the CLB population has been successfully eradicated due to negative results of survey in the last period of control. However, the conclusive statement will be possible only after the next two years, since risk still exists and survey will be continued as defined by the EU and HR protocols. Early detection and fast phytosanitary measures
Abstracts of Poster Presentations

carried out are considered as vital and main prerogative in successful eradication of this extremely harmful invasive organism.

**Keywords**: Citrus longhorn beetle (CLB), *Anoplophora chinensis*, *Acer palmatum*, *Rosa* sp., phytosanitary measures, eradication, Croatia, invasive pest
An early snowstorm and the overall health of an urban forests

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On October 24, 1997, before leaf senescence, a severe snowstorm swept through Lincoln, NE resulting in 33.5 cm (13.2 inches) of accumulation over roughly two days. The weight of the snow caused devastating damage to the urban forest trees. It was reported that 90 to 95 percent of trees in southeastern Nebraska were damaged (IANR News Service 2001). Did this snowstorm cause changes in the urban forest? A survey in 2003 found that 48% of the trees recorded in a 1992 survey, were lost. A comparison of trees by size revealed that the smallest trees were most devastated while larger trees were not, and a comparison of trees by condition showed substantial losses in all condition classes. Losses varied among species. Species such as mugo pine (Pinus mugo), mulberry (Morus sp.) and plum (Prunus sp.) had losses greater than 80%, while some others, white pine (P. strobus) and pin oak (Quercus palustris), had losses of 20% or less. Using the Shannon diversity index, there was a loss of approximately 6% of the total diversity of trees. Species richness decreased by nearly 10%. There was also no correlation between specific tree species vulnerability to snow damage and inherent tree species physical properties: wood density, specific gravity, modulus of rupture or modulus of elasticity.
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