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Track 1: Governance of urban-rural linkages

Competition on agri-urban models for the Cologne metropolitan region

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The thriving Cologne urban region is facing considerable challenges. Rising demand for land for living, working and infrastructure at the expense of agriculture is increasing the pressure on land as a resource. Additionally the planned phase-out of the brown coal industry is boosting the transformation of the region. Here, it is necessary to manage growing land use claims and conflicts while at the same time safeguarding the quality and identity of the agriculturally shaped cultural landscape.

With the slogan 'growing together', the municipalities of this region have joined forces and formed an intercommunal network. One goal is to set up sustainable and resilient forms of spatial development in contrast to traditional patterns of suburban sprawl.

Multiple stakeholders develop spatial images and innovative land use concepts with ambitious guidelines for new urban density.

On selected local sites, arise exemplary urban concepts that are ready for implementation and transferable. Sustainable spatial models beyond a "business as usual" scenario take into account new forms of housing and living, intelligent mobility, the impending structural change and reuse of industrial infrastructure as well as the various landscape and agricultural structures.

In a competition for ideas, students of urban planning, architecture and landscape architecture design agri-urban neighbourhoods and seek for innovative and forward-looking ideas for locally known locations. Aspects of mobility, new forms of work and housing or recreational opportunities in nature will be taken into account, as well as the requirements of local agriculture and nutrition.

The results of the competition will illustrate to the public how sustainable settlements in the urban environment could look like in the future. The discussion on spectacular designs and new formations of the urban and agricultural environment will make an important contribution to future regional development and transformation.

Track 1: Governance of urban-rural linkages

Symbiotic Landscapes

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As any society in today's age progresses, the impact of modernization often turns a blind eye towards its ethno-spatial and the socio-cultural constructs. This speaks volumes about the fact that the process of moving towards becoming a contemporary society is not so inclusive of the local culture and identity after all. This study investigates methods of developing contemporary landscapes which are anchored to the underlying cultural processes and can hence become manifestations of a successful amalgamation of cultural practices and contemporary trends. The study is about the agrarian societies and their rustic landscapes through the specific context of Silvassa, an erstwhile tribal place in DNH. As Silvassa is characterized by a peculiar land acquisition pattern with farmlands being bought by industrialists and converted into residential townships, the intermediate stage of the land left undeveloped in adherence to the FSI regulations creates immense scope of recreating the local cultural identity through our landscape interventions wherein the rich cultural past and the 'bright' modern future share a middle ground. The study attempts to devise a typology of development in Silvassa through modules of urban landscapes which are contemporary in nature but align with the local culture symbiotically and at the same time have their character and aesthetics derived from the native landscape. Can the landscape of a place be visualized such that it translates the mental and physical comfort of the different resident groups into a typological identity of the place? As in many other such places in India which are home to people from different ethnicities, beliefs and cultures, here too the market place becomes a common ground where all of them come together to earn their living but the way it is done defines the physicality of the market place. In response to this situation, there is an exploration of the idea of a Market garden and rejuvenation of the local culture.

Track 1: Governance of urban-rural linkages

Network governance arrangements and rural-urban synergy

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Rural and urban areas have different assets that complement each other, and a better interaction between them is therefore needed. Rural-urban synergies may contribute to improved services provision and wellbeing as well as to increased growth opportunities. Consequently, increasing attention has been paid to the importance of balanced rural-urban interaction to sustainable regional development. Yet, our knowledge on the elements of such solutions is scarce. The elements of good governance as such, e.g. the role of informal networks, bottom-up initiatives, agency, trust and transparency, as well as participation, communication and collaborative approaches are well recognized by the scientific community. In practice, they are not often translated into effective policy strategies. Therefore, more information on the elements of balanced rural-urban interaction and the conditions for them with real examples is needed. In this paper we analyse five existing and evolving cases of functioning rural-urban interaction in EU members states (Finland, Latvia, The Netherlands, Slovenia, Spain) using network governance framework as an analytical lens. Moreover, we elaborate to what kind of spatial understanding or combination of different spatial lenses (relational, relative and absolute) the studied rural-urban governance arrangements rely on. With these examples we understand the heterogeneity of governance models that are shaped by time and place and are context dependent. In addition to differences, we also elaborate commonalities in governance systems, and thus generalise from these examples to the EU level. Our results emphasise the significance of division of power and divisions of labour in guaranteeing balanced and mutually beneficial interaction. Furthermore, we recommend changes in current policies in order to tap into the potential of rural-urban synergy.

S1: Territorial governance arrangements for resilience in urban-rural interaction

Regional Typology as a Factor in the Energy Transition in Europe

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The study is based on the results of a European-wide survey on energy-related personal behavioral choices and the research findings on the effectiveness of current policies aimed at energy transition within eight countries (ECHOES project, Horizon 2020); results were connected to publicly accessible geospatial data on regional typologies - differentiating urban and rural among others, and to the characteristics of active planning and governance systems. The paper discusses outlined similarities and differences concerning the energy-related features of the built environment (housing and transportation in particular), inhabitants' lifestyles and energy consumption patterns, and their perceptions about the importance of energy efficiency in everyday life. The authors claim that in order to support the implementation of relevant and effective EU policy for energy transition, further and more detailed studies would be needed with an explicit focus on regional typology, settlement morphology, and their influence on inhabitants' lifestyle, personal attitude to energy consumption, and practical choices made. There is a need for better understanding the diversity of paths to energy transition in Europe in urban and rural situations but also in transitional ones, in order to define required and possible energy-related changes in the built environment, lifestyles, and behavioral modes. The paper is also expected to raise a discussion on how European policy could effectively motivate national planning systems to be more sensitive and respectful to existing regional peculiarities and to influence a shift from predominantly city-focused approaches to acknowledging the opportunities provided by different settlement types. An international research on the development and implementation of smart energy models and networks would be of key importance in supporting an effective energy transition policy.

Keywords: regional typology, urban–rural energy profiles, spatial planning, energy transition, ECHOES.

S1: Territorial governance arrangements for resilience in urban-rural interaction

Global Neo-rurals: Are they all the same? A case study in Portugal.

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In Portugal, rural areas located in the interior of the country are, in general, lagging regions that have suffered from a continuous exodus and an aging population. For several decades, no political actions or programs targeting rural territories have been able to reverse this situation. Despite this, in recent years there has been an emergent phenomenon of arrival of people from urban places (neo-rural population), as a result of a global counter-urbanization movement. The municipality of Penamacor, located in Beira Interior region, is a paradigmatic case of this phenomena. With less than 5,000 inhabitants, this is one of the municipalities with the lowest population density in Portugal and in 2011 (according to the national Census) was the municipality with the highest aging rate. In 2012, one of the national newspapers (Público, July 16), announced the death of its small villages, declaring them “in extinction”. However, from 2017 the municipality returned to the news, but this time to deal with a striking phenomenon: “Penamacor was the oldest municipality in the country. Today, it has the highest rate of foreign residents in the interior - almost 10% of the population. They are mainly English, working age and fleeing brexit. They are buying abandoned farms, they opened an international school, they work online for the whole world. There is a new world in Beira Interior. (in Diário de Notícias, 14 October 2018).

It is intended with this presentation to answer the following questions, in order to better understand and take full advantage of a global trend that may be the ultimate hope for these dying territories: who are these new residents? what are they patterns of mobility? Why did they come to this territory? how do they live and work? how do they relate with the territory and with the rest of the world.? Are they all the same? What are the conditions for permanence of the foreign communities and for co-existence of both, rural and neo-rural communities?

S1: Territorial governance arrangements for resilience in urban-rural interaction

Fostering inter-city cross-border cooperation with international student projects

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The contribution discusses how the cooperation between cities can be fostered bottom-up by activities between university students in a form of international student competition. Universities, as non-political entities, have the ability to cooperate on multiple levels and by their activities contribute to improving the relationship between universities, the cities and city departments by involving them into the student projects under the umbrella of academic environment.

MUNISS student competition is a project originally by Faculty of Economics and Administration at Masaryk University in Brno and the city of Brno, initiated for the first time in academic year 2011/2012. The assignment is to propose a solution for specific problem in the urban area and student teams with their proposals are competing for prizes. In academic year 2016/2017 the Slovak University of Technology in Bratislava and the city of Bratislava became project partners and international student teams were created working on international assignments. Under this configuration, the project had been running for the fourth time and we argue that it allowed improved cooperation, communication and common projects between the cities of Brno and Bratislava. The contribution includes examples of this improved cooperation and lists perspectives for the future. Both cities continue to support this project and are eager to take up also other cities and universities on board (Vienna, Prague, Budapest) and MUNISS and similar projects have potential to improve overall cooperation among the cities and cities with universities.

S1: Territorial governance arrangements for resilience in urban-rural interaction

Managing cross-border regional identity over time – lessons from CENTROPE region (2003-2020)

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Central European Region (CENTROPE) has been established in 2003 as an initiative integrating the cities and regions from 4 Central European states (Austria, Slovakia, Czech republic, Hungary) and reflecting the process of culminating European integration and cooperation among cities and regions. The key underlying idea was to profile the highly competitive region around the national capitals Vienna and Bratislava as a framework for increasing wealth and sustainable growth in area of living and working space for more than 6 million citizens and to generate a plausible pattern for strong regional identification, Place Branding and place attachment of the stakeholders. Coordinated effort for establishing and maintaining highly profiled regional identity is an important underlying assumption for the success of the similar initiatives. The initiative delivered both highlights and setbacks but after the decade of optimism (2003-2013) it appears to be inactive and slowly fading away. On the basis of extensive literature review, during the 2018 year the 12 semi-structured interviews with key stakeholders from the area of public policy/academia and experience from more than 20 years of working in the field of cross-border cooperation were externalized. The presentation is discussing the lessons from CENTROPE that can be drawn for maintaining, fostering and managing the identity of cross-border European region. CENTROPE's key aim was to improve this status and ensure sustainable development of whole area overlapping national borders which roles were continuously softening and becoming fuzzier. However, the initial momentum of successful cooperation and mutual communication (which resulted in several successful cross-border projects) was not kept up and the initiative soon lost the drive and for the past several years it has not been as progressive as it once was. Our presentation examines this development and delivers conclusions with recommendations on positive lessons and negative trends to be avoided.

Key words: regional identity, CENTROPE, cross-border region, place attachment, vision

S1: Territorial governance arrangements for resilience in urban-rural interaction

Densification as a regional challenge: A normative view on spatial processes and actors' interests

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In many countries, densification goals are pivotal for promoting sustainable urban development that retains compact settlement structures. Densification in terms of adapting existing structures to new and more intensive uses is often attributed to urban centres, while suburban and rural parts of city regions remain often out of focus. This is in contrast to the urgent need to rethink urbanisation in regions as a whole. In Germany, the instrument of regional land use plans has the potential to give new impulses for regional co-operation and coordination in densification for functionally interlinked regions.

It is thus the aim to introduce into an approach that allows for taking a regional perspective and analyse the allocation of densification on regional level. We propose a GIS-approach for automated identification of changes in building density and the location in the regional transport network. We then analyse the introduction of a regional land use plan with regard to densification objective and actors' interests. In a next step, the effects of densification on population and different locations, from urban to rural, are looked at. The region of Frankfurt am Main is taken as a case, which is covered by a Regional Land Use Plan with ambitious densification goals. The results show that indeed densification is mainly directed to places of high population density. The same applies to the accessibility of places. Higher accessible places tend to have more densification. As this is in line with general assumptions on urbanisation, we look at this allocation from a normative vantage point to better understand the interests of planning actors. As densification changes the allocation of social and environmental burdens and benefits, such a view allows for insights into constraints and opportunities for co-ordinated regional densification efforts. We namely apply concepts of justice to interpret the interests of municipal and regional planning actors.

S1: Territorial governance arrangements for resilience in urban-rural interaction

Governance of energy transition in coal mining regions – a Czech and German comparison of regional development approaches

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In 2019, the German government decided to phase out coal by 2038, while the Czech government is pursuing a similar approach and set up a coal commission in 2019. Not only are the political top-down-processes comparable, but the lignite regions in Czechia and Germany face similar challenges. After the political turnaround and economic reforms of the 1990s, coal regions such as Lusatia and the Usti Region experienced their first structural changes. Since then, development paths have been marked by tendencies of peripheralization, characterised by the closure of inefficient enterprises, a decline in employment, an outmigration of young people and a loss of political significance. However, the connection and dependence on lignite mining is still evident (economically, in identities, and industrial regimes) and is again being addressed in public discourses. This exerts enormous political pressure on decision-makers at multiple levels to offer alternative development strategies for those regions undergoing structural change. So far, governmental concepts have concentrated on strategies to regain economic competitiveness e.g. implementing modernization strategies such as infrastructure investments and re-industrialization.

From a regional policy perspective, the question remains how a more regional governance and approaches of strategic planning can support innovation, resilience and transformation towards sustainability including more balanced urban-rural interaction. In theory, strategic planning is intended to foster reflection upon trends and development paths and develop new perspectives with regional actors. Yet, the implementation of these instruments in the context of the ongoing transformation of lignite regions shows diverse results.

In our paper we will discuss the preliminary results of an analysis of the transformation process in Lusatia and compare its challenges, policies and dynamics of regional development with the Usti Region.

S1: Territorial governance arrangements for resilience in urban-rural interaction

Bridging urban, suburban and rural areas in metropolitan spatial planning: lessons from Poland.

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Since 1990s large urban areas in the Central and Eastern Europe have been undergoing a very dynamic functional and spatial transformation. The adaptation to the new political, social and economic conditions has usually not taken place in a planned and coordinated way. In the face of the liberalized spatial planning system, most of the new investments in metropolitan areas of CEE were subordinated to the interests of individual actors rather than comprehensively managed spatial development processes. Therefore, major city-regions in CEE have become complex patchworks of urban, suburban and rural areas. The aggressive local policies of residential, commercial and industrial growth have created a serious threat to the principles of sustainable development and urban resilience. This could be overcome by more complex institutional arrangements of metropolitan-wide governance and planning. But the experience of governing metropolitan areas in post-socialist countries is much poorer than in Western states and this results primarily from the historical conditions and the socialist centralisation heritage.

The paper deals with failed attempts for “top down” metropolitan reform in the largest CEE country – Poland which are contrasted with more successful “bottom-up” initiatives implemented on the basis of political consensus and cooperation of municipalities. The empirical part of the paper covers a thorough analysis of Poznań metropolitan area – considered to be a leading city-region in Poland in the field of bottom-up voluntary planning integration at the supra-local scale. Two main research methods are 1) face-to-face interviews with key political figures and planning officers and experts, 2) analysis of working mechanisms and documents of Metropolitan Planning Commission - a non-statutory body appointed by the Poznań Metropolis Association to coordinate local planning policies with metropolitan visions and concepts. The main research question is whether the informal metropolitan planning arrangements are able to influence local policies on such issues like protection of green areas or promotion of public transit-oriented development.

S1: Territorial governance arrangements for resilience in urban-rural interaction

Establishment of an advisory board for the implementation of projects with regional relevance

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In the course of the present transdisciplinary research project “RLC 2040” in Römerland Carnuntum in Lower Austria (<https://www.clubofrome-carnuntum.at/forschungsprojekt-start-2/>), regional processes of self-empowerment and self-organisation for future-oriented, transformative learning and action are to be co-creatively developed, implemented and systematically tested with regard to their transformative learning success. The region is situated in the sub-urban area between Vienna and Bratislava, consisting 30 municipalities, which recognized building and planning cultural guidelines as an opportunity for integrative development. The methodological basis of the project is a participatory scenario process for the formulation of a vision for the region. The implementation of concrete projects will be tested in two real-labs, the so called “Regions-Schmiede” (“Regional-Forge”), regarding social learning and transdisciplinary transformation research as a part of sustainable development.

As part of the project the “Regions-Schmiede” was set up to provide a platform for regional stakeholders to work out future development paths for habitat design. The main topics include communicating, discussing, and testing possibilities for saving land and an active soil policy. The aim is to formulate region-specific guidelines for a sustainable development of living space with relevant stakeholders and the population together. This provides a basis for coordinated regional planning. The following focal points are included: (1) Preserve and carefully develop settlement and landscape areas; (2) Consider and establish regionally typical building and housing; (3) Improve communication within the region and between all those involved and affected in planning; (4) Promoting mindfulness, awareness and knowledge of architectural cultural issues. The aim is to establish an advisory board for the implementation of planning, which consider the principles regarding building and planning culture.

S4: Towards spatial justice in a sustainable urban-rural context

Spatial justice only with the people 'affected'. Some considerations from a rural perspective

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In recent years, issues of spatial justice have been (again) vividly discussed. In political terms, there is a strong and at least in Germany also reconsolidated commitment to spatial justice or, as it is usually framed here, to the 'equivalence of living conditions'. In contrast, some scientists argue against this principle by referring, for example, to issues of (in)efficiency or just costs and based on more or less linear future assumptions. However, whether being in favour or against the idea of equivalent living conditions in regional terms, very often this proves to be a mere top-down debate that is far away from people's daily lives. These life worlds have to do with the availability of jobs, the accessibility of basic public and private services, making ends meet and living a good life.

While rural areas are a major focus of the debate on spatial justice, the way they are perceived is surprisingly undifferentiated. Their infrastructure is less dense, the villages are depopulating, living conditions are worse and jobs lower paid. In this vein, rural areas are per se regarded as disadvantaged, declining or deprived. Such popular media (and partly also scientific) accounts are often formulated from an urban (rather: metropolitan) lens as media, science and political parties use to have their headquarters in large cities. Thus, urban-rural interrelations are also mentally shaped. In my paper, I will argue that achieving sustainable interrelations between 'the urban' and 'the rural' also requires taking into account the self-perceptions of the people living in – supposedly or indeed – disadvantaged rural areas. From various both qualitative and standardised investigations in recent years, I will provide empirical insights of how rural inhabitants consider their living conditions, advantages of the rural and daily-life problems. This will reveal a more differentiated picture of rural lives along with subjective perceptions of spatial justice and injustice.

S5: New fissures in the urban-rural fabric and social justice: ethnic and immigrant ghettos at the systemic edge

Slums and Ghettos in Central and Eastern Europe: Assessing their Magnitude and Features

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This contribution aims to collect and synthesize most of the available information on Roma ghettos and slums in Central and Eastern Europe. The aim is to distinguish historically constituted ghettos as well as more recent Roma slums in 10 CEE countries, namely the Czech Republic, Poland, Slovakia, Hungary, Romania, Bulgaria, Serbia, Bosnia and Herzegovina, Montenegro and North Macedonia. The data sources used will include academic sources, media sources and data from the Environmental Justice Atlas. The collected cases will be classified in terms of size, urban location, brief history as well as the negative environmental and housing conditions affecting their residents. This research will form the basis for future, more focused inquiries on the situation of Roma slum and ghetto-dwellers in CEE, by providing a general assessment of their magnitude and characteristics. A selection of cases for which rich historical and qualitative information is available will be explored along two dimensions, namely expulsions and the creation of extreme (environmental) conditions. Is there a discernable influence of ongoing processes of forced relocation and the deepening of social and environmental inequalities in ghetto areas? What are the main articulations between these two dimensions? The selected case data will be used to explore this possible relationship, which might be a symptom of new emerging fissures in the urban fabric of Central and Eastern European cities.

S5: New fissures in the urban-rural fabric and social justice: ethnic and immigrant ghettos at the systemic edge

`We lurk in the hidden places`. The invisibilization of Roma segregated communities living in extreme conditions

Ionut Marian Anghel; Filip Alexandrescu

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Our presentation explores the theoretical interconnections and the empirical applicability of a conceptual pair (expulsions/systemic edge) advanced by sociologist Saskia Sassen in her recent work (2014, 2015, 2016). Her argument is that the political economy of today's neoliberalism no longer integrates people either as workers or consumers (as in the post-war developmental regimes), but rather it functions on a totally different dynamics. The current logic requires only a small but highly functional economy, whose side effect is the expulsion of individuals and groups who inhibit the accelerated accumulation of financial capital. This process creates a space outside the economy of the haves, which Sassen calls the systemic edge. In this realm, a condition becomes so extreme that it is rendered invisible and ungraspable to the dominant scientific and bureaucratic forms of knowledge. (Sassen, 2015: 174).

What is still missing from Sassen's argument is the internal architecture of the systemic edge. By what mechanisms, processes, and discourses are the expelled rendered invisible? How is life on the edge stabilized and reproduced or ruptured and transformed? We explore these theoretical interconnections by discussing several makeshift Roma ghettos at the margins of two middle-sized cities in Transylvania, Romania. We use semi-structured interviews and observations to reconstruct the histories of the expelled, their invisibilization and modes of resistance. We conclude that making Roma ghettos invisible involves their adverse incorporation into a social and discursive order in which those expelled are depicted as voluntary participants in their own expulsion. This adverse incorporation field (Fligstein and McAdam 2012) relies on specific definitions of the "Gypsy problem", on rules of action and on the positioning of actors as incumbents and challengers. The reproduction of these fields or their possible disruption will determine the political future of Roma ghettos.

S5: New fissures in the urban-rural fabric and social justice: ethnic and immigrant ghettos at the systemic edge

Housing discrimination at home and abroad: from life in the ghetto to life in the makeshift camp

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There are many forms in which housing is affected by various policies, public or private, and equally many in which it is affected by the lack of specific policies that would otherwise lead to a decent standard of living for the disadvantaged. In the case of Romanian Roma several forms can be identified: exposure to substandard conditions, exposure to hazard, segregation and forced displacement. Following several examples collected during fieldwork, I will illustrate the link in between the housing conditions in the country of origin and the strategies of adaptation of Roma families that are engaged in a process of pendular migration towards wealthier states within the EU. A main claim is that people living in substandard conditions in Romania would end in even worse conditions in other countries, and that this is in close connection with the migration patterns that dominate the intra-EU movement of the Roma.

Multi-sited ethnographic studies are still scarce, though in the last decade they started to multiply (Olivera, Benarrosh, Tesăr, Vrăbiescu). What they reveal is a similar dynamic in terms of the establishment of an initial shelter in a new environment and of its tribulations that lead to several forms of resolutions to a set of problems that have their roots in the place of origin. One major contentious issue is related to the situation of children, another one, made visible more recent, in the context of the pandemic, has to do with the sanitary situation of these settlements. The paper will present examples from Italy, France and Romania with a focus on camp policies.

S5: New fissures in the urban-rural fabric and social justice: ethnic and immigrant ghettos at the systemic edge

Making ghettos, invisibilizing racisms: comparative reflections on Romania and the US

Ryan Powell

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The theoretical concept of the ghetto has proved useful in exposing the seclusion and separation of denigrated groups on either side of the Atlantic. This paper utilizes the notion of the ghetto as a device of ethnoracial domination à la Wacquant in both Romania and the US. In critiquing Wacquant's thesis, it spotlights commonalities and differences in articulating segregation as a key characteristic of the contemporary urban condition in both countries. It shows how any understanding of the dominant logics of racial classification and housing struggle today must be rooted in an historical understanding of group interdependencies and the desire to exclude racialized others in preserving status, privilege, value and in perpetuating a superior group self-image. Economic, cultural and social value accrues from one's distance from racialized others, with threats to that producing new modes and frames of racialization. These logics invisibilize inherent racisms and preserve segregation. The article concludes with some reflections on potential lines of inquiry in moving toward a comparative understanding of ghettoization and the collective urban struggles against it. One that moves beyond binaristic understandings (e.g. micro/macro, agency/structure, inclusion/exclusion, global north/global south) and is centred on shifting relationalities across time.

S7: Linking practical requirements and territorial policies: Tools and policies

The European Green Deal and a Shorter Food Supply Chains Road Map in the context of Rural and Urban Dynamics

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The European Green Deal calls for collective ambition transforming the EU economy and society into a more sustainable developmental model, whilst recognising that this cannot be achieved by Europe acting alone. As with the COVID-19 pandemic, the drivers of climate change and biodiversity loss are global and are not limited by national borders . Extended lockdowns across the world put food security issues at the forefront of the global agenda. To achieve regional and local food security, shorter food supply chains will need to be re-introduced in the context of land-use tensions between rural and urban areas, as well as well-established global food supply chains, versus, non-existent at times, local food supply chains.

Cities and towns have a role to play in the sustainable food chain, by connecting to processing, logistics, storage, retail, and general food services. The role of metropolitan areas and peri-urban areas cannot be underestimated in capitalising on all economic aspects of sustainable and circular food chain systems.

As part of the road-mapping exercise for shorter food supply chains, an analysis of the global and European territorial policies on rural and urban linkages will be carried out, in order to evaluate to what extent these policies can aid in the implementation of shorter food supply chains and what may be needed to be added, so that they remain relevant and a source of tools for a greater rural and urban integration.

S10: (Re)growth and urban-rural linkages in a regional scope: a cross-European perspective

Factors driving the regrowth of European cities and the role of local and contextual impacts: a contrasting analysis of regrowing and shrinking cities

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This paper undertakes a comparison of two regrowing and two shrinking European cities in order to identify the factors driving demographic regrowth and economic recovery of cities and how and why those factors are at work in some cities that turned from population decline towards new growth while others did not. Our objectives are to systematically elaborate the factors that are influencing urban regrowth, explain how these factors interact and are mutually dependent and to discuss how these factors relate to contextual conditions at different scales. For our contrasting analysis, we chose the cities of Liverpool and Leipzig that see regrowth after shrinkage and Łódź and Ostrava that are further on shrinking. As a result of this comparison, we identify general local and contextual factors driving regrowth and discuss their interaction and what we learn from this for the wider urbanization debate.

In the planned contribution, our focus will be, apart from the comparative perspective, on the case of the examples Leipzig and Liverpool while a second talk by Petr Rumpel (see his submitted abstract for the same session) will deepen the case of Ostrava.

S10: (Re)growth and urban-rural linkages in a regional scope: a cross-European perspective

METAPOLIS – An inter- and transdisciplinary platform for the sustainable development of urban-rural relations in Lower Saxony: TOPOI - a new method for identifying urbanization patterns and their linkages along the urban-rural gradient.

Vanessa Miriam Carlow

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In today's globalized and networked world, new settlement patterns have emerged along the urban-rural gradient requiring a new understanding of the phenomenon of urban-rural linkages to foster a more sustainable development of urban and rural areas alike.

In the planned contribution, we will present research outcomes of the project METAPOLIS. An inter- and transdisciplinary platform for the sustainable development of urban-rural linkages in Lower Saxony (>> www.tu-braunschweig.de/metapolis) - a cooperation between TU Braunschweig, Leibniz University Hannover and a multitude of regional partners.

