



From Plans to Land Change: Dynamics of Urban Regions

**International Conference
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Book of abstracts

**Organized by the Swiss Federal Research Institute WSL
In the framework of the CONCUR - Project**



Impressum

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Welcome Words

Dear Colleagues and Friends,

I am very excited to welcome you at the Virtual conference “From Plans to Land Change: Dynamics in Urban Regions” organized by the Swiss Federal Research Institute WSL in Birmensdorf, Switzerland.

The Swiss Federal Research Institute WSL is concerned with the use, development and protection of natural and urban spaces. The focus of the research at WSL is on solving problems related with the sustainable and responsible use of landscapes and forests and a prudent and considerate approach to natural hazards, especially those common in mountainous countries. WSL occupies a leading position internationally in these research areas and provides groundwork for sustainable environmental policies in Switzerland. It is widely recognized that cities and urban regions are among the most dynamic land-use systems in the world, with dramatic consequences for the provision of ecosystem services and the livelihood of people. The WSL studies these changes and assesses how the changes affect ecosystems, biodiversity, but also recreational potential and the quality of the living environment, among others.

The conference links to the CONCUR project “From plans to land change: how strategic spatial planning contributes to the development of urban regions” that runs from 2016 to 2021. The overall objective of the CONCUR project is to analyze and operationalize how spatial planning and spatial policies affect land change in urban regions. This interdisciplinary project is ultimately aiming to develop a scientific basis for adequately integrating spatial policies into quantitative land-change modelling approaches at the urban regional level. To do it so, the project proposes to focus on planning intentions, governance arrangements, and external conditions to better analyze the role of spatial planning and spatial policies in the development of urban regions .

This conference brings together 130 scholars working on planning evaluation and urban modelling. Together we will enjoy 4 exciting Keynotes, 35 presentations in six parallel sessions, exchange our research ideas and results on four major topics: Planning and urban land use modelling, The role of planning in urban land use change, Governance of plan making and plan implementation in the parallel sessions. Please join the topic discussions networking and social events.

A special thanks to our scientific and organizing committees, for their enthusiasm and for putting together an exciting and stimulating scientific program. Finally, I thank you, participants, for participating in this conference, and for building together an intellectually rich and diverse conference. I hope we will spend together exciting and rewarding three days.

Kind Regards,
Anna M. Hersperger

Committees

Scientific committee

Dario Domingo, Swiss Federal Research Institute WSL, Birmensdorf, Switzerland

Simona Raluca Gradinaru, University of Bucharest, Romania

Anna M. Hersperger, Swiss Federal Research Institute WSL, Birmensdorf, Switzerland

Eduardo Oliveira, University of Kiel, Germany

Sofia Pagliarin, Otto-Friedrich-Universität Bamberg, Germany

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Chunhong Zhao, Northeast Normal University, People's Republic of China

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Organizing committee

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Robert Pazur, Swiss Federal Research Institute, Birmensdorf (Switzerland)

Susanne Senn, Swiss Federal Research Institute, Birmensdorf (Switzerland)

Conference Program

Conference Program

Tuesday, 20 April 2021		
14:00–14:15	Conference Opening Anna Hersperger (Chair of conference, WSL) Rolf Holderegger (Acting Deputy Director WSL)	
14:15–14:30	KEYNOTE Peilei Fan	
14:30–14:45	KEYNOTE Stefan Siedentop	
14:45–15:00	KEYNOTE PANEL DISCUSSION Peilei Fan Stefan Siedentop	
15:00–15:40	SPEED-MEETING WITH YOUR PEERS	
15:40–16:00	Coffee break	
16:00–17:00	Parallel Session 1a: Planning and urban land use modelling	Parallel Session 2a: The role of planning in urban land use change
Evening	Informal and fun social event	
Wednesday, 21 April 2021		
14:00–14:05	WELCOME BACK	
14:05–14:20	KEYNOTE Dena Kasraian	
14:20–14:35	KEYNOTE Angelus Eisinger	
14:35–14:50	KEYNOTE PANEL DISCUSSION Dena Kasraian Angelus Eisinger	
14:50–15:10	NETWORKING EVENT	
15:10–15:30	Coffee break	
15:30–16:30	Parallel Session 1b: Planning and urban land use modelling	Parallel Session 3a: Governance of plan making and plan implementation
16:30–17:00	TOPIC DISCUSSIONS in subgroups	
Thursday, 22 April 2021		
14:00–14:05	WELCOME BACK	
14:05–15:05	Parallel Session 2b: The role of planning in urban land use change	Parallel Session 3b: Governance of plan making and plan implementation
15:05–15:50	Gather Town Meeting	
15:50–16:10	Coffee break	
16:10–16:45	PODIUM DISCUSSION Looking ahead: Research avenues in planning evaluation and urban modelling	
16:45–17:00	WRAP-UP AND CONFERENCE CLOSING	

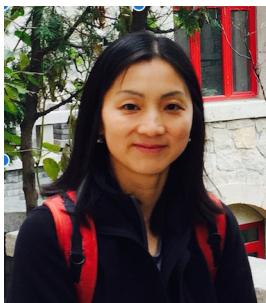
Keynote Presentations

From Planning to Land Changes: Perspective from Transitional Economies in Asia

Prof. Peilei Fan

Michigan State University, United States of America

Since the late 1970s, several economies in Asia have embarked upon the transitioning process, characterized by liberalization, macroeconomic stabilization, restructuring and privatization, and legal and institutional reforms. Under this transformation, has planning still been effective in guiding land use changes? What is the relationship between planning and market force in driving land use changes? Based on 17 case urban systems in a variety of natural and socioeconomic conditions in Southeast, East, and North Asia (SENA), Dr. Fan will introduce the evolved role of planning in guiding different kinds of land use changes, including urban land, suburban land, industrial land, and urban greenspace change in cities of SENAs. Some of the findings are the following: Using a control effective index, urban planning is found to fail to perform effectively in Hangzhou, reflected by the uncontrolled urban sprawl during all the planning periods from 1964–2013. Nevertheless, planning or the local government have been particularly instrumental for certain types of land use changes. For example, as suburbanization has been on rise for SENAs countries, suburbanization was found not necessarily the result of diversion of excess capital from over-accumulated investments in the manufacturing industry, but facilitated by local government for China. Planning policies contributed to the recent conversion of Shanghai's industrial land for both periods 2002–2009 and 2009–2016 in addition to other major spatial determinants such as and price, the existing industrial land. In a case study of Hangzhou, we found that in addition to travel time to the central business district, distance to urban arteries, distance to schools and colleges, percentage of industrial land and residential land, and surrounding land as major spatial determinants, distance to Qiantang River, the new urban development center initiated by the local government, is also one of the major spatial determinants, highlighting the role of local government in urban land use changes.



Peilei Fan is a Professor of Urban & Regional Planning at Michigan State University. Focusing on urban environment, sustainability and innovation, her research has been funded mostly by NASA and NSF. She has been the Secretary General of International Association of Landscape Ecology (2019–24), a Public Intellectuals Program Fellow of the National Committee on US–China Relations (2019–20), and a Fulbright US Scholar in Taipei and Shanghai (2017–18).

Managing Urban Growth: Lessons from Research and Planning Practice

Prof. Dr. Stefan Siedentop

TU Dortmund University

ILS–Research Institute for Regional and Urban Development, Germany

The management of growth is a challenge of sustainable urban development globally. Growth management (GM) – often referred to as ‘smart growth’ or ‘urban containment’ – seeks to achieve a compact urban form, with dense and mixed-use development as well as the preservation of farmland and nature conservation areas. In doing so, GM policies intend to maximize positive externalities of urbanization while minimizing inevitable negative externalities. Although effective governance modes and planning approaches are highly context sensitive, some generalizations from planning research and practice can be made. This talk presents an international review of experiences with the variegated strategies, instruments and governance frameworks at local and regional scales. The main aim is to identify key requirements of a successful (‘sustainable’) management of urban growth. This is based on both planning research literature and planning practice in selected Western countries.



Stefan Siedentop is Professor for Spatial Planning at the Technical University of Dortmund and Managing Director of Research in the ILS–Institute for Regional and Urban Development (ILS). He graduated in spatial planning at the University Dortmund and started his academic career as a research assistant and project manager at the Leibniz–Institute of Environmental and Regional Development (IÖR) in Dresden. In 2007, Stefan Siedentop was appointed as a full professor of spatial and environmental planning at the Institute of Regional Development Planning, University of Stuttgart. He headed the institute until 2012 before taking up his current position in Dortmund. His research addresses the analysis of urban spatial structure and urban change at different spatial scales as well as policies of urban growth management and sustainable land use.

Long-term impact of Spatial Policies on Urban Growth: Insights from the Netherlands

Dr. Dena Kasraian

Eindhoven University of Technology, The Netherlands

Spatial planners and policy makers have used a host of spatial policies to channel urban growth across different scales and time periods and in varying contexts. However, it is hard to empirically measure the impacts of spatial policies on urbanization as policies are not always easy to quantify and because a multitude of other factors drives urbanization (e.g., economic growth and market forces, transport accessibility, neighborhood interactions). Importantly, the impact of policies (if existing) becomes observable over time and possibly with some delay, as urbanization is a slow process. Finally, the lack of consistent longitudinal data on urbanization and its drivers pose a major problem for the efforts to pinpoint the role of spatial policies. This speech presents the results of an empirical analysis of the Dutch metropolitan region of the Randstad, the population and economic core of the Netherlands, since 1960s. It discusses the various national spatial and transport policies aimed to curb urban sprawl in the region over 5 decades and their impacts. The findings show that using long-term panel data of major drivers of urbanization and areas designated for spatial policies, plus a longitudinal model that controls for interaction of policies with time can shed light upon the role of policies. The results indicate that spatial policies played a significant role in channeling new urbanization, while preserving the centrally located green and mainly rural area. Remarkably, the legacy of earlier policies is still significant despite shifts in predominant Dutch spatial policies.



