

4-5 April 2019

Paris Forum on NBS

**Addressing major societal challenges:
climate change adaptation-mitigation,
risk management and resilience**

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Introduction

Climate change and associated risks are among the most significant societal challenges today. These challenges are at the epicenter of the global public debate, since they require immediate management in order to prevent potential threats and disasters. Towards this effort, the scientific community in cooperation with citizens, stakeholders, and decision makers has to conceive, develop and implement solutions, serving the objectives of sustainability and resilience. In this context, most conventional approaches and solutions fail to adopt these guiding principles.

Nature-based Solutions (NBS), based on an eco-systemic approach, constitute a new paradigm for handling these challenges efficiently in a sustainable way. “Climate change adaptation and mitigation” and “Risk management and resilience” have been identified by the EU as the two overarching goals of NBS¹. The implementation of NBS can offer multiple benefits and major opportunities for dealing with the impacts of climate change, as well as seizing the anthropogenic greenhouse gas emissions. Moreover, NBS offers potentials to enhance resilience through multiple natural processes and functions against natural and technological hazards, leading to an integrated risk management.

The forum will be a lively debate among multidisciplinary participants on the current knowledge, facts and ongoing research on NBS; related mainly to the questions: “*How can NBS offer opportunities for climate change adaptation and mitigation?*” and “*How can NBS be applied in order to achieve integrated risk management and resilience?*”. The forum format is designed to promote the dialogue among the participants, including inspirational key inputs by lead experts and parallel interactive working sessions.

The discussions are oriented towards enriching the documented knowledge concerning:

- Identification of integrated holistic cross-sectoral NBS for enhanced risk management;
- Combination of NBS, multiplying their benefits, reducing threats and offering resilience;
- Climate Change Adaptation and Mitigation by Nature: urban ecology, urban quality and well-being;
- Integration of NBS into local and regional spatial planning and decision-making;
- Performance monitoring and impact assessment of the deployed NBS;
- Involvement of NBS’ stakeholders in funding and implementation;
- Enhancement of NBS’ cost-effectiveness.

This 2-day Forum, co-organized by ThinkNature H2020 Project and Paris Municipality, aims to bring together multiple stakeholders of different sectors and backgrounds (i.e. scientists, market actors, policy makers), including members of several International Organizations (e.g. EC, EEA, IPCC, UNEP, IUCN), large scale research projects on NBS (e.g. Connecting Nature, Nature4Cities, Urban GreenUP, GROW GREEN, UNALAB), pioneer cities, public and financial institutions and green businesses. Over 150 delegates across EU and overseas, representing the key actors in NBS, are expected to attend.

¹ European Commission, 2015. Towards an EU research and innovation policy agenda for nature-based solutions & re-naturing cities. Final report of the Horizon 2020 expert group on “Nature-based solutions and re-naturing cities.” Brussels.

Table of contents

Thursday 4th April4

 Plenary session: Holistic approaches on risk management and resilience5

 Parallel sessions: Introducing risk management and resilience through NBS6

 Session 1: Combining NBS as an integrated approach for risk management and resilience.6

 Session 2: NBS for risk management across scales: synergies from local to city and regional level8

 Session 3: Innovative methodologies for monitoring the efficiency of NBS towards climate resilience and disaster risk mitigation 10

 Plenary session: NBS Financing and Business 12

 Parallel sessions: NBS Financing, Business Models and Decision-Making 13

 Session 1: Business models for NBS – what are the essential elements? 13

 Session 2: Socio-Economic Benefit Analysis of NbS 15

 Session 3: Local planning regulation and bottom-up governance for NBS and sustainable land use management..... 17

Friday 5th April..... 20

 Plenary session: Nature for urban adaptation and mitigation to climate change? 21

 Parallel sessions: Can Nature enhance urban resilience? 24

 Session 1: Can nature support quality of life and resilience?..... 24

 Session 2: Can green housing quality encourage to resilience? 27

 Session 3: Can nature and landscape contribute to resilience? 31

 Parallel sessions: Can “(re)naturalisation” contribute to urban climate change adaptation and mitigation? 34

 Session 1: How could biodiversity and ecosystem be a factor of climate change adaptation and mitigation? 34

 Session 2: Can urban forests support cities to climate change adaptation and mitigation? 37

 Session 3: Can ecological urbanism create urban quality and atmosphere? 40

 Plenary session: Adaptation to climate change, ecological issues, urban quality and well-being 44

Thursday 4th April

8.30 - 9.00 Welcome and Registration

9.00 - 9.30 Introduction

Nikolaos Nikolaidis (ThinkNature),
Dorothee Marchand and Emeline Bailly (CSTB),
Julie Delcroix (European Commission)

9.30 - 10.30 Plenary session: Holistic approaches on risk management and resilience

Nektarios Chrysoulakis (FORTH), Jorn Birkmann (University of Stuttgart), Nathalie Seddon (University of Oxford)

10.30 - 11.00 Coffee break

11.00 - 13.00 Dialogue 1 - Parallel sessions: Introducing risk management and resilience through NBS

1 - Combining NBS as an integrated approach for risk management and resilience

Stavros Stagakis (FORTH), Henk Nieboer (Ecoshape), Tom Armour (Arup), Daisy Hessenberger (IUCN)

2 - NBS for risk management across scales: synergies from local to city and regional level

Sara Van Rompaey (E2ARC), Denia Kolokotsa (TUC), Dimitra Theochari (Ramboll Studio Dreiseitl), Sara Van Rompaey (E2ARC), Karen Landuyt (AGSL / City of Leuven)

3 - Innovative methodologies for monitoring the efficiency of NBS towards climate resilience and disaster risk mitigation

Nektarios Chrysoulakis (FORTH), Gemma Garcia Blanco (TECNALIA Research and Innovation), Julie Berckmans (VITO)

13.00 - 14.00 Lunch break

14.00 - 15.00 Plenary session: NBS Financing and Business Models

Steven Banwart (University of Leeds), Erik Mink (EUDA), Siobhan McQuaid (Connecting Nature), Elena Lopez Gunn (NAIAD)

15.00 - 15.30 Coffee break

15.30 - 17.30 Dialogue 2 - Parallel sessions: NBS Financing, Business Models and Decision-Making

1 - Business models for NBS - what are the essential elements?

Jonathan Porter (OPPLA), Helen Toxopeus (Naturvation), Aitziber Egusquiza (Nature4Cities)

2 - Socio-economic benefit analysis of NBS

Steven Banwart (University of Leeds), Ernesta Maciulyte (UnaLab), Oshani Perera (IISD), Kym Whiteoak (Grow Green)

3 - Local planning regulation and bottom-up governance for NBS and sustainable land use management

Claudia De Luca (University of Bologna), Giovanni Fini (City of Bologna), Åke Hesslenkrans (Malmo City Planning Office), Sanja Jerković (City of Zagreb)

17.30 Cocktail drinks

Plenary session: Holistic approaches on risk management and resilience

Moderation: Nektarios Chrysoulakis, FORTH

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Speakers:

Nathalie Seddon (University of Oxford)

Professor Seddon read for her BA (Hons) Zoology and later completed her PhD at the University of Cambridge. She became a Royal Society University Research Fellow at the University of Oxford in 2005 working as an ecologist in tropical forest. In 2015 she was made Professor of Biodiversity, and in 2017 was awarded a NERC Knowledge Exchange Fellowship, which enables her to work at the science-policy interface, focusing on nature-based solutions to climate change. Professor Seddon's main research interests are the causes and consequences of biodiversity loss and climate change and how we might bring nature central to decision making in business and in government.

Jörn Birkmann (University of Stuttgart)

Professor Dr. Joern Birkmann has been appointed as coordinating lead author for the IPCC's Sixth Assessment Report (AR 6). In 2007, the Nobel Peace Prize was awarded jointly to Al Gore Jr. and to the IPCC which assesses global climate change, risks as well as adaptation options. Worldwide, 3000 experts were nominated and 721 were finally appointed for the three Working Groups of the Sixth Assessment Report. In the course of the next four years Prof. Birkmann will – together with experts from 90 countries - analyse the impacts of climate change, questions of vulnerability and adaptation. The first two meetings in 2019 will take place in South Africa and in Nepal. The report will be published in 2021.

Parallel sessions: Introducing risk management and resilience through NBS

Session 1: Combining NBS as an integrated approach for risk management and resilience

Moderation: Stavros Stagakis, FORTH

Email: sstagaki@iacm.forth.gr

Session description:

The session will examine applied methodologies of NBS towards risk management and resilience in various settings and related risks: i.e. urban, land, coastal ecosystems. The demand for holistic approaches for achieving resilience is high, since the negative impacts of potential risks affect various social, environmental and economic aspects. In this context, there is a need for identifying synergies among NBS leading to risk management and resilience and ways of adjusting them effectively in planning and decision making. The session will steer dialogue on proposed strategies that would combine multiple policies, actions and practices to prevent or confine extended disasters.

Speakers:

Henk Nieboer (Ecoshape)

Henk Nieboer graduated as a civil engineer from the Technical University in Delft, The Netherlands in 1987. He joined Witteveen+Bos Consulting Engineers that same year. He has served as specialist in coastal and hydraulic engineering, as leader of a business unit and member of the board of directors. Since 2017 he is senior consultant on coastal and river engineering, specializing in climate adaptation and nature-based solutions (Building with Nature). Since 2015 Henk is the director of the EcoShape foundation, responsible for the public-private innovation programme Building with Nature. Henk has working experience in The Netherlands, Indonesia, Serbia, Poland, Kazakhstan, Russia, Latvia, Singapore, Dubai and other countries.

Tom Armour (Arup)

Tom is a Director and Leader of Global Landscape Architecture at Arup and a Fellow of the Landscape Institute in the UK. Tom founded the landscape business at Arup and has developed it into an award-winning practice with teams in the UK and internationally. He plays a key role in developing Arup research and thought leadership in the field of landscape architecture, nature-based solutions, resilience and well-being particularly in relation to contemporary issues facing cities and urban environments. He founded the Cities Alive initiative in Arup which provides wider thought leadership and contemporary thinking on the development of future cities.

Questions:

- What is the greatest natural hazard potential in Europe and what are the related existing policies (EU to regional level) and tools for risk mitigation?

- Who are the stakeholders involved and what are the decision-making mechanisms in defining the strategies for risk management?
- What is the current status of involving NBS (or ecosystem-based strategies) in the EU and regional policy context?
- Which are the most prominent NBS approaches/practices (or combinations of them) for risk management and resilience?
- What would be alternative decision-making mechanisms to facilitate NBS uptake in risk management and resilience?

- How to facilitate uptake of NBS in the strategies for risk management and resilience at diverse spatial levels?
 - Identification of Barriers (knowledge, financing, policy, governance)
 - Policy proposals

Session 2: NBS for risk management across scales: synergies from local to city and regional level

Moderation: Sara Van Rompaey E2ARC

Email: sara.vanrompaey@skynet.be

Session description:

Improving risk management and resilience using nature-based solutions can lead to greater benefits than conventional methods and offer synergies in reducing multiple risks. The scope of this brainstorming session and debate is to explore apart from the benefits, the possible synergies across different levels/ areas and the various barriers to be faced when applying risk management through nature-based solutions. The implications and interactions of different spatial scales during this process, are another very important aspect that will be examined. Therefore, the topic of risk management and resilience through NBS is explored taking into account:

- a) The interactions of environmental aspects when applying NBS for Risk Management and Resilience with the other pillars of sustainable development (Culture, Economy, Society)
- b) The effect of applying NBS for Risk Management and Resilience in different scales and their impact (Local vs City and Regional level)
- c) The existing governance and legislative barriers that impede the successful implementation and wide replication of NBS for Risk Management and Resilience.

Speakers:

Denia Kolokotsa is currently an Assistant Professor at the School of Environmental Engineering of the Technical University of Crete, Greece. Her research interests include energy management for the built environment, energy efficiency and renewables. She has developed expertise in the field of urban energy dynamics, environmental and ecological impact at the metropolitan and regional scale with an emphasis on the urban heat island mitigation and adaptation strategies. She is the author of more than 100 papers published in high impact scientific journals and conference proceedings. She is Editor-in-Chief of the *Advances in Building Energy Research*, Taylor and Francis as well as Editorial Board Member of *Renewable Energy and Energy and Buildings Journal* of Elsevier. Finally, she has participated in more than 25 European and National projects and coordinated 3 EU (FP7 and Horizon2020) projects, as well as 3 national projects.

Dimitra Theochari is an architect, engineer and landscape architect holding Master degrees in both fields currently working in Ramboll Studio Dreiseitl. Highlights of her professional career include the two-year cooperation with Turenscape, while during this period she joined Turenscape+LakeFlato Team for the "Waller Creek Competition" in Austin, TX. In 2013, she worked on food urbanism projects for Verzone Woods Architectes, and designed the winning entry for the Agro-Parc Bernex Competition in Geneva. As part of the Ramboll Studio Dreiseitl team she received First Prizes for the Tongzhou Green Heart competition (2018), in Beijing, Chaobai River Restoration and Wetland Park competition (2017) in Hebei-China, Sanlin EcoPark competition (2017) in Shanghai, Xiao River and Wetland Area Competition (2017) Beijing, and was part of the design team for the FOUR Project – the Deutsche Bank Areal Development Competition (2017) developed with UNStudio Frankfurt-Germany. Dimitra is also a researcher in topics of nature-based solutions, regenerative sustainability, urban agriculture, and dealing with compound weather events.