The aim of the project is to investigate urban-rural relationships in two selected study regions in Lower Saxony, Germany, including a large number of local municipalities shrinking and prospering in close geographic proximity. As a result of the unbalanced development, unsustainable effects are caused, such as a high sealing of land and dense commuting patterns. Based on the assessment of the settlement patterns, future scenarios for certain typical settlement types are developed.

The inter- and transdisciplinary framework of the Metapolis project allows opening up new planning approaches for a more sustainable development by integrating disciplinary research perspectives from fields such as urban planning and architecture, ecology, digital technologies, mobility, resource management and governance etc..

In the second part of the session “(Re)growth and urban-rural linkages in a regional scope: a cross-European perspective“, we will introduce three METAPOLIS research papers. The first presentation will present the TOPOI method allowing for the identification of settlement types based on eleven parameters of physical form, function and spatial linkages. The second contribution will focus on resource consumption of exemplary settlement patterns and types. The third contribution will address the question of policy network formation in a Lower Saxonian municipality.

S10: (Re)growth and urban-rural linkages in a regional scope: a cross-European perspective

METAPOLIS – An inter- and transdisciplinary platform for the sustainable development of urban-rural relations in Lower Saxony: Local Policy Network Formation.

Malte Möck

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Urban-rural relations in Lower Saxony are shaped by political, economic and societal actors involved in sustainable development at a local level. Their relevance is reflected in the transdisciplinary approach of the METAPOLIS project. From the political science perspective of the sub-project Governance, it is interesting how and why such local stakeholders exchange their knowledge and coordinate their activities. These interactions can be represented in policy networks and have been investigated extensively for policy areas at national levels. Less is known about their formation under the specific conditions of local communities.

Taking up the interdisciplinary METAPOLIS - theme of understanding networks, this contribution examines information and coordination networks of councillors in a Lower Saxonian municipality. Hypotheses on their formation are derived from literature on policy networks and local politics in Germany. They include belief and local party homophily, concentrating effects of local offices and influence reputation as well as structuring consequences of issues and institutions. Building on relational and attribute data from an online survey, the dynamics of the observed networks are explained utilizing exponential random graph models. Results support power-related dynamics observed at different levels, but also underline the important roles of parties, mayors and institutions at the local level.

S10: (Re)growth and urban-rural linkages in a regional scope: a cross-European perspective

METAPOLIS – An inter- and transdisciplinary platform for the sustainable development of urban-rural relations in Lower Saxony: A spatially explicit life cycle assessment tool for existing residential buildings.

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The German federal government has set an ambitious goal to achieve a “nearly climate-neutral” building stock in Germany by 2050. The impact of private households accounts for about one third of the whole end-energy consumption [Federal Ministry for Economic Affairs and Energy, Public Relations Division (2018)]. Therefore, the energy-efficiency during operation is a policy goal for existing and new buildings. Nevertheless, buildings already consume energy during production, the so-called embodied energy. For example new buildings with low energy consumption standards - which often results in thick insulation walls, high tech building services and mostly no sustainable materials – produce up to 50% of their total greenhouse gas emissions during production phase. The consideration of the whole life cycle of a building is therefore essential when estimating the environmental impacts of buildings.

Within the project METAPOLIS. An inter- and transdisciplinary platform for the sustainable development of urban-rural linkages in Lower Saxony, the sub-project “Energy + Resources” developed a spatially explicit life cycle assessment (LCA) tool for residential buildings in Lower Saxony, which offers the quantification and evaluation of embodied energy as well as energy consumption during operation in urban and rural areas. By combining LCA data for building typologies from different construction year classes with spatial census data on a one square kilometer grid, it is possible to quantify the environmental impact of buildings on a large scale.

In a next step, this spatially explicit LCA information can be combined with different settlement types, so called TOPOI (identification based on eleven parameters of physical form, function and spatial linkages). The interdisciplinary method allows for the development of statements about the sustainability of different settlement types.

S10: (Re)growth and urban-rural linkages in a regional scope: a cross-European perspective

Why is Ostrava not a regrowing city? A case study of regrowth policy initiatives.

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This paper focuses on assessment of factors and policy initiatives trying to change the urban development trajectory towards new economic and population growth after a long-term population decline of the city of Ostrava. It is based especially on research results and knowledge from our European research comparing two regrowing cities Leipzig and Liverpool and two shrinking cities Ostrava and Lodz in Poland. Ostrava is a third largest city in Moravia Silesia region, Czechia. Ostrava grew dynamically on the base of development of hard coal mining and related coke, iron and steel industries in the period 1830-1989. In this period, the industrialization pulled the urbanization and creation of fragmented, polycentric industrial city in a broader Ostrava agglomeration in different geoeconomic and geopolitical conditions. In 1990, after the launch of political and economic transformation and restructuring in the former post-communist Czechoslovakia the growth changed into long term slight demographic shrinkage (in the period 1990-2020, from 331.000 to 284.000 inhabitants). The local urban governance faced the demographic shrinkage with measures in the field of economic development and improvements of physical structures of the city. The objective will be the critical examination of policy initiatives of Ostrava's governance system, which should help Ostrava to move from shrinkage towards regrowth. As important context serves the emerging regrowth theory summarizing the knowledge from regrowing cities in the USA and Europe.

S10: (Re)growth and urban-rural linkages in a regional scope: a cross-European perspective

Regrowth and urban-rural linkages in a relational perspective – the case of Leipzig/Germany

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Urban regions are often characterized by a misfit between functional interdependencies and administrative boundaries. Hence, the cooperation of core cities and peri urban areas to manage new residential building areas is one option for strengthening joint strategies among other things. Building on the reception of the relational turn in planning, metropolitan regions can be conceptualized as temporarily collaborating heterogeneous entities (assemblages) (Deleuze/Parnet 1987). Based on this approach, the presentation asks for the role of regional planning agencies in governing sustainable regrowth of urban regions.

The contribution is based on a case study in the urban region of Leipzig, Germany. Dynamic growth after a phase of shrinkage and stagnation motivates regional cooperation initiatives which envisage the development of a shared strategy for residential areas. After years of debate in the region, the ongoing planning process is supported by two transdisciplinary research projects. We analyze the ongoing process based on a framework introduced by Müller and Schurr (2016) connecting assemblage-theory (DeLanda 2006) and the concept of translation (Callon 1984) using qualitative interviews, document analysis and participatory observation. Based on these results, we discuss the role of regional planning agencies in the sustainable management of land.

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S11: Land thrift, housing, and densification –international perspectives on strategies of land policy

Land use policy, the dichotomy of growth and preservation in Lyon metropolitan “villages”

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If the fight against sprawl makes consensus into urban policies, locally this international injunction has social, environmental, and spatial effects. Deeply linked to the urbanization process and imposed through the paradigm a sustainable urban development, the land use issue is crossing the globe.

This paper is based on a qualitative research. Around fifty semi-structured interviews had been made with councillors, public urban planners, architects, metropolitan representatives, and national stakeholders to discuss how land use policies are implemented at the municipal level to build a rural-urban balanced development. Our research focused on the case of Lyon peripheral municipalities which identify themselves as “villages”. Populated by around 2000-5000 inhabitants, these metropolitan “villages” fight to preserve agricultural and natural land, to maintain their environmental landscape, their quality of life and a social statut quo.

For this purpose, municipalities are using, initially, several urban planning tools. We are exploring two of them:

1. The PLU, a powerful local master plan elaborated by municipalities in the French legislation to set the land use to set the land use
2. The Penap, a national programme perimeter of natural and peripheral agricultural spaces protection

Secondly, these peripheral municipalities, which are historically known for attracting upper middle classes interest in large individual houses, oriented their housing production strategies toward densification forced by the national legislation to limit their sprawl. Crossing their aim for landscape preservation, national legislation and metropolitan region’s housing shortage, municipalities reinvest already urbanized areas.

This paper aims to show how implemented locally sustainable urban development catch up to local interests and with which consequences for highly attractive metropolitan peripheries.

S11: Land thrift, housing, and densification –international perspectives on strategies of land policy

The factor land in the EIA-directive: Its operationalization in different EU countries and its contribution to tackling urban sprawl

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In 2014, the EU included 'land' in the list of factors that need to be considered during Environmental Impact Assessments (EIAs) (Directive 2014/52/EU, Art. 3), and 'land take' was mentioned in recital 9 as an example of a process that could impair the new factor. Since all EU member states had to transpose the amended directive into domestic legislation until 2017, and in some countries (e.g. Germany), this has affected also the procedures for assessing the environmental impacts of public plans and programmes (subject to Strategic Environmental Assessments, SEAs), one may expect that land take receives increased attention in approval and planning processes across the EU. The implementation of the amended EIA-directive could therefore contribute to enhancing the knowledge base for land-use related decisions and to shaping strategies for reducing adverse effects of urbanization processes, such as urban sprawl.

In a study covering (approx.) eight EU countries, we analyse whether these assumptions are supported by empirical data. Based on interviews with experts working in administration, science or institutions applying relevant regulations, we scrutinize how the factor land has been included into national law and whether this has changed the ways in which impacts on land are addressed during EIAs or SEAs. In particular, we asked how the factor land is operationalized (and differentiated from the factor soil) and which indicators are used at the national scale. By providing this comparative overview over how land is accounted for in environmental assessments in selected EU member states, our study aims at contributing to the discussion of possible approaches for steering spatial developments toward sustainability. Given the still high rate of land take in the EU, it seems important to evaluate the EIAs' and SEAs' potential of limiting ineffective use of land, i.e. in the context of expanding cities, of containing urban sprawl.

S11: Land thrift, housing, and densification –international perspectives on strategies of land policy

Post-Soviet satellite city and market forces: Volzhskij case-study

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GeoClever, Russia

Satellite cities in the Soviet Union were designed based on a different logic than in countries where the concept of a satellite city first appeared. In the UK, satellite cities were interpreted as the next stage in the evolution of the garden city concept, united by the goal of creating the most favorable environment for people. In the USSR, the new satellite city was understood as a consequence of the most rational distribution of industrial enterprises. Therefore, in our opinion, we should talk about a special Soviet variety of the satellite city, which is expressed in the peculiarities of its development. In this sense satellite cities can be considered as a specific discrete marker in an urban-rural continuum.

The transition to a market economic system has led to a transformation of the spatial structure of most satellite cities in Russia. This is due to such phenomena as the densification of buildings due to open public spaces, the extensive spread of buildings, a decrease in the effectiveness of land use regulation.

The Volzhsky city, built in the orbit of the influence of Volgograd, is a typical example of the Soviet satellite city. The goal of the study was to analyze the spatial dynamics of the satellite city from 1990 to 2020. The satellite imagery data, open data from government information systems, data on transport and urban mobility, and real estate market monitoring were used.

We have identified relationships related to the initial and achieved building density, accessibility of services, distribution of property prices, expansion of built-up areas. As a result, we built a semantic model of the spatial development of the satellite city, which can be used to regulate land use parameters and the development of similar urban areas.

S11: Land thrift, housing, and densification –international perspectives on strategies of land policy

The “stop beton” (stop-concrete) strategy: a last hope for urban containment in Wallonia?

Jean-Marie Halleux

University of Liège, Belgium

Our presentation will be structured in three parts. In the first part, we will comment the path-dependency mechanisms that explain the tradition of urban sprawl that affects Belgium in general and Wallonia in particular. It will be developed that this path-dependency is intrinsically linked to both, the great respect for individual property rights and the power relations between urban and nonurban interests. The consequence of this tradition is the important size of the artificial surfaces compared to population numbers.

The second part of the presentation will analyse the hypothesis that Wallonia is experiencing a period of transition in spatial planning and land policy. Cities are now understood to be the driving force in economic growth and, in parallel, land thrift has been recognized increasingly as an important element in building sustainability. The match between those two trends explains the current “stop beton” (stop-concrete) strategy of the Walloon regional government. This strategy has been announced in the 2019 Regional Master Plan, on the basis of quantitative guidelines: to reduce land artificialization to 6 km²/year by 2030 – i.e. half of the current consumption – and to move towards (tendre vers) 0 km²/year by 2050.

In the third and last part of the presentation, we will describe the current work of the regional government for giving concrete form to these guidelines. This work is based on the development of an active land policy which represents a critical juncture in comparison to past practices. This active land policy will require the use of devices such as transfer of development rights or land readjustment. In terms of feasibility, this notably raises the question of the technical expertise that will be required for the appropriate use of those land policy devices.

S11: Land thrift, housing, and densification –international perspectives on strategies of land policy

Developer's obligations as incentives for densification – the case of Prague

Eliška Vejchodská

J. E. Purkyne University, Czech Republic

Prague belongs to cities with high costs of housing and a relatively low density. More intense development might increase housing affordability. The appearance of the city is shaped by various stakeholders who influence the decision-making process – developers, city council, municipality district councils as well as planning committees of these political representatives. All of them have different preferences concerning the character of newly developed individual buildings or city districts. Currently, municipal district representatives who are potent players in the game, tend to prefer less intense development. Their preferences are not unchangeable, however. They are also based on actual external conditions and might be subject to changes if external conditions change. I discuss the developer's obligations as one of the instruments of land policy which brings an incentive to prefer more intense development, thus densification. I base my findings on the interviews with representatives of developer companies who see developer's obligations, rather than as a financial burden for them, as an opportunity instead. Developer's obligations might open the door for them to the approval of their development intentions by the public and politicians.

S12: Environmental perspective on the urban-rural nexus

Managing Cultural Landscapes: deal - cultivate - show

Florian Etterer

TU Dresden, Germany

Landscape is divided in different properties and interests.

But Cultural Landscape is shared space.

This means: The management of cultural landscape presumes the interaction of different parties and interests. For this reason the development and maintenance of cultural landscapes are very complex tasks.

The project "stadt PARTHE land" was facing the challenges of a suburban landscape called "Partheland" in the surroundings of Leipzig. The transdisciplinary project team designed a profile for Cultural Landscape Management. The big variety of needed activities was put into a simple order:

1) Deal

includes all activities regarding the negotiation of cooperation for cultural landscape. The management is interacting between the interests of land owners, companies, authorities and interested civil society.

2) Cultivate

A successful management should cultivate landscape resources also by itself. These resources may be their own land, biomass or certain landscape elements.

3) Show

Finally the management has also to show the values and challenges of the landscape. Its aim is to attract people's interest in their landscape and to motivate them for action. In this context "Showing" is much more than just Public Relation.

The activities and modes of operation for Cultural Landscape Management will be presented by several practices in different German regions and by results of "stadt PARTHE land".

"stadt PARTHE land" was a project funded by the German Ministry of education and research from 2014 to 2019.

S12: Environmental perspective on the urban-rural nexus

Functional and spatial relationships in regional bioeconomies

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The withdrawal from lignite-based electricity generation in Germany by 2038 induces profound societal changes in the affected regions. However, the underlying structural change processes offer regions and their stakeholders the opportunity to shape the transition towards future oriented regional bioeconomies and, accordingly, to position themselves as model regions.

Against this background, current results of the ongoing MoreBio project are presented. Referring to the Central German and the Lusatian lignite study regions, the project comprehensively maps regional biobased structures and analyses the region's potentials to build future-oriented and viable biobased development paths. As part of the status-quo analyses aspects such as regional biomass availability, material flows, existing supply and value chains, knowledge (re)sources etc. are systematically monitored and quantified.

Presenting specific examples of material flows (e.g. sugar, starch) as well as associated supply and value chains, our contribution sheds light on the diverse functional (e.g. industrial, administrative, knowledge-related etc.) and spatial (e.g. regional-extra regional, rural-urban etc.) relationships of biobased structures in the regions. Thereby, the contribution allows to reflect upon the scope of these relationships and their significance to build, strengthen and diversify regional bioeconomies. The establishment of future-oriented and viable bioeconomies should both, build on existing regional resources, value chains, actors, networks and knowledge bases and couple these regional structures with extra-regional structures and capacities. Our analyses constitute an essential basis for actors from policy, industry and societal circles to develop viable and regionally differentiated and distinct bioeconomies.

S12: Environmental perspective on the urban-rural nexus

Potentials and Effects of Virtual Mobility

Holger Heinfellner

Environment Agency Austria

Mobility serves the satisfaction of basic human needs, and it has crucially influenced the development of today's social and economic systems. Mobility in the form of movement of people and goods causes traffic, especially between urban and peripheral regions, which creates significant ecological and socio-economic impacts. Avoiding traffic is a key strategy to make mobility more climate- and environment-friendly, but also more affordable. Intensifying virtual mobility can mitigate the resulting area of conflict between traffic avoidance and simultaneous satisfaction of mobility needs.

The potentials of virtual mobility result from the increasing digitalization of all areas of life. However, little is known about whether and to what extent virtual mobility actually leads to reductions in physical mobility. On behalf of the Austrian Federal Ministry of Climate Action, the research project PoviMob (Potentials and Effects of virtual Mobility) investigates these effects and explores supportive framework conditions.

Based on a participatory multi-stakeholder process, we identified forms of virtual mobility (e.g., teleworking, consumer behavior) that have the greatest potential impact on physical traffic. In response to the spread of the SARS-CoV-2 virus, a public opinion poll from autumn 2019 was repeated in April 2020 in order to understand changes in the public acceptance of these technological alternatives.

The talk will present first quantitative analysis results for the GHG reduction potentials of telework. About a quarter of all employed people in Austria could in principle work permanently from home due to the nature of their activities. Considering the current level of acceptance, this leads to a short-term savings potential of around 0.75% of traffic-related GHG-emissions. In the long term, technological progress and constant digitization and automation can increase these savings to up to 4% of traffic-related GHG emissions.

S12: Environmental perspective on the urban-rural nexus

Economization of Land Use in Logistics by Optimizing Utilization of Logistical Space: An Assessment of Potentials Based on a Systematic Literature Review

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Emerging trends, such as globalization, and the steady expansion of e-commerce, are leading to an ever-increasing flow of goods and resources. This flow is of growing importance to many social as well as corporate processes, which are becoming—due to the sheer volume of daily transactions—increasingly complex. Therefore, a well-structured organization of logistical processes within supply chains, is becoming more crucial than ever. However, in order to efficiently complete all processes in warehouse, production, and transport logistics, a wide variety of buildings and areas must be available, and due to the afore-mentioned trends, a steady growth in demand for logistical space can be observed. Inefficient, excessive or hazardous utilization of such logistical areas, may lead to diverse economic, ecological or social impacts.

Despite the growing dependence on logistical spaces, and possible negative consequences, a geographical and spatial view in logistics is often neglected. In order to show companies what possibilities exist to prevent negative consequences, by reducing space utilized for logistical activities, and how minimizing and rearranging such space can positively affect their business, this article gives an overview of relevant scientific findings on spatial optimization in logistics. In addition, selected practical examples of success stories (best cases) are presented, to show actual practical solutions.

By using a framework proposed by Webster and Watson (2002), a structured literature review was carried out, with the goal of taking all relevant articles into account. The information obtained, shows that there are many promising ways to optimize or minimize the use of logistical space by implementing cooperative, digital or other innovative business models. Advantages that go along with an optimized use of logistical space may include monetary benefits, new cooperative partnerships, environmental protection and improved process efficiencies.

S12: Environmental perspective on the urban-rural nexus

Urban adaptation in Europe: how cities and towns respond to climate change

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European cities and towns are important locations for urgent implementation of adaptation to climate change. This is due to the large share of the European population living in urban settings; the economic importance of cities; and the emphasis on the local-level adaptation action in the key international frameworks and European policies.

Whilst adaptation in Europe at the local authority level is progressing, it has not been captured to date in a comprehensive overview of the local governments adaptation efforts. The forthcoming EEA report „Urban adaptation in Europe: how cities and towns respond to climate change“ (publication in October 2020) aims to address this gap by presenting the status quo of adaptation to climate change at the local level in Europe and suggesting further steps for policy, practice and research to expedite action.

The report is based on the investigation into multiple Europe-wide datasets, including the Covenant of Mayors for Climate and Energy database, combined with review of scientific evidence and policy analysis.

The report highlights the increasing commitment of local governments to adaptation in their regional and national context. At the same time, many European cities exacerbate the magnitude of climate impacts through their expansion into flood- and wildfire-risk areas, progressing surface sealing and limited vegetation cover. The report draws attention to the absence of monitoring and evaluation of adaptation actions, in particular with regards to the effectiveness and cost-efficiency of measures. It emphasizes the need for improved access to knowledge and funding for local and regional authorities in order to progress adaptation implementation. Finally, the report calls for adaptation to be considered as an essential aspect of sustainable urban development, firmly integrated with spatial planning, climate change mitigation efforts and equitable social policies.

S12: Environmental perspective on the urban-rural nexus

Environmental issues and perspective on the urban-rural nexus of a post-socialist city: the case of the municipality of Shkodër in Albania

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This paper takes into consideration a specific type of peripheral areas - the urban peripheries and their development processes in post-socialist countries and positively in Albania. After 1990, when a new political and economic system was introduced, Albania experienced one of the most striking internal migrations in the history of modern Europe: this phenomenon lies at the center of the main environmental and socioeconomic changes of this country during this period. More than elsewhere, these development processes occurred in the outskirts of the largest Albanian cities - but outside their urban boundary line, in their urban – rural nexus.

The paper is mainly focused in the spatial transformations that occurred in the periphery of Shkoder city after 1990 and especially in the environmental issues it experienced. For the purpose of this study, the urban – rural nexus of the municipality of Shkodër, has been identified with “Rrethinat” administrative unit, a previously rural area that doubled in population during the last 30 years and that now is part of the larger municipality of Shkodër.

By analyzing the data in disposition and using field work, the findings suggest that the main environmental issues experienced in this area during this period are: the unsustainable use of the natural resources; the increased rate of water, land and air pollution; the mismanagement of urban waste; the increased scale of erosion; the reactivation of the floods hazard; the increased rate of deforestation; the fragmentation and tendencies of desertification for the agricultural land.

The paper concludes on giving some useful recommendations about the measures that should be taken in perspective for this area regarding these environmental issues with the aim to better manage them and to orient it toward a sustainable development integrated as now it is, with the larger municipality of Shkodër.

S12: Environmental perspective on the urban-rural nexus

Sustainable Urban-Rural Partnerships: Workshop Report from an On-going Project of the German Environment Agency

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The entire surrounding area of a city must be considered for proper sustainable urban development since rural, suburban and urban areas are often spatially, administratively and functionally closely interwoven. Being able to live sustainably and in a mobile manner is often determined by the use of land and other natural resources in an urban-rural context and the associated negative environmental consequences. Here, we want to point out some issues gathered from an on-going project at the German Environment Agency on sustainable urban-rural partnerships. The project is currently a work in progress and for this reason only intermediate results are presented.

The focus of the analysis is to be placed on the following “fields of demand”: living, mobility, working as well as leisure and relaxation. The following questions are to be examined:

- How can the development of residential areas be sustainably managed for the varying demands found in a city and its surrounding areas and at the same time reduce the consumption of land?
- How can society achieve an ecological transformation of mobility in cities as well as beyond?
- How can modern working forms (e.g. home office) be realized in order to enhance the potentials for environmental protection and contribute to socially and ecologically sustainable city-rural relationships?
- How can open space in the city as well as the surrounding areas not only be secured for continued future use but also be qualified for their various ecosystem functions? What requirements are to be set for the improvement of the quality of open spaces?

The project will also address cross-cutting issues which look to explore the relevance of the findings for the following topics: environmental targets and load limits (i.e. emissions), infrastructure, regional value chains and the social dimension which includes aspects of environmental justice.

The project aims to show how sustainable urban-rural partnerships should be defined according to an environmental perspective. Further, the project will formulate options for acting as well as existing research demands to then promote these on a political level as well as within the field of urban planning.

S13: Implementing multifunctional blue-green infrastructure – challenges and opportunities

BlueGreenStreets – multifunctional streetscape design in urban neighborhoods

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Green spaces and open water areas within cities are not only of great importance for quality of life, but also for the microclimate within neighborhoods. In growing cities, because of soil sealing, there is an increasing risk of losing green spaces and simultaneously an increase in the risk of urban flooding. The task of future urban development is therefore not only to develop different land uses side by side, but also to combine them. Urban greenery and urban flood protection need to be integrated into multifunctional streetscapes. The research project BlueGreenStreets aims at investigating, evaluating and further developing the effectiveness of (existing) planning instruments and regulations concerning urban green infrastructure, urban water management, the management of the rehabilitation of roads and canals, as well as the design and planning of streets and open spaces. Streetscapes should be designed to be sustainable and thus serve the multifunctional needs of resilient urban neighborhoods. For this purpose together with key urban stakeholders planning tools will be tested on-site in several German cities. Among them are Hamburg, Berlin, Neuenhagen, Solingen, Bremen and Bochum. These pilot projects will help to better understand existing technical restrictions, process-related obstacles as well as mental barriers in blue-green planning. In contrast to new urban developments integrating blue-green infrastructure into the existing streetscape presents a lot of challenges. To overcome some of them BlueGreenStreets designs, builds and monitors f.e. stormwater tree pits. The transferability to other municipalities is ensured via the creation of model solutions, which can be integrated into the streetscape.

S13: Implementing multifunctional blue-green infrastructure – challenges and opportunities

Future development and management of Leipzig's urban green and water – ideas and relevant topics from the citizen's perspective

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In line with other European cities, inhabitant numbers in Leipzig, Germany are constantly rising. This results in increasing pressure on remaining open spaces for the development of housing, cultural and educational institutions. Implementing highly functional urban green blue infrastructure (UGBI) meeting the multiple demands of a highly heterogeneous urban population can contribute to solve global and local problems going along with densification.

In this study we analyse results from an online survey about ideas and topics that are relevant to citizens regarding the improvement and future development of Leipzig's UGBI (n>3000). We identified most frequently mentioned topics and ideas, arranged them into the local planning strategy and its leading topics (biodiversity, climate change adaption, health, environmental justice, and sustainable mobility), current use, and conflicts, identified mis/-matches and investigate their contribution to multifunctional UGBI.

Results indicate respondent's wish for the preservation of present UGBI including green-grey integration (street trees, façade greening) and for qualitative UGBI providing adequate facilities, maintenance and waste removal. The establishment of near-natural maintenance promoting biodiversity and the integration of "wild corners" are furthermore highly relevant topics for Leipzig's inhabitants. Respondents support the integration of sustainable mobility and wish to actively participate in UGBI development. Ideas and topics can contribute to reduce current conflicts mainly referring to the overuse of parks and perceived litter pollution and for instance increase human-nature interactions by fostering biodiversity and participation.

