13th International Conference on Innovation in Urban and Regional Planning

Methods, Models and Technologies for Future Cities and Regions
PAVIA, 8-10 September 2025

CONFERENCE SESSIONS

The Call for Paper is OPEN

The deadline for the paper submission is May 5th, 2025
How to submit: https://input2025.unipv.it/how-to-submit/

S_01 - AI and Machine Learning for Urban and Territorial Analysis and Forecast

ORGANIZERS: *INPUT 2025 Scientific Committee*

Session description: The relationship between Artificial Intelligence (AI) and the urban planning process is a crucial and evolving aspect of contemporary city development. The integration of AI into urban planning holds significant promise for revolutionizing how cities are designed, managed, and optimized for sustainability and efficiency. One key aspect of this relationship is how AI can enhance data analysis and decision-making in urban planning. With the ability to process vast amounts of data in real-time, AI technologies can provide urban planners with valuable insights into various aspects of city life, such as traffic patterns, energy consumption, waste management, and public safety. By analyzing these data points, AI systems can help identify trends, predict future needs, and recommend strategies for improving the overall functioning of a city. Moreover, AI can transform the way urban planners approach spatial design and infrastructure development. By utilizing AI algorithms and/or LLM for scenario modeling and predictive analytics, planners can simulate different urban layouts, test the impact of proposed changes, and optimize resource allocation for better urban design outcomes. This predictive capability enables planners to make informed decisions that maximize the functionality and livability of urban spaces. Furthermore, AI-driven technologies play a crucial role in enhancing citizen engagement and participation in the urban planning process. By developing user-friendly applications and platforms powered by AI, city residents can provide feedback, report issues, and contribute to decision-making processes in a more accessible and transparent manner. This increased public engagement fosters a sense of community ownership and enables planners to align their strategies with the diverse needs and preferences of urban dwellers. In addition, AI can support the development of sustainable urban systems by optimizing resource management, reducing environmental impact, and promoting resilience in the face of climate change.

Through predictive analytics and optimization algorithms, AI can help cities minimize energy consumption, enhance waste management practices, and mitigate the effects of natural disasters by identifying vulnerabilities and implementing proactive measures. Overall, by leveraging the capabilities of AI in urban planning processes, cities have the opportunity to become smarter, more efficient, and more responsive to the needs of their residents. The integration of AI technologies represents a paradigm shift in how cities are planned, managed, and experienced, shaping a more connected, sustainable, and inclusive urban environment for future generations. The Session aims to address a series of questions, among which the most relevant are:

- How can AI enhance data analysis and decision-making in the urban planning process?
- What role does AI play in fostering citizen engagement and participation in urban planning?
- How does AI contribute to the development of sustainable urban systems and resilience against the main challenges for next cities (climate change, urban energy, ecological transition, social conflicts, etc..)?

Keywords: AI and urban planning, AI city, AI trends for urban communities, sustainable urban systems and AI

S_02 - New Simulation Methods and Models

ORGANIZERS: *INPUT 2025 Scientific Committee*

Session description: The concept of a model, defined as a theoretical framework designed to represent the fundamental elements of one or more phenomena, is inherent in urban planning and numerous scientific and humanistic disciplines. Urban planning originates and evolves through identifying city models – multidisciplinary, analytical, and predictive frameworks for future scenarios applied to heterogeneous territorial systems. The most suitable contemporary approach to modeling is simulation, understood as the artificial reproduction of a natural process or a complex situation. In urban and regional planning, as well as in urban studies, the primary focus is on examining the functioning of causal and non-causal relationships within urban phenomena. In its contemporary sense, a model is not a unified or holistic tool but rather a support for the construction of future scenarios. It does not rely on the mere replication – potentially serial – of repeatable prototypes.

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A crucial cultural shift – initiated approximately sixty years ago and still ongoing – has redefined the model as a means of generating urban knowledge rather than merely a tool for data processing or the quantitative and qualitative control of urban phenomena.

As computational and visualization capabilities have advanced, models have become increasingly interwoven with new analytical and predictive methodologies. This continuous development reveals at least three key factors: (i) new challenges – the need to understand and manage big scale metropolitan areas as well as small scale neighborhoods; (ii) new theoretical advancements – the simultaneous development of a robust body of theories capable of addressing these emerging challenges; and (iii) new computational tools – the increasing availability of IoT technologies and their computational power, which has enabled the operational application of these theories through numerical solutions.

