# Synthesis Report
# COMPETING FOR URBAN LAND

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URBAN-NEXUS

SEVENTH FRAMEWORK
PROGRAMME

# Content

# 1. About this Report

This is the third in a series of synthesis reports produced by URBAN-NEXUS. These Reports are intended mainly for municipalities, policy-makers and businesses engaged in urban issues. They may also be of interest to organisations, institutions and networks involved in decision-making and developing partnerships to tackle problems encountered in urban sustainable development and management. This includes public sector agencies, utilities, the private sector, civil society organisations and community groups.

## 1.1 Purpose of the report

The synthesis reports will help inform debate and discussion as part of an on-going "structured dialogue" across a network of urban researchers, professionals and actors on developing integrated approaches to the challenges and opportunities of sustainable urban development. The main forum for supporting a rich exchange and learning environment will be a series of "dialogue cafés" held in different European cities during the course of the project. These will encourage participants to identify and prioritise common issues and develop partnerships to help promote and deliver innovative, effective and integrated responses to improving urban sustainability.

Each Synthesis Report will address a different theme. The theme for this report is COMPETING FOR URBAN LAND. It is intended to stimulate discussions at the third URBAN-NEXUS dialogue café that will be held 10th-11th April 2013 in Göteborg, Sweden. The discussions will form a follow-up report due late summer, 2013, which will feed into subsequent thematic synthesis reports on urban data and monitoring and integrated urban planning and management. This will engender an evolving dialogue and foster integrated approaches to urban

sustainability that become intrinsic to decision-making processes and partnership activity.

The first Synthesis Report on URBAN CLIMATE RESILIENCE was presented and discussed in Glasgow, in May 2012, during URBAN-NEXUS' first dialogue café. The second Synthesis Report on HEALTH AND QUALITY OF LIFE was presented and discussed in Barcelona, in October 2012 at the second URBAN-NEXUS dialogue café. Outcomes and results can be consulted at www.urban-nexus.eu/

## 1.2 Report preparation

Land use was identified as a priority research area as part of the work undertaken by the EU predecessor research project, URBAN-NET, in developing a strategic research framework for sustainable urban development. The URBAN-NET study was based on partners' collective knowledge and evidence pooled from across Europe as part of a comparative assessment of national and regional research programmes.

The current report considers research, mainly European and undertaken in the four years since the URBAN-NET Framework was published. It also considers evidence from cities, towns and partnerships of practical interventions and strategies adopted to deal with urban land use and the competition for land that goes on in cities. This information was collected from the URBAN-NEXUS consortium, the strategic partners and a wider network of contacts. Examples of case studies and research are presented throughout the report to illustrate relevant sections. A complete list and summary details of all of the information provided is available as an annex to this report.

## 1.3 Concurrent reports and initiatives

Cities are gaining more and more policy attention at European level. A rapidly growing majority of

Europeans live in urban areas of different sizes. And the division of rural and urban is deepening, as is the division between growing and shrinking cities. Cities, as motors of job creation, innovation and growth, play a key role in implementing the Lisbon Strategy and the Europe 2020 agenda. At the same time, the EU Territorial Agenda, Leipzig Charter and Toledo Declaration highlight the important link to urban development in the context of achieving territorial cohesion.

The urban dimension plays an important role in the tasks of the European Commission through in particular the various European Regional Development Funds with the goal to strengthening economic, social and territorial cohesion. The Community Strategic Guidelines on cohesion specifies several possible actions with a focus on urban areas. Moreover, several European strategies and documents have been released recently explicitly focusing on urban areas:

- the Thematic Strategy on the Urban Environment,

- the Communication on Cohesion Policy and Cities,

- the Green Paper on Urban Mobility.

The Commission promotes and financially supports sustainable urban development (with projects like URBAN II, Interreg III, ESPON, Urbact and INTERACT), but there is a lack of a system to monitor the social, economic, environmental and territorial impacts of urban development in an integrated manner.

The recent change of name of DG Regio to Directorate General for Regional and Urban Policies reveals the importance of many considerations addressed in this report.

Also the European countries are putting more emphasize on urban development. One example is the Joint Programming Initiative Urban Europe which main aim is to coordinate research and make better use of Europe's public funds in order to:

- Transform urban areas to centres of innovation and technology

- Realise eco-friendly and intelligent intra- and interurban transport and logistics systems

- Ensure social cohesion and integration

- Reduce the ecological footprint and enhance climate neutrality

With the above in mind, this report focuses more specifically on European research rather than policy and implementation.

## 1.4 Questions for the dialogue café

In preparation for the URBAN-NEXUS dialogue café on 'Competing for Urban Land: Partnership Approaches', being held 10th and 11th April in Göteborg, Sweden we would like participants to consider the following questions:

- Does the report cover the theme appropriately? What is missing and what should be covered in more depth?

- With which of the key messages do you agree/disagree?

- What do you find most encouraging or interesting in the report?

- What do you find most challenging in the report?

## 1.5 Acknowledgements

## 2. Use of Terms

For ease of reading, the terms "urban", "urban agglomerations" and "city" are used interchangeably throughout this document and no specific distinction is drawn between either term with regard to distinct morphologies or administrative boundaries.

Accessibility: A general term used to describe the degree to which a product, device, service or environment is available to people. The physical accessibility to a space or service is one of its components and the one used in this document. Note that there is a difference between accessibility and access, where the former denotes a potential and the latter refers to an actual and realized access.

Biodiversity: The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part. This includes diversity within species, between species and of ecosystems (UN Convention on Biological Diversity).

Brownfields: Land previously used for industrial or commercial purposes that may be contaminated by concentrations of hazardous waste or pollution but has the potential to be reused once such pollution is cleaned up.

Commons: Traditionally defined as elements of the environment – forests, atmosphere, rivers, fisheries or grazing land – that were shared, used and enjoyed, but also looked after and cared for by all. Today, the commons are also understood in a cultural context and then also include literature, music, arts, design, film, video, television, radio, information, software and sites of heritage. The commons can also be seen to include public goods, such as public space, public education, health and the infrastructure that allows our society to

function (such as electricity or water delivery systems).

Common good: The sum of those conditions of social life which provide social groups and individuals with the means for self-fulfilment. This is a matter of making the social systems, institutions and environments, on which we all depend, function to the benefit of all people. Common goods include accessible and affordable public health care systems, effective systems of public safety and security, peace among the nations of the world, just legal and political systems, unpolluted natural environments, and flourishing economic systems.

Compact cities: Cities with higher densities to promote better accessibility, lower infrastructure cost, more efficient use of urban services, preserved land resources, lower cost of economic transactions, and social integration.

Connectivity: Street connectivity refers to the density of connections in a street network and the directness and efficiency of these links. A well-connected street network has many short links, numerous intersections, and minimal cul-de-sacs. Trouble-free connections between different means of transport within the modal split, for example changing from bus to train to bike is also important. As connectivity is strengthened, route options and potential travel modes increase whereas travel distances decrease – all in all creating more accessible and resilient transport systems.

Ecosystem: A community of living organisms (plants, animals and microbes) in conjunction with the non-living components of their environment (such as air, water and mineral soil) interacting as a system. All these elements are linked together through nutrient cycles and energy flows. Ecosystems can come in any size but usually encompass specific, limited spaces.

Ecosystem services: All the goods and services that natural and human-modified systems supply to people and communities, and on which societal welfare and economic development directly depend (drawn from the Millennium Ecosystem Assessment).

Globalisation: The worldwide movement toward economic, financial, trade, and communications integration. Globalisation implies the opening of local and nationalistic perspectives towards a broader understanding of a world that is interconnected and interdependent, with free transfer of capital, goods and services across national frontiers. (www.businessdictionary.com)

Green-blue infrastructure: Interconnected networks of land and water that support species, maintain ecological processes, sustain air and water resources, and contribute to the health and quality of life for communities and people. However, urban green-blue infrastructures are not simply natural and freely produced services that benefit urban residents. There are also significant costs associated to designing, creating and managing such urban ecosystems.

Grey infrastructure: Termed "grey" in contrast to the "green-blue" systems described above, such infrastructure include

socio-technical systems for communication (roads, rail, ICT), food distribution, retail, waste and water management, and energy provision.

Informal settlements: Often refer to unplanned squatter areas that lack street grids and basic infrastructure, with precarious shacks erected on unsanctioned subdivisions of land or without the consent of the land owner. However, informal settlements can also be of more permanent character with significant degrees of services and security of tenure.

Subdivision of land: Historically, we are used to divide land into parcels or plots, which can be easier sold or developed. Each affectation or designation of land – so called "zoning" – is determined by a list of approved uses and is regulated in the form of a governance document. In the capitalist system of land use, the significance of land property and its use is very high.

Land use: Can be seen as the human modification of natural environments or wilderness into built environments, such as settlements, mining, agriculture or pasture. By defining new functions to land, also in terms of changing its functionality, we start to transform our environment consequently. The resulting land structure can be considered as the result and mirror of our society and culture, since it is a result of the actions of many different actors, such as individuals, households, companies, communities, cities, and investors.

Land Use Planning: The process undertaken by public authorities to identify, evaluate and decide on different options for the use of land. It also includes the consideration of long term economic, social and environmental objectives, the implications for different

communities and interest groups, as well as the subsequent formulation and promulgation of plans that describe permitted or acceptable uses.

Metropolitan area: Includes not only the urban area, but also satellite cities and intervening rural land that is socio-economically connected to the urban core city. Typical such links are employment ties through commuting into the urban core city as the primary labour market.

Mixed-use cities: Cities planning for compatible and co-existing uses that will bring multiple social, economic, land use and infrastructure benefits.

Polycentric cities: Such cities seek to deliver the benefits of both sprawling and compact cities, while minimizing their detriments, for example by providing clear distinctions between quarters and districts to maintain their identity and to keep in-between space free from building. Polycentric cities may take on many different shapes, such as finger/corridor cities, star cities, linear cities, satellite cities, galaxies of settlements, polycentric nets, or fractal cities.

Resilience: The ability of a system, community or society exposed to hazards to resist, absorb, accommodate and recover from the effects of the threat in a timely and efficient manner. This often entails the preservation and restoration of its essential basic structures and functions (UNISDR).

Shrinking cities: Usually describes a densely populated urban area that has, on the one hand, faced a population loss in large parts and, on the other hand, is undergoing economic transformations with some symptoms of a structural crisis (Shrinking Cities International Research Network).

Smart cities: Cities that coordinate transportation, land speculation, conservation, and economic development. This is done by synthesizing hard infrastructure with the availability and quality of knowledge communication and social infrastructure.

Smart grid: An electrical grid that uses computers and other technology to gather and act on information, such as information about the behaviour of suppliers and consumers, in an automated fashion to improve the efficiency, reliability, economics and sustainability of the production and distribution of electricity.

Socio-cultural space: Denotes the use, interconnections and disconnections of people and groups of people as well as their relationships with the material elements and physical structures of the city.

Subsidy and cross-subsidy: A benefit given by the government to groups or individuals, usually in the form of a cash payment or tax reduction. Such subsidies are usually given to remove some type of burden, promote certain behaviour or for equity reasons. Cross-subsidies imply that tariffs or other prices for services and goods are set in a way that distributes costs differently among different categories of customers. One main objective is to reduce the price barriers for the access to certain services for certain user groups.

Urban area: Here, definitions vary somewhat between nations. European countries define urbanized areas on the basis of urban-type land use, not allowing any gaps of (usually) more than 200 metres, and use satellite imagery instead of census blocks to determine the boundaries of such urban area. In less developed countries, in addition

to land use and density requirements, a requirement is sometimes that a large majority of the population (typically 75 per cent) is not engaged in agriculture and/or fishing.

Urban Sprawl: The "spreading of a city and its suburbs over rural land at the fringe of an urban area" (www.sprawlcity.org 2008) in a rapid and low-density expansion. Urban sprawl is driven by the populations preferences for one-family-housing and their dependence on (or possibility for) using private cars

Wicked problems: Complex problems where there is never final resolution, but instead continuous development processes in need of constant strategic facilitation.

# 3. Summary

We open with some key messages based on our overall personal impression of the evidence available from recent research and practice. Next, we provide an overview of urban land use challenges and opportunities which outlines the critical role for cities in responding to the competition for urban land. The fact that throughout history cities always have experienced processes of growth and decline is highlighted. We probably have to assume a long phase of side-by-side growth and shrinkage processes taking place in contexts of both competition and cooperation. We discuss main drivers for change: demography, economy, technology, climate change, and energy transition.

Reaching sustainable land use and settlement structures appears mainly to be a question of decision-making. Research is thus needed to understand driving forces, interactions and dependencies and how to develop innovative solutions through participatory decision-making process involving citizens, local government and many other stakeholders.

In European policy the compact city seems to be a key response to urbanization. It is argued that cities no longer can be allowed to sprawl out over unsafe locations, valuable agricultural land and areas of natural resources and values. The compact city ideal is, however, not unproblematic. By focusing on dense and dynamic urban cores, and by emphasizing economic growth, it may conflict with or overlook essential local needs, not least in how to improve life in small towns and sprawling suburbia.

Europe has a polycentric structure of large, medium and small cities. Some cities will grow, some will be stable, and others will shrink. However, 40 per cent of all European cities with more than 200,000 inhabitants are currently experiencing population decline. Shrinking cities find themselves in the unusual situation of an abundance of land with no demand for new industrial, commercial or housing structures. There is no investment, prices are declining, and estates lose their value. Very few cities will be able to turn this around, and competition between cities and city districts will only make things worse. We argue that cooperation between cities or city districts, qualitative regulation of land use on a regional level and equalisation of financial burdens between those municipalities that won inhabitants and income and those, where poorer inhabitants were left is the only way out.

This section also identifies areas and knowledge gaps that are discussed in later sections of the report.

The next sections present preliminary surveys of research and practice on three key themes.With the hypothesis that a growing or declining economy and population as well as the growth or shrinkage of the connected physical structures and societal functions make a difference in competing for urban land this report considers socio-cultural space, green-blue infrastructure as well as building mass and physical structures across the two contexts of (a) shrinking and (b) growing cities.

# 4. Key Messages

## Socio-cultural Space

KEY MESSAGE 1:  Planners and spatial planning can play an important role both in negotiating diverse interests and in advocating less powerful social groups and Nature. However, in the end the economically and politically most powerful wins.

KEY MESSAGE 2: The socio-cultural identity of European cities is threatened. Instruments and procedures have to be found to better negotiate conflicting interests.

KEY MESSAGE 3: Cities have always flourished and declined. However, there are still no planning strategies and instruments for clever adaptation to present shrinking processes.

KEY MESSAGE 4: Cities with strong cohesion, a well-balanced relation of public and private, built up and open space, and ways to deal with conflicts before they turn into crisis are characterized by on-going negotiation, cooperation between different actors and in general a strong participation of the civil society matched by enabling administration and policy.

## Green-blue Infrastructure

KEY MESSAGE 1: Urbanization is both a challenge and an opportunity for management of ecosystem services globally, regionally and locally.

KEY MESSAGE 2: Planning for, developing, and maintaining functioning urban green-blue infrastructure can significantly enhance human health and wellbeing.

KEY MESSAGE 3: Urban ecosystem services and urban blue-green infrastructure can significantly contribute to climate change mitigation and adaptation

KEY MESSAGE 4: Ecosystem services and biodiversity must be integrated in urban policy and planning. Successful management of ecosystem services and urban blue-green infrastructure should be based on multi-scale, multi-sectoral and multi-stakeholder involvement

# Building Mass and Physical Structures

KEY MESSAGE 1: Shaping "better" cities is seen as a main response to current sustainable development challenges globally. This entails creating cities that succeed in mixing a plethora of different land uses and activities to ensure equal and efficient access to urban qualities and functions – regardless of whether the cities are growing or shrinking. The complexity of such endeavours calls for dealing with urban development tasks as "wicked problems", where there is never final resolution, but instead continuous development processes in need of constant strategic facilitation.

KEY MESSAGE 2: From both resource saving and cultural heritage perspectives, the most obvious approach to urban development is to make the most of existing buildings and infrastructures. However, to make them perform well from social, cultural, environmental and economic viewpoints, a multitude of interests have to be negotiated with all involved stakeholders – including the public. Such an integrated approach to conservation and transformation also needs to be institutionalised into the different systems for urban planning and management.

KEY MESSAGE 3: Urban infrastructures – and in particular traffic and urban water – take up vast areas of urban land. To mediate between different land use demands, there is a need for more integrated approaches to infrastructure planning and management that build capacity for future-oriented transformation and resilience. This is not least a matter of negotiation between different urban development interests.

KEY MESSAGE 4: Turning cities smarter is put forward as a key response to urban development challenges, but to promote sustainable development such approaches need to shift from seeing smartness as an engineering challenge to dealing with smart cities as a wider societal challenge involving a multitude of urban stakeholders.

KEY MESSAGE 5: Combining high urban density with polycentric urban structures may deliver benefits of both compact cities (such as accessibility, efficiency and cohesion) and more sparse cities (such as urban greenery), and be implemented both locally and on the city-scale. However, density is highly city-specific, where cultural factors and lifestyles impact on what is seen as good urban patterns and acceptable density in different locations.

## 5. Land Use Challenges and Opportunities

Urban populations worldwide will grow from present 3 billion to 6 billion in 2050 (UN DESA 2009). Already today, global economy, cultures and politics are growing increasingly urban (Brugmann 2009; Graham and Marvin 2001). Even ecology is changing as urban areas develop into new biospheres (ICLEI 2013). All in all, this will lead to immense urbanization and environmental pressures in parts of the world especially in Africa and Asia. However, in the early industrialized countries many cities are shrinking. According to different studies every 6th to 4th large city worldwide has lost population in the 1990s (Wiechmann 2006).

Through their resource consumption, urban areas are responsible for almost 80 per cent of global emissions of greenhouse gases (Stern 2007). The wealth generated through this consumption is, however, far from equally distributed across the urban populations globally, a majority of whose members cannot meet their basic needs (UN-HABITAT 2010).

In Europe, 40 per cent of the EU's population live in predominantly urban regions and a further 36 per cent in intermediate regions. By 2020, about 80 per cent of the Europeans will be "urban". Some regions, such as Belgium or the Netherlands, have already more than 90 per cent of the population living in urbanised areas. However, megacities neither are nor are expected to be a characteristic of Europe. Apart from the two megapolises London and Paris, the EU has a polycentric structure of large, medium and small cities. In the latest Eurostat Urban Audit there were only 62 cities with more than half a million inhabitants. A further 72 cities were in the next tier, with populations ranging between a quarter of a million and half a million and the great majority have less than 100 000 inhabitants (Eurostat 2012). Some cities will grow, some will be stable, and others will shrink. Thus both challenges and opportunities are context dependent.

The potential for developing good living conditions and safe and resource efficient cities is decisive for Europe. If managed properly, urbanization and migration dynamics can be used as leverage for responding to critical economic, socio-cultural and environmental challenges by being more resource efficient, while at the same time creating livable and lively cities. This involves a series of challenges and opportunities.

The earlier published Urban Nexus Synthesis Report on Uʀʙᴀɴ Hᴇᴀʟᴛʜ ᴀɴᴅ Qᴜᴀʟɪᴛʏ ᴏғ Lɪғᴇ has described and gone into details about urban development and human health and quality of life, highlighting the significance of both green areas and the physical structure of the built area. The Synthesis Report on Uʀʙᴀɴ Cʟɪᴍᴀᴛᴇ Rᴇsɪʟɪᴇɴᴄᴇ has described and gone into particulars about urban development and climate adaptation and mitigation, emphasizing the significance of urban land use and spatial configuration. In this report the themes of urban health and resilience will only be briefly touched upon, while recently published research focusing on urban land use as such will be presented and new perspectives on sociocultural space, green–blue infrastructure, and building mass and physical structures will be further elaborated on.

Reliable, accurate, sufficient and integrated spatial data bases are of fundamental importance for adequate assessment of urban land use and for efficient urban management decisions. Different data sets must also be harmonised and used in an integrated manner. By establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) in 2007 the EU has taken a valuable step in this direction. However there is a need for simplification of INSPIRE towards more

user-oriented requirements, recommendations and tools. There is also a need for systematic and regular monitoring of for example urban sprawl and other land-use changes as well as for strategic assessments of potential risks and of positive or negative tendencies in urban development, including simulation scenarios. These questions will be dealt with in the September 2013 Synthesis Report and Dialogue Café on **INTEGRATED DATA AND MONITORING.**

Evidence from both research and practice indicate that an integrated approach to urban planning and management in many respects would be advantageous. Although there are many promising initiatives in Europe and globally, this is easier said than done. The last Synthesis Report and Dialogue Café in early spring 2014 will therefore address challenges, opportunities and obstacles with regard to **INTEGRATED URBAN PLANNING AND MANAGEMENT**.

## 5.1. Urban growth and decline – not a new thing

Throughout history cities have always experienced processes of growth and decline. Within the nature of cities there is an element of instability which makes them liable to rapid growth in favourable circumstances and to stagnation and contraction when these circumstances alter ( Dyer, 1991). Shifting economic dynamics and political power relations between territories have always resulted in an uneven but shifting geography and in constant (slow or rapid) restructuring of urban configurations.

One of the major influences on contemporary cities in Europe was the late 19th century transformation from a predominantly agricultural and merchant society to an industrial society. Industrialising cities showed exponential rates of growth and a continuous concentration resulted in congested and polluted inner cities unable handle the migration pressures within existing urban areas.  Additionally, technological innovations like the railway and the private car enabled more and more people to settle outside the core city. Cities therefore started to rupture their old (medieval) boundaries and new city areas grew up outside of the inner city – the beginning of suburbia (Hohenberg 1985) but also a driver for emerging garden cities (Howard 1965) and new towns (Osborn et al. 1963).

The long post-war economic boom in industrialized countries was coming to an end due to structural changes in the economy in the 1960s and 70s. Many industrial cities stopped growing and their inner cities began declining. The ensuing economic shift from the industrial capitalist city to the post-industrial or information age city – in a context of increasing globalisation – entailed significant urban restructuring. In fact, globalisation can be seen as generating major changes in urban structures worldwide. Liberalisation of the flows of goods, capital and people, in combination with technological advancements in transport and communications, have resulted in a new division of labour regionally and globally. This is changing the geography of both companies and cities, resulting in increased urban concentration. Additionally, the role of cities has changed and they are now regarded as engines of economic growth, as key centres of economic, political, and social innovation, and as key actors in promoting and consolidating international competiveness and innovation (Jessop 2004).

Another consequence of the globalisation of urban economies is that some cities have experienced shrinkage in the last decades, where such shrinkage signifies a loss of functions and population (decline of industry, suburbanisation, demographic change etc.). Apart from wars, epidemics and

natural-disasters, the German Shrinking Cities project defines four causes that can be described as the main reasons for post-World War II urban shrinkage: de-industrialization, change of urban structures (de-centralization and sub-urbanization), demographic and political changes (Oswalt 2004)

This development engenders further increase in the competition among cities where these aim to position themselves very carefully on the global market, sometimes leaving the nation states behind (Newman 1996). Urban areas have become nodes in a global network of cities, where cities and clusters of cities compete and cooperate with each other and where the performance of European cities largely depends on the global economic situation. With an increasingly multipolar world economy, where the future of many of the present strong players is uncertain, European cities can only expect continued volatility both in global markets, such as those for oil, credit, and industrial products, and in more local markets, such as those for labour, services, and real estate.

In Europe, 40 per cent of all cities with more than 200,000 inhabitants are currently experiencing population decline (Turok and Mykhnenko 2007). The proportion of cities with a declining population has increased considerably in recent decades, and is now close to that of growing cities. Industrialized regions in Great Britain, France, and Germany, as well as undersized regions such as Southern Italy, are internationally well-known examples of regional population decline. The same goes for the Northern parts of Scandinavia. Moreover, in post-socialist Europe shrinkage rather than growth or recovery has become the dominant trajectory of development (Turok and Mykhnenko 2007).

However, shrinkage is far from becoming the dominant mode of development even if some regional exceptions do exist. There are great disparities within countries where some parts are growing and others shrinking and also where parts of society face shrinking processes while others face growing processes. We probably have to assume a long phase of side-by-side growth and shrinkage processes taking place in contexts of both competition and cooperation (Rink and Kabisch 2009).

## 5.2. Urban challenges

Cities and urban areas are confronted with manifold challenges regarding how to improve competitiveness, ensure social cohesion and meet environmental demands. As these challenges are interconnected, holistic, integrated and multidisciplinary approaches towards urban research, policy and practice are essential for finding adequate answers and solutions.

**Demographic trends:** The total population of Europe reached its peak in the year 2000, and is now declining with a negative annual rate, and will continue to decline (United Nations 2011). Throughout Europe, also the demographic composition is changing and the decline in population is merged with an increase in the average age of this population. The proportion of the population being in the 65+ age group is predicted to increase from 11.9% in 1985 to 19.8% in 2025, and the proportion of population in the 0-14 age group will decrease from 21.3% to 16.3% during the same period (United Nations 2006). There is also a growing number of single households. All in all, these circumstances change the requirement on urban design as well as the type and scope of services demanded. Furthermore, the population size and profile changes in different ways in different regions and cities, with a decrease in residents in some areas, and rapid increase in others. Migration within Europe is

accompanied with global population movements, further increasing the pace and scope of demographic change.