This study provides relevant insight into the multiple demands and perspectives on UGBI from a heterogeneous urban society. Results point to similar issues and ideas among respondents and how these can contribute to reduce local conflicts but also to major global topics.

S13: Implementing multifunctional blue-green infrastructure – challenges and opportunities

Sustainable heat-management of urban quarters – Integrated contemplation in the urban development process

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Climate change and its consequences require improvements in the energy efficiency and a higher percentage of sustainable energy. For this purpose, the standards for constructing and maintaining buildings are already tightened. The legal framework for energy building policy has a tremendous impact on urban structures and design. Considering this background, independent local heating systems are becoming increasingly important.

In the research project “IWAES” (www.iwaes.de), funded by the German Federal Ministry of Education and Research, we are analysing how an even-tempered annual heat balance in the investigation area is possible by using the „anyway-infrastructure“ of the sanitary environmental engineering. The constructive design has to consider a sewer in which absorber pipes and transport lines are integrated. The sewers work like a combined heating and cooling network, whose task it is to transport waste heat or cold from one building to another building with heat or cold demand. If there is no balance between supply and demand in the network, the heat is extracted from the ground using hybrid channels. The ground thus becomes a cold or heat storage.

A sufficient heat density is needed for functionality and economic viability of local heat systems. This can ensure a supply guarantee as well as an increase in efficiency. However, the informal nature of the energy consumption concepts makes it difficult to achieve necessary heat densities. Therefore, the aim is to investigate how to establish new formal instruments to achieve the required heat density. In addition, connections between the needs of urban planning and sanitary environmental engineering as well as the effects of the implementation of the modified infrastructure on the urban design have to be examined. For this purpose, the intersections between the disciplines of city planners, civil engineers and others need to be worked out in close collaboration.

S13: Implementing multifunctional blue-green infrastructure – challenges and opportunities

Perspectives of multifunctional energy infrastructures at district level

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Smart energy management is a key component to pursue the aim of developing sustainable and climate-resilient cities. Based on the ambitious goal to produce sustainable green energy, a combination of energy sources and applications have to be developed and addressed in urban planning. Based on a current research project we show how to address these issues using an energy mix of different sources like solar energy, geothermal energy, district heating return energy,, sewage heat pumps etc. and also the combination with infrastructure elements from the water sector at the district level Different energy scenarios (status-quo, ambitious, zero-Co2) for the district are developed and are simulated using a complex model software. Important boundary conditions for the application of the different scenarios like technology requirements, profitability as well as legal requirements are considered within the development process. For the functionality and the application of the energy-system-scenarios, adapted operation and maintenance models are designed. The innovative solution to use green roofs or ponds for heating or cooling are presented and their feasibility discussed.

S13: Implementing multifunctional blue-green infrastructure – challenges and opportunities

Perspectives of multifunctional water infrastructures at district level

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Integrated urban water management is a key component to pursue the aim of developing sustainable and climate-resilient cities. Based on the ambitious goal to maintain the natural water balance at district level, drainage, groundwater recharge and evaporation have to be addressed in urban planning. Based on a current research project we show how to address this issues using blue-green low impact developments like green roofs, natural drainage systems or cisterns. Due to the multifunctional features of these technological solutions, it is possible to investigate multiple effects for sustainable city development like water retention, air cooling, local infiltration or higher biodiversity. The co-design process with stakeholders from the municipality, other scientific partners, the investor and companies are an important requirement for successful development of new innovative solutions that have to be financially and legally feasible.

S13: Implementing multifunctional blue-green infrastructure – challenges and opportunities

Urban planning in the face of climate adaptation needs

Thorsten Rupp

City of Leipzig, Germany

The City of Leipzig is highly affected by several impacts of climate change. Mainly heavy rain events, droughts and heat waves are causing damages on buildings and infrastructure as well as burdens for the citizens in- and outdoors. Therefore blue-green infrastructures can help to reduce multiple impacts. However the trade-off between the scarcity of urban developable areas or compact city development and the aims of climate adaptation and resource efficiency represents a huge challenge for the municipality. Therefore partnerships between scientific institutes, citizens, companies and investors of new districts can provide the opportunity of a unique co-design process. This talk will give insights from the project “Leipziger BlauGrün” from the perspective of the city planning department pointing to needs and challenges of an exciting transdisciplinary process.

S14: Urban-resilient city: how to integrate justice in re-naturing urban areas

The Affordability of Flood Risk Property-Level Adaptation Measures

Paul Hudson

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The affordability of property-level adaptation measures against flooding is crucial due to the movement toward integrated flood risk management, which requires the individuals threatened by flooding to actively manage flooding. It is surprising to find that affordability is not often discussed, given the important roles that affordability and social justice play regarding flood risk management. This article provides a starting point for investigating the potential rate of unaffordability of flood risk property-level adaptation measures across Europe using two definitions of affordability, which are combined with two different affordability thresholds from within flood risk research. It uses concepts of investment and payment affordability, with affordability thresholds based on residual income and expenditure definitions of unaffordability.

These concepts, in turn, are linked with social justice through fairness concerns, in that, all should have equal capability to act, of which affordability is one avenue. In doing so, it was found that, for a large proportion of Europe, property owners generally cannot afford to make one-time payment of the cost of protective measures. These can be made affordable with installment payment mechanisms or similar mechanisms that spread costs over time. While focused upon property-level measures that would be suitable for urban areas, such definitions would also be useful when contributions towards urban nature based solution as a DRR or CCA solution are expected. Therefore, the movement toward greater obligations for flood-prone residents to actively adapt to flooding should be accompanied by socially accessible financing mechanisms.

S14: Urban-resilient city: how to integrate justice in re-naturing urban areas

Social justice and link to resilience: how flood risk management can (need to) include both concepts

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The frequency and severity of extreme weather events is expected to increase due to climate change. These developments and challenges have focused the question how to manage flood hazards in the future. Flood risk management governance requires a comprehensive assessment of flood hazards impacts on society, and of the costs and benefits of community resilience, both from a policy and an economic perspective. However, their development and implementation often ignore questions of social equality or even run the risk of increasing social inequalities in urban areas. To realize community resilience, often nature-based solutions (NbS), such as wetlands, green roofs and facades, forests, water retention areas, are often discussed as solutions with multiple benefits and hardly any downsides for adaptation to climate change. They promise to mitigate consequences of flooding, but also reduce further effects, such as urban heat islands, improve health and quality of life, and increase the attractiveness of a community/neighborhood. However, recent studies of NbS' planning and implementation show that they also run the risk of manifesting or even increasing social inequalities, such as gentrification or housing policies (dis-)favoring specific ethnical groups, into current policy design. The overall objective of this paper is to critically question current development and implementation practices of NbS and foster the implementation of NbS in a way that increases both urban resilience (reducing the socio-economic impact of hydro-meteorological hazards) and social equality.

S14: Urban-resilient city: how to integrate justice in re-naturing urban areas

Contribution of urban green spaces on city dwellers' health in the Basque Country (Spain): towards guiding a sustainable and inclusive urban planning

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The role of urban green spaces (UGS) as salutogenic (i.e. health improving) is being increasingly acknowledged in the field of public health prevention due to their contribution to the provision of ecosystem services on which depends human wellbeing. This is remarkable for cities, where UGS may help compensate the multiple negative outcomes derived from urbanization and so contribute to enhance city dwellers' quality of life. In this study, we explored the relationship between UGS and health in the Basque Country urban areas (Spain). We took into account different socioeconomic contexts to control for the effects of income-related inequalities on health. UGS were measured by Normalized Difference Vegetation Index and analyzed in relation to the relative risk of mortality by lung disease and a deprivation index for a set of urban municipalities (n=30). Data were retrieved from official public sources, examined by a GIS and statistically tested for both men and women. Linear correlations between mortality by lung disease and urban green spaces were examined and general linear models were performed introducing the deprivation group and the exposure to UGS (quintiles of NDVI surface) as factors. Results showed that for both men and women, a greater exposure to urban green spaces was related to a lower relative risk. Moreover, for men, there was an interaction between the exposure to urban green spaces and the deprivation suggesting the socioeconomic determinants on health may be compensated by a greater exposure to UGS. With these results, we aimed at highlighting the key role of green spaces and especially in the urban context, in terms of the city dwellers' welfare and also their potentiality in reducing income-related inequalities in health. We also intended to contribute to guide just and inclusive urban planning by including a lens of equity for the most vulnerable which might benefit more.

Keywords: Urban green spaces, Health, Deprivation Index, Sustainability

S15: Paradoxes of resilience in the context of urban and rural areas

Hiding in Plain View – The Impact of Public Agencies on the Success of Efforts to Increase Urban Resilience

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In cities around the world, participatory and integrated risk management strategies have been identified as central to efforts to increase urban resilience and reduce the vulnerability of communities against natural hazards. In some cases, however, the introduction of such strategies has not achieved the desired effect and public actors remained inactive in the face of risk. One explanation for policy inaction in these cases (despite the seemingly conducive conditions) are barriers connected to the 'soft underbelly' of public agencies. The argument being that addressing known institutional fault lines may be undermined by social/political counterincentives that prevent elected and appointed officials from taking decisive action for the sake of risk reduction and human security. The paper asserts that this line of thought has not been explored in depth by the mainstream literature on urban resilience, leading to a gap in understanding of the factors that make efforts to increase resilience successful. The argument is illustrated by the case of the city of La Plata, Argentina where efforts to implement a more participatory and integrated flood risk management strategy between 2001-2013 were, among other things, thwarted by the political influence of external groups with vested interests that blocked the possibility to collaboratively develop and introduce non-structural measures to reduce vulnerability to extreme flood events.

S15: Paradoxes of resilience in the context of urban and rural areas

Rural-Urban Migration in India: Paradoxical Vulnerability Effects?

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In India, over 450 million people are considered migrants as per Census 2011, many of which have moved from the rural periphery to metropolises like Delhi, Mumbai or Pune.

For an investigation of the migration trajectories of slum residents having migrated from rural areas, we conducted 24 semi-structured interviews in several informal settlements in Pune, ranging from consolidated slum neighborhoods to improvised roadside tent structures.

Tentative results show that the reasons for migrating are manifold and usually interlinked. Environmental hazards, such as droughts, are often part of the push factor complex, albeit not always directly visible: Several interviewees initially gave livelihood concerns as reasons for migration, but elaborated that the underlying cause were droughts that reduced agricultural yields.

In search of better livelihood opportunities, they started their – oftentimes non-linear – journey to the current (not necessarily final) location in one of Pune's slums.

Pune has recently been hit by a number of severe riverine and pluvial floods. Among the most affected areas were informal settlements where many of the migrants had settled. Their location and building structure, but also their unique occupational and living characteristics made them especially vulnerable to the flood damage.

With these first insights we would like to enter discussion within Session 15. To what extent did the migrants' decision to migrate from rural to urban areas constitute a vulnerability paradox in that it decreased exposure to one environmental hazard (drought) and increased that of another (floods); and how was their coping capacity affected by the change of place?

S15: Paradoxes of resilience in the context of urban and rural areas

Multi-level governance for building a sustainable and resilient metropolitan region: the case of the Lisbon Metropolitan Area

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The purpose of this paper is to present the multi-level governance model designed to support the Urban-Rural Dynamics Laboratory, and the investigation on rural-urban synergies within the metropolitan area of Lisbon, in the context of the ROBUST project. In this governance model we bring together national, regional and local administration stakeholders, as well as private businesses and the third sector, to share knowledge and experiences and to build together multiple forms of collaboration that can stimulate an urban-rural continuum, as well as institutional and territorial links to enhance urban-rural synergies. The arrangement is constructed around three main elements: Policy, Education and Partnerships, and three macro-orientation development programmes: Sustainable food education, Valuation of local assets (through market dynamization, land development and strengthen of partnerships); and Promotion of natural resources (through sharing practices in natural areas). Through a methodological process of envisioning, experimenting and exploring cross-sectoral interactions towards the definition of an action program, we have mapped core stakeholders, their motivations and their mutual interests, and stimulated their interaction. This enabled the set up of two working groups, with separate but complementary purposes and agendas, engaging multi-level and multi-sector stakeholders. One aims at enhancing public school food programs, involving the normative and regulatory dimension of procurement, led by the national administration, the engagement of local schools led by the local administration and the food providers with emphasis in short linkages, led by the business and the third sector. The second group aims at establishing more territorial driven policies for sustainable and resilient (multifunctional) territories, and engages experiences taking place in municipalities and in the metropolitan area at regional level towards exploring territorial management through the mapping of ecosystem services, also linking up to the interests of national sectoral authorities, such as tourism and nature conservation.

S15: Paradoxes of resilience in the context of urban and rural areas

Resilience and social justice: how current flood risk management policy encourage inequalities

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Despite considerable efforts to reduce disaster risk by using technical solutions, losses due to hydro-meteorological hazards remain significant. Due to location, high concentration of people, and increasingly complex and interdependent infrastructures, large areas are highly vulnerable to pluvial and fluvial flooding. Community resilience has been emerging as a response to such events. Flood-resilient communities are meant to anticipate, recover from, and adapt to shocks and stresses. To realize community resilience, various measures, such as Nature-based-Solutions, property-level adaptation management, planned relocation are often discussed. However, the key question remains how current resilience strategies can ensure social equity instead of creating inequality. So far, social justice has been barely addressed by both scholars and policy-makers in relation to resilience. This paper discusses questions regarding social justice aspects and ongoing resilience strategies and how resilience affects different social groups in communities.

S16: Urban – rural (dis-)continuities: Better understanding the urban-rural interactionsto ensure equitable, green and healthy urban transitions in Europe and Chinathrough nature-based solutions

Assessment of Relationships between Land-use Changes and Socio-Economic Restructure at the Local Scale: A Case Study of Taizhou in China

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Rapid urban sprawling characterized the development of Taizhou for the past 20 years and urban fabrics manifested obviously in the urban-rural interface. The dynamic of land cover showed a ‘normative’ urbanization trajectory that urban areas devour the agriculture lands and green spaces while urban-rural development has drastic impacts on ecological system and social-economic structure in Taizhou City, located at the middle of the East China Sea coast of Zhejiang province, China. Herein largely affected by strong global networking in terms of industrialization, urgent needs in local industrial transformation, environmental protection, and circular economy guided by sustainable development were increasingly aware of. Using approaches of land cover analysis and housing prices distribution assisted by GIS, census analysis, participatory observation, in-depth interview with relevant actors, and engaging in the global debate of the “three E’s” of sustainable development (i.e., environment, equity, and economy), this research reveals the relationships between land-use and land cover changes and socio-economic restructure at the local scale. It shows that there have been gaps and implementation challenges of statutory land use planning at different levels. The overall planning of land utilization could only guide local development towards sustainability at meso-level (strategical level). Whilst at the micro-level, though is of equal importance regarding sustainability, current planning interventions fails to meet the ends as land uses and social groups were highly mixed which resulted in the invariably informal arrangement of space uses. Community initiatives and engagement and tailored nature-based solutions at micro-level are, therefore, critical in the venture toward sustainability.

S16: Urban – rural (dis-)continuities: Better understanding the urban-rural interactionsto ensure equitable, green and healthy urban transitions in Europe and Chinathrough nature-based solutions

Cities at a cross-road: Nature-Based Solutions and meta-governance of urban green transitions in Europe

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With accelerating climate changes and rising social inequality, cities across the Global South and the Global North face societal changes at a scale and speed which have not been experienced before. Major environmental problems affect social structures, political practices, technical innovations and the state of nature. These impacts expose interlinkage, often lead to rising inequality and increased poverty for vulnerable population groups, and may undermine social cohesion, trust, governance capacity and local economies. Actions towards e.g. increasing biodiversity and sustainable climate adaptations that also benefit overall green transitions in the city - including social inclusion, cohesion, diversity and equality – expose flaws in urban governance systems and gaps in the institutional capacity to meet and manage major and complex challenges.

Urban and peri-urban nature is increasingly entering the stage, and offer approaches and perspectives which provide solutions to a range of urban problems, including climate adaptation and mitigations, biodiversity, air quality and clean water, and also to issues of wellbeing, health, urban liveability, community cohesion and sustainable mobility. In the form of nature-based solutions, urban nature hence offers a range of sustainable co-benefits and novel approaches to take advantage of ongoing societal transformations.

In the perspective of urban governance, NBS thus have the propensity to draw up paths to urban transitions and guide policy actions, as is investigated in the research and co-creation with European cities in REGREEN. However, NBS equally expose, firstly, the processual nature of governance/NBS, and secondly, the power relations, tensions and struggles which form the basis for city development – enabling or blocking for the good life in the city and for fundamental urban changes. Addressing the role of NBS in sustainable urban transitions entails question such as who benefits from nature; how to balance interests when nature and resources, including urban land, space on policy local agendas and public finances, are scarce; what is ‘nature’ for urban citizens, policy makers and businesses; how does it generically benefit the specific city; how to integrate NBS across policy areas; how does it impact the local practices of governance; and how to involve the actors and sectors that are affected by the amenities and risks of nature, and the associated transitions.

S16: Urban – rural (dis-)continuities: Better understanding the urban-rural interactionsto ensure equitable, green and healthy urban transitions in Europe and Chinathrough nature-based solutions

A framework for multi-scale benefits in Urban-Rural interactions

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Urban areas exist within a much larger landscape, but most urban studies interested in Nature Based Solutions (NBS) focus purely on the urban area. Yet, there are many interactions between urban and rural where aspects of green and blue space in one location provide a benefit to people in another location. These urban-rural interactions are not uni-directional, they can be two-way, and include ‘up-stream’ and ‘down-stream’ components as well as within cities. The interactions can occur along corridors, or more widely within ‘airsheds’ or ‘watersheds’.

More importantly perhaps, they have different characteristics in space and time depending on the ecosystem services that the NBS provide. For example, woodland both inside and outside an urban area will remove air pollutants, but the benefit that is provided by woodland outside cities can be greater than that provided by the woodland inside the city. Flooding and flood management happen at a catchment scale, but this can range from small catchment units within a city to river networks crossing even national boundaries.

We propose a framework which starts to recognise and understand the scale relationships and spatial patterns which govern the interactions between urban and rural areas. This framework takes into account areas where service is provided, and areas which benefit across the urban-rural transition, and how scale affects those relationships. The framework also helps understand how good governance can help to manage these urban-rural connections to achieve maximum and sustainable benefit for both areas.

S16: Urban – rural (dis-)continuities: Better understanding the urban-rural interactionsto ensure equitable, green and healthy urban transitions in Europe and Chinathrough nature-based solutions

Nature-based solutions for Aarhus – potentials and gaps

Lene Vinther Larsen

Aarhus Municipality, Denmark

Aarhus municipality is the second largest city in Denmark with nearly 345,000 citizens and growing. Nature-based solutions are essential for creating a resilient city and the municipality plans for a more green and blue city to obtain multiple benefits for climate adaptation and disaster risk reduction, biodiversity, drinking water protection, storage of CO₂ and improved physical and mental health.

Adopted targets include nearly doubling the area with forest and protected nature in open land to 8000 ha forest and 4000 ha protected nature before 2030; establish 10,000 new trees in the city and create more recreational pathways.

Also new targets and policies are under development in Aarhus Municipality: doubling the capacity of water retention in rural areas to avoid urban flooding while creating more green space for biodiversity and recreation and increase people's proximity to green areas to improve health conditions. Also management is set to change with a policy to protect veteran trees so they can become biodiversity assets; introduce large herbivores as nature managers (like wild oxes, wildhorses) on a quarter of the protected grassland and restore and rewild forest ecosystems.

Most of these policies and targets are dependent on an effective and inclusive collaboration and involvement of rural landowners (the State and private landowners), residents and Aarhus Municipality. Currently, buying land is based on principles of voluntary agreements, making plans only realized in the long term. Securing funding for these investments in natural capital also depends on showing evidence of values created for the community and individuals (e.g. reduce damage costs of extreme events, increase in property values, mental and physical health benefits etc.). Today, many of these values are not quantified. Also, concrete and locally adapted decision support tools are essential to help the administration assess, rank and select the optimal nature-based solutions based on science-driven evidence of effectiveness, costs and benefits generated for the wider community.

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S16: Urban – rural (dis-)continuities: Better understanding the urban-rural interactionsto ensure equitable, green and healthy urban transitions in Europe and Chinathrough nature-based solutions

Urban Greening or Browning? Observations, Drivers and Impacts: A lesson from 107 cities in China

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In large agglomerations worldwide, urban green spaces (UGSs) have gained increasing public health attention due to their environmental and social functions. In China, urbanization and policies have several nuanced impacts on UGSs dynamics in the past few decades, which remain unclear. Here, in order to remedy this gap, 107 cities in China were chosen as urban living laboratories (ULLs) to find out the UGS dynamics, drivers and impacts from 1990 to 2019.

In this study, we obtained the extent of UGS using over 380,000 cloud-free Landsat images during this period. We could qualify the UGS dynamics over the past 30 years by exploiting the Google Earth Engine (GEE) platform. Firstly, a new index, the Urban Developed Index (UDI), was proposed using multi-temporal Visible Infrared Imaging Radiometer Suite (VIIRS) nighttime lights (NTL) data to classify urban area into three gradients, including Well-built-up (WB) with few urbanization disturbances, New-built-up (NewB) with huge urbanization disturbances and Non-build-up (NonB) without urbanization effects. Secondly, the spatial-temporal UGS dynamics were analysed based on the annual peak of the Normalised Difference Vegetation Index (NDVI) derived from Landsat. Spatially, greening and browning pixels were further detected with trend analysis in three different gradients of each city. Thirdly, various climatic and social-economic factors, including mean annual temperature (MAT), total annual precipitation (TAP), mean annual radiance (MAR), GDP, urban population and impervious surface coverage (ISC) were utilised to find the drivers of urban greening or browning. Finally, we mainly discussed the negative consequences of urban greening or browning on Urban Heat Island (UHI). This study provides insights on the dynamics, drivers and impacts of UGS dynamics, which can play a significant role for urban designers and planners in addressing public health and therefore a sustainable urban development.

S16: Urban – rural (dis-)continuities: Better understanding the urban-rural interactionsto ensure equitable, green and healthy urban transitions in Europe and Chinathrough nature-based solutions

Biodiversity patterns of woody plants under urban-rural gradients in Shenzhen, China

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Biodiversity is an important type of ecosystem service to maintain the livable environment for urban residents. Especially, the biodiversity of woody plants at city scale plays a vital role to provide various kinds of ecosystem services sustainably. With the rapid development of urbanization, the boundary between urban and rural areas is constantly blurred by the newly expanding urban areas, which leads to the fragmentation of the natural landscape, which changes the original pattern of woody plant biodiversity and poses a serious threat to urban biodiversity and ecological security. However, understanding the biodiversity pattern of woody plants under urban-rural gradients and its influence factors helps us to reveal how urban ecosystem changes with such intensive anthropogenic activities, and provides guidelines to urban planners and policy makers to better design and manage the urban environment. In this study, we chose Shenzhen, the first city with 100% urbanization rate in China, as case study to investigated its woody plants biodiversity on different land use types within the scope of entire city. And then we analyzed the biodiversity patterns under the urban-rural gradients, and explored the impacts of urban-rural gradients, urban land use types and socioeconomic factors on the pattern. Our results show that the patterns of woody plants biodiversity in intensive urban areas with more population and industries were different from those countryside-like areas. Even in the entire urbanized city, the woody plants biodiversity patterns still show the differences with the various levels of anthropogenic activities, which indicates the different potential ability of generating other ecosystem services. It also provides the basis of modelling the changes of ecosystem services in the future.

S16: Urban – rural (dis-)continuities: Better understanding the urban-rural interactionsto ensure equitable, green and healthy urban transitions in Europe and Chinathrough nature-based solutions

Resilience of the industrial growth and optimization of the spatial distribution in the developing county: the case study of Linqu County in China.

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Counties, with fiscal autonomy and at middle administrative level, integrate urban and rural areas geographically in China. For developing counties, resilient industrial growth, influenced by the industrial structure and types, the employment distribution and the industrial land use, is essential to a sustainable urban-rural relationship. The three aspects, limited to natural resources, the labor force structure, local culture, external capital and the regional market, have primary impacts on the spatial distribution. Thus, this paper focuses on the optimization of spatial distribution in the county-level territorial spatial planning under these impacts to improve the resilience level of the local industrial growth.

The research chose Linqu County, in Weifang City, Shandong Province as a typical case, and measured the fluctuation law of its industrial growth by analysing the regional and local statistical data from 2011 to 2018. Then, three main factors with their sub-indexes, including the utilization of ecological resources, the efficiency of land and human resources, and the urban-rural income gap, were weighted by both the Delphi method and the entropy method. Results showed that environmental protection policies, current land spatial layout, local employee quality and R&D investment restrained the resilience level of the industrial growth in Linqu County.

After the above analysis, the paper discussed the coupling path between these factors and the spatial distribution in such developing areas. Under existing policies, optimizing local industrial types, integrating the industrial chain and centralizing the industrial land in urban-rural corridors will enhance the land-use efficiency. Increasing the R&D investment, introducing relevant talents and developing tertiary industries can improve the resilience level of the industrial growth in developing counties. These suggestions would be considered in the spatial planning of similar areas in China and worldwide.

S16: Urban – rural (dis-)continuities: Better understanding the urban-rural interactionsto ensure equitable, green and healthy urban transitions in Europe and Chinathrough nature-based solutions

Nature-based solutions in rural areas for urban flood protection

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Climate change is expected to lead to more frequent and severe fluvial flood events in Northern Europe. Nature-based solutions (NBS) are increasingly recognised as a natural insurance against flood risks in vulnerable areas. This requires collaboration at landscape scale between providers and beneficiaries of flood control. In particular, mechanisms to incentivise owners of land could potentially offer cost-effective ways to reduce damage to urban infrastructure. NBS which comprise actions inspired by, supported by or copied from nature, are increasingly recognised as a valuable yet still under-utilised means to alleviate negative effects of a changing climate. In relation to the goals of developing climate change adaptation and improve risk management and resilience, NBS represent measures that can increase the natural insurance against adverse events such as flooding. The insurance value of an ecosystem results from the capacity to cope with external disturbances to reduce risks to human society, for instance by overflowing farmland, which deliberately increases the flood intensity on farmland compared to the current situation as a way to protect more vulnerable and costly urban infrastructures downstream. This presentation discusses the potentials and limitations of landscape scale Nature Based Solutions for climate adaptation and draws on the results of a choice experiment among farmers concerning their willingness to accept payment to allow their land be flooded during extreme events.