In this Session, contributors are invited to explore these three dimensions by answering, for example, the following questions:

- Which are the new theoretical approaches that ensure the reliability of simulation models?
- In which best practices can we have evidence that the use of new methods and models facilitated the decision-making process in recent time and history?
- Which are possible future scenarios for the application of emerging methodologies and models according to the new technological advance?
- Which are the critical perspectives that cause distress to the theoretical framework to which simulation refers?

Keywords: methods and models, emerging technologies, data management, analysis and forecasting, new urban knowledge

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S_03 - Transition's Management: Ecological, Energetic, Economic

ORGANIZERS: *INPUT 2025 Scientific Committee*

Session description: The perspective taken in relation to the management of ecological, energy and economic transition processes is based on the paradigm of spatial planning oriented toward maximizing the benefits produced by ecosystems.

Ecosystem services (ESs) deliver benefits to human beings by the provision of goods and services, by regulating or supporting natural processes in order to improve life quality, and by increasing the cultural level of the local societies. These services are produced by ecosystems, which are "dynamic complex[es] of plant, animal and micro-organism communities and their nonliving environment interacting as a functional unit" (United Nations Convention on Biological Diversity, 1992: Article 2).

As regards the United Nations Convention on Biological Diversity, ratified by Italy by Law no. 1994/124, an ecosystem is "a dynamic complex of plant, animal and micro-organism communities and their nonliving environment interacting as a functional unit". Ecosystem goods and services, unequivocally defined as "ecosystem services", represent the benefits human populations derive, directly or indirectly, from ecosystem functions (Costanza et al., 1997).

When trying to assess the ESs of natural resources the usual vision is always based on qualitative approaches. We all know how important the environmental services are and that they are worth protecting and restoring. But it is really difficult to compare the costs, which can be easily revealed in monetary terms, to the benefits, which are always in the abstract world of ideas. Actually, it is impossible to compare apples to oranges. It would be of huge utility for planning and managing to have tools that bridge this gap.

The Session aims to address a series of questions, among which the most relevant are listed below:

- Sustainable management of natural resources (including: water management, land use and land cover changes, biodiversity) leading to enhanced supply of ecosystem services;
- Synergies and trade-offs in ecosystem services' provision;
- Mapping ecosystem services supply and demand;
- Development and testing of indicators for the assessment of ecosystem services and their trade-offs;

- Development and implementation of toolkits for the assessment of ecosystem services;
- Assessment of ecosystem services and its integration into decision-making processes;
- The ecosystem-based approach within spatial planning tools.

Keywords: spatial planning, climate adaptation, ecosystem services, green infrastructures, Nature-based Solutions

S_04 - 3S City (Smart, Safe, Sustainable)

ORGANIZERS: *INPUT 2025 Scientific Committee*

Session description: Among the many contemporary approaches to urban studies and urban/regional planning, certain key concepts have emerged as highly recurrent both in scientific literature and in urban practice. Topics such as smartness, safety and health, and sustainability have traditionally been addressed separately, despite their evident interconnections in terms of methodological approaches and potential outcomes for urban analysis, forecasting, and management.

Of these, sustainability is the most established notion, often regarded as a prerequisite for every urban and regional action or strategy. Sustainability informs both large-scale global programs and smaller-scale interventions, from building-level projects to daily individual practices. Nevertheless, cities continue to face significant environmental, social, and economic challenges, as illustrated in numerous reports (such as those from the IPCC). To address these, cities and regions should work toward a balanced approach that harmonizes the various dimensions of sustainability while integrating them with smart technologies and behaviors (both at the city and citizens level) and the evolving concept of urban safety, which has expanded from risk management to encompass health, resilience, and well-being.

The challenge ahead lies in defining the limits, boundaries, and opportunities for combining these three critical concepts into a cohesive framework, which we can refer to as the “3S City”, built upon the older “3R” approach (reduce, reuse, recycle), closely aligned to sustainability goals. In this Session, the Authors are invited to explore the following questions:

- What knowledge base is needed to conceptualize the 3S city?
- Which specific methodologies and tools should be developed?

- Can the “3S City” serve as a prototype for “multiple goals management”, which is central to addressing complex urban actions?
- How can Artificial Intelligence (AI) and Extended Reality (XR) enhance the Implementation of the “3S City” model?

Contributions should draw upon both theoretical perspectives and practical experiences to propose future scenarios and contribute to the ongoing development of urban strategies and decision-making processes that effectively integrate sustainability, smartness, and safety principles.

