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Central European space is facing multiple challenges. Dominant part of them are joint challenges with the other parts of Europe and World resulting from global processes e.g. climate change, urbanisation, societal transformation towards civil society, development of knowledge based economy or migration. In addition, the specific historical societal and geographical preconditions derive specific challenges, threats and problems. The broad scale of the problems in the spatial development in central European space is a big challenge for spatial planning practice, theory and education. New tasks and new frameworks, brought by current development of the transformation of society and economy, require the implementation of new approaches, methods and instruments, in some cases not only new but very specific as well, in the spatial development management, new understanding of the role of planning. Those challenges are addressed by current research under broad participation of young generation of researchers in spatial planning, who present their papers in this issue of TERRA SPECTRA.

The effort of presented research work is to contribute towards integrated approaches to sustainable development and the processes of economic, social and cultural transformation. The interdisciplinary research on current problems and challenges is integrated part of the education and training of young researchers emphasizing the integration of landscape-ecological, economic, social and technological aspects.

Research and its outputs in the form of the proposals focused on optimising the spatial structures contribute to the sustainable spatial development, to balancing negative effects of regional disparities and at the same time to preserving cultural and ecological diversity, to improving the quality of life and to strengthening of social cohesion in Europe.

Trans-disciplinarily based research projects under participation of young researchers, primarily TRANSGREEN project of the Danube Transnational Programme, the outputs of which are represented in this issue, have been focused on creative research work starting from the issues of complex planning of sustainable spatial development in functional urban areas (FUA) and ending with the focus on specific problems of a region lagging behind in Slovakia and on efficient use of the EU structural funds.

I believe that the papers will find respond among academic society in the field of spatial planning not only in the CEE countries and bring impulses not only for research but and for societal practice as well.

Maroš Finka



Micaela Scacchi¹

“CHINA: FROM ECO-CITIES TO ECO-REGIONS THROUGH ECOSYSTEM SERVICES

Abstract:

Today, in the global context, “the City” are the epicentre of the reorganization of economic, social and cultural dynamics, as well as the organization of space and time.

In particular, in Countries with a strong growth economy, like China, “urban space” has become a crucial place for overall societal transformation, for developing and disseminating innovations - the places where mobility, flows, networking and all their dynamic interactions take shape in a concentrated and complex fashion. Contemporary City is a point of intersection of the local and global, between the natural and the man-made; it is the space where intersections between new urban economy, new urban ecology and new urban society create synergies. So, rethinking the City and its government and its transformation, focusing on among new urban economies and urban ecosystems seems crucial in catalysing transition to a new form of urban socio-ecosystems resilient in the face of global and local crises.

This article is about the Chinese urban development and a more holistic approach with the use of nature-based solutions to address urban challenges and climate change adaptation/mitigation.

Key words:

Environment and Sustainable Urbanization; Urban Ecosystem Management; Nature-based solutions and Resilience

Introduction

The search for an “Ideal City” recurs in all cultures, but while stimulating new reasoning, definitions, models, it can remain a good intention if not supported by political decisions, social sharing and spatial transformations.

Today, the main challenge of the upcoming decades is to handle a series of challenges: economic (growing global competition); environmental (less renewable energy sources, more carbon produced); demographic (ageing, migration); socio-spatial (migration with growing inclusion problems, growing inequalities within society).

More than one half of the world population lives now in urban areas, and virtually all Countries of the world are becoming increasingly urbanized, but contemporary urban boundaries are transformed. The city spreads over the territory, it expands, yes disseminates. The diffusion of the city manifests itself in a sort of “urbanized continuum” and in the densification around some nodes. There is a “specialization” of areas in the territory (trade, leisure, health, culture, residential): the territory becomes multipolar. These characteristics require ideas but also innovative capacity for new territorial integration. One of the main tasks of contemporary urban areas concerns the development “based on integrated complex infrastructure eco-systems to ensure comfort and healthy environment to their residents” (Moustafa Saada M. et al., 2017).

As for the People's Republic of China, it is undergoing the largest scale urbanization in history and new, bigger and complex cities and conurbations are being built.

Strongly influenced by national land use policy and the history of urbanization after 1949, China's urban ecology has gone through three main development periods: the emergent period (1983–1989); the early growth period (1990–1999), and the rapid development period (2000–present).

After more than 5000 years of being predominantly agrarian, China is now urban, and will become only more urban in the future. This continued rapid urbanization has inevitably brought severe pressure on resource conservation and environmental protection in territorial eco-systems. China, therefore, has become a living laboratory for studying urbanization, and Chinese urban ecology seems poised to make strides in the coming decades.