Sara Van Rompaey is a Belgian conservation Architect and EU project expert in the field of historic building renovation, urban regeneration, climate change and Nature Based Solutions. She has an active role in national and international professional organisations such as the Belgian Order of Architects, ACE (Architects' Council of Europe), EFAP (European Forum for Architectural Policies), UIA (International Union of Architects), CEN TC 346/WG8 "Energy efficiency of historic buildings", ICOMOS and EUROPA NOSTRA. As owner of E²ARC (Energy Efficient Architecture Renovation Cities) she has

more than 25 years of expertise in the design, development and execution of buildings projects with a special focus on energy efficient renovation and conservation. Through E2ARC, Sara is also involved in several EU funded research projects that relate to buildings' sustainability, cultural heritage and energy retrofitting, innovative building materials and Nature Based Solutions.

Karen Landuydt studied Engineering Architecture and Urbanism and Spatial Planning at the KU Leuven. Professionally her focus has always been on project and quality management of spatial projects. At the Flemish State Architect focus was on setting ambitions, defining projects and searching for qualitative design through architecture competitions. At the Mobility Department of the Flemish Government focus was on quality management of public infrastructure. At the city of Leuven the program management was added by coordinating different projects and actors in a city precinct towards an overarching vision.

Questions:

- Priorities to prevent climate related hazards: How to prioritize among scales before disasters
- Priorities to prevent climate related hazards: How to prioritize after disasters
- How can urban infrastructure become regenerative over time, taking into consideration scale?
- What are the foundations for creating resilience and which can be new approaches for future proof city planning?
- How to keep actors and stakeholders engaged and ambitious through the entire process of a complex spatial project?

Session 3: Innovative methodologies for monitoring the efficiency of NBS towards climate resilience and disaster risk mitigation

Moderation: Nektarios Chrysoulakis, FORTH

Email: zedd2@iacm.forth.gr

Session description:

The session explores innovative applications for monitoring and quantifying the effects of NBS towards climate resilience and risk mitigation. Methodologies for measuring the impact of NBS against risks such as heat waves, hydrological floods and landslides will be discussed. The role of different sectors and stakeholders to the development of multi-disciplinary and trans-disciplinary approaches for robust NBS monitoring and impact evaluation will be assessed. The session will also investigate the potential of multiple EU initiatives, infrastructure (e.g. Copernicus services) and Research & Innovation developments to serve as common tools for continuous, long-term and large-scale monitoring of NBS impacts. This session will seek the methodological, knowledge and technological drawbacks that may prevent the development and the harmonization of NBS monitoring methodologies and explore the possible actions to overcome such barriers.

Speakers:

Gemma Garcia-Blanco (Tecnalia)

BA in Geography (University of Oviedo, Spain), MSc in Environmental Management (School of Environmental Sciences, University of East Anglia, UK). Joined TECNALIA Research & Innovation in 2005. Currently engaged in the Climate Change Team within the Energy and Environment Division. More than 14 years of research experience on the fields of spatial planning, integrated territorial analysis and sustainability, strengthening initiatives for public administrations at all governance levels, including international cooperation activities. More recent research interests include climate change vulnerability assessment, urban adaptation strategies with focus on ecosystem-based approaches and innovative planning.

Julie Berckmans (VITO)

Julie Berckmans obtained an MSc in Meteorology and Air quality in 2011 at Wageningen University and Research, and a PhD in Sciences in 2018 at the University of Antwerp, on the topic of regional climate modelling with a particular focus on land-atmosphere interactions and urban climate. Julie started working at the Flemish Institute for Technological Research (VITO) in 2018 in the Climate Service Centre team, who have a strong expertise in urban climate monitoring and modelling. In the framework of Copernicus Climate Change Service, she developed expertise in tailoring climate information to climate indicators for specific sectors.

Nektarios Chrysoulakis (FORTH)

Dr. Nektarios Chrysoulakis is a Director of Research, at the Foundation for Research and Technology - Hellas (FORTH) in Heraklion, Greece and head of the Remote Sensing Research and Applications in Urban and Natural Environment Laboratory (<http://rslab.gr>) at FORTH. He has coordinated the projects URBANFLUXES (H2020), SEN4RUS (ERA.Net-RUS Plus), BRIDGE (FP7) and GEOURBAN (FP7) and

participated to ECOPOTENTIAL (H2020), ThinkNature (H2020) and FLIRE (LIFE+). He has more than 200 publications. Link to full CV: <http://rslab.gr/pdf/NekCV.pdf>

Questions:

- What are the most critical requirements of the methodologies in order to provide efficient and holistic NBS monitoring/evaluation towards risk management and resilience?
- Are there available monitoring methodologies or indicators to evaluate NBS contribution to risk management and resilience? (Explore technological/methodological/knowledge limitations, gaps and drawbacks in the available/applied NBS impact assessment methodologies)
- Explore and suggest new tools and infrastructure that meet the recognized critical requirements to provide efficient and holistic NBS monitoring/evaluation towards risk management and resilience.
- Explore and suggest approaches for indicator development, data standardization and methodology harmonization for improving NBS assessment schemes towards risk management and resilience.

Plenary session: NBS Financing and Business

Moderation: Steven Banwart, University of Leeds

Email: S.A.Banwart@leeds.ac.uk

Frederik Mink is a Senior Consultant who applies a thorough knowledge of European Union environmental and marine rules and regulations with an in-depth analysis of environmental concerns faced by the maritime, marine and recreational yachting sector, as well as by the dredging industry. He has been adviser to the European dredging industry and has regular contacts with the European shipowners and the European seaports sector. Prior to becoming an independent consultant, Frederik had 10 years of hands-on experience in European Affairs as secretary-general of the European Dredging Association. Before entering the EU scene, Frederik worked for more than 20 years in the energy field, notably for the Westinghouse Corporation in the nuclear division. Frederik has degrees in engineering and business administration.

Siobhan McQuaid, Section Head of Innovation and Principal Investigator in Sustainability and Innovation, Centre for Social Innovation, Trinity College Dublin / Founder and Director of Horizon Nua. Siobhan is a finance and innovation specialist working for over 25 years with academic, industry and innovation intermediaries to bring new ideas to life. Siobhan is currently leading research and innovation on novel finance, business and governance models for green infrastructure and nature-based solutions (NBS) and measures to support the start-up and growth of nature-based enterprises (NBE) across Europe. Siobhan is also director and founder of Horizon Nua empowering the creation of viable, valued social enterprises across Europe.

Elena López Gunn is the Founder and Director of ICATALIST and a Visiting Fellow at University of Leeds. part of the water@leeds in the United Kingdom. Elena finished her PhD at King's College, London. She holds a Masters from the University of Cambridge, and a Master in Investigative Journalism, Data Management and visualization from the University Juan Carlos I with "El Mundo" newspaper. She was an Associate Professor at IE Business school and a Visiting Senior Fellow at the London School of Economics as Alcoa Research Fellow. Professionally, Elena has collaborated with a number of organizations including UNESCO, FAO, UNDP, EU DG Research and Innovation, universities (Spanish and Dutch) and river basin agencies, the England and Wales Environment Agency, as well as the private sector like Repsol, and NGOs like Transparency International-Spanish Chapter. She has published on a range of topics mainly related to water security, social innovation, collaborative decision making, water governance, evaluation of public policy, knowledge management and transfer. Her current main focus is on climate change adaptation and the role of green infrastructure, as well as groundwater strategic management. Elena lives in Madrid with her husband, Dave, and her three fabulous children.

Parallel sessions: NBS Financing, Business Models and Decision-Making

Session 1: Business models for NBS – what are the essential elements?

Moderation: Jonathan Porter, Oppla

Email: jonathan@oppla.eu

Session description:

In the face of urban sustainability challenges such as climate change and urban densification, urban nature-based solutions (NBS) can play an important role in addressing multiple sustainability challenges simultaneously, and therefore in a cost-effective way. The development of sustainable business models specifically for NBS can enable private actors to play a meaningful and profitable role in urban NBS uptake. One of the key challenges we encounter is how to coordinate collaboration between different actors to realize NBS together.

Speakers:

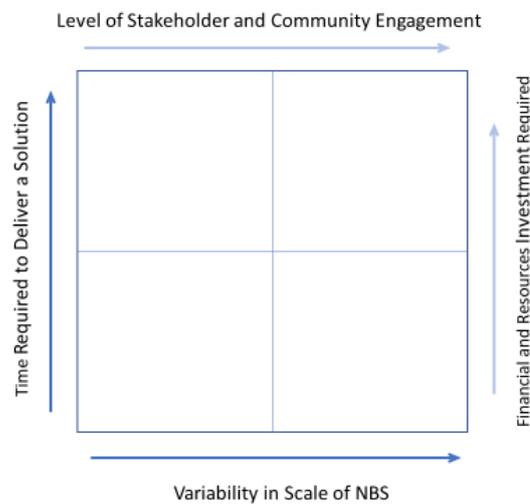
Aitziber Egusquiza Ortega holds PhD on decision making process for improving sustainability and liveability of historic urban environments using multiscale information management. She is graduated as architect with post degrees in Urban Management and Cultural Heritage. Currently is the leader of the work package regarding “New governance, business and financing models for NB-oriented urban planning” in Nature4cities project and the work package regarding “Conceptual and operational framework for heritage-led rural regeneration” in RURITAGE project. Coordinator of SHELTER (Sustainable Historic Environments hoListic reconstruction through Technological Enhancement & community based Resilience) that has been selected for funding by European Commission under the topic “Resilience and sustainable reconstruction of historic areas to cope with climate change and hazard events”. Member of several coordinating teams in European and National research projects (SmartENCity, FASUDIR - Friendly and Affordable Sustainable Urban District Retrofitting, EFFESUS - Energy Efficiency for EU Historic Districts’ Sustainability, REACT- Resilience, Accessibility and Conservation for Historic Cities among others). Head of the project that established the sustainability standard for the Galapagos islands.

Helen Toxopeus is a researcher within the NATURVATION consortium, responsible for the research on finance and business models for upscaling urban nature-based solutions. She works at the Sustainable Finance Lab at Utrecht University (Utrecht School of Economics). She obtained a PhD from Erasmus University Rotterdam on the topic of ‘Finance for Sustainable Innovation’ (early 2019). She co-authored several books on sustainable finance and circular business models. She previously worked at ABN AMRO bank as an innovation manager.

Questions:

Activity: Where do the case studies/developments you have worked on fit in the matrix? Use a post-it note to show where it would fit on the chart

1. Is this framework robust enough to assess NBS projects
 - a. Where are there opportunities and barriers to change on the matrix? Incentives?
 - b. How could you manage risk of a project that is at one extreme of the chart?
 - c. What are the performance indicators of an NBS?
2. Is this something we can develop into a NBS evaluation framework that can include multiple business cases for large projects or step/incrementally-based projects?
3. How does this perform against standard business case scenarios?
 - a. Can this ideology be incorporated into the classical business case model?



Session 2: Socio-Economic Benefit Analysis of NbS

Moderation: Steven Banwart, University of Leeds

Email: S.A.Banwart@leeds.ac.uk

Session description:

The session will explore (1) Green public procurement (GPP) which is one of the key instruments that policy makers can employ to address their environmental policy targets. It promotes the development of innovative and sustainable technologies and solutions and facilitates innovation across a variety of relevant municipal departments. GPP is one of the key tools that could trigger a more efficient and sustainable NBS uptake in cities, while stimulating inter-departmental collaboration. However, successful implementation of NBS calls for well-defined GPP strategy that would allow for a wider array of potential solutions. (2) the session will explore economic analysis to better link beneficiaries and funding streams. It is well understood by practitioners that NbS investments produce multiple benefits to many different stakeholders across social, environmental and financial dimensions, but funding models for NbS investments seem to be largely stuck on grants and government funding. How can we better convey the benefits that NbS projects produce, link those benefits to their actual beneficiaries, and attract funding from them to expand the NbS estate? Furthermore, (3) we will also explore Sustainable Asset Valuation (SAVi) methodology that allows to evaluate the financial attractiveness of nature-based infrastructure.

Speakers:

Ernesta Mačiulytė has recently graduated from the University of Hohenheim with a M.Sc. in Bioeconomy. She is currently working at Fraunhofer IAO as a Research Assistant supporting the Urban Nature Labs (UNaLab) project by investigating the innovative business models, financing strategies, and governance aspects of NBS.

Oshani Perera is a Director, Public Procurement and Infrastructure Finance Programme at the International Institute for Sustainable Development (IISD). Oshani leads IISD's work on public procurement and infrastructure finance. She advises policy makers on planning, procuring and financing of sustainable infrastructure and innovative solutions to share risks between public and private counterparties. She serves on the OECD Expert Groups on Public Procurement, Green Finance and Long-Term Finance and on the B20 Task Force on Infrastructure Finance. Oshani also works on expanding the use and scope of the Sustainable Asset Valuation (SAVi) developed by IISD and the MAVA Foundation. Before working with IISD, Oshani worked with McKinsey and Company on foreign direct investment and KMPG Sustainability Services on sustainability reporting and the advancement of corporate social responsibility. Oshani holds a BSc in Business Administration from the Cornell University, USA and University of St Gallen, Switzerland, a MSc in Natural Resource Management from the University of Strathclyde, Scotland, and a MSc in Environment Technology from the Imperial College of Science Technology and Medicine, UK. She is also an Associate of the Trinity College of Music and Drama, London.