Keywords: sustainability, Healthy City, safety, urban exposure

S_05 - How Is the City Moving? Tracking Flows and Enhancing Planning Policies

ORGANIZERS: *Garau Chiara (University of Cagliari), Corazza Maria Vittoria (Sapienza University of Rome), and Delponte Ilaria (University of Genoa).*

Session description: Reaching detailed and real-time knowledge of mobility needs and flows has been for long primary wish for territorial planners and policymakers in order to ensure responsive and forerunner design of institutional initiatives.
In this direction, chosen approaches and methodologies have therefore evolved during decades due to the sudden affirmation of disruptive technologies. Qualitative techniques have initially allowed urban planners and policy makers to deepen citizens mobility patterns and needs, on a individual basis. Together with on site surveys, revealed and stated preferences interviews set the initial background for a progressive data-driven approach.
Nevertheless, subsequent affirmation of sensors supporting massive data collection, together with digital tools enabling data management and processing changed the way scholars and policymakers looked at planning-oriented mobility knowledge. Quantitative methodologies stepped in, being pivotal both on the side of the state-of the-art reconstruction within modeling environments, as well as to build dashboards and decision support systems driving planning and policies design.

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Planner and scholars ambition to collect growing amount of continuously generated data has been supported by the consolidation of Big Data concept and with the availability of more and more sophisticated Artificial Intelligence-driven tools paving the way for the implementation of a real-life Smart City utopia, in which the contribution of citizens-users, has emerged dramatically both as an ethical prerequisite to support policy design, as well as a pragmatic way to overcome privacy-related. Taking into account these changes and the resulting challenges, the Session expects inherent contributions:

- Examples and lessons learnt on traffic and mobility surveys;
- Cases on the use of transport-related mapping, databases and statistics;
- Home-work and home-school travel plans;
- Applications on LPT services;
- Travel data sharing: tracking methods and barriers;
- Willingness to pay and experiences of nudging and rewarding;
- Gender mobility issues.

Keywords: transport flows' analysis, mobility tracking, survey techniques, data sharing, users-centered approach

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S_06 - Innovations in the 15-Minute-City Approaches: Conceptual, Data-Driven, and Practical Developments Towards a Sustainable Urban Planning

ORGANIZERS: *Garau Chiara (University of Cagliari), Murgante Beniamino (University of Basilicata), Cutini Valerio (University of Pisa), Nesi Paolo (University of Florence), Zamperlin Paola (University of Florence), Mara Federico (University of Pisa), Delponte Ilaria (University of Genoa), Caselli Barbara (University of Parma), and Plaisant Alessandro (University of Sassari).*

Session description: Cities accessible to great part urban amenities within 15 minutes provide a promising way for redesigning the urban system (temporal, spatial, and activity-related) in terms of livability and quality of life. This approach is central to addressing contemporary challenges, including the different initiatives related to the evolution of sustainable urban mobility policies. In addition, walking or biking enhances mental and physical health and reduces urban inequities among residents as it is not dependent on social status and affordability. Creating inclusive access for all also demands that cities enable walkability through social-spatial integration and by avoiding segregation. The 15-minute city model integrates several urban approaches and is vital for developing sustainable cities, even if it is not a new concept. The current strategy to remodel cities aligns with the United Nations Sustainable Development Goals (UN SDGs). The main aim is promoting global development towards universal well-being and the move away from the unsustainable way of life in cities. Applying the “15-minute city” principles can improve the quality of urban planning and policies to create a more sustainable and healthy community, addressing the city’s efficiency and resilience and contributing to climate change mitigation.

Starting from these assumptions, the purpose of this Session is to promote discussions regarding the concept and its application in urban planning. Although contributions are expected to focus on the use of data-driven tools to evaluate the 15-minute city dynamics and design, the Session is also open to discussions about forthcoming conceptual and practical developments for the theme, by considering (but is not limited) these three main thematic sub-themes:

1. Conceptual development for the minute-city approach;
2. Urban design for the 15 minute-city - Morphological approaches for identifying the 15 minute-city spaces - Pedestrian and Cycling planning and practices towards sustainable mobility;
3. Data-driven analysis for the 15 minute-city - Spatial analysis and digital twins for replicating the minute-city – time and place - Functional analysis for identifying living centers and optimal econom-

ic activities distribution within the 15 minute-city - Configurational analysis to highlight movement dynamics within the 15-minute city context.