Mega-urban agglomerations play a vital role in both national economic development strategies and new-type urbanization. However, they suffer a series of environmental problems in the process of development. If since 1971, with China's participation in UNESCO's Man and Biosphere Program (MAB), the Chinese government has recognized the importance of Sustainable Development, then it began a “gradual interdisciplinary research on urban ecosystems” (Jehpsson, 2014) with a constant presence of these issues on the political Agenda (Fengrui et al., 2009).

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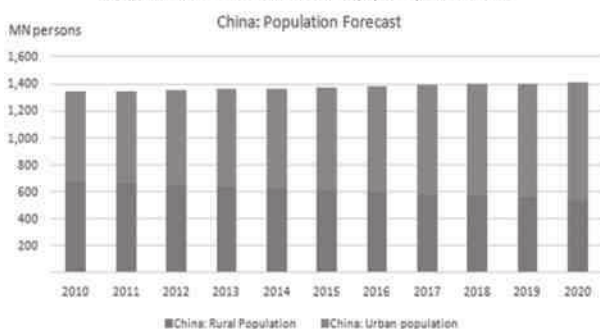
From an ideal definition of some models of urban development, promoted as prototypes, exemplars for a “harmonious development”, the constant transformation of Chinese urban areas is increasingly growing linked to economic and technological development and to great social changes. It, indeed, has led to this interest that is having direct repercussions on the realization of new urban expansions. Since the early 2000s the research has been oriented, to do this, to focus on the configuration of “sustainable development hypotheses” applied to cities (Girardet, 2005).

Among the UN Sustainable Development Goals (SDGs), one wonders about how to achieve a transition to sustainable cities, with a focus on cohesion, inequality, diversity, well-being and specific cultural heritages? Which solutions to adopt to offer the systemic and scientific decision making for sustainable development of urban agglomerations?

The European Union is positively involved and active in promoting new urban economies and best practices to identify innovative eco-solutions and to promote projects of urban regeneration. The triple helix (3H) of university - industry - government relations has become one of the most popular innovation models in the last two decades. “The helix (DNA) is used as an image to illustrate a complex network of relationships rather than three connections arrived at by placing the three sectors in a triangle” (URBACT II, 2015). Sharing this knowledge, States like China have seen organising and optimising their “helices” as a priority, rethinking their policies and strategies to improve sustainability and integration in many cities (megacities) and regions. Chinese professionals and scholars have promoted “a holistic, use-inspired, transdisciplinary philosophy for studying and managing urban systems, which has unique Chinese characteristics” (Jianguo Wu et al, 2014).

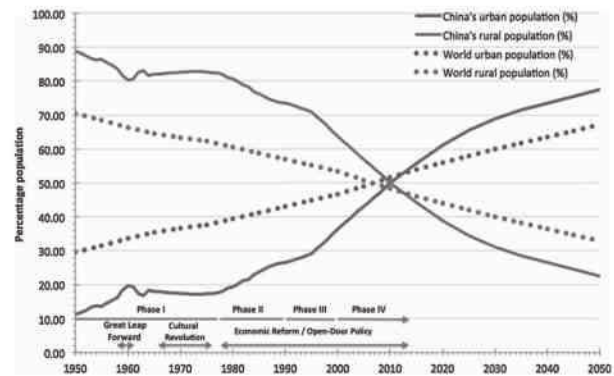
The following charts represent the Chinese population forecast and temporal dynamics of the urbanization levels (urban population) for China and the World. In the second, the data for China between 1950 and 2010 compiled from the 2012 and previous versions of China Population and Employment Statistics Yearbook, published by the National Bureau of Statistics of China (<http://www.stats.gov.cn/>) and the rest of the data all from <http://esa.un.org/unpd/wup/>.

Graph 1. CEIC China Discovery (CCD)'s forecast



(source: <https://www.ceicdata.com/en>)

Graph 2. Temporal dynamics of the urbanization levels for China and the world



(source: Jianguo Wu et al, 2014)

From an “Eco-desire Idea” to a concept of “Smartness”

Recognizing that China is one of the countries that are highly vulnerable to the impacts of local and global climate change and that these resource, environmental and health challenges are intrinsically linked to the construction and operation of cities, new city development concepts have entered policy and planning and the “Eco-City concept” has been gradually translated into practical initiatives. The main aim had been to try to create the union between prosperity and green economy, eco-sustainability and energy self-sufficiency.