Dena Kasraian is Assistant Professor of Urbanism and Urban Architecture at the Department of the Built Environment, Eindhoven University of Technology. She has experience in the fields of architecture, urbanism and transportation and is interested in conducting multidisciplinary research between these fields. Her research interests include investigating long-term transport–land use interactions, determinants of travel demand and urbanization, and the role of spatial policies, using geographic information systems and quantitative spatial analysis.

The Quest for Adequate Planning Strategies in a Drastically Changing Context. Notes from the Zurich Case

Dr. Angelus Eisinger

RZU Planungsdachverband Region Zürich und Umgebung, Switzerland

The functional area of Zurich is thriving for more than 25 years. From the year 2000 to 2020 the population in the area of the RZU, the planning association of the Region of Zurich and its surroundings at the core the metropolitan area of Zurich, grew from 800'000 to more than 1'000'000 inhabitants, i.e. the aggregate population of the 10 biggest towns in the area after city of Zurich itself. According to the latest forecasts this dynamic is expected to even accelerate over the next decades with an expected population in 2050 in the area of the RZU of more than 1.3 million inhabitants.

This considerable growth process is taking place under the quite specific framework of the swiss planning regulations that are drastically differing from the regulations that most other countries know. Since 2013 the swiss planning law calls for a strict concentration of the future settlement growth within the already existing building zones («Innenentwicklung»). This abstaining from the familiar strategy in spatial planning of extending the amount of settlement areas through green field development challenges the usual planning models fundamentally and calls for approaches that are able to deal with a broader range of actors, interests and determinants. In the Zurich case this swiss constellation is being even accentuated because in the whole functional region there are no vacant building zones or brown fields left. In other words: from now on the whole growth dynamic has to be accommodated within the existing building stock.

This specific situation in the functional area of Zurich leads to an urgent need for novel planning models and strategies that are able to cope with the drastically changed conditions under which spatial changes nowadays is taking place. The talk illustrates some of the preconditions and requirements of this fundamental shift in planning by looking at some examples in Zurich area as telling laboratory for planning in general.



Angelus Eisinger is a historian of urban planning. Since 2013 he is director of RZU (Planungsdachverband Region Zürich und Umgebung), a Zürich based think tank on spatial planning. From 2008–2013 he held the Chair of Metropolitan History and Culture at HafenCity University in Hamburg. He habilitated at the ETH Zurich and published multiple books and research papers on urban transformation and the impact of planning.

Parallel Session 1a: Planning and urban land use modelling

Spatiotemporal analysis of the underlying factors in urban transformation: quantifying the importance of urban planning in central Texas

Zhao, Chunhong (1,2)

1: Northeast Normal University, People's Republic of China;

2: Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland

Urban regions have the most dynamic land–use systems on the earth, which is closely related to the ecosystem services provision and the people's livelihood. Regional and local planners and governments have been trying to steer the urban growth processes for compact urban forms such as “new urbanism” and “smart growth” movement. Despite ample of previous work in understanding the interactions between human and urban form transformation at specific areas, the actual intervenes and outcomes of planning and policies (e.g., ‘smart growth’) on urban forms have been poorly measured. The hypothesis is that spatial planning and policies are important factors of urban growth. The Austin metropolitan area, Texas, U.S., one of the fastest urban growth and transformations region, is selected to test the hypothesis through the following steps:

- 1) Measuring the historical urban transformations from the year 1992 to 2016;
- 2) Exploring and statistically modeling the driving mechanism of urban transformations. The related topographic, economic and demographic driving factors are selected based on previous studies; the current and historical comprehensive and regional planning intentions and implementations are quantified and incorporated.

Results found that 1) terrain factors have a constant effect, while proximity factors and socioeconomic factors showed strong temporal variation in terms of the impacts on urban transformation during the study periods. 2) The density of the original urban pixels is significantly related to the urban transformation for the Austin metropolitan area. 3) Plan intentions have been a strong effect on urban growth in the study area, which have contrary effects on the urban transformation between 2001–2011 and 2011–2016.

Keywords: underlying factors, urban transformation, urban planning, spatiotemporal analysis, central Texas

Effects of urban planning on land–use dynamics in Romania’s major metropolitan areas

Stoian, Constantin–Alexandru; Groza, Octavian; Sandu, Alexandra

Alexandru Ioan Cuza University of Iași, Romania

Monitoring of land use dynamics is an essential process for efficient territorial planning, but also for identifying /examining socio–economic and environmental trends. To that end, our study proposes a multitemporal analysis between the years 2000 and 2018 of the land–use/land–cover changes in seven metropolitan areas of Romania in order to identify the predominant patterns and their driving forces at a national level. We also aim to discover how these metropolitan areas compete or relate to one another, and to further develop the overall understanding of the urban sprawl in Romania while taking into account housing and urban policies. Consequently, the results of the analysis were also interpreted statistically and the land use changes were captured into various maps by using specific GIS–based methods.

Keywords: land use, dynamics, planning policy, Romania

Modelling the post-socialist urban dynamics in Central and Eastern Europe

Sandu, Alexandra (1,2); Groza, Octavian (1); Stoian, Constantin-Alexandru (1)

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2: Université de Lyon– CNRS – Université Lumière Lyon 2– EVS–UMR5600, France

The literature concerning the post-socialist city mainly focuses on the socio-economic and political dimensions of transformations after the fall of communism, addressing the decentralization, the real estate privatization, the motorization of the Bacău households, the growth of services and the end of industrial primacy, etc, to cite only the most often recurrent ones. The weak point in the current literature is the rather limited modelling of spatial structures through a quantitative approach, both morphological and functional. Therefore, this research aims to give some insights on the land-use patterns that characterize the post-socialist cities from Central and Eastern Europe, after the fall of communism. It wishes to check if there is a common regional pattern in what concerns the urban dynamics, or if there are national or regional particularities. Based on a GIS and statistical approach, the study analyses 94 cities in order to outline their morphological and functional profiles. The results show both similarities to the Western Europeans Cities and differences due to their socialist legacy, proving the complex urban dynamics of the Central and Eastern Europe.

Keywords: land use patterns, post-socialist city, GIS, Central and Eastern Europe

How effective is spatial planning for cropland protection? An assessment based on land–use scenarios

Tobias, Silvia ; Price, Bronwyn

Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland

Spatial planning plays a key–role in cropland protection, but its effectiveness remains unclear, as urban and infrastructure areas still expand at fast pace. In addition, methods to assess the effectiveness of spatial planning are lacking. The revision of the Swiss spatial planning legislation in 2014 was a new starting point for stricter regulations of urban development. Using land–use suitability models and land–use scenarios, we simulated potential future land–take on prime cropland according to the new cantonal structure plans that were revised in line with the new planning legislation. The simulated potential future land–take on prime cropland is six times smaller than that from extrapolating the observed trend of urban development over the past 25 years. Hence, the revised planning legislation might be more effective in protecting prime cropland than in the past. However, our land–use scenarios showed that most cantons still plan to convert more prime cropland into urban areas than absolutely necessary according to the expected population growth. Land–use scenarios have the potential to visualize and anticipate the consequences of planning decision and should, therefore, be further developed for policy evaluation.

Keywords: land–use modelling, spatial analyses, cropland protection policy

Assessing and modelling alternative settlement change trajectories

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2: Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland

The representation of urban areas in spatially explicit land use models and scenarios is often rather simplistic in that they only include one class of urban land. Such characterization hardly allows to assess impacts of typical urban land use plans, such as those aiming for compact development and those allowing preventing sprawl, since no differentiation is made between different types of urban land. In this study we explore how settlement systems have changed historically, in terms of the spatial distribution of settlements (e.g. in villages, towns, and cities), as well as in intensity (represented by population density of built-up land). We find that most built-up land in China exists as small fractions of otherwise rural areas, and that between 1990 and 2010 more than half of all new urban land is also added to villages and small towns, rather than to big metropolises. We also find that some countries in Europe follow a path of urban intensification, while others are still predominantly accommodating population growth by expansion of urban land. In order to move forward we present a land-use model that includes various land use mosaics along the rural-urban gradient, and which can simulate different urbanization trajectories, representing expansion and intensification pathways of urban land. We demonstrate the advantage of such approach by assessing the impact of different land use policies on urban development trajectories in China.

Keywords: Urban development, Land use model, Settlement systems, Sprawl, Intensification

Effect of zoning plans on urban land–use change: a multi–scenario simulation for Spanish urban regions

Domingo, Dario (1); Palka, Gaëtan (2); Hersperger, Anna M. (1)

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2: CNRS UMR 6554 LETG, Université Rennes 2, France

The transformation from rural to urban land uses constitute a relevant source of environmental changes. Urbanization processes have spread with great rates all over the world being a phenomenon that demands planning to create sustainable urban environments. Despite urban land–use change simulations provide useful information for decision makers, planning is generally weakly integrated into land–change modelling. However, the increasingly digitally available zoning data from statutory planning offers new opportunities. This study aims to reveal the potential effectiveness of statutory planning in terms of sustainable urban development by integrating zoning regulations in a multi–scenario simulation. Specifically, the gross floor area that can be built per parcel, as defined in the zoning plan, supports the allocation of varying degrees of urban densities. Using the CLUmondo modelling framework that couples cellular automata and multivariate logistic regression, we simulated urban growth in Madrid, Barcelona, Valencia, and Zaragoza Spanish Functional Urban Areas from 2012 to 2030 in four scenarios. The scenarios reflect the degree of planning intervention, ranging from high intervention to unrestricted development, while consider Spanish legislation and urban agenda 2030 sustainability goals. Simulations shows that by shifting growth to zones with urbanization projects almost 4200 ha of grassland and cropland could be saved from overbuilding. In this sense, strict urban planning can prevent non–sustainable trends characterized by a loss of natural and agricultural lands. The simulation results provide critical quantitative information to support decision–makers and planners in revising plans and designing new plans to reach urban sustainability goals.