**Social and cultural shift:** Many social and cultural phenomena appear to be global and, in diverse ways and to a varying extent, influence all cities. Others are national, regional or local and may move in different directions in different cities. Ethnic and religious groups in Europe are raising more vocal demands for equal treatment and respect for their culture. On the other hand multiculturalism is increasingly met with suspicion, not to say hostility, from a growing number of "natives".

Social life is also increasingly moving online. Hyper connected citizens make accelerate reaching tipping points where social unrest and even full out riots are triggered. Another consequence of the virtual social world is that people spend a larger share of their interactions with likeminded people, regardless of their physical location. This appears to lead to large socially congruent groups globally, but also to more polarized local social structures.

**Governance:** The administrative borders of European cities are inherited from times when cities were both smaller and less integrated with their surroundings. What was once neighbouring cities with defined borders are now often different cities only by name and administrative arrangements, with interwoven labour markets, urban metabolism and transportation net-works. Furthermore, active citizenship takes new forms, with ad hoc single-issue movements being formed faster and more fluidly than ever before, and often experiencing poor interfaces with traditional governance structures and systems.

**Climate change** will increasingly affect urban areas, and cities have to both mitigate and adapt to climate change. The majority of urban climate change research, policy and practice appears to be concerned with mitigation, energy efficiency, new developments, eco cities, etc. (SR Urban Climate Resilience 2012) Here, European cities have the potential to lead the development of mitigation by transforming into zero carbon systems. The changing climate has different effects on different urban areas. In Southern Europe, rising temperatures will require changes in the built environment to ensure the well-being of the residents. Coastal cities and urban areas along rivers will be affected by rising sea levels and storm floods. Even when only considering adapting to moderate effects from climate change, there is reason for action in all parts of the European continent.

**Scientific and technological innovation:** Cities have always been dependent on and influenced by technology. New technologies can ease the life of the citizens and have the potential to contribute to more livable and sustainable urban areas by enhancing the efficiency of urban systems. Many of the sectors providing for cities are fundamentally driven by technological innovation, including transportation, heating and cooling, communication, as well as waste and water management. However, there are reasons to be cautious regarding exaggerated beliefs in urban innovation and technological fixes to successfully address all critical challenges of contemporary and future cities, leaving less incentive for needed changes in lifestyles.

**Urban sprawl:** Our daily consumption of land (conversion of natural or agricultural land into built-up areas) is high and even cities with declining population consume more and more land through urban sprawl. In Europe, urban sprawl appeared in the second half of the 20th century. The urbanisation process, driven by long periods of economic and population growth, evolved into a sub-urbanisation dynamic, and later on, into a de-urbanisation. In the Post-war period, many European authorities

invested in urban expansion, often in the form of new towns or large peripheral extensions of existing urban structures. Areas affected by sprawl are often regions with a high population density and intense economic activity, but also regions having benefited from both national and EU regional policies (EEA 2006). Such financial supports have strengthening the development of new urbanisation patterns, for example around new transportation nodes (airports, high-speed trains etc.), new or improved transport infrastructure and external shopping centres.

Urban sprawl is a challenge for European cities and metropolitan regions, as they are becoming progressively less compact. City extensions are often no longer dense quarters, but low-density housing areas, consisting of one-family-homes, semi-detached and detached houses with abundant green space. However, there is also a growing trend of cities striving for densification and re-use of brownfield areas.

## 5.3 Urban development drivers

On the regional scale, five "mega drivers" behind land use change can be identified, in turn being possible to break down into numerous driving-forces: Demography, Economy, Technology, Climate Change and Energy Transition (Zondag and Borsboom 2009). In addition, future land use is strongly influenced by existing patterns of land use as well as by policies – here directly through for example spatial policies or indirectly through different subsidies.
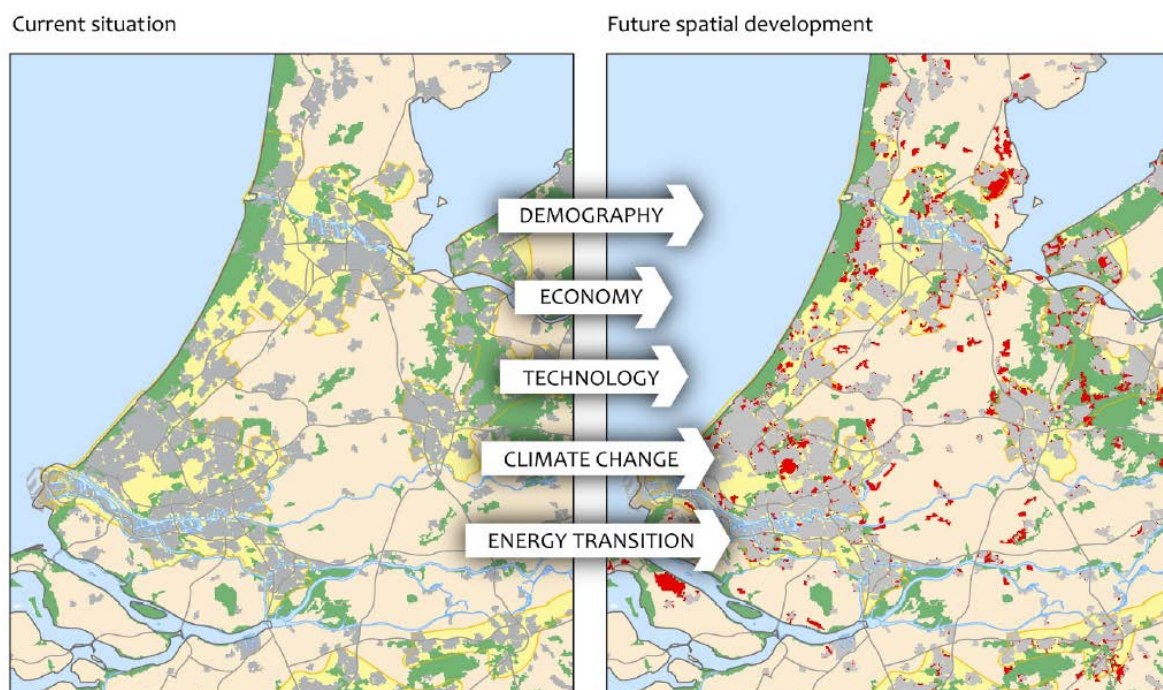


*Five main drivers of urban development (Zondag and Borsboom 2009)*

Urban development drivers can also be specified into environmental factors (such as rainfall and temperature) that affects suitability for particular uses; economic factors (structural adjustment, land values and profitability); infrastructure development (accessibility over road, rail, air and ports); shifts in consumer preferences (preferences for land with amenity and environmental value); and

population numbers (Rama et al. 2010).

From an urban sprawl perspective, the European Environment Agency has identified a number of drivers on macro, meso and micro levels (EEA 2006:17; se also ESPON 2009:71):

- Macro-economic factors: economic growth, globalisation, European integration
- Micro-economic factors: rising living standards, price of land, availability of cheap agricultural land, competition between municipalities
- Demographic factors: population growth, increase in household formation
- Housing preferences: more space per person, housing preferences
- Inner city problems: poor air quality, noise, small apartments, unsafe environments, social problems, lack of green open space, poor quality of schools
- Transportation: private car ownership, availability of roads, low cost of fuel, poor public transport
- Regulatory frameworks: weak land use planning, poor enforcement of existing plans, lack of horizontal and vertical coordination, and
- Collaboration

Urban development is driven into different patterns and velocities both from the supply side and the demand side, and often in combination. Supply-based drivers include urban projects developed on speculation by land owners, investors and entrepreneurs. Also technological and institutional innovation may contribute on the supply side by offering for example infrastructural solutions that – deliberately or unintentionally – strongly drives urban development patterns.

Additionally, local governments are seeking to gain a competitive edge – regionally or globally – by supplying urban environs and services believed to be in demand among residents, industry or business. This may be sufficiently challenging for cities in a growing city situation. For shrinking cities, such competition between neighbouring towns – to supply building sites and services to attract investment in housing, industry and retail – may have devastating consequences for most of those involved: neighbouring cities, the region, the estate market, existing owners, house prices and rents, natural resources, as well as the aesthetic values of both the built environments and landscapes. An alternative approach may be to increase supply through collaboration between cities, seeking out complementarities instead of competitiveness.

Demand-based drivers involve all individuals and institutions (public, commercial, civic, community, etc) seeking shelter and support systems. As our societies continuously change, the demand for urban development – in terms of both quantity and quality – will change. Such transformation is driven by policies, legislation and incentives but even more strongly by changes in lifestyles, preferences and worldviews and need to be met by more efficient and innovative ways from the supply-side when delivering the urban qualities in demand.

But what happens when the demand is reversed to its opposite and there instead are vacancies and decline? In the US we have seen the consequences of laissez faire, for example in Detroit with its urban core city in decay. In parts of Germany, demolition programmes have been financially supported by the government, not least to manage the large amount of – now empty –publicly owned flats located in what used to be East Germany. In many East European states the loss of population was not realised straight away, and definitely not as a problem since it contributed to

solve a severe housing problem. Even so, when the flats in pre-fabricated, industrial buildings from the socialist period are turned into private ownership, the new owner-occupiers often do not have the financial capacity to maintain the buildings. If this is the case, caring for energy efficiency and further modernisation becomes insurmountable. (Rink et al. 2012)

Throughout this web of interdependent supply and demand drivers, a critical question is where and how it is best to address negative drivers and to strengthen positive ones. From a development perspective, it seems most effective and transformative to tackle the demand side to attain positive urban change. The land-use debate, however, often tends to get caught up in discussions linked to different ways of supplying novel models for urban development.

Another issue is who has the responsibility and/or the capacity to drive urban development in desired directions. A traditional modernist view on urban planning would argue that it is the public sector – at state, regional and municipal levels – that should shape and lead development and be able to deliver sustainable urban development. A second line of argumentation emphasizes the role of the market as the most appropriate mechanism for an efficient delivery of urban qualities. A "third way" reconciling the two extreme positions – and seemingly the most current approach to urban development – instead proposes different forms of collaboration, ranging from top-down public-private partnerships to truly democratic processes of negotiation including both civil society and economic and political actors. Of course, such collaborative approaches to urban development entail challenges in terms of who has voice and who is excluded; who has opportunities and who has not.

Land use strongly depends on the interests of the stakeholders. Developers aim for estates with easy access to transport infrastructure, families are looking for quiet, green places to live, young people like to live in up-to-date central locations, "where it all happens", responsible politicians and administrations or environmental NGOs argues that certain types of land or areas of importance to natural reproduction should not be used for development purposes. All these interests are more or less explicitly announced and regulated/negotiated according to market powers and legal systems, which differ a lot, not just across Europe but also in the individual countries and their regions.

**EXAMPLE**

Competing interests find their expression in images used to advertise one and the same region - here: Silesia Metropolis



http://www.scenariuszeslask2050.pl/index.php?lang=en

http://www.silesiametropolia.eu/images/stories/foldery/gzm_zielona.pdf

Two of the most intensive competitions for land concern all citizens in their role as users of different types of land: the conflict between agricultural use on the one side and "urban" functions on the other, and the conflict between societal interests and the reproductive needs of nature, upon which all societies depend.

To achieve sustainable land use and land management practices, research is needed to understand driving forces, interactions and dependencies and how to develop innovative solutions through participatory decision-making process between citizens, local government and many other actors. Negotiating interests needs many different tools in parallel to market and parliamentary procedures, and more attention must be given to encouraging common discussion and experiences on the local levels, to the weakening/dismantling of unproductive hierarchies and to the appreciation and valorisation of everyday culture. Reaching sustainable land use and settlement structures mainly appears to be a question of decision-making. Thus, research should also contribute to implementation of good urban knowledge through scientific analyses, advice and evaluation – always keeping in mind that only transdisciplinary research, including the knowledge, experiences and interests of all urban stakeholders can find negotiated solutions and prepare the ground for their realisation.

## 5.4. Urban land use policy

### 5.4.1 The compact city – a key response to urbanization

In European policy, urban densification towards compact cities and concentrated decentralization is promoted as a key response to challenges of local and global urbanization pressures and to promote sustainable urban development (e.g. EC 2004; EEA 2006). It is argued that cities no longer can be allowed to sprawl out over unsafe locations and areas of natural resources and values. Additionally, to avoid being at the mercy of suburban sprawl, demographic change and gentrification, cities should not be allowed to disrupt sociocultural space or create barriers reinforcing segregation.

EXAMPLE

**Planning strategies, recent developments and future prospects in the Netherlands**

The notion of compact urban forms has played a major role in Dutch spatial planning. The concept of the compact city was present already in the Forth National Policy Document on Spatial Planning in 1988 and the more recent National Spatial Strategy from 2004 sets up goals for "concentration areas" around larger urban conurbations and for "urban densification" in existing built-up areas. Research carried out by the Netherlands Environmental Assessment Agency (PBL), shows that higher urban densities support economic productivity and new jobs and that a concentration of functions around multi-modal infrastructural nodes reduces car-use significantly. Additionally, inner city development is found to reduce ethnical and socio-economic segregation.

However, as national funding supporting urban regeneration is being reduced significantly and as the responsibility for urban planning – and thereby for implementing the policy for urban densification – is decentralized to regional and municipal levels, the image of the country as a compact city role model may be questioned (Nabielek 2012). When comparing urban density in terms of dwellings, inhabitants and jobs from 1996 to 2008, it can be seen that the densification of dwellings has slowed down; that the number of inhabitants actually has decreased during the second half of that period, and that the amount of new jobs has become significantly fewer.

However, as there are no plans for large suburban developments around Dutch cities, there is really no alternative other than to revitalize the focus on urban densification. This is also crucial to successfully address environmental challenges, economic viability and the quality of urban life. At the regional level, there is a need to better differentiate ambitions and strategies for shrinking and growing regions and to strengthen development initiatives around existing multi-modal infrastructural nodes. At the local level, multi-functional areas need to be supported through high quality public and green space and housing types need to match – or be adaptable to – the preferences of (future) inhabitants.

As the responsibility for urban development in the Netherlands currently shifts from national to regional and local bodies, local decisions become decisive. The current economic crisis has however stalled urban development inside and near cities. At the same time, municipalities still have possibilities to allow small scale development outside the existing urban areas, and such local decisions may well add up to more dispersed and less sustainable urban structures in the future.

http://www.pbl.nl/en/publications/2012/the-compact-city-planning-strategies-recent-developments-and-future-prospects-in-the-netherlands

The proximity and scale offered by cities is seen as crucial for resource efficiency as well as for generating new practices (Jenks 1996). It is estimated that almost all economic growth over the coming 30 years will take place in cities in a context of innovation, culture, and the arts (Redman and Jones 2005) and cities are said to have the potential to successfully face the abovementioned challenges through their capacity for innovative and effective responses (Brugman 2009; Campbell

2009). However, such innovation needs to be supported through innovation in terms of inclusive governance (Dente and Coletti 2011).

In the perspective of aging and inefficient infrastructures and buildings of European cities, increased density may provide momentum for retrofitting malfunctioning infrastructure and building mass (Rice 2010). The compact city ideal is, however, not unproblematic. By focusing on salvation through dense and dynamic urban cores, and by emphasizing mitigation of climate change and economic growth, it may conflict with or overlook essential local needs, not least in how to improve life in small towns and sprawling suburbia (Williams et al. 2010). Also, there is no direct link between innovation and sustainable urban development. The most unsustainable production and consumption patterns are currently found in Europe, Australia, and North America – regions where innovation has traditionally been driving economic and urban development. Today, the world's richest 7per cent are responsible for 50 per cent of worldwide carbon dioxide emissions, while the poorest half of the global population is responsible only for 6 per cent of such emissions (Worldwatch Institute 2010).

As cities grow wealthier they consolidate services, but expanding economic activities also tend to consume larger quantities of natural resources, release more greenhouse gases, and reduce natural carbon sinks. The resulting effects are global and more delayed in nature, and threaten life-support systems (McGranahan 2007). Although the benefits of increased urban wealth are mainly enjoyed by the world's richest, the negative impacts of the associated resource consumption are shared by all, rich and poor, because cities tend to shift the environmental burdens onto other, less fortunate localities. Although cities may still be seen as sites where aspirations for an improved quality of life for the urban poor can be realized (in urban economies underpinned by scale and proximity), benefits and opportunities need to be justly distributed through effective, rights-based policies and institutions (UN-HABITAT 2010).

## 5.4.2 The shrinking city – abundance of and competition for urban land

Cristina Fernandez-Martinez, Ivonne Audirac, Sylvie Fol and Emmanuèle Cunningham-Sabot introduce the shrinking city phenomenon in the special issue of the International Journal of Urban and Regional Research as follows:

> "Urban shrinkage is not a new phenomenon. It has been documented in a large literature analyzing the social and economic issues that have led to population flight, resulting, in the worse cases, in the eventual abandonment of blocks of housing and neighbourhoods. Analysis of urban shrinkage should take into account the new realization that this phenomenon is now global and multidimensional — but also little understood in all its manifestations. Thus, as the world's population increasingly becomes urban, orthodox views of urban decline need redefinition. ... [the authors] … belong to the Shrinking Cities International Research Network (SCIRN), whose collaborative work aims to understand different types of city shrinkage and the role that different approaches, policies and strategies have played in the regeneration of these cities." (Férnandez Martinez et.al. 2012).

Thorsten Wiechmann and Karina Pallagst, describing "Urban shrinkage in Germany and the USA" continue its description:

> "Many American and European cities have to deal with demographic and economic trajectories leading to urban shrinkage. According to official data, 13% of urban regions in the US and 54% of those in the EU have lost population in recent years. However, the extent and spatial distribution of declining populations differ significantly between Europe and the US. […] The article suggests that a new transatlantic debate on policy and planning strategies for restructuring

shrinking cities is needed to overcome the dominant growth orientation that in most cases intensifies the negative consequences of shrinkage."(Wiechmann and Pallagst 2012).

This last perception finds approval in the PhD-thesis of Beatriz Fernández Águeda, who investigates the cases of Detroit and Nantes – Saint-Nazaire concluding that the analyses:

> "[…] seemed to have confirmed the existence of direct links among economic paradigm, local decision-making and territorial structure. The evolution of both regions helps us avert an understanding of decline as an unavoidable process exclusively linked to external dynamics. On the contrary, it has revealed the relevance of the local context. The research has pointed to the crucial role of political and spatial decision-making in the process of decline. However, it has also shown the limits of local action confronted to global economic processes."(Fernández-Águeda 2008  English abstract).

These observations and conclusions can guide us through the material on urban land use in shrinking cities. The most striking issue is that a city losing population has been losing and still loses functions as a cause and consequence, which in turn results in further loss of both population and functions. These cities are caught up in a vicious circle.
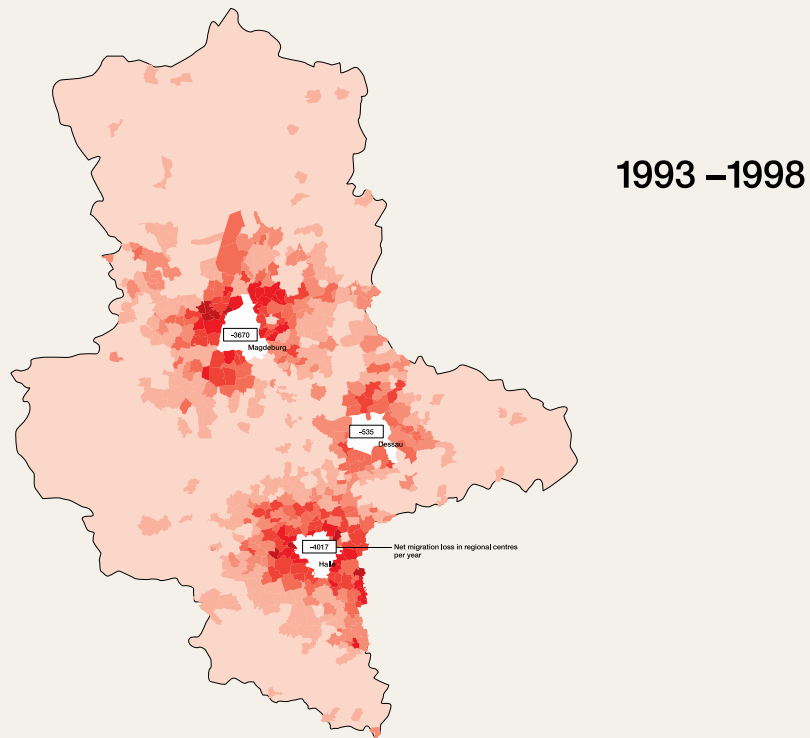
Shrinking cities find themselves in the unusual situation of an abundance of land with no demand for new industrial, commercial or housing structures. There is no investment, prices are declining, and estates lose their value. The expected return on investment cannot be realised anymore threatening pension funds just as well as private owners. At the beginning of such a situation municipal decision-makers often worsen the conditions considerably by allocating more land for different building purposes in anxiety for the neighbouring city to attract more investment. Subsidies, strong support for investors without qualitative indicators on the investment, neglect of social, ecological and cultural concerns are the consequence. Competing for urban land in a market that does not function because of a lack of demand makes no sense. But before this situation is clearly realised, the competition is even harder and a lot of damage is done. Once land is allocated for specified construction purposes the legal situation makes it often impossible to deny investors to build even if the situation has changed and a municipality realises that housing and retail would rather be directed into the city centre.

One of the first observations of the IBA Urban Redevelopment in Saxony-Anhalt, Germany was: The shrinking city grows. This growth in area, whilst population numbers decline, is illustrated in the following map of the suburbanisation process from 1993 to 1998 (www.iba-stadtumbau.de/index.php?iba2010-en).

EXAMPLE

**International Building Exhibition Urban Redevelopment Saxony-Anhalt 2010**

1993 –1998

-3670
Magdeburg

-535
Dessau

-4017
Ha...

Net migration loss in regional centres
per year
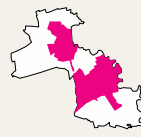
http://www.iba-stadtumbau.de/index.php?iba2010-en

## Municipal Boundaries of the IBA Cities

Aschersleben
29.300 Einwohner

Bernburg
36.100 Einwohner

Bitterfeld-Wolfen
45.400 Einwohner

Dessau-Roßlau
88.700 Einwohner

Halberstadt
38.800 Einwohner

Halle
230.400 Einwohner
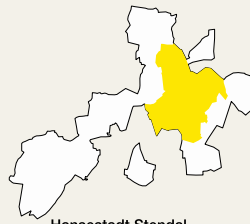
Hansestadt Stendal
40.600 Einwohner

Köthen
29.800 Einwohner
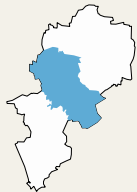
Lutherstadt Eisleben
26.200 Einwohner
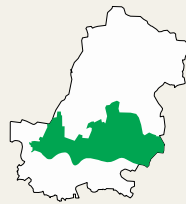
Lutherstadt Wittenberg
46.700 Einwohner
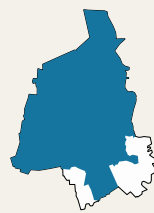
Magdeburg
230.100 Einwohner

Merseburg
35.400 Einwohner

Naumburg
34.200 Einwohner

Quedlinburg
21.500 Einwohner

Sangerhausen
21.300 Einwohner

Staßfurt
29.700 Einwohner

Schönebeck
38.800 Einwohner

Wanzleben-Börde
18.100 Einwohner

Weißenfels
34.400 Einwohner

Whereas Magdeburg and Halle were the largest cities in terms of area in Saxony-Anhalt in 1990, they have been superseded in 2007, by a number of small and medium-sized cities, which extended their urban areas through incorporations and fusions, whilst still losing inhabitants and the average density declining all the time.

The incorporation of suburbs might bring financial relief, because the wealthier citizens are again paying their taxes into the city's budget and the allocation of funds per capita increases. But the incorporation multiplies the stakeholders wanting to have a say in land use, diminishes the symbolic strength of identification with the place of living and consequently changes the cultural use and value of places within the "new" city.

This is the point, when competition for land returns from being between cities into the city itself, despite its loss of population and functions. The interests of the former villages, suburbs or inner districts are stronger then the belonging to the overall community of the newly created city. The playground on the former village green is more important than the updating of the central market place. To save cost on the maintenance of small residential streets is perceived as depreciation of the entire suburb. The status of the different districts and/or their city councillors adds to the problem. Furthermore, there is often a temptation to allocate parts of the "grown" area to new purposes.