Keywords: 15 minute-city, data-driven analysis, urban growth, digital twins, walkability and cycling, configurational analysis

S_07 - Smart Happy Region. Relationship between Planning and Subjective Well-Being

ORGANIZERS: *Garau Chiara (University of Cagliari), Murgante Beniamino (University of Basilicata), Rossetti Silvia (University of Parma), Campisi Tiziana (University of Enna "Kore"), Annunziata Alfonso (University of Basilicata), Garda Emanuele (University of Bergamo), Carra Martina (University of Brescia), Basbas Socrates (University of Thessaloniki), and Torrao Guilhermina (Aston University).*

Session description: The rising need for cities to adapt to future scenarios provides new issues relating to the conceptualization of quality of life and the relation between the Built Environment and quality of life, measured in terms of Subjective Well-Being (SWB). SWB is characterized as an individual's inclination to focus on positive stimuli or as a state resulting from eudaimonic aspects related to realizing one's potential and hedonic aspects related to positive emotions and life satisfaction. In urban research, scientific literature shows how the built environment affects different parts of SWB through a set of interconnected variables, such as travel, leisure, work, social relationships, residential well-being, emotional reactions, and health. This Session aims to gain insight into the strengths but also the weaknesses of the new paradigm of Happy City in territorial planning and explore the potential of technological developments and their applications for effectively handling human-centered planning tools that combine social, spatial, and technological strategies

to improve the quality and well-being of regional users. Focusing on the main strengths and weaknesses of regional territories as well as the current technological developments and their potential for coping with the post-pandemic scenario, the concept of "Smart Happy Region" is explored by critically focusing on (but not limited to) the following issues:

1. Exploration of current national and international initiatives, knowledge and practice on the topic of Happy City;
2. Consideration of technology at the service of Happy Regions' sustainability, resilience, cultural development, citizens' empowerment and engagement, strengthening of identity and social ties, and so on;
3. Identification of indicators, methodologies and tools for measuring, evaluating and monitoring a Happy City;
4. Exploration of the vulnerability of regional contexts in terms of digital, social, geographical/territorial, infrastructural, and other divides;
5. Potential innovative applications for serving environmental, societal and sectoral needs and goals of Happy Regions;
6. Exploration of Regions 'challenges related to the sustainability of land transformations in a post-pandemic scenario;
7. Exploration of smart governance and spatial data management for place-based decision-making and monitoring of spatial dynamics in regional contexts;
8. Delineation of practical or theoretical guidelines or strategies for establishing smartness in "fragile" regions spatial contexts, also in terms of mobility and distributive logistics;
9. Exploration of the effects of urban regeneration practices on smartness and well-being.

Keywords: smart happy region, Happy City, urban and regional growth, subjective well-being, intelligent region systems, vulnerable regions areas, regions' sustainability

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S_08 - Transforming Urban Landscapes Using Geospatial Technologies: Smart, Safe, and Sustainable Cities

ORGANIZERS: *Thatiparthi Vijaya Lakshmi (Jawaharlal Nehru Technological University Hyderabad)*

Session description: As cities worldwide undergo rapid transformation, geospatial technologies (GST) have become the foundation for intelligent urban development. This dynamic Session will delve into the potential of geospatial innovations in reshaping urban landscapes to meet the evolving demands of the 21st century. As urban populations are projected to reach 68% globally by 2050, geospatial technologies represent a critical pathway to creating intelligent, responsive, and sustainable urban ecosystems that can dynamically address complex urban challenges. Geospatial technologies provide a powerful, data-driven framework for addressing these challenges through enhanced urban planning, efficient resource management, and climate adaptation strategies. Key Session tracks include:

1. Technological Innovations:
    - Exploring the role of GST, Artificial Intelligence, and Machine Learning in urban transformation.
2. Resilient Urban Development:
    - Climate adaptation, disaster preparedness, and sustainable infrastructure, green cities and buildings.
3. Smart City Solutions:
    - Integrated approaches to address mobility, resource efficiency, and livability.
4. Data-Driven Decision Making:
    - Leveraging predictive analytics and real-time data for urban governance.

Participants will gain insights into:

- The trans-formative capabilities of geospatial technologies in urban planning;
- Innovative methodologies for sustainable and inclusive city development;
- Practical strategies for implementing smart city initiatives;
- Real-world case studies showcasing successful geospatial applications;

Target audience refers to: urban planners and policymakers, geospatial and GIS professionals; municipal and regional government officials, environmental experts, technology innovators and solution providers, academics and researchers in urban development.