Kym Whiteoak is an environmental economist with Trinomics, with expertise in the identification and quantification of benefits produced by NbS investments in cities, and the use of this information in business cases for green infrastructure investment. Kym often works with cities and governments to identify NbS projects that produce highest value for money from a whole-of-society perspective, and develop business cases for these projects with multiple funding streams.

Questions:

1. What could be the key barriers the cities face when procuring NBS? What are the key competencies and support mechanisms for successful procurement of NBS?

- a) Do procurers understand what NBS are/ what options are available on the market?
- b) Do procurers have the technical expertise to set criteria and evaluate bids? Are planners/ architects sufficiently involved in the procurement process?
- c) What is needed to promote the shift towards “best value” approach away from “lowest cost” mentality in selecting the procurement criteria?
- d) How easy is it for procurers to compare lifetime costs between grey infrastructure and NBS? Do they have access to the necessary data and tools to make these comparisons and assess bids?

2. Can Green Public Procurement (i.e. the procurement of goods, services and works with a reduced environmental impact throughout their lifecycle) be used to improve the implementation/ long-term performance of a NBS?

- a) What elements of an NBS implementation can be improved through green requirements on work carried out by contractors, materials used in construction and remediation activities, etc.
- b) Can Contract Performance Clauses be used to ensure long-term performance of the NBS?
- c) Is there scope to use innovation procurement procedures? How much flexibility should the market be given to propose new NBS solutions when bidding?

3. To what extent GPP could support the mainstreaming of NBS implementation?

- a) Are procurers encouraged to think of NBS as standard practice when procuring? Are NBS included in policies and building/ urban design standards? Do procurers have support from managers and city leaders to invest in NBS.

Session 3: Local planning regulation and bottom-up governance for NBS and sustainable land use management

Moderation: Claudia De Luca, University of Bologna

Email: claudia.deluca5@unibo.it

Session description:

This session aims at better understanding how NBS and ecosystem services can be further and better integrated into local planning process and governance schemes. The session will be divided in two different blocks. In the first part, three short presentations of cities that are following paths towards a better integration of NBS in different parts of EU will be presented:

Giovanni Fini (City of Bologna) will present the overall process of the Urban Agenda for the EU, co-lead by the city of Bologna and the Ministry of economic development in Poland, and the most relevant actions to be implemented in Bologna in the next months.

Sanja Jerković (City of Zagreb) will present the work of the city both in relation with the Urban Agenda process and through its involvement in the H2020 funded project ProGleg
Åke Hesslekrans (City of Malmö) will focus on the plan for the New Harbour in Malmö where NBS will be implemented by private companies.

After these presentations, participants will be divided into three groups according to different selected topics: competing priorities in land use, participatory process and bottom-up governance and planning instruments and minimum legal requirements. Participants will be invited to interact and provide their views on the topics presented by the facilitators.

The session will be moderated by Claudia de Luca (UNIBO) and Heather Elgar (WENP).

Speakers:

Giovanni Fini is an Environmental quality project coordinator for the city of Bologna. He holds a degree in civil engineer and a PhD in construction and territorial engineering. He has been working since 1998 in the Municipality of Bologna where he is responsible for the Office of Plan and Manager of the Environmental Quality Unit. In 2012 he coordinated the work for the preparation of the SECAP (Sustainable Energy and Climate Action Plan) and is the contact person of the "Bologna Smart City" working group. He was also the responsible of the LIFE-BLUEAPP project that led to the development of the local climate adaptation plan of Bologna. From 2017 he is coordinating on behalf of the City Council at the Urban Agenda for the EU partnership on Nature Based Solutions and Sustainable Land Use.

Sanja Jerković is Head of City of Zagreb City Office for Strategic Planning and Development of the City since December 2016. Sanja was born in Labin, Croatia in 1977. She studied architecture on IUAV Venezia where she graduated in class of prof. Semerani, post graduate study in the Technical University Delft. In her years long practice from year 2000. Sanja worked at Architectural University IUAV Venetia, Faculty of Architecture University of Zagreb and Faculty of Architecture Technical University Delft as an honorary assistant, scientific researcher and lecturer. Previous work experience also includes working for architectural biros AG Planum d.o.o. and Masa project d.o.o. Parallel to her scientific work Sanja worked as an expert architect focused on the urban development themes, residential architecture, infrastructure and underground architecture. Sanja was an executive director and coordinator of numerous national and international expert conferences and congresses (congress of Croatian Architects, EXPO Milano – City of Zagreb exhibition in 2015 etc.). Coordinator of Croatian exhibit on XI. International architecture show, La Biennale di Venetia project leader on the XIV. Republic of Croatia exhibit. Main executive of the City of Zagreb candidature for European Capital of Culture 2020. Sanja

was the youngest president in the history of Croatian Society of Architects, founded in 1878., through two mandates in 2013. and 2015.

Åke Hesslekrans is an architect working for the city council of Malmö under Strategical Department, city planning office. Employed since 1999 as planning architect, project leader, head of planning unit and now as strategic architect developing implementation processes.

Questions:

- How to favour NBS in land use competing priorities?
 - How to support decision makers in defining priorities for land use favouring NBS?
 - How to face the increasing issue of green gentrification? Discussion on existing good practices and tools
- Participatory process and bottom-up governance
 - How to boost co-ownership and engagement of citizens in maintenance and implementation of NBS?
- Planning instruments and minimum legal requirements
 - What are the legal/governance barriers for the further uptake of NBS?
 - Can minimum legal requirements and planning standards boost the further uptake of NBSs?

Day 2, April 5th

Climate Change Adaptation and Mitigation by Nature Which issues for urban ecology, urban quality and wellbeing?

The stakes to face climate change, combined with the context of increasing urbanization, call for considering the possibilities of adaptation and urban mitigation to environmental issues while ensuring the urban quality of the metropolises that have become the main environment for people.

In this perspective, nature, and more specifically Nature Based Solutions, offer prospects for resilience and improvement of the urban quality of urban spaces. This question involves a new urban paradigm which relies on nature-culture reconciliation. This recomposition nature-city supposes and relies on a new apprehension of the relations between humans, nature and city.

Reconciling the place of nature with the development of cities and inhabited environments emerges as a lever for designing urban environments more resilient. Nature is not reduced to the idea of a city of nature, symbol of the antithesis of the technological artifact.

Nature, nature Based Solutions, NBS, can constitute a new way of thinking more resilient cities to face climatic hazards, but also to answer to the challenges raised by metropolisation. Nature is then considered in its global sense; "One nature". Urban nature doesn't only refer to vegetation, wildlife or artificial nature. It refers to the four main categories of natural elements: water, land/soil, air and fire/energy.

Nature-based solutions are more or less innovative according to historical strategies for adapting human societies to their natural environment and their hazards. They are based on an eco-systemic approach, on the observation and mobilization of the understanding of nature to adapt inhabited environments and reduce vulnerability to climate issues and events. For us, NBS constitute a first step to rethink the Nature of urban spaces. They question the scientific and political horizons since they impose, suppose, require redesigning the anthropic vision of nature in its relation with inhabited, constructed spaces; the city.

The objective of this forum is to cross the interdisciplinary scientific viewpoints with those of engineers and urban policy stakeholders in order to understand the levers and the possibilities for considering Nature (NBS) as a vector of urban resilience, improvement of urban quality, and well-being.

Friday 5th April

8.30 - 9.00 Welcome and Registration

9.00 - 10.30 Nature for urban adaptation and mitigation to climate change

Sébastien Maire (General Delegate for Ecological Transition and Resilience of the City of Paris), Gilles Boeuf (University of Pierre and Marie Curie), Sandra Naumann (Ecologic Institute), Chris Younes (Laboratoire GERPHAU - ENSA Paris la Villette)

10.30 - 11.00 Coffee break

11.00 - 13.00 Dialogue 3 - Parallel sessions: Can nature enhance urban resilience?

1 - Can nature support quality of life and resilience?

Ricardo Garcia Mira (University of A Coruna), Morgane Colombert (EIVP), Sébastien Maire (Oasis Project, General Delegate for Ecological Transition and Resilience of the City of Paris), Lise Bourdeau Lepage (University of Lyon)

2 - Can green housing quality encourage to resilience?

Alain Zarli (ECTP), Rick Bell (City of New York), Maeva Sabre (CSTB), Alain Maugard (Energy Renovation Program, French Minister)

3 - Can nature and landscape contribute to resilience?

Paris Sansoglou (EUDA), Andrea Voskens (Room for the Wall, Nijmegen), Philippe Moutet (Regional Nature Parks), Barbara Bonnefoy (University of Nanterre)

13.00 - 14.00 Lunch break

14.00 - 16.00 Dialogue 4 - Parallel sessions: Can “(re)naturation” contribute to urban climate change adaptation and mitigation?

1 - How could biodiversity and ecosystem be a factor of climate change adaptation and mitigation?

Frédéric Lemaître (Biodiversa FRB), Sunandan Tiwari (ICLEI), Marc Barra (Agence régionale de la biodiversité Ile-de-France), Ghazlane Fleury (University of Nantes)

2 - Can urban forests support cities to climate change adaptation and mitigation?

Carine Bernede (City of Paris), Raffaella Gueze (City of Bologna), Serge Muller (Museum National d'Histoire Naturelle, Paris), Lorenz Dexler (Topotek1, Berlin)

3 - Can ecological urbanism create urban quality and atmosphere?

Sylvie Laroche (AAU-Cresson & CSTB), Jerome Defrance (CSTB), Andre Butz (BENE Program, City of Berlin), Magali Paris (ENSA Grenoble)

16.00 - 16.30 Coffee break

16.30 - 17.30 Plenary session: Adaptation to climate change, ecological issues, urban quality and well-being

Emeline Bailly, Dorothee Marchand (CSTB), Enric Pol (University of Barcelona), Nathalie Blanc (University Paris Diderot), Luc Schuiten (Atelier d'architecture Schuiten)

17.30 - 18.00 Concluding remarks

Julie Delcroix (European Commission),
Pénélope Komitès (Deputy Mayor, City of Paris),
Nikolaos Nikolaidis (ThinkNature),
Dorothee Marchand and Emeline Bailly (CSTB)

Plenary session: Nature for urban adaptation and mitigation to climate change?

Animation: Sébastien Maire, General Delegate for Ecological Transition and Resilience of the City of Paris

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Sébastien Maire is the General Delegate for Ecological Transition and Resilience of the City of Paris, and is former Chief Resilience Officer (CRO). As an expert in local authorities' management, he used to be both an elected official (deputy-mayor of his birth town, in charge of university and international relationships) and an administrative director in other French municipalities (for economic and local development). From 2008 to 2014, he had to manage many kinds of crisis, especially social ones, as the Mayor's chief of staff of a major yet poor city in Paris' suburb. In 2015 he graduated with a Master degree in Innovation management in public organizations and policies at the age of 40. He's a specialist in sustainable development and urbanism, and territorial governance. As Paris CRO, and member of the 100 Resilient Cities network, he has been building the city resilience strategy with a wide panel of stakeholders, in two main directions: how to strengthen social cohesion and the dwellers' preparedness to face any kind of crisis, and how to adapt middle and long term urban planning and development to the consequences of climate change.

Since February 2019, he is the General Delegate for Ecological Transition and Resilience of the City of Paris. He now coordinates the implementation of the climate, air quality, circular economy and resilience policies.

Gilles Boeuf, Biologist, University of Pierre and Marie Curie

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Gilles Boeuf is full professor at Sorbonne University where he carries out his research within the research team « Integrative biology of marine organisms » at the “Laboratoire Arago”, Oceanological Observatory of Banyuls (OOB), in the Pyreneans, on the Mediterranean Sea. He spent 20 years at the French Research Institute for Exploitation of the Sea (IFREMER) in Brest. He was the director of the OOB for 10 years, and from 2009 to 2015 he was chairman of the National Museum of Natural History (MNHN) in Paris. He was also an invited professor on the chair «Sustainable Development, energy, environment and society» at the Collège de France for the academic year 2013-2014, devoting his lessons to the subject of « Biodiversity and its interrelationship with humankind ».

In 2015-2017, he was scientific advisor for life and wildlife sciences, climate and ocean for Ségolène Royal, minister of environment, energy and sea. Presently, he is member of the bureau of IPBES, International Platform for Biodiversity and Ecological Services of United Nations and the chairman of the Scientific Board of the French Agency for Biodiversity. In 2013, he received the Albert 1st great medal for his career, devoted to the sea and the ocean.

GB is a specialist of marine and terrestrial biodiversity and environmental physiology. He is the author of more than 400 publications including scientific popularisation, book chapters, lectures and he is often invited in France and abroad. He took part to more than 140 missions abroad in more than 100 countries in the world. He participates to many lectures, either public or devoted to community staff, institution, Universities and firms on various subjects: ocean life, living resources, the role of water in life, biodiversity and on the influence of climate change on the living.

Sandra Naumann, Geocologist, Ecologic Institute

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Nature-based solutions – An effective approach to increase cities’ climate resilience?