Zandersen, M., Oddershede, J.S., Pedersen, A.B., Nielsen H.Ø., Termansen, M. (In press) Nature Based Solutions for Climate Adaptation - Paying Farmers for Flood Control. *Ecological Economics*

S17: Linking urban and rural ecosystems in policy, practice and governance

Distance and proximity: analytical concept for a better understanding of the complex interactions between urban and rural areas

Alexandra Doernberg

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Urban-rural relations can be synergistic, neutral or conflicting and require well-balanced governance approaches. One of the major challenges for the sustainable management of the resource “land” and land-based ecosystem services are the multiple interactions between urban, peri-urban and rural spaces and across spatial and political scales.

In this paper I present an approach for the analysis of urban-rural interactions, land use conflicts and institutional change in a spatial and temporal perspective. Based on existing telecoupling frameworks by Liu et al. 2013, Friis et al. 2016 and Eakin et al. 2014 we developed an analytic approach that links decision making, land use changes and conflicts with governance in local- and telecoupled systems.

Key features of the telecoupling concept are that it offers a structured and processual perspective on urban-rural relations as well as wider human-environment interactions, which makes it valuable for ecosystem service research.

Furthermore, the developed approach allows to distinguish between local and distant places of provision and consumption of ecosystem services and considers the distribution of benefits between actors in different spatial units. The related question of spatial and environmental justice could be of practical importance for planners and policy makers. However, the complexity of the approach itself poses a challenge to local stakeholders (incl. land owners) and practitioners in policy and planning.

Nevertheless, we currently assume that our analytical framework can improve the understanding of the complex interactions between urban, peri-urban and rural spaces in science and could assist the evaluation and implementation of suitable governance approaches for a collaborative and sustainable management of land and ecosystems in practise.

This assumption will be tested in the context of a running research project on a just urban-rural equilibrium (see www.regerecht.de).

S17: Linking urban and rural ecosystems in policy, practice and governance

Linking rural and urban economies through tourism and recreation

Klaus Ehrlich

European Federation of Rural Tourism, Spain

For more than 100 years, the rural territory around urban areas has not only provided agriculture products and raw materials, but also serves as destination for recreation and holidays. Starting with farm tourism in the middle of the 20th century as complementary income for farmers, this activity developed in a full-fledged part of the European tourism industry with about 15% of its total capacity under the concept of „Rural Tourism“. It evolved from a pure provision of basic accommodation and related food services to a wide range of leisure and recreation activities that put into value the rural resources such as nature, landscape, history, culture, and of course the local production both in agriculture and food processing.

Current reality is still based on a traditional understanding of rural tourism as based on small-scale hospitality and consumption of services on-site. However, the process of digitalization and improved logistics give leverage to this potential that responds to an increasingly selective customer that is looking for authentic and sustainable services. Post-visit relations offer the possibility for sustained consumption of rural products in the line with short supply chains. Furthermore, the demographic trends and recent changes in market priorities due to COVID-19 offer additional opportunities.

The contribution will outline the current situation and outline existing but not yet exploited further potentials. It then provides suggestions for a strategic approach that would allow to unleash the full potential of rural areas through a complementary peer-to-peer cooperation and symbiosis of rural and urban ecosystems, assuring lively and sustainable communities based on touristic and recreational services.

S17: Linking urban and rural ecosystems in policy, practice and governance

FROM THEORY TO PRACTICE: SUSTAINABLE RURAL AND URBAN DEVELOPMENT IN UGANDA.

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Cities across the globe attract people for reasons such as employment opportunities, education, and health care. In most Sub-Saharan Africa, urbanization is largely due to neglect of rural areas and the inadequate allocation of resources such as operational expenses and insufficient investment in rural infrastructure, agriculture, schools and hospitals. Government policies, including marketing of agricultural products, which push farmers and their families into the cities, are largely responsible for this trend. This therefore implies that the prevailing integrated spatial planning system has failed to achieve its intended goal of promoting orderly urban-rural development as well as generally improving service delivery across urban rural territories.

In Uganda, over 70% of the urban residents live in slums and/or informal settlements with precarious public services. Although this is partly due to other, non-spatial planning factors such as inadequate funding, poor urban governance, failure to enforce the existing urban laws, complex land-tenure regimes as well as urban culture and value systems, it's worth arguing that none of these can be remedied without a robust, functioning, integrated urban and rural territorial planning system. However, to achieve this, the development policy at national and even global levels need to recognise this great need. The aim of this paper therefore, is to highlight the criticality of this need through the lens of linking practical requirements and territorial policies for sustainable rural and urban development. The conclusions drawn from this paper will help policy makers and other urban and territorial development practitioners understand the critical practical requirements for sustainable urban and rural development in Uganda as well as other developing countries.

S17: Linking urban and rural ecosystems in policy, practice and governance

Climate resilient infrastructure finance in renewable energies: Global challenges ahead and the role of citizen (co-)ownership

Peter B. Meyer¹; Reimund Schwarze²

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Across the globe, urban-rural physical infrastructure investment needs vastly exceed the funds readily available. In particular local authorities charged with fulfilling energy efficiency and climate policy goals and with these responsibilities straining their limited budgets, often lack the means to initiate new and innovative projects. Municipalities are unlikely to make such a financial commitment without political advocates, who in turn will be harder to convince the more costly a novel infrastructure project is. This conjunction is where consumer/citizen financial participation can be the key to lowering the public cost, while at the same time providing grassroots support. Scalable consumer co-ownership models meet both of these requirements. They facilitate a low-risk loan large enough to finance a significant share of the project costs while requiring only a small financial contribution from the participating citizens. In particular, Consumer Stock Ownership Plans (CSOP) offer low-risk loan financing of a significant share of the project while requiring only a small financial contribution from the CSOP participants. Community participation, in particular citizen capital participation as proposed in this paper, anchors community-wide and community-connecting projects in the citizenry, thus strengthening their democratic legitimacy and facilitating sustainable urban and urban-rural development.

S18: COVID19 – Implications for Sustainable & Resilient Urban-Rural Partnerships

Memorandum Post-CORONA: Providing sustainable and resilient development of cities and regions

Jens Libbe¹, Lena Bendlin¹, Robert Riechel¹, Stephan Bartke², Karl Eckert², Katrin Fahrenkrug³, Michael Melzer³, Lutke Blecken³, Julia Reiss³, Uwe Ferber⁴, Stephanie Bock¹, Jan Abt¹, Julia Diringer¹, Katja Wendler⁵, Michaela Koller⁵, Gudrun Gräbe⁶

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Conclusions of a workshop organized by several initiatives which are addressing the sustainable transformation of city districts, municipalities and regions into a “Zukunftsstadt” – City of the Future – as sponsored by the German Federal Ministry of Education and Research (BMBF)

The coronavirus crisis has many wide-ranging impacts on the development of cities and regions. In June 2020 multiple research evaluation projects of the German Federal Ministry of Education and Research in the area of sustainable city and regional development took on the initiative to start a discussion with projects funded by the BMBF along with model cities and regions about the possible developmental trends and impacts of the coronavirus pandemic.

Included on the agenda for discussion were topics related to city and regional planning which have been clearly affected due to the pandemic as well as their interactions to each other. The coronavirus crisis is being seen as a challenge of critical proportions on the one hand while also offering a window of opportunity for initiating sustainable transformations in cities and regions on the other. At the same time, the crisis has implications for research on the future of cities and regions.

S18: COVID19 – Implications for Sustainable & Resilient Urban-Rural Partnerships

Reflections on the impact COVID-19 from a geographical perspective

Carsten Butsch

University of Cologne, Germany

The COVID-19 pandemic quite suddenly changed the rules of daily life for the majority of the world's population. This includes restrictions in the freedom of movement locally, regionally and transnationally, the slowdown of economic activities, the shut-down of education institutions etc. Thus, SARS-CoV-2 as a non-human actor, changed the structures in which our daily lives take place – and it fundamentally changed every-day geographies. Geographers are investigating the impacts of the COVID-19 pandemic from various perspectives, focusing on the impacts on the economy, mobility and migration, the health care system, tourism, how it changes specific spaces like border-regions etc.

In this input statement, findings from the symposium “COVID-19 as disruption?” will be presented, illustrating emerging geographic research on the pandemic. Based on this, the short contribution will (1) highlight, emerging research questions and (2) implications of the pandemic for the development of rural-urban linkages.

S18: COVID19 – Implications for Sustainable & Resilient Urban-Rural Partnerships

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S18: COVID19 – Implications for Sustainable & Resilient Urban-Rural Partnerships

Tracking the COVID-19 discourse on sustainability transformations: an integrated approach using text mining and thematic discourse analysis

Mariana Madruga de Brito; Danny Otto; Christian Kuhlicke

Helmholtz Centre for Environmental Research – UFZ, Germany

The COVID-19 pandemic has brought vast changes to just about every area of our lives. What remains to be understood is if these changes can lead to far-reaching sustainability transformations or if as the immediate crisis wanes the climate agenda will be set aside in pursuit of short-term solutions for a quick reboot of the economy. This raises the fundamental question: What does the current crisis mean for sustainability efforts such as the European New Green Deal and Sustainable Development Goals?

To tackle how the debate evolves, here, we propose an innovative approach to monitor the COVID-19 discourse on sustainability transformations based on text-mining, topic modelling and thematic discourse analysis. The proposed approach allows processing large amounts of articles, reports and policy documents at near-real-time. Based on this, theme coverage patterns can be investigated, providing an overview of discursive change in both time and space.

To illustrate the proposed methodology and operating principles, the COVID-19 crisis in Germany is used as a case study. For this, around 80.000 newspaper articles published between March and July 2020 were considered. An emphasis is given to aspects related to sustainability transformations, following the European Green Deal framework as well as the Sustainable Development Goals related to ecological sustainability. We analyse how sustainability measures are discussed in relation to the crisis and aim, among others, to understand if the pandemic is perceived as a chance or an obstacle for sustainability transformations. Differences between local and national press coverage are also investigated. Especially the analysis of regional press coverage of COVID-19 can elucidate differences of discourses on the pandemic in rural and urban areas.

S18: COVID19 – Implications for Sustainable & Resilient Urban-Rural Partnerships

Beyond COVID-19 – the need for comprehensive health transformations in the Asian urban-rural nexus

Sigrun Kabisch¹; Frauke Kraas; Ulrich Kuch; Carsten Butsch; Till Bärnighausen

¹ Helmholtz Centre for Environmental Research – UFZ, Germany

Ongoing urbanisation, including more than two billion urban dwellers, is fundamentally impacting societies and landscapes in Asia. The need to provide humane living conditions, appropriate social infrastructure and care systems, in particular well-functioning health systems, is urgent. As the SARS-CoV-2 pandemic has shown, the health systems of many Asian cities were not prepared to withstand this crisis. Thus, urban resilience is poorly developed, if at all. Comprehensive health transformations are indispensable. This includes several dimensions. One refers to the in-migration of large groups of the population from rural areas to cities in the hope of finding improved living conditions or at least generating income to support family members at home. The often time-restricted stays of workers in cities and their poorly paid service jobs lead to unhealthy living and housing conditions. Another dimension includes the out-migration of people from cities to their ancestral rural areas in the current COVID-19 situation. Fluctuating with the level of lockdown restrictions and food security, this has led to major frequent population movements in either direction in some countries. Specific physical and social environments, the plurality of healthcare systems and their differential accessibility in various urban and rural settings result in severe health disparities.

While the impact of urbanisation on the health of large populations is profound, urban health in Asia is currently not a major international research focus. Furthermore, the scientific community has so far mainly applied limited disciplinary methods, rather than much needed transdisciplinary approaches to its study. In our contribution, we will describe research priorities concerning health transformations in Asia considering the urban-rural nexus. Based on our own research results, we call for a more comprehensive approach that incorporates sociological, geographical, medical and epidemiological expertise.

S18: COVID19 – Implications for Sustainable & Resilient Urban-Rural Partnerships

COVID19 triggered initiatives promoting urban-rural synergies: insights from the Metropolitan Area of Lisbon

Isabel Loupa-Ramos¹; Alexandra Almeida²; Joana M. Lima¹; Margarida Monteiro¹; Maria Partidário¹; Linda Pereira³; Carlos Pina³

¹ Técnico - Universidade de Lisboa; ² Comissão de Coordenação e Desenvolvimento Regional de Lisboa e Vale do Tejo ; ³ Comissão de Coordenação e Desenvolvimento Regional de Lisboa e Vale do Tejo, Portugal

Beyond the health crisis, the COVID-19 pandemic is causing unique economic and social challenges and presenting opportunities for novel and more sustainable life style in the future. In the middle of this global crises, people get back to basics and start to value aspects of life they did not before - as food. Food security issues become salient in people's life. As well as the search for alternative food sources. On the other hand, producers lose their conventional distribution channels, especially those that producing for external markets and who are now not able to sell their products. In Portugal this situation has spurred farmers, distributors and consumers to find novel relationships of mutual benefit. Existing minor niche initiatives previously focused on food safety as box schemes have mushroomed in new forms taking advantage of ITC and new business models have been put in place by farmers and distribution chains. All this an unprecedented response time.

This communication aims to present the research carried out in the context of the Lisbon Living Lab of the ROBUST project. It aims to provide an overview of the novel urban-rural relationships emerging in the context of the COVID-19 based on a systematic collection of initiatives focused on the Metropolitan Area of Lisbon using social media and complementary sources. Ultimately the future viability of these initiatives in an "post-COVID-19 world" is discussed taking advantage of interviews to stakeholders among farmers, distributors and public authorities.

S18: COVID19 – Implications for Sustainable & Resilient Urban-Rural Partnerships

Resilient cities in a post-corona world

Frederic Rudolph

Wuppertal Institut für Klima, Umwelt, Energie gGmbH, Germany

The Corona crisis may mark a turning point - politically, economically, socially, and individually. The future of cities and their relationship to the surrounding area also needs to be rethought. The consequences of the crisis are becoming vivid and concrete. This article aims to articulate to what extent urban environmental protection over the last years has contributed to the corona-resilience of cities. To what extent has the ambition of local policies and measures to protect the environment contributed to the ability of cities to react to the new circumstances of a lockdown, social distancing and its social and economic consequences?

To answer this question, the article has two main fields of analysis. First, it argues what makes a city resilient vis-à-vis the corona crisis. It argues that a city during and post corona pandemic has to be "closer", "more public" and "more agile". In so being, it can provide impulses for a "post-corona world" a more social, greener, more diverse urban environment.

Second, it analyses six big and fast growing cities, which have already implemented successful measures to protect the urban environment, namely Belo Horizonte, Moscow, Kochi, Beijing, Cape Town and Jakarta. The analysis entails urban environmental protection challenges, and corresponding sectoral and cross-sectoral policies, measures and other activities to protect the urban environment based on available information by desk research.

On this basis the article discusses to what extent these (successful) local policies and measures to protect the urban environment contribute to the cities being closer, more public and more agile.

S18: COVID19 – Implications for Sustainable & Resilient Urban-Rural Partnerships

Rethinking the role of urban green and blue infrastructure: variations of multifunctionality during the Covid-19 pandemic

Anika Schmidt

Helmholtz-Centre for Environmental Research GmbH – UFZ, Germany

The current Covid-19 Pandemic demands a reflection on conceptual approaches of urban transformations towards sustainable and resilient cities and especially the importance of urban green and blue infrastructure. In this contribution, we want to shed light on the role of public parks, riversides and further kinds of green and blue infrastructure in the course of the pandemic and a currently unforeseeable future. We relate to practices and measures, e.g. distancing in public life and lock-down, which led to an intensified and diversified use of these spaces for sports, recreation and events (e.g. concerts, meetings) and a rising awareness for the provided ecosystem services. At the same time, social inequalities and variations of environmental injustice are gaining visibility and new disadvantages and inequalities arise. Thus, we see a need to revise existing approaches of planning and design of green and blue infrastructure and its role within an urban development towards resilient and sustainable cities. One field of action can be seen in the comprehensive multifunctional design of green spaces, involving a cooperative process design and innovative governance solutions.

(This contribution is based on a paper currently drafted by the steering committee of the Integrated Project "Urban Transformations" at the Helmholtz-Centre for Environmental Research- UFZ, further main authors will presumably be Annegret Haase, Sigrun Kabisch, Sonja Knapp and Ellen Banzhaf)

S19: Land-use change along urban-rural linkages: the role of food production and consumption

Food systems in transition and new land-use conflicts (note: Session contribution not a paper title)

Kim Philip Schumacher

Osnabrueck University, Germany

As stated in the description of the session and discussed via telephone with Mr. Meyer the session does not seek abstracts for presentations but active participants for the discussions and world café format „Food systems in transition and new land-use conflicts“.

I would like to contribute to the discussions in the session from the background of critical research experience with the meat-production systems and intensive agriculture in Germany in particular and rural development and food geographies in general.

I would like to point out how current discussions about the transition of the agri-food systems might also transform urban-rural linkages and what land-use change and new land-use conflicts might arise e.g. by a strong reduction of live-stock keeping (“vegan landscapes”).

S19: Land-use change along urban-rural linkages: the role of food production and consumption

How does urbanization affect environmental and social dimensions of agricultural systems? A systematic review

Pramila Thapa¹; Mario Torralba¹; Andreas Buerkert¹; Christoph Dittrich²; Tobias Plieninger³

¹ University of Kassel; ² University of Göttingen; ³ University of Kassel and University of Göttingen, Germany

Though urban surfaces cover only around 3% of the Earth's land area, urbanization often significantly changes environment and society. In this study, we aimed to gather and investigate the fragmented empirical evidence on environmental and social outcomes of urbanization on agricultural systems. In doing so, we considered a) environmental variables: water quality, agro-biodiversity, carbon sequestration, control of invasive species, soil fertility, control of soil erosion, pollination; and b) social variables: equity, health & education, social network, conflict mitigation, demographic stability, income & employment, food security, and cultural identity. From 107 selected studies, we extracted positive and negative outcomes of urbanization on these variables. We also assessed mediation of these outcomes by continents, population numbers of cities, national per-capita GDP, and dominant farming systems. We found more negative than positive outcomes. While outcomes on social variables are predominantly positive, environmental ones are largely negative. Threats to water quality, demographic stability, and cultural identity arise as particular pressing issues of study and subsequent mediating action. The social outcomes related to the economic viability of farming and employment are largely positive, while those relating to cultural and equity aspects are predominantly negative. The environmental outcomes are frequently negative in the Global South, medium-large cities, poor countries, and in livestock or fishery systems. Social outcomes are more frequently negative in the Americas, largely populated cities, wealthy countries, and in livestock or fishery systems. The particular threats and opportunities of urbanization-driven rural-urban transformation in different dimensions and contexts of farming systems should be considered in urban planning strategies.

S19: Land-use change along urban-rural linkages: the role of food production and consumption

Towards environmentally-friendly and resilient food systems: increasing food self-sufficiency and mitigating climate change in metropolitan areas

José Luis Vicente-Vicente¹; Annette Piorr; Ehsan Tavakoli¹; Alexandra Doernberg; Ingo Zasada¹

¹ Leibniz Centre for Agricultural Landscape Research (ZALF), Germany

Increasing food self-sufficiency has become one of the main goals in almost all the roadmaps of every cities, especially after the disruptions in the supply-chains during the COVID19 crisis. The area demand (i.e. area required to meet the food demand) is around 2000m² per capita. However, food self-sufficiency implies meeting the food demand of a specific population with their own resources. That is, the demand has to be adapted to the supply and vice versa. Therefore, in order to increase the self-sufficiency of a specific population different variables related to the supply and demand have to be considered: i) foodshed area (i.e. surrounding area that will be considered for the food supply of the specific metropolitan area), ii) diets: current diets and different type of diets in the future (e.g. organic vs conventional, local vs long-distances, vegan, low meat consumption) iii) specific pedoclimatic characteristics and management practices conditioning crop species and yields (e.g. organic vs conventional, soil fertility properties), iv) food processing and harvesting: food wastes and losses and v) population growth. At the same time, the adoption of more environmentally-friendly food systems leads to lower greenhouse gas (GHG) emissions, which are also in the roadmap of many cities (e.g. C-neutral cities by 2050). In the SUNEX project, we have assessed the self-sufficiency of Berlin, Vienna, Bristol and Doha by applying the Metropolitan Foodshed and Self-sufficiency Scenario (MFSS) Model (Zasada et al. 2019) in different scenarios according to the five variables mentioned. Furthermore, we have developed a tool to estimate the associated GHG emissions to the different levels of self-sufficiency. In our study we demonstrated that it is possible to improve the resilience of the food system by increasing self-sufficiency of metropolitan areas, fostering urban-rural linkages and at the same time decreasing GHG emissions.

S19: Land-use change along urban-rural linkages: the role of food production and consumption

Regional food systems and sustainable land use in the Urban-Rural Nexus

Stephanie Wunder

Ecologic Institute EU, Germany

This presentation will show how the development of regional food strategies and city region food systems can serve as an innovative tool to (re-)build a sustainable nexus between rural and urban areas.

The results are based on the findings of the research project “Rural Urban Nexus - Global sustainable land use and urbanisation“ (“RUN”, www.rural-urban-nexus.org) that aimed to develop approaches and policy recommendations for an integrated rural and urban development and sustainable land use. The project (2016-2019) was funded by the German Federal Environment Agency (UBA) and the German Federal Ministry for the Environment (BMU) and carried out by ICLEI, TU Berlin and Öko-Institut under the lead of the Ecologic Institute.

Strategically linking rural (and peri-urban) production and urban demand for regional food creates an opportunity for cooperation and mutual benefit. In addition, numerous positive effects can be achieved in other policy areas (environment, health, regional development, culture, regional economy, etc.). Food policies are also a particularly suitable entry point to break administrative silos and stimulate civic engagement in the policy process. Based on a series of international studies, the relevant success factors and necessary core elements for the development of regional food strategies have been identified by the RUN project.

Additionally, the project team identified needed policy changes on regional, national and EU level to further develop sustainable land use and sustainable food systems as part of an integrated sustainable development of rural and urban areas. The findings will be presented within the session, thereby providing concrete suggestions for approaches how to overcome many of the challenges that the integrated development of rural and urban areas currently face.

S20: Meeting the challenge for transition of rural-urban value chains towards sustainability and resilience

The transformative potential of newcomers and returnees in local agri-food systems

Johannes Fuchs

University of Greifswald, Germany

The transformative potential of newcomers and returnees in local agri-food systems: Agri-food value chains are mainly dominated by highly globalized mass production based on an industrial agriculture and highly centralized food processing. This production system limits the potential for value capture in many rural regions. The literature on sustainable regional development often presupposes that simply activating the endogenous potential of rural regions is central for transforming agri-food systems towards a higher degree of local value creation and value capture, e.g. in the form of locally produced food specialties. However, the strong focus on change agents from within the region has been challenged more recently. Against this background, the paper aims at better understanding the role of newcomers and returnees for the transformation of local agri-food networks. The argument is developed based on the empirical case of Western Pomerania, a peripheral rural region in the northeastern part of Germany. The region is characterized by large agricultural companies and limited local processing. Therefore, the endogenous potential of traditional agricultural actors in the region is limited. Based on qualitative interviews, external knowledge and ideas by newcomers and returnees to the region have been identified as critical sources for the transformation of the local agri-food system. As a result, the transformation of the local agri-food system is rather characterized by small-scale initiatives which resemble alternative food networks or short food supply chains.

S20: Meeting the challenge for transition of rural-urban value chains towards sustainability and resilience

Modellregion BioökonomieREVIER: Regional innovation partnerships as key measures for sustainability transition

Christian Klar; Katrin Spoth; Ulrich Schurr

Forschungszentrum Jülich, Germany

Structural change due to the exit of lignite mining is an enormous challenge for the Rhenish region. However, it also offers the opportunity to gradually transform the fossil based economy into a sustainable, bio-based and circular economy. The BMBF funded project “BioökonomieREVIER” is aiming on the implementation of a model region for sustainable bioeconomy. This includes the opportunity for more regional value creation and new rural-urban interaction. The pre-conditions for a transition are very promising: The region has a highly productive agriculture, a strong food and chemical industry, an excellent research network and innovation system and urban markets along the Rhine River. To pursue the vision the initiative follows a holistic approach including (1) communication, participation and knowledge transfer, (2) networking and integration, (3) innovation transfer labs & science-to-business approaches and (4) value creation and business development.

Cross-sectoral networking of companies, agriculture, science, municipalities and society has contributed significantly to a re-organization of traditional value chains and partnerships. The so called regional innovation partnerships, which address real-world problems, are the source of new rural-urban material, product and knowledge transfer. Key elements of a successful transition are the establishment of a regional knowledge base, innovation labs and a transfer ecosystem (incl. societal innovations), which foster the development and implementation of new sustainable value creation nets.

The presentation will introduce the “BioökonomieREVIER” transformation approach. Key measures, their interaction and effectiveness will be explained by two exemplarily regional innovation partnerships from the Rhenish region: (1) new biological resources for chemical and textile industry and (2) new regional food products.

S20: Meeting the challenge for transition of rural-urban value chains towards sustainability and resilience

Regional innovation systems of the bioeconomy in structurally weak regions and the importance of supra-regional networks – A case study from north-east Germany

Lena Stock

University of Greifswald, Germany

Concepts for analysing regional innovation systems (RIS) have mostly been designed for economically strong regions, while structurally and economically weak regions have played a significantly lesser role in the literature. Concerning the specific conditions in structurally weak regions coupled with the specifics of the bioeconomy, however, there are various aspects that must be considered in the RIS analysis and have not been sufficiently reflected in existing concepts.

The aim of this paper is to develop a RIS analysis framework for the bioeconomy in structurally weak regions, i.e. regions characterized by a thin RIS. In addition to adapting the concept to the specific context of structurally weak regions and the bioeconomy, the importance of a supra-regional compared to a rather intra-regional network for innovation-based structural change will be focussed.

Based on a literature review, several approaches to the analysis of RIS were investigated – including literature on compensation and exploitation strategies, change agency and the influence of different actor types and cooperation structures on innovations. Moreover, the geographical and economic characteristics of structurally weak regions were compared with the assumptions made in the literature. Structurally weak regions are characterised by a low actor density and thus little potential for intra-regional cooperation. Compared to structurally and economically stronger regions, this is reflected both in cooperation patterns and the roles of individual actors. Regarding the bioeconomy, it should also be noted that it is not a separate sector, but rather a sector-spanning economic concept.