Keywords: geospatial technologies for green city rating, green buildings, net-zero buildings, urban vision, deep learning for urban infrastructure health monitoring, smart IoT, urban floods

S_09 - Transforming Urban Future: Interactive Technologies and Energy Systems for Climate Neutrality and Resilience

ORGANIZERS: *Mohammadpourlima Naghmeh (Åbo Akademi University), Shokri Kalan Ali (University of Vaasa), Esmailpour Zanjani Nastaran (University of Pavia), Alizad Farshid (Islamic Azad University), and Kheiri Gharajeh Hadi (Polytechnic of Milan).*

Session description: Urban areas are responsible for a large share of global energy consumption and greenhouse gas emissions, making them key players in the fight against climate change. With the world's population concentrated in cities, and the intensifying impacts of climate change—such as extreme weather events, rising temperatures, and flooding—urban areas must transition to become both climate-neutral and resilient. Despite ambitious goals set by many cities, clear and actionable pathways to achieve carbon neutrality remain uncertain.

This Session will explore practical solutions using advanced technologies such as Artificial Intelligence (AI), interactive tools, and big data to reduce emissions, enhance resilience, and foster community engagement in climate action. It will also highlights how these technologies, alongside advanced energy systems, can help cities manage energy efficiently, monitor environmental impacts, and optimize resources use. In addition to technology, the Session will also cover policy frameworks and governance strategies, focusing on best practices for supporting sustainable urban development and fostering multi-stakeholder approaches to climate governance. Topics covered will include:

- Interactive technologies (gamification, VR, AR, platforms, etc.) to engage citizens in climate action;

- Data-driven tools (AI, big data, IoT, sensor networks, etc.) for monitoring environmental impacts and optimizing resource use;
- Smart energy systems and the integration of renewable solutions;
- Policy frameworks and governance strategies to drive urban climate transitions;
- Urban data ecosystems to support climate action and policy-making;
- Citizen science and social innovation for inclusive climate action.

This interdisciplinary Session unites experts in urban planning, energy, and policy—alongside providers, academics, and researchers in urban development—to explore innovative solutions for shaping climate-neutral and resilient cities of the future.

Keywords: interactive technologies, renewable-based energy systems, smart and sustainable cities, carbon neutrality, climate change

S_10 - Geodesign for Local and Global Sustainability Challenges

ORGANIZERS: *Campagna Michele (University of Cagliari), Mourao Moura Ana Clara (Universidade Federal de Minas Gerais), Scorza Francesco (University of Basilicata Minas Gerais), and Conti Alfio (University of Basilicata).*

Session description: Over the past decade, scholarly interest in the Geodesign approach has expanded significantly among researchers and professionals in urban and environmental planning. In response, academic institutions worldwide, particularly in North and South America, and Europe, have integrated Geodesign into curricula, reflecting its growing relevance. While its conceptual foundations date back to the early 20th century, ongoing research is essential to explore its potential for addressing contemporary challenges such as climate resilience, sustainable urban development, and data-driven decision-making. The rapid advancement of spatial information technologies, artificial intelligence, and Planning Support Systems offers unprecedented opportunities for innovation in planning and design.

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This Session aims to advance the discussion on Geodesign methodologies through insights from international case studies. Key topics include the integration of knowledge-based design, the dynamics of the planning process, the role of emerging technologies, and participatory and collaborative approaches. Additionally, scenario modeling and impact assessment will be explored. A multidisciplinary perspective will enrich the debate, examining the benefits of Geodesign in research, education, and practice while critically assessing its limitations and barriers to implementation.

Keywords: geodesign, co-design, participation, smart communities

S_11 - Impact Assessment of Nature Based Solutions in Cities: Theoretical, Methodological and Practical Perspectives

ORGANIZERS: *Stanganelli Marialuce (University of Naples), Torrieri Francesca (Polytechnic of Milan), La Rosa Daniele (University of Catania), and Grimaldi Michele (University of Salerno).*

Session description: It is widely recognized that solutions based on the functioning of natural ecosystems represent an innovative and sustainable approach to addressing many of the environmental, social, and economic challenges faced by contemporary cities. However, the actual validity and effectiveness of these solutions remain poorly defined and unclear in all their implications, particularly regarding social and economic challenges. Methodological references for evaluating and estimating the economic costs and benefits, as well as identifying and assessing impacts—including potential negative externalities—are still lacking. The evaluation of the impact (both positive and negative) is closely tied to the specific location and the social, cultural, and economic context in which the green solutions are developed. Therefore, it is particularly important to design spatial and flexible methodological approaches that can be easily customized to be effective in different contexts.