Cities are increasingly rethinking their development concepts to more effectively address societal challenges, not least by exploring and employing nature-based solution. Climate change adaptation and mitigation as well as biodiversity conservation, social equity and human well-being are amongst the most urgent urban challenges. A recent inventory of nature-based solution case studies from the NATURVATION project reveals the variety of such solutions being implemented at local level and their contributions to tackling these challenges. But are such local, site-specific examples sufficient to transform a city into a climate-resilient city? What are critical factors for achieving a wider transformative effect in urban and surrounding areas? What are the limits to the role that nature-based solutions and similar approaches can play in city-wide transformations?

Sandra Naumann is a Senior Fellow at Ecologic Institute and coordinates the Institute's activities on biodiversity. Her work focuses on the evaluation and enhancement of European and national policies on land use, soil, and biodiversity conservation as well as their link to climate change. She is particularly interested in nature-based solutions (NBS), green and blue infrastructure and ecosystem-based approaches to climate change. Sandra is currently exploring the linkages between NBS, biodiversity and ecosystem services, with a particular focus on the policy and institutional contexts, barriers to NBS implementation, citizen’s perceptions of urban nature as well as the development of policy options to foster NBS. These aspects are addressed within the EU H2020 projects NATURVATION (‘Nature-based Urban Innovation’) and CLEVER Cities, the BiodivERsA ENABLE project and the EUKI project ‘Climate NBS Polska’. As a member of the expert group on “Nature-based solutions and renaturing cities”, she supported the European Commission Directorate-General for Research in developing a European policy and research agenda for nature-based solutions.

Chris Younès, Urban Philosopher, Laboratoire GERPHAU – ENSA Paris-la-Villette and professor at Ecole Spéciale d'Architecture, Paris

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Synergic resilience by nature: reviving and interlinking

The anxiety linked to the devastation of ecosystems and the growing awareness of the finiteness of planet Earth, of its vulnerability and that of humans, insistently leads to questions concerning the sustainable relationships to be established between nature, *techne* and society. The art of human settlements has always established relationships with the natural *milieu* which are both interior and exterior ones, whether it is by controlling it to better use it to the point of blindly exploiting it, by keeping it at a distance due to fear or respect, or by attempting a symbiosis. The current debate concerning the regenerating capacities of urban *milieus*, their resilience, reveals most particularly the crucial issues of reconfiguring these territories. If being modern, as deemed by the Athens Charter, was to favour the 'tabula rasa' and to free oneself from the context, the challenge from now on is to understand and to imagine other possible elements from the resistances and resources of the *milieus*: different types of alliances aiming to capture, reveal, treat with care and revive whilst at the same time taking into account the geographic, tectonic, atmospheric, biological, cultural elements.

There are possible choices. Beyond representations which consider nature as a lost paradise or a hostile environment, and humans as disturbers or masters of the world, the quest for appropriate natural-artificial rhythms constitutes an aesthetic *oeuvre* and a critical ethic: establishing a lively relationship between nature and culture, life and *techne* by exploring different paths of regenerating synergies. Broadly speaking, thinking about rhythms and timeframes in architecture means thinking about the incessant metamorphoses of inhabited environments, it means rediscovering the underlying naturo-cultural energies or vibrations and the articulations of space and time, the importance of cycles and recurrences. But it also means remembering that man is a being in motion and one needs to leave room for the unpredictable in designing living spaces. It is a central challenge for architects and urban designers to introduce this paradigm of urban and architectural synergies.

We are thus invited to think in terms of interdependence, of totality and evolutivity, of composite totalities, of interactions.

Chris Younès, PHD philosophy, is specializing in «*architecture des milieux*» (ADM), and serves as a professor at the École Spéciale d'Architecture (Paris). Founder and member of laboratory, and of the PhilAU (Philosophy, Architecture, Urban) international network. Her researches are located in the interface between aesthetics and ethics; between nature and artifact. Among her publications : *Ville contre-nature* (La Découverte, 1999) ; *Philosophie de l'environnement et milieux urbains* (La Découverte, 2010) ; *Recycler l'urbain* (MétisPresses, 2014) ; *Ressources urbaines latentes* (MétisPresses, 2016) ; *Au tournant de l'expérience. Interroger ce qui se construit, partager ce qui nous arrive* (Hermann, 2018) ; *Architectures de l'existence* (Hermann, 2018) ; *Synergies urbaines* (MétisPresses, 2018) ; *Villes et architectures en débat. European* (Parenthèses, 2019).

Parallel sessions: Can Nature enhance urban resilience?

Session 1: Can nature support quality of life and resilience?

Animation: Ricardo Garcia Mira, Professor of Social Psychology, University A Coruna
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Dialogue on Nature-based solutions to face climate change in urban environment: quality of life, urban quality and well-being

Quality of life refers to the set of conditions contributing to make pleasant and valuable our life. According to the WHO (1995), it also refers to the degree of happiness or satisfaction experienced by an individual or group, specifically with regard to health and its domains. From our recent research we have learnt that contact with nature may have both a direct effect on health as well as acts as a facilitator of healthy behaviour. We have found evidence suggesting direct and indirect impacts on the health effects of NBS. A number of research studies demonstrate that green areas as well as other green/blue solutions foster physical and mental health not just through providing opportunities for exercise, but also fostering meaningful and constructive social contacts or mutual knowledge (Kaiser *et al.*, 2013), what might enhance perceptions of neighbourhood quality (Hidalgo & Hernandez, 2001). Living in a green neighbourhood is linked to higher levels of self-reported health, happiness and robust predictor of overall neighbourhood satisfaction. Furthermore, exposure and closeness to urban green spaces are related to lower levels of stress (Hartig & Kahn, 2016). In general, the restorative effects of nature experiences have been studied within the framework of two major theories: Attention Restoration Theory (Kaplan & Kaplan, 1989) and Stress Reduction Theory (Ulrich *et al.*, 1991), focused on the recovery of intrapersonal resources that have diminished due to adaptation to environmental demands, stressors and challenging tasks. Exposure to nature triggers positive reactions involving both physiological and emotional changes which facilitate psycho-physiological stress recovery.

Cities are facing a series of social and environmental challenges that go from the reduction of the most negative impacts of climate change to manage inadequate infrastructure for addressing these challenges. Climate resilience is necessary in order to help cities in adapting to climate change, but also in planning to make this adaptation not considering the impacts as side issues, but as part of a comprehensive plan which considers locally adapted projects into every aspect of the urban development (land use planning, transport, or housing decisions). Our own research on NBS is evidencing knowledge gaps, barriers, and opportunities for action. NBS aim to address a series of environmental challenges, through specific objectives and actions. Each action has an associated set of expected impacts, that require a set of indicators associated with climate resilience for targeted quantification of benefits. Some of them have been implemented on urban green infrastructure projects and tended to be focused on climate change adaptation or mitigation. Adaptation focused on temperature reduction and providing urban comfort zones for urban communities, using ground level greenspace and trees (Demuzere *et al.*, 2014), or green walls and green roofs (Baro *et al.*, 2015). More holistically, implementation of a climate resilience strategy was also considered as a very useful indicator for measuring change (Bosch *et al.*, 2017).

Ricardo García Mira is a Professor of Social Psychology at the University of A Coruna, Spain, where he leads the People-Environment Research Group since 1995. He has conducted applied research in environmental issues during the last 25 years. He is also a Visiting Professor (2016-2020) at the *Institute for Policy Research of the University of Bath*, UK. He was elected as a Fellow of the

International Association of Applied Psychology and he was invested Doctor Honoris Causa by the University 'Alexandru Ioan Cuza' of Iasi, Romania. Recent research: European Commission FP7 and Horizon-2020 programmes. He has been the Project Coordinator of the GLAMURS project (2014-2016), as well as the LOCAW project (2011-2013), and a partner of the TRANSIT project (2014-2017). Current research: He is a partner in the European research Consortia: CONNECTING on Nature Based Solutions for Cities, and SMARTEES on Social Innovation. He is the Past-President of the *International Association for People-Environment Studies* (2014-2018) and he is the current European Editor of the *Journal of Architectural and Planning Research*. In the last years he was elected a Member of the Parliament of Spain (2015-2019), where he is the Spokesman in the Commission for the Study of Climate Change.

Morgane Colombert, Engineer, EIVP

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The place of adaptation to climate change in Parisian urban planning: from regulation to experimentation

Adaptation to climate change is a recent issue in comparison with the issue of mitigation. As a result, adaptation measures are not yet as well structured and of lesser scope. The time is still today to implement punctual measures and adjustments of practices, rather than to deeper transformations. Several studies make it possible to analyze the multiple obstacles that are at the same time technical, organizational, cognitive, cultural, political, contextual, etc.

Following the 2003 heat wave that had shown its vulnerability, the City of Paris has committed to improving its territory and structured its actions to adapt to climate change. In addition, its actions are linked to other issues - biodiversity, resilience, food, etc. - which contribute to the increasingly important consideration of this long-term challenge.

Step by step, the City of Paris has organized itself to propose an ambitious policy in terms of adaptation to climate change. After having identified the major issues for its territory (protection against flood risk, refreshment of the city, promotion of a more local food supply and energy production, or anticipation of the risks of drought and scarcity of water) and highlighted the points of vigilance and actions to be carried out, the City of Paris was able to gradually implement different kinds of measures. Thus, between the first climate plan of 2007 and that of 2018, the issue of adaptation to climate change has evolved, consolidated and integrated new issues. This strategic document allows to organize several actions to engage the City of Paris and its territory in the adaptation to climate change.

Thus, the appropriation of climate change adaptation is carried out at different administrative levels: from the territorial strategy document (climate plan, adaptation strategy, resilience strategy, etc.) to experiments (call for projects, vegetated streets, pavement irrigation, etc.) and via large-scale projects (development projects, mapping of fresh areas, etc.). While some professionals are expecting more restrictive regulation as well as limiting greenhouse gas emissions, many do and are engaged in a better integration of climate change adaptation in their activities.

What is interesting to observe is that far from fully integrating this issue into regulatory documents such as the Local Urban Plan, the City of Paris supports this commitment through more agile structures: the Paris Urbanism Agency (Apar), Paris Climate Agency (APC), Paris & Co, etc.

Today, the Parisian experience shows the necessary steps to adapt a territory such as levers and brakes to achieve a complete transformation of it. This analysis makes it possible to point out the necessary cross-cutting of actions to adapt to climate change with issues identified as more in line with citizens' aspirations: well-being in cities, health, resilience, etc. This is also reflected in the actions implemented, which will not only reduce the climatic impact of change (by fighting against heat islands, for example), but also affect the vulnerability of the inhabitants and users of Paris.

Morgane Colombert is assistant professor in the Lab'Urba laboratory at Paris-Est University and head of Energy and climate Division at the Engineering School EIVP. Her research focuses on urban

engineering, urban environment, urban development, energy efficiency and adaptation to climate change. Within the various research projects carried out with French and European partners, she develops a research related to the action of professional actors of urban planning (local authorities, planners, etc.). With the prism of energy and climate issues, she assesses the actions implemented today by local authorities and urban stakeholders and, to do this, she develops new simulation tools, new indicators or new methods. She also analyzes the operational and planning tools available to urban stakeholders for incorporating energy and climate issues into their activities and strategy.

Sébastien Maire, General Delegate for Ecological Transition and Resilience of the City of Paris

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Paris Resilience Strategy: the oases Schoolyards:

The city of Paris is facing numerous challenges regarding its potential resilience: air pollution, climate change, terrorist threat, inequalities and social cohesion, risks related to the river and territorial governance.

This presentation will focus especially on one project of the city of Paris, which is part of the resilience strategy: the oases schoolyards, which mean to cope better with heatwaves, favouring the creation of “cool islands”.

Session 2: Can green housing quality encourage to resilience?

Animation: Alain Zarli, Secretary General of ECTP

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Green housing defines a type of housing designed to be environment-friendly and sustainable. Green housing focuses on the reduction of energy use but also on the use of sustainable resources that will provide comfort and well-being of the inhabitants. Thus, green housing can provide environmental, economic and societal benefits. The session will focus on how green housing can encourage and/or create resilience in cities among various aspects: urban, social, environmental, climatic.

Dr. Alain Zarli has been Head of the “Innovation Numérique pour la Construction” division at the Centre Scientifique et Technique du Bâtiment (CSTB) and in the “Technologies de l’Information et Diffusion du Savoir” department (Sophia-Antipolis - FRANCE), and acting as European Affairs manager in CSTB. He is now Managing Partner at R2M Solution, and is Secretary General of the *European Construction Technology Platform* (ECTP) since 2016. His main fields of interest are programming languages and compilation, product modelling, rule-based languages and knowledge-based systems, distributed architectures, software components, and technologies for smart constructions – and their broad application to the Built environment and the Construction industry. He has been the Project Coordinator of various FP5, FP6 and FP7 projects, including the IST ICCI and ROADCON projects, and the REEB project establishing a roadmap to ICT-enabled Energy Efficiency in Buildings and construction. He has been in support for a long time of ECTP initiatives (the E2B cPPP, and the “Energy & Efficient Buildings”, “Active Ageing & Design” et “Infrastructures & Mobility” Committees) in roadmapping and impact assessment. He is acting expert for the review of European R&D projects on behalf of the European Commission and has been participating in the European Commission Advisory group for ICT Infrastructure for energy-efficient buildings and neighbourhoods for carbon-neutral cities. He has been acting as leader of the “Open Data” Action Group in the European Innovation Partnership Smart Cities and Communities (EIP SCC), and is contributing as expert to both the EIP SCC Operational Implementation Plan, in particular in the “Sustainable District and Built Environment” Action Cluster.