The so-called “Chinese eco-desire” was based on three closely related factors: technocratic trust in engineering; reliance on authoritarian political structures to facilitate environmental progress; “ecological harmony between man and nature” conceptual idea (Sze J., 2015). This led to the search for a “new urban dimension” declined through the combination of imagination, design, ecology, technology and politics, but without a real integration with the context. Therefore, the illusion of rapid urbanization has led to the “failure” of a lot of these projects: many cities built in China remained empty, ghost towns, denouncing the disaster of a governmental plan of wrong development.

The contradictions and excessive rates of development, the large pollution indexes, the extensive socio-economic disparities and widespread political and entrepreneurial corruption have led to the failure of the utopia of an ideal model, such as Dongtan City on Chongming Island in eastern China (Shanghai), which was sponsored as “the First Great Ecological City in the World”. A few years ago I wrote an article on this Chinese eco-city idea, in utopian part, promoted as urban model at the World Exposition 2010 Shanghai China. Dongtan in Shanghai was to be a model for the world, but after lots of “great expectations”, the results to date mean little has happened, nothing has been built, apart from some buildings in progress and a giant bridge linking the island to Shanghai.



This allowed however to reconsider the initial idea, to change the political strategies and to develop a “smarter” urban ecosystem management and to propose contemporary projects addressed on nature-based solutions and urban resilience. The public “eco-desires” today can no longer be just a utopian fantasy, but it is necessary to define it as an essential operative approach for the future of the world ecosystem.

The Chinese government, therefore, has recently been increasingly moving towards urban policies and planning that are no longer oriented towards “quantity” but to “quality”. The innovation and “competitiveness” of contemporary cities is not only being measured in terms of competitive economic and built environment outcomes, but rather to be evaluated in terms of social benefits and costs and their distribution among citizens. For this reason in the latest years, China is been inclined to consider the importance of a more sustainable development, which reflects models to increase urban climate change adaptive capacity and the principles of a urban circular economy development. Therefore new standards are proposed on energy efficiency, conservation of natural resources and the environment, scientific and social innovation in the revitalization and development of urban conurbations and regional-metropolitan areas. Innovation, as it is understood “is a social and territorial construction, whose production and effects depend on local and global socio-economic contexts that are conflict ridden and hierarchical. From this perspective, the territory mediates and structures arrangements of production actors, organizations and decision makers, thus allowing for the emergence of specific innovation cultures but that are not isolated from nor independent of more global contexts” (EaSI, 2013).

The “13th Five-Year Plan” for economic and social development of the People’s Republic of China (2016-2020) focuses heavily on new urbanization to develop “harmonious and pleasant cities”; to promote coordinated urban and rural integrated development and to implement the master strategy for regional development; to have a vision of new eco-society of XXI Century. [<http://en.ndrc.gov.cn/policyrelease/201612/P02016120764576696662.pdf>]

Two are the main topics on which the today’s Chinese urban development must be focused: on the one hand the integration of the economic-technological development with the safeguard of the environment and natural resources; from the other the direction towards new models of urban life and social innovation. In the recent years, along with a broader concept of developing a “resource-conserving and environmentally friendly society”, China has initiated policies, strategies and pilot projects at both national and local levels to address this challenge (Wu Deng, 2017).

The Country mentioned in its suggested 13th five-year plan the target of doubling the country’s GDP in 2020 compared to 2010. Urbanization is one of the economic engines to maintain the country’s high to medium

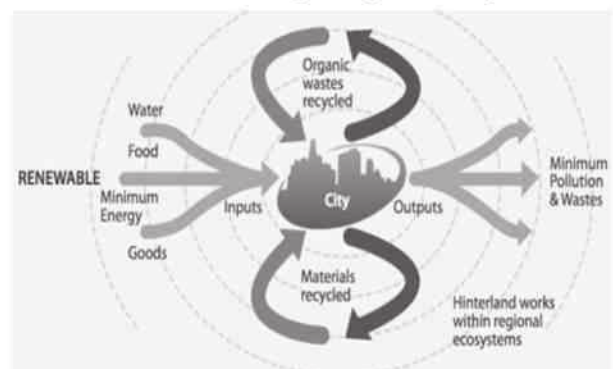
economic growth and China has already started a new-style urbanization plan in 2014. The term “new-style” refers to the urbanization plan that would not degrade residents’ living quality, the region’s agricultural development and ecological environment (CEIC Data, 2015).

The Chinese political structure and its “top-down and large-scale approach” can bring about these radical changes, but will it succeed in sustaining them for the long term? Perhaps moving from an “eco-desire idea” to a concept of “smartness”, through the identification of alternative urban ecosystem solutions and the inclusion of social and institutional innovations can lead to the satisfaction of the needs of all citizens, entrepreneurs and other stakeholders.

Eco-regions and Nature-based solutions

The best way to overcome the challenge of restoration and rehabilitation of urban ecosystems is to address the complex transformation of social-ecological systems of cities and regions (core cities, their agglomerations and their functional areas). Technically Ecoregions are geographical units with characteristic flora, fauna and ecosystems. Political divisions of countries do not respect ecological processes, so it is very important to develop an eco-regional approach and policies that include appropriate spatial scales and that consider environmental dynamics. Contemporary city is an unsustainable ecosystem: it dissipates energy, wastes resources and produces waste and socio-economic conflicts. It is necessary to intervene, making a “circular city”. The approach to follow is the implementation of nature-based solutions for creating a resourceful circular city. Circular metabolism cities reduce consumption and pollution, recycle and maximize renewables (Girardet H., 2013).

Picture3. Visualising the Regenerative City



(source: Girardet H., 2013)

In order to tackle challenges, it is necessary to promote healthy urban living environment through a holistic and systemic sustainable approach that combines local climate regulation; noise reduction; recreation and cleaner air; multi-functional areas; green infrastructure.



Nature-based solutions (NbS) are multi-functional and they can be applied in different urban strategies. They are defined as “actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits” (International Union for Conservation of Nature, 2016).

These innovative solutions are designed to bring more nature and natural features and processes to cities and landscapes. They, also, support economic growth, create job and enhance our well-being.

Picture4. Conceptual framework on Nature-based Solutions as an umbrella term for ecosystem-related approaches



(IUCN: International Union for Conservation of Nature)

Below is a selection useful for the relationship between the environment and the human pressure, to prevent and mitigate some urbanization problems:

- **Natural Resources:** safeguard, protection, management of biodiversity, forests and agro-ecosystems and also marine and freshwater systems very important is also the prevention of erosion and maintenance of soil fertility, essential for plant growth and agriculture and well-functioning ecosystems supply.
- **Climate Changes:** mitigation of climate changes and local climate conditions; regulation of urban temperatures; removal of air and noise pollution and regulation of air quality through the use of “green, natural elements” (green space; urban gardens; urban forest; green roof; green walls,

vertical gardens ...) and water recycling and reuse.

- **Moderation of Extreme Events:** ecosystems and living organisms create buffers against natural disasters (floods, storms, tsunamis, avalanches and landslides), thereby preventing possible damage.
- **Implementation of Cultural Services:** important role of green spaces for the recreation and mental and physical health, the development of relationships and the increase in tourism.
- **Sustainable Urban Planning and Design:** importance of integrated land-use and ecological transport planning; discovering and incentivize different building materials and new technologies; climate and energy neutral construction; efficient water management and green areas for pleasant and healthy urban living.
- **Extend the concept of Eco-City to Eco-Region:** development of effective policies to reduce soil consumption and to aim a low-impact development model.

An intelligent economic and cultural growth of the city, that also develops new solutions and new spatial shapes, can be pursued considering a new ecosystem approach to the protection of natural resources and to a sustainable transformation of the human settlements.

In general, the objectives of ecosystem recovery, pursued through innovation services and eco-solutions, aid the development of society and to safeguard human well-being according to environmental, cultural and social heritages. In specific, to explore the potential of ecosystem services, it is necessary to describe a range of valuation approaches (cultural values, health benefits, economic costs and resilience) and then to develop urban planning and territorial governance practices.

Conclusion

The massive urban expansion has resulted in significant natural habitat loss in some areas in China. This raises serious concerns about biodiversity and climate change phenomena. Effective policies, regulations and sustainable projects must be implemented and enforced to sustain regional and national development in the protection of the natural and man-made environment. Nature-based solutions can definitely change urban landscapes and provide different benefits both for city governments and for residents. Through a regional ecosystem approach it is possible to overcome the gap between rural and urban planning in China.

Yet there is still work to be done to facilitate wider implementation.



In addition to the directives from the central government, local governments also have an important role to play in building collaboration among stakeholders to ensure ecosystem services and nature-based solutions become part of planning and policy across sectors.

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Dagmar Petříková

LUMAT PROJECT MEETING AND PROJECT STEERING COMMITTEE IN LJUBLJANA, SLOVENIA 24-25.05.2018
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