This Session will explore theoretical frameworks, methodologies, and practical applications associated with the impact assessment of nature-based solutions (NbS) in cities, emphasizing a multidimensional perspec-

tive that considers both positive and negative impacts. The Session welcomes contributions that cover a wide range of topics, including the development of robust metrics for assessing ecological outcomes, social benefits, and economic impacts linked to NbS. A significant focus will be placed on case studies exemplifying either successful or unsuccessful implementations of NbS across various urban settings. These examples will illustrate how NbS can contribute to urban regeneration while addressing critical issues such as urban flooding, urban heat island, biodiversity loss, and spatial equity, as well as identifying examples in which costs related to NbS implementation may overcome their potential benefits. Furthermore, discussions could highlight the importance of stakeholder engagement throughout the evaluation process, ensuring that local knowledge and perspectives inform project assessments. By facilitating dialogue among practitioners, researchers, and policymakers, this Session aims to enhance understanding of how effective impact evaluation can inform the design and implementation of NbS, especially when used in regeneration projects. Participants will ultimately leave with actionable insights and a deeper appreciation for the role of NbS in fostering sustainable and resilient urban environments. This comprehensive approach not only seeks to improve project outcomes but also aims to establish a shared understanding of the multifaceted impacts of NbS in contemporary cities.

Keywords: nature-based solutions, impacts, valuation, urban regeneration, indicators

S_12 - Urban Biodiversity and Social Equity: Challenges for Planning Sustainable Cities

ORGANIZERS: *Dell'Ovo Marta (Polytechnic of Milan), Ronchi Silvia (Polytechnic of Milan), Maiullari Daniela (Delft University of Technology), and Schretzenmayr Martina (ETH Zurich).*

Session description: The "New Urban Agenda," which was adopted at the Habitat III conference in 2016, underscores the necessity of sustainable urban development. Urban areas are confronted with significant challenges, including rapid urbanization processes, increasing social inequalities, high pollution levels, biodiversity loss, and growing demands on natural resources. To effectively address these imminent challenges

with urban transformation, cities and city regions must strategically align their urban planning initiatives with the emerging trends that are shaping the future of urban landscapes. Green and Blue Infrastructures (GBI) and Nature-based Solutions (NbS) are pivotal tools in this effort. However, access to green spaces is often inequitable, mirroring social inequality, with affluent neighborhoods benefiting from better-managed green spaces while economically disadvantaged areas have deficits in these essential resources. This phenomenon is often referred to as the "luxury effect."

Urban planning must address these disparities by incorporating strategies that protect the existing and create new green spaces, ensure biodiversity conservation, distribute ecosystem services (ES) equitably, and foster climate resilience by providing cost-effective solutions. It is imperative to acknowledge that the effective integration of GBI and NbS into urban planning, in alignment with broader sustainability objectives, necessitates a comprehensive understanding of the ecological, social, and economic dimensions of urban transformation. This Session seeks innovative research on the intersection of ecosystem services (ES) and socio-economic equity in the context of global ecological, social, and economic transition. Contributions may include case studies, exemplary applications of planning tools, and theoretical frameworks regarding:

- The role of GBI and NbS in fostering urban biodiversity and climate resilience;
- The assessment of GBI, NbS and equitable ecosystem services (ES) distribution in urban planning processes;
- Innovative strategies for aligning ecological and socio-economic goals in cities and city-regions undergoing transitions.

Keywords: luxury effect, ecosystem services, spatial planning, green gentrification, multi-methodological evaluation

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S_13 - Emerging Technologies in the Resilience and Safety of Sustainable Cities

ORGANIZERS: *Esmaeilpour Zanjani Nastaran (University of Pavia), Razavian Amrei Seyed Ali (Payame Noor University), Goodarzi Ghazaleh (Islamic Azad University), Ziari Yousef Ali (Islamic Azad University), Danesh Pajouh Hamid (Technical University of Ankara), Shahhosseini Gelareh (Garmsar University), and Fatemi Ezaz (Garmsar University).*

Session description: Smart, Safe, and Sustainable Cities (3S Cities) require advanced technologies and resilient infrastructure to tackle emerging urban challenges and enhance resilience. Remote Sensing, UAVs (drones), and advanced GIS systems provide precise environmental data, enabling the identification of natural hazards, monitoring of infrastructure quality, and optimization of crisis management. In this regard, spatial data analysis and satellite imagery facilitate accurate predictions of risks such as earthquakes, land subsidence, floods and etc. Additionally, smart environmental monitoring systems equipped with modern sensors can track air quality, humidity levels, and structural conditions, offering timely alerts. In urban planning as well as civil engineering and related majors, the development of structures with automated monitoring and remote control technologies helps detect structural damages early, reducing risks associated with aging infrastructure. Furthermore, sustainability in smart cities requires the integration of new systems such as new energy systems, and climate-resilient infrastructure. However, challenges like, the high cost of implementing new technologies, the lack of integrated environmental data, and reliance on communication networks pose obstacles to fully realizing 3S Cities. Therefore, adopting technology-driven governance models and leveraging remote sensing and smart monitoring systems can pave the way for resilient, safe, and sustainable urban development.