Rick Bell, Architect, City of New York

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Nature in the City: Can green housing quality encourage resilience?

Sustainability means more than reducing energy use and greenhouse gases. Projects can bring nature closer to city residents, while using natural systems to slow flooding and filter polluted runoff. Resilient design sets priorities for addressing the principal hazards that threaten New York City’s infrastructure and buildings, including public housing. Municipal agencies and authorities in New York are minimizing greenhouse gas emissions through dramatically reduced building energy use in both new construction and renovation. On building sites and infrastructure projects, design threads natural systems and habitats to manage stormwater and add the benefits of nature.

Opportunities abound to create habitats for plants and animals. These can include bird-friendly planting areas, along with bioswales and green streets to help filter pollutants and aid infiltration, minimizing the release of water into the sewer system. Runoff from severe rain can be held in landscaped basins, rooftops and recessed playgrounds. Green or blue roofs, tree canopies and plantings in public spaces are among many tactics that can dissipate severe heat.

Resilient design delivers projects capable of adapting to change. Resiliency means preparing the City's public buildings and infrastructure to maintain service, and to rapidly rebound from extreme events. The chief known hazards to the City's built environment are storms and flooding of increased frequency and greater severity, extreme heat, extreme cold and human caused tragedies. Some resiliency challenges develop over time, such as hazards from sea level rise and critical systems that are not maintained. Design can not only make us safe, but can also build communities, enhance neighborhoods and invite investment.

Public housing serves 400,000 of New York City's lowest-income households for whom there are few housing alternatives. The New York City Housing Authority (NYCHA) provides almost three quarters of the rental apartments that cost less than \$500 per month, and more than half of those that rent for less than \$800 per month. Yet the future of New York's public housing is threatened by decades of disinvestment.

NYCHA is the largest residential landlord in the City. Its public housing stock includes 178,000 apartments in 328 developments made up of 2,550 buildings containing over 175 million square feet of space. NYCHA's public housing units comprise 8 percent of New York City's rental housing stock and are in such high demand that they boast an average vacancy rate of less than one percent.

NYCHA's Sustainability Agenda is a commitment to create healthy and comfortable homes that will withstand the challenge of climate change. As New York's largest low-income housing provider, and the largest public housing authority in the nation, NYCHA is acting now to blunt the impact of climate change on its portfolio and its residents.

The vast majority of NYCHA developments are located in areas subject to more than their fair share of polluting industrial, municipal, and commercial infrastructure. Further, NYCHA serves thousands of vulnerable residents, including children and seniors whose health is threatened by airborne pollution. Climate change is expected to exacerbate health risks of all types. If the aftermath of Hurricane Sandy is any indication, low-income people will suffer from climate change disproportionately.

Examples of current and planned work at public housing sites will be shown, along with other sustainable housing design projects.

Rick Bell, FAIA, serves as Deputy Director of the recently-created Center for Buildings, Infrastructure and Public Space at Columbia University's Fu Foundation School of Engineering and Applied Science, where he is also an Adjunct Associate Professor. From 2015 until 2018 he served as Executive Director of Design and Construction Excellence at the New York City Department of Design and Construction. Among his responsibilities at DDC were strategic planning for design and construction excellence initiatives, including the creation of the Guiding Principles for Design and Construction Excellence. Rick served as Executive Director of the New York Chapter of the American Institute of Architects and the Center for Architecture from 2001 until 2015. He was instrumental in establishing and animating the Center for Architecture on LaGuardia Place. At AIANY he created programs, publications, and exhibitions on topics including active design, affordable housing, building material innovation, sustainable buildings and infrastructure, and transit-oriented development. Rick also was an architect and partner at Warner Burns Toan Lunde Architects & Planners (1979-1994) where he was chief of the studio designing libraries, public schools and university structures nationwide. He is a graduate of Yale College and Columbia's Graduate School of Architecture, Planning and Preservation.

Maeva Sabre, Climatologist, CSTB

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The European GROOF project groups 11 partners from 5 countries (9/2017-08/2021). This project is an innovative cross-sectoral approach to reduce CO2 emissions in the construction and agricultural sectors by combining energy sharing and local food production. The idea is to use a greenhouse on rooftop as a tool for (1) recovering actively the produced and not consumed heat generated and otherwise lost by the building that supports the structure (through the ventilation system) and passively (30% heat lost through the roofs on average) in vegetables and herbs production, (2) collect CO2 produced by human

activity and building activities to "feed" the plants, (3) reduce transport-generated CO₂ emissions by producing plants locally. The project will aim specifically at (1) identifying and reducing barriers to market access (urban planning rules, technical regulations, insurance, etc.), (2) supporting first users in the implementation of their project, (3) experimenting and demonstrating the effectiveness of technology for a representative number of business and social models. The originality of GROOF is to invest in four pilots, designed to prove the effectiveness and durability of the models related to different building types.

Maeva SABRE is a climatologist in charge of studying the impact of climate on structures and is currently senior engineer at the CAPE department of the CSTB in Nantes. She joined CSTB in 2001 and has over 20 years' experience in climatology & meteorology, climate transfer and climate change, extreme climates (statistics of extreme values), physics and chemistry of the atmosphere, wind energy, erosion, turbulence and structure of the wind. During the last 10 years she specifically worked on the urban climate and the role of vegetation using different approaches such as experimentations (on-site and in wind tunnels) and simulation/modelization.

Alain Maugard, Engineer, QUALIBAT

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How does Green Housing Quality encourage Resilience, biophilia and biodiversity?

A necessary step towards resilience.

Green infrastructures have been shown to be efficient to fight heat island effects and be contributing to rainwater harvesting. In that perspective, 0.5 to 2°C temperature decrease and 20 to 50% decrease of fine particles concentration are expected, as well as the levelling out of hours of rainfalls.

A green building can be qualified as such when it incorporates indoors and shared roof gardens, as well as botanical walls. Among other possibilities, green districts can integrate urban vegetable gardens, urban farms and everything agriculture related.

In tertiary buildings, the workplace can be extended to open and green spaces, giving the possibility to work within nature.

Local governments demonstrated this shared perspective by setting up many initiatives, like in Paris, to "reinvent the city". Let's mention, as an example, the launch of "Natura 2050 – Métropole du Grand Paris" contest.

Facilitate an encounter between "city dwellers" and Nature:

Beyond the objective of more resilient cities, ensuring the encounter with nature is crucial to healthy balanced inhabitants. This refers to the theory of biophilia developed by E.O Wilson, as an innate and genetically determined affinity of human beings with the natural world.

In 2009, Unep-Ipsos revealed in a study that for 93% of the French, contact with plants, vegetables and gardens is important for a balanced life.

This affinity deeply underlines the "city dweller" concern over reconnecting with nature – with which he/she is no longer or poorly familiar. His/her concern is centred around the ability to connect with it on a daily basis, in an immutable temporality.

In that respect, it is necessary to redesign cities and their density by incorporating natural elements and dedicating them sufficient space. However, the solution is not to stop cities' sprawl, source of soils alteration – the solution is to give nature back its place within cities. It means that cities can expand under the condition that they extensively incorporate nature within them.

A biodiversity booster

There is another beneficial and largely under-estimated aspect of greenhouse quality: the rediscovery of the crucial importance of biodiversity.

"Biodiversity in-situ"

Holding on to the theory, Biophilia is shown to be a biodiversity driven phenomenon. By rediscovering biodiversity's treasures and wealth, the "city dweller" is led to be more respectful of its being. Therefore,

the city dweller can be enabler of biodiversity – this is called Biodiversity in-situ or inside. In short, the city generates new animal and plant species as part of a Positive Urban Biodiversity plan.

“Biodiversity ex-situ”

Because of the extensive urbanization of our societies, city dwellers are changing for a nature prone lifestyle – this involves better respect of nature and more responsible consumer habits (see local food movement or locavores).

All in all, this phenomenon urges the restoration of the damages caused by the agricultural revolution by favouring natural selection and single-crop farming. Bio sourced materials in construction processes and buildings are encouraged as well.

Those behavioural evolutions are causing an “ex-situ” biodiversity or “outside” biodiversity.

This ternary analysis is dedicated to buildings but can certainly be easily applied at district and city scales. Those phenomena will surely become key enablers in changing our urbanized societies.

Alain Maugard is an engineer from Ponts et Chaussées. He is currently the President of QUALIBAT and European France. He has been Head of Construction at the ministry of Housing, he directed the Etablissement public de l’Aménagement de la Défense (EPAD) and the CSTB. He specialized in the forecasting of Building and Urbanism, and is the author of several recent publications such as “Regards sur le Bâtiment – le futur en construction”, “Regard sur la Ville Durable”, “Faire société en ville, une utopie réaliste”.

Session 3: Can nature and landscape contribute to resilience?

Animation: Paris Sansoglou, Secretary General of the European Dredging Association

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Landscapes are very varied and are interconnecting sometimes complex human and natural elements, the resilience of which is being tested by the new challenges created from climate change. In this session, a scientist, an expert and a policy-maker will explore, with examples taken from three types of landscapes, coastal, urban and riparian, the importance of a multidisciplinary approach. The goal is to assess the landscape's resilience and how this can be enhanced by well selected Nature-Based Solutions (NBS). To this end, it is necessary to develop an in-depth understanding of the risks and responses in each situation in order to identify optimal solutions. The understanding of how NBS can contribute to the landscape's resilience needs to be integrated and implemented through holistic policies and their effectiveness assessed.

Paris Sansoglou holds a degree of Commercial Engineer from the Solvay Business School (ULB) that he has complemented with degrees in Environmental Studies (ULB), Business Informatics (VUB) and Financial Analysis (CIAF).

His professional experience is varied and includes research (in ULB on sustainable development), statistics (Business Statistics for Eurostat), knowledge management, economic, environmental & financial consulting activities (for Ernst & Young). He has spent most of his career on the 'European' scene working in the European Commission (Eurostat) and in trade associations (representing successively the European manufacturers of synthetic fibres, the European shipyards and now the European dredgers).

Paris developed his strong kinship with maritime policies and technologies since he joined the Community of European Shipyards' Associations (CESA) and now he pursues his passion for the sea and related issues with the European Dredging Association (EuDA) where he is Secretary General since April 2009. He has been managing maritime strategic activities covering research projects (coordinator in FP5 & FP6 and partner in H2020 ThinkNature), trade issues, social aspects, technical and environmental issues, statistics, market monitoring.

As the representative of EuDA, he is promoting approaches like Building with Nature, hence EuDA's participation to the H2020 project ThinkNature (promoting Nature-Based Solutions). In 2013 and 2016, he co-wrote two EuDA papers on Blue Carbon opportunities and strategies for the European Dredgers.

Andrea Voskens, senior advisor and citymarketeer, City of Nijmegen

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Room for the Waal

Between the cities of Nijmegen and Lent, the Waal river makes a sharp bend. The winter bed is very narrow at this point in the river. During extreme high water levels, the location acts as a bottleneck, making it difficult for water to drain away. The project Room for the Waal has solved this problem by moving the dyke at Lent 350 meters land inwards. An ancillary channel is dredged in the flood plain to

help drain the river during extremely high water. This in turn creates better flood protection for the area behind the dyke.

The extreme flooding of 1993 and 1995 made it clear that the River Waal is too narrow to drain away large volumes of water. The problem is especially acute near the city of Nijmegen, where the river is trapped in a narrow winter bed between the dykes. In order to be able to drain away high water, the river needed more space at this point. Together with the municipality of Nijmegen and its residents, Rijkswaterstaat decided to move the dyke landwards near Lent, on the north bank of the river.

Repositioning a dyke is a very radical but also effective and sustainable measure to better protect the watershed against floods. In extreme circumstances, it can even facilitate a reduction in water levels of around 35 centimetres. Moreover, the measure provided an impetus for making major improvements to the city of Nijmegen's spatial quality, as it has created an island in the Waal, a unique river park in the heart of the city. With the island and the ancillary channel, Nijmegen has been given an entirely new landscape with opportunities for recreation and new urban development.

Within the project Room for the Waal, the relocation of the dyke is combined with the construction of an ancillary channel in the widened floodplain. During high water, the water in this channel will flow along with the river. Between December 2012 and the autumn of 2015, workers have dredged the sand and gravel. The channel, three kilometres long and five meters deep, prevents the river from rising too much, and will therefore make an important contribution to protecting the river's floodplain.

Relocating the dyke and dredging an ancillary channel has created a long island in the Waal. Most houses on the river side of the dyke could remain in place. The Island is connected with Nijmegen-Noord through three bridges: two new bridges and an extension of the Waal bridge. These bridges facilitate new urban development on the island.

Room for the Waal required a major alteration to the area. Not only had the dyke to be relocated and new flood control measures to be created, but the island and the ancillary channel together has formed a unique river park. A 1.6 km long slanted quayside forms the new flood control, together with the green banks on the east side.

Andrea Voskens works as a senior advisor economic affairs and citymarketeer for the City of Nijmegen since 2015. Since 2012 she has been a stakeholdermanager for the Room for the River Project (Room for the Waal).

She is graduated in Architecture and worked as an architect designing health care buildings until 2005. After that, she worked as a government official for the building department of the city of Nijmegen and as a project coordinator for complexed building projects.