Keywords: urban land–use dynamics, scenario simulations, digitized zoning plans, CLUMondo, Spanish urban regions

Session 2a: The role of planning in urban land use change

Quantifying the deviation between land use planning objectives and outcomes

Daunt, Beatriz Pierri (1); Inostroza, Luis (2,3); Hersperger, Anna M. (1)

1: Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland;

2: Ruhr–University Bochum Department of Geography, Germany;

3: Universidad Autónoma de Chile, Chile

It has been predicted that urban growth will continue at a fast rate, precisely in peri–urban areas of developing countries surrounded by biodiversity hotspots. The necessity in restructure the urban and environmental planning instruments appears in a scenario where urban expansion is difficult to manage. Indicators based on spatially explicit time series data sets has been suggested as an effective tool to evaluate the implementation of land–use planning since they can shade light on the efficiency of planning measures and the fulfillment of claimed objectives. This work aims to analyse the deviation between land–use planning objectives and observed land–use change, as well as the role of socioeconomic characteristics for attaining the planning objectives. The study area is located in a coastal region in São Paulo State, Brazil, characterized by fast urban expansion mostly as the result of economic policies for developing the tourism and transportation sectors. We evaluate the 2005 Ecological–Economic Zoning, and two municipal master plans (2006). We used Partial Least Squares – Path Modelling (PLS–PM) to understand the relationship between socioeconomic, accessibility, biophysical and land–use conditions at the time when the plan was made and plan strategies. We furthermore use PLS–PM to explain the relationship between the plan strategies and land–use change ten years after implementation in terms of cities´ compactness, urban infrastructure, and nature conservation. Our first results indicate that original land–use and public services best explain plan–strategies for urban development. This will allow us to describe spatially explicit the efficiency of the plans to foster more compact cities, urban infrastructure, and nature conservation. With t this method, we intend to clarify the deviation between planning objectives and outcomes for different land–use planning strategies and scales. We believe that this study can provide evidence to support the much needed restructuring of urban and environmental planning instruments.

Keywords: Land change, plan–implementation, plan–strategies, quantitative method

Does land use planning in Poland is an effective tool for preventing housing development in protected areas and their buffer zones?

Jakiel, Michal

Jagiellonian University, Poland

Protected areas (PAs) and their buffer zones are crucial for biodiversity conservation, but in present time they are in danger of becoming isolated islands in human-dominated landscapes. Land use changes, urban sprawl and their implications for PAs have received increasing consideration in many countries and regions over the past decades. However, the impact of land use changes and urban sprawl on the loss of natural areas is still unclear, specifically in the context of land use planning. This study aimed to assess if land use planning policy in Poland does effectively protect national parks (NPs) and their buffer zones from housing development. This study was carried out for zones of varying scope and level of protection: NP area, buffer zone and the outside area, so results can be assessed for areas of different nature conservation level. The analysis was carried out for two NPs in Poland located in suburban area. The historical land use changes (last 50 years) were analysed, as well as the future land use that is presented in the spatial planning documents. The data used in this study included various databases: historical topographic maps and planning documents (planned land use). The results have indicated that the land use changes in the surroundings of NPs are mainly connected with housing development, tourism infrastructure and abandonment of arable lands. The main problems with urban sprawl occur in the areas located close to the big cities. Local governments planned too large areas for development without considering the need of nature protection which leads to the significant urban sprawl in the surroundings of NPs. These results pose significant questions regarding the effectiveness of current conservation efforts and legal instruments in the spatial planning system for reducing the intense housing development and urban sprawl process for PAs and their buffer zone.

Keywords: spatial planning, urban sprawl, land development, nature conservation and land use planning

Drivers of agricultural land abandonment in urban regions: A review

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1: University of Bucharest, Romania;

2: Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland

Strategies for efficient use of urban land are increasingly promoted worldwide. In parallel, under food security concerns and increase interest in green infrastructure and multi-functional urban spaces, agriculture is mainstreamed on urban agendas. However, many urban regions around the world are faced with abandonment of open and agricultural areas. Although much research has been conducted on abandonment of large scale, intensive agriculture, few studies addressed the factors (i.e. drivers) behind land abandonment in urban regions. Even few studies investigated the role of planning and policies in land abandonment. Increasing the knowledge on this type of abandonment, could support the development of tailored mitigation measures.

With this research we aim to fill the knowledge gap by developing a framework for understanding the drivers of agricultural land abandonment in urbanized areas and the causal links among them. To fulfill our aim, we resorted to a review of international publications which discuss the causal mechanisms behind abandonment; papers published between 1990 and 2019 were included in the review. A protocol was developed to systematically gather information on: study area, authors, methodology, abandonment process (i.e. definition, land uses), and factors behind abandonment (i.e., trigger factors, enabling factors, and factors that prevent abandonment). Attention was paid to the way each document explained the causality behind the land abandonment process.

Preliminary findings show that the main trigger factors are the changes in political regimes, growth-oriented urban plans and policies, and increased costs of agricultural production. Aspects such as land use displacement, land speculation and soil characteristics tend to enable abandonment. Few studies have mentioned concerns for food security as hindering factor. Furthermore, while various forms of land management interventions are proposed to reduce abandonment, very few studies actually evaluate the policy impact.

Keywords: land abandonment, urbanization, driving forces

Spatial planning and its influence in shaping urban landscapes. Insights from Bucharest urban region

Bacău, Simona; Hersperger, Anna M.

Land Change Science, Swiss Federal Institute for Forest, Snow and Landscape Research WSL,
Switzerland

Urban regions worldwide employ spatial planning as a means to cope with uncertainties. Plans' envisioned scenarios of development assist the understanding of how places could transform in a given timeframe. To date, efforts have been made to link visions expressed in spatial plans with the actual land-use changes. However, urban transformations cannot be explained by a plan alone, just as they cannot be explained by planning alone. Among natural, socioeconomic, cultural and technological drivers, the actual contribution of planning is challenging to acknowledge. To better understand its influence, our study aims to integrate planning among other driving forces in a land-change model and test it for Bucharest (Romania) urban region. Our procedure implies both qualitative and quantitative methods and is divided into a six-step workflow. We first extracted planning intentions on transportation infrastructures, built-up and (semi-)natural areas from eight spatial plans. Second, for each plan, we conducted expert interviews. Experts' inputs were then used to weight the extracted planning intentions. We then retrieved past (from 2000) and current land uses as well as natural and socioeconomic drivers. Using the CLUMondo land-change model with spatial data from 2000, we predicted the current situation. Finally, we developed and assessed scenarios of future development. Our results indicate that planning had overall a rather low contribution in Bucharest. Since Romania's multi-level planning system allows derogations from plans for specific projects, plans' visions are not implemented as originally stated. Moreover, by focusing on three categories of planning intentions we identified differences in their implementation. Thus, implementation is highest for built-up and transportation infrastructures projects and lowest for projects regarding (semi-)natural areas. Consequences of these findings for assessing the (lack of) transformative capacity of plans, for selecting and integrating plan data into land-change models and for computing scenarios of future development are discussed.

Keywords: spatial plans, planning intentions, driving forces, urban transformations, Bucharest

Spatial and temporal analyses of urbanization of Mardan city, its causes and impacts on environment

Qasim, Muhammad; Gul, Saba

University of Swat, Pakistan

Urbanization is an emerging problem causing many environmental issues especially in developing world. In this study we analysed the Mardan city temporal and spatial urban expansion, using satellite images of the year 2001, 2008 and 2014. We found a drastic increase in the built up area having adverse impacts on agriculture land production, vegetation loss and local biodiversity just in 14 years. Our results showed that Mardan expanded on the most fertile and agriculturally available land, causing agricultural and biological decline as well as a negative impact on water quality.

The identified reasons were the strong efforts and political will of Awami National Party government in the region who brought mega projects to this area such as institutions of higher and professional education, Campuses of Agriculture and Engineering Universities, Intermediate and Secondary Education Board, Sports Complex and new roads. All these institutional developments triggered a new start of many residential societies both legal and illegal. With this new era of commercialization and increase in shopping centers, new businesses and market chains were launched. Pak Army having Punjab Regiment Center in the heart of Mardan, started buildings and commercial plazas as well, and played very active role in expanding the City. These were the driving forces behind the rapid expansion of the city in a very short time. We recommend that Local Government needs to address the problem of haphazard urban growth, which needs proper planning and policy for future land use and cover change. The local government must identify the sites suitable for housing keeping in view all the rules and regulations with strict EIA implementation. Illegal residential societies must be banned and the Government must take serious action for land conservation. Provide basic needs to local rural population will decrease migration to urban areas.

Keywords: Land use change; Urbanization; Vegetation and Biodiversity loss; Mardan City; Pakistan

Evaluating the efficacy and effects of regional planning instruments on urban land-use change in Germany

Eichhorn, Sebastian

Research Institute for Regional and Urban Development, Germany

Urban sprawl is a worldwide phenomenon. It addresses the progressive spread of urban areas in the landscape. It is particularly associated with low densities, dispersed settlement structures and mono-functional spaces and represents the flip side to a space-saving, compact and multifunctional urban development. In general, planning has the aim of promoting efficient urban development, avoiding urban sprawl and reducing negative external effects.