The Session aims to examine how advanced technologies—such as Remote Sensing, UAVs (drones), and GIS—can enhance urban resilience and support climate-resilient infrastructure development. Participants are encouraged to contribute by sharing case studies, research findings, or practical experiences related to applying these technologies in urban environments. Discussions may include innovative solutions for monitoring infrastructure, predicting natural hazards, optimizing urban planning, and overcoming challenges such as high costs, data integration issues, and reliance on communication networks.

The Session will also welcome insights on policy frameworks and governance strategies that can facilitate the adoption of smart technologies for sustainable urban development.

Keywords: smart cities, urban resilience, GIS, remote sensing, sustainable infrastructure, disaster management

S_14 - Circular Economy and Planning. Fostering Energy and Industrial Symbiosis in Cities and Ports

ORGANIZERS: *Balletto Ginevra (University of Cagliari), Borruso Giuseppe (University of Trieste), Ghiani Emilio (University of Maribor), Kumer Peter (University of Debrecen), Kulcsár Balázs (University of Ljubljana), Ladu Mara (University of Cagliari), and Zanne Marin (University of Ljubljana).*

Session description: This Session focuses on innovative approaches to planning urban and port areas with a focus on circular economy principles, industrial symbiosis, and energy systems integration, exploring how innovative planning strategies can foster sustainable development, resource efficiency, and resilience in these critical spaces. We particularly encourage contributions that address the complex interplay between urban and port activities, recognizing their interconnectedness and potential for synergistic solutions.
The Session welcomes original contributions on the following – or related – topics:

1. Circular Economy in Urban and Port Planning:
    - Contributions may address strategies for minimizing waste generation, maximizing material reuse, and promoting sustainable consumption patterns within urban and port contexts. Specific examples could include circular business models for port operations, strategies for integrating circularity into urban regeneration projects, and policy frameworks for promoting circular economy practices.
2. Industrial Symbiosis for Energy Optimization:
    - Contributions exploring how urban and port areas can facilitate the exchange of energy and resources between different industries and stakeholders are welcome. Topics of interest include the development of industrial symbiosis networks, the identification of synergistic opportunities, and

the assessment of the environmental and economic benefits of industrial symbiosis. Particular attention will be given to innovative approaches for energy sharing and waste heat recovery.

3. Industrial Symbiosis for Energy Transition in Urban and Port Areas:
   - Contributions may explore strategies for integrating renewable energy sources, improving energy efficiency, and reducing greenhouse gas emissions. An attention on the specific energy needs of port operations, including shipping, logistics, and industrial activities, and how these can be addressed in a sustainable manner will be appreciated.
4. Digital Twins and Geospatial Technologies for Circular Planning:
   - Contributions may focus on the development and use of urban and port digital twins for simulating and optimizing resource flows, energy systems, and circular economy initiatives. Submissions can focus on the use of advanced geospatial visualization and modeling techniques for analyzing urban and port systems, identifying opportunities for industrial symbiosis, and assessing the impact of circular economy interventions. Examples could include using digital twins to model the impact of circular economy policies, using geospatial analysis to identify optimal locations for resource recovery facilities, and developing interactive platforms for stakeholder engagement.

Keywords: spatial planning, circular economy, industrial symbiosis, energy planning, sustainable development

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S_15 - Innovative Approaches and Data-Driven Methodologies for driving Sustainable and Inclusive Urban Regeneration

ORGANIZERS: *Fiorini Lorena (University of L'Aquila), Saganeiti Lucia (Institute of Methodologies for Environmental Analysis - CNR-IMAA), and Pilogallo Angela (Institute of Methodologies for Environmental Analysis - CNR-IMAA).*

Session description: Urban planning must respond to the urgent need to address global challenges such as climate change, environmental degradation and socio-economic inequalities. The increasing complexity of urban transformations requires a multidisciplinary and data-driven approach to ensure sustainable and resilient development.