The resulting analytical framework allows a visualisation of the intra- and supra-regional network structures of different actors and is empirically tested in north-east Mecklenburg-Western Pomerania based on a survey of regional bioeconomy firms and research institutions as well as expert interviews with key actors.

S20: Meeting the challenge for transition of rural-urban value chains towards sustainability and resilience

Barriers to regional networking in the food-sector in Vorpommern-Rügen, case study results of innovative craft-food businesses

Gesine Tuitjer

Thünen Institute for Rural Studies, Germany

The material presented here stems from an applied research project from the food sector of Vorpommern-Rügen, which was concerned, among other things, with the establishment of regional business networks and innovative entrepreneurship.

The collected material consists of a total of 19 interviews, ranging from innovation or business biographies with individual entrepreneurs; a group discussion with the female entrepreneurs, and expert-interviews with the region's administration from tourism and economic development and from regional industry.

We have looked into the phase of business growth of a group of craft-food businesses. This phase is characterized by a mode of diversification beyond the established niche of the craft-businesses. The presentation elucidates how the regional context of industrial agriculture and food processing impacts on the development of the (micro-) businesses. This influence is visible in the composition of the entrepreneurial networks. First, envisaged cooperation between the innovative craft-food businesses and regional industrial food factories failed. Instead of yielding cooperation with industry, the entrepreneurs return to their former strategy characterized by high levels of vertical integration, and turn to portfolio diversification and additional spaces for sales and distribution of their products such as a local market. In sum, the regional economic context, characterized both by industrial agriculture and some industrial food production and tourism, leads to an alignment of the entrepreneurial practices among the micro-businesses and an intensification of the niche-specific growth trajectory of diversification. While linkages to affluent consumers of urban centers are manifold, these are not necessarily located within the same region. The results thus call into question 'regionalized' food networks as a panacea for rural development and point to area and sector specific production networks.

S21: Measuring economic and material flows: methodological options for the analyses of urban-rural metabolisms

Urban-Rural Region Shifting to Circular Economy: Flows & Governance

Konrad Czapiewski

Polish Academy of Sciences, Poland

In the last decade, the European Union has supported numerous initiatives aiming at reducing waste generation by promoting shifts towards Circular Economy approaches. Governing this process has become imperative.

This presentation focuses on the results of a Material Flow Analysis and governance analysis in Łódź Metropolitan Area (Poland). In the analysis the data concerning the waste flow from 28 communes (municipalities) were used. By means of semi-structured interviews, document analysis and workshops with local stakeholders, also a list of governance challenges which prevent contextually this necessary shift to circularity was drafted. The various challenges have been categorised with the help of PESTEL-O method. Results highlight a significant variation in policy contexts and the need for these to evolve by adapting stakeholders' and policy-makers' engagement and diffusing knowledge on circular economy. All these elements call for a multi-faceted governance approach able to embrace the complexity of the process and comprehensively address the various challenges that might appear to complete the shift towards circularity in metropolitan area.

This research is done within the framework of the European Horizon 2020 funded research 'REPAiR: REsource Management in Peri-urban AREas: Going Beyond Urban Metabolism'. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688920. This presentation reflects only the author's view. The Commission is not responsible for any use that may be made of the information it contains.

S21: Measuring economic and material flows: methodological options for the analyses of urban-rural metabolisms

Food R-Urban Metabolism: a hybrid approach to connect rural-urban landscapes and enhance sustainable policies in Trentino

Sara Favargiotti; Pianegonda Angelica; Betta Alessandro; Carrieri de Souza Marina; Ciolli Marco
University of Trento, Italy

Food R-urban Metabolism examines the complex relations between physical and social processes in the Trentino alpine area aiming to connect and to enhance sustainable relations between urban and rural area by analysing and mapping the biomass flows related to food cycle.

We refer to Urban Metabolism as the “collection of complex socio-technical and socio-ecological processes by which flows of materials, energy, people, and information shape the city, service the needs of its populace, and impact the surrounding hinterland” (Currie and Musango, 2016).

Following an analysis of different accounting approaches and methods, we focused on a spatial-oriented view merging ‘top-down’ and ‘bottom-up’ activities. These are combined with the Material Flow Analysis (MFA) standardized accounting method.

We recognized that a ‘top-down’ approach ensures good comparability with other studies at the expense of a precise picture of the local condition and it does not include local stakeholders. For these reasons, the ‘top-down’ work has been combined with ‘bottom-up’ activities to assure a closer relationship with local stakeholders and a more precise picture of local flows.

Once data has been collected, they have been used to calculate the ecological footprint of different biomass flows. Results will be compared to regional biocapacity to define which sectors have the highest resource consumption. Combining the two approaches and closing the gap with local stakeholders support the development of locally-targeted guidelines towards a circular economy perspective.

The contribution will present the critical position on the different approaches and the results of the R-Urban Metabolism mapping in the Trentino territories. In the framework of the EIT Climate-KIC project SATURN (1), one of the foreseen achievements will be to guide and support local administrations in the adoption of more sustainable territorial planning policies by using the MFA as decision-making support at the local level.

(1) “SATURN - System and sustainable Approach to virTuous interaction of Urban and Rural LaNdscaPES” is an applied research projects that aims to reintegrate the natural assets within the city climate change impact strategy and enhancing ecosystems services and dynamics. It includes three different pilot areas: Birmingham (UK), Göteborg (SWE) and Trentino (IT). More info available at the website: <https://eventi.fmach.it/saturn>.

S21: Measuring economic and material flows: methodological options for the analyses of urban-rural metabolisms

Challenges of the food-water-energy nexus in Amman, Jordan

Bernd Klauer

Helmholtz Centre for Environmental Research – UFZ, Germany

Jordan's economic prosperity as well as environmental integrity is reliant on its extremely scarce water resources. This is particularly true for the citizens of its densely populated capital Amman which make up for 42% of total Jordanian population. An intensive system analysis and stakeholder process - integrated in a two-stage living lab approach - revealed that many of Amman's water problems cannot be fully understood, managed and eventually resolved by concentrating on the water sector alone but require a rather holistic approach taking into account the nexus between water, energy and food production and consumption as well as relationship between the urban agglomeration and its hinterland.

This paper describes how the valuable information from a stakeholders could be recognized, processed and turned into hints and ideas for the design of a proper integrated physico-economic model of the food-water-energy nexus in peri-urban environments.

Based on stakeholder statements a systematic overview of the challenges of the food-water-energy nexus in Amman is given. An analysis of the relationships between the challenges shows that urbanization pressure is a relevant driver of the nexus problems in the case study. Coping strategies used by Jordanians as well as proposed solutions are clustered and potential management measures and policy interventions are derived. A physico-economic model of the food-water-energy nexus in Amman and hinterland is then outlined which shall be able to analyze future scenarios and policy interventions with respect to people's vulnerability and the overall system's sustainability.

S21: Measuring economic and material flows: methodological options for the analyses of urban-rural metabolisms

The regional governance of residual biomass

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Currently it is a challenge to manage residual biomass in a way it can be utilized in new value chains and their associated wider regional networks to benefit a sustainable regional development. The contribution explores the regional governance of residual biomass in the case of Bodenseekreis county. We follow biomass value chains originating from agriculture, forestry, road and landscape maintenance. Doing so, we will show that even residual biomass is currently utilized in various ways. We argue that unlocking the yet unutilized potential of residual biomass requires the adaptation of regional residual biomass governance. Our contribution will:

- present the variety of stakeholder groups involved in regional residual biomass governance (using stakeholder mapping based on desk analysis and interviews): these include actors along the value chains (e.g. biomass producers, logistics companies or users such as operators of waste water and CHP plants) as well as relevant authorities and further stakeholders.
- analyse their approaches in governing residual biomass (using SWOT and success factor analysis): i.e., the interplay of different existing governance structures (market-related, hierarchical, network-based) and their strengths and need for further development.
- discuss regional actors' collaboration potential in order to reorganise existing residual biomass value chains regarding the establishment of activated carbon and bioenergy value chains.

We draw on our experience in the BMBF Stadt-Land-Plus CoAct project (<https://www.uni-kassel.de/forschung/coact/coact/>). The project examines the potential of residual biomass for the production of activated carbon and bioenergy. We will assess the possibilities for the establishment of activated carbon and bioenergy value chains and present policy recommendations for local actors to promote the valorization of residual biomass.

S21: Measuring economic and material flows: methodological options for the analyses of urban-rural metabolisms

Possibilities and Barriers for Preparation RE-USE Centers in Rural Areas

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One of the society goals is to reduce the amount of waste in the coming years. One of the possibilities is, within the framework of circular economics, the transfer of products for further use – RE-USE. This ensures that used but still functional products do not become waste. In many cities today, large RE-USE centres are being set up, for example in Brno, Vienna, Budapest and others.

However, the situation in rural areas is different from many points of view. This paper describes the possibilities, opportunities but also barriers for the application of Re-Use activities in rural regions. It brings the conclusions of a Feasibility Study for the Smart Re Use park for the Microregion Stonávka. Feasibility study was prepared as one of the outputs of the SURFACE - Smart Urban Reuse Flagship Alliances in Central Europe project. This Project was supported by Interreg Central Europe.

During the elaboration of the Feasibility study, it was necessary to identify stakeholders, the waste collection system, the possibilities of educational activities and the involvement of the social care institution in the activities of Re Use. The presentation will present the main barriers that are associated with Re-Use in the legislative context of the Czech Republic.

Part of the presentation will be a description of the specifics of the rural area in relation to the production and collection of waste. Economic context of preparing Re Use activities in rural area give a good feedback for understanding possibilities. Also important are the identified key differences between Re- Use activities in large cities and rural areas.

Above all, the possibilities of solutions for building re-use activities in small municipalities will be presented. If people accept and support the idea of re-use, it is positive news for sustainable development. The solutions are designed to ensure transferability to other similar micro-regions.

S23: Circular Economy – from business models to regional transition?

“akzente Hand:WERK” – fabric remnants, new products, innovatory partnerships – a promising mix for social innovation and circular economy in rural Styria

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Social inclusion and environmental sustainability are key elements of the project “akzente Hand:WERK” which is located in the rural district Voitsberg near Graz, Austria. The intention when founding the social enterprise in 2017 was twofold: (i) it should create new jobs for long-term unemployed women over 50 years and (ii) it should contribute to resource-saving by re- and upcycling fabric remnants and thus returning waste to the regional economic cycle as high-quality products. The initial financing was given by LEADER funding of the LAG “Lipizzanerheimat”. Furthermore, the project gained subsidies from the “Action 20,000”, a public employment creation campaign. All in all, six women were employed and participated in trainings to acquire tailoring skills. The range of products developed over time and thanks to the cooperation with diverse customer like geriatric care institutions or diverse companies and an association with a high school for media, more and more innovative and valuable products could be produced. Thus, the range of products includes: “Agera”-products, which are motoric cushions, especially produced for people with dementia. Furthermore, purses and bags, table decorations, toys for children, pen rolls, shopping bags or aprons, etc. are produced by using old clothes and fabric remnants, donated by the local population and businesses. Thus, the lifetime of those resources is extended and used more efficiently. By addressing social and demographic challenges, increasing the inclusion of “weak” members of rural society (unemployed women, people with dementia), orientating its activities on the common good as well as re- and upcycling textiles “akzente Hand:WERK” contributes to the revitalisation of the rural area of Voitsberg.

S23: Circular Economy – from business models to regional transition?

Metropolitan Region Amsterdam on transition to circular economy

Yolanda Musson

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The Metropolitan Region Amsterdam has known diverse ways of working together. Since 2017 there is a covenant which comprised the MRA in 32 municipalities, two provinces (North Holland and Flevoland) and the Transport Authority Amsterdam. Some 2.4 million people live within the MRA and it is the Netherlands most robust economic region. The MRA sets its ambitions for every 4 years in the MRA-Agenda. It's a spatial and economic program with ambitions on mobility, housing, labourmarket, landscape, energy and climate.

The MRA is developing as circular region, the circularity is driven by various governmental- and business-organizations. The MRA's circular economy-program is enhancing this development by focusing on how the cooperation between all the local governments (35 in total) within this region can be of value regarding 3 main strategies:

- Enhancing the circularity in 5 product-chains: textile, plastic, diapers, building and biomass.
- Circular procurement
- Circular spatial development ((circular building, infrastructure within public space, maintenance of public space etc.).

These strategies are supported by the development of a Human Capital Agenda, monitoring, a platform to exchange practices how to deal with regulations , public affairs and communication.

Imported to mention is that the urgency of course is the prevention of shortage of raw materials along with climate change. For the local governors at this moment of crisis, this urgency is connected with the urgency to develop jobs. So the MRA is now working on a Green Deal together with business organizations and knowledge institutes how the realization of sustainable goals can contribute to economic recovery.

S23: Circular Economy – from business models to regional transition?

Co-operation of two generations of eco-business pioneers – an encouraging example for circular and common good economy in the Austrian Almtal

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Circular economy is a widely discussed concept, which aims at the cyclical use of materials. Already in the 1980s, the company “Grüne Erde” was founded in Almtal, an alpine valley in Upper Austria. The founder's vision was doing business in a sustainable manner without exploitation of people and nature. Starting with the production of mattresses the company expanded the product lines to modern wooden furniture, cosmetics and clothes. The pioneering performance was the focus on high quality standards in production, ethical values, short value chains, regional relatedness of the production and good working conditions. Nowadays, the company has 500 employees (80% women), 14 shops in cities in Austria and Germany, and a turnover of € 56.7 million in 2019. Through crowd funding a new headquarter and visitor centre was built in 2018 in Almtal. In this centre, approximately 70.000 visitors per year can experience the entire production process from raw materials to the finished products. This “old” eco-business pioneer is also an enabler for “young” eco-business pioneers. In 2016 two new enterprises with similar values were founded in the region. They produce vegetables and flowers on the agricultural plots of the “Grüne Erde” visitor centre. “almgrün” is a micro farm based on the concept of community supported agriculture (CSA). The two female entrepreneurs produce 180 varieties of ecologically grown vegetables for 70 families in the region and deliver the vegetables to the bistro of the visitor centre. “wildflorie” is a company for floristry, garden design and landscape planning. The two female entrepreneurs are pioneers for ecologically and regionally grown plants and flowers. These three companies implement the principles of a circular economy by producing sustainable goods, short value chains, co-operation with partners with similar commitment, sharing knowledge with the consumers to raise awareness for sustainability, ecological agriculture, and common goods.

S23: Circular Economy – from business models to regional transition?

Building regional circular economy to address soil and climate issues in Maharashtra, India

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GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit), Germany

The Urban-Rural Nutrient and Carbon Cycle (URNCC) initiative by ProSoil, a project for soil protection and rehabilitation by GIZ and government partners in India, works on innovations and models at the urban-rural nexus. Since the Green Revolution, Indian soils were used to maximize agricultural productivity. This has deteriorated soils limiting their ability to continue to provide ecosystem services. While croplands have a high potential for storing carbon, most carbon rich waste from agriculture produce ends up in urban waste streams.

Maharashtra generates 13,000 tons of organic waste daily, posing a challenge to waste management in cities and an opportunity to return this waste to depleted soils as nutrient and carbon rich organic compost. To ensure the efficient cycling of the concerned resources, critical issues such as the management of waste, quality assurance, cost effectiveness, incentives, governance systems and capacities must be addressed.

URNCC works to ensure that suitable systems, governance and policy frameworks and required capacities are in place. Presently around 50,000 tons per year of urban compost are being produced (in 384 ULBs) and made available to farmers through collectives and fertilizer distribution networks. Since farmer collectives play a role in promoting its on-farm application business models around compost are being developed. There is the opportunity to generate around 20 million EURO yearly from this business on supply and demand side. To increase the efficiency and transparency of the circularity process digital solutions will be deployed e.g. blockchain-based HARIT Ticker, a digital marketplace for urban compost supplier and farmers.

Innovations around URNCC are being scaled through institutional and governance systems, capacity development and knowledge exchange, ensuring resource efficiency for sustainable and resilient agriculture but also contributing to global and national commitments around climate change and Land Degradation Neutrality.

S24: Town hinterland water and nutrient transactions

Leveraging urban-rural synergies towards Sustainable Development Goal 6: A Case study of District-wide Sanitation Planning in Dhenkanal, India

Neha Agarwal

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India has made tremendous gains in reducing open defecation during the last five years through a national toilet construction drive under the Swachh Bharat Mission (Clean India Mission). The low penetration of centralized sewerage in the country in both urban and rural areas necessitates On-Site Sanitation (OSS) systems like septic tanks and pits coupled with Faecal Sludge Management (FSM) as the primary mode of wastewater management. While the private sector often transcends the urban-rural boundaries in providing FSM services informally, the formal policy and planning processes for FSM largely remain siloed between 'urban' and 'rural'. The present work, in recognizing the new commonalities in context and the resulting potential for synergies across the urbanization spectrum, describes a novel approach to sanitation planning for the district of Dhenkanal in Odisha, India. In the first part, it employs infrastructural, operational, and financial planning and the creation of suitable regulatory tools to enable urban and rural local bodies to collaboratively leverage existing urban FSM infrastructure for extending safe sanitation services to rural areas. In its second part, it focuses on identifying clusters of settlements for development of cluster-level Solid and Liquid Waste Management systems. The approach aims to mainstream systematic rural-urban convergence and cluster-based planning in the ongoing efforts to scale up sanitation in India and other Lower Middle- and Low-Income Countries.

S24: Town hinterland water and nutrient transactions

People's Participation in Water Share of Upper Godavari Sub-Basin, Maharashtra, India

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The paper highlights the complexity of transboundary water share in irrigation in the rural area of Upper Godavari lake basin, in central Maharashtra in India. The Upper Godavari lake basin, measuring 21443.2 sq.kms., covers three district administrations namely, Nashik, Aurangabad and Ahmednagar which includes 29 urban and 2523 rural centres. The basin is home to 10.3 million population of which nearly three-quarter is the rural population are engaged in water intensive farming and farm related small scale industries. We carried out perception surveys, focus group discussions and expert interviews at four villages namely, Govardhan Gangapur, Girnare, Dhakephal and Karehetakali from the head and the tail reach of the basin, besides a detailed geo-spatial timeline mapping of the basin to understand the social-spatial mechanisms of water governance. The approaches were structured broadly around inquiring, who got rights to draw the water utilities, what are the sources, who contributes in water share, how monitor happens, what sanctions for violations and how conflicts are resolved. We found that despite being closest to the source, both ends are facing water distresses. However, people in farming and farm related businesses found ways to get their water share through informally crafted traditionally existing rules. As a resilient approach towards water distresses, farmers take formal-informal routes like, support of microcredit, illegal water lifting, deviation in cropping pattern and in extreme case work temporarily as labourers. Water user associations are delineated by the upstream farmers as a positive self-initiative for regulating and monitoring of irrigation water from the reservoir. It is crucial that the water sharing mechanisms are 'just' at the smallest unit of the farmer to the village and to the district level both at the upstream and downstream.

Keywords: Transboundary Water, Water Share, People's Participation, Interactive Water Governance, Upper Godavari basin

S24: Town hinterland water and nutrient transactions

Framing a Landscape Planning Agenda for Metropolitan Watersheds

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India's metropolitan regions are rapidly growing into peri-urban hinterlands at the expense of landscapes that subsidize and support urban functions through a variety of ecosystem services. The metropolitan areas of Chennai and Kolkata present iconic examples of water and waste dynamics that straddle urban and rural landscapes. As one of the fastest growing metros, Chennai is physically expanding into farmlands, wetlands, water bodies and untapped aquifers. Unbridled urban development at the expense of landscape systems has resulted in recurring flood-drought cycles. Urban households are now dependent on the depletion of rural aquifers through an extended network of water tankers.

Kolkata has been historically subsidized by the world's largest sewage fed-aquaculture system within the East Kolkata Wetlands (EKW). EKW is a compelling example of coupled socio-ecological systems, where incrementally constructed and community managed fisheries use a variety of traditional practices and nature-based filtration processes to rear fish while filtering urban sewage. A community of peri-urban fishermen manage over 200 ponds fed by an engineered sewage canal to create a resilient landscape infrastructure system. However, the economic dynamics and landscape flows within the EKW is threatened by Kolkata's urban expansion.

The presentation will situate the compelling urban-rural and socio-ecological dynamics within the watersheds of the respective metropolitan regions. The lens of landscape planning will be used frame a management agenda that protects, restores, enhances, and constructs a system of nature-based solutions at the metropolitan scale. Using these case studies, landscape planning will use a multi-disciplinary approach to integrate ecological principles with spatial planning tools that can navigate competing demands from multiple stakeholders. The presentation is informed by site visits, preliminary landscape analysis, and a comprehensive landscape framework study.

S24: Town hinterland water and nutrient transactions

Town and hinterland - water and nutrient transactions

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Introduction: Tumakuru City, Karnataka , India with a population of 300,000 , is located at a distance of seventy kilometers from the state capital Bengaluru. It has a dynamic relationship with its hinterland in with regard to water and especially wastewater. Tumakuru City does not have any perennial river source of water. It depended on a large lake called Mydala tank . That being insufficient for a growing urban population and it had to move all the way towards Hemavathi river water of Gorur dam, which is about 170 kilometers away as a source. Every year 1.135tmc (thousand million cubic feet) of Hemavathi water is allocated and about 50mld of water is supplied to Tumkur City.

Tumakuru City is treating its wastewater in a Sewage Treatment Plant located at Bheemasandra Lake and post treated water is let into the Lake. STP follows a simple Aerated Oxidation Pond technique and is operating since 2004. Tumakuru City is having just 40% of UGD of coverage and currently around 13mld of wastewater is treated in the plant. It is noted that a more sophisticated treatment using Sequential Batch Reactor of an additional 25 MLD is proposed to operate in a year. Tumakuru Smart City mission is having 24/7 water supply scheme and Karnataka Urban Water Supply and Drainage Board has started the work.

The study in seeking to establish the current informal usage of treated and untreated wastewater of Tumakuru, the risks and benefits to its usage finds a flourishing agricultural use with interesting crop choices being made by farmers.

It seeks to determine the various possibilities of usage of the increase in availability of treated wastewater from the current 13mld to an additional 25mld by the end of 2020 with a view to find a balance between a commercial economic and livelihoods based use.

S24: Town hinterland water and nutrient transactions

Sustainable Activated Carbon from Rural Biomasses for Urban Wastewater Treatment

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Additional wastewater treatment with activated carbon (AC) becomes more and more important in selected wastewater treatment plants of cities and bigger towns in Germany and Switzerland. The largest part of all costs (investment and operating) is accounted for by the material costs of activated carbon. In addition, most of the resulting global warming potential is caused by AC production (up to 18 tCO₂eq. per tAC), whereby the type of activated carbon (hard coal, lignite, coconut shell carbon) plays a major role. Therefore, by producing AC out of residual biomass types, a sustainable and necessary product can be created. By using regional biomasses and a rural production site, transport distances are shortened and thus, sustainability is further increased.

As part of the joint research project CoAct, funded by the Federal Ministry of Education and Research (BMBF), it is being investigated to what extent residual biomass can be converted into AC by a pyrolysis and activation step. Determining the optimum production conditions is important in order to produce cost-effective, efficient, and therefore competitive activated carbon.

AC has been produced after drying and pelletizing the biomass, by pyrolyzing at 900 °C for 40 minutes in a laboratory reactor. Activation was achieved by adding steam into the reactor.

Adsorption performance of AC from maize straw was compared with a commercial reference AC. The results showed that the iodine number, which correlates with the surface area, of the maize straw AC was with 784 mg/mg lower than that for the reference AC with 1017 mg/mg. A higher reduction of spectral absorption coefficient SAK at 254 nm at constant laboratory conditions could be reached with the maize straw AC (21.3 % compared to 18.5 %). In terms of the removal of organic micro pollutants out of conventionally treated wastewater, the maize straw AC achieved with an average reduction of 80 % of 8 substances a higher elimination rate than the reference AC with 65 %.

S24: Town hinterland water and nutrient transactions

A metropolis and its hinterland - Wastewater reuse for agriculture in Bengaluru, India

Vishwanath Srikantaiah

Biome Environmental Trust, India

The city of Bengaluru (population 13 million) is the capital of Karnataka state, India. It is one of the fastest growing cities in India and its population is estimated to reach 20 million by 2031. The city consumes around 1850 million litres of water per day and generates 1440 million litres of wastewater.

Most of the wastewater was being informally used by farmers alongside the two major valleys which drain the city. An attempt will be made to understand the scale of reuse by farmers.

The city now is implementing a project to transfer 440 mld of wastewater to the drought affected hinterland around it and fill 134 lakes. Already 65 lakes are full.

The paper will examine the challenges faced in the implementation of the project, the lessons being learnt from it and whether it will be feasible for other cities in India to replicate this model.

While there are competing uses for wastewater, from the industrial, to the urban, to the ecological the paper seeks to examine the challenges faced in drawing a balance between the various competing reuses and how a policy can be framed around reuse.

The paper will also look at the climate change mitigation possibilities of larger and larger volumes of wastewater being generated from cities and the necessity for appropriate fit for purpose standards to be evolved in the Indian context.

S25: More digital = more sustainable? How cities and regions can use the digital transformation to build sustainable and resilient societies

Unequal Futures of Rural Mobility: challenges for smart countryside and the first mile

Gary Bosworth¹; Liz Price²; Martin Collison³; Charles Fox²

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Transport strategy tends to be strongly urban-focused, with assumptions that technological advances in mobility will simply trickle down into rural areas. In this paper we challenge such a view and instead draw on rural development thinking which emphasises the need for place-based approaches. Survey and interview methods are employed to develop a framework of rural needs associated with older people, younger people and businesses. This framework is employed to assess a range of mobility innovations that could most effectively address these needs in different rural contexts, with a focus on the Midlands region of England. In presenting visions of future rural mobility, the paper also identifies key infrastructure as well as institutional and financial changes that are required to facilitate the roll-out of new technologies across rural areas.