As states and regions have increasingly adopted growth management policies, the debate over their efficacy and their effects on sustainable urban development has intensified significantly over the last 20 years.

In Germany, urban development is regulated within a multi-level system of spatial planning and is characterised by the reciprocated influence of both local and supra-local planning. Here, regional planning takes on a mediating role between the state and municipal level. On the one hand, it is responsible for spatial operationalisation of rather abstract regulations in state development plans, and on the other hand, regional planning regulations serve as a framework for urban land-use planning.

Although scholars have shown that planning is capable of positively influencing sustainable urban land development, there is no study for Germany to date that has examined the regulating influence of certain regional planning instruments on specific forms of urban development. Based on a content analysis of German regional plans and the analysis of different urban development trends, a quantitative, conformance-based evaluation is applied to analyse the effects of major positive planning instruments on urban land-use change between 2000 and 2012. Methodologically, effects are measured using specific spatial indicators and other context variables and examined with the help of correlation and regression analyses.

Main question to be answered in this study is whether and to what extent planning instruments fulfill their intended objectives, namely, the regulation of different dimensions of urban land-use change.

Keywords: urban land change, regional planning, conformance

Session 1b: Planning and urban land use modelling

Agent-based models to explore potential effects of urban planning: potentials and challenges

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We can link urban planning and modelling of urban systems in several ways, i.e. using model output as information for the planning process, simulating the planning process itself and – or using planning as an input for urban simulation models. The latter can lead to more realistic scenarios for the future of a specific case study, an increased understanding of the urban system in general, and also raised awareness about potential effects of urban planning. This presentation will reflect on challenges related to including spatial planning instruments into models for urban systems. These challenges relate, first, to the translation of planning instruments into the models, e.g. identifying plan intentions, formalising the instrument's impact on land change and issues of plan implementation. I will argue that agent-based models have the potential to accommodate a broad range of planning instruments, since they explicitly model human decision-making and behaviour. However, this modelling approach leads to a second set of challenges on how to model human decision-making and behaviour responding to the planning instruments. In the talk, I will draw on examples from my recent research on simulating urban planning instruments such as zoning and economic instruments in agent-based models. These examples include both empirically-based, data-rich agent-based models for a specific case study and more generic, stylised models. I will compare the challenges and lessons learnt for both approaches. To conclude, I will emphasise the potential of such models to investigate the potential effects of urban planning instruments and contribute to planning evaluation.

Keywords: agent-based model, model purpose, planning evaluation

Urban regions: the challenges and opportunities of peri-urban areas

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Urban planning often has a focus on urban core areas and densely populated expansions of the city into more rural terrain. However, urbanization is often a gradual process in which rural areas are transformed into peri-urban areas, sometimes continuing into a full urbanization. Peri-urban areas present challenges and opportunities for spatial planners. It is in these urban hinterlands where strategic planning can really aim at providing the services and green space needed to serve the urban region and improve the sustainability of the urban system as a whole. At the same time, these are the regions with high potential risk of losses of agricultural land and nature.

This presentation will be based on a meta-analysis of processes documented in a meta-analysis on peri-urban development. Based on these processes the planning challenges associated will be discussed and the role of land use modelling to help strategic planning of these regions indicated. Different roles of land use modelling in a strategic planning process will be indicated and first results of a review of planning support tools presented.

Keywords: land use models, peri-urban area, spatial planning

Tracking transformative changes in the global land system linked to urbanization

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Transformative changes in land use systems are needed to limit climate change and conserve remaining areas of intact nature for biodiversity. Urbanization may help reducing the pressure on land globally, as it allows for more efficient use of resources. We consider the transition of an area from rural to urban to be a social tipping point. Defining and identifying such points in time and space, allows for a better understanding and planning of land use management, especially in emerging regions of the world. In a global-scale analysis, we combined annual maps (2000 to 2018) of population-density with detected presence and absence of night-lights from satellite imagery, as an indicator for electrification and industrial activity. This allowed us to classify the global land surface into four groups: A1 – low population (< 5 people per km²) and no night-lights; A2 – higher population and no night-lights; B1 – low population and night-lights; B2 – higher population and night-lights. We defined shifts to the B2 category as a sign of urbanization. We found that the A1 category (largely uninhabited areas) occupied about half of the global land and remained relatively stable in size over time. The A2 category (rural areas) decreased, while B2 (urbanized areas) increased. The B1 category (mostly determined by resource extraction in remote areas), was at an overall low but increasing level. Industrialization and access to infrastructure allow people to satisfy their needs for water, energy and food from increasingly remote – “telecoupled” – sources. Yet, despite population growth, urbanization seems to remove pressure from the overall land by abandonment of previously inhabited places, where ecosystem restoration will be key in the future. Our approach to track social tipping points related to urbanization is simple, but robust across scales and regions and therefore accessible to planners around the world.

Keywords: Land cover change, human–environmental systems, night lights, infrastructure, development

Are urban and conservation planning goals compatible? Optimising living conditions for humans and animals in coupled settlement and habitat networks

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A wide variety of regional planning goals exists, but little is known about their compatibility. For example, polycentricity (i.e. multiple urban centres) is a common regional urban planning goal, which has shown to be beneficial for a region's socio-economic conditions, but may also change the configuration of the settlement network (i.e. settlements connected by roads and traffic). Given the dependency of animal species on well-connected habitat networks, another possible planning goal is to maximise habitat availability (i.e. the total amount of habitat accessible for an animal species). However, changes to a region's settlement network can have a variety of impacts on the region's habitat networks. Due to these interactions, it is unclear whether maximising polycentricity and habitat availability are compatible planning goals. To address this question, we developed a mathematical model of interacting settlement and habitat networks in a region of Switzerland. The settlement network model allowed us to predict commuter and traffic flows in our study region under a certain distribution of jobs and people across the municipalities. The level of polycentricity in our region was measured by calculating the hierarchy in the commuter flow network. The traffic flow network was linked with the habitat network and used to calculate the mean habitat availability. With multi-objective optimisations, both polycentricity and habitat availability were maximised by changing the distributions of jobs and people. Although both goals could be improved compared to the current situation, there was a trade-off between polycentricity and habitat availability along the Pareto-front. Developing the region towards either of the planning goals can be achieved by changing the distribution of jobs and people mainly in mid-sized municipalities and by a strong collaboration between municipalities. Our results increase the understanding of the complex interactions in urban regions and can lead to recommendations for regional urban and conservation planning.

Keywords: habitat networks, settlement networks, social-ecological systems, multi-objective optimisations

Integrating societal differences and disaster risk reduction into models for planning support

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Urban planners need to intervene in a complex and everchanging world. They need to plan for citizens and other actors with different characteristics and behaviours, living, working and recreating across various locations in the city, in low- to high-rise buildings, and amidst open spaces, green areas, rivers and coastal environments. To ensure long-term sustainable urban development they need to account for ongoing dynamics due to socio-economic and climatic changes, as well as for shocks that have sudden impacts on the city.

Land use change models have been instrumental in assisting urban planning over the last decades. However, they are often incapable of dealing with real-world multifunctionality, leading to a narrow representation of society and the urban environment. Moreover, dealing with events, such as natural hazards, is not generally incorporated well in strategic planning, although incorporating risk reduction strategies alongside urban development plans has clear benefits for planners as well as emergency managers. To support disaster risk reduction as part of strategic planning, we have developed a spatially explicit and dynamic decision support system, UNHARMED, that includes a suite of model components including land use, building stock, population and disaster risk (coastal inundation, riverine flooding, bushfire, earthquake, heatwave). UNHARMED calculates at a high spatial resolution changes in urban and population developments over time, while distinguishing amongst various building types and societal groups, each with their own characteristics and behavioural profile. In addition, dynamic risk maps are calculated as a function of the hazard, the exposure –who and what is affected– and vulnerability –the susceptibility of these values to the characteristics of the hazard–.

We will present an application to Melbourne, Australia, in which we will show different future urbanisation pathways, along with the impact planning options have on sustainable development and risk reduction.

Keywords: Integrated modelling, Behavioural modelling, Disaster risk reduction, Planning support, Scenario support

Local variations in global trends of urban land development

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Globally, urban areas are growing at a faster rate than their population, potentially reducing environmental sustainability. However, it is unclear to what extent this trend varies locally. Here, we decompose urban land change into growth related to population dynamics and growth related to changes in urban land use intensity, for 75,102 regions worldwide. Results show that changes in urban land use intensity, expressed as built-up land per person, relate to 29.5%, 50.0% and 41.2% of the total increase in urban land in the periods 1975–1990, 1990–2000, and 2000–2015, respectively, but with large local variations. Interestingly, we find that large urban centres intensify in all three periods, while surrounding areas show an opposite development, suggesting an urban polarization effect. We also find intensification in many regions in the Global South that already have a high population density, leading to potential trade-offs in terms of human wellbeing.

Keywords: Urban expansion, Population dynamics, Urban intensity, Land-cover change, Human settlements

Session 3a: Governance of plan making and plan implementation

Future land use planning to be context–dependent, conditional, dynamic, and inclusionary

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Since the Swiss federal Spatial Planning Act (SPA) was introduced in 1980, Swiss municipalities were obliged to use urban land parsimoniously, however, up to today they hardly are. To ensure parsimonious urban land use, changes in urban policy are inevitable. Therefore, the current static normative and exclusionary urban planning must be replaced by a context–dependent conditional dynamic and inclusionary one.