Philippe Moutet, historian and geographer, Regional Nature Parks

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A regional nature Park is an inhabited rural area or peri-urban area, recognized at a national level for its high heritage and landscape value, which organizes itself around a concerted project of sustainable development, based on the protection and valorisation of its heritage. How to build and test climate control and adaptation strategies inside these network of 53 territories with high environmental and heritage quality?

The French regional nature parks and climate change - Understanding the issues, acting and building shared solutions

For nearly 20 years, the Parks network has been involved in the energy and environmental transition and has been working with local stakeholders to find solutions. Concerning climate change, this dimension is particularly sensitive for coastal territories such as the Camargue or the Gulf of Morbihan. In these territories, climate change is perceptible by all through a disruption of the coastline and a need to rethink the way in which the territory functions in all its activities.

For Parks, exceptional natural spaces that combine urbanization with strong environmental and heritage quality, the issue of resilience is almost existential!

When they are created for a renewable period of fifteen years (duration of a charter), Parks are already in a process of construction and arbitration between development and preservation, conservation and creation, experimentation and maintenance.

Climate adaptation is another challenge they face with a number of assets:

- In order to be classified, Parks must make a detailed territorial diagnosis of the issues at stake in the territory
- the issue of climate change and energy transition and included in all Parks charters
- Parks have a multidisciplinary team that will deal with the subjects without omitting the various issues
- over the past ten years, there has been a real awareness among the population and companies of the notion of quality of life, preservation of the planet and collective responsibility in adapting to the climate and in the fight against this change.

Through one or two concrete examples of initiatives underway in Parks and more particularly in coastal Parks, we can undoubtedly better perceive and understand the articulation between governance and territorial action.

For the Regional Nature Parks of France, the option is not to propose an adaptation in the form of resignation but on the contrary to work on an adaptation that leads to more qualitative lifestyles and makes it possible to pursue the Parks' non-standard mission.

This intervention will attempt to present how Parks is addressing this issue by promoting knowledge, sharing and the development of shared solutions.

Philippe Moutet, historian and geographer by training, is in charge of energy-climate and architecture issues at the Fédération des Parcs naturels régionaux de France.

He leads a network of technicians in all 53 regional nature parks and represents the Federation in various structures dealing with energy and climate issues.

Barbara Bonnefoy, Environmental Psychologist, University of Nanterre
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The positive effects of natural environments

We discuss the positive links between urban environment, health and well-being. The qualities of living environment when it favors a good person-environment congruence, leaving in particular room for the plant and more broadly for the nature, helps the inhabitants, the walkers, the townsmen to regulate the excess of information and of stimuli related to urban life. The environment can, indeed, have a restorative effect. After having defined briefly the notion of quality of the living environment, we will show how the presence of the plant in the city is a source of quality because the benefits of one-off or repeated contact with these environments favor the reconstruction of the attention reserves of the individuals, essential to the well-being. They also make you feel connected to nature.

Barbara Bonnefoy is Associate Professor at the *Laboratoire Parisien de Psychologie sociale, Université Paris Nanterre* since 2001. Social psychologist by training, Barbara Bonnefoy combines her training with the theme of the environment. She is interested in the consequences related to our way of consuming natural resources such as water and energy and reflects on the behaviors to be adopted in order to preserve our environment in the best possible way. Her research focuses on the connection to nature.

Parallel sessions: Can “(re)naturalisation” contribute to urban climate change adaptation and mitigation?

Session 1: How could biodiversity and ecosystem be a factor of climate change adaptation and mitigation?

Animation: Frédéric Lemaître, Biodiversa-FRB

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Nature-based solutions for urban well-being and climate change adaptation and mitigation: What role for biodiversity and ecosystem services?

Nature-based solutions (NBS), ecosystem services and biodiversity have an intricate role to play in cities' climate change adaptation and mitigation strategies. Simultaneously, NBS can deliver improvements in the quality of life in urban areas, i.e. physical, psychological and social well-being of its citizens. Such diverse benefits make NBS a potentially powerful tool for local authorities in responding to climate changes, while delivering valuable co-benefits. The very diversity of these benefits, as well as the trade-offs inherent to the design and management of NBS have called for local authorities around the world to explore new approaches to bringing nature in cities, with a purpose. But does any NBS, any “greening” imply greater urban resilience and well-being? How does biodiversity affect the performance and sustainability of NBS in the context of climate change adaptation, mitigation? And for urban well-being? How can local authorities take advantage of biodiversity and ecosystem services in support of NBS?

This session gathers perspectives from ecology, psychology, practice and local authorities to explore the role of biodiversity for sustainable and resilient NBS, under the prism of climate change adaptation and mitigation in cities and urban well-being. It seeks to exchange with the wider session audience, building on initial perspectives from Marc Barra, ecologist working for the Paris region on the relation between biodiversity, NBS and the delivery of services in response to climate change; Ghazlane Fleury, environmental psychologist working in Nantes and H2020 projects on the links between the use of NBS and well-being in cities; and Sunandan Tiwari, Global projects leader at ICLEI, knowledgeable about how local authorities adapt locally and manage biodiversity in support of NBS.

Key questions to guide this sessions' discussion:

- What evidence is there of biodiversity and NBS supporting successful climate adaptation, mitigation and greater human wellbeing in cities?
- What opportunities are there for local authorities and urban planners to manage biodiversity for more sustainable, resilient and/or efficient NBS?
- What are the current limitations and challenges in introducing more biodiversity in support of NBS in cities?

Frédéric Lemaître is the officer in charge of science-policy and science-society interfacing for BiodivERsA. BiodivERsA is a partnership of European and international research programmers and funders. Together they promote transnational research efforts on biodiversity, ecosystem services and

nature-based solutions, building on excellent science and producing concrete knowledge, tools and recommendations destined to stakeholders from policy and practice. Frederic has a background in European business and environmental economics, a long-standing interest for decoupling economic development and environmental degradation and a wide-ranging experience in building bridges between scientists, policy-makers, practitioners and businesses.

Sunandan Tiwari, Ecologist, ICLEI, Global projects leader

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Nature-based Solutions: A Perspective from Local Authorities

It has become increasingly clear that the cumulative impacts of the three major phenomena of our times, namely, urbanisation, climate change and globalisation, result in disasters and shocks in our cities and their surrounding regions. Cities are recognized as a cause and victim of climate change. Given existing rates of urban growth, it is estimated that we would roughly need to build a city for a population of Beijing every 100 days. Following conventional development pathways to meet these needs will, and are increasingly, exacerbating environmental, social, and economic challenges, and building negative feedback loops.

Given these looming infrastructure needs, cities need to be encouraged and capacitated to assess how they could balance their focus on service provision with that of infrastructure development, and in which contexts they could be synergized by investing in nature-based solutions.

We are working with cities to try and create a shift towards self-perpetuating positive feedback loops, which are broadly defined by investing in nature-based solutions with the dual purposes of improved service provision and improved management and conservation of ecosystems, so that as the latter is increasingly met the former is enhanced, which in turn increases the willingness and interest to continue to invest in nature. This shift is generally made possible with changes across the spectrum of stakeholders in the following closely inter-connected areas:

- Perceptions and understanding of nature, biodiversity and ecosystems and the variety of beneficial services that they provide
- Approach to planning for, designing and creating infrastructure
- Creating a socio-economic case for investing resources in nature

Examples from ongoing work with cities in Brazil – for developing multi-functional connectivity areas and informing the implementation of related legislation, India – incorporating biodiversity management into the annual budgets, and Tanzania – creating tools for facilitating decision making on selecting greening solutions, will help substantiate these points. This will be supplemented by learning on promoting vertical integration for improved biodiversity management, and the CitiesWithNature initiative that comprises of a reporting platform that is being developed for cities share their achievements and aspirations and garner support for the same. This work is being undertaken as part of the IKI funded Interact Bio project.

Sunandan Tiwari leads the global projects team and coordinates the biodiversity work at ICLEI. He manages and supports the implementation of key projects funded by the International Climate Initiative run by the German government. He previously worked in the ICLEI South Asia Secretariat and developed the urban resilience program. Sunandan has a background in ecology with over 20 years of experience across a range of sectors from rural to urban domains.

Marc Barra, Urban ecologist, Agence Régionale de la Biodiversité Île-de-France

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Paris region (Île-de-France County) accounts for 20% of the French population on 2% of the French territory. Climate change in Paris region is a reality: the metropolitan area has faced several flood events in the past years (2016 and 2018) and strong heat waves (2018). At the same time, biodiversity is facing a strong decline in urban areas: common birds populations have dropped by 33% in abundance whereas

butterflies species have declined by 22%. As a consequence, there is a growing interest for nature-based solutions that could address both climate change and biodiversity issues. However, there is still a lack of knowledge about how to design and manage these new ecosystems. The effectiveness of nature-based solutions has rarely been evaluated and stakeholders need to understand clearly the real quantitative and qualitative benefits provided by these ecosystems in terms of ecosystem services (water regulation, carbon storage, habitats for biodiversity). Moreover, what are the links between biodiversity and nature-based solutions? Often seen as one isolated parameter, biodiversity is at the core of ecosystem functioning and services. To address this question, the regional Agency for biodiversity in Paris region (ARB îdF) has carried out a research on green roofs: 36 green roofs have been selected throughout Paris region. We carried out an evaluation of different ecological aspects such as biodiversity and three different ecosystem services (cooling effect, water storage and soil quality). After 2 years of research, we found that all green roofs are attractive for biodiversity, but the composition of species strongly differs between extensive to intensive ones. Intensive green roofs are more attractive to pollinators than others. We also found that semi-intensive and intensive green roofs are more efficient to store water and cool local atmosphere by evapotranspiration than extensive ones. These results help us to understand the real functioning of green roofs and their contribution to climate change adaptation-mitigation and show that the “multifunctionality model” of green infrastructure has its limits as each green roof have specific patterns. This methodology can easily be adapted to other kinds of green infrastructures.

Marc Barra has a degree in functional ecology from Paris University. He works at the Agency for Biodiversity in Île-de-France (ARB îdF - formerly Natureparif), based in the Ile-de-France Institute of Planning and Development. Marc leads projects in applied ecology and solutions for mainstreaming biodiversity into urban planning, architecture and construction. He has written several technical books on the relationship between societies and biodiversity, including "Biodiversity and the building sector" and "Ecological economics : living within biosphere boundaries". Marc gives lectures in ecology at Paris-Saclay University, AgroParisTech, the University of Cergy-Pontoise, UniLasalle Rouen and the Catholic Institute of Paris. He is an administrator of AFIE (French Association of Ecologists).

Ghozlane Fleury-Bahi, Environmental psychologist, University of Nantes

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Biodiversity as an opportunity for well-being in the city

Biodiversity is associated with multiple nature-based solutions like green roofs, collective gardens or water bodies. What are the psychological benefits of urban biodiversity in terms of well-being and quality of life? How could NBS enhance this positive relation between biodiversity and self-reported psychological benefits? The objective of this communication is to discuss these links by presenting results from the city of Nantes and European examples from the Nature4Cities project.

After gaining a PhD in Psychology at the University Paris Descartes, **Ghozlane Fleury-Bahi** became an associate professor at the University of Nantes in 2000. Since 2010, she is full professor of social and environmental psychology at the University of Nantes. Her research focuses on the evaluation of environmental risk, the environmental determinants of quality of life and well-being and prevention in the field of environmental health. Since 2017, she is the head of the Laboratory of Psychology of the Pays de la Loire. As a member of this lab, she is principal investigator and co-investigator of collaborative research projects funded by the ANR (French National Agency of research), the European Commission and the ANSES (Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail).

Session 2: Can urban forests support cities to climate change adaptation and mitigation?

Urban forests are likely to contribute to climate change adaptation and mitigation as they provide several ecological services such as enhancement of air quality, sequestration of carbon dioxide... The benefits of forests and trees in cities are going to be discussed in this session through three different points of view.

Key questions for the discussion:

- 1- What are the main benefits to Climate Change for cities?
- 2- What are the main challenges to develop urban forests?
- 3- How can stakeholders speed up the evolutions? What should be the roles of scientists, policy makers, private sector to involve greater awareness and to develop NBS?

Animation: Carine Bernede, Director of Green Spaces and Environment of the City of Paris

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Carine Bernede, engineer by training, Director of Green Spaces and Environment of the City of Paris, is in charge of managing parks and public gardens, cemeteries and woods, driving the projects of the mayor's mandate until 2020 including targets to open additional 30ha of green spaces, plant 20,000 trees, reach goal of 100ha of greens roofs and walls, develop urban agriculture and to build new strategic action plans (adapting to climate change, climate, air and energy plan, sustainable food systems plan, biodiversity plan)

Raffaella Gueze, Environment and Green Department, Municipality of Bologna

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GAIA- Urban Forestation Agreement

Bologna, like many Southern European cities, is facing draught, extreme temperatures, storms and water scarcity as a result of climate change.

The city of Bologna approved a voluntary local Adaptation Plan to Climate Change in 2015 (BLUEAP life project). The plan focuses on the development of innovative, concrete measures that could be tested locally. One of the successful initiatives improved in the city is called GAIA the "green areas inner-city agreement".

GAIA is a public-private partnership model based on the idea to use financial compensation for the carbon footprint of businesses to plant new trees on the city's territory.

Thus it offers private businesses and NGO's the opportunity to contribute to the financing of the green public areas.