S25: More digital = more sustainable? How cities and regions can use the digital transformation to build sustainable and resilient societies

Are we even prepared for automated mobility? Challenges among the transition pathway for adapting transport related innovations into the society

Torben Quickert

City of Bremen, Germany

Automated mobility will change spatial development, the transport system and governance structures. Public authorities have to learn how to deal with these new technologies, particularly in their infrastructure, street design and digitalisation. The innovation of automated driving is a complex phenomenon, where never is technology alone. It is more a sociotechnical transition that changes the way a system fulfils specific societal needs. The multi-level perspective helps to understand the implications of automated mobility. Accordingly, landscapes provide the superordinate framework conditions (e.g. COVID19, digitalisation, individualization). Thereunder exists the level regimes, where practices, behaviours or regulations are forming the structure of the system. Niches are deforming the status quo (car dependency, combustion engine) and breaking through the regime level. Sharing, smart or electric mobility are providing the development and implementation of automated mobility. This transformation requires a high level of digitisation and sustainable transport planning. This gives rise to the following questions: What kind of capacity building is important for the cities and region? How can automated driving related innovations adapt to the society and policy framework? Is automated mobility promoting the creation of resilient cities and regions? What are the specific differences between rural and urban needs? Which functions and importance are having each levels for automated mobility? This conference contribution shows with the help of the multilevel- perspective the pathways of automated mobility into society and describes the implications and measures for sustainable municipalities. Because the implementation of digital mobility innovations in an existing socio-technical system is not a linear process, but change consists of permanent friction.

S25: More digital = more sustainable? How cities and regions can use the digital transformation to build sustainable and resilient societies

How smart city partnerships create sustainable solutions

Helene Qvist

City of Albertslund, Denmark

The contribution focuses on how Danish municipalities, through strong partnerships across the Greater Copenhagen area, have managed to achieve a number of sustainable solutions based on smart city technologies. Through examples, Helene Qvist will review how Albertslund's long tradition of focusing on the environment continues in the smart city living lab - as technology is just another tool for achieving a sustainable city.

S25: More digital = more sustainable? How cities and regions can use the digital transformation to build sustainable and resilient societies

Using Challenge-Based Learning interventions to increase resilience in rural enterprises, in the wake of COVID19 pandemic

Eliseo Vilalta-Perdomo¹; Rosario Michel-Villarreal²

¹ Aston University ; ² Royal Agricultural University, UK

Challenge-Based Learning (CBL) is a cutting-edge educational approach that integrates traditional learning modules (theory and practice) and real-life challenges that require solutions. Learning modules are specifically designed to provide the necessary theoretical and practical knowledge to solve the challenges. In this presentation, we propose an approach for the use of CBL with a focus on digital technologies, and present findings from its implementation based on students' first-hand experiences. Results suggest that the proposed CBL approach increased students' understanding of real-life settings, and was conducive to students' development of 21st century skills.

UoL4.0 Challenge is one of the nine regional pilot projects related to "Building Competencies for Competitive Companies" (COM3), a multinational project funded by Interreg North Sea Region that involves 19 partner institutions from seven North Sea Region countries. COM3 aims at enhancing regional innovation support capacity to increase long-term innovation levels and support smart specialization strategies. Accordingly, the purpose of UoL4.0 Challenge is twofold. On one hand is to support the development of highly engaged, employable and creative-thinking graduates who contribute to the development of society and the economy; on the other, for businesses to connect their new commercial ideas with their potential markets, through the development and use of digital technologies. All of these from a sustainable community perspective.

UoL4.0 Challenge shows how relevant is to support innovation in times of crisis, an example of this is present in current COVID19 pandemic. Collaboration between different stakeholders, such as businesses, academia and governmental agencies, need a framework where to operate with efficacy, efficiency and effectiveness. UoL4.0 Challenge provides such scaffolding. This initiative provides also real-world first-hand working experiences in a digitally-based world for students.

S26: Smart Villages – Catalysts of inclusive development?

Moving towards Smart Villages in Greece: Exploring the local socio-spatial needs of disadvantaged populations

Evgenia Anastasiou; Konstantina Ragazou; Marie-Noelle Duquenne

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Rural areas in Greece and depopulation are directly intertwined while the abandonment of the countryside and dynamic urban mobilities are still observed. The present paper explores the possibilities of enhancing the resilience of rural areas in Greece, especially the demographically and socially disadvantaged ones, through the emergence of new approaches to local development. Recent research suggests that the implementation of Smart Villages strategies could strengthen the resilience and attractiveness of rural areas. In Greece, the concept of smart villages as an alternative model of rural development has been hardly studied.

The Greek rural areas constitute a major pillar of the country's social and economic fabric. Meeting the main spatial, social and economic needs of the local population of the disadvantaged and fragile areas contributes to a minimum level of social integration and improvement of living standards. In this context, systematic research is carried out in order to detect, at the local level, the socio-spatial needs of disadvantaged populations in Greece. This endeavor is expected to face multiple challenges such as high population aging, declining overall population, expected urbanization, rural underdevelopment, migration/mobility, low living standards and deprivation.

This real knowledge of the disadvantaged populations' needs is an essential condition for finally defining and proposing appropriate alternative approaches for the resilience of Greek fragile countryside areas by shaping smart villages.

Keywords: Smart villages, social demography, disadvantaged population, Greek rural areas, resilience, attractiveness

S26: Smart Villages – Catalysts of inclusive development?

Smart villagers and digital pioneers? Towards a new definition of urban-rural partnerships

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Although there is an expanding body of literature on smartness in the context of regional spatial development and planning – reflected for instance in debates on smart countries, digital villages, smart territories and smart regions – approaches to digitalization in this context are not yet fully understood. Among unclarities is a lack of knowledge about how regional governance arrangements form and act in order to support digitalization in rural peripheral regions.

Our paper investigates actors and stakeholders in urban-rural relationships that foster inclusive spatial development using ICT-knowledge in an innovative way. Against the backdrop of in particular smart regions and smart territory debates, it will examine the engagement of and interplay between local, regional and supraregional actors. Drawing on existing notions about e.g. smart villagers and digital pioneers, results will firstly propose a new categorization of stakeholders, and secondly reflect on their role in regional governance constellations that use digitalization as a catalyst and enabler of innovative spatial development strategies. The paper presents insights that were generated by the ongoing research projects “Smart Villagers” – a case study analysis of four German villages - and “Digital Pioneers”. Its main contribution is in an increased understanding of the formation of governance in regional spatial planning by means of ICT-knowledge, and thus a new reading of the interplay between “digital social innovation” (DSI) and “technological knowledge”.

S26: Smart Villages – Catalysts of inclusive development?

COVID-19 spatial spreading in a high-density city: mobile phone location data analysis, predicting model and implications for urban planning

Junyoung Choi¹; Hyungmim Kim²; Taehyun Kim¹

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South Korean approaches are known as one of the best practices in dealing with COVID-19. In addition to medical measures and social distancing measures such as the development of test kits, a high number of tests, and the strict application of face masks, the use of digital technology has played a significant role in reducing the spread of the virus. Contact tracing is an important way to pinpoint those who must undertake the COVID-19 test and where these contracted people have visited is an important source for further tests. Viral diseases are particularly detrimental to high-density and hyper-connected urban environments. However, Korean cities have maintained low numbers of confirmed cases without the implementation of citywide lockdown measures.

The Seoul Metropolitan Area (SMA), a case study area of this research, is intrinsically vulnerable to communicable diseases because of high-density environments – one of the highest population density cities in the world, requiring fine-tuned strategies that can be supported by digital technology. This research presents the spatial pattern of COVID-19 and proposes a model to predict the spatial spread that the Seoul Institute of Technology (SIT) has developed using contact-tracing technology. The research will pay attention to the following three elements.

First, the research will address urban density concerns in relation to the spread of COVID-19. Mobile phone location data can offer precise information for spatial and temporal analysis, which can be used to simulate future trends. Second, the research will discuss the changing land use patterns. During the COVID-19, the rise of online modes has been observed in almost all industries. Third, the research will examine how the analysis can better inform urban planning practices post-COVID-19.

S26: Smart Villages – Catalysts of inclusive development?

Digitization for resilient, sustainable and balanced cooperation between “smart urban and smart rural territories”

Gérard Peltre

Rurality-Environment-Development, Belgium

RED (www.ruraleurope.org), an international association created in 1980, has campaigned since 2015 (with the support of the European Countryside Movement) in favor of a European Rural Agenda, echoing the European Urban Agenda, to energize intelligent cooperation between rural and urban areas that recognize each other as innovative development poles.

The use of integrated territorial development processes, with reference to the CLLD approach, as well as the recognition of rural territories as poles of development and innovation, as promoted by RED, are essential in this. This is also expressed by the definition of "Smart Eco-social village" validated within the framework of the European study initiated by DG AGRI and implemented by Ecorys, the Origin, Diversity and Territories Forum, and RED.

Our recommendations:

Increase connectivity to very high speed internet and bet on Smart Villages / Smart rural territories to:

- Support the increase in teleworking in rural areas, food issues in short circuits ... (as highlighted during the Covid 19 lockdown)
- Foster new methods of governance and cooperation in rural areas and between urban and rural areas
- Boost economic and energy multifunctionality (Energy mix, etc.), sustainable mobility and public services, thanks to digital and social innovation;
- Optimizing and strengthening investment in human capital and collective capacities through education and lifelong training programs

As necessities: The reinforcement of cross-border cooperation, the reintroduction of the EAFRD in the common strategic framework, the inclusion, in the cohesion policy, of a minimum reserve of 5% for the integrated territorial development of rural territories;

RED calls for them to be included in the recovery plan and in the EU's 2021-2027 political and regulatory corpus

S26: Smart Villages – Catalysts of inclusive development?

The strategy of cultural highland for the recovery of villages in Songyang County

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This article discusses the strategy of culture highland promoted by Songyang County in recent years for the recovery of villages. This strategy is composed of three tactics which are culture orientation, design tactics and art tactics.

Culture orientation is a clear summarization of existing resources which reflect local features and culture height. Songyang County is known for three brands of culture: Gardens and fields, reflect the difference of Songyang from other counties in Zhejiang Province. The fairyland in the south, attractive to the middle class in cities for the pursuit of cultural experience. The example of county for classical China, provides a working point for the state department to develop international communication which gifts Songyang a cultural height as the representative of China.

The design tactics refers to a professional tour route for architectural design different from ancient villages in Songyang on the base of high-quality architectural design works accumulated in recent five years. These high-quality works are basically generated by the historical tradition and site characteristics of their location which interpret with the three brands of culture. They connect the tradition with modernity and even enhance the vitality of tradition. To some extent, Songyang county has reshaped its cultural image with architectural design for which it is no longer the home of multiple ancient villages with rich traditional cultures, but a pioneering front for the imagination of future.

The art tactics refers to the worldwide measures of art aimed to attract talent and cultural brands for the establishment or event planning which have been actively implemented in Songyang County, including National Art College Dean's Forum, art exhibition, the settlement of hundreds of artists etc. These measures reflect the future picture of Songyang with imagination and superiority from the current time on the base of preserving its culture orientation.

S26: Smart Villages – Catalysts of inclusive development?

Public digital literacy initiatives in rural areas- a case study

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Our daily lives become more and more influenced by ICT and therefore it is crucial for people to be digitally included. Although European rural areas are often still disadvantaged in terms of fast internet connectivity (Saleminck and Strijker, 2018), the digital divide is generally shifting from an accessibility to a usage difference, called the second-level digital divide (Büchi et al., 2016). Townsend et al. (2016) have shown that also rural SMEs often lack the knowledge or confidence to make use of digital tools and applications. Since a lack of digital capacities can have a negative impact on community resilience (Roberts and Townsend, 2016), rural areas are in need of a digital inclusion agenda tailored to the regional circumstances, to foster sustainability and resilience (Roberts et al., 2017). Municipalities also feel the urgency for a digital transformation (van der Ent and de Vries, 2017). These developments beg the question how do local governments try to improve digital literacy and stimulate broadband adoption in rural areas, and which obstacles do they encounter? To answer this question, we make use of a longitudinal case study in the North of the Netherlands. The case entails the establishment of a broadband information centre, based on a similar initiative in a nearby university city. Initially the centre was targeting local businesses, but this gradually changed over time under influence of various local political stakeholders. We observe that it is challenging to address the various requirements of the different potential users. A blend of target groups might help to create critical mass to reach a threshold, but at the same time this blend poses a threat to long-term commitment of particularly local businesses because they no longer see a supporting institute targeted at them specifically. In spite of the troublesome progress of the broadband information centre, we believe it presents valuable lessons for other communities and local governments.

Food chains in Urban Rural Partnerships

A balanced alliance between rural and urban areas to boost the resilience of regions to the crises and challenges of a changing world

Gérard Peltre

Rurality-Environment-Development, Belgium

A balanced alliance between rural and urban areas to boost the resilience of regions to the crises and challenges of a changing world

RED (www.ruraleurope.org), an international association created in 1980, bases its strategic proposals and its action on two structuring challenges: the recognition of rural territories as poles of development and innovation; and the search, within regions, of a proactive territorial cohesion by betting on strong and balanced cooperation between urban centers and rural areas.

We were thus involved in 2008, in the DG Regio working group on territorial cohesion as well as in the RurBan experiment initiated by the European Parliament and steered by the European Commission. The conclusions of this work form the basis of the common strategic framework (FEDER, FEADER, FSE, FEAMP).

Findings:

The post-Covid 19 recovery as well as the transition challenges (digital, climate, social, etc.) of a world in profound transformation require an alliance between rural, urban and peri-urban areas:

- Organized on the basis of an integrated shared territory project in connection with the Community-led local development approach (CLLD)
- Committed to a mutual recognition of the development and innovation potential of each territory
- Recommendations:
- Encourage regional and cross-border cooperation between urban and rural areas on the basis of integrated sustainable development projects structured around the CLLD approach
- Include in the cohesion policy a minimum reserve of 5% for the integrated development of rural territories
- Reintegrate the EAFRD into the common strategic framework: territorial food plans

The call of RED, in association with the ECM organizations, in favor of a European Rural Agenda and our definition of rural territory reinforce these objectives and the necessity.

Food chains in Urban Rural Partnerships

A European Rural Agenda, in addition to the Urban Agenda, to capitalize on the added value of rural territories

Gérard Peltre

European Countryside Movement, Belgium

Rural areas have a lot to offer. However, they are facing economic, social and environmental challenges. Without a strategy targeted to these areas the risk of territorial imbalance remains. As a response the EU has set mechanisms and funding, such as the Cohesion Policy. However, there is a tendency to concentrate these policies in urban areas, at the expense of peri-urban and rural areas.

In order to rebalance the focus, the European Countryside Movement call for a European Rural Agenda. This comprehensive strategic framework will provide, in addition to the Urban Agenda, a real development policy for rural areas with a reinforced vision of territorial cohesion and smart interterritorial cooperation.

The ECM recalls the added value of rural areas for the European project. They carry innovative solutions and meet essential European health and food safety needs. The European Parliament Resolution (3/10/20), based on a proposal from the RUMRA Intergroup, already expresses the need for recognition and potential of rural areas. The ECM organizations recommend:

Highlighting the multifunctional dimension of the integrated development of rural areas in the post-2020 CAP, and its anchoring in the cohesion policy. The aim is to promote economic recovery, plural agriculture, and the legitimate mobilization of rural and peri-urban areas.

Reintegrating the EAFRD into the CSF, at least for LEADER/CLLD, and the strengthening of this approach, for a greater interrelation between the funds to finance local strategies.

Changing in social, economic and territorial paradigm: rural areas showcase innovation, resilience and solidarity. This added value has to be at the center of European rural policies, placing the human at the heart of concerns, in a constructive relationship with the urban centers. Therefore the ECM calls for a European Rural Agenda. It would express ambitious political guidelines for better territorial cohesion as well as for the crucial involvement of the citizens.

Food chains in Urban Rural Partnerships

) Territorial and pPeople-centred approaches to address COVID-19 in Africa: Issues from experience in agriculture and food

Karim Hussein

Independant Consultant, Ghana

Most observers concur that COVID-19 poses a threat to agriculture and food production and trade at all levels. With quarantines, measures to restrict social contact and unprecedented travel restrictions in place at national, regional and international levels in most parts of the world the medium-long term implications for agricultural and food supply chains between rural and urban areas are enormous. In order to mitigate the risks of a looming economic and food crisis, measures need to be employed to protect vulnerable food producers and consumers, keep global food supply chains alive, and mitigate the effects of this pandemic across the agri-food system.

This paper will examine examples from Africa of the utility and effectiveness of territorial approaches to address the food and agriculture-related challenges, particularly those facing smallholders and family farmers, of pandemics, such as COVID-19. Based on the analysis of the evidence on key challenges and what has worked to date, it will propose a number of recommendations for investment programmes and policy in food and agriculture in Africa in the context of the new situation that is emerging. It will focus on fostering territorial approaches that can foster a mutually beneficial and inclusive transformation of rural-urban linkages that contribute to the achievement of the SDGs, particularly SDG 1, 2, 5 and 11.

Food chains in Urban Rural Partnerships

Exploring citizen-driven governance models to foster resilient city-region food systems

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Although a number of politician, civic initiatives, and academics have long argued that our food system is not sustainable, the Covid-19 pandemic has unveiled the complexity and fragility of our current food system, in particular when it comes to globalized food supply chains. In search for adaptation strategies towards a more adaptive and resilient food system, city-regions are currently transforming food governance at regional level by experimenting with multi-stakeholder and networked governance models. Within these networks, citizens are central to the development of food system and policy innovations.

To support current food system changes towards a better alignment with regional needs and potentials, the EU-project FoodSHIFT2030 situates citizen-driven innovations and actions at the centre of research. The study explores various citizen-driven governance models as examples of “good governance” based on three European city region case studies including Berlin (Germany), Oostende (Belgium), and Wroclaw (Poland). To deal with complex food policy issues, the three city-regions provide answers to pressing questions such as: How can administrative silos and hierarchical separation in city-region governance structures be overcome? And how can political spaces for multi-stakeholder engagement, citizen empowerment, and decision-making processes be created?

FoodSHIFT2030 helps to understand how citizens utilize existing and/or build new governance structures in a particular context to shape tomorrow’s food systems. In short, there is no one-fit-for-all solution, but multiple governance models depending on the socio-cultural, political and economic context. The different models will be conceptually introduced and discussed regarding their level of participation and democratization, including key tool and mechanism. The paper argues, that systemic and collaborative approaches are key building blocks for food governance practices which foster sustainable and resilient city-region food systems.

Key-words: City-regions food systems, multi-stakeholder governance, citizen-driven innovation, odSHIFT2030, case studies (Berlin, Oostende, Wroclaw)

From national policies to criteria for success – innovation in urban-rural governance in Europe?

USA Case Studies: Sustainable Strategies for Land Recycling in Urban and Rural Communities

Nova Blazej

United States Environmental Protection Agency, Pacific Southwest Region, USA

Background: Infill development is the process of reusing an existing, pre-developed property for a new, and generally higher use. Infill development occurs in both the urban and rural context and has multiple benefits that strengthen existing communities by investing “in” rather than pushing out and consuming additional land. Many infill properties are complicated by past uses that may have contaminated the soil or groundwater resulting in what are known as “brownfield” properties.

Aim: Locally driven solutions with transferable results: Federal programs within the United States can provide a structure for community-specific solutions for sustainable development and can share transferable results with other communities. The U.S. Environmental Protection Agency (USEPA) Brownfields Program focus is on the identification, clean-up and redevelopment of formerly contaminated properties, also known as “brownfields.”

USEPA recognizes recycling complicated properties takes creativity, partnerships and community engagement. One of the most successful tools of the program is flexible technical assistance in redevelopment planning to spur innovative problem-solving.

Description: Six brief case studies of sustainable redevelopment strategies for brownfield properties in urban and rural communities

This session will provide an overview of six recent strategies for brownfields redevelopment in urban and rural communities:

1. Modular Construction of Affordable Housing (San Francisco Bay Area, California)
2. Tactical Urbanism (Central California)
3. Amortization to Phase Industrial Uses Out of Residential Neighborhoods (Southern California)
4. Biomass Generation from Forest Products (Northern California)
5. Electric Vehicle Charging Stations (San Francisco Bay Area, California)
6. Farmers Market-Food Security (US-Mexico Border, Arizona)

From national policies to criteria for success – innovation in urban-rural governance in Europe?

Criteria for successful trade-off regimes in intercommunal land management

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Prosperous regions face increasing land use conflicts fueled by economic growth and immigration. This is particularly true for the :rak-region (Bonn / Rhein-Sieg / Ahrweiler) which experiences densification, congested transport systems and imminent exhaustion of remaining land reserves. The core city Bonn and the surrounding municipalities seek to jointly (re-)allocate the development pressure on land by residential or commercial use. Within the :rak's framework, the project NEILA seeks to establish an integrated intercommunal land management regime.

Cities have a tendency to avert regimes with formal commitment and fiscal redistribution which supposedly reduce their autonomy. Creating win-win-situations can facilitate the acceptance of binding components in informal cooperation frameworks. To achieve this, successful land management may be complemented by a trade-off mechanism to balance costs and benefits of settlement development. It defines tradable objects and means to trade them. The purpose of such a platform is to enable a systematic reconciliation of interests and beneficial exchange between cities at eye level. Ideally, if properly adjusted to the individual region, it resolves the perpetual contradictions between local interests and regional objectives.

This paper aims to determine the requirements for successful intercommunal trade-off regimes with the method of a best practice analysis. Until now, compensation systems with a higher level of integration are rare. To serve as a basis for NEILA's trade-off regime, existing systems will be classified according to objects, means and integration depth of compensation and exchange processes. Comparable regions will be selected for deeper investigation by means of expert interviews and additional research. This paper will outline the key findings and which criteria can be identified to have the greatest impact on the success of intercommunal trade-off regime.

From national policies to criteria for success – innovation in urban-rural governance in Europe?

Spatial Dynamics and Strategic Planning in Metropolitan Areas (SPIMA)

Pietro Reviglio

EUROCITIES, Belgium

SPIMA stands for Spatial Dynamics and Strategic Planning in Metropolitan Areas (MA) . It is a research project initiated by 10 cities member of EUROCITIES Working Group on MA.

Key policy question: With the continuous urban sprawl in Europe and the increased linkages between core urban centres and their suburban areas, cities need to cooperate with others authorities to manage together the main spatial dynamics going beyond their administrative borders. But the current planning and governance schemes seem not appropriate to address these complex challenges at the appropriate functional scale. With SPIMA, the ten cities wanted to get an answer to the following policy question: Which spatial planning policy tools and governance approaches can be useful to plan and manage spatial development at metropolitan level, taking into account the institutional and spatial context.

Main findings : 6 common findings in the 10 metropolitan areas studied:

1. No single definition for the delineation of a Metropolitan area. The research proposes an alternative approach: the “Metropolitan Development Area”
2. Three key planning approaches: strategic, statutory and collaborative. Strategic and statutory planning in the 10 metropolitan areas address metropolitan scale “to a limited extent”
3. Most common spatial dynamics in the 10 metropolitan areas: urban growth, suburbanization in periphery and densification in the centre
4. Institutional frameworks for cooperation: plurality of arrangements from formal to semi-formal or informal. However, the type of legal status is not itself a determining factor for an effective metropolitan.
5. Key challenges to manage spatial development in the 10 metropolitan areas: transport and traffic congestion, multilevel cooperation, shared vision on strategic plans and more political involvement
6. Key success factors to implement a metropolitan planning approach: shared governance and mix of tools allowing dynamic interactions between actors and policies.

URP II 2020

POSTER

Track 1: Governance of urban-rural linkages

Learning from capacity building and training program on 'Conservation and Green Development' for Uttarakhand, India

Mansee Bal Bhargava

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The presentation is about the learning from a recently concluded capacity building and training program on 'Conservation and Green Development' for Government and Civil Society of the mountain region of Uttarakhand in India. The foundation of the course was that Green Infrastructure and Resilience Planning are crucial to achieve the SDGs. The course content included reducing risks to negative shocks of growth, benefits of green infra, green infra solutions, mainstream conservation into development planning with focus on green skill development, green accounting, and restoration opportunities assessment methodology tool. The focus is to empower local skill building for forest landscape restoration at a regional level to contribute to the global agenda of the Bonn Challenge that India is signatory too. The mountain region development cases of Pithoragarh, Uttarkashi, Rudraprayag and Chamoli districts of Uttarakhand are taken as the action area in the training program. While, I shall share my experience of developing the training program, now with the COVID time, in the digital form, I'm also curious how these global ideas get translated through us to the local people and what indigenous and traditional wisdom are crucial to complement the successful and sustainable ground actions in the individual or collective efforts. I'm hoping to be able to hit the ground before the URP conference to share more insights from the ground but for the time being the abstract is written from the desk study of the subject and past experience of working on afforestation and water conservation.

Track 1: Governance of urban-rural linkages

How to measure Circular Economy in a regional context? Case study of a locally produced bio-based and reusable cup in the region of Augsburg

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In Germany, around 2.8 billion disposable cups are consumed annually for the use of hot drinks with devastating environmental consequences, which causes requests for renewable and reusable alternatives. The Circular Economy (CE) concept aims on closing regional resource loops and is thereby a promising path to achieve a sustainable future. However, while a vast array of proposed frameworks for the measurement of sustainability in cities and regions exist, practical implementations are still scarce. To address the gap of practical implementations of circular economy concepts, we identify CE measures applicable to the region of Augsburg, Germany, and evaluate the effect of these measures by means of existing sustainable region and circular economy indicators. The selection of indicators is embedded in Bavaria's bioeconomic strategy to reduce the use of fossil resources, waste and emissions in the long-term. In a first case study, we will present our approach with a regionally produced bio-based and reusable cup. In order to investigate the benefits of this CE measure, the results are compared to the conventional reference 'disposable cup'. Due to the fact that current research of circular cities and circular regions shows a lack of empirical data or quantitative analysis, we aim to follow a tangible approach that has the potential to be generically applied to other regions. The methodology of this research contributes to the analysis of circular economy interventions from an environmental, economic and social perspective, using region-specific data of material and waste flows, as well as considering other region-specific circumstances. This application is part of the reGIOcycle project funded by the German Federal Ministry of Education and Research (BMBF), activity "Stadt-Land-Plus".

Track 1: Governance of urban-rural linkages

Regiopolis Region Rostock

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Rostock Region uses a new way of urban-rural collaboration: The Regiopolis Region of Rostock (RRR). In Germany, regiopolis region defines an area with a major city (>100,000 inhabitants) having strong interlinkages with and impact on its mainly rural surroundings. Leaned on the concept of metropolis regions, the regiopolis offers development and supply functions for its respective interrelation area and thus, for the citizens living in the whole area. At the same time, it supports a deconcentration policy in spatial planning. Within this structure, several administrative actors and the regional chamber of commerce and industry work together.