This oral presentation presents the changes in urban policy that would be necessary for municipalities to guide urban growth towards parsimonious urban land use. It shows that for better coordination of settlement and transport a multi–level and multi– scale approach with geographical and web–based information systems is needed. With the changes described the implementation deficit should be overcome. However, the future study of fees to internalize negative externalities and to generate and to distribute public revenue from economic and agglomeration rent are of high need.

Keywords: Urban Growth, Urban Land Use, Urban Modelling, Urban Land Use Regulations

A practical proposal about how to stop urban sprawl by establishing quantitative targets and limits to urban sprawl

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Increasing competition for suitable land for food production, energy production, and urban development have been identified by W. Haber as the three central “ecological traps” that threaten humanity. Landscapes in many parts of the world have been greatly altered by urban sprawl, in clear contradiction to the principles and the spirit of sustainability. How are we going to address this growing challenge? I propose establishing targets and limits to curtail urban sprawl, similar to limits and standards in other environmental sectors such as noise limits and limits to water pollution. The method of Weighted Urban Proliferation (WUP) can serve this purpose. The WUP is a combination of the amount of built-up areas, their dispersion, and land-uptake per person. Based on results for Switzerland, I explain the proposed values of targets and limits for Switzerland, and a set of concrete measures to control urban sprawl and to use land in a more resource-efficient way. Without rigorous measures, scenarios of future urban sprawl for Switzerland for 2050 show that sprawl will continue to increase strongly, but a few encouraging examples demonstrate that it is possible to reduce sprawl. The WUP method has recently been implemented in Switzerland’s landscape monitoring system (LABES). Banks can help avoid urban sprawl, such as the Alternative Bank of Switzerland (ABS) does, by not giving loans to projects that would strongly contribute to urban sprawl, i.e., a divestment from urban sprawl. The WUP method is highly suitable for performance control of targets and limits to urban sprawl once they will be established. –

Recommended readings: Hennig et al. (2015): Multi-scale analysis of urban sprawl in Europe: Towards a European de-sprawling strategy. *Land Use Policy* 49: 483–498. – Schwick et al. (2018): *Zersiedelung messen und begrenzen* (Measuring and limiting urban sprawl). Haupt-Verlag, Bern.

Keywords: landscape metrics, limits, targets, urban sprawl, environmental standards

Governance of the territorial management instruments at local level: blocking or facilitating factor?

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The planning instruments are used to mediate between constitutional principles, sectorial guidelines, territorial policies and strategies and their implementation with owners, investors, public institutions and other users of territorial resources.

The interests which naturally fall on a scarce commodity such as the territory are distinct, often divergent and even contradictory, resulting in tensions which are not always easy to resolve. This is the case between the various public entities (environment, infrastructure, tourism, etc.), between the public sector and the private/associative sector and even among the different private activities. In addition, the recent emergence of an active citizenship, much in the wake of digital social media, often calls into question traditional institutional arrangements and solutions.

The plans have been useful tools for managing this myriad of interests and an ever-wider constellation of actors. It is understood that as they expand, diversify, reinforce or weaken also the legal framework becomes more complex/densifying in the attempt to seek regulation that defends the collective interest, but does not harass private/individual interests. The problem is that along this path, effectiveness (since the time required for consensus-building takes away the options and solutions found) and efficiency (since too much energy is consumed for sometimes so limited results) are lost.

Therefore, the goal of this presentation is to analyse and show, from the perspective of the governance of the municipal planning process, the growing complexity visible in the number and type of actors involved, but also in the relationship they establish between them, increasing the risk of occurrence of dysfunctionalities, misunderstandings and high general costs in the process of territorial management at local level. For this purpose we will compare the legal framework of the planning instruments adopted in 1999 and the one in force adopted in 2015.

Keywords: governance, stakeholders, spatial planning, local planning, regulation

Mapping Green Infrastructure for the canton of Geneva : integrating biodiversity, connectivity, and ecosystem services into landscape planning decisions

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The concept of Green Infrastructure (GI) emerged in response to the need to integrate natural values in spatial planning, and is formulated as a strategically planned network of natural and semi-natural areas. It promotes the multifunctional use of landscapes, and is based on principles of landscape ecology and systematic conservation planning to identify and prioritize areas of high ecological value for wildlife and people.

In Switzerland, establishing a functional GI network by 2040 is one of the central objectives of the Swiss Biodiversity Strategy adopted as a law in 2017. In 2018, the canton of Geneva also established a roadmap for biodiversity conservation, which includes the operationalization of a GI framework to conserve 30% of the territory.

Our approach is based on the separate assessment of three pillars, namely species distribution, landscape structure and connectivity, and ecosystem services to optimize the allocation of conservation actions. The pillars are then integrated into the final map using spatial prioritization methods with the Zonation software. This allows the attribution of different weights to selected features, which ensures that each constituent is represented according to the conservation objectives agreed upon with stakeholders. We then investigated the relative influence of GI inputs on the distribution of priority areas and on red list species, as well as the overlap of existing natural reserves with the proposed G.I. and its feasibility. Visualizing priority conservation areas in a spatially explicit manner will support local decision-makers to optimally allocate limited resources for ecosystem preservation. This GI map will soon be integrated into landscape planning processes in the canton of Geneva.

Keywords: spatial conservation prioritization, ecosystem services, species distribution, ecological connectivity, Geneva

EUSALP a metaplan for soft planning

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The EU adopted several instruments to overcome the barriers and face in an integrated way common, spatial and environmental problem that have effects by crossing the administrative boundaries. Among these the Macroregional strategies are the most interesting and innovative. They can be considered sort of transnational meta-plan oriented to collecting consensus and resources. They are policy instruments acting according to the “soft planning” principle, without direct effect, economic resource, binding rules or competence by local actors but by the mean of voluntary agreements and negotiations. Amongst them, EUSALP is the latest approved by the Commission but at the same time one of the most interesting because it involves one of the most complex geographical macro region in Europe, apparently homogeneous by the morphological aspect but at the same time with many unbalances inside. The EUSALP area is the result of a negotiation and is composed of the Interreg Alpine Space 2014–2020 area enlarged with adding part of Laender Baden Württemberg, including lowlands and urbanized areas, with major cities located outside the ‘core Alpine area’. The motivation to delineate such a large functional region responding to the principle of soft planning ensures thinking in a flexible way about the functional relationships between metro-regions and the Alps.

The Interreg Transnational cooperation areas and Macro-regions as testing grounds for applying the place-based policy method fully respond to the concept of “soft planning” with multi-level governance of fuzzy perimeters that adapt to different issues and problems.

Keywords: EUSALP, macroregional strategy, soft planning, spatial planning

Spatial planning instruments and data flow – the impact of digitalisation on the cognitive and structuring functions of plans in France and Norway

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National digitalisation agendas reorganise the relationships between planning instruments, plan data and the representation of space, possibly putting central concerns of spatial planning at stake. In the field of spatial planning the national “owner” of the institutional planning system (often represented by ministerial authorities) seems to be motivated by the possibility of an apparatus capable of aggregating and communicating everything. This aspiration implies a potential conflict of interests regarding the system’s performativity. While digitalisation may improve the efficiency of production and consumption of data through planning activities, a plan is, nonetheless, an image; a symbolic form, subject to individual and collective decoding and interpretation. The relationship between public sector digitalisation agendas and the formation of public awareness of spatial phenomena and processes may be an issue of concern.

A question, then, is how to keep a balance between appropriate or excessive degrees of standardisation and regulation of digital plan data in concrete operational situations of spatial planning. Maps and plans provide spatial information, regulating the relationship between citizenship and space. An essential difference resides in their relationship to time and their attribution of rights. Today, however, these devices share geodata and plan data through increasingly integrated digital systems of data production and consumption. A comparison of practice within different national planning systems may shed light on the issue. The French juridical system and culture is characterized by a strong protection of citizens against the exercise of state authority, with a maximisation of predictability and a reduction of discretion concerning decision-making in the frame of plans. The Norwegian understanding of juridical regulations is more based on process control and discretionary agency. Comparison may highlight how digital information facilitates the decision making process and the attribution and uses of rights in the two national contexts.

Keywords: Plan data, planning systems, planning practice, spatial representation, urban transformation

Session 2b: The role of planning in urban land use change

China's Ecosystem Services Urban Planning new paradigm: Will Shanghai lead the way? A case study from the Baoshan district in Shanghai

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Ecosystem services (ES) are a fundamental component of well-being and sustainable urban development with tremendous potential to enhance urban planning. Recently several studies have been evaluating the environmental performance of urban plans using the ES approach. To strengthen this science-policy integration, it is still necessary to perform ES assessments within the urban planning practice as well as to collect empirical evidence on the impacts of envisioned planning measures on the supply of ES in urban environments across the world. In this research, we analyze the State of the Art of China's new environmental governance, which aims to change China's land use policy and particularly the role of green infrastructure (GI) regarding urban planning and ES. We focus on the Shanghai Baoshan district Master plan as a case study, analyzing the master plan under the lenses of ES supply using the matrix approach. We ascertain the supply of ES as delineated in the ecological network plan for 2035, developing an evaluation framework based on CICES v5.1 and two expert workshops. Our approach allows for an integrated preliminary ES-assessment, discussing the consequences for the supply of ES in Baoshan district, which is adaptable to varying urban geographies. The results of our assessment show that, if realized as planned, the district will increase the supply of ES especially cultural services, that play an important role within GI on the urban level. ES assessments within urban planning are an important tool for sustainable urban development that are proved of worthy integration in LULC-based planning approaches. However, spatially explicit solutions considering aspects of urban form and spatial equity are required to optimize the spatial patterns of ES supply.