Deliverance from this "prisoner's dilemma" can only be achieved by cooperation between cities or city districts, qualitative regulation of land use on a regional level and equalisation of financial burdens between those municipalities, that won inhabitants and income on one side and those, where poorer inhabitants were left, a large proportion of housing units is empty and which bear the costs of infrastructures and services used not only by the local, but by the regional population.

## 5.5. Urban opportunities

There are several reasons why cities are regarded as "engines of economic growth and also key centres of economic, political, and social innovation".

In a city, people have a wide variety of choices when looking for both education and employment, just as employers have a broader choice when looking for qualified labour. In a large, dense, and diverse city, almost any kind of specialist in almost any field can be found within commuting distance. As city dwellers more often encounter people with different backgrounds, they generate more new ideas and spur innovation. This can be seen both in the relative concentration of patents and start-up companies in urban centres, and on the stages, galleries, and art scenes of the most vibrant cities (JPI Urban Europe 2013).

Cities are potentially also more resource efficient than more sparse habitats. With shorter distances, the establishment of infrastructure to connect people, workplaces, and services requires fewer resources per capita. More people sharing the same infrastructure also make maintenance less costly, on a per-capita basis. Shops and services have a larger customer base within walking distance in densely populated areas and public transport with a high service level is supported by high population densities.

With the hypothesis that a growing or declining economy and population as well as the growth or shrinkage of the connected physical structures and societal functions make a difference in competing for urban land this report considers socio-cultural space, green-blue infrastructure as well as building mass and physical structures across the two contexts of (a) shrinking and (b) growing cities.

| | SHRINKING CITIES | GROWING CITIES |
|---|---|---|
| SOCIOCULTURAL SPACE | | |
| GREEN-BLUE INFRASTRUCTURE | | |
| BUILDING MASS AND PHYSICAL STRUCTURES | | |
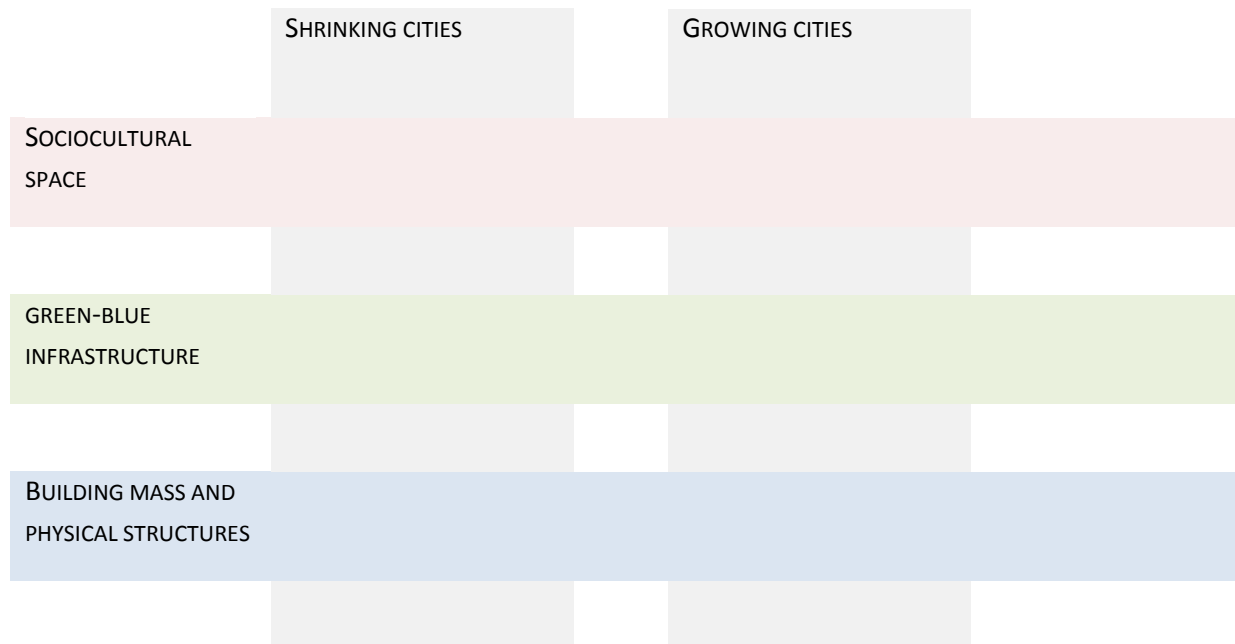
The following chapters will treat evidence from research illustrated by illuminating examples from practice in an attempt to reflect findings and present a position from which recommendations can be given.

# 6. Socio-cultural Space

Cities are not just containers, filled with houses, streets, factories and people. The perception of cities as socio-cultural spaces includes the relationships between the material elements, the use, connection and disconnection of people and groups of people to each other as well as to the physical structures of a city. The discourse about "container-space", "relation-space" and "process-space" became vivid around the turn of the last century and includes planners and architects as well as sociologists, psychologists, geographers and environmentalists. It is a very complex debate and unnecessary to unfold/explain here. Yet, it is important to point out, that to consider, explore and empirically research space in its aspects of material shape (Gestalt), structuring relations, historical constitution and cultural or symbolic expression (Sturm 2000)[1] is still a new and not generally accepted way to look at space, including urban space.

Urban sociology has mainly operated as a science looking at the social conditions, interests and relations **in** an urban space, neglecting the mutuality in the origin of physical, functional and socio-cultural space. However, if we seek to understand the socio-cultural elements forming urban space, we soon realise how crucial this perspective is also for the physical and functional development and the perception of our cities.

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[1] It was not by accident but rather systematically that feminist planners and sociologists developed this approach pointing to the hidden distribution conflicts about space between the genders demanding appropriate methods for a non-hierarchical distribution of (access to) space.

To analyse the competition for urban land in this sense means not only to look who has the property rights, money or planning power to physically shape the city, but also to search for the social conditions, interests and relations that bring forth the spatial shape, the borders of in- and exclusion, the symbols of identity, the specific culture of appropriation of the city etc. All this is part of the competition for urban land. Moreover there are different kinds or cultures of appropriation either excluding others or making inclusion and common activities possible or even inviting the others. Also the administrative culture, the strictness of hierarchies, the experience with participation and the style of political decision making express themselves in the vibrancy of built structures and design.

In Budapest Mathias Square was a turning point in the way of urban rehabilitation, when local inhabitants and different NGOs were involved with the aim to gain experience on "social-planning".

EXAMPLE
**Socio-cultural creation of space - Mátyás Square**
Mátyás Square in the 8th district of Budapest is in the middle of living areas and has utmost importance in forming a kind of local identity. Activity here has a deep impact on the poorest and most ravaged area of Budapest. Some years ago people who crossed the square tried to leave it as soon as possible – it was not a pleasant place to rest in. In October 2005 a social city-rehabilitation project was commenced in the district, during which renovation of public spaces got special attention. Two European projects ASTUTE (Interreg IIIB for urban walking and cycling) and Greenkeys (Urban Green as a Key for Sustainable Cities) co-operated in the implementation.

The local development company produced information booklets and used questionnaires and advertisements in newspapers to learn about the needs of the locals. 80 per cent (!) said that they would be willing to undertake community service both in creating and in sustaining the changes.

The renovation of Mátyás Square was – after several interim events involving local inhabitants – finished in the spring of 2008. Locals are still involved in the maintenance of the park. ASTUTE-monitoring proved that the use of the square has transformed: Now walkers come to have a rest in the park and meet others. With bike racks and a drinking fountain the square is now a resting place for bicyclists, too (Miklos Marton, unpublished).

Furthermore, with this perspective, and the aim of a sustainable urban development in mind, we are searching for institutions, procedures, instruments and of course actors that shape the cities for more intra- and intergenerational justice, for a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (UN Commission 1987).

And there is another actor influencing urban land use and development: Nature. A very societal nature for sure, manifold influenced by human activity, but still to be distinguished, if its qualities as actor, its influence in creating urban space and its rights for using urban land shall be considered. The socio-cultural space includes the societal relations to nature.

However, one has to keep in mind that nature is not just the "pleasant greenery". Nature is also a source of danger like floods, landslides or pests. How we relate to natural elements in our cities is the

expression of a socio-cultural tradition and/or situation. Are they seen as assets? Which can improve urban life, to which do we have to adapt and which do we have to fight? Competition for land is often connected to the way nature is treated: as a precious common good or wasted and destroyed (often enough unintentionally, by carelessness, habit, convenience); protected in an exclusive way or influenced to become a user friendly area. However, urban nature is a "second" nature – strongly influenced by social use and hence subject to political decisions, for which "Silesia" Metropolis is a good example:

EXAMPLE

**Nature creating space in the city - the Green Side of "Silesia" Metropolis**

As part of the Interreg IV-programme PeriUrban Parks (http://www.periurbanparks.eu) 14 member cities of the Metropolitan Association of Upper Silesia presented the development of their everyday and weekend recreational areas, which emerged in cooperation with nature and enables the residents to get in closer contact with nature.

Among the potentials of "Silesia" Metropolis are numerous parks, a number of water reservoirs, recreation centres and woodland complexes located at city outskirts or nearby urban areas. In spite of the highly urbanized character of "Silesia" Metropolis, nature was a partner in shaping these urban spaces. There is no need to leave the town in order to enjoy beautiful scenery and the health services of nature.

Over 23 per cent of the area of "Silesia" Metropolis is covered with woodland. This is the result of land reclamation activities undertaken over 50 years ago in the period of highest industrialization of Poland. This process included reconstruction of the stand of trees destroyed by the industry, protection of existing natural forests, intentional afforestation of the derelict and heavily degraded sites or the adaptation of some anthropogenic forms towards recreational purposes. An exceptional undertaking of that kind was the development of the "Forest Protective Belt" of former Upper Silesia Industrial centre in 1968. It performed not only a protective and climatic function to minimize the harmful impact of industry but also became a place of everyday and holiday recreation.
(http://www.silesiametropolia.eu/images/stories/foldery/gzm_zielona.pdf)

## 6.1. Key messages

KEY MESSAGE 1: Planners and spatial planning can play an important role both in negotiating diverse interests and in advocating less powerful social groups and Nature. However, in the end the economically and politically most powerful wins.

KEY MESSAGE 2: The socio-cultural identity of European cities is threatened. Instruments and procedures have to be found to better negotiate conflicting interests.

KEY MESSAGE 3: Cities have always flourished and declined. However, there are still no planning strategies and instruments for clever adaptation to present shrinking processes.

KEY MESSAGE 4: Cities with strong cohesion, a well-balanced relation of public and private, built up and open space, and ways to deal with conflicts before they turn into crisis are characterized by on-going negotiation, cooperation between different actors and in general a strong participation of the civil society matched by enabling administration and policy.

The following chapters will focus on research, policy and practice related to the key-findings, with a special focus on shrinking cities and some concluding recommendations for action.

## 6.2. Interests, policy, legislation, daily culture – who is competing for which reasons?

Accumulation and concentration of capital leads to accumulation and concentration of societal functions in space. That is: larger cities and agglomerations keep growing, absorbing all the tasks and offers of economic, public, social and cultural life like a hoover. In such places competing for urban land intensifies and although spatial planning has a long history in ordering, systemising and negotiating different interest, trying to find consensual solutions and co-existence between different usages, in the end the most powerful wins. Depending on the national legislation it is more or less difficult for a stakeholder to use its power and push through its own interests.

Planners play a key role in this competition in as far as they can act as advocates for the not so powerful social groups and nature. But of course, they can also just use their abilities to organise the different functions in space, suggesting what is possible. In fact, planning is often used as the technical instrument, offering different pathways for using (urban) space and leaving the decision to politicians (a clear division of labour).

There is obviously a competition for public space versus private space. Streets and squares, parks and means of transport and to a certain extent even residential gardens and yards were unquestioned (semi)public domain. People met each other, observed the stranger with different cultural behaviour – people were passing by, commented on by others, sometimes laughed at or followed with eyes full of wonder. Yet, the multitude was accepted. With an increase of global migration, the intensification of socio-economic differences, a competition for the up-to-date or most-exclusive lifestyle, the competition for perception and influence increased. Differences become dichotomies; inclusion and exclusion of social groups play a role in design and use of space. This development is accompanied by anxiety – to be involved in hazards, to get dirty, to be robbed, or to have to see beggars and ill people – the list is long. Thus public space gets more and more privatised: shopping malls house the shops and exclude poor-looking people just looking not buying. Stations are more often run by private companies closing their doors when homeless people just want a warm place. Parks are closed off to keep them tidy, gated communities evolve.

So far the general debate was repeatedly coined by the assumption that privately owned public spaces are diminishing the publicness by restricting social interaction, constraining individual liberties, and excluding undesirable populations. Nemeth and Smith (2011) undertook a study in modelling and measuring publicness, which empirically determines whether privately owned public spaces are more controlled than publicly owned spaces. They identified publicness as the interaction between the ownership, management, and uses/users of a space and found:

> "…that the use of the private sector to provide publicly accessible space leads to increased control over use, behavior, and access. Furthermore, while both publicly and privately owned public spaces tend equally to encourage public use and access, managers of privately owned spaces tend to employ more features that control behavior within those spaces. More specifically, spatial control in privately owned spaces is normally achieved through the use of surveillance and policing techniques as well as design measures that `code' spaces as private."(Nemeth and Schmidt 2011:5)

Who then has an interest in public space? UN-HABITAT argues that well designed public space "is a vital component of a successful city" (2012:40), since it improves urban economy, safety, health and wellbeing, and reduces impacts from climate change and fear of crime. European societies and politics promote public space as an expression of cohesion and democracy. On a pathway to sustainable development municipalities try to keep large parts of the city area public, rehabilitate and upgrade the design of public spaces, involve the citizens in these processes to create a common identification and hence responsibility for the city. On the other side there is a tendency to support private investment, allocating urban land for commercial and high-level housing construction. Several projects and studies show the effort of municipalities to find the right balance.

Urban socio-cultural space can in this way be understood as an outcome of negotiating conflicting interests. Often the result of such negotiations depends on a conglomerate and the specific political weighting of interests. The desire of an estate owner for more revenue, the interest of a city councillor to refurbish his election district and the anxieties of the inhabitants of the district that their street turns into the place of begging, vandalism and crime can for instance turn into the expulsion of poorer households. Nobody deliberately wanted to exclude these families, but the summation of interests, the proportion of financial, political and administrative powers and opportunities leads to exactly such results, which are difficult to dissolve. There is no "guilt" in it and the more often it happens in a city the more difficult it becomes to change the (political) culture and find new solutions.

Piotrkowska Street in Łódź (Poland) is an example of such developments:

EXAMPLE

**Competing for public space in the city** - **Piotrkowska Street, Łódź (Poland)**
Piotrkowska Street is the central axis of the city centre and the city was developed around it. In the course of time, the street became a magnet for visitors, its entertainment and commercial centre where the life of the growing industrial agglomeration was concentrated. Piotrkowska Street was multi-cultural, after World War II the inhabitants of the street were mostly poor newcomers from the region of Łódź and the street deteriorated. Only after 1990, the revitalization process began. The character of the street was changed; it became a cultural phenomenon and famous far beyond Łódź. Weekend tourism became popular, e.g. visitors from Warsaw came to Piotrkowska to spend their time in numerous clubs and pubs. The street began deteriorating again

in the early 2000s, for many different reasons. It is losing its prestige, both in its cultural and entertainment aspect, economic aspect, space planning, also in the socio-cultural aspect.

Chaos, trash and poor quality are present in Piotrkowska. The street is in spatial, social and economic disorder. New commercial centres located nearby, i.e. Gallery of Łódź and Manufaktura, made the lively street slowly dying. The authorities of Łódź try to combat the situation and fight for social, economic and spatial order, and to implement the local development policy of the city. A number of actions must be taken according to the authorities:

- repairs in all houses and yards
- more safety: monitoring, city guard patrols, professional guards at restaurants, pubs, clubs
- stylistic unification of Piotrkowska Street (niches, advertisements)
- transforming Piotrkowska into a city garden: benches, fountains, green places (flowerbeds, ball-shaped crowns of trees)
- more high-level events: concerts of world known stars, days of fashion, street theatre
- removal of shops selling used clothes and street stalls

(http://urbact.eu/fileadmin/Projects/URBAMECO/outputs_media/LAP_Piotrkowska.pdf)

The above example is not specific for this street, for Łódź or for Poland. It applies to many streets in the big cities of Europe. Hence it raises some exemplary questions:
→ But what happens to the inhabitants, who like to drink their beer in Piotrkowska?
→ Ten years since the last upgrading action? Is this not a very short investment cycle? Has the public to keep on investing to create attractive environments for private enterprises?
→ If the new centres for shopping and leisure activities distracted customers from Piotrkowska, then an upgraded Piotrkowska will again distract customers from these centres. And all this supported with public funding?

Cities think up instruments and procedures to improve public spaces with the involvement of local actors, inhabitants as well as enterprises and organisations. Silesia Metropolis e.g. has a competition for the best public spaces. The places are chosen according to their contribution to local socio-economic development, the increase in quality of life, re-use and recycling of places and materials and the ability to strengthen public consciousness for the quality of the urban environment.

An important issue for public spaces is their greening to allow people access to non-built environments for exercise and contemplation, for aesthetic pleasure and education, for physical and psychological health (more on this aspect in chapter 7.2).

**EXAMPLE**

The **city of Malmö** in Sweden has constructed **themed playgrounds** that attract its inhabitants to visit different neighbourhoods. The first was built in 1997 and today jungle, circus, ecology, fisheries, and movement are some of the 20 themes that you will find around the city.



The playground serves as a meeting place in the district and is at the same time a destination for pre-schoolers from other districts. Today it is part of many preschools' educational work to visit all the theme playgrounds. It is seen as an important part of integration to visit each other's neighbourhoods. Theme playgrounds have in some ways made the children tourists in their own city, even in their spare time.
(www.malmo.se/English/Technical-visits/Theme-Urban-Environment/Theme-Playgrounds.html)

**Malmö** also chose an **international competition** to create public green spaces that were meant to attract everybody from across the city, appealing to different socio-cultural milieus. Everybody who lives in Malmö should have good reason to enjoy recreational activities in the new Västra Hamnen district. Furthermore, these parks had to be linked to the theme of the Bo01 housing exhibition that took place in Malmö in 2001: sustainability. The focus has been on three aspects in particular; use of resources, plan metrics and emotions and aesthetic appeal. This quality programme formed the basis for the planning and design processes all over the Västra Hamnen district. The success of the spatial development was achieved by strictly keeping to the guidelines chosen: to become a leading international example of environmental adaptation and social sustainability in a densely built-up area. This is manifest in such details as protection against the wind and pleasant outdoor areas with a good view and proportions to which residents can relate. In order to ensure a sustainable resource management and recreational and aesthetic values, water in the district flows through an ingenious system of ponds, open channels and moss-covered roofs. Whilst not all visions of a sustainable, socially mixed district became true, the open spaces of Västra Hamnen were well accepted by the inhabitants of Malmö and are used frequently. (http://www.malmo.se/English/Western-Harbour/Plans-and-on-going-projects/Bo01-expo-area/Public-environment.html)

Another way of dealing with a city district with a multitude of problems was chosen in Rotterdam: The neighbourhood of **Carnisse**, which is part of the Netherlands´ urban support programme '**neighbourhoods of extra interest'** ('aandachtswijken') received special attention and funding for some time. Yet, as cost reductions, government cuts and a withdrawal of the welfare-state occurred recently, there are little funds for significant investments in infrastructural or psychical (re-)development. But while old welfare structures are being dismantled, there is still a high level of (non-) governmental activity as well as a long history of local participatory processes and

interventions by professionals and/or researchers. Frank van Steenbergen (Dutch Research Institute for Transitions – DRIFT) describes that the inhabitants of Carnisse

> "…expressed their frustration on the high level of seemingly uncoordinated (non-)governmental activity. However, they were also eager to relativize the picture of a deprived neighbourhood by pointing to the many initiatives that are arising from within the neighbourhood. One of the main problems that people experience is a fragmented social infrastructure, lack of social ties and no sense of a shared direction. Accordingly, most actors acknowledge that dominant practices and ways of thinking are insufficient for dealing with the persistent problems and occurring challenges in Carnisse. The focus of the community arena process aims to deal with these perceived problems. There is an increasing call for innovative ways of dealing and thinking, involving (unusual) actors and forging new coalitions. One of these new ways is being explored by a local action group aiming to re-open the local community centre in a self-sufficient manner."(Steenbergen 2012)

This again is a typical development of recent years, at least for the north-western states of Europe with a democratic tradition. Inhabitants take on responsibility for the district, civil society forming the back bone of urban development in the city quarters, defining common aims for the use of urban land and public structures. However, this does not work without the state! The challenge for administration and politicians is to support and enable the local actors.

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EXAMPLE

**Lively Cities: Reclaim public space for public use**

Lively Cities is an INTERREG IVB project that aims to turn misused, underused and/or non-used spaces into new destinations where people choose to spend their time. The project proposes to turn empty public spaces into Urban Lifestyle Points (ULP) where spaces have their own identities that live and evolve with users. An ULP is:

- Defined by a clear positioning, relevant through its set up and the proposed animations on site.
- A space in constant motion, evolving through time, seasons and over the years, according to its users' needs, new wishes and expectations.
- A flexible space all users can identify with where each one can create its own space, by concretely designing one's room to share with others or to be alone.
- Daily managed by a public private partnership bringing all relevant stakeholders together.

http://www.lively-cities.eu/

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The **Leipzig Charter on Sustainable European Cities** declares that European cities "are centres of knowledge and sources of growth and innovation" (EU Ministers 2007). Innovations can be seen as "creative destruction" recombining existing resources to create new products, processes or structures. For cities, such innovation would imply redefinition of the urban fabric, such as reorganization of municipal budgets, reconfiguration of stakeholder alliances and revitalization of brownfields or run-down neighbourhoods. Sociotechnical innovations in how cities develop and perform may thus help alleviate both rapid growth and shrinkage. As a measure of consolation in the face of massive future urbanization pressures discussed earlier, the levels of innovation and wealth in cities are actually growing at a faster rate than the urban populations themselves (Bettencourt et al.

2007). In contrast to considerably slower biological evolutionary processes, sociotechnical innovations in how cities develop and perform may thus, at least theoretically, keep pace with imminent urbanization pressures globally.

However the divisions and tensions between central/metropolitan and peripheral cities in a region - or even between districts within cities or urban agglomerations - are both a result of and causes diverse dynamics of growth. For many years European countries focused their efforts to support peripheral regions, cities and enterprises. New research shows that there is something like an "inner periphery" where urban agglomerations and polycentric regions are faced with a similar phenomenon: some parts are strong and attract inhabitants and enterprises others seem to lose all the time.

EXAMPLE

**SUITE The Housing Project – Social and Urban Inclusion Through Housing**

Cooperating for two years ten cities (Krakow, Newcastle, Rennes, Tallinn, Nantes, Iasi, Hamburg, Medway and Santiago de Compostela) dedicated their efforts in housing politics to the integration of environmentally sound, economically viable and socially inclusive projects and strategies. Next to local action plans for each of the cities they summarized their experience and turned it into descriptions of political dilemmas and recommendations.

Partners recognized that in practice it is very difficult to fully integrate all three pillars of sustainability in one and the same project. Instead, concrete or 'tangible' outputs such as physical infrastructure or very targeted physical improvement measures that can be put to use fairly quickly tend to be favoured. Yet, different aspects of sustainability tend to reinforce each other. For example, improving energy performance (environmental aspect) in residential buildings contributes to improving the economic and social situation of residents.

Another example is the improvement of social integration of residents in a neighbourhood, which is likely to result in lower levels of anti-social behaviour and better care of the common areas, thereby enhancing the environmental quality of the neighbourhood/city. In accordance with the very concept of sustainability implying a long-term, cross-sectoral vision that requires continuous commitment to the original goal, the representative of SUITE's partner cities highlighted 'continuity' repeatedly as a key success factor in sustainable housing projects.

Robust institutional agreements, which cut across governments of different political signs, are key to achieving a coherent final result. In addition, this involves a good working relationship between all project partners. Amongst the key factors mentioned by partners in this process are: working with human resources (i.e. staff skills can be the greatest asset or a big obstacle); collaboration between professionals and politicians; early resident involvement/support for sustainable housing projects; continuity of funding/political support/ robust institutional arrangements, etc. (http://urbact.eu/fileadmin/Projects/Suite/documents_media/SUITE_LAP_SUMMARY_ENGLISH.pdf)

(http://urbact.eu/en/projects/quality-sustainable-living/suite/partner/?partnerid=193)

(http://urbact.eu/fileadmin/Projects/Suite/documents_media/NEWCASTLE_SUPPORT_AND_CARE_SERVICES.pdf)

To achieve spatial and socio-economic cohesion many municipalities try to support the weaker districts and cities. These supportive actions include the allocation of social/affordable housing, Special Economic Zones; measures to attract highly qualified, creative inhabitants; strengthening the natural highlights or promoting traditional architectural and cultural values.