The city of Bologna has developed clear guidelines that detail the different steps that need to be taken in the process and which party is responsible. On signing a statement of intent, the council agrees to plant the trees, cover any extraordinary maintenance costs for the first 3 years. Maintenance costs after the third year are at the expense of the Municipality of Bologna.

About 23 areas such as urban parks, hillside parks and local recreational areas, have been selected for the GAIA Project. They have environmental value in terms of conservation of biodiversity and protection of the territory, and they provide a revitalization of the area and social value, which offered a potential of planting 3,000 trees. Trees are known to be able to provide necessary cooling during heat waves

through evaporation and transpiration, which creates a natural air conditioning effect. They also help to preserve vulnerable areas such as river banks and landslides areas. In addition, green areas can help to decrease air pollution in the city. With the Ibimet-CNR contribution, 24 species were selected. The pre-selection of these species was based on scientific knowledge. The 5 primary objectives for environment included were: CO₂ absorption, potential absorption of gaseous pollutants, potential dust capture, emission of VOCs, ozone formation potential and temperature mitigation. The project was initially tested through a pilot of 116 trees in 3 different typologies of public areas (public park, courtyard, public space). GAIA has realised until now, the planting of 2320 trees in the Bologna city area. This accounts for the mitigation of 6960 CO₂ emissions due to the great interest of NGO in 2017. We implemented a GAIA spin-off project for citizens called Opengaia, a crowdfunding platform. The first initiative was called RADICI, 10 trees were selected and planted in each neighborhood district of the city, about 150 citizens participated and contributed to the success of the campaign. In Spring 2019, thanks to H2020 Rock project, Bologna will launch a new initiative on Public-Private Partnership with a new crowdfunding campaign.

In this case we would like to engage citizens in the greening of private spaces. The pilot project will be the terrace of the Opera House in Bologna “Teatro Comunale” which will be transformed into a pocket garden for the events of the summer program.

Raffaella Gueze has a degree on “Environmental Engineering”. Since 2003 she works at the Environment and Green Sector of the Municipality of Bologna. She is specialised in participatory processes and sustainability projects.

She is technical referent for the Environmental Annual Budget in the city of Bologna.

She is expert as project assistant and technical coordinator on the behalf of the Municipality of Bologna in many LIFE projects : Eco-budget, GAIA- green Area inner city agreement, BLUEAP-Bologna adaptation plan , and H2020 ROCK-Regeneration and Optimization of Cultural heritage in creative and Knowledge cities.

Serge Muller, Biologist, Museum National d’Histoire Naturelle, Paris

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Urban forests, which are dense plantations of trees in streets, squares and parks in cities, provide a lot of ecological services: (1) improvement of air quality and removal of air pollution, by intercepting particulate matter on plant surfaces and absorbing gaseous pollutants through the leaf stomata, (2) sequestration of carbon dioxide during their development, (3) decrease of air temperature under the trees and local climate mitigation, in particular during heat waves, (4) increase of biodiversity (plants, lichens, insects, birds, etc.) and improvement of aesthetic beauty of the urban landscape, (5) enhancement of well-being and health, and decrease of stress of urban people.

However, urban forests can also provide some inconveniences, such as ozone pollution consequently of emission of BVOC (Biogenic volatile organic compounds) or allergy due to tree pollen. These negative aspects are very different depending on tree species.

Therefore, the choice of tree species to be planted in each local context is very important, in the aim of increasing the positive aspects and reducing the possible inconveniences. A tool called i-Tree has been developed since 2002 in the USA in order to select the species which respond to selected criteria. In France a similar tool, called “SESAME” (*Services EcoSystémiques rendus par les Arbres, Modulés selon l’Essence*), is currently been set up for the city of Metz by the CEREMA (*Centre d’Etudes et d’Expertise sur les Risques, l’Environnement, la Mobilité et l’Aménagement*), the city of Metz and Metz-Métropole.

More and more cities are developing ambitious programs of tree plantations. In France, the city of Paris has planted 10,000 trees between 2014 and 2018 and has the aim to plant 10,000 trees more until 2020 and to create an additional 30 ha of green spaces open to the public, as part of its second Biodiversity Plan adopted on March 20, 2018. The metropolis of Lyon adopted a Tree Charter (“*Charte de l’Arbre*”) in 2000, renewed in 2011 and 2016 to address climate change. This charter also includes an exemplary Canopy Plan with the plantation of about 33,000 trees since 2003 and plans to plant another 40,000 by

2030 in the public spaces of the metropolis. The objective is to increase the proportion of shaded canopies in public spaces by 12 to 22% and that of linear canopies planted by 21 to 29%, while favoring a diversity of species to deal with potential risks and hazards. In North America, the city of Montreal, Canada, launched in 2012 the Canopy Action Plan for the planting of 300,000 trees by 2025, in order to achieve a 25% forest cover for the city.

Such ambitious programs will enable these cities to support climate adaptation and mitigation. But it is nevertheless crucial to reduce the emission of greenhouse gases in the aim of limiting climate change.

Serge MULLER is a French botanist, who graduated in 1976 as an agronomical engineer at the Institut National Agronomique Paris-Grignon (INAPG) and achieved in 1978 a PhD in plant ecology at Paris XI University. After his education, he first worked for 3 years at the Parc Naturel Régional des Vosges du Nord. Then he became an assistant professor at the INAPG between 1982 and 1989, and in 1989 a full Professor in botany and plant ecology at the University of Metz. In 2014 he was recruited as a Professor at the Muséum national d'Histoire naturelle, where he was appointed scientific head of the national herbarium. He has an expertise in plant ecology, biological invasions, ecological restoration and urban ecology, with a particular interest for trees in cities. He is also the current president of the French "Conseil national de la protection de la nature".

Lorenz Dexler, Managing Partner, TOPOTEK 1, Berlin

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In the course of planning the new BER Airport in the south-east of Berlin, Tegel Airport was about to be closed and subsequent uses were discussed. In 2008, a basic evaluation commissioned by the Berlin Senate for City Development formed the point of departure for the project, followed by a series of brainstorming, 'site conferences' and workshops. A research and industry-based technology park with the Beuth Hochschule (University for Applied Studies) at its core was envisaged, promoting the design, production, and export of urban technologies for the cities of tomorrow, as well as a smaller section dedicated to housing units. The new site was called Berlin TXL-The Urban Tech Republic.

In 2012, the Tegel Projekt GmbH was commissioned to develop and expand the site, fill around 150,000 square metres of building space and bring in new industrial settlements. Topotek 1 developed the TXL Design Manual, an overall framework that provides Design Guidelines for the development of the site and gives it an identity in order to avoid the usually messy, unattractive look of business parks. The in-between structures – such as roads/streets and trees – play a leading role in structuring and defining the area. Divided into zones, each has a distinctive look and function – including education, production, trade, and housing. The self-imposed rule was: 'Whatever is already there must be preserved. If anything is missing, it is replaced using the materials from the airport: in situ concrete and asphalt.'

Particular emphasis is placed on the selection of trees: Topotek 1 plans to have so-called climate trees on the campus grounds, testing here future urban planting. At the fringes of the area, where there is already a substantial tree population, indigenous trees will be predominant. Trees and roads provide the frame for the new settlements. Building typologies for the private plots have been suggested. Additionally, limitations – for example, building borders and parking solutions – are imposed on buyers and developers.

With TXL Design Manual, an overall framework is created, which encourages diversity while promoting a specific spatial character for each sector. The concept leaves space for interpretation, for disrupted harmonies, as well as inventive growth.

Lorenz Dexler was born in Darmstadt in 1968. He studied landscape architecture at Hannover Technical University. After working at the office of Prof. Günther Nagel in Hannover and at Wehberg Eppinger Schmittke in Hamburg, he began his collaboration with TOPOTEK 1 in 1996. In 1999, Dexler became a managing partner at the studio. He lectures at a diversity of schools and institutions, and frequently serves on international design juries.

Session 3: Can ecological urbanism create urban quality and atmosphere?

Animation: Sylvie Laroche, architect, CSTB & AAU-Cresson

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This session focuses on the potential of ecological urban planning, urban quality and the atmosphere for climate change adaptation and mitigation in cities. We raise the question of the relationship between urban nature, quality of life, well-being and the sensory landscape and their consideration in political strategies. Through this approach to ecological urban planning, it will be a question of paying attention to the living experience in Nature-based Solutions. The three interventions will propose an invitation to immerse oneself in the uses in renaturation projects. More precisely, it will be a question of capturing the ordinary and daily practices of the inhabitants in the urban, social and sensitive forms produced by ecological urban planning. This approach makes it possible to present the spatial characteristics of the places produced and to better understand the capacity of the inhabitants to feel and appropriate the renaturation projects. How do the inhabitants practice these spontaneous or planned developments? How are the aesthetic characteristics of the various situations of daily life taken into account by users? How can renaturation projects promote and train urban opportunities in contemporary metropolitan areas?

The second challenge of the session, related to the living experience and allowing to identify urban qualities and atmospheres in renaturation projects, is the opening to the plurisensory. In the projects presented, attention will be paid to the sensory dimensions of the living. How are sight, hearing, touch, smell and even the pleasures of taste integrated into renaturation projects? How is climatic, visual and sound comfort defined, or even sought in developments defining ecological urban planning? How are these sensory flows perceived by the living and how can they make a sensitive environment habitable and hospitable?

This approach to renaturation through urban qualities and atmospheres will be addressed according to environmental, landscape, social and economic dimensions. Through the three interventions, different forms of interdisciplinarity, or even transversality of disciplines, will be discussed. This approach thus invites us to identify and cross-reference measured and observed data, from the conceived to the lived, from the measurable and the immeasurable, from the tangible to the intangible. The projects presented will examine the consideration of these data at all scales of the territory, from the smallest vegetated area in a urban environment to the largest metropolitan corridor. Based on examples of gardens on the edge of road and rail infrastructure, Magali Paris will present the link between land use planning, gardeners' practices and the urban environments produced. André Butz will present one of the programs of the Climate Change Adaptation through Renaturation (BENE) program in Berlin. Finally, Jérôme Defrance will present the benefits of vegetation on the acoustic atmosphere and their integration into urbanized fabrics.

Sylvie Laroche is a professional architect (orientation research), she holds a doctorate in architecture. She is currently undertaking a post doctorate at the Scientific and Technical Centre for Building, and is an associated researcher at the Centre for research on sound space and urban environment, UMR CNRS 1963 "Ambiances Architectures Urbanités". She regularly teaches at the Graduate Schools of Architecture (of Grenoble and Nantes). Her research themes are centered on the sensory dimensions of the city, to question the transformations of urban spaces. This approach relies on original pluridisciplinary methods, at the crossroads between architecture, social sciences and engineering.

Jérôme Defrance, Physician in Acoustic and Vegetalization, CSTB

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Urban soundscape improvement by use of vegetation

More than half of the residents of large European cities live in areas where it is likely that noise levels adversely affect their well-being and health. The main source of this are roads and railways. Recent research works have shown that vegetation is a promising way to reduce traffic noise in cities. It is however not a quick fix! Combining nature-based solutions is also an issue. In this presentation we will be dealing with urban ground transport noise abatement for an enhanced well-being. The expected acoustical gain of several families of innovative noise reduction means will be presented and discussed: greening the facades and roofs of buildings, planting shrubs and trees, grassing tram tracks. A focus will be done on novel vegetated noise protections: low-height noise barriers, lightweight barriers at bridges, barrier caps and optimized-shape berms. Most findings shown in this presentation have been achieved within the FP7 European project HOSANNA "Holistic and Sustainable Abatement of Noise by optimized combinations of Natural and Artificial means" (www.greener-cities.eu).

Jérôme DEFANCE (PhD Acoustics, MSc Acoustics, MSc HVAC) is currently head of the R&D Acoustics Division at CSTB (French scientific and technical building research center). His domains of expertise are outdoor sound propagation, engineering prediction models for noise mapping, transportation noise, urban noise and innovative noise reducing devices including low barriers. For the past 25 years, he has been involved in many national and international environmental noise projects such as ALPNAP, HARMONOISE, ADRIENNE, CITEDYNE, QUIESST, URBASON and HOSANNA. He is author or co-author of over 170 journal papers and papers in congress proceedings and books.

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BENE – Berlin Program for sustainable development

Funding for Climate and Environmental Protection in Berlin

Berlin has 30 years of experience in promoting environmental protection. In 1990, Berlin was Europe's first region to use European Structural Funds specifically for environmental as well as climate protection.

The current Berlin Program for Sustainable Development (BENE) provides funding for innovative measures, projects and initiatives in the period from 2015 to 2020, which will contribute to a climate-neutral and environmentally friendly Berlin. BENE is co-financed by the European Regional Development Fund (ERDF).

The aim of the program is to sustainably and profitably support the reduction of commercial and public sector CO₂ emissions in order to reconcile economic growth and resource conservation. An environment-friendly infrastructure should accelerate ecological structural change and improve the quality of life and the environment in Berlin.

The program consists of two packages of measures: BENE "Climate" with five funding priorities and BENE "Environment" with two funding priorities.

In selected quarters of Berlin BENE supports green areas and neighbourhood green areas that improve the quality of life. BENE also promotes measures to reduce noise and air pollution in the living environment.