Keywords: ecosystem services, Shanghai, urban planning

Plan: history or vision? Testing plan-to-reality adherence using spatial analysis in the Metropolitan Area of Lisbon

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Portugal experienced a late metropolitan expansion, with Lisbon and Porto witnessing rapid processes of suburban growth a few decades later than most European countries. As such, the first generation of modern municipal and regional land-use plans was produced in a very dynamic context. In the early nineties, agricultural soil, forests, and natural areas in the Metropolitan Area of Lisbon were under threat from new urban development, and these early plans have been criticized for what many regard as over-generous expansion areas.

These plans were consequently the first to reflect extensive suburban development and were at the same time the first planning documents to incorporate then-recent environmental and soil protection instruments.

In this communication we investigate the extent to which these first local planning instruments were focused on legitimizing pre-existing unplanned urban areas, and then analyse how much of the generous new urban perimeters were de facto used, and where.

Using spatial analysis, we compare the zoning plans of the mid-nineties with contemporary land-cover maps (1995) reflecting pre-existent unplanned urban development and then contrast both with the most recent land cover maps (2018). Special attention is granted to urban development occurring in areas with environmental restrictions in place.

Results are critically analysed against the governance processes, notably scrutinizing how the local administration have incorporated these findings in the ongoing elaboration of second-generation land-use plans.

Keywords: planning

Which contextual factors affect the efficacy of regional planning instruments in Germany?

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Urban land take is a worldwide phenomenon. It is closely linked to urban sprawl as low–density and/or dispersed urban development and is directly or indirectly related to negative effects such as degradation of landscapes, biodiversity loss or rising infrastructure costs. Taming urban sprawl is embedded in different strategies on the European level for sustainable (urban) development and is implemented via various growth management approaches on different administrative levels. These include a variety of public policies like regulations or incentives.

Germany is one of few countries in Europe which has set a clear political target on the state level to limit urban land take. In the federal state, the aim of regional planning is to mitigate urban sprawl by setting legally binding regulations for the municipalities' land–use decisions.

Previous research from case studies in Germany shows that external conditions like population development or settlement structure and the institutional framework can affect the efficacy of planning instruments used by the regional planning. Nevertheless, the importance and the interdependencies of these factors remain unclear.

By using plan content analysis, I identify the main positive and negative planning instruments used and their strength to influence local–level planning (regulatory intensity) for all German planning regions. I incorporate the score for regulatory intensity together with important contextual factors in a kernel–based regularized least squares regression to explain urban land take in the respective region between 2000 and 2012. This method estimates the marginal effects of each independent variable for each observation to reveal how the effect of regulatory intensity on urban land take varies across planning regions depending on their different external conditions and institutional frameworks. The results indicate that these contextual factors affect the damping impact of the regulatory intensity on urban land take in different, partly in non–linear, manners.

Keywords: regional planning, regulatory intensity, contextual factors, policy outcomes, urban land take

Does upzoning increase housing supply? Evidence from the City of Zürich

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Densification and inward development have emerged as key paradigms in urban planning. The goal is to increase the supply of residential housing within urban centers in order to mitigate rising housing prices and to reduce mobility emissions. The standard policy instrument to achieve densification are upzoning policies, allowing private landowners to build denser and higher in certain delineating areas. Yet, despite the widespread use of upzoning policies, there are only few studies investigating the effect of upzoning on residential construction, mainly covering Anglo–Saxon countries. To fill this gap, we examine the effects of two waves of upzoning policies in the city of Zürich. As many other cities worldwide, Zürich has experienced high demand pressures on its housing market to which the local government has responded with upzonings. Using a unique data set on zoning changes and residential construction in Zürich from 1993 to 2018 and using a regression discontinuity framework, we estimate how much and how quickly private landowners react to upzonings by constructing new denser housing. Thus, our paper aims to make two contributions to the existing literature: first, it is the first paper to quantitatively investigate the effects of upzoning on housing supply in a continental European country whose planning law differs fundamentally from the Anglo–Saxon discretionary planning system. This allows us to consider whether private land owners respond differently to upzonings depending on the respective planning system. Second, the time span of 35 years covered by this study is higher than in previous studies, enabling us to examine also the long–run reactions to zoning changes.

Keywords: Densification, Upzoning, housing prices, housing supply, planning policy

Closer to causality: how effective is spatial planning in governing built-up land expansion?

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Spatial planning has been globally developed as a policy tool to govern built-up land expansion. However, causal evidence of the effect of spatial planning on built-up land expansion is limited. We evaluated the effect of the Major Function-Oriented Zone (MFOZ), the first strategic spatial plan in China, on built-up land expansion in Fujian Province over three time intervals (2010–2015, 2010–2018 and 2010–2020). Propensity score matching (PSM) was applied to overcome selection bias and obtain causal evidence. We implemented a conformance-based evaluation as a reference for the PSM-based evaluation, to demonstrate the problem of selection bias. The conformance-based evaluation showed that the cells in the development-restricted zone had lower built-up land expansion than the cells in the development-prioritised zone. However, the PSM-based evaluation showed that the development-restricted zone had higher built-up land expansion in 2010–2015 (452 m² more) compared to the development-prioritised zone and lower built-up land expansion in the time period 2010–2018 (2430 m²) and 2010–2020 (4465 m²). The findings suggest that in the conformance-based evaluation, inherent selection biases induced by non-randomised assignment of areas during plan making resulted in an initially ineffective effect of the MFOZ being estimated as effective in the period 2010–2015. Results also suggest that the conformance-based evaluation exaggerates the effect of the MFOZ on built-up land expansion in 2010–2018 and 2010–2020. Furthermore, the causal effect of the MFOZ on built-up land expansion varied from ineffective to effective over its implementation, suggesting a time lag in plan implementation. To conclude, we recommend a wider application of PSM-based evaluations in assessing the effectiveness of spatial planning, since this method accounts for selection bias and provides more accurate results regarding causality than conformance-based evaluations.

Keywords: Major Function Oriented Zone, built-up land expansion, evaluation methods, Fujian Province

Planning for the economic development: the role of commercial and industrial areas in German city regions

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Providing commercial or industrial areas is considered key for economic development. Municipal authorities strive for increases in tax revenues and employment when planning for these types of land uses, whereas firms locate in a place most suitable to meet their location requirements. Thus, the regional distribution of commercial and industrial land is the result of an interplay between supply-oriented planning and demand-driven development. Characterizing the evolving patterns is considered crucial to better understand the role of spatial planning. Moreover, how reliable is the underlying claim that new commercial and industrial areas contribute to regional employment growth, hence economic prosperity? Accordingly, the goal of this contribution is to present an approach for analysing commercial and industrial land use development within city regions and to set it into a socio-economic context. The approach is tested for 13 city regions in Southern Germany. We measure small scale land use changes and their accessibility within the city regional road network. This spatial land use change and its related accessibility change is then contrasted with socio-economic changes. The data is retrieved from processed topographic land use information (ATKIS® Basis-DLM, 100m raster data) and official statistics (Regionaldatenbank Deutschland) for 2000 to 2018. This rather long time span also mitigates inertia in the expected effects of land use change.

Our results show regional and municipal patterns of distinct spatial and socio-economic trends. Thus, they facilitate to approach the question which effects new commercial and industrial land have for regional economic development. Similarly, our results prepare a discussion of cause-effect relationships between the provision of commercial and industrial areas, accessibility, employment and population. These results are thus a first step to disentangle both supply-demand and cause-effect relationships. Finally, we contribute with this work to the development of city regional models that help to critically assess planning policies.

Keywords: geographic information, land use change, network analysis, accessibility, employment

Session 3b: Governance of plan making and plan implementation

The benefits of spatial planning: Assessing the performance, conformance and governance of spatial planning

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Influencing land use change is a key task of spatial planning. However, we know little about how spatial plans are implemented and how planning outcomes are generated. Spatial planning evaluation research usually focuses on either processes (performance) or outcomes (conformance) of spatial planning. As both perspectives are limited in scope, this paper proposes an analytical framework that links the conformance and performance perspectives and adds governance research. Regional governance research expands the understanding of plan implementation and planning outcomes because it analyses the interplay of planning instruments (and other rules-in-use) and actors and by doing so is able to specify the role of specific governance arrangements for observed developments. Understanding how plans influence planning outcomes and why planning outcomes might deviate from plan intentions is crucial to improve spatial planning.

We use our analytical framework to investigate spatial planning outcomes in six municipalities in Switzerland and Germany. Drawing from interviews, observations and document analysis, our findings demonstrate the usefulness of our analytical framework. Focusing empirical planning research on performance, conformance and governance helps to understand how and why plan intentions and outcomes conform or deviate. Across all case studies, we identified five main factors influencing spatial planning conformance and performance: i) the quality of the plan; ii) the bindingness of regulations; iii) governance capacities (resources, personnel, and authority's assertiveness); iv) interlinkages of conformance and performance (high performance can compensate for non-conformance); and v) the local context. Future research should continue to expand planning evaluations with governance research to come up with sound judgments about planning success or failure and to fully understand how spatial planning works in practice.

Keywords: Spatial planning, conformance, performance, implementation, governance capacity

Success in environmental planning implementation. The case of Romania.