New methodologies to assess the sustainability of transformations need to be developed, enabling the identification of key metrics that measure socio-economic dynamics, environmental quality, ecosystem services and safety. Urban regeneration emerges as an effective alternative to indiscriminate land consumption, aiming to meet specific local needs and, at the same time, increasing the sustainability of urban settlements in the face of ongoing crises.

In this context, already structured elements such as indicator engineering and innovative elements such as research infrastructure in the environmental domain are gaining strength.

Their integration allows for more accurate scenario analyses, more robust predictive models and greater policy coherence, making them crucial for urban and spatial development governance. This approach promotes spatial justice and contributes to the achievement of the Sustainable Development Goals (SDGs) outlined in the 2030 Agenda, while complementing disaster risk reduction strategies as specified by the UNDRR, thereby fostering more equitable, sustainable and resilient communities.

Innovative Approaches and Data-Driven Methodologies for driving Sustainable and Inclusive Urban Regeneration Session aims to gather contributions addressing the following topics: Urban regeneration processes; Climate change; Ecosystem services; spatial justice; disparity in the urban transformation dynamics.

Contributions should address, but not be limited to: case studies where approaches and indicators to evaluate the sustainability of transformations have been developed; reviews, studies or position papers on sustainable urban regeneration topics.

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Research works dealing with:

- Formulation of decision support tools to guide regeneration programs also with a view to achieving an improvement in urban resilience and the pursuit of municipal mitigation targets;
- Experiences of participatory planning and citizen engagement activities to raise awareness of sustainability and urban resilience issues;
- Processes and initiatives for co-designing interventions aimed at improving the quality of the urban environment;
- Regeneration projects based on local demand for ecosystem services (e.g. improving air quality, reducing noise pollution, regulating the micro-climate) also with a view to improving the adaptive capacity of the urban environment;
- Development of indicators for monitoring climate-positive regeneration programs;
- Development of indicators to measure the performance of regeneration actions in terms of environmental and climate justice with a focus on the most vulnerable population groups (minors and the elderly, ethnic and religious minorities, gender equality).

Research to explore the potential of using research infrastructures to build robust knowledge frameworks and responsive monitoring systems to support the development of regeneration programs.

Keywords: urban regeneration, resilience, urban sustainability, indicators engineering, research infrastructures

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S_16 - The Rise of Food Charity in Urban Areas. What Hope for the Right to Food?

ORGANIZERS: *Cattivelli Valentina (Pegaso Digital University and Polytechnic of Turin).*

Session description: Recent studies indicate that increasing numbers of people in countries across the Global North are finding it harder to feed themselves and their families.
Poor access depends on food infrastructure deficiency and economic factors, such as income disparities, unemployment, rising food prices and economic downturn, that degenerate in social inequalities among the local population. Inequalities leads to food insecurity and injustices among people, and result in serious repercussions for the most vulnerable social groups and remote or food deserted territories.
To address food insecurity, local governments usually revise their local food policies and allocate assistance programs to help individuals or associations buy food and receive income support. Almost at the same time, local voluntary associations and the population have mobilized to create several food supply initiatives at the local level, which are considered examples of food charity.
Food charity initiatives typically receive food donations from a variety of sources, such as grocery shops, restaurants and individuals, and then distribute the food to those in need through food banks, soup kitchens and other programs. These initiatives can also address the root causes of hunger, such as poverty and lack of access to affordable and healthy food, through advocacy and education. They also seem to be good examples of social innovation, as their realization depends on the mobilization of the local community to restructure the local food network and solve local food supply difficulties through sustainable solutions. However, to our knowledge, there are not yet many studies that confirm this hypothesis or investigate their characteristics and the actors involved.
Although food charity initiatives play an important role in providing food to those in need, there are some challenges and problems associated with this type of activity. The most common are: limited financial resources of many operators and their low accessibility to those in need (who are sometimes embarrassed or ashamed to ask for help), dietary diversity and quality, waste, over-dependence, etc.

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This Session addresses the following topics:

- What are the essential characteristics of food charity initiatives?
- Who are the actors involved? What kind of relationships exist between them?
- What is the role of local governments in promoting these initiatives?
- How do they permanently solve the problem of food security?
- Are they really experiences of social innovation? Once the Covid-19 emergency is over, will some of the experienced experiences continue?
- What are the implications on food chain planning at the urban level? And with relations to urban-rural areas? How are these initiatives distributed across urban regions?
- Can there be significant impacts on the spatial distribution of areas and urban mobility? Are there exemplary case studies worldwide that can provide guidance?

Keywords: food charity, food planning, urban-rural linkages, gift economy, peri-urban areas