Since 2018, the secretariat of the RRR manages a small regional fund (300,000 € p.a.) financed from the Joint Agreement for the Improvement of Regional Economic Structures (GRW), supporting projects aiming to foster equal living conditions within the region. One of these, called “Stadt-Land-Gut” (city-countryside-manor), focuses on cultural heritage as engine for local development by putting a spotlight on manor houses. These shape the rural areas of the RRR in a unique way. The project brings together local inhabitants to discuss future living conditions such as needs in mobility, the provision of everyday goods or cultural life in order to empower the local community and to find means how to capture value of the manor house and the beautiful landscape. The aim is to rediscover manors as a “garden for the regiopolis” and thus, to strengthen the functional interaction of urban and rural everyday life. The focus of activities around the manors is set on culture, art exhibitions, open house events, and multi-modal tours from the city into the countryside. Also, the network of manors supports the development and sale of regional products – reaching from agricultural and craft products to touristic offers. These activities shall trigger further development in rural communities and thus, reduce disparities in living conditions.

Track 1: Governance of urban-rural linkages

The European Urban Institute Project

Antoine Frémont; Pierre Perrin

University Gustave Eiffel, France

Our poster aims to describe the ambition of the European Urban Institute (EUI), its principles and the first training cycle.

The ambition of the EUI is to create an outstanding training programme which will be a free place of discussion on cities dedicated to practitioners (policy-makers, top-executives working for public authorities, companies delivering urban services or NGOs) with already good knowledge and interesting professional background. It is a place to discuss urban issues through the sharing of knowledge, successful and unsuccessful innovative experiences, research results and practical case studies. As such, the EUI offers critical reflections and proposes controversial debates to examine urban issues from varying perspectives. This is why the European Urban Institute (EUI) is an independent structure grouping European universities.

The EUI activities rest on four principles: multi-disciplinary approach, international comparison, excellence and critical capacity of analysis.

EUI principles will be applied throughout the analysis of a key urban challenge in four cities of different countries. This challenge will be addressed in local sessions which will take place in each city. A local session has a duration of 5 days and comprises a series of activities such as study visits, discussion with local experts and practitioners, round tables, debriefings.

The key challenge of the first 2021-2022 training cycle will be cities coping with social cohesion. In the last decades, cities have faced increasing social inequalities which are threatening their functioning and development. The challenge of social cohesion will be explored in four cities offering different contexts:

- The Paris region : tackling social and territorial inequalities in a global city
- The Geneva cross-border region: Governing global and local Geneva: a cross-border experience
- Leipzig: Social cohesion and adaptation to extreme dynamics – from shrinkage to growth
- Ravenna : mass tourism and social cohesion

15 to 20 participants will be selected for this first training cycle.

Track 1: Governance of urban-rural linkages

Sustainable management of commercial areas in the Northern Black Forest Region

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As part of the “Stadt-Land-Plus” research program, which aims to improve the sustainability of regions and explores the relations of urban-rural cooperation, the KoOpRegion project focuses on the improvement of commercial areas land management towards more sustainability through inter-communal cooperation. Case study is the central area of Pforzheim, located in the Northern Black Forest region. The poster presents the trans- and interdisciplinary project design, that aims at establishing a “community of practice” including all relevant stakeholders to engage in a co-design process in order to develop and apply a suitable sustainable management of commercial areas. This co-design process comprises (a) a locally adapted inter-municipal vision of sustainability based on, among others, an existing integrative sustainability concept, and (b) the identification of possible forms of inter-municipal cooperation as new governance structures in the region. With this participatory design, the project aims at supporting a collaborative process by showing potential options and mid- and long-term sustainability-related effects of commercial areas managed by inter-municipal cooperation. An important product of the project will be a knowledge platform with a prototype of a decision-support tool, that supports information exchange on the potentials of a regionally coordinated sustainable commercial zone management and policy, considering the relations between the city, peri-urban regions and rural municipalities. The transferable project methodology supports the provision of context specific results as well as conclusions and recommendations regarding the transferability of the projects’ findings. Finally, the poster will present first results concerning the characteristics of the case study region and previous local experiences with inter-municipal cooperation.

Track 1: Governance of urban-rural linkages

Cities of the Global South as transnational climate-change actors: Theoretical approaches and policy implications

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'Cities of the Global South' have become an increasingly popular reference in urban studies and urban development practice. Also global urban policies refer to the term Global South. However, the term remains underexplored and definitions on which cities are actually part of the Global South are scarce. My contribution aims to provide a more detailed analysis.

Using the research field 'cities as transnational climate change actors' as an example, I highlight both advantages and problems of categorising urban areas as 'cities of the Global South'. Structural differences between Northern and Southern cities regarding climate change action do exist, and theory building on cities as transnational actors has not yet considered those differences. Also policy implications on the different forms of international activity in the Global South and North are hardly discussed. Notwithstanding, the categories Global North/Global South are only one possibility to analyse cities as transnational climate change actors and – depending on the research question – should be accompanied by analytical attention to additional factors such as geographical location, city size or political regimes. The contribution presents findings from a recent article in TWQ (<https://doi.org/10.1080/01436597.2020.1789964>) and especially tries to discuss the implications for a truly global urban polity.

Track 1: Governance of urban-rural linkages

Project OIKOS: case study of a recycling project in the countryside of Brazil

Clarissa Mazon Miranda; Monique de Oliveira Goulart; Bruno Wesner Bullé; Rayane Sielo Felin; Any Regina Rothmann

Fundação Antonio Meneghetti & Antonio Meneghetti Faculdade, Brazil

This paper presents the case study of Project OIKOS, an initiative of Fundação Antonio Meneghetti, from Brazil, which has created a recycling program in the district Recanto Maestro, which is geographically located among the cities of São João do Polêsine and Restinga Sêca, in the state of Rio Grande do Sul (Brazil). This project assists these cities and Brazil in reaching SDG 5, SDG 8, SDG 11, SDG 12, SDG 15 and SDG 17. The theoretical framework of the paper is based on the works of scholars of Sustainability, such as Meneghetti (2018), Sachs (2015 and 2012), Kirchherr, Reike, Hekkert (2017), Baumgartner, Ebner (2010), Bell, Morse (2012) and scholars of circular economy such as Stahel (2016), Bocken, Savaget, Geisdoeffler (2017). The recycling initiative of OIKOS Project was created in 2017. The idea was to establish the selective garbage collection for the 320 people who live in the district Recanto Maestro, which is also the campus of Antonio Meneghetti Faculdade (a college with 1200 students). In order to make that possible, a partnership was settled with the cooperative named Associação Força no Braço, which unites 16 professionals that work collecting reusable garbage in Restinga Sêca. Also the city hall of Restinga Sêca is a partner of this idea. The garbage collection is made daily in the district by employees of Fundação Antonio Meneghetti and then taken to a shed in the campus. Once a week, the city hall of Restinga Sêca sends a truck to collect this garbage and takes it to the headquarter of Associação Força no Braço. The associated workers separate the garbage and sell it to be processed. Only in May of 2020, 3 tones of garbage were collected in the district originating an extra income of 6 thousand reais for the workers. Fundação Antonio Meneghe also created occasions of new experiences for the workers, such as: a beauty day in a saloon, watch a classical music concert, initiate the production of biodegradable soap, a vegetable garden and a composter.

Track 1: Governance of urban-rural linkages

Slum upgrading frameworks for better liveability: Case of Pune, India

Subhashree Nath

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Liveability studies are mostly limited to formal settlements, whereas in emerging economies like India, a large proportion of the population lives in informal settlements. Lack of liveability studies for informal settlements often lead to the assumption that ensuring safer housing structure and providing basic services like household-level water, sanitation, and electricity, inevitably leads to an improved living experience. Consequently, slum upgrading frameworks rarely consider improvement in liveability as one of the criteria. The research paper addresses this knowledge gap by studying the change in liveability perceptions of residents when they move to upgraded housing. Five residents each from four settlement types were interviewed: slums with no intervention, slums in-situ upgraded through retrofitting or relocating into multi-story housing in the same area, and slums upgraded through relocation to new housing. It aims to find how different liveability indicators weigh in the overall liveability score of these settlements by mapping their perception through Fuzzy Cognitive Maps and find the most influential (central) indicator as well as poor performing indicators. It hypothesizes that indicators related to community ties are most influential and despite improved housing quality and availability of basic services, community ties are lost when up-gradation is done through relocation to new housing. The result of the analysis highlights areas of potential improvement for a better liveability in the upgraded settlement. This comparison could then become a tool for guiding policies for slum upgrading, which considers the causal relationship of various indicators for an overall higher liveability. The centrality values of different indicators further help city administrator in prioritising areas which need immediate action.

Track 1: Governance of urban-rural linkages

Negotiating sustainable land use in an inter-municipal land management system

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Regional land management is one of the major challenges for regions with parallel processes of growth and shrinkage such as the region of Bonn/Rhein-Sieg/Ahrweiler. The project NEILA assumes that an improved balance of interests between cities, surrounding areas and rural areas can only succeed if instruments and measures to reduce land use conflicts are considered in an integrated manner and coordinated between municipalities. To successfully establish a system for a long-term sustainable and inter-municipal land management in the Region of Bonn/Rhein-Sieg/Ahrweiler and to anchor joint liabilities of the municipal partners beyond the project in legal, fiscal and organisational terms NEILA follows a bottom-up approach, viz. a strong collaboration with the local planning authorities is required. In order to implement a stable and efficient project management NEILA primarily relies upon an existing regional working group (:rak) and has established an organisational framework which involves different levels of the local planning administration. Moreover, the project embeds a continuous feedback from local politics throughout the project term, ensuring an enhanced acceptance of the project's suggestions.

The project poster demonstrates the unique organisational framework including its different levels of participation and its advantages for the development process. Further, the poster will reflect the first experience with the working structure focussing on the response rate and reaction the research project had so far.

Track 1: Governance of urban-rural linkages

Sustainable development and spatial planning: addressing the challenges of inequality

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The importance of sustainable development has been stressed by many international organizations, such as the United Nations, which is improving coordination mechanisms to support subnational governments and increase the capacity of the 2030 Agenda. As a consequence, numerous cities and regions are adopting strategies that promote sustainable development, as well as promoting institutional changes in order to better address these challenges. Yet, social, economic and environmental challenges are also intensifying and, as a direct consequence, inequality levels are rising.

It is essential for cities and regions to promote a more balanced, resilient and holistic long-term development. Nevertheless, as the convenors of this session point out, an overarching framework of relevant guiding principles is still missing, often leaving subnational levels without clear guidelines. It is, therefore, important to examine the quality of territorial governance and the institutional mechanisms behind political and planning decisions. This contribution uses the lens of sustainable and equitable well-being to look at the principles underpinning a balanced and long-term sustainable development. It focuses on the challenges of achieving spatial equality and justice, highlighting the role of current spatial planning approaches in tackling inequality.

Track 1: Governance of urban-rural linkages

Urban-rural transformations in the context of the GDR socialism

Maren Weissig

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Based on an innovative interdisciplinary project on the topic of urban-rural linkages on a regional scale, relevant transformation processes are investigated in various historical, political and ideological contexts. While corresponding processes in Western Europe can already count on a solid scientific base, there are obvious knowledge gaps about the relatively new and still ongoing structural transformations, which were caused by the socialist regional planning in the former GDR [1].

The socialist settlement structure was initially planned for an "agricultural city" and later for a regionally centralized village, but was in any case oriented towards highly industrialized agricultural production. The socialist planning system, but also the emerging new social order, triggered further emigration in favour of the centralized villages, which were often equipped with excellent local infrastructure and social networks.

This complex legacy was replaced by new "western" values in record time. The breakdown of rural identity is already history; driven by and from the metropolitan centres, the local development of the rural areas is now under pressure to adapt to changes [2].

The research presented here combines examples from comparative case studies of villages in Thuringia and Saxony that were affected by transformation, i.e. development and agricultural programs for the modernization of rural areas.

Framework conditions are discussed, through which the local development processes are either slowed down or enhanced. This process is embedded in current political discussions, which culminated in a discussion that would ultimately focus solely on cities [2].

The topics have inspired two recent exhibitions on rural spaces, in the Lisbon CCB [3] and in the New York Guggenheim Museum [4].

[1] „International Conference on Cities and Change“, session „Rural Areas in the Post-Socialist Context“ (V. Capresi), Darmstadt 2019

[2] IWH study "Vereint in Ungleichheit", 2019

[3] Sebastien Marot, „Agriculture and Architecture: Taking the Country's Side“, exhibition, CCB Lissabon, 6.10.2019 to 16.2.2020

[4] AMO and Rem Koolhaas, „Countryside: The Future“, exhibition, Guggenheim Museum New York (due to the COVID-19 pandemics not accessible)

Track 2: Land-use management on a regional scale

Rural-Urban ecosystems need emphasis on people's participation

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We can define Ecosystem as the complex of living organisms, their physical environment, and all their interrelationships in a particular unit. Natural ecosystems are “balanced” systems. This means the interactions between the different organisms that make up the ecosystem contribute to certain stability. But in the race of development, we didn't pay attention to the small changes that occurred in the ecosystem and now the different sectors of the ecosystem are demonstrating big changes. An Environmental Impact Assessment (EIA) is accepted worldwide for better management of natural resources. EIA is commonly described as an assessment of the impact of planned activities on environment, including impacts on air, water, biodiversity, flora-fauna and ecology. More than 100 countries have legislations for mandatory implementation of EIA. In India, the Union Ministry of Environment and Forests (MoEF), under The Environment Protection Act 1986, promulgated an EIA notification making Environmental Clearance (EC) mandatory for selected projects. Since then there have been 12 amendments made in the EIA notification of 1994. In 2006, MoEF published new EIA notification which is legal provision for taking necessary environmental clearance for development projects. In the EIA process, the public hearing (or public consultation) stage is the only stage where there is some scope for intervention by local communities. Public hearing is a process in the environmental clearance process in which stakeholders can interact directly with government officials and the project proponent about the concerns regarding upcoming project. In this way people can express their objections and opinions, and offer suggestions on a proposed undertaking in order to influence the decision-making process. Public participation may benefit both the proponent and affected community, whereas if ignored it may lead to conflicts and problems for project implementation, acceptability and sustainability. The goal of the paper is to contribute to better understanding of how people participate in the management of their environment, both in situations where they are motivated, encouraged and supported by outside actors and in situations where they must formulate their plans and conduct their activities in spite of the neglect, resistance or even active opposition of external force.

Track 2: Land-use management on a regional scale

Ds! that challenge the Urban-Rural Lake Conservation & Management in India

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The presentation platform shall be used for promotion of a short EBook that highlights the Dilemma of urban-rural lake conservation and management in India through the various aspects that are coincidentally Donned by words that start with the letter 'D' as guided by the development driver and gushed by the disciplines lacking comprehensive water education. The multiple Ds that feed into the lake development while affecting the lake conservation approaches besides degradation and deterioration are, drought, drainwater, drainage distribution, definition, designation, delineation, dredging/desilting, deweeding, design, designer, demography, density, department, and discipline (academic and research). They are discussed here to bring to the notice of the lake planners, designers and decision makers, the possible realigning required in the lake development approach towards lake conservation for the sustainable future of the lakes that further contribute to the sustainable and resilient city building process. The focus is on green-blue integrated development. The ebook is written in simple working language as what NOT to do in lake development in order to realign towards lake conservation. The ebook aims to reach the non-scientific community engaged with the lakes that are a plenty in the country despite systematic degradation and disappearance of them in the rush to development of both the habitat as well as lake.

Track 2: Land-use management on a regional scale

Commune Land Use Planning in The Context of Cambodia: Methodologies and Approaches

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The commune land use planning refers to the planning of land uses for all land in the commune, including state land and private land of private persons. The purposes of the commune land use planning include: Provide competency to commune councils in preparing effective land and natural resources use and management. Support equitable and sustainable socio-economic development. Contribute to the people poverty reduction. Help to achieve high productivity of land use in the commune based on the actual conditions and natural potential of the land. Respond to the land need of authorities and commune residents. Help prevent degradation and inappropriate use of land and natural resources. Facilitate better fulfilment of commune council role as state representatives in determining and managing state land in the commune. And seek supplementary technical support from various institutions and units as well as from private sector for preparation of commune development plan and investment program. In generally, the commune land use planning is an importance tool for commune council as well as stakeholders at sub-national level to contribute in management and using the natural resources in sustainable and equitable manner. Truly, land issues are the core factors for economic development and livelihood. Thus, if land use plan existed, local authorities at all levels will get a wide angle of perspective and, integrate land use plan into the socio-economic development plan at local level through district integration planning, then get approval at provincial level, as same as the usual procedure in socio-economic development planning, which all stakeholders involve in decision making. The outcome of CLUP is “Commune Land Use Plan”. The main objectives of the CLUP process are to: Analyse the present situation in the commune with regards to land uses, land tenure and land conflicts by identifying problems, causes and solutions. Examine future options for the commune, based where necessary on land suitability analysis to reserve for this purpose. Produce an implementation plan as a basis for Commune Investment Plan by identifying future development projects and activities on a present land use map, linked to proposed implementation steps and timing. Methodologies and Approaches: To simplify required procedures for the commune, a commune land use plan as a standard template will be filled in by the commune council. The CLUP template specifies the format of maps as well as the procedures and final format for the concrete outputs specified above. The commune land use plan contains at least six categories of information that are collected by the Provincial CLUP Facilitator Team based on available data/information (including. Problem Curse and Solution, and existing local knowledge in the commune and at village level: 1) Population and population projection: Land use is driven by the need of people for land. To estimate this need, it is necessary to estimate the level of population. 2) Present land cover and uses: Present land use based on a categorization system (detailed and simplified), including infrastructure (roads, schools, health centre) and land use types (economic, and social concessions, protected areas etc.). 3) Land capability/potentials: Capability of selected land compartments for various uses (e.g. paddy production) is determined by the Provincial CLUP Facilitator Team using indigenous knowledge on the suitability of the land and/or by the use of

other information from Community Agro-Ecosystem Analysed (CAEA) or fieldwork, e.g. transect walks, etc. 4) Projection needs for lands: Various needs of the community for the next 5, 10, 15 years will be listed based on priorities of suitability analysis (e.g. school, health centre, community forestry/fishery, social land concession). 5) Future land use options: Future land use options are shown on a future land use map. 6) Implementation Plan: Future land use options (like infrastructure, Community Forestry, Community Fisheries, Social Land Concession) are divided into projects for submission to the Commune Investment Plan. They are shown on a project map. Commune Land Use Planning (CLUP) is a participatory process which is related to legal, technical and institutional aspects therefore, it required a bit longer period of time and sufficient human resources to proper implement within an effective way. The most importance things are involving of all stakeholders in the planning processes thought consultation and meetings at all levels from the village, commune to district and finally at the province.

Track 2: Land-use management on a regional scale

Housing dynamics in Functional Urban Areas. The high demand for specific planning instruments in Romania's Growth Poles

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While metropolitan areas have long been considered to capture the institutional reflection of urban-rural partnerships, in the last 15 years the concept of Functional Urban Area (FUA) has emerged in connection to the degree of urbanization around cities. FUAs illustrate the economic interdependencies between an urban core and its hinterland, usually determined by commuting patterns or accessibility criteria. Based on OECD's methodology regarding population, density and contiguity, FUAs were defined for Romania's county capitals (40 cities) as territories where urban development projects could be financed from regional development funds in the framework of the 2014-2020 programming period. In this paper, we analyse the relationship between the defined FUAs (considering their total surface, number of Local Administrative Units, percent of the county occupied by the FUA) and the territorial dynamics in both the urban core and the hinterland (with reference to the demographic and economic profile - population size, number of employees, etc, and, most importantly, the spatial pattern of housing and amenities) for three of Romania's Growth Poles: Cluj-Napoca, Braşov and Iaşi. The results showcase the spatial impact of the economic development around these emergent cities, reflected especially through the development of housing units in the peri-urban areas. In the context of a fragmented territorial organisation configuration, the current administrative boundaries are no longer able to scan the new functional relationships generated by the real estate dynamics in the last decade. Given this argument, we support the need to introduce a normative territorial plan at Functional Urban Area level in the Romanian planning system, in order to correlate the spatial development vision of peri-urban areas around Romania's developing cities. Such an instrument will not only support an efficient land-use management process, but it will also provide a framework to systematically integrate territorial investments.

Track 2: Land-use management on a regional scale

Analyzing the regional green infrastructure planning of a degraded rural-urban landscape of Central Chile affected by megafires and with urgent sustainability needs

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The Green Infrastructure at regional scale proposes an interconnected network of natural areas that help maintain biodiversity and provide essential ecosystem services, aimed at generating sustainable rural spaces. The Regional Green Infrastructure Plan for the Maule region (Chile) was designed with spatial resolution information of 30 meters (Landsat) and has a central zone devoid of natural areas to conserve, compared to the coastal and Andean zone. This work seeks to adjust the spatial information using 10-meter spatial resolution satellite images (Sentinel), in order to evaluate the current structure, fragmentation and connectivity of the landscape, and detect new opportunities for conservation and/or restoration, improving the connectivity and fragmentation of the landscape, connecting rural areas with urban areas to improve their sustainability.

The study area is mainly dominated by farmland, while the natural covers are small fragments distributed throughout the area. Natural covers need restoration measures since they are found in a low proportion, with 20% in the core areas of protection and 9.8% in the core areas for connectivity. Even so, there are opportunities to conserve, which are not being recognized by the Ecological Infrastructure. When testing the Green Infrastructure designed with Landsat images, compared to Sentinel 2A it was evident the existence of differences that were not significant, so for landscape works at a regional scale Landsat is a good option to carry out this type of plan. It should be borne in mind that, when conducting ecological or green infrastructure studies, all scales of work are important, be they regional, local, and urban, since they all meet different objectives. This plan seeks to recover a landscape that was long affected by the mega-fires in Central Chile in 2017, in order to strengthen its resilience, while ensuring the provision of essential ecosystem services identified by regional actors.

Track 2: Land-use management on a regional scale

Local governments between fiscal incentives and regional land-use planning ambitions

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Unsealed soil is a valuable but limited resource. Therefore, minimizing land loss caused by urban and infrastructure development is a major priority for European governments and globally. Local governments play a key role in implementing instruments of land thrift policies such as urban growth management plans. However, local growth ambitions often stand in the way of regional land thrift goals. These growth ambitions are thought to be caused by intermunicipal competition for tax revenues. Incentives from the fiscal system and their influence on municipal land-use plans have not been researched sufficiently. Adapting a neoinstitutionalist approach, qualitative research was performed on two case study areas with contrasting fiscal systems. Interviewed municipal planners had little knowledge of the fiscal consequences of different spatial developments and underlined that other interests than the generation of revenues shaped their municipality's land use policy. Many other factors than the incentives from the fiscal system determine the weighting of interests in municipal land use policies. Understanding context-specific barriers for the implementation of land-thrift policies can ultimately lead to more fitting and more effective land-thrift policies.

Keywords: Urban Growth Management, Land thrift, fiscal incentives, Germany, the Netherlands, local growth ambitions

Track 2: Land-use management on a regional scale

Using ecosystem services valuation for sustainable land use management – an integrated GIS-based assessment tool in the PROSPER-RO project

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In order to provide attractive conditions for business and quality of life, cities tend to grow steadily. This growth leads to an ever-increasing land consumption. The loss of (agricultural) landscapes usually affects the surrounding rural regions. At the same time, ecosystem services provided by these regions are crucial for the adjacent urban areas (e.g. provision of food, water, local recreation).

The aim of the research project PROSPER-RO is to develop tools for a sustainable and resource saving land use management in urban and rural areas, including a knowledge-based balance between socio-economic interests and the preservation of natural landscapes and their services. The assessment of ecosystem services such as provisioning services (e.g. food), regulating services (e.g. climate regulation) and cultural services (e.g. recreation) supports the integration of different perspectives.

In the first step, relevant ecosystem services in the study area have been identified and quantified based on indicators. In a second step, ecosystem services have been valued. This economical assessment relies on different methods, such as cost- and price-based approaches. Moreover, a discrete choice experiment is conducted for the valuation of cultural ecosystem services.

In a GIS-based approach, ecosystem services and their corresponding monetary values were related to different land use categories (which are typically used in urban and regional planning).

Exemplary fields of application contribute to SDG 11 “sustainable cities and communities”:

- low-impact site selection for housing areas
- compensation for natural habitats
- Identifying trade-offs between provisioning ecosystem services and regulating services or landscape aesthetics

The associated outcomes will enable planners to implement a holistic and transparent evaluation of land use changes based on environmental economics.

Track 2: Land-use management on a regional scale

Assessment of the effects of land use changes on river surcharge

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When planning new building areas, flood risk should be identified as early as possible so that appropriate measures can be taken early in subsequent planning phases. As part of the research project PROSPER-RO funded by the German Federal Ministry of Education and Research, a method for early detection of discharge peaks of sealed areas and river surcharge was developed.

On the basis of homogenized stream data (GIS files of stream lines and catchment areas), combined precipitation-runoff models and hydrodynamic stream models are set up in a first step, in order to simulate various flood load cases with defined return periods based on the current state of land use. In this way, peak runoff for different land use areas and flows for the river sections as well as cross profile capacities can be pre-processed and integrated into a GIS-based expert support system (GIS-ESS). By drawing or uploading new land use polygons to the GIS-ESS and specifying a certain level of soil sealing, a new peak runoff can be calculated using a simple runoff coefficient method. The additional runoff that would arise from the new building area can be determined and passed on to the nearest river section. This runoff is added to the pre-processed flows and routed through the river network. For each individual section of the stream, it is assessed whether the capacity is exceeded by the additional discharge. This enables a quick and reliable GIS-based query regarding river surcharge.

Track 2: Land-use management on a regional scale

Governance of land use: a systematic review of economic instruments

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Land is a limited resource that leads to conflicting uses such as agriculture, environmental protection, infrastructure, industry and housing. Thus, there is an urgent need for effective land management measures. In addition to long-established approaches in spatial planning, the scientific community examines management instruments from other disciplines. A promising approach is the application of economic instruments in the context of land use. Payment for Ecosystem Services is an established example of transferring economic instruments to land use. In addition to this approach, there are many other instruments such as tradeable planning permits that have so far only been applied selectively. In addition, the scientific discourse about economic instruments for land management is still fragmented and lacks a consolidation of previous research findings. To support an effective land management, an overview of suitable economic instruments is a reasonable next step. Yet, no systematic synthesis on empirical literature about economic instruments and their effectiveness in land use management exists. The purpose of this study is to address this research gap by conducting a systematic literature review, which reveals the strengths and weaknesses of specific economic instruments in land-use. We systematically reviewed 2603 peer-reviewed articles at the intersection of land use and economic instruments from 1933 to 2020. The study identifies a comprehensive range of economic instruments that are already empirically tested in the context of land use. By identifying clusters, the study reveals emerging trends and research gaps. Additionally, it identifies which economic instruments are found to be particularly effective in meeting specific demands of land use management.

Track 2: Land-use management on a regional scale

Potential bioenergy production from *Miscanthus x giganteus* in the Brandenburg region: producing bioenergy and improving soil properties while ensuring food security in the Berlin-Brandenburg area.

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Biomass is an important source of energy for the transition to renewable energies and climate change mitigation policies. *Miscanthus x giganteus* is a perennial crop characterized by its relatively high biomass production, low nutrient requirements, the ability for soil restoration (through soil organic carbon sequestration) and its cultivation potential on marginal land. The development of bioenergy in Brandenburg, with maize as the predominant crop, has recently drawn attention to its negative environmental impacts, competition with food production and uncertainties regarding its further development towards the state's bioenergy targets. This study aimed to estimate bioenergy production potential in Brandenburg by cultivating *Miscanthus* only on marginal land thereby avoiding competition with food production. We applied the Muenchenberg Soil Quality Rating (SQR) to identify the marginal land. By using IACS database (Integrated Administration and Control System) and geographic information system (GIS) we created maps of soil fertility, land-use cover maps, and map of maize fields for biogas production. We demonstrated that 53% of the current biogas maize production is occurring on productive agricultural lands in the region. Furthermore, with the assistance of the food self-sufficiency model Metropolitan Foodshed and Self-sufficiency Scenario (MFSS) (Zasada et al. 2019) we assessed the feasibility of the Brandenburg bioenergy goals under maize and *Miscanthus*. We estimated that by 2030 the Berlin-Brandenburg region would require 1,132,611 ha to achieve food self-sufficiency, hence there would be 389,690 ha land left for bioenergy production. Our results suggest that the region would require 568,627 ha of land of maize to achieve 58 PJ (energy share of the biomass of the 2030 bioenergy targets), which is 178,937 ha more than available area for bioenergy production. However, under *Miscanthus* plantation, the required area would be reduced by 2.4 times to 232000 ha. Therefore, *Miscanthus* could enable Brandenburg to meet its bioenergy targets by 2030, avoiding the trade-offs with food production, also providing a potential for SOC sequestration of 255200 tC/yr, which increases soil fertility and other ecosystem services (e.g. biodiversity), compared with bioenergy from maize. Therefore, allocation of productive soil for food and marginal land for bioenergy production under *Miscanthus* cultivation is expected to be a suitable solution to ensure food production in the Berlin-Brandenburg metropolitan area and meet the Brandenburg's bioenergy targets.

Track 3: Resilience and extreme events

The necessity to facing corruption for the creation of Sustainable Cities: The analysis of the damages caused due to the corruption in the COVID 19 pandemic in Brazil.

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The Habitat III conference discusses urban and city policies and points to the basis of planning in public management, which must be attentive to the needs of the population, as well as to sustainable urban and city development in such a way that they minimally affect the environment, at the same time of reducing demand for non-renewable resources and generation of pollution managed advance climate action, in addition to the environmental focus, social aspects need to be taken into account, such as the reduction of urban inequalities. Besides, some challenges need to crossover to achieve sustainable cities, as corrupt practices that generate a non-inclusive society, causing lacks in the essentials services such as basic sanitation, in addition to facilitating practices that are harmful to the environment, such as the payment of bribes to facilitate construction in the preservation area. In the COVID 19 pandemic, the harmfulness of corrupt practices became more evident with the diversion of resources that should be used to purchase hospital supplies and build hospital beds. Thus, this paper aims to study how acts of corruption can affect the achievement of cities development, especially concerning the needs of the population, showing examples mainly of the misuse of public funds in the health sector was affected Brazil in the pandemic of COVID 19. Data were collected from published files and reports. These finds support that we cannot discuss about sustainable cities without facing methods to fight corruption.

Keywords: Covid 19 Pandemic, Corruption, Sustainable Cities.

Track 3: Resilience and extreme events

What drives park revitalization in Czech cities? An empirical glimpse over the current practice

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Parks have long been part of cities with a significant impact on broad range of social sites. Whether they were built to satisfy the need of people to stay in touch with nature; to become places for people to meet; or simply just to make a city more attractive they evolved in order to keep up with evolving human needs and demands. The look of parks has changed during the centuries. In the context of extensive research in the field of perception of natural features by urban dwellers, the presence of adequate parks in a city gained its importance. The positive effect of urban greenery is being demonstrated in various ways, including, e.g., human health, both physical and psychological; feeling of safety, as the green and pleasant urban space generally contributes to the willingness to spend time outside and to deepen social relationships in the neighbourhood; or the urban economics with regard to, for example, value of surrounding buildings. Along with these arguments, we take in this paper a stance that the policymakers and stakeholders are the actors responsible for initiating and supporting the transition of inadequate urban greenery into the adequate one. The adequacy is based on local conditions. What today cities deal with, is the necessity to make parks and other urban greenery different - safe, inclusive, pleasant, healthy and most importantly, accessible. The paper introduces the examples of park revitalization in Czech cities that are members of the network of healthy cities. This membership leads the cities to commit themselves to improving every aspect of urban health. The aim of the paper is therefore to critically evaluate, whether the motivations for and paths of park revitalization meet the variegated character of urban health, including the broader societal aspects of accessibility, inclusiveness and justice.

Track 3: Resilience and extreme events

Water Resources and Storage Infrastructure to Meet Agricultural, Energy and Urban Needs in sub-Sahara Africa

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Majority of water storage has been driven by hydro power, with electricity tariff as the cash-cow that will bring sustainability. Deficient electricity supply across the continent means that the power sector will continue to invest in storage for the foreseeable future. The mining of industrial processing sectors are also significantly players and both hold significant prospects for private public partnership engagement in new investment.

The nature of the challenges of climate change means that the financing of new storage becomes a global public good. An adaptation measure by African communities placed at risk by external factors driven by high-carbon emitting nations beyond the continent. It is important that the countries with good dam sites potentials cater for other countries through benefit sharing, Those countries may lie within or beyond the river basin. Region integration over development outcomes will be the key if dams are to make their most effective contribution to sub Sahara Africa citizens.

The storage demand are large, critical investments in storage are feasible in the short and medium terms if they are focused into select areas that will yield high economic returns. The scale of the investment requirement in storage for hydro-power agriculture, municipal demands hazard management and climate change adaptation and the poverty reducing benefits would be demanding of a new Africa policy vehicle, particularly on financing an expansion of storage. This work aims to assess the benefits of integrating renewable energy technologies to satisfy the energy needs of a wastewater treatment facility based on a conventional activated sludge system, and also considers the case of including a membrane bioreactor so treated wastewater can be reused for irrigation. Overcoming Africa's energy access gap will require a paradigm shift from energy as a commodity to energy as an enabler of productive uses and services. In other words, energy access that can not only power households and service customers but drive local and national business, generate employment and deliver overall development. There is an urgent need to mobilize finance at scale to support nature-based solutions if we are to have any hope of responding effectively to the ongoing climate and biodiversity crises. The private sector has a key role to play, alongside scientists, civil society and governments.

Keywords : Water storage. Infrastructure. Energy . Sub-Sahara Africa

Track 3: Resilience and extreme events

Paradoxes and Challenges in Post-Earthquake Housing Reconstruction in Nepal

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In 2015, a massive earthquake of 7.8 and 7.4 magnitude struck Nepal. This resulted in adverse economic and infrastructure damage including many human casualties. The Government of Nepal has identified 625,000 houses as fully destroyed and 180,000 houses as partially damaged. A large-scale housing reconstruction programme is ongoing. This research is a comparative study of traditional-urban, peri-urban and remote rural settlement of Nepal which were severely hit by the earthquake. Following a case study method and using qualitative and quantitative methods, data is captured from earthquake affected households of the three types of settlements. Research provides an overview of interests and perceptions of local communities towards recovery process. Research shows that design and technology preference of people changed after earthquake. More people are opting to construct cement concrete houses departing from their vernacular architecture and construction technology. Vulnerability might increase for households which have more reliance on cement concrete construction without proper technical assistance. In addition, many houses that are reconstructed do not take into consideration the spatial and functional requirement of households. This might lead to unplanned expansion of the houses in near future causing increase in their vulnerability. Lack of financing is a major hindrance for reconstruction in all study areas. This research also identifies resilience in terms of basic service recovery like basic shelter, electricity, water supply, telecommunication, groceries and highlights existing challenges in housing recovery programs. It then proposes policy recommendations to bridge some of the challenges.

Track 3: Resilience and extreme events

Sustainability assessment of rural-urban partnership in wastewater-energy-food nexus. Transferable concept of German case to Indonesian case.

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Indonesia urgently needs to deal with the wastewater problem in big cities. Due to land scarcity, Bandung City built a wastewater treatment plant (WWTP) on its neighboring rural area, Bandung Regency. The operation started in 1992 through a government partnership. After more than a decade, protests arise from the rural inhabitants for not receiving any benefits from the WWTP operation. The novel concept from a German research study is transferable to solve the dispute in the Indonesian case due to its similarity. Within the context of wastewater-energy-food (WEF) nexus, the study proposes the use of wastewater from an urban area to produce and utilize organic fertilizers and bioenergy domestically. The process recovers valuable materials from waste products, thus closing the nutrient cycle between rural and urban areas. This paper aims to discuss the main features of a comprehensive sustainability assessment of the proposed rural-urban partnership, which addresses the needs to treat wastewater while providing benefits to the rural community in Bandung Regency, such as water for irrigation, fertilizer, and external energy supply. Sustainability assessment is a necessity for decision-makers to develop their solution in the partnership mechanism. This paper introduces the Integrative Concept of Sustainable Development (ICoS) as a methodology for assessing sustainability. The rules within ICoS are transformed into multidimensional indicators that equally treat the ecology, economy, and social issues. Using ICoS as the methodological background, the main characteristics of an indicator set for Bandung Regency will be presented. Hence, the decision-makers can address the conflict between sustainability aspects and formulate better policies.

Track 3: Resilience and extreme events

Making the City a Village? An Urban-Rural Comparison of Community Resilience in Times of Crises

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The coronavirus crisis fuels an urban scepticism that already existed before the pandemic and currently leads to a rediscovery of the resilience of rural structures. While the city as the focal point of global networking is suddenly experienced as threatening and vulnerable, the countryside is appreciated as a shelter of retreat. Rural life appears to be a place of communitarisation, and therefore seems to offer better capacities to cope with the inevitable global crises than the anonymous social structures of big cities. The state of research attests social cohesion a central role in building community resilience towards crises and disaster situations. Close social networks facilitate people's preparedness and awareness and enable them to localise assistance services more quickly and to seek direct help. Empirical studies show that the people affected by a crisis or disaster are not only willing to help themselves but also to help others. Based on a written-postal population survey and a "lost letter"-experiment in the German cities of Münster and Wuppertal and the small towns of Ostbevern and Breckerfeld, the BMBF research project "Resilience through social cohesion – The role of organisations (ResOrt)" examines the extent of social cohesion in an urban-rural comparison. Referring to the concept of community resilience, the project explores the relationship between the perceived social cohesion in the neighbourhood, the expectations for neighbourly help and the willingness to provide social support. The results show a positive correlation between the perceived social cohesion in the residential area and the expectation of neighbours to help each other in case of an event. In turn, the expectations for help has a positive influence on their own willingness to support in crisis situations. The poster illustrates the results of the study and highlights the coping capacities of social cohesion in both urban and rural communities.

Track 4: Regional circular economies

Burden of the Urban: Co-Producing Water and Gender in the Drinking and Domestic Water Realm in Periurban Hyderabad

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The neoliberal urban-centric growth process has created an expanding urban appetite for water resources to satiate its rapidly growing demands. Having exhausted options to further exploit the limited resources of a densely populated metropolitan urban core, the growing demands for water resources are often met through a plurality of modes of spatial transfers from the surrounding periurban areas. The physical and institutional processes set in motion as a result of these transfers interact intimately with the social milieu to produce various levels of resource burden and insecurity among the periurban populace, which becomes more critically evident in a lean resource period. The gendered relations with household water are manifested into unequal burdens of water scarcity borne by men and women within the household. Using mixed methods in four periurban villages in the Hyderabad Metropolitan Development Area, this paper attempts to understand the ways in which changing periurban water ecology co-produces gender interactions around household water collection and use, across associated intersectionalities along other axes of social inequality. The gendered outcomes of this co-production, both deviate and align to those observed in the rural hinterland, depending on the use of household water. However they continue to be, if at times deceptively so, markers of a deep patriarchal structure embedded within the rapidly deteriorating periurban hydro-ecology. These outcomes are mediated by the materialities of increasingly informalised and commodified household water sources acted upon by the evolving political and institutional milieu of the periurban space.

Track 4: Regional circular economies

Bioregional Governance Models for Circular Economy: a multi-stakeholder approach

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This poster attempts to answer the question: what is an enabling governance model for a thriving circular economy? As Korhonen, et al point out in their 2018 article, governance structures for circular economy (CE) do not yet exist at trans-national or global levels. Our thesis holds that the best models for governance that promote circular economies are based on bioregional thinking. Enabling governance for circular economies should be focused at the bioregional level because of the emphasis on multi stakeholder involvement, localized decision making, and democratic processes. A coalition of cities within a bioregion dedicated to making decisions toward CE along bioregional principles creates governance structures that form partnerships across municipal boundaries in favor of watersheds or land regions. These characteristics of bioregional planning and governance enable practices that cultivate trust between stakeholders: governments (at all levels), civil society, business, and citizenry. With a focus on bioregional governance, circular economy interventions can move beyond changes in company management or supply chains toward participatory processes that set priorities between different stakeholders, policies that encourage collaboration through common agendas at a bioregional level and between existing levels (municipal, national, etc.), and iterative processes for gathering stakeholder opinion and designing new policies. Our poster will present two concrete cases for how bioregional governance may be preferable. The first case examines policies that rethink concepts of waste to enable trans-boundary movement of outputs normally categorized as waste that can now be reused in other ways. The second case points out the benefits of social inclusion at a bioregional level, citing ways to get citizens engaged in supporting CE through sharing economy practices on a personal level, through support of businesses using a CE model, or through policy engagement.

Track 4: Regional circular economies

The Reuse of Building Components and Data Shortage

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The construction sector is emitting a large share of the global CO₂ emissions. Therefore, changes in this industry can have a significant impact on global greenhouse gas emission. Part of the research project WieBauin is to analyse if the reuse of specific building components can have a positive impact on CO₂ emissions and how the share of reused building components can be increased by the implementation of a specific business model.

Indicators such as CO₂ emissions or revenue help to measure those ecological and economical goals. Due to the variety of building components and other factors there is a considerable data shortage related to those indicators, e.g. the amount of existing building components in a predefined urban and rural area. WieBauin intends to solve this problem by combining different sources of information. Those sources of information are existing statistics, e.g. the statistic of demolition and ZENSUS 2011, governmental construction files and literature on component intensity coefficients. This approach allows us to calculate an approximation of the amount of existing building components in this area, which is the theoretical upper limit for reuse. This information further enables us to set this amount in proportion to the data on approximation of the building components that are released yearly. As a result, it is possible to calculate scenarios that are the basis for the business model generation.

Track 4: Regional circular economies

Food-Water-Energy Challenges in Rapidly Urbanizing Regions – a Focus on Rural-Urban Interlinkages

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The food-water-energy (FWE) nexus is receiving increasing attention in academia and politics. Especially urban-rural systems of the Global South face complex bundles of multiple nexus challenges that cannot be solved in isolation but require a clear understanding of the systems' functionality as a whole.

In a collaborative process with local stakeholders and decision-makers, as well as an in-depth study of the literature body, 17 major FWE nexus challenges have been identified for the case region of Pune, India. Among others, these encompass increasing regional water scarcity in rural areas and at the same time flood damage in the city, dysfunctional water and energy distribution between and within rural and urban areas, and the loss of agricultural land due to urban sprawl.

Our analysis shows that, like in many other rapidly urbanizing regions of the Global South, Pune's food-water-energy nexus is under pressure. Challenges are exacerbated by environmental (e.g. climate change, resource depletion), demographic (population growth, urbanization), economic (growing economy, increasing inequality) and socio-cultural (changes in lifestyles and cultural norms) Driving Forces.

We translated both FWE challenges and their driving forces into components of a coupled human-geophysical simulation model. These components are (1) exogenous (e.g. climate change) and (2) endogenous (e.g. policy interventions) model inputs, (3) model mechanics (e.g. feedbacks between modules) and (4) output metrics.

This process allows us to run scenario-based simulations of long-term future development trajectories tailored to the specific context and to the requirements of the local stakeholders and decision-makers. The results from these simulations will enable them to anticipate potential impacts of changing conditions and different interventions on the entire nexus system in both urban and rural areas, thus fostering the integrated perspective required for tackling future challenges.

Track 4: Regional circular economies

True cost accounting of organic and conventional foodstuff: Does LCA sufficiently evaluate agricultural sustainability?

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As industrial agricultural activities are one of the biggest polluters globally, the reduction of environmental impact caused by this sector is of utmost importance. Encouraging a shift in consumers' demand patterns towards more sustainable dietary choices is one auspicious approach to promote a more sustainable food supply. Consumers are currently misled towards demand of inadequately priced foodstuff by an insufficient internalization of external costs. These market distortions are followed by a loss in welfare, as well as detriments for ecosystems and human health alike. Therefore, we introduce an interdisciplinary framework that evaluates ecological economically, according to the polluter-pays principle: We model the Life Cycle Inventory of various foodstuff of plant and animal origin in SimaPro 9 using i.a. Agri-footprint 4.0 database. A meta-analysis is then conducted to quantitatively model the differences in production between conventional and organic farming practices from cradle to farmgate. Using the ReCiPe 2016 method for Life Cycle Impact Assessment, midpoint and endpoint level results are then linked with cost factors to adjust food prices regarding their vast array of unaccounted impacts. Lastly, the calculated external costs are put into relation with the foods' current prices resulting in necessary surcharge of each examined product. While results emphasize scientific consensus of the significant environmental burdens caused especially by animal production, they are not quite as clear regarding the differences of organic and conventional agriculture: Especially the lower yield of organic production narrows the alleged benefits of the same. We therefore discuss the limitations of the LCA methodology in depicting all relevant impacts of agricultural production and consider possible ways to broaden the scope of the assessment (e.g. by including ecosystem services).

Track 4: Regional circular economies

Is it possible to generate economic, ecological and social scaling effects through novel cooperation and pooling models involving urban-rural partnerships?

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Regional agriculture and food supply have been traditionally bound between town and country. However, due to the ongoing globalisation of agricultural and food systems, they are increasingly decoupled. The reconnection of food production to urban areas owns potential for a more sustainable regional agro-food system but many approaches, business models and governance strategies currently developed remain in niches. To be able to scale their efficiency and scope, there is a need for cooperation and pooling models for the joint use of urban and rural resources and for the collective use of production means, services, land, markets, capital, knowledge or network structures.

We introduce the theoretical background, objective and research design of the transdisciplinary project KOPOS, aiming at advancing the conceptual development, the exemplary implementation and the evaluation of such cooperation and pooling models. The exemplary implementation involves the creation and scientific support of so-called “pilot projects”.

KOPOS investigates in two German regions and in two fields of action: (1) In the Berlin-Brandenburg region KOPOS addresses the issue of “land access” for a regional, sustainable agricultural use. (2) in Freiburg i.Br. the project deals with the establishment of short value chains and their municipal design options. In addition, the aim is to initiate regional learning processes as well as knowledge transfer to other regions.

The “pilot projects”, cooperations, as well as transfer and learning processes are designed to supporting civil society and economic actors in optimizing strategies and implementing them within regional transformation processes. For local and regional actors in politics and administration, the participatory methods, strategies, good practices and indicators can be used for establishing integrated urban-regional cooperation and governance approaches as well as benchmarking and monitoring systems.

Track 4: Regional circular economies

Analysis of the circular economy in Rostock and the surrounding communes.

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Within the framework of the project “Prospective synergistic planning of development options in regiopolis for the example of the agglomeration area of Rostock” (Prosper-Ro) funded by the Federal ministry of Education and Research (BMBF) one of the major part relies on the circular economy. The main goal is the analysis of the flows of recyclable and non-recyclable materials in Rostock and its surrounding area. The aim of the work was to evaluate the reachability as well as the user satisfaction of the recycling sites.

Recycling yards are institutions for waste delivery by the citizen. These recycling sites are in focus on making a contribution of transforming the linear economy to a circular economy.

In cooperation between the University of Rostock, the faculty of Agriculture and Environmental Sciences, Professorship for Geodesy and Geoinformatic, a survey was conducted with the title “Recycling yard of the future” on the recycling yards in Rostock as well as a GIS-based situation analysis of the recycling yards in Rostock and in the surrounding area of Rostock.

Existing digital plans from the city of Rostock as well as local measurements were used to record the size of the different buildings, storages and containers at recycling yards. For the transport infrastructure a manually corrected dataset from OpenStreetMap (OSM) was used as a database. The calculation of the population density is based on the official population in combination with the actually populated area.

The results of the analysis show, that the accessibility of the recycling can be rated as "very good". For ~ 98 % of the population in the city area of Rostock the recycling yards can be reached within 15 minutes. In the communities of the district of Rostock this applies to ~ 71 % of the population. The results are very promising and showing the power of an in depth GIS analysis in combination with a local survey to evaluate the current situation in Rostock and its surrounding communes.

Track 5: Digitalization in cities and villages

Modelling land use change in a dynamic region based on open source GI stack

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Urban growth is causing serious problems worldwide: This includes not only environmental problems but also a loss of agriculture on most fertile soils. The thriving metropolitan region of Cologne, Germany is an example for that. The region is also well known as one of the most productive agricultural regions in Central Europe. The expected population growth of around 150.000 inhabitants in the next 20 years is likely to increase current problems by further replacing fertile agricultural land and by leading to an increased fragmentation with negative environmental effects. To identify more sustainable pathways for the regional development we model the allocation of new housing areas. Therefore, we develop a toolchain building on a free software stack including postgresql/postgis, python with the scik-learn, pandas and numpy packages and QGIS. The allocation model for new housing areas is currently based on random forest classifier that has been trained on the official governmental ATKIS vector dataset that describes land use. The following predictors include: distance to public transport and social infrastructure as well as existing land use development plans. The allocation of new housing areas has been limited to areas that are not inside protected areas. Furthermore, only a few land use classes – mainly agriculture – are allowed for the allocation of new housing areas. The distance-based predictors have been calculated based on the openrouteservice. A 100 by 100m vector grid has been used for model training and prediction. The random forest classifier has when be used to allocated the demand for projected new housing areas. We used two different scenarios based on different building density thresholds. The modeled scenarios will be evaluated with a set of indicators. These indicators include environmental, agricultural and social aspects. It is intended to wrap the model in a QGIS plugin to make it easily available for land use planning.

Track 5: Digitalization in cities and villages

Algorithmized Generation of a Digital Stream Network and Catchment Dataset for the Urban and Suburban Area of Rostock

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Digital stream network and catchment datasets are the basis of land-use management, which are available in Germany and provided by the authority. Nevertheless, for sustainable and resilient land-use management in urban-rural areas, especially in metropolitan regions where intensive land-use and changes take place, such datasets need to be further developed with detailed and up-to-date information from various sources.

Within the project PROSPER-RO (Prospective synergistic planning of development options in regiopolies using the example of the city-surrounding area of Rostock), an algorithm has been developed using ArcGIS and Python to generate a digital stream network and catchment dataset for the urban and suburban area of Rostock.

Firstly, stream geometries are homogenized from different sources, topologically corrected and separated at confluences.

Secondly, catchments are generated for each segment using a modified Digital Elevation Model (generation and calculation of their cumulative areas).

Thirdly, stream hierarchy is determined. Main streams are identified with reference data from the authority. Hierarchy of parallel streams that are not included in the reference data is defined according to their waterbody names (if given) or their cumulative watershed areas. After main streams and their tributaries are ordered, tributaries are reckoned as primary flows and their inflowing branches are searched similarly. The algorithm runs recursively until all streams are ordered.

Fourthly, stream segments and their catchments are numbered based on the above-determined orders and the reference data.

Lastly, a dataset of pipe and culverts is snapped to the stream network, after which routes are generated.

The results of this algorithm are an ordered stream network, which integrates pipe and culverts, as well as numbered catchment geometries. This routine can be applied to other regions to prepare stream network and catchment datasets efficiently and systematically.

Track 5: Digitalization in cities and villages

Harit Ticker: Digitalization to close the urban-rural nutrient and carbon cycle

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The Urban-Rural Nutrient and Carbon Cycle (URNCC) initiative by ProSoil, a project implemented by NABARD, GIZ and State of Maharashtra in India, works on innovations and models for the urban-rural nexus. Presently around 50,000 metric tons of compost are being produced in 384 urban locations and made available to farmers through various farmer collectives, farmers, ULBs and fertilizer distribution networks. It is estimated that the production potential of compost and demand in agriculture sector presents an opportunity to generate businesses of around 20 million euro every year. There are over 10 million farmers, 384 Urban Local Bodies (ULBs) and more than 1000 FPOs in the state of Maharashtra involved in this business. There were many challenges in ensuring supply and demand, transparency and effective monitoring as it involves multiple players to handle for decision makers. To increase the efficiency and transparency of the circularity process blockchain based digital marketplace HARIT Ticker (mobile phone and web based application) is developed. HARIT Ticker on one hand provides the platform to ULBs to register themselves as compost producers/suppliers and on the other hand ensures access to compost for farmer collaboratives, individual farmers and entrepreneurs. Harit ticker is based on Blockchain technology it ensures transactional efficiency and transparency in terms of production, quality, sale, stocks and its usage at end users. The department, by means of budgetary allocations, provides incentives to ULBs for quality production and supply of compost to farmers through Harit Ticker. Based on the needs the plan is to further refine and develop the HARIT Ticker, to integrate the incentive flow to ULBs and also to use it for other administrative functions. Considering the dynamics of players involved monitoring of city compost supply chain became difficult for decision in absence of Harit ticker as it provides real time information and ground for quick interventions to promote the demand and supply of city compost.