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The outcomes of environmental plans are rarely assessed. Therefore, there is still a need to determine whether and how well such plans have been implemented. An assessment of official implementation evaluation reports along with a web-based questionnaire designed to examine two conceptions of plan implementation success (conformance and performance) and the factors affecting it were used to systematically evaluate the implementation of Local Environmental Action Plans (LEAPs) in Romania. Our results revealed that implementation of LEAPs is not easy, as shown by the mixed levels of conformance and performance. Therefore, LEAP implementation is in conformance with the plans when it comes to policies being carried out while they weakly conform when changes on the ground are not being delivered. LEAPs perform well in alleviating local environmental problems but they perform poorly in the process of decision-making. Furthermore, the capacity of the planning agency, the political support to implement the plans and stakeholder participation are important factors to LEAP implementation. Understanding of LEAP use and effectiveness provides important information for LEAPs devising to improve the implementation of the plans.

Keywords: environmental plans, implementation, conformance, performance, Romania.

Practices of supra–local spatial planning and local land–use patterns in the Barcelona and Milan urban regions

Pagliarin, Sofia

Otto–Friedrich–Universität Bamberg, Germany

Recent contributions examined how supra–local spatial plans can (in)directly influence local land–use patterns (a processes–patterns approach). However, few attention has been paid so far to which spatial planning practices are routinely performed by urban planners that enable supra–local authorities (e.g. regional governments, metropolitan authorities) to control and steer, to a certain degree, decisions on local land–use transformations (a practices–patterns approach). The main argument of this study is that the impact of supra–local plans on local land–use decisions can be detected by comparing differences in the ordinary planning practices between supra–local and local public actors. These practices are expected to be different when supra–local spatial plans are either present (control) or absent (steering), and their differences are assumed to be most visible when supra–local authorities have to assess local land–use plans prior to their final approval. By applying a qualitative research approach (in–depth interviews in 2012 and 2019; document analysis; 1950s and 2000s land–use data at different territorial scales), this study investigates the practices of supra–local spatial planning performed by metropolitan authorities in the Barcelona and Milan urban regions over time (since the 1950s), hence over a timespan when supra–local plans could be either present or absent. Results show that not only the presence and type of supra–local plan (strategic, statutory or mixed) are relevant, but also the type of interaction between supra–local and local actors is important for influencing local land–use decisions and hence the local implementation of supra–local plans.

Keywords: multiple land use, governance, strategic spatial planning, urban land change, urban regeneration

Exploring opposition to densification across different settlement types in Switzerland

Wicki, Michael; Kaufmann, David

Institute for Spatial and Landscape Development, ETH Zurich, Switzerland

Around the world, central building land is valuable but scarce. This scarcity makes efficient use of available space a necessity. Policymakers can formulate strategies aiming at densifying existing urban settlements with the aim of optimal and intensive use of the existing areas. While the broader public generally accepts such approaches, residents often oppose proposed densification policies that are planned in their local area. We aim to test how individuals from different residential settings assess settlement densification and how those individuals may differ. We empirically focus on Switzerland, a particularly interesting case due to its high population density and recent shifts in the policy focus to develop existing urban settlements internally. Our analysis is based on an adaptive, selection-based conjoint experiment with a representative sample of 3,003 residents from the Canton of Zurich, the most populous Swiss subnational unit. Results indicate that residents are indeed supportive of general densification approaches but reject such project within their own neighborhood thus leading to substantial shifts in majority. However, there are specific differences between residents from different residential settings. Specifically, urban residents are more likely to support both general and local densification strategies but also tend to more NIMBYism behavior.

Keywords: NIMBY, urbanization, urban policy, residential location, survey experiment

Re-building the Alpine Rhine Valley – An exploratory study of densification regimes and social sustainability in the Alpine Rhine Valley

Herburger, Johannes

University of Liechtenstein, Liechtenstein

Urban sprawl came under increased scrutiny in all urbanizing regions because of the vast amount of soil it consumes, the traffic it produces and the social segregation it hardens. As in many other regions, urban densification emerged as a key planning policy in all three states of the Alpine Rhine Valley to counter these unintended consequences and embark on a path to a more sustainable urban development. Urban densification involves diverse concepts such as “the re-use of brownfield land, more intensive use of urban buildings, sub-divisions and conversions of existing development” to increase “the density of population in urban areas” (Burton, 2000, p. 1969).

But as Holden (2012, p. 528) argues, urban densification often neglects goals of social sustainability and is driven by “technoscientific urbanism” (Brenner & Schmid, 2015, p. 156). Urban densification is not only a motor for growth, but Quastel et. al. (2012, p. 1057–1060) go further when they state that “sustainability planning actively contributes to (...) growing urban inequality as it reinforces rising house prices and social exclusion associated with the new economy.”

Urban densification influences social sustainability in a variety of ways and as Charmes and Keil (2015) insist, densification is a complex policy field with a plethora of different interests. The focus of this study lies on if and how different actors in densification regimes pursue goals of social sustainability in three empirical cases in the Alpine Rhine Valley. I relate a densification regime to the urban regimes concept (e.g. Mossberger & Stoker 2001): A densification regime therefore constitutes a stable arrangement of public and private actors that strive to realize densification projects to pursue individual and shared goals through the cooperative use of fragmented resources.

Keywords: urban densification, densification regimes, social sustainability, Alpine Rhine Valley

Topic Discussion

	Topic	Moderator (s)
1	Integrating planning into models - experience with various models and approaches	Nina Schwarz Hedwig van Delden
	Discussion on how planning has been implemented in various land change models. Participants share their experience on data used, types of planning, insights and challenges.	
2	Developing land change scenarios	Bronwyn Price Dario Domingo
	Participants could share their ideas about ways to develop realistic scenarios and minimise uncertainty.	
3	What makes a plan successful?	Simona Bacau
	Discussion about the factors that influence plan implementation. Participants can share their ideas about the role of institutions, practices, stakeholders, as well as differences in these factors between various types of planning (land use planning, environmental planning, zoning).	
4	What's new in planning evaluation?	Simona Gradinaru
	A focus on paradigms, new methods and data to assess the role of planning in driving land changes.	
5	The role of policy and planning in shaping urban regions	Luisa Pedrazzini Peter Verburg
	Debate about how strategic spatial planning is addressing land change processes. What has been studied so far, on what should we focus next.	
6	The role of the public in shaping urban land changes	Johannes Herburger
	The discussions will focus on the role of public involvement in the planning process, with a particular focus on plans and policies targeting land change processes. Participants will discuss about support and opposition towards land change policies and plans.	
7	Multi-level planning and land changes - how to address them	Jorge Manuel Gonçalves
	The discussions will address the way planning conducted at various levels shapes land changes. Participants can share their experience about methods and approaches in disentangling the role of each planning level.	
8	Governance of current environmental challenges	Fritz Kleinschroth
	Participants share their ideas about ways in which the ongoing environmental challenges (such as climate change, biodiversity loss) are addressed by governance studies.	
9	Land changes at the urban-rural interface	Jochen Jaeger Jasper van Vliet
	The discussions will focus on particular land changes happening at the urban–rural interface.	
10	Share your PhD experience	Sebastian Eichhorn
	PhD students are sharing their experiences on writing, summer schools, data, methods.	

Podium Discussion

Looking ahead: Research avenues in planning evaluation and urban modelling

Moderation: Sofia Pagliarin

Dr. Constantina Alina Hossu

Centre for Environmental Research and Impact Studies, University of Bucharest, Romania

Constantina Alina Hossu is a scientific researcher with a PhD in Geography since 2014. Her recent research activity includes coordination of national research projects focused on environmental policy and planning, collaborative planning and urban green infrastructure.

Dr.-Ing. Mathias Jehling

Leibniz Institute of Ecological Urban and Regional Development (IOER)

Mathias Jehling is senior researcher at IOER, focusing on geographic information in the context of urban planning. He works on regional settlement structures, urban densification and institutionalist approaches to the analysis of land policies.

Prof. Dr. Isabel Loupa Ramos

Polytechnic Institute of Lisboa (Instituto Superior Técnico)

Isabel Loupa Ramos is an associate professor working on how landscape assessment and monitoring can be integrated into land-use planning, especially regarding peri-urban areas and green-infrastructures in urban and regional planning.

Detailed Schedule

	Tuesday, 20 April 2021
14:00-14:15	Conference Opening Anna Hersperger (Chair of conference, WSL) Rolf Holderegger (Acting Deputy Director WSL)
14:15-14:30	KEYNOTE Peilei Fan
14:30-14:45	KEYNOTE Stefan Siedentop
14:45-15:00	KEYNOTE PANEL DISCUSSION Peilei Fan Stefan Siedentop Moderation: Simona Gradinaru
15:00-15:40	SPEED-MEETING WITH YOUR PEERS
15:40-16:00	Coffee break
16:00-17:00	Parallel Session 1a: Planning and urban land use modelling
	Moderation: Peter Verburg and Gaetan Palka
	Spatiotemporal analysis of the underlying factors in urban transformation: quantifying the importance of urban planning in central Texas Zhao, Chunhong Northeast Normal University, People's Republic of China Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland
	Effects of urban planning on land-use dynamics in Romania's major metropolitan areas Stoian, Constantin-Alexandru; Groza, Octavian; Sandu, Alexandra Alexandru Ioan Cuza University of Iasi, Romania
	Modelling the post-socialist urban dynamics in Central and Eastern Europe Sandu, Alexandra ^{1,2} ; Groza, Octavian ¹ ; Stoian, Constantin-Alexandru ¹ 1: Alexandru Ioan Cuza University of Iasi - Faculty of Geography and Geology, Romania 2: Université de Lyon- CNRS - Université Lumière Lyon, France
	Discussion
	How effective is spatial planning for cropland protection? An assessment based on land-use scenarios Tobias, Silvia; Price Bronwyn Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland
	Assessing and modelling alternative settlement change trajectories van Vliet, Jasper ¹ ; Li, Mengmeng ¹ ; Wang, Yuan ¹ ; Verburg, Peter ^{1,2} 1: VU University Amsterdam, The Netherlands 2: Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland
	Effect of zoning plans on urban land-use change: a multi-scenario simulation for Spanish urban regions Domingo, Dario ¹ ; Palka, Gaëtan ² ; Hersperger, Anna M. ¹ 1: Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland, Switzerland 2: CNRS UMR 6554 LETG, Université Rennes 2, France
	Discussion

16:00-17:00	Parallel Session 2a: The role of planning in urban land use change
	Moderation: Sofia Pagliarin and Carole Imhof
	Quantifying the deviation between land use planning objectives and outcomes Daunt, Beatriz Pierri ¹ ; Inostroza, Luis ^{2,3} ; Hersperger, Anna M. ¹ 1: Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland 2: Ruhr-University Bochum Department of Geography, Germany 3: Universidad Autónoma de Chile, Chile
	Does land use planning in Poland is an effective tool for preventing housing development in protected areas and their buffer zones? Jakiel, Michal Jagiellonian University, Poland
	Drivers of agricultural land abandonment in urban regions: A review Gradinaru, Simona ¹ ; Iojă, Cristian ¹ ; Nita, Mihai ¹ ; Hersperger, Anna M. ² 1: University of Bucharest 2: Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland
	Discussion
	Spatial planning and its influence in shaping urban landscapes. Insights from Bucharest urban region Bacau, Simona; Hersperger, Anna M. Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland
	Spatial and temporal analyses of urbanization of Mardan city, its causes and impacts on environment Qasim, Muhammad; Gul, Saba University of Swat, Pakistan
	Evaluating the efficacy and effects of regional planning instruments on urban land-use change in Germany Eichhorn, Sebastian Research Institute for Regional and Urban Development, Germany
	Discussion
Evening	Informal and fun social event

	Wednesday, 21 April 2021
14:00-14:05	WELCOME BACK
14:05-14:20	KEYNOTE Dena Kasraian
14:20-14:35	KEYNOTE Angelus Eisinger
14:35-14:50	KEYNOTE PANEL DISCUSSION Dena Kasraian Angelus Eisinger Moderation: Eduardo Oliveira
14:50-15:10	NETWORKING EVENT
15:10-15:30	Coffee break
15:30-16:30	Parallel Session 1b: Planning and urban land use modelling Moderation: Gaetan Palka and Peter Verburg
	Agent-based models to explore potential effects of urban planning: potentials and challenges Schwarz, Nina University of Twente, the Netherlands
	Urban regions: the challenges and opportunities of peri-urban areas Verburg, Peter Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland ; Vrije Universiteit Amsterdam, The Netherlands
	Tracking transformative changes in the global land system linked to urbanization Kleinschroth, Fritz Ecosystem Management, Department Environmental Systems Science, ETH Zurich
	Discussion
	Are urban and conservation planning goals compatible? Optimising living conditions for humans and animals in coupled settlement and habitat networks van Strien, Maarten Jan; Khiali-Miab, Amin; Grêt-Regamey, Adrienne Planning of Landscape and Urban Systems, ETH Zurich, Switzerland
	Integrating societal differences and disaster risk reduction into models for planning support van Delden, Hedwig ^{1,2} ; Riddell, Graeme ^{1,2} ; Maier, Holger ² ; March, Alan ³ ; Nogueira de Moraes, Leonardo ³ ; Vanhout, Roel ¹ 1: RIKS, The Netherlands 2: The University of Adelaide, Australia 3: The University of Melbourne, Australia
	Local variations in global trends of urban land development Li, Mengmeng ¹ ; Verburg, Peter ^{1,2} ; van Vliet, Jasper ¹ 1: VU University Amsterdam, The Netherlands 2: Swiss Federal Research Institute WSL, Switzerland
	Discussion

15:30-16:30	Parallel Session 3a: Governance of plan making and plan implementation
	Moderation: Silvia Tobias and Eduardo Oliveira
	Future land use planning to be context-dependent, conditional, dynamic, and inclusionary Wälty, Sibylle ETH Wohnforum - ETH CASE, ETH Zurich, Switzerland
	A practical proposal about how to stop urban sprawl by establishing quantitative targets and limits to urban sprawl Jaeger, Jochen A.G. Concordia University Montreal, Canada
	Governance of the territorial management instruments at local level: blocking or facilitating factor? Gonçalves, Jorge Manuel; Condessa, Beatriz CiTUA, Instituto Superior Técnico, Portugal
	Discussion
	Mapping Green Infrastructure for the canton of Geneva : integrating biodiversity, connectivity, and ecosystem services into landscape planning decisions Honeck, Erica ¹ ; Moilanen, Atte ² ; Guinaudeau, Benjamin ¹ ; Wyler, Nicolas ³ ; Schlaepfer, Martin ¹ ; Martin, Pascal ³ ; Sanguet, Arthur ^{1,3} ; Urbina, Loreto ⁴ ; von Arx, Bertrand ⁵ ; Massy, Joëlle ⁵ ; Fischer, Claude ⁴ ; Lehmann, Anthony ¹ 1: University of Geneva, Switzerland 2: University of Helsinki, Finland 3: Conservatory and Botanical Garden of the City of Geneva, Switzerland 4: HEPIA (Haute Ecole du Paysage, d'Ingénierie et d'Architecture de Genève) 5: OCAN Office cantonal de l'agriculture et de la nature Genève, Switzerland
	EUSALP a metaplan for soft planning Pedrazzini, Luisa Regione Lombardia, Italy
	Spatial planning instruments and data flow – the impact of digitalisation on the cognitive and structuring functions of plans in France and Norway Grønning, Marius; Rutledal, Bjørnar; Galland, Daniel Norwegian University of Life Sciences, Norway
	Discussion
16:30-17:00	TOPIC DISCUSSIONS in subgroups

	Topic Discussion	Moderator (s)
1	Integrating planning into models - experience with various models and approaches	Nina Schwarz Hedwig van Delden
2	Developing land change scenarios	Bronwyn Price Dario Domingo
3	What makes a plan successful?	Simona Bacau Beatriz Pierri Daunt
4	What's new in planning evaluation?	Simona Gradinaru Zhichao He
5	The role of policy and planning in shaping urban regions	Luisa Pedrazzini Peter Verburg
6	The role of the public in shaping urban land changes	Johannes Herburger Silvia Tobias
7	Multi-level planning and land changes - how to address them	Jorge Manuel Gonçalves Tim Geiges
8	Governance of current environmental challenges	Fritz Kleinschroth Maria Garcia Martin
9	Land changes at the urban-rural interface	Jochen Jaeger Jasper van Vliet
10	Share your PhD experience	Sebastian Eichhorn Carole Imhof

	Thursday, 22 April 2021
14:00-14:05	WELCOME BACK
14:05-15:05	Parallel Session 2b: The role of planning in urban land use change
	Moderation: Dario Domingo and Beatriz Pierri Daunt
	China's Ecosystem Services Urban Planning new paradigm: Will Shanghai lead the way? A case study from the Baoshan district in Shanghai Inostroza, Luis; Zepp, Harald; Falke, Matthias; Gruenhagen, Lars Ruhr University Bochum, Germany
	Plan: history or vision? Testing plan-to-reality adherence using spatial analysis in the Metropolitan Area of Lisbon Loupa-Ramos, Isabel; Condessa, Beatriz; Pinto, Pedro University of Lisbon, Portugal
	Which contextual factors affect the efficacy of regional planning instruments in Germany? Pehlke, David Justus-Liebig-Universität Gießen, Germany
	Discussion
	Does upzoning increase housing supply? Evidence from the City of Zürich Lutz, Elena Catharina; Kaufmann, David ETH Zürich, Switzerland
	Closer to causality: how effective is spatial planning in governing built-up land expansion? He, Zhichao Martin Luther University Halle-Wittenberg
	Planning for the economic development: the role of commercial and industrial areas in German city regions Jehling, Mathias; Krehl, Angelika; Krueger, Tobias Leibniz Institute of Ecological Urban and Regional Development, Germany
	Discussion

14:05-15:05	Parallel Session 3b: Governance of plan making and plan implementation
	Moderation: Eduardo Oliveira and Silvia Tobias
	The benefits of spatial planning: Assessing the performance, conformance and governance of spatial planning Kiessling, Nadine; Pütz, Marco Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland
	Success in environmental planning implementation. The case of Romania. Hossu, Constantina-Alina ¹ ; Iojă, Ioan-Cristian ¹ ; Mitincu, Cristina-Gabriela ¹ ; Slave, Andreea-Raluca ¹ ; Hersperger, Anna M. ² 1: University of Bucharest, CCMESI, Romania 2: Swiss Federal Research Institute WSL, Switzerland
	Practices of supra-local spatial planning and local land-use patterns in the Barcelona and Milan urban regions Pagliarin, Sofia Otto-Friedrich-Universität Bamberg, Germany
	Discussion
	Exploring opposition to densification across different settlement types in Switzerland Wicki, Michael; Kaufmann, David ETH Zürich, Switzerland
	Re-building the Alpine Rhine Valley - An exploratory study of densification regimes and social sustainability in the Alpine Rhine Valley Herburger, Johannes University of Liechtenstein, Liechtenstein
	Discussion
15:05-15:50	Gather Town Meeting
15:50-16:10	Coffee break
16:10-16:45	PODIUM DISCUSSION Looking ahead: Research avenues in planning evaluation and urban modelling Moderation: Sofia Pagliarin Panelists: Constantina Alina Hossu Isabel Loupa Ramos Mathias Jehling
16:45-17:00	WRAP-UP AND CONFERENCE CLOSING