As an example, the small City of **Jyväskylä in Finland** is developing Creative Clusters in low density areas of the city through the **Creative Clusters** project by re-shaping mature industries into new productive realities based on accessibility, mixed land use , community life, culture and creativity-based business models: so called innovation ecosystems where people are at the core and where spaces are reactivated for interaction (Creative Clusters 2011).

In the city of Malmö in Sweden, the **Fosie neighbourhood** from the 1950s is today characterized by social segregation and unemployment. The SÖM project (South East Malmö) is a **CoNet** project aimed to promote increase of gainful employment and decrease in the dependency on social allowance (CoNet 2011). This was done through processes of social innovation to improve existing and create new meeting points where bonds could be developed between the inhabitants and the city officials. A number of sub-projects aimed at young people with a focus on developing trust and participation.

**Almere** in **the Netherlands** aims to grow into an innovative and diverse city. Unlike most major cities in the country, Almere still has abundant space available to accommodate entrepreneurs with businesses of all sizes. The population is made up of people from a wide range of cultures, ethnicities and religious backgrounds. The project **New Chinatown** draws on the cultural mix of the area and incorporates water and mixed land use into a design process shaped by residents (http://www.chinatown-almere.nl/).

The Swedish city Gothenburg is physically fragmented and is also facing significant challenges from globalization, social exclusion and the effects of climate change. The project **RiverCity Gothenburg** aims to counteract physical segregation and social exclusion by building on large and centrally located brownfield and through strategic links across the river (City of Gothenburg 2012).

EXAMPLE
**Brno, Czech Republic – Upgrading the international status of the city and its region by attracting highly qualified people and activities**

Brno city itself has 370 000 inhabitants, the wider metropolitan zone 520 000. Brno is a traditional industrial city, but since 1990 it has seen major transformation; in 2011, the tertiary sector dominates the local economy. Brno also has international status potential, given its Central European location and  its many universities and research centres. Brno's challenges are to develop its innovative economies and international RandD functions and make them sustainable. To address these, the city is starting to attract highly qualified people through different research and grant programmes. Attracting people and activities also raises important issues for future action: developing an integration policy for newcomers, increasing benefits for local students and convincing locals about the programmes' long-term benefits.
(http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/citiesoftomorrow/citiesoftomorrow_final.pdf)

The efforts of the municipality of Brno stand for the recognition that the urban development also depends on the quality of social relations between the inhabitants. As an example the integration of newcomers is much too seldom an issue on the urban agenda but very important to create a common identity of the already settled and the incoming inhabitants, both groups having to accept each other´s interest for urban land use.

Supporting weaker parts of a city or agglomeration is yet not free of problems. Too often it leads to "strengthening the strong" – a strategy explicitly adopted by the government of the federal state of Brandenburg in Germany, when it tried to concentrate the scarce financial resources onto spaces of intervention, where most success could be expected. On certain trajectories of economic development it might seem necessary to give impulses to selected districts, but one must be aware that these also influence the economic and socio-cultural relations in the city and create a quality of some spaces, which hinders social cohesion.

Choosing the right planning strategies was – in addition to this always being a difficult task – a big problem in the Eastern European countries after 1990.

> "After the democratic changes in Central and Eastern Europe during 1990s planning activities were generally abandoned and neglected for almost a decade – partly because of the extreme shifts in social and economic life and partly due to a general misunderstanding about liberalization of society after the shift from centralized economy." (Dimitrova, Burov 2010).

How can cities and municipalities handle built-in tensions and goal conflicts in compact city and city centre development, and to what extent can current and new planning tools and practices serve to facilitate the balancing of conflicting concerns and to secure inter- and intra-generational justice? These are the questions addressed in the on-going **DEMOSREG II** research project (Democracy and Governance in Regional Context) - a cooperation between Denmark, Finland, the Netherland, Norway, and UK. The programme focusses on the interaction between policy, the market and civil society, giving special emphasis to a spatial or territorial perspective. Particular attention will be paid to local and regional processes and how these are linked to components at the national and international levels (www.forskningsradet.no/prognett-demosreg/Home_Page/1224698086029).

Asking for the right planning strategies and tools and mentioning the built-in tensions of a big agglomeration Silesia Metropolis can again be mentioned as an example. This area with a great urban and industrial tradition, a melting pot of nationalities and a long standing tradition in reclaiming brownfields for industry, housing and leisure is still facing big economic, social and demographic problems. It is a shrinking region with shrinking cities and only very(!) few winners – not even Katowice the "capital" is amongst them.

EXAMPLE

**Population development in Silesia 1990-2010**
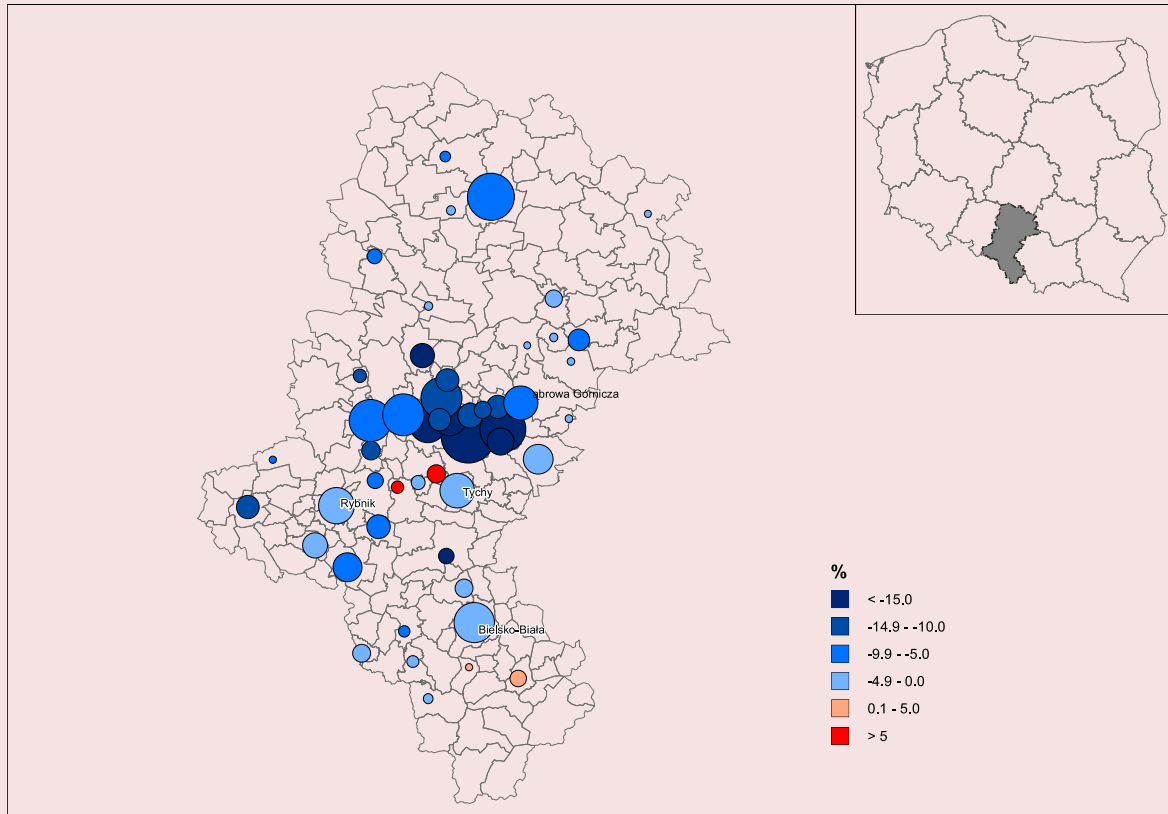


Emilia Jaroszewska, Adam Mickiewicz University, Poznan, Poland Institute of Socio-Economic Geography and Spatial Management
(http://www.cost-cires.eu/fileadmin/Dortmund/COST_Training_School_Report_final.pdf)

One of the measures taken to support economic development, attract investment, and create jobs for more people is the establishment of a Special Economic Zone (SEZ). Searching the websites of the Silesian subzones it becomes quickly visible that there is competition between the constituting cities as well; Dabrowa-Gornicza, with the administrative headquarters of the SEZ, winning a big share of the investment. Very interesting is the endeavour to use the peri-urban parks and re-cultivated mining areas, the "second nature", to attract investment: Dabrowa-Gornicza with its action "Oak is ok" being a good example (http://dabrowa-gornicza.com/en/atrakcje.html).

EXAMPLE

**Katowice Special Economic Zone (KSEZ)**
KSEZ claims to be "the right choice for those companies, which are willing to use the public aid in the form of a tax relief, calculated on the basis of the investment cost or new job creation." The Katowice SEZ is located in three provinces in the intersection of the A4 and A1 (under construction) motorways. The second biggest didactic centre of Poland (44 universities, 200 000 students) and highly developed railway infrastructure are also situated in the Silesia Province.

KSEZ-Investment areas are located in four Subzones: Gliwice, Sosnowiec-Dąbrowa Górnicza, Tycka and Jastrzębie-Żorska. The current development amounts to approximately 50 per cent and still has available area for new investments.

Major investors in the Katowice Special Economic Zone:

| Investor | Country of origin | Sector |
|---|---|---|
| General Motors Manufacturing Poland | USA | Automotive |
| Fiat - GM Powertrain Polska sp. z o.o. | Italy | Automotive |
| NGK Ceramics Polska | Japan | Automotive |
| Nexteer Automotive Poland | USA | Automotive |
| Brembo Poland | Italy | Automotive |
| Isuzu Motors Polska | Japan | Automotive |
| Guardian Częstochowa | USA | Glass goods |
| Eaton Automotive Systems sp. z o.o. | USA | Automotive |
| Lear Corporation Poland II | USA | Automotive |
| Maflow Polska Sp. z o.o. | Italy | Electric |

(http://www.paiz.gov.pl/investment_support/sez/katowice)

One might question the strategy of poor municipalities subsidising strong multinational enterprises with the support of the EU. But rejecting this way of tackling the problems, one has to come up with alternative answers, which are surely not easy to find. Competition for investment between cities is a widely accepted phenomenon. Only in connection to shrinking processes questions start to be asked in how far cooperation between the municipalities would in the end bring all cities involved more advantages.

In some cities revitalisation of old industrial districts went hand in hand with economic restructuring and allowed cities back on the pathway of economic strength and growth. Nantes (France) is such an example and with the return of economic growth the power of the market forces returned as well. The successful processes of participation and negotiated development were far too quickly lost again.

EXAMPLE

**Nantes, France – airport of Notre-Dame-des-Landes**

Even though it can be considered the symbol of Nantes' revitalization, île de Nantes must be comprehended as part (though a significant one) of a long-term regional restructuring strategy supporting the construction of a complex and resilient territory. However, contradictions may also be found in the process, since economic development seems to have gained growing significance throughout the years, sometimes at the expense of environmental or social issues. This is the case of the future airport of Notre-Dame-des-Landes.

In 2008, the 1960s project of building a new airport near Nantes was reactivated. While the regional strategy has been based on recycling and urban integrated development this new airport will entail the closure of the existing one, which could be enlarged if necessary. Since the west coast of France has experienced a sustained growth in the last years, Notre-Dame-des-Landes is

intended to become the airport of France *Grand Ouest*.

Nevertheless, the location raises questions both from environmental and social points of view. The land is near to a nature protected area, part of *Natura 2000 network*, and to existing towns. Although the project's reports claim that the impact would be low, it would certainly involve the destruction of highly valuable agricultural land. The project has been the origin of a long-term social protest which has engaged local farmers, ecological groups, citizens and left political parties. This movement has been going on for the last four years and has gained attention since Ayrault's (former mayor of Nantes) appointment as Prime Minister. The project of the new airport raises questions regarding which social groups are integrated in the decision-making and also which activities may be subordinated to economic growth (Fernández Águeda 2010; 2011a; 2011b).

The situation is different when it comes to housing, because there is a broad awareness of possible segregation processes. Cities try hard to avoid big differences and strong competition between urban districts, which can lead to – sometimes even violent – conflicts. Thus researchers from the **Shrink Smart** project (http://www.shrinksmart.eu/) asked:

> "What happens to the process of socio-spatial differentiation if a housing market is characterized by supply surplus, at least in selected segments? What does the access of underprivileged groups to the housing market look like in such cases? Does shrinkage impact on the dynamics of residential segregation and if so, how?"

In their conclusion the authors connect the different answers to their questions to different causes of shrinkage and point out that these trajectories will continue in different patterns.

EXAMPLE
**The Cases of Leipzig, Ostrava, and Genoa**
One surprising result is the effect of niches that are opened by decline in the housing market, paving the way for a rapid concentration of low-income and minority groups. The cases of Genoa and Leipzig show that migrants obtain access to the low-price segments of the housing market. These segments are typically located in urban areas that are characterized by housing vacancies, decay, and abandonment. In addition, in housing markets dominated by owner occupancy, low-price rental areas with vacancies are likely to be the first destinations of all kinds of newcomers, which can lead to rapid changes in the social make up of rental-dominated areas. For example, in Genoa, owner occupancy delays the effects of population change, maintaining older people in oversized apartments and creating a new social mix within historical areas, where recent in-migrants live next to this older population. In Ostrava, we see that a minority of the Roma population has, in general, only very limited access to the housing market, independent of tenure forms. They are pushed to the worst districts of the city by upgrading initiatives and political regulation.

Leipzig, the housing market with the highest level of supply surplus and vacancy rates, shows the highest dynamics of change, i.e. quick alterations in the character of neighbourhoods. The connections between shrinkage and its socio-spatial effects are always related to the causes of shrinkage.

What we can envisage for the future development of segregation differs for each case. In Genoa, one can expect up-grading and gentrification if the historical city centre becomes more attractive for population segments other than low-income groups, older people, and new ethnic minorities. But, due to the small-scale ownership structure mentioned above, this will be attenuated and slowed down. Thus, a persistence of the situation of the groups involved is probable, at least in the mid-term.

The situation is different for Leipzig: due to the relatively high number of housing vacancies in districts inhabited by migrants and low-income groups, their situation will not change in the short-term and probably also not in the long-term perspective. The respective quarters in Leipzig's inner East might be threatened by growing demand only when a lack of housing develops in other (more attractive) areas.

For Ostrava, it can be assumed that, for the time being, the relatively spatially limited localities with above-average concentration of socially weak population may spread further (compare with Sýkora 2009). This assumption is based on the massive privatization of municipal apartments, the deregulation of rents, increasing market price rents (Sunega et al. 2009), continuing suburbanization, and the absence of compensatory instruments (e.g. social housing). (Großmann et al. 2012).

More or less successful urban strategies for socio-spatial cohesion in the housing sector were developed in many cities. Only very few can be mentioned here:

EXAMPLE
**Lyon, France**
One of the most important social challenges for the city of Lyon is to enhance social cohesion between people of different social groups. The segregation within the city is one of the basic problems. Geographically, the richer people live in the centre and in the Western parts of Lyon while the poorer people live in the Eastern part. Arrangements have to be implemented focussing on educational, health, social and cultural issues. Linked to this challenge is the construction of more new flats in the whole city area. One third of the new housing is supposed to be public social flats in order to demolish the old social housing blocks in deprived areas. These old areas should be used for the construction of more private flats. This is also meant to generate more social diversity.
(http://urbact.eu/en/projects/human-capital-entrepreneurship/urbameco/partner/?partnerid=87)

But building upmarket residential qualities does not automatically lead to mixed quarters. The opposite: it might enhance segregation. Even more so because there are more social distinctions than poor and rich. What does it mean to a city if one third of housing construction is dedicated to social housing and two thirds will be private flats? Will two thirds of the inhabitants be able to afford the new private residential buildings? Is it a good decision to build private housing in "deprived areas" or is this seen as expulsion? Inhabitants might share the view about the bad quality of the house, but they live in grown neighbourhoods, have arranged their ways from home to the place of

work, know the places, where they do their shopping; the children have their peer groups and places of adventure etc. To demolish such a site might be well intended, but also has to be considered from the perspective of everyday culture, habits and a certain identity of a community. On the other hand the plots meant for building private housing might not be accepted by those, who can afford it because of the bad reputation of a district.

EXAMPLE

**Sofia, Bulgaria: Improving inclusion of the Roma minority in Krasna Poliana**

Krasna Poliana is a large housing estate with high rise buildings, bungalows and makeshift housing where 65,000 people are living, among them 25,000 of the Roma population. The Roma is the most marginalized and least involved group in Bulgaria. Other problems for the Roma are the high unemployment rates, poverty, and lack of access to health, social and educational services. An additional factor limiting the development of the community is its characteristics as a socio-spatially polarized ghetto, where children tend to re-live patterns of social exclusion of their parents.

The Sofia Local Support Group focused on complex child and family services, bringing both children's and parent's learning together. This is being combined with the integration of sport, culture, leisure and health with vocational training. Embedded into this integrated strategy is a part-time kindergarten within a health and social community centre, where pre-school children are enrolled to prepare for a good start at school. In parallel, their parents are involved in a parental skills programme.

http://urbact.eu/en/documents-and-resources/documents/?project=86

An even broader set of grave problems becomes visible in two different descriptions of La Mina, a city district of Barcelona, where residential upgrading was meant to overcome ethnic segregation and create a high quality living area according to the standards of planners and municipal authorities.

EXAMPLE

**Urban Design: Art, City, Society. Project: La Mina, 2009**

"Conclusion: The district of La Mina is almost a warning: when the poor is cast aside, it becomes poorer and more dangerous. Fortunately La Mina has been noticed. Already the zone shows signs of big change. Such as, the construction of external lifts, new schools and police stations. One day, in time, La Mina will be finally integrated into Barcelona society. With the help of the Forum, the Barcelona Government hopes that in years to come the upper class citizens will want to live in the newly developed area and will buy the older housing in La Mina. The government planned the regeneration scheme from 2000, to be completed by 2010. More time is needed for the natural long-term positive changes to happen. The proposed plans are spread out throughout La Mina, but will take numerous years to come into effect." (Nicholas Socrates: http://de.slideshare.net/nicksocrates/la-mina-research-barcelona).

**Urban transformation and social change in La Mina neighbourhood**

La Mina neighbourhood has undergone deep changes in the last years. After two decades of popular claiming for an integral intervention, aimed for the resolution of social and urban development conflicts, a Consortium was created in 2000, leading the Transformation Plan for la Mina neighbourhood. Ten years later, critical voices within the neighbourhood have raised

concern about the failure in achieving the Consortium's objectives. An internationally promoted and prizewinning plan has failed to fulfil the social needs it was supposed to solve.

The anthropologists Emanuela Bove and Martha Pelayo (2009) summarize the main results of a qualitative analysis of the current social situation in La Mina, taking as a reference the starting point of La Mina's Transformation plan. This research emerges as a first report built on information collected by interviewing key agents in the neighbourhood and on-site observation work.

To end with, the authors reformulate some prejudices regarding the relationship between Barcelona (the city) and La Mina (its *ghetto*). It is not the *ghetto* that is dependent of the city, but the other way around. Barcelona needs La Mina to displace the problems which are not acceptable: the shanty towns, first, drug dealing later on. That is why social stigma (motivated from above) has been maintained on La Mina. The key question (a rhetorical one) would be if the massive inversions within the Transformation Plan have managed to end with the neighbourhood's bad reputation. Not for the moment.
(http://periferiesurbanes.org/wp-content/uploads/2010/11/LaMina2009-TransformacioUrbanaCanviSocial.pdf)

English resume: Miquel Sáinz de la Maza

The success of regenerating neighbourhoods and making them liveable areas for many inhabitants often depends on citizen´s participation in the process. This is, why the Transition Management instruments of the Dutch Research Institute For Transitions (DRIFT) were introduced into the project partnership MUSIC (Mitigation in Urban areas: Solutions for Innovative Cities) of five European cities. Transition Management is an innovative, scientifically underpinned approach to achieve changes in core systems in society.

EXAMPLE

**MUSIC - Mitigation in Urban areas: Solutions for Innovative Cities**
Cities play a leading role in decreasing $CO_2$ emissions with 20 per cent in 2020 and the involved challenges are mainly institutional and organisational:

- How can policy be translated into concrete and innovative projects?
- How can all stakeholders formulate one vision for a sustainable city?
- What role should companies, research institutes and the government play?
- How can urban citizens be involved?

The MUSIC project sees this as a transition to innovative ways of cooperation between public, civic and private sectors – a transition that can never be completely controlled but can be steered by influencing, adapting and monitoring. The transition management approach is based on a multi-stakeholder actor learning process, to search for tangible small scale solutions to big problems. It includes a series of workshops with several stakeholders (businesses, government, research institutes, citizens) resulting in a local sustainability vision and action plan.

**MUSIC activities in Rotterdam** are about implementing public private partnerships for energy saving and production. These partnerships will apply energy efficiency measures in "clusters of public buildings" – in this case a cluster of eight swimming pools, being big energy consumers –

and also set up a revolving fund for renewable energy production by sun or wind, which uses the huge potential of roof surfaces of public buildings.

The stakeholder-driven transition management approach will create local partnerships, a culture of energy efficiency among public and private actors, as well as a shared vision and a list of actions.

http://www.themusicproject.eu/

http://www.themusicproject.eu/partners/rotterdam

## 6.3. Shrinking cities – abundance of and competition for urban land

At present many European cities as well as their different districts and quarters have problems with their socio-cultural identity. A cause as well as consequences of this is the privatisation of public spaces (shopping malls, stations, gated communities), segregation, and an astonishing proximity of decay and upgrade. This is accompanied by the loss of the average, the intensification of differences (social, cultural, physical, ecological) and the typical urban diversity and "freedom" (somewhere between individualism and liberty). Social cohesion becomes a topic not only in the public debate but also in European and national legislation, only as the smaller sister of (economic) growth, but in context with a debate on equality as a factor of general happiness and less conflicts. To keep the wholeness, the unity within diversity for the socio-cultural space of a city, is one of the great challenges and means, that instruments and procedures have to be found to negotiate the conflicting interests in land use and find consensus, a balance of interests or compensation.

With climate adaptation, ecological concerns, connected considerations of health and quality of life, the recognition of ecosystem services and hence the interest in keeping up biodiversity – a new interest/demand arrives in the competition for urban land. In how far it is satisfied depends on the power of the social groups bearing it. Research shows that it grows into a more generally accepted and hence stronger issue.

Already since the 1970s a loss of population and economic strength could be observed in European cities connection with dynamic suburbanisation or severe economic structural changes. But only after the collapse of the socialist system in eastern Europe the phenomenon of shrinking cities, became so obvious and wide spread and merged with persistent demographic structural changes, that it did not only surface in public debate but became a challenge to urban planning and politics too.

Within at least the last 15 years, experience could be gathered and systematic scientific work carried out, providing first results and recommendation. Mature work, reaching from analyses to political strategy was carried out at Netherlands Environmental Assessment Agency:

EXAMPLE

**From combating to managing: Demographic decline in the Netherlands**. Policy Strategies for current and future shrinking regions

It would make sense for municipalities to coordinate their shrinkage policies on a regional level. This applies to housing market policies as well as to retail trade and business location policies. Coordinating construction, demolition and redevelopment plans for residential, shopping and business locations not only prevents intraregional competition for the same residents and businesses, but also prevents unprofitable spatial investments and empty buildings.

Declining regions can and should generate no growth. Instead, stabilization and sometimes deconstruction with the goal of sustainable development are needed. This can, however, neither be measured with the figures of official statistics nor assessed by the existing indicators systems. Descriptive statistics is therefore an inappropriate instrument to evaluate success in declining regions, and the current indicator systems are exclusively focused on growth and therefore useless for the evaluation of decline.

If the self-set goals are achieved, the development of the region by those affected will be evaluated as a success and "it is a success". For all regions affected by decline it is therefore important that the success of regional policy and development cannot be measured quantitatively but only qualitatively. The social inclusion, participation of citizens in the life of "their" community is the yardstick for success (Verwest and van Dam 2010).

If one looks in more detail there are of course different strategies that shrinking cities apply.

**Tear it down** – This strategy is based on being unable to do anything about a huge vacant housing stock of low quality, badly in need of renovation and with a population still decreasing. The need of renovation is to be judged against the feasible return from rents. Many prefabricated housing blocks of socialist times could easily have been modernised, even restructured for different needs of smaller and bigger households. But if the fewer inhabitants of a city choose to live in one family houses or pre-war buildings, investment is not worthwhile.

Yet, it is important to realise, that in East Germany, for instance, at the beginning of the demolishing-programme not even half of the overall vacancies was in prefabricated housing blocks. Houses from Wilhelminian time or the 1930ies were empty as well. The first assumption, that vacancies only or predominantly occur in the much disliked socialist housing blocks, could be proofed wrong by statistics. In Eastern Europe this is even more so; the prefabricated blocks stay inhabited, because these flats, also in socialist times, were privately owned, often owner occupied and more were privatised after 1990. In Western Europe there are still little analyses of which types of houses and quarters are falling empty, accept for processes of suburbanisation, when city centres are emptying.