For companies, BENE supports measures that reduce the consumption of process and building energy and increase the share of renewable energies. In public and non-profit organizations BENE also promotes measures to save energy and increase the use of renewable energies. For example, it supports the energy-efficient refurbishment of schools, day-care centers and cultural buildings. BENE supports investments in public transport infrastructure and the development of cycle paths.

BENE was agreed under the Operational Program of the ERDF of the State of Berlin for the period 2014-2020 and approved by the European Commission. Europe will allocate about € 102 million to the BENE Climate part and about € 15 million to the BENE Environment part. Together with state and private funds, around 240 million euros are available for 150 to 200 projects.

André Butz is an engineer for technical environmental protection (Technical University of Berlin) at B.&S.U. in Berlin, where Mr Butz currently leads as managing director the implementation of the Berlin Programme for sustainable development (BENE), a large public support programme in the field of climate protection and environmental protection.

B.&S.U. was founded in 1991 and is active on local, regional, national and international level in programmes and projects concerning environmental and climate actions and the promotion of activities for the adoption of the rational use of energy and the securing of energy supplies for the future. The company has about thirty employees.

With the European Energy Award (eea) the company together with Austria and Swiss designed a quality management system with certification, which supports local authorities in establishing interdisciplinary planning approaches and implementing effective energy and climate policy measures through the rational use of energy and increased use of renewable energies. There are more than 1,500 municipalities participating today. In Germany B.&S.U. acts as federal eea-office and accompanies more than 300 municipalities. In France the programme is called Cit'ergie with more than 100 participating municipalities, coordinated by ADEME, the French Environment and Energy Management Agency.

B.&S.U. elaborated more than 25 municipal climate protection concepts in Germany.

Recently B.&S.U. developed with the European Climate Adaptation Award (eca) a quality management instrument similar to the eea for local authorities focussed on climate adaption issues.

Magali Paris, Urbanist, AAU-Cresson & ENSA Grenoble

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Roadside allotment gardens, well-tempered territories?

Allotment gardens are grouped vegetable plots gardened for non-profit. Their history (end of the XIXth century for the French context) is strongly linked to the history of railways and roads because they were especially located there ("jardins des cheminots") or because they found there the opportunity of a non-coveted land before or after the ways construction.

Our research (2009-2016) focuses on the evaluation of the qualities and the issues of those roadsides territories.

Do they have landscape qualities? Landscape should be outlined here through its atmospheres, its sensory and human dimensions: sightscape, soundscape and taskscape, approached by sound measures and recordings, observations and interviews with gardeners.

What is their (wild) *fauna-flora* biodiversity? Is this biodiversity different from the one of the semi-natural verges? How roadside nature contributes to the ecological network? The ecology of the gardens in their environment has been studied through biodiversity with a survey of *fauna-flora* in presence/absence and landscape ecology with maps analysis.

Are the soil, the air and the crops polluted? Is it healthy to cultivate the roadside? The pollutions of the garden (soil, air and vegetables) have been investigated through *in situ* measures (CEREMA and Agroparistech).

To answer those questions, the « roadside-nature » multi-disciplinary research conducted since 2009 - with the financial support of CNRS, MCC, PUCA, MEDDE and ADEME – set the ambition to cross-reference quantitative and qualitative data, nature and human questionings.

18 roadside allotment gardens, located in France (A480, A41, N87 /Isère and A86, A6, A13/Ile-de-France), Portugal (E1, subway, railway and the express way /Lisboa) and United-States/California (280 and 101 Freeway /San Francisco) and their nearby « wild » nature have been studied *in situ*. 3 types of roadside gardens have been highlighted in the 3 countries: the island gardens surrounded by roads and railways and disconnected from the urban fabric, the home gardens surrounded by dwellings, the parks gardens included in a public park.

During this 7-year study, we explored in the 3 countries how local authorities deal with the roadside gardens' issues and stakes. The roadsides could become urban agriculture areas in order to satisfy the social need. They can be an alternative to expensive maintenance of large areas. These road sides are one of the rare soil areas in the urban artificial context, they contribute to the heat island reduction. Sometimes, through bottom-up or top-down processes, they could be and become a part of urban project that contribute to a better connectivity to retrofit the city margins' fragmented fabrics and their atmospheres.

Magali Paris is a Landscape architect, Phd in Urbanism and Architecture, Associate Professor at Grenoble School of Architecture where she teaches urban landscape and landscape ecology. She is a researcher at laboratory AAU-Cresson (<http://aau.archi.fr/cresson/>) where she conducts research programs on ecological issues, public spaces and citizens. Since 2001, she works as a landscape architect in collaboration with architects and ecologists at various scales from garden to eco-network infrastructure. Since 2012, she is involved in a pluridisciplinary team for the design and the implementation of French eco-network infrastructure (*trame verte et bleue*) with local authorities (Plaine Commune, Est-Ensemble et Plaine de France) in the East of Paris. Through her research, her design practice and her teaching activities, she stresses the essential role of inhabitants' empowerment in the analysis and design processes.

Plenary session: Adaptation to climate change, ecological issues, urban quality and well-being

Animation: Emeline Bailly, researcher in Urbanism and Dorothée Marchand, researcher in Social and Environmental Psychology, CSTB

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Nature, nature Based Solutions, NBS, can constitute a new way of thinking more resilient cities to face climatic hazards, but also to answer to the challenges raised by metropolisation. Nature is then considered in its global sense; "One nature". The objective of this session is to think adaptation to climate change and ecological issues according to urban quality and well-being.

Emeline Bailly is PHD and researcher in Urbanism at Centre Scientifique et Technique du Bâtiment (CSTB) since 2010 and associate researcher at Lab'Urba / Ecole d'Urbanisme de Paris (EUP). She currently works on sustainable and sensible urban research projects. She is developing a specific focus on the concept of urban landscapes, public spaces and quality of urban life. She is in charge of urban research programs on an international scale (FACT /Urban landscape/Paris & New York, Ecodistrict/Paris, Urban edge/Genève), and she regularly teaches in urban planning institutes and schools of architecture in France. Her last publications are *Oser la ville sensible*, Cosmografia edition, and with Dorothée Marchand, *Penser la qualité, vers une ville sensible et résiliente*, Mardaga edition.

Dorothée Marchand PHD is researcher in social and environmental psychology at the CSTB (Scientific and Technical Center of the Building). She drives her research on the psychological processes that influence the relationships between the individual and his environment. She studies more specifically risk representations, resilience, well-being and quality of life.

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Green City: collective commitment vs isolation, empowerment vs learned helplessness

Nature Based Solutions (NbS) are an important decision to help to stop and adapt to climate change. However, they are not free of dangers, and can be very counterproductive, if we don't consider them. From personal experiences in contributing to the management of behavior in urban spaces, and from the results of own and other researches, I will try to share some of these critical points, according to my perspective.

Green city can be useful and efficient to compensate the effects of climate change. As it has been shown many times, one thing is the decorative green (which can be even counter-productive from an ecological point of view). A different thing is the promotion of sufficient ecosystems, with a regenerative capacity of maintenance of biodiversity. In this case, sufficient large extensions are needed, according to how they articulate the visible part of the city. At the same time, there may have counterproductive social effects, which further deteriorate environmental conditions. It is not a matter of universal magic formulas. It is a question of adaptation to capacities of each ecosystem.

Among the counterproductive effects that I refer to, some are sufficiently obviously known. For instance, the increase in distances and therefore the need for more transport for long journeys or the increase in energy consumption in isolated homes. However, we must also take into account some less obvious, subtler, direct and indirect effects.

Among these subtler effects, we must mention the sensation of loneliness, which leads to an increase in fear or mistrust on the use of public space. We live in an age where there is a strong increase in interest in studies on 'walkability'. Moreover, this is nothing more than stated the diminution of the social use of the public space. Meanwhile, we are trying to rediscover which forms stimulate this social use and favor the social interaction, especially the spontaneity of that "naturalized" social diversity. If social diversity is not 'normalized', it could be perceived as a threat and, at the same time, make people look for 'refuge' at home or in closed and controlled spaces.

The social interaction, the social networks of informal support (especially face-to-face, not so virtual, which can lead to isolation) are one of the keys to well-being and quality of life, but, above all, to the social identity of the person. This social identity can be plural and open, close or restricted and, therefore, excluding. What some authors have called 'clubism' (encounter and social exchange only in restricted spaces, with equals) do not stimulate the assumption and the commitment with collectives and shared challenges for the whole society, such as those related to climate change.

The isolation of certain urban places (and dynamics, and situations), tends to favour the "learned helplessness" rather than encourage collective commitment.

Nature-based solutions (NbS) provide conditions that can favor the desirable behaviors, but they are NOT generators of a unidirectional and directional cause-effect relationship. The willingness and the ability to cope with a desired orientation (for the case we are dealing with, confrontation / adaptability to climate change) requires a shared commitment (empowerment), which if it is given, can also be 'used' to face with success other decisions or situations. In addition, I fear that this does not appeal to everyone (especially to all factual powers...).

... Perhaps that is why sometimes are proposed NbS which do not favor empowerment but rather isolation, despite of being dressed in good intentions ... and indirectly they can end up damaging the effective assumption of the challenges related to climate change.

Enric Pol is a Professor of Social Psychology and Environmental Psychology at the University of Barcelona. Since 1987, he directs the Master of Environmental Management and Intervention: Person and Society. Since 2005 he coordinates the Research Group in Social, Environmental and Organizational Psychology (PsicoSAO). Between 2006 and 2016 he coordinated the interdisciplinary Doctorate program in Sciences and Technologies of the Environment, of the Universitat de Barcelona. Among its areas of work and research is the development of Environmental Management instruments with an emphasis on aspects related to individual, social and organizational behavior. The concern for the educational, communication and socialization aspects were also expressed in the coordination of the Catalan Research Network in education for sustainability (edusost.cat) between 2006 and 2010. He is a reviewer of national and international journals and research projects. He has developed numerous research and advisory activities for companies and public administrations on issues of management and citizen behavior in relation to environmental issues. He is the author of numerous articles and books on the subject highlight the chapter of Environmental Management, published in the *Handbook of Environmental Psychology* (Bechtel and Churchman, 2002), and with prof. Fleury-Bahi and prof. Navarro, he has been co-editor of the *Handbook on Environmental Psychology and Quality of Life Research* published by Springer on 2017.

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"Thinking differently about the climate issue" involves interrogating adaptation. As the global focus on climate change adaptation intensifies, our goal is to focus on transformational approaches to adaptation, building on capabilities, that is, to express the relationships between the possibilities offered by the environmental, socio-economic and cultural environment and the citizens' abilities. However, we show that adaptation is still considered through risk reduction. The participation of the public does not make

it possible to put forward the capacities valorized by the populations. The desectorialization of climate policies nevertheless makes it possible to better include citizens and make the link between social, economic and environmental problems.

Nathalie Blanc works as a Research Director at the French National Center for Scientific Research (CNRS). A pioneer of ecocriticism in France, she has published and coordinated research programs on areas including habitability, environmental aesthetics, literature & environment and nature in the city. A founding member of the French Environmental Humanities Portal, she has also been from 2011 to 2015 the French delegate of the European COST program on New Materialism '*How Matter Comes to Matter*' (2015-2018). Her latest book is: *Form, art, and environment: engaging in sustainability*, by Routledge in 2016. N. Blanc animates and coordinates a project of LABArtSciences devoted successively to urban soils SOIL FICTIONS (2016) and sustainable food THE TABLE AND THE TERRITORY.

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The deterioration of our environment, climate change and damage to biodiversity are increasingly leading to negative, deeply worrying visions of a planet utterly ravaged by human aggression, where it seems that the only future awaiting us is apocalyptic. So, to counteract these harmful dystrophies, I decided to think up ways of bringing us together around positive creativity and to explore avenues for achieving a more desirable future. As an architect, my approach was first to design buildings intended for construction in the near future and, aware that any implementation starts with a plan, a sketch, I sought to design a desirable and biomimetic future on paper and using mock-ups, a kind of preliminary step towards a future very different from the one envisaged by policy-makers. I allowed myself to dream of towns where we are no longer afraid of being harmed by the air we breathe, where instead we can enjoy the fragrance of vegetation, the sound of birdsong, and gaze upon kitchen gardens and meandering rivers. Through my drawings, I wish to blur the lines between man-made and natural and thus bring together aggressors and aggresses in a renewed awareness of a vast, interdependent relationship, respect, and shared wonder for life on Earth.

Luc Schuiten: I like to present myself as a Utopian architect, in a time when this term is considered, in the political sphere, as the worst insult possible. My profession is drawing, since my main occupation is communication by drawing. I never claim that I am an artist, since I do not believe that is it correct to term oneself practitioner of any form of art. Such a label can only be conferred to me, or denied, by public opinion. My commitment to preserving the environment dates back to the 1970's. Freshly qualified in Fine Arts, the upheavals of May 68, the first oil crisis and underground movements all led me to think about alternative ways of operating, in line with the return to nature called for by hippies. It made me realise that we have forgotten, perhaps too hastily, that we are first and foremost biological beings, living on a planet which is itself alive. In line with this realisation, I began imagining new living spaces designed based on the study of vast ecosystems, such as coral reefs or primary forests. I also seek solutions for the public and individual transport systems of tomorrow, imagining the future of cities such as Lyon, Brussels and Strasbourg for the 2100 time horizon. These original representations of a sustainable future are supported by the work I do with biologists from the Biomimicry Europa association.