A good step towards such analyses is the work of Gina Willner, who looked at the district of Tungendorf in Neumünster, a settlement from the first half of the 20th century, refurbished later. The district is characterized by detached and duplex houses or small apartment houses as well as by a population of families and a growing community of senior citizens. Such districts will form a typical

problem area with continuing aging of a homogenous population. In small towns, and especially in regions with population decline due to demographic reasons, the demolition in this type of dwellings (with increasingly non-marketable property which the next generation will inherit) is a possible scenario.

EXAMPLE
**Cultivate Tungendorf, Germany**
A new chance for sustainability for an inner-city district in the presence of demographic change



Much of the original detached and duplex housing from the early 20th century is found along the main thoroughfares. The majority of housing stems from the years before and directly following the second world war, both single family houses and apartment buildings. Although once very similar in form and style, most homes have been carefully personalized and adapted over the years. What is so obvious today is the complete change in living standards society has undergone since these homes were first built. As families in this district grew bigger, so did the houses, the majority of which feature numerous dormers, additions and alterations.

While most renovation happened piece by piece and over time, it hasn't been sufficient to bring the building stock to meet twenty-first century standards. In a survey conducted by the city, 25 per cent of the residents expressed dissatisfaction with the outdated condition of the houses they lived in. Additionally, the limited building typology predisposes the area for families, as only 27 per cent of the housing stock is found in apartment buildings. As families are increasingly few, many homes may need to be adapted to house other household forms as well, especially the growing population of seniors, but also patchwork families and households of not-related persons (Willner 2010).

It might be difficult to understand the strategy of tearing down, if one is not familiar with the dimension of vacancies in some cities. The statistics of Hoyerswerda in East Germany, a town highly industrialised between 1956 and 1990, with a peak of 71.000 inhabitants in 1981 illustrate the conditions for such a decision:

**Hoyerswerda (Germany)**

|  | 1990 | 1995 | 2000 | 2001 - 2005 | 2005 | 2006 - 2010 | 2010 |
|---|---|---|---|---|---|---|---|
| **existing flats** | 27.027 | 27.444 | 28.108 |  | 24.142 |  | 20.570 |
| **vacant flats** |  | 1.654 | 4.597 |  | 3.353 |  | 1.173 |
| **demolished flats** |  | 76 | 389 | 4.138 |  | 3.889 |  |

Statistisches Landesamt des Freistaates Sachsen, Amt für Planung, Hochbau, Baufsicht und Liegenschaften,1990 und 1995 lt. Wohnraum- und Gebäudezählung

So yes: It is better to tear down the old and write off debts. Then a better overall environment can be achieved. But it is always an economic loss and an ecological burden, since the building sector is using up enormous amounts of energy and materials.

Most shrinking cities have or will demolish substantial parts of their housing stock. But this strategy is only adopted when a majority of decision makers really comes to terms with the end of growth and considerable economic loss is also insight when the estate markets fail to work. There might be a few cases where demolition is applied as a strategy for distinct quarters and a new start is feasible.

**Bet big** - This strategy would address the surplus of houses, and thus a declining trend, with doing the opposite and build away from the crisis. Improved attractive environments give people a good self-image, creating a positive atmosphere and contribute to an increased interest from outside. Cities in Western Germany, in a later phase of the post-industrial restructuring (late 1980ies/early 1990ies) and with better basic economics, have been able to make large investments. Examples are Düsseldorf and Oberhausen, and also a radical project like Emscher Park. But this was possible only at the expense of other cities and regions and in a densely populated area. It was supported by a general turn towards a strong IT and media-based economy, for which the Ruhr region had free space and labour at the time. Even in a shrinking phase with demolishing there is often a parallel upgrade, such as the East German cities of Halle and Leinefelde. The upgrade needed an economy as strong as the German and did hardly ever change course. Every shrinking city in East Germany was upgraded, but still has empty houses. It is especially hard, when renovated buildings are empty. But even this happens not infrequently.

According to researchers municipalities in the current shrinking regions of Parkstad Limburg, Eemsdelta and Zeeuws-Vlaanderen in the Netherlands have for many years failed to anticipate demographic decline. If they responded to it at all, mainly in the form of a housing market strategy that focuses on offsetting the effect of shrinkage by attracting new residents. But there has been no

or very little attention paid specifically to demographic decline in spatial-economic, retail trade, labour market and business location policies. (Verwest and van Dam 2012)

This is why this strategy should not be recommended at all: betting big means almost every time losing a lot of public money. There are on the other hand occasional cases like Nantes-Saint Nazaire in France, which was an old industrial city and in the structural "break" also lost population. After a change in the mayor´s office the city adopted a new strategy, accepting that conversion needs time and the support of many groups of the population. Thus the important project of the redevelopment of île de Nantes, the centre of the old shipyards, took well over ten years. Socio-cultural identities being discussed just as well as perspectives for future living and working. On the basis of such a cultural/identity related process it might happen (like in Nantes) that new growth occurs.

EXAMPLE

**Ile de Nantes, Nantes, France**

The largest and most significant redevelopment plan in Nantes, île de Nantes, may also serve as an example of how planning and urban action are envisaged in the city. This 350 hectares island, the historic place of the shipyard industry, located near the city centre and regarded as the future centrality of the region, has undergone a profound transformation in the last few years.

In 1987, the last shipyard company closed and the mayor decided to remove the industrial buildings and transform it into a business area. As this idea emerged, land prices in the island rose. However, citizens rejected the project and elected a new mayor, Jean-Marc Ayrault, in the elections of 1989. As Ayrault arrived, the debate on the future of the island reached its peak. Different groups made conflicting proposals, from the preservation of every element of industrial heritage to the tabula rasa of the business area. Nevertheless, Ayrault argued that the island had to take its time.

For the next ten years, the local council did not start any redevelopment plan. On the contrary, they focused on the most urgent issues, like the improvement of public transport with a new tram system that connected the city centre with isolated social housing neighbourhoods. However, during that decade the local council preserved significant industrial elements to avoid further deterioration and initiated debates with different stakeholder groups and agents. Meanwhile, the uncertainty about the future of the island made investors lose their interest. As land prices decreased, the municipality was able to buy land and former industrial buildings for future public developments. Years later, when redevelopment began, this acquisition turned out to be essential in order to control land prices, maintain current residents and avoid gentrification.

In 1996, Jean-Marc Ayrault, the city's mayor, created *Comités Consultatifs du Quartier*, (neighbourhood councils) aimed to enhance citizen participation. Although some authors have remarked the contradictions of this model (Devisme 2006), it certainly constituted a radical departure from the hierarchical and descendent previous forms of government. Even though in the councils there is not only debate to reach a consensus but also a presentation by politics of already taken decisions, the experience is clearly based on heading towards a participatory democracy and have reinforced the role of civil society. Since 2002, French cities over 80.000 inhabitants must establish a new civic structure, very similar to Nantes' neighbourhood councils.

In 1999, a competition for the redevelopment of the island was finally announced. The local

council chose a procedure called "marché de définition", three teams of planners worked for a whole year with all the groups involved (civil society, civic associations, politicians, former industrial workers, investors, local entrepreneurs…), to reach consensus on the program, which was not fixed beforehand. Engaging society in a collective and progressive process that took into account everything that was already there was one of the preconditions of the selected project, by Alexandre Chemetoff. Although critics have arisen through the process, they have also contributed to the evolution of the project, making île de Nantes a very innovative restructuring strategy. (Fernández Águeda 2008; 2010; 2011a; 2011b)

Then there are categories of management or strategic procedures, which are very much interwoven. They accept shrinkage and experiment with strategies of adaptation:

**Lean city** - This strategy does not attempt to change the trend of declining population and economic base. It tries instead to adapt to conditions and use what is positive in that, on the basis that development does not have to assume continuous growth. Examples include developing green structure, utilizing existing empty buildings, promoting new types of collaboration and local economic initiatives.

Some cities have developed a holistic approach based on the resources and potentials that exist, for example, Cottbus and Eisleben. It is very hard to make a consistent strategic policy to manage shrinkage and not to be tempted or pushed back onto the growth path. This is why the decision to accept shrinkage and to adapt to it is very often connected to more cultural projects like in Dietzenbach, Aschersleben (all Germany) but also Parkstad Limburg (Netherlands) with the setup of an IBA (http://www.parkstad-limburg.nl/).

EXAMPLES

**Parkstadt Limburg, The Netherlands**
On September 24th, 2012 the government of the province Limburg, the authorities of the eight Parkstad-municipalities and the Parkstad-administration in a memorandum of understanding agreed to establish "IBA Parkstad 2020". It was perceived that structural changes in the estate sector and strengthening the economic structure – a process that occured in the recent five years, could receive a new strong impulse by the IBA Parkstad.



This is the image used on the website to advertise structural reinforcement: (http://www.parkstad-limburg.nl/index.cfm/parkstad-limburg/stadsregio_parkstad/iba)

The administration aims at investments of 45 million € from their own budgets topped by private and other public money, which is attracted by the common efforts. Creative cooperation,

strengthening of the regional identity and the pride of the regional actors in communication with international partners, especially the bordering region of Aachen will be more potentials for the creation of a sustainable future. The region hopes for similar effects as from the European Capital of Culture 2018 and the Floriade (Venlo 2012).

IBA Parkstad aims at spatial and procedural qualities, creative actors and innovative instruments. Three central topics are agreed upon: flexible city, energy city, recycle city: A scenario Parkstad Limburg 2030 discusses the sustainable future of the city (www.iba-parkstad.nl).

(http://www.iba-parkstad.nl/nieuws/erster-offizieller-schritt-auf-dem-weg-zur-iba-parkstad - German).

**Lutherstadt Eisleben, Germany**
Within the context of the IBA Urban Redevelopment 2010, an informal planning committee was founded. "Common Responsibility—Redeveloping Luther's Town" initiates an annual ideas and concepts workshop. This group includes town representatives, experts on monument protection, external planners and advisers, as well as building owners and landowners. These are both individuals and institutions, such as the Foundation for Luther Memorials. The planning committee eventually developed the idea of the "Luther Trail". It was first revealed to the public in a guided walking tour in 2006 using the motto "Walk with Luther—From Eisleben out into the World". Thus, remembering Luther becomes the conceptual base for the conversion of empty buildings or demolition sites.



(http://www.iba-stadtumbau.de/index.php?lutherstadt-eisleben-en)

**Aschersleben, Germany**
The area near the main through-road is particularly problematic. Seventeen thousand vehicles pass through every day. Homes were abandoned here because of traffic noise and exhaust fumes, leaving the town "frayed." The IBA Urban Redevelopment 2010 transformed this road from a traffic slum to a "stabilising ring."

In the road section called "Hinter dem Zoll," the experiment with the first DRIVE THRU Gallery was begun. The objective was to use the road as a public space, to show art and culture to appeal to people, particularly the young, and to give Aschersleben creative impetus. "Hybrid walls" showed exhibitions such as Hitzefrei by Christopher Winter and Feierabend by Andre Volkmann.

A light installation lit up the windows of empty buildings. The town's general public reacted strongly but ambivalently to the DRIVE THRU Gallery. There was criticism of the appropriateness of

spending money on the DRIVE THRU Gallery in view of the structural and social problems in Aschersleben.




The inner-city industrial wasteland of the Bestehorn family's cardboard factory is also located near the ring road. The IBA process developed this into the Bestehorn park education centre. The main buildings of this industrial monument were converted into school buildings and completed by a modern extension designed by Arno Lederer's architect's office. The open areas of Bestehorn park, which join the campus with the surrounding quarters, will be set out as a school park within the framework of the 2010 State Garden Show.

To the south, the ring around the old town is closed by the river Eine. At the Steinbrücke bridge, the course of the river, previously tunnelled over, has been opened up, and cycle paths have been installed on the riverbanks. This has proved popular with the citizens of Aschersleben.




(http://www.iba-stadtumbau.de/index.php?aschersleben-en)

**Heterogeneous configurations** - This strategy aims to, based on a formulated vision or issue for the city in question, coordinate a variety of measures to jointly meet the target image. Actions may be in different scales and with different audiences and funders, and treat issues such as housing

rehabilitation, small-scale trade, education, and ecological recovery. The actors are able to formulate clear and communicable vision targets and to coordinate implementation.

The International Building Exhibitions in Germany (IBA Internationale Bauausstellungen), are paradigmatic examples of constellation thinking, where Emscher Park, Fürst-Pückler-Land, and Stadtumbau 2010 in different and equally interesting ways handled the issue. The very concept of the IBA is to experiment when new challenging questions in the fields of architecture and urban planning/design arise. That there are so many IBAs at the moment (IBA Fürst-Pückler-Land and Stadtumbau both finished in 2010, still running is Hamburg, newly started Basel, Parkstad Limburg, Thuringia and Heidelberg), even crossing the German border is an indication that urban development is challenged by the transformation to the post-fossil society. Structural distortions like growth and shrinkage in closed proximity (even within one urban body), demographic disproportions and growing tensions between social groups are the content of this process. Competing for urban land is part of the power struggle between different interests.

The initiating actors of the three IBA mentioned (each time scientists working in transdisciplinary, experimental settings) put negotiation, cooperation, integration on the first position in their activities. This is why networking, communicating, organising participation were the main activities, very often supported by cultural (artistic, design) actions.

**New networks** - This strategy seeks to form new alliances between actors. This may include operational partnerships between government, research and towns, or between user groups, planners and commercial interests.

IBA Stadtumbau 2010 has not only brought together participating cities in a formal network, it has also managed to get various ministries of the federal state of Saxony-Anhalt to engage in open dialogue. On a planning level, some state-organized events, such as the City of 2030 and Wettbewerb Stadtumbau Ost, put forward new collaborations between professional groups. Planning Offices like Stadtbüro Hunger, Büro für urbane Projekte - Leipzig, Büro für Stadtplanung, -forschung und – erneuerung – Berlin, Büro für Siedlungserneuerung – Dessau, Raumpioniere – Berlin, Complizen – Halle/Berlin – in fact, all those successful in shrinking cities – work interdisciplinary. They are coordinating and vindicating partnerships between local stakeholders, such as in the city of Cottbus. Cultural projects like Hotel Neustadt (Halle/Saale) and 100qm Dietzenbach have had the same long-term performance.

In the following paragraph the case of the city **Dessau** is used to discuss some details of the development of a shrinking city. Dessau is a good example, because socio-cultural as well as green and physical structure components and their interconnection can be discussed.

The city of Dessau was described in the urban development concept from 2001 as "city of enlightenment, city of modernity, city of arms industry, socialist industrial city and city in change" and indeed with the beginning of the new millennium the massive disruptions in the physical as well as social and cultural tissue of the city became highly visible. Between 1990 and 2000 the number of inhabitants declined from 97.331 to 83.153, a loss of ca. 15 per cent (in reality nearer 20 per cent - considering the incorporation of neighbouring villages). In the housing sector this meant that by the year 2000 there were 5.859 empty flats (almost every sixth) in Dessau. Important to note that within the five years before 3.080 new flats were built, more than a third in 1- or 2-family homes, but also nearly a third by enlarging or upgrading existing buildings. Still, within five years half as many flats

were built as there were empty in 2000. The three main owners, the municipal housing company and two housing cooperatives holding 70 per cent of the rented flats (32 per cent owned by the city´s company), were alarmed and participated in informal talks. These led to a decision of the city council to stop all allocation of land for housing construction. Yet, even in 2011 there are valid allocation plans for 150 building plots and the plan for another 180 plots is scheduled.

Still, twelve years after the federal subsidy programme for demolition started about 3.600 flats were "taken from the market", e.g. demolished – the three main companies bearing most of the burden. With an average about 50 single family houses being built per year and the incorporation of some villages and the small town of Roßlau (ca. 12.000 inhabitants) Dessau has 53.249 flats today (2012), 14,7 per cent of which are empty. And there is no light at the end of the tunnel: No matter if calculated from the number of inhabitants or household numbers, considering secondary residences or not, there will be a backlog of something between 5 and 8.000 flats in 2025 if the demolition programme is not continued.

Turning to commercial and industrial sites one finds a similar picture: 2001 the city had almost 300 ha commercial area. Whilst the capacity of the smaller, inner-city areas were used to 81 – 92 per cent, the big new allocation at the former Junkers airfield (today offering capacity for sports and occasional small private aircraft) comprising 153 ha uses only 10 per cent of its capacity with 40 jobs being created. The five other areas being used by 3.880 employees. Even in 2012 not even 20 per cent of the commercial site "airfield" is in use. The incorporation of the villages north of Dessau brought some more industrial sites into the city, amongst them a traditional and very important bio-pharma-location, with reserve area to develop this specific branch. The demolition of old industrial buildings was costly and took a long time. It was only possible with subsidies from the federal government and the EU. It is not yet finished and more commercial sites being prepared on brownfields will hardly find investors.

To exacerbate the situation Dessau had lost its inner city in World War II and ever since felt the lack of a "real" city centre. Socialist town planning developed some large pre-fabricated blocks between the old town hall and a city park, which originated from the gardens of former urban palaces from classicism. When the debate on "Stadtumbau" = urban redevelopment, meaning overwhelmingly the demolition of housing stock started in Germany (2001 with the report of the "vacancy commission", installed by the federal minister for building and traffic) the majority of municipal politicians denied the necessity of the programme. Over time, when the programme was more and more accepted, the next ideology was that cities shrink from their ugly fringes with pre-fabricated building blocks on to their historic European city centres.

This was when Dessau took on a pioneering role. One precondition was obvious to everybody: Dessau does not have a centre to shrink towards. With support from the Bauhaus Dessau Foundation the city developed in partnership with the housing companies and further local stakeholder an integrated urban development concept based on the idea of landscape zones and urban cores.

The success of this idea was promoted by the fact that Dessau is embedded in the Dessau-Wörlitz Garden Realm, the creation of prince Franz of Anhalt-Dessau from the period of the enlightenment. Citizens are familiar with landscape elements like the oak quincunx and the trimmed edges of the scope of meadows. Yet, it was not easy to put the slogan "Where buildings fall, landscape emerges" into practice. Introducing landscape, wilderness in the city is also a competition for urban land. Green structures , sought for in large cities and advertised as a means for adaptation to climate change, cannot win support when they are seen as derelict brownfields, reminding people of the "glorious" past, when the city was still humming and growing. Citizens accept urban parks, trees and herbaceous borders along streets. They expect the lawns to be cut and the paths swept. – How much landscape can a city tolerate and what can citizens tolerate as urban green?



During the IBA Urban Redevelopment 2010 the development of urban cores and landscape zones was strongly supported by experts and a potent City Councillor for Building and Construction. Very intensive communication and a sincere support of participation of the inhabitants of the most concerned areas (a district office for urban redevelopment was established) led to acceptance and even engagement into the "claim"-action.

The city was rasterized in "pixels" of 400 m$^2$ – a size that is meaningful in the estate economy and imaginable for non-planners. Citizens can occupy a "claim" of 400 m$^2$, in this way claiming to have a say in their city´s development. Several inhabitants of Dessau used the chance and actually appropriated devastated areas. Five associations and seven single actors used 19 claims in 2010 for meeting friends, gardening, sports activities, environmental and energy education, contemplation, walking. The only preconditions being that the actor takes on responsibility for the piece of land,

does not build on it and keeps it in public use. These claims are provided free of charge under license agreement.

The municipality wishes to stimulate diverse usages, and therefore generally avoids imposing regulations and restrictions. The license agreement is supplemented by an informal "set of rules for cultural appropriation". Active partners, sponsors and benefactors were sought to give shape to and cultivate the succession landscape. The challenge for politicians, administration and community is to find new structures to govern the commons, to organise all the public activities of the citizens in a way that they are kept visible in a vast area with a smaller number of people. The activists in Dessau created reasons to go out and meet each other, to use an area without buildings and without being forced to consume. Instead they were productive, creating landscapes for their special needs.



Yet, Dessau is not the example of "best practise" either. After the presentation of the IBA Urban Redevelopment in 2010 the City Councillor for Building and Construction changed, the district office for urban redevelopment was closed for financial reasons and a majority of city councillors got back onto the "normal" paths: enough landscape now, let´s develop the building mass, support economic development and attract wealthy inhabitants and industrial investors. Another old industrial area was cleared and advertised for commercial investment. Old plans for residential construction sites re-activated – even an area just behind the dykes that almost broke in the Elbe river flood in 2002. The dyke was raised and people, who were not in Dessau in 2002, don´t know any fears.

Competing for urban land is a continuous process, determined not just by market forces but also by traditional socio-cultural habits and images.

## 6.4. Negotiation and cooperation as pathways to govern urban land as common good

A new factor emerges in planning with the appearance of "shrinkage", understood as a loss of functions and population (decline of industry, suburbanisation, demographic change etc.) in some regions in the 1970/80ies but predominantly with the end of the century. Planning has no instruments for this, because urban planning always was organising the growing amount of functions, interests and people within limited space. Now cities (and regions) experience an abundance of space, "under-used" cities and areas.

To start with this leads to even harder competition for urban space. Highly popular, ecologically precious, historically valuable areas are thrown on the market to attract investors, inhabitants, visitors, global or national or regional attention. A city admitting its shrinkage is out of the game. Yet, even at a later stage, when shrinkage is politically accepted, it is difficult to decide which use to allocate to which space. How much landscape – and which kind – is acceptable in a city? How to keep

up urban density with a loss of functions and population? The discussion is still quite new and experience yet to be gathered. The COST-Action "Cities Regrowing Smaller" will publish its results in 2013 with more examples of urban practices for adaptation to shrinkage.

Many of the cases reflected here allow the conclusion that competition for urban land and power driven realisation of different interests for using urban land will not lead to the aspired sustainable land use. The opposite seems to be true: patient negotiations, empathy for weaker actors and nature, strategic cooperation, supportive compromises – next, of course, to professional up-to-date planning instruments that can integrate a multitude of differing interests – these are the strategies and tools that lend themselves to sustainable urban land use. Elinor Ostrom´s work on "Governing the Commons" can be applied just as well as the experience of the Transition (Town) Movement (http://www.transitionnetwork.org/).

### EXAMPLE

**Transition Towns** (also known as Transition network or Transition Movement) is a grassroots network of communities that are working to build resilience in response to peak oil, climate destruction, and economic instability.

The term *transition town* was coined by Louise Rooney and Catherine Dunne. Following its start in Kinsale, Ireland it then spread to Totnes, England where Rob Hopkins and Naresh Giangrande developed the concept during 2005 and 2006. The aim of this community project is to equip communities for the dual challenges of climate change and peak oil. The Transition Towns movement is an example of socioeconomic localisation. In 2007, the UK-based charity Transition Network was founded to disseminate the concept of transition and support communities around the world as they adopted the transition model.

People get involved in their local Transition initiatives for a range of reasons. When Transition started it was framed very much as a response to peak oil and climate change. As time has passed and the idea has taken root in more and more places, it has been fascinating to see the wide range of reasons why people get involved: ... because of wanting a fairer world, because of Peak Oil, because it means people do the projects they've always dreamed of, because of climate change, because of the economic crisis, because it gives me hope ...
(http://www.transitionnetwork.org/)

Often bottom-up initiatives in neighbourhoods result in more sustainable characteristics of the area while fostering social cohesion among citizens in the process. Interestingly, many promising initiatives happen in areas confronted with demographic decline. It is a cost-effective way to improve the general quality of life in cities. Moreover, large-scale political action on sustainability can only be enforced if there is wide support for it among the population. Bottom-up initiatives can create such support, in tandem with the wider partnerships between business, research, civil society and policy-makers mentioned above - regional networks are a potential solution.

EXAMPLE

**Shrinking Areas. Front-runners in Innovative Citizen Participation**

Dealing with shrinkage is obviously closely related to local citizens. They are the owners of homes, the users of streets and the customers of shops and services. Shrinkage thus provides a major opportunity for governments to empower their citizens and truly strengthen the involvement of residents in local affairs. Local residents are very well able to come up with creative solutions to problems relating to the fact that their neighbourhood, city or region is shrinking.

Next to the early involvement of citizens it is the revitalisation of regional networks and the cooperation of different layers of government as well as of the business and civil sector, that is enabling a city to stand up to the challenge. Furthermore the changes in the housing market, rising costs of public services, businesses leaving the area, unemployment – are all policy areas that need to be tackled jointly, on the basis of strong and innovative partnerships that are able to look beyond tomorrow towards a sustainable future.

Thinking of shrinking cities as breathing cities, full of new possibilities, might push the discussion of shrinkage into a more positive direction and might make politicians, scientists and all the stakeholders consider if lessons learned in shrinking cities might not also be beneficial in growing cities. Citizen´s participation, cross-sector strategies and integrated planning surely are. (http://www.eukn.org/E_library/Social_Inclusion_Integration/Community_Development/Citizens_Participation/EUKN_Key_Publication_2012_Shrinking_areas_front_runners_in_innovative_citizen_participation )

In regions of growth, faced with continuous scarcity of construction land and high prices, actions are undertaken for inner urban development, increasing the density and reusing brownfields lead to some success. In regions and cities with stagnating or even declining claim for construction plots decision makers often react with new allocations without seriously considering other options. The competition of the municipalities for investment and inhabitants leads to the intensification of the competition for urban land. Allocation and site preparation in times of non or hesitant demand adds to the budget deficits, often enough the development costs cannot be refinanced, the existing real estate lose value, diminishing the credit-worthiness of the owner and threatening pension funds. At the same time maintenance costs for infrastructure rise and lesser users must bear them.

The way out is regional control of land allocation in the form of cooperation between municipalities or by governmental regulation. But also the reconsideration of subsidies and national or regional support for municipalities, which should no longer be bound to the number of inhabitants or the like, is needed. Subsidies must be adjusted to the needs of cities and the evaluation criteria derive from the content and include qualitative measures.

Part of these adaptive measures is the diversification of economy in the cities supporting them to become less vulnerable to global economic crisis. This means integrating small enterprises, using local resources, focussing ethnic and caring economic activities. All these procedures need cooperation of the different stakeholders.

EXAMPLE

**URBAMECO –promote local economic development**

The URBAMECO project aimed at economically viable, socially just and ecologically sustainable development, achieved by governance, politics and democracy. The main idea was to create osmosis among connected and disconnected communities within an urban region, finding measures or projects to create flows of resources, along which economic and spatial effects trickle down into all quarters of a city.

The team suggested promoting local economic development within integrated urban regeneration claiming that the "sustainability triangle" must be further developed to overcome the domination of the economy and the separated management of the different spheres. Local Action Plans were drawn up to provide the city with a concrete roadmap and a range of solutions to tackle the problems identified. The instruments/means used were: economic profiling, inclusion of situated knowledge, appreciation of local/personal capacities (including the consideration of gender and ethnic economy), combination of new ideas and past experience, acknowledging the existing individual and collective instrument and integrating urban policies.

More specifically URBAMECO called attention to support for existing resources and capacities even if they appear to be small: create a favourable climate for new projects and self-employment, combine endogenous and exogenous structural improvements. To put neighbourhoods in a better position, assist local initiatives and offer incentives to informal economic systems to further develop. For these purposes also non-financial support, empowerment and mentoring are appropriate tools.

(http://urbact.eu/fileadmin/Projects/URBAMECO/events_media/MA3.pdf)

But as always there are different solutions: Not just the support of the local economy also the direct backing, encouragement and empowerment of the community leads to cooperative, lively neighbourhoods. A good example, Coin Street Community Builders (CSCB) is a social enterprise and development trust which seeks to make London's South Bank a better place to live and work in and to visit. Since 1984 CSCB has transformed a largely derelict 13 acre site into a thriving mixed use neighbourhood by creating new co-operative homes; shops, galleries, restaurants, cafes and bars; a park and riverside walkway; sports facilities; by organizing festivals and events; and by providing childcare, family support, learning, and enterprise support programs. The success is amongst other factors owed to the strong ties to the local community. The company was established by local residents in 1984 following a campaign against large scale office proposals. It is controlled by a Board, which only people living locally can elect. Profits are not distributed but are ploughed back into CSCB's public service objective. Tied to this enterprise is the Coin Street Secondary Housing Co-operative (CSS), an Industrial and Provident Act Society registered with the Tenant Services Authority as a social landlord. It was established to meet the housing need by promoting, developing and supporting housing co-operatives. It provides advisory, training and management services to housing associations. Furthermore a charity was created that currently oversees Coin Street family and children's centre and Colombo Street community and sports centre. In the future the Trust will also offer a sports and leisure programme from the public swimming and indoor leisure centre being planned as part of CSCB's Doon Street development.

One of the main guarantees for the continuous development is the remarkable network, which over the last two decades has integrated organisations and individuals with an interest in the future of London's South Bank. (http://www.coinstreet.org/)



EXAMPLE
**Coin Street Community Builders**

Coin Street Community Builders own and manage a range of indoor and outdoor spaces for hire, from flexible conference and meeting rooms to contemporary gallery space to riverside parks and gardens, as well as 220 homes at affordable rents for people in housing need. (http://www.coinstreet.org/images/images.html)

# 7. Urban Green-blue Infrastructure

The green-blue infrastructure inside and around cities has turned into a prominent topic in European urban policies and such infrastructure has emerged as a valuable tool to strengthen urban ecosystem services and urban resilience. Many countries and regions have elaborated programmes and action plans to enhance ecological coherence and connectivity. And a number of cities have already included green-blue infrastructure into their strategic plans.

The current interest in urban ecosystem services has its roots in previous developments in urban planning, going back at least to Frederick Law Olmsted in the late 19th century and including the green advocacy movements of the 1950s and -60s that emphasized the need for parks and open space to provide benefits for urban residents. With the migration into cities in the 21st century, and awareness of that with such concentration of population, cities are the points of greatest environmental impact (Newman 2006; Rees 1996); there is a need for cities to develop knowledge and capabilities to systematically reengineer their built environment and urban infrastructure in response to climate change and resource constraints.

Cities are more and more adopting programmes for increasing renewable and distributed energy systems, carbon and waste reduction, and water savings. An important component of these strategies is the use of green- blue space in new ways, including the utilization of biological processes to address urban stressors and reduce waste. This reflects a general shift toward the instrumentalisation of nature for human benefit – ecosystem services – that was first codified globally by the Millennium Ecosystems Assessment (MA), considered the ecological equivalent of the IPCC work on climate change. The MA was an important global milestone attempting to parse out the different services nature provides humans: provisioning, regulating cultural and supporting services (Millennium Ecosystem Assessment 2005)[2].

## 7.1. Key messages

> KEY MESSAGE 1: Urbanization is both a challenge and an opportunity for management of ecosystem services globally, regionally and locally.

> KEY MESSAGE 2: Planning for, developing, and maintaining functioning urban green-blue infrastructure can significantly enhance human health and wellbeing.

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[2] The MA was called for by the United Nations Secretary-General Kofi Annan in 2000. Initiated in 2001, the objective of the MA was to assess the consequences of ecosystem change for human wellbeing and the scientific basis for action needed to enhance the conservation and sustainable use of those systems and their contribution to human wellbeing. The MA has involved the work of more than 1,360 experts worldwide, and included a vast number of sub-global assessments of which the Stockholm Metropolitan Area was one of the few urban-oriented projects (see e.g. Colding et al. 2006).

KEY MESSAGE 3: Urban ecosystem services and urban blue-green infrastructure can significantly contribute to climate change mitigation and adaptation

KEY MESSAGE 4: Ecosystem services and biodiversity must be integrated in urban policy and planning. Successful management of ecosystem services and urban blue-green infrastructure should be based on multi-scale, multi-sectoral and multi-stakeholder involvement

The following chapters will focus on research, policy and practice related to the key-messages. An additional chapter will deal with **HOW TO VALUE ECOSYSTEM SERVICES - INTEGRATED DATA AND MONITORING.**

## 7.2. Urbanization - challenge and opportunity for ecosystem services

Urbanization is both a challenge and an opportunity to managing ecosystem services globally, regionally and locally. The Millennium Ecosystems Assessment (MA) was developed for non-urban ecosystems, but the approach – identifying under- or unvalued benefits of ecosystems– is increasingly being applied in cities.

**CLASSIFICATION OF ECO SYSTEM SERVICES**

- *Provisioning services*- products obtained from ecosystems like food, fibre and energy.
- *Regulating services* – benefits from regulation of ecosystem processes like air and water infiltration.
- *Cultural services* – nonmaterial benefits from ecosystems, like spiritual enrichment, cognitive development, recreation and aesthetic experiences.
- *Supporting services* – necessary for the production of all other ecosystem services.

(MA 2005 www.millenniumassessment.org/en/GraphicResources.html)

Knowledge about the **provisioning services** is fairly good. It is easy to understand that ecosystems provide the conditions for growing food in managed agro-ecosystems, marine and freshwater systems or forests as well as for producing raw materials for construction and fuel including wood, biofuels and plant oils that are directly derived from wild and cultivated plant species. Ecosystems - especially those with high biodiversity - provide many plants used in traditional medicines and also the raw materials for the pharmaceutical industry. Ecosystems also play a vital role in the global hydrological cycle, as they regulate the purification and provision of water

The **regulating services** often derive from complicated processes that we often take for granted and rarely notice. Trees not only provide shade but also help lowering both temperature and wind velocity. Forests and other vegetation influence rainfall and water availability both locally and regionally. Trees or other plants also play an important role in regulating air quality by removing pollutants from the atmosphere.

Ecosystems regulate the global climate by sequestering and storing greenhouse gases. As trees and plants grow, they remove carbon dioxide from the atmosphere and lock it away in their tissues. In this way forest ecosystems are carbon stores. Biodiversity also plays an important role by improving the capacity of ecosystems to adapt to the effects of climate change. Furthermore ecosystems and living organisms create buffers against natural disasters, thereby preventing possible damage. For example, wetlands can soak up storm water thus preventing flooding and trees can stabilize slopes to prevent landslides.

Ecosystems such as wetlands filter both human and animal waste and act as a natural buffer to the surrounding environment. Through the biological activity of microorganisms in the soil, most of the waste is broken down. Soil erosion is a key factor in the process of land degradation and desertification and here vegetation cover provides a vital regulating service.

Insects and wind pollinate plants and trees which is essential for the development of fruits, vegetables and seeds. Animal pollination and seed dispersion are ecosystem services mainly provided by insects but also by some birds and bats. Ecosystems are important for regulating pests and vector borne diseases that attack plants, animals, and people. This is achieved through the activities of predators and parasites - birds, bats, flies, wasps, frogs and fungi all act as natural controls.

**Cultural services** are associated with our culture and cultural history. Language, knowledge and the natural environment have been intimately related throughout human history. Biodiversity, ecosystems and landscapes have been the source of inspiration for much of our art, and culture. In many parts of the world natural features such as specific forests, caves or mountains are considered sacred or have a religious meaning. Nature is a common element of all major religions and traditional knowledge, and associated customs are important for creating a sense of belonging

EXAMPLE

The **Woodland Cemetery in Stockholm** is a World Heritage site where adventures, cultural and natural values are integrated. The cemetery, which opened in 1920, was created by the architects Gunnar Asplund and Sigurd Lewerentz. On the pine-covered boulder ridge of about 100 ha the two architects created a sacred landscape with several smaller chapels arranged in harmony with nature. The old open-standing sunlit pines have very high conservation values. (www.skogskyrkogarden.se/en)



Walking and playing sports in green space is not only a good form of physical exercise but also lets people relax. The role that green space plays in maintaining mental and physical health is increasingly being recognized. Ecosystems and biodiversity also play an important role for many kinds of tourism which in turn provides considerable economic benefits and is a vital source of income for many countries.

**Supporting services** are necessary for the production of all other ecosystem services. Habitats provide everything that an individual plant or animal needs to survive: food, water, and shelter. Each ecosystem provides different habitats that can be essential for a species' lifecycle. Migratory species including birds, fish, mammals and insects all depend upon different ecosystems during their movements. Genetic diversity is the variety of genes between and within species populations. Such diversity distinguishes different breeds or races from each other thus providing the basis for locally well-adapted cultivars and a gene pool for further developing commercial crops and livestock. Some habitats have an exceptionally high number of species which makes them more genetically diverse than others and are known as "biodiversity hotspots".

**Cities and Biodiversity Outlook, CBO** (Cities and Biodiversity Outlook 2012) is the first global assessment of the links between urbanization, biodiversity and ecosystems carried out by combining science, policy and practice. More than 75 scientists and policy-makers from around the world have summarized how urbanization and urban development affect biodiversity and ecosystems. Cities, local authorities and subnational governments have contributed with their practices and lessons learned on how to incorporated ecosystem services in urban agendas and policies.

There is an increasing interest in expanding green spaces and constructed green-blue infrastructure in cities to mitigate rapid urbanization and associated environmental problems. Also shrinking cities, where there is less pressure on land, are beginning to see the benefits of improving their green-blue infrastructure. However, cities are currently designing and implementing urban greening programmes under considerable uncertainty regarding the impacts of green space on the environment, and also the capacity of current institutions to fund and manage extensive green-blue infrastructure (Pincetl et al. 2012; Pincetl 2010).

Yet, new and on-going research is gradually clarifying the technical and ecological aspects (see e.g. (Pierce 2010, Noreng et al. 2012) and experience from pilot projects give valuable insights (e.g. Berlin, Birmingham, Glasgow, Helsinki, Malmö, Seattle, Stockholm and Vancouver).

EXAMPLE

**The Stockholm region** is structured around transport lines and **green wedges**, large coherent green spaces connected to the built up areas. The star-shaped built up structure provides good access to large and varied natural areas and waters for the inhabitants, even in the region's most densely populated parts. This is unique to a metropolitan region the size of Stockholm (2.1 million inhabitants). The value and function of the wedges are strongly linked to the built up areas and people living there. The wedges can be perceived as an integrated part of the local green-blue infrastructure of parks and green-blue spaces or as barriers between residential areas. (RUFS 2010)
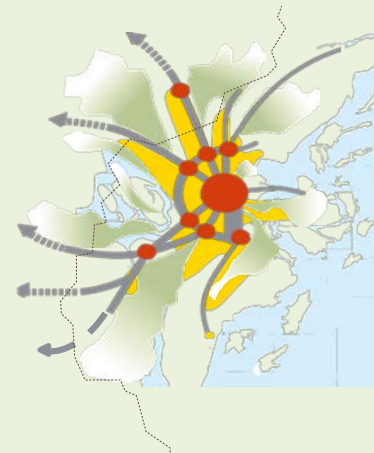


Cities and the related processes of urbanization and des-urbanization alter and transform terrestrial ecosystems, and this is particularly noticeable in biodiversity rich areas (Sala et al. 2000).While

urbanization displaces many species we also know that other species have evolved adaptive responses to not only survive but actually thrive in cities. Novel plant and animal communities have evolved in urban areas often through active management by humans and society. Residential gardens and parks, for example, have become important reservoirs for populations of bees and other pollinators that find it difficult to survive under modern intensive agriculture. Innovations such as green roofs and green walls and human interventions such as supplementary feeding and watering offer new habitats that may be quite different from those in more natural ecosystems. However, not all developments of "urban nature" are beneficial. New "alien" species may threaten the native flora and fauna, for example by bringing about pests or allergens that can be harmful also to humans.

Cities thus represent a new class of ecosystems shaped by the dynamic interactions between ecological and social systems (Cities and Biodiversity Outlook 2012). Also, urban ecosystems are not simply natural, freely producing services that benefit urban residents since there are significant costs associated with designing, creating and managing these novel ecosystems. Urban ecosystems are above all a new "thing" whose services are contingent on factors that ecosystem science has traditionally not taken into account. New ecological science is therefore needed to address novel and heretofore not researched types of ecosystems and green spaces present in cities (Grimm and Redman 2004).

An additional challenge is to join green spaces with traditional grey infrastructure, to create hybrid grey-green-blue systems that function to retrofit cities for greater sustainability and resilience. This coupling of grey, green and blue poses technical, administrative, budgeting and aesthetic challenges that are often overlooked (Pincetl et al. 2012).

Such urban retrofit requires rethinking the role of non-profit organizations, traditional city administrations, and the business community. These stakeholders sometimes interact uneasily, which poses challenges for democracy, transparency and legitimacy.

### EXAMPLE



In the U.S., and especially in California, the urban green infrastructure agenda has been pioneered by **non-profit organisations**, largely tree planting groups. Now supported by U.S. Forest Service research and "tool" development (models that generate the value of urban trees), these groups have influenced ideas of urban sustainability and made planting trees in cities the sine-qua-non of urban green space and urban ecosystem services. (www. vibrantcities.org)

## 7.3. Urban green-blue infrastructure and quality of life

Planning for, developing and maintaining functioning urban green-blue infrastructure can significantly enhance human health and wellbeing. There is growing international recognition of the vital links between **human health and nature**. The evidence base supporting this claim has grown considerably in recent years, with high profile studies highlighting the links between access to green space or having views of nature and health and wellbeing. Already in the 1980s researchers learned that most natural sceneries produced positive emotional states and helped to calm stress (Ulrich 1984). Several Scandinavian studies have demonstrated that access to green areas enhance the cognitive abilities of both preschool children (Söderström et al. 2004) and the elderly (Ottosson and Grahn 2006). Other studies stressed the importance of therapeutic gardens for mentally ill and "burned out" people (Ottosson and Grahn 2008).

These kinds of studies have been duplicated in other countries with similar results (see e.g. Gilchrist 2011). A recent Belgian study investigates the nature of the relationship between the greenness of the local environment and the health and wellbeing of its inhabitants by looking at a number of possible mediators, such as physical activity, perceived stress, ability to concentrate, social cohesion and neighbourhood satisfaction. Among the specific (environmental and social) neighbourhood qualities studied, perception of neighbourhood greenness was found to be the most important predictor of neighbourhood satisfaction (van Herzele and de Vries 2012).

An experiment in the U. S. was used to test whether a major change to the natural environment - the loss of 100 million trees to the emerald ash borer, an invasive forest pest - has influenced mortality related to cardiovascular and lower-respiratory diseases. Researchers found an increase in mortality related to cardiovascular and lower-respiratory-tract illnesses in counties infested with the emerald ash borer. The magnitude of this effect was greater as infestation progressed and in counties with above-average median household income (Donovan et al. 2013). However, there is also opportunity and hope.

EXAMPLE

The **Healthy Parks, Healthy People** initiative was launched in 2000 by the park management agency of the State Government of Victoria, Australia, in order to emphasize the value of visiting parks and natural open spaces as healthy places for body, mind, and soul. As it gained momentum, the programme served as springboard to a partnership with a national health insurance provider, which is now funding public activities to encourage people to increase their physical activity by visiting and engaging in activities in parks (Maller et al. 2008).
(www.nps.gov/public_health/hp/hphp.htm)



The Healthy Parks, Healthy People Programme has now been expanded to a number of other countries.
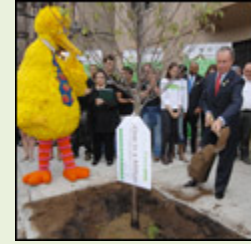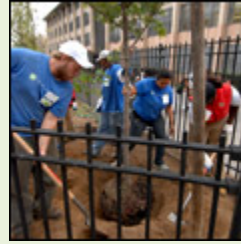
**The MillionTreesNYC** initiative is harnessing both public-and private sectors to plant a million new trees in the city by 2017. The project will provide immediate greening to more streets, and offer further opportunities to study the benefits of urban nature for health (www.milliontreesnyc.org/html/home/home.shtml).

Many research papers related to urban tree planting and establishment have been published lately. Major topics include causes of deep root systems, load-bearing soils, estimation of root space requirements, installation of root paths, use of pervious pavements, prevention of root defects in containers, a new bare root transplanting method, use of soil applied growth stimulators at planting, effectiveness of support systems, effects of mulch on soil biology, and new perspectives on tree selection (published research is summarized in Watson 2011).

The most commonly articulated link between urban green space and human wellbeing in current urban planning is through so called cultural ecosystems services for recreation and health (Tzoulas et al. 2007; Maas et al. 2006; Swanwick et al. 2003). Also provisioning services, like food production in home gardens and allotment gardens (Altieri et al. 1999; Krasny and Tidbell 2009) and links to biodiversity conservation has been in focus (Goddard et al. 2010; Galluzzi et al. 2010; van Heezik et al. 2012).

The current trend of consolidation and densification of city structures will cause conflicting interests between various urban land uses – a prominent consequence being the loss of urban green space and the ecosystem services it provides. In the **KatuMetro project** researchers are investigating the importance of urban green space in mitigating various environmental problems caused by urbanization. Special emphasis is put on ecosystem services - their ability to improve human wellbeing and enhance the sustainability of urban areas in northern latitudes. Pivotal questions are: Considering the plans towards urban densification, are ecosystems services worth a penny in the urban planners' agenda? Does the conceptual complexity of "ecosystem service" hinder its applicability to urban planning? (www.helsinki.fi/urbanecosystems/index.htm)

There are numerous areas where spatial planners can make a difference to our lives. Health and environmental inequalities are interlinked and poor environments contribute significantly to both poor health and health inequalities. Spatial planning has a clear influence on healthy choices made by individuals, highlighting issues like the location, density and mix of land uses, street layout and connectivity, access to public services, local fresh food and other services, safety and security, open and green space, air quality and noise, community interaction and transport (Barton 2010; Marmot and Bell 2011).

EXAMPLE

The UK Spatial Planning and Health Group (SPAHG), which include academics, practitioners and community representatives, seek to improve public health through the positive use of spatial planning. In 2011 they published **"Steps to Healthy Planning – Proposals for action"**.

- Action 1: Designing in Health
- Action 2: Sustainable Communities Strategies and Health
- Action 3: Local development frameworks and core strategies
- Action 4: Evidence used as the basis for local development frameworks and core strategies
- Action 5: Scoping plan and project appraisals
- Action 6: Integrating health assessment
- Action 7: Health promoting design principles
- Action 8: Development design, management and control
- Action 9: Monitoring and review
- Action 10: Health and planning capacity and collaboration
- Action 11: Training and professional development
- Action 12: Research and evaluation

These action points provide a clear and concise way for planning and health professionals to work together (www.spahg.org.uk).

**Making Places Profitable – Public and Private Spaces (MP4)** is an Interreg project focusing on innovative approaches for planning, designing, maintaining and using public places. The project demonstrates how open space improvements offer positive socio-economic benefits, and how the benefits offered to key communities can be maintained in the long run ("place-keeping"). The project has created model agreements for partnerships and social enterprises that are transnationally transferable. It has also developed an EU-level Agenda for place-keeping and mainstreamed best practice across the North Sea Region. (www.mp4-interreg.eu)

EXAMPLES

In the densely populated province of **Limburg, Belgium**, a local NGO convinced policy makers in 2006 with an economic argument (job creation) to create Belgium's first national park: Apart from protecting biodiversity, **the Hoge Kempen National Park** created some 400 jobs and stimulated private investment in tourism in this de-industrialised region. Tourists appreciate the recovering nature in former coal mines for its particular landscape and biodiversity values (Schops 2011).

A similar example is the peri-urban park **"Silesia" Metropolis, Poland** described in chapter 6.

Given the current economic climate, stalled development spaces are a persistent feature of our cities and are likely to remain so for a foreseeable future. If left to fall into dereliction, these spaces will have detrimental effects on local neighbourhoods in terms of individual and community health and wellbeing, local economic activity and environmental quality. The development of temporary green space uses for **stalled spaces** offers a variety of opportunities to deliver social, environmental and economic benefits. There are, however, some significant (real and perceived) obstacles to developing

temporary uses for stalled spaces. These often relate to fears that spaces which become temporary green spaces will be difficult to return to development or concerns that financial or legal liabilities will fall on site owners. A Greenspace Scotland report outlines a range of approaches and projects from Scotland, the UK and elsewhere in the world. It suggests priority actions like awareness raising, design guidelines, legal and technical guidance and incentives of different kinds. (www.greenspacescotland.org.uk/SharedFiles/Download.aspx?pageid=133andmid=129andfileid=126).

However, especially in shrinking cities there are often no future constructions or commercial uses to be foreseen and established solutions such as green spaces or new parks can no longer be financed. To avoid spontaneous succession, rubble vegetation and a state of neglect (overgrowth) "**controlled urban wilderness"** might offer a solution if seen as a new structuring element in urban planning (Rink 2009).

> EXAMPLE
>
> The **city of Dessau,** with support from the Bauhaus Dessau Foundation; developed an integrated urban development concept in partnership with the housing companies and other local stakeholders. The concept was based on the idea of **landscape zones and urban cores**. The city was rasterized into "pixels" of 400 m$^2$ and citizens could claim a pixel for meeting friends, gardening, sports activities, environmental and energy education, contemplation, walking etc. (See section 6.3.).

## 7.4. Urban ecosystem services, blue-green infrastructure, and climate resilience

Urban ecosystem services and urban blue-green infrastructure can significantly contribute to climate change mitigation and adaptation. Building urban resilience by way of strengthening ecosystem services enhances the reliability of a city´s performance over time, making it better apt to endure (rapid) change. Resilience depends on the capacity to anticipate and plan for the future. Creating cities that can cope with climate change requires building resilience into urban land-use planning and management, to take care of mitigation opportunities and adapt to reduce vulnerability. Resilience is not to be an add-on but rather an integral part of urban planning and management.

> QUALIFYING AND QUANTIFYING RISK
>
> The Urban Risk Assessment is a standardized tool to access urban risk and identify areas and populations that are the most vulnerable. It will assess exposure and vulnerability of specific assets and populations, analyse institutional capacities and data availability, and quantify city vulnerability through the application of a base-line benchmarking approach. (www.kcccc.info)

**Cities of the Future** is a Norwegian initiative where the Norwegian government cooperates with13 towns and three private financing organizations in order to reduce greenhouse gas emissions and simultaneously work out strategies to meet climate change. Government and towns work together to both implement and create national policy (www.regjeringen.no/nb/sub/framtidensbyer). One of four key areas is climate adaptation where green-blue structures play an important part. Green roofs

constitute a win-win solution with regard to rain- and storm-water management, insulation and reducing the urban heat island effect. The solutions are closely accompanied by research. An example is a recent report on green roofs, their run-off effect, which plants are suitable on extensive and intensive green roofs (Noreng et al. 2012).

EXAMPLE

**Retrofitting Urban Parks** to deliver climate change actions is a resource structured around "before" and "after" pictorial representations of a typical urban park. From these images, you can link to descriptions of climate change actions for following key components of urban parks:



• buildings and built features • community growing • grassed areas • lighting • parking• paths • pitches • planted beds • play areas and multi-use games areas • ponds and associated wetlands • trees and woodland • watercourses and associated wetlands • park-wide and non-site specific actions. (www.greenspacescotland.org.uk/climate-change-parks.aspx)

In the Helsinki Metropolitan area long-term socio-ecological research focuses on the interrelationship of ecological (ecosystem services and biodiversity), socio-political (land use patterns and neighbourhoods) and economic changes (urban growth and economy) in urban environments, and the policy implications of these developments.

In the **VACCIA research programme** (Assessment of Climate Change and Land Use Impacts in Urban Environments) researchers aim at finding ecologically, economically and socially sustainable ways of planning and building urban areas, while simultaneously addressing the interactions between climate change, runoff water, land-use and land-cover change. The city of Lahti and the Kumpula-Arabianranta area in Helsinki were selected as pilot grounds. The aim is to study changes in land use, socio-economic development and environmental outputs (for example those measured in urban run-off waters, soil and biodiversity) in selected urban areas representing different patterns and densities of land use as well as different eras of urban planning. (www.helsinki.fi/urbanecosystems)

Urban green and their ecosystem services are increasingly being integrated into buildings. Already in1998 **Eco-city Augustenborg** in Malmö, Sweden was one of the pioneers combining green roofs and open storm water system with dams and channels in a system that has solved the area's flooding problems. Its Botanical Roof Garden offers 9,500 m² of green roof areas of various kinds.

There is plenty of both research and experiments going on in Europe and elsewhere regarding green roofs and green walls. Researchers are trying to find out suitable growing media and plant palettes reflecting native conditions. Edible green screens as well as hydroponic agriculture are other expanding research and experimentation areas.

More people than ever are growing food in cities, on windowsills and rooftops and in residential and community gardens. **Urban farming** is a response to a variety of pressures. Large parts of the developing world are facing shortages of both water and arable land. In the developed world, small-scale urban farms are seen as an antidote to the excesses of industrialized agriculture, including chemical fertilizers that pollute waterways and the high costs - both monetary and environmental - of transporting food to urban markets. The world is estimated to already have 800 million urban farmers and, although data is sketchy, they could account for 20 per cent of overall global agricultural production (Nierenberg 2013).

However, to feed a substantial part of a city's population there is a need for more advanced farming and gardening methods. Professor Dickson Despommier at Colombia University challenged his students to feed the population of Manhattan (approx. 2 million people) using 13 acres (5.3 ha) of usable rooftop gardens. The students calculated that, by using rooftop gardening methods, only 2 percent would be fed. Despommier then made an off-the-cuff suggestion of growing plants indoors, vertically. The idea sparked the students' interests and gained major momentum. By 2001 the first outline of a vertical farm was introduced and today scientists, architects, and investors worldwide are working together to make the concept of vertical farming a reality (Despommier 2010).



Vertical farming is not a new idea; it has existed at least since the Hanging Gardens of Babylon. Architect Ken Yeang proposes that plant life should be cultivated within open air, mixed-use skyscrapers. His version of vertical farming is based upon personal or community use rather than on wholesale production and distribution that aspire to feed an entire city (www.kenyeang.com).

**Natural Green Farms in Racine**, Wisconsin, USA, is a vertical greenhouse in an urban environment. The plant does not quite live up to Despommier's vision of a greenhouse skyscraper since it is a combined salad and fish plant, housed in a four-storey factory building. The lettuce is grown hydroponically and the water from the fish farm is used as fertilizer. The plant produced 7,000 heads of lettuce per month. But the power consumption has been a major concern. The electricity bill for lighting in the dark industrial premises meant that business margins were too small and currently the farm is fallow. A U.S. scientist calculated that Natural Green Farms used 3.5 times more energy than

conventional greenhouses and fish farms require. In comparison with conventional outdoor cultivation and wild fish, the plant consumed as much as 33 times more energy (Nyström 2013).

In 2009, the world's first pilot production system for vertical farming was installed at **Paignton Zoo Environmental Park** in the U.K. The project showcased a technological solution for vertical farming and provided a physical base to conduct research into sustainable urban food production. The produce is used to feed the zoos animals while the project enables evaluation of the systems and provides an educational resource (Frediani 2011).

EXAMPLE

**Plantagon, Linköping Sweden**

In the beginning of 2012 the construction of Sweden's first urban vertical greenhouse – a 16 storey high building combining greenery and office space - started. The crops will be grown hydroponically in boxes filled with pumice stone instead of earth.

The company has partnered with the municipally owned energy company in Linköping. The idea is to use the carbon dioxide formed during digestion in the energy company's biogas plant, a now completely unused residue. In addition, the greenhouse will be heated using waste heat from the energy company's district heating plant (www.plantagon.com).



*The Plantagon Greenhouse - updated Linköping model with greenhouse and office area combined. View from the south side, showing the greenhouse part of the building. Ill: Sweco.*

If vertical farming is still at an experimental stage rooftop farming and gardening is rapidly gaining momentum not least in the U.S.

**Gotham Greens** is a 2000 square foot greenhouse on the roof of an old industrial building in Brooklyn, New York. The greenhouse produces around 100 tonnes of vegetables a year, mainly different lettuce varieties and basil. Crops are grown hydroponically and a photovoltaic system generates a large portion of the electricity needed to heat crops during winter (http://gothamgreens.com)

Proximity to consumers enables the company to deliver its products the same day they are harvested. The business is profitable and the company is selling everything they produce. Gotham Greens will soon open several new rooftop greenhouses, and other companies have similar plans. One of them, **Bright Farms**, has announced that they plan to build the world's largest rooftop greenhouse on top of an old warehouse in New York harbour. The greenhouse will have an area of 90,000 square metres. There are also plans to build rooftop greenhouses on supermarkets. The idea is that supermarkets would not have to pay for the facilities, but they must commit to sell greenhouse products (http://brightfarms.com/s/).

## 7.5. Integrated urban policy and planning - multi-scale, multi-sectoral and multi-stakeholder involvement

Ecosystem services and biodiversity must be integrated in urban policy and planning. Successful management of ecosystem services and urban blue-green infrastructure is based on multi-scale, multi-sectoral and multi-stakeholder involvement.

Presently, peri-urbanization is one of the most pervasive processes of land use change in Europe with strong impacts on the environment, ecosystem services and quality of life. The peri-urban - a transition zone where rural and urban features co-exist - is growing even in shrinking cities. In growing cities it is a potential zone of innovation and knowledge-based and globalized enterprise, but it also attracts new types of housing, transport infrastructure and multifunctional agriculture, with a diverse range of recreation sites and ecosystem services. However, there is also an obvious risk of urban sprawl. Since the mid-1950s European cities have expanded on average by 78 per cent whereas the population has grown only by 33 per cent (EEA 2006). A more balanced and sustainable pattern of development needs to be supported through a more stringent policy focus, not only on peri-urban areas, but also on the wider surrounding rural-urban region (Piorr et al. 2012).

The **PLUREL** project presents a novel, future oriented approach to the planning and management of peri-urban areas with a main focus on scenarios and sustainability impact analysis. The research focuses on the future by linking quantitative scenario modelling and sustainability impact analysis with qualitative and in-depth analysis of regional strategies, also including a study at European level with case study work (Nilsson et al. 2013).

### EXAMPLE

In **The Hague Region farmers** are rewarded for their improvement of the landscape, so-called Green and Blue Services. The system was instituted by a fund created by a number of municipalities from their revenues of housing projects. The Green Blue Service strategy provides an alternative to land purchase since the farmers gain extra income. The strategy is tailored to farmers' entrepreneurship. They negotiate the design, the measures and the price. The strategy contributes to maintaining agriculture, but also to biodiversity, recreation and tourism. There is an interest from both farmers and authorities to develop the model further as well as to fill the "green funds" with money. However, the strategy needs complementary measures, such as land banking to make a real difference (Aalbers and Eckerberg 2010).

### EXAMPLE

The **Montpellier Agglomeration** has an active policy for protection of agricultural land use in the urban fringe. Besides land use zoning, land price regulation and stimulation of shorter channels from farmer to consumer **an agri-park** is developed **in North Lez**. The agri-park concept relies on multifunctional land use, where recreational and other social functions are integrated in the agricultural production and farming as a cost-efficient way of protecting and maintaining open spaces in the urban fringe (Buyck et al. 2008).

Regional visions and planning regimes are important. In the Netherlands model studies show that many "buffer zone" areas between cities are likely to urbanize if regional and local governments relax planning controls (Kuipe and Evers 2002).

In many European countries urbanization may have come to an end, but urban growth has not. We are continuously using more and more urban land per capita, and the pace is increasing. A driving force behind this trend is the emergence of metropolitan regions, integrating vast parts of rural areas into the urban system. Agricultural and nature areas are thus under significant transformation pressure and growth management strategies are necessary to secure balanced and sustainable future development throughout the whole of urban regions (Fertner 2012).

The German federal government has set the goal of reducing land consumption for new settlement and transport-related areas from about 115 hectares per day in the year 2002 to 30 hectares per day by 2020. In order to provide a scientifically reliable basis for decisions and measures, the **REFINA programme** (2006-2012) supported the development and testing of innovative concepts for the reduction of land consumption. Throughout the Germany, the programme covered over 110 projects in some 45 research consortia and single projects. However, in spite of the ambitious efforts Germany is not likely to reach the goal. (See www.umweltbundesamt-daten-zur-umwelt.de/umweltdaten/public/theme.do?nodeIdent=2898).

A significant proportion of brownfield land, specifically in areas with shrinking populations, is not commercially viable to bring back into beneficial use. Without some form of public intervention these sites will remain unused, and potentially derelict, for a foreseeable future. The consequence is blight on the surrounding areas and communities. High costs of reclamation or redevelopment and low market value constitutes a specific challenge for many cities and regions. The problems associated with these sites particularly relate to the fact that market forces are not a driver for redevelopment and that future use is often limited to soft end uses (e.g. tree and naturalised planting, public open space, recreation, footpaths, picnic sites, playing fields). The **Kosar project** has developed analytical and methodological repertoires to **reintegrate brownfield sites** into functional urban areas (Ferber et al. 2010). The repertoires are based on technical feasibility, planning and management costs for a pilot site in **Fürstenstrasse in Chemnitz** and on standards and procedures of decommissioning, remediation and protection of brownfields as well as their management as a reserve area investigated at other sites in Saxony, Thuringia and Saxony-Anhalt. (www.refina.kosar.de)

EXAMPLE

**Emscher Landscape Park** (ELP) is an early German flagship project started already in 1989. The Park was together with heavy investment in the IT-industry a central component of an integrated development strategy for the former industrial Ruhr region. The aim was to improve the working and living environment for more than 2 million inhabitants in the region. The objectives were to preserve the remaining leftover landscape linking up the isolated, separate areas of the urban agglomeration. Using selected areas, it was demonstrated that linking green space management and rainwater management as well as decentralised wastewater management in ELP was both feasible and appropriate.

ELP was revisited in 2006-2009 and the idea of "development through maintenance" was fleshed out on the basis of a quality-focused strategy of regional park maintenance. Using a regionally

agreed maintenance and development concept, the quality of usability, ecology and aesthetics of integrated green and open spaces can be improved. This makes a contribution towards the question of how to manage the quality-based development of urban landscapes. A permanent regional park association maintains and manages the new open spaces.
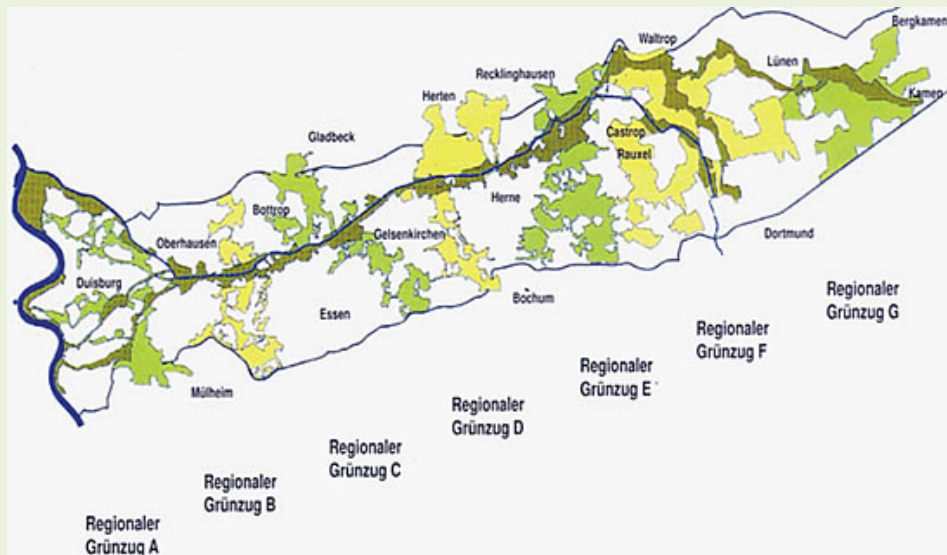


(www.refina-info.de/en/projekte/anzeige.phtml?id=3129andlan=en).

Urban environments are in continual transition. In many parts of the world the shrinking cities phenomenon has given rise to a new awareness of urban transitions that provides new conditions at the intersection of urbanism and ecology. With property vacancy rates exceeding 50 per cent in certain locations, those areas no longer look like bustling cities. A central question is how vacant land, through the provision of ecosystem services, can become a resource as opposed to a liability.

While the vast vacant areas of a shrinking city provide potential for ecosystem services, a key requirement in making these services possible over the long term is to assure they remain planning and management priorities (Douglas and Ravetz 2011). However, **vacant land** generally receives very little management. In some cities, sections of the urban fabric have been considered for closure and natural re-establishment. While this process of "off-lining" could provide amenities, such as enhanced habitat connectivity, increased storm-water management, carbon sequestration, and a reduction in both urban heat island effects and air pollution, these are not the primary factors behind such closures (Rink 2009).

Urban restructuring programmes in shrinking cities often lead to the demolition of empty buildings. As a result diverse sizes of wasteland will occur in various locations of affected cities and towns (so called perforation, see also chapter 8). These "holes" in the urban fabric constitute a real challenge for urban planners. Projections within the European-American project "Shrinking Cities" have adduced that these cities will develop into **patchwork cities** made up of heterogeneous fragments of shrinking and isolated city districts with unstructured connections (Oswalt 2005). More experience

has been gathered since and will be published in September 2013 "Shrinking cities in Europe" - the results of the EU-COST-action "Cities Regrowing Smaller".

During 2008-2011, the public private collaborative research and development project **ASTUCE AND TIC** (Anticipation des Aménagements Sécurisés des Territoires, des Campagnes et de leur Environnement par les Technologies de l'Information et de la Communication) developed IT tools to model and simulate the complex interactions between economic development, land allocation, climate, underground water, agriculture and irrigation, and then applied them to the **Crau plain in the south of France**.



The Crau plain is an old alluvial plain, open to the Mediterranean Sea. It covers around 600 km$^2$ consisting of mainly five cities with a population of 200 000. Crau is also a fragile ecosystem with irrigation systems dating back to the XVI century maintaining normal levels in the underground water connected to the Mediterranean Sea.

The study shows that the consumption of land depending upon old irrigation resources for economic activities generated too much strain on the water cycle. If nothing major is done, in less than twenty years, underground water would function in a reverse mode, meaning that salt will progressively poison the ground making centuries of efforts wasted in no time. Among the most acute problems of land allocation are the facts that:

- Land demand is directed to irrigated land, or on lands of better agricultural quality.
- Land demand is exercised mainly by large firms responding to global scale economic issues: for instance logistics companies seeking land for depots and exchange platforms, and proposing in consequence land prices that have nothing to do with the "traditional" land value.
- Each decision of land acquisition is a micro-decision, not decisive in its own effects; it is only when examined at a more accumulated and global scale from both territorial and time points of view, that the dramatic future can be evidenced.

This example highlights both the dramatic reality that the competition for urban land may take, and the fact that the impact may not always be noticed on the local scale and that governance consequently also must be effective at more global scale than the level of *prima facie* decision. http://www4.paca.inra.fr/emmah/Programme-Scientifique/Projets/ASTUCE-TIC

Land-use planning and policy commonly suffer from a widespread **misfit between administrative sectors and institutions** and the relevant scales for urban ecosystem management. Recent research shows that local actors groups and networks are instrumental in the stewardship of urban green-blue areas and ecosystem services. However, their work tends to be invisible in urban land use planning and policy (Andersson et al. [in review]).

EXAMPLE

At least 18 per cent of green space in Stockholm is **managed by civil society** (Colding et al. 2006) and in one of the largest green areas in the region 69 organisations are engaged, of which 25 as active stewards (Barthel 2006; Barthel et al. 2005). Cultural diversity appears to promote the ability to build and increase the capacity for learning and adaptation in groups that manage land in cities (Colding and Barthel [in review]).

The regional plan for Greater Stockholm (RUFS 2010) put restrictions on the appropriation of greens paces for new built up areas. Local and regional politicians aim to secure recreational, nature and cultural values and to avoid sprawl. An emerging trend is to visualize and integrate green-blue elements in urban development (Colding 2007). Traditional urban services, such as roads, water and sanitation and waste management, are intimately interrelated with ecosystem services. Green-blue elements, constructed in a clever way, can enhance biodiversity and ecosystem services. As an example, a man-made wetland on a golf course or in a park can improve the living conditions of wetland living organisms in the entire region (Colding and Folke 2009).

Researchers at Stockholm Resilience Centre and Royal Institute of Technology (KTH) have developed a **model for socio ecological urban development**. The point of departure is the integration of building mass and its spatial forms with ecosystem services (Barthel et al. 2010). The critical design elements are:

- Green arteries – streets and passages etc…
- Performative buildings – green walls, green roofs, wetlands and allotment gardens on roofs and terraces
- Active (non-sealed)ground – the concept aims at creating a diversity of urban green spaces with different qualities and thus actively sustain different kinds of ecosystems
- Institutional structures and social net works



*Source: Q Book 4*

In the **SUPER project** system ecologists, spatial planners and urban practitioners from Holland, Sweden and Turkey jointly explore how natural processes could become more integrated in urban

spatial designs, and how public participation could be broadened through local participation and management of ecosystem services. The term "spatial-institutional design" is used including both the urban design and the governance processes. The new university campus in Stockholm, the Albano area, is one of three in-depth case-studies where various designs have been examined with the aim to increase the capacity of the campus area to generate ecosystem services. The work has been undertaken in close cooperation with the City of Stockholm in order for research to inform practice (www.stockholmresilience.org).

In order to manage and further develop the design elements it is imperative to set up appropriate institutional structures. A promising way is to facilitate active involvement of inhabitants and community based organizations (CBOs) or networks in both design and management. Formal contracts between city administration and individuals, local businesses or CBOs is one way to go, the creation of urban commons another. For example in the city of Stockholm it is possible to sign so called **participatory contracts** (brukarmedverkansavtal) between city administration and inhabitants, businesses or interest groups. The interested party then takes care of and manages a particular green space (www.stockholm.se).

EXAMPLE

**Allotment gardens** can be said to be a form of urban common where allotment managers create values for the environment. Research has shown the allotment gardens in Greater Stockholm are providers of a number of central ecosystem services. As an example they are often urban sanctuaries for pollinators.(Colding et al 2006, Andersson et al 2007, Barthel et al 2010)



**Well-structured partnerships** with residents, the private sector and different levels of government is one way for cities to mobilize support and get the resources needed to implement urban plans linked to green-blue infrastructure. Leveraging such resources brings access not only to funding, but also to technology and management skills. Partnerships with CBOs can mobilize local residents and resources (Ernstson et al. 2010).

EXAMPLE

Since 1944 the **London Green Belt** is protected from all exploitation. However, due to budget cuts many parts of the Green Belt have been neglected and are no longer available for recreational purposes. To deal with the problem so called community forests have been created in parts of the Green Belt. People living and working in the neighbourhood get access and in return they manage the area and make it more available (Colding et al. 2006).

## 7.6. How to value ecosystem services – integrated data and monitoring

Already in the early 1990ies studies showed that in some US cities increasing tree cover by 10 per cent can reduce the energy used for heating and cooling by up to 10 per cent (McPherson et al. 1994) However, many ecosystem services are "invisible". We normally do not see how water and air is purified by plants or how insects pollinate our crops and therefore those services are often not present in financial balance sheets. Almost any ecosystem generates a "bundle" of ecosystem services, but not all of these services can be translated into numbers. Hence it is notoriously difficult to attach a comprehensive economic value to an entire ecosystem and some scholars also question if it is right or even useful to attach market value to natural elements and ecosystems.

Nevertheless, the quest to **make nature "worth" preserving** took a quantitative turn in the late 20th century. Demonstrating the value of natural processes to economic activities was believed to create circumstances under which the intrinsic natural functions that humans rely on could and would be better appreciated and integrated into decision-making. A study in New York calculated the monetary value of the city´s five million trees based on estimations of the trees´ impact on property values, the amount of carbon dioxide they removed from the air and the amount of cooling energy their shade conserved. The author concluded that for every dollar spent on trees the benefit for each resident could be quantified at USD 5.60 (Nadkarni 2008).

In 2008 the global initiative **Economics of Ecosystems and Biodiversity (TEEB)** made an economic assessment of the global loss of ecosystem services. TEEB concluded that if nothing is done the yearly losses of these services could amount to seven per cent of the world's GDP. The TEEB synthesis report, Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB (TEEB 2010) outlines three scenarios: a natural ecosystem (forests), a human settlement (city), and a business sector (mining), to illustrate how the economic concepts and tools described in TEEB can equip society with the means to incorporate the values of nature into decision-making at all levels

A **TEEB Manual for Cities** was launched in August 2011. This publication builds upon the TEEB reports, tailoring information specifically for cities, drawing on ICLEIs and IUCNs Local Action for Biodiversity Pioneer Project. The manual highlights how a focus on ecosystem services and their valuation can create direct benefits for cities. It also provides stepwise guidance on how to do this illustrated by in-depth case studies.

> EXAMPLE
>
> The **New York City** authorities decided to pay landowners in the Catskill mountains to improve farm management techniques and prevent run-off of waste and nutrients into nearby watercourses in order to **avoid building expensive new water treatment facilities**, which otherwise would have been required by federal regulations. (TEEB for Regional and Local Policymakers, Chapter9).
>
> The cost of this choice, between USD 1 and 1.5 billion, contrasts with the projected cost of a new water filtration plant at USD 6 to 8 billion, plus USD 300 to 500 million in estimated annual operating costs. Water bills for New Yorkers went up by 9 per cent, rather than doubling as they would have if a filtration plant had been built (Perrot-Maître 2001; Elliman 2007).

When it comes to securing resources for green schemes, the TEEB manual stresses the importance of coordination across departments, engaging private developers and stimulating local citizens and local businesses to participate both in planning and management. The project **Urban Biodiversity and Ecosystem Services** (URBES) is now further developing how to integrate ecosystem services into urban land use planning and governance by developing new monetary and non-monetary valuation methods, and link these to land cover data, multicriteria decision support, land use scenarios, and strategy-making (http://urbesproject.org).

EXAMPLE

In the study**, Evaluation of urban qualities in the Stockholm metropolitan region** the impacts from different urban qualities, for example access to parks and nature, on housing prices are calculated. This is done by analysing the relationship between housing prices and the availability to a park within 1 km. The study shows that not only is access to a park important but so is the size of the park.

The price per living space increases with 600 €/m$^2$ between condominiums with access to 17 acres of park and 27 acres of park ,all other parameters equal. The study also shows that it is parks that are valued high when buying a condominium, while access to other types of green space or nature is not given the same importance. By park is meant a green area larger than 0.5 hectares of land and where there are facilities for games, sports and athletics. (TMR info 2011:3)

EXAMPLE

The **City of Cape Town**'s Environmental Resource Management Department set out to determine the economic value of their ecosystem services based on the challenge of rapid biodiversity loss in perhaps the world's most biodiverse and biodiversity-threatened city. In order to involve stakeholders the department actively engaged with all other departments within the City's management structure that have responsibility for, or impact on, natural assets within the City

It was calculated that for every dollar the municipality spends on the environment, almost 8.30 dollars of ecosystems goods and services is generated (De Wit et al. 2011; De Wit et al. 2009a; De Wit et al. 2009b).

The social benefits of trees and green space is well known as described in section 6.2.3. However, only when more recent research started to quantify the environmental benefits and the associated financial value provided by green spaces and urban trees did these become an essential element in the city. A great deal of this research has been done by the U.S. Forest Service (McPherson et al. 2007; Nowak et al. 2007; Peper et al. 2007) now providing a number of free tools for urban forest managers via their **i-Tree software suite** (www.itreetools.org)

**Wisconsin DNR's Fox Valley Metro Area Analysis Project**

The Wisconsin Department of Natural Resources Northeast Regional Urban Forestry Coordinators completed the second phase of a regional analysis of street trees and canopy cover in the Fox Valley Metro Area (www.itreetools.org/resources/projects.php).

The project showed that public trees provide $ 4.89 million in annual benefits. In addition, the canopy analysis revealed that the Fox Valley metro area is currently covered by 20 per cent tree canopy with the potential of an additional 55 per cent of canopy cover.



The study highlights the significant benefits that community trees provide Fox Valley area residents including the following:
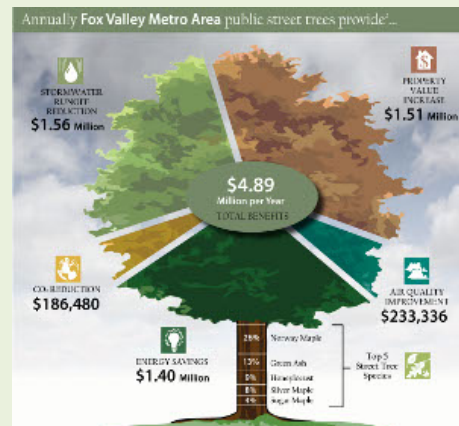
- $1.40 million per year in summer cooling and winter heating energy savings.
- $1.56 million per year in storm water management savings by intercepting approximately 58 million gallons of storm water annually.
- $1.51 million per year increase in local property values.
- $233,336 per year in air quality improvement by mitigating harmful air pollutants.
- $186,480 per year in atmospheric carbon dioxide reduction.

Most cities have access to planning legislation and environmental protection legislation. However legislation and administrative rules vary from country to country and are also in most cases sectoral not taking a holistic view. In order to integrate green-blue infrastructure in urban development planning and management we need both new ways of thinking and better tools.

Green-blue structure plans must include long term visions and cover green-blue space in all its forms and it is pivotal that the implementation of the plan is followed up in a systematic way.

**Matrix Green** Landscape Ecological Network Analysis Tool is a GIS-tool that helps predict ecological connection. The tool is under development by Stockholm Resilience Center, Royal Institute of Technology and Swedish Agricultural University. The tool can for example analyse and pedagogically visualize how different forms of exploitation affect ecological connections (Andersson and Bodin 2009; Zetterberg et al. 2010; see also www.stockholmresilience.org/research/matrixgreen).

**Green Space Ratio** (grönytefaktor) is an interesting institutional tool prescribing that a certain amount of green space must be set up when establishing new built up areas. The tool was originally developed in Berlin and further elaborated in Malmö and Stockholm where it is now applied to for example the flagship project Royal Seaport (Norra Djurgårdsstaden). (www.stockholm.se/PageFiles/64797/Grönytefaktor.pdf)

**Ecological "land-use complementation"** is a planning tool that helps adapting new construction or land-use to enhance qualities that are favourable to ecosystem services in the whole urban region. Single family housing areas, golf courses, allotment gardens, nature reserves etc can be constructed in ways that complement each other from an ecosystems services point of view (Colding 2007).

Norway has a long tradition in research and practice on planning for a multifunctional green structure. In 1985-87 the **NAMIT (Natur- og miljövennlig tettstedsutvikling) pilot project** was undertaken and the green structure concept was launched. The main NAMIT project took place 1987-92 focusing on whether different environmental objectives can be combined. **Indicators** of various values and functions of urban green structures were developed and tested against other key objectives for sustainability. The green structure concept and methodology was further developed through connected research projects and real life projects resulting in guidelines and handbooks for municipal planning. The green posters were introduced at municipal level as a planning tool to identify urban green structure´s various values and functions. Social values and functions as well as biological and technical values and functions were addressed (Gutto 2007).The focus is now aiming at "green-blue urban landscapes without boundaries"/"the landscape is everywhere" as a further concept (Halvorsen-Thorén 2012).

**Monitoring progress and documenting change** are important for knowing whether or not a city is on track or not. Evaluation of land-use plans and performance measurements focusing on efficiency of delivery are helpful in achieving this knowledge. A set of indicators helps to determine if conditions are improving and monitoring brings about opportunities to create and strengthen community development.

There are also tools not specifically developed for green-blue-infrastructures that are useful for integrative management of sustainable urban development.

**PLUREL** provides tools that allow users to explore the sustainability of peri-urban land use relationships, and to gain insight into the challenges facing Europe and its regions. Tools and publications (including all publicly available deliverables) can be accessed through www.plurel.net.

**PLUREL Xplorer** condensates and configures the knowledge and various products of PLUREL into a form that supports planning and policy discussions on urban-rural land use at pan-European and regional level. It provides information for policy-makers, planners and other practitioners on processes, problems and places offering thee different perspectives on peri-urbanization. *Processes* is the holistic approach comprising all products, interlinked into an analytical chain. The *Problems* category comprises the thematic perspective, while *Places* displays spatially explicit results from PLUREL from the pan-European to the case study level.

The European integrated **Impact Analysis Tool (iIAT-EU)** represents a novel interface between science and policy-making contributing to further knowledge on impacts of future urbanization in Europe. The application principles, the functionality and the graphical user interface of the iIAT-EU have been developed in close collaboration with planners, administrators, policy makers and stakeholders.

The **iIAT-Region** approach, technically similar to the iIAT-EU, allows selecting regional land use related impact indicators, case studies to be compared, and scenarios that should form the basis of the comparison, as well as thresholds or target values for single indicators. Currently, three European PLUREL case studies are included: Haaglanden (Netherlands), Koper (Slovenia) and Leipzig-Halle (Germany).

The PLUREL iIAT is an internet tool that displays results in the form of spidergrams. These provide an interface that enables an easy and holistic perception of multilevel information and also allow for a visualisation of changes in sustainability indicators. Positive or negative trends according to different scenarios are immediately visible as shifts in the lines of the spidergrams.

Land use data must integrate different sectors, multi-functional uses and cross administrative boundaries, as well as physical, socio-economic and environmental dimensions. **The LUPA project** aimed to develop a consistent methodology for analysing comparable information about European regions and cities, based on data from different sources and at different levels. Moreover, the project aimed to supply regionalised information integrating the physical dimension (land cover) with socio-economic (land use) and environmental dimensions, in order to understand land use dynamics, land use changes and current land use patterns in the European territory. Based on these main challenges in different types of territories, regions and cities can be identified and policy recommendations to cope with the challenges can be defined. The report produces a map of land use characteristics and changes in Europe at the regional level with comparable data. It also identifies hotspots where the intensity of change has been significant (EU-LUPA 2012; se also www.espon.eu/main/Menu_Projects/Menu_AppliedResearch/EU-Lupa.html).

Modern urban monitoring systems based on quantitative data such as statistics and numbers provided in spatially implicit and explicit modes (e.g. GIS systems, data bases) can be useful, but often they are still lacking of more qualitative, perception oriented data. This subject will be more thoroughly treated in the Synthesis Report and Dialogue Café INTEGRATED DATA AND MONITORING planned to take place in Sofia, Bulgaria in September 2013.

# 8 Building Mass and Physical Structures

While the chapters on socio-cultural space and green–blue infrastructure discuss different aspects of the life taking place in cities, building mass and physical structures is about the material fabric that accommodates and shelters this urban life. People, animals and plants need to be securely nested within urban environments of different kinds, and also be effectively interconnected with other people, animals and/or types of vegetation:

> "Cities are the summation and densest expressions of infrastructure, or more accurately a set of infrastructures, working sometimes in harmony, sometimes with frustrating discord, to provide us with shelter, contact, energy, water and means to meet other human needs. The infrastructure is a reflection of our social and historical evolution. It is a symbol of what we are collectively, and its forms and functions sharpen our understanding of the similarities and differences among regions, groups and cultures. The physical infrastructure consists of various structures, buildings, pipes, roads, rail, bridges, tunnels and wires. Equally important and subject to change is the 'software' for the physical infrastructure, all the formal and informal rules for the operation of the systems." (Herman and Ausubel 1988:1)

The following chapters will discuss urban structures in their widest sense – also including building mass – and how development drivers can be channelled into sustainable directions. This will be done across a number of themes: efficiency, conservation, infrastructures, smart cities, and urban form.

## 8.1 Key messages

KEY MESSAGE 1: Shaping "better" cities is seen as a main response to current sustainable development challenges globally. This entails creating cities that succeed in mixing a plethora of different land uses and activities to ensure equal and efficient access to urban qualities and functions – regardless of whether the cities are growing or shrinking. The complexity of such endeavours calls for dealing with urban development tasks as "wicked problems", where there is never final resolution, but instead continuous development processes in need of constant strategic facilitation.

KEY MESSAGE 2: From both resource saving and cultural heritage perspectives, the most obvious approach to urban development is to make the most of existing buildings and infrastructures. However, to make them perform well from social, cultural, environmental and economic viewpoints, a multitude of interests have to be negotiated with all involved stakeholders – including the public. Such an integrated approach to conservation and transformation also needs to be institutionalised into the different systems for urban planning and management.

KEY MESSAGE 3: Urban infrastructures – and in particular traffic and urban water – take up vast areas of urban land. To mediate between different land use demands, there is a need for more integrated approaches to infrastructure planning and management that build capacity for future-oriented transformation and resilience. This is not least a matter of negotiation between different urban development interests.

KEY MESSAGE 4: Turning cities smarter is put forward as a key response to urban development challenges, but to promote sustainable development such approaches need to shift from seeing smartness as an engineering challenge to dealing with smart cities as a wider societal challenge involving a multitude of urban stakeholders.

KEY MESSAGE 5: Combining high urban density with polycentric urban structures may deliver benefits of both compact cities (such as accessibility, efficiency and cohesion) and more sparse cities (such as urban greenery), and be implemented both locally and on the city-scale. However, density is highly city-specific, where cultural factors and lifestyles impact on what is seen as good urban patterns and acceptable density in different locations.

## 8.2 Cities as a promise for global well-being: The urban efficiency logic

In Chapter 5, a series of challenges linked to demography, land use, sociocultural changes, innovation and urban governance was outlined. Drivers on different scale-levels tend to propel urban change into development patterns that are often not seen as optimal from a sustainable urban development perspective.

In both policy and research there are strong beliefs that "better" cities will deliver effective responses to current global and local challenges (Hardoy et al. 1992; EEA 2010; UN-HABITAT 2012). Urban efficiency is now replacing "ecological modernization" as a major saviour of mankind in a context of population increase, (hopes for) continued economic growth, inequity, social unrest, resource scarcity, environmental degradation and climate change. Additionally, a combination of density and functional integration – the mixed-use city – is pointed out as being crucial (Power 2012; Hofstad 2012; EGUE 2001).

> "Even when rapid urban growth will require extension of the city, a compact spatial structure that is aligned with the city's characteristics; one that creates net benefits for the public at large and minimizes negative external impacts, may still be the one to strive for. Promoting a sensible use of land by having policies on population density and mixed use would make these goals achievable. If a city leader does not opt to make decisions on urban development, his or her city may miss a unique chance to grow sustainably." (UN-HABITAT 2012:24)

UN-HABITAT argues that single-use of land in low-density urban environments leads to increased car use and less viability of public transport. It also reinforces social exclusion of those less well-off and induces social fragmentation. In contrast, mixed-use environments is said to be the genuine raison d'être of cities and urban agglomerations, where compatible and co-existing revenue-producing uses bring multiple benefits. The car based and functionally separated city resulting from "modern" planning practices has led to barriers to coexistence.

Removing such barriers would have (UN-HABITAT 2012):

- *Social benefits* by improving accessibility to services, urban amenities and housing for all, as well as improve perceived safety with more people moving around on foot.
- *Economic benefits* through more potential for exchange and trade as co-location of activities attract more people for longer hours, which in turn leads to more tax revenues.

- *Land and infrastructure benefits* by reducing average trip lengths and need of commuting, thus promoting walking, biking and public transport and thereby requiring less space for roads and parking.
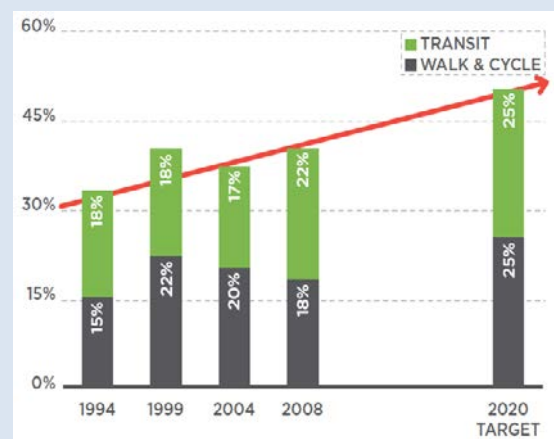
However, both policy and research are inconclusive regarding the more specific and localized benefits and detriments of dense, mix-use cities. As an example, although the tree largest Swedish cities emphasize the need for densifying their urban structures through different programmes and policies – Promenadstaden: Översiktsplan för Stockholm (The Walkable City: Stockholm City Plan), Stadsbyggnadskvaliteter Göteborg (Urban Qualities Gothenburg) and Så förtätar vi Malmö! (This is how we densify Malmö!) – they are still struggling to get to grips with how densification should be operationally understood and turned into reality.

EXAMPLE

**Vancouver 2020 Action Plan**

"Vancouver has proven that a city can grow and prosper and still become a green capital - a global leader in addressing climate change" (Vancouver 2012:0)

The city will meet the green transportation challenge by creating compact and high density neighbourhoods for better access to work, shopping and recreation. Its infrastructure has shifted investment towards walking, cycling and transit instead of new roads. Vancouver's aim to become the greenest city in the world by 2020 is supported through a number of "Highest Priority Actions" in areas such as Green Economy, Climate Leadership, Green Buildings, Green Transportation, Zero Waste, Access to Nature, Lighter Footprint, Clean Water, Clean Air, and Local Food.



Share (%) of all trips to and within the city by transit (public transport), walking and cycling

http://www.construible.es/construible/biblioteca/20130104-greenest-city-action-plan-vancouver-2020.pdf

To better understand how more liveable and effective cities can emerge, densification needs to be studied in relation to proximity and access. In addition to understanding density in demographic and morphological terms, we need to include also functional (access to greenery, resources and services, including ecosystem services), economic (access to opportunities), equity (equal access), social (cohesion and interaction), cultural (heritage, identity and diversity), etc. aspects (Kain et al. 2011). Making the most of urban opportunities without exacerbating potentially negative impacts on the health and well-being of humans and ecosystems is a matter of equal and efficient access to various kinds of urban qualities, where only some are physical properties but where all in various ways are housed in buildings, urban structures, and urban space.

However, the shift from focusing on merely technology to dealing with a wider set of issues up for "modernization" – such as social interaction, culture, fairness, innovation processes, economic development, governance – brings with it new dimensions of complexity in urban development processes. It is essential that such complexity is appropriately and efficiently dealt with – in policy-making, planning, design, management, decision-making, implementation and operations – to actually deliver positive transformations of urban realities. If not, urban complexity may well get the upper hand with unforeseen outcomes. During the last few years, the idea of dealing with complex urban problems as being "wicked" rather than "tame" has seen a surge in the literature on urban development and planning (e.g. Weber and Khademian 2008; Batty 2012; Xiang 2013). Although the idea of wicked problems was coined already in the 1960s (Churchman 1967; Rittel and Webber 1973) the concept is surprisingly up-to-date in relation to current urban challenges:

 "Policy problems cannot be definitively described. Moreover, in a pluralistic society there is nothing like the undisputable public good; there is no objective definition of equity; policies that respond to social problems cannot be meaningfully correct or false; and it makes no sense to talk about 'optimal solutions' to social problems unless severe qualifications are imposed first. Even worse, there are no 'solutions' in the sense of definitive and objective answers." (Rittel and Webber 1973:155)

When working with wicked and complex urban problems, what seems like a demanding but still reasonable mission soon turns out increasingly elusive and shifting the more you engage with the issue as if having a life of its own. "Once it appears a solution has been found, the problem reappears often in mutated and more extreme form, like an uncontainable disease" (Batty 2012:4).

## 8.3 Using what's already there: Transformation and conservation

The rapidly changing basic conditions of modern times pose a big challenge on the management of historic towns in Europe. The imbalance of progress and the preservation of the historic urban fabric often results in either economic stagnancy or loss of cultural heritage values and with it the loss of identity.

From a resource saving perspective, the most obvious approach to urban development is to make the most of what is already there – of existing buildings and infrastructures – as long as they perform to satisfaction from social, environmental and economic viewpoints. As important is the potential safeguarding of cultural heritage when preserving and wisely developing existing building stock and structures. Standing built structures are sustaining an important asset – sometimes called cultural capital – that can be turned into a valuable development driver integrating history and culture into contemporary urban life. This asset should thus be neglected neither from an economic, aesthetic or sustainability viewpoint nor as a resource providing social continuity, sense of belonging and historic roots.

EXAMPLE

**The eco-restoration in the district of La Chanca, Almeria, Spain**

In Almeria, architectural and urban design projects proposals basically consider three aspects in order to be environmentally sensitive: its place, its history and its culture. By also taking the proper location, climate, orientation and sunshine into account, the conditions of negative habitat, energy consumption and pollution are diminished. In this respect, experiences from the special conditions of cave-dwellings, such as in the renovation of the Cuevas de Pecho, have been transferred to other interventions carried out by the Junta de Andalucía.
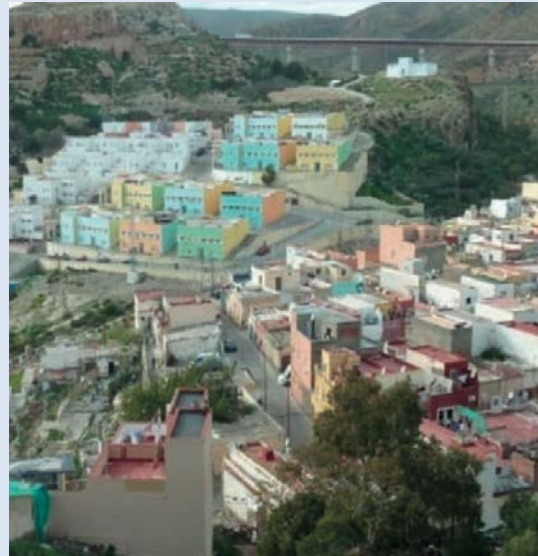
Traditional materials and internal organization (such as patios) have been given the "style of the day" by the architect Ramon de Torres. Inspired by the works of Vitruvius (First century BC), he highlighted the qualities of some thermal hydraulic lime.

http://urbact.eu/fileadmin/Projects/LINKS/documents_media/Urbact_50_HD.pdf

In a shrinking city context, it becomes crucial to counteract that remaining public, commercial and housing activities shift into new constructions, obviating and abandoning existing building stock. The **USE***Act* **project** focuses on providing urban development and business opportunities in existing locations and without consumption of rural land, by making the most of the historic building heritage. It aims to reduce energy consumption and cut costs for infrastructure and management. This is achieved through:

1.  "planning framework and urban planning tools aimed at an effective 'urban growth management', with reduction of urban sprawl and re-use of urban areas;
2.  managerial and regulatory frameworks to induce, support, control and manage (also in partnerships with other stakeholders) 'area based' interventions of urban re-use;
3.  specific tools to guarantee 'quality' of interventions, to cater to communities' requirements from a long -term perspective" (Torbianelli 2012:6-7).

In growing cities, there is often a different story of intense pressures to demolish existing neighbourhoods and historic public or industrial estates to make way for new development projects, often driven by economic growth rationality. Existing buildings can however provide considerable assets in terms of cultural capital also in growing cities – a capital that can never be recuperated once it has been destroyed. The completed **HerO project** has addressed this challenge through focusing on the management of conflicting usage interests to capitalize on cultural heritage assets: Heritage as Opportunity (HerO 2011a). The main objective was facilitating the right balance between the preservation of built cultural heritage and the sustainable, future-proof socio-economic development

of historic towns in order to strengthen their attractiveness and competitiveness. The project argues for developing Integrated Cultural Heritage Management Plans that determine and establish appropriate strategies, objectives, actions and management structures to both safeguard the cultural heritage for the benefits of local stakeholders and balance different demands while using historic urban areas as development assets.

EXAMPLE

**HerO Recommendations**:

1. Make cultural heritage a top political priority ensuring local and regional authorities value their heritage providing leadership to local stakeholders within their communities and helping secure the right environment to attract investment.

2. Develop a Cultural Heritage Management Plan using the integrated HerO methodology ensuring senior management drive forward corporate policy on cultural heritage and are committed to overcoming sectoral or departmental resistance to an integrated approach.

3. Engage politically and managerially with stakeholders and the local community to ensure public support for the cultural heritage strategy and management plan and thereby develop a coordinated and balanced approach that is sustainable over time.

4. Focus on action and project delivery ensuring consistent political and managerial support and commitment; work with managing authorities to secure EU and other funding is in place and develop monitoring and evaluation processes that enable the management plan to adapt to changing circumstances. (HerO 2011b)

**Lessons learnt and main benefits:**

- Through the integrated approach a broad basis of common objectives to safeguard and sustainably develop urban heritage sites can be defined, and the identification and motivation for urban heritage can be extended.
- Structuring concrete actions that are ready for implementation and discussed with a broad variety of stakeholders make the result of the process very tangible and real.
- Through the early integration of the responsible authorities for European, national and regional funding the chances of getting funding for the defined actions are enhanced.
- The relationships between the local governments and the managing authorities in charge of European, national and regional funding can be improved.
- The balance between the safeguarding of urban cultural heritage and the sustainable development that fosters economic benefits can be improved. (HerO 2011c)

(http://urbact.eu/en/projects/urban-renewal/hero/homepage)

The on-going **LINKS project** argues that the old European town could be seen as a role model for sustainable urban development due to its density, high architectural quality, constructions economizing on natural resources, diversity and proximity of urban functions as well as its economic,

cultural and educational development potential (LINKS 2012). Evidently, preservation of ancient city centres is also important for the creation of socio-culturally integrative spaces already discussed in Chapter 6, thus linking social, cultural and environmental issues. The project indicates that historic districts can become sustainable if the expectations of the inhabitants are met through citizen's participation, and negotiating a multitude of interests, such as eco-restoration, energy-efficient buildings and modern comfort, and high quality public spaces. Additionally, affordable housing has to be prioritized to counteract segregation or turning all old buildings into holiday homes.

In the final recommendations, LINKS partners claim that it is possible to combine heritage and environmental issues and propose to Europe to rely on its network of historic cities to promote a sustainable urban development, which is energy-efficient and resource-conserving, and also presents real opportunities for local economies.

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EXAMPLE

**Action points promoted by LINKS**:

More Sustainable and Efficient Energy **Retrofitting** for a Better and Effective Revitalisation of Historic Buildings:

- Adapt current energy efficiency assessment methods to the features of existing buildings.
- Consider the reduction of the global environmental footprint of renovation works as a criterion for a resource efficient policy.
- Support the necessary change of practices by the means of specific attention to characteristics of traditional building within the Energy Performance Building Directive.
- Foster the use of renewable energy.

More and Better **Jobs** for the Construction Sector, Particularly in Renovation Activity, as Real Benefits of Energy Saving Policies:

- Accompaniment of measures to generate job opportunities.
- Facilitation of access to the market for eco-materials in order to create opportunities for small and medium size enterprises.
- Raise awareness of practitioners and decision makers.

More Innovative **Governance** for a Better Use of Public Funds:

- Overcome obstacles which hinder the effective cooperation of stakeholders.
- Ensure provision of a clear and stable financial support.
- Disseminate good practices.

http://urbact.eu/fileadmin/Projects/LINKS/documents_media/Urbact_50_HD.pdf

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Back to the shrinking city context, the idea of strengthening the old European city core – shrinking from the edges to the centre – is only possible where an old city centre actually exists. As result of World War II and the idea of the socialist city (very strongly using the Athens Charter from 1933) many cities do not have a centre into which they can shrink. Here, the idea of cultural heritage conveys another meaning and alternative avenues to urban morphology are needed. One solution

may be the polycentric city, providing clear distinctions between quarters and districts to maintain their identity and to keep in-between space free from building.

Large sites that for different reasons become abandoned constitute a particular urban development challenge. Such vacating of urban land may result from radical change in politics or from economic restructuring leading to sudden decline in specific sectors of industry or services. There are often high costs involved in recovering large obsolete areas and there is a need for reaching agreement with private sectors, not least since many such areas are privately owned. This also touches upon difficulties to secure territorial cohesion and urban qualities when areas and buildings are in the hands of the market. One way of strengthening diversity and multifunctionality is to develop and consolidate new identities of such urban areas that may guide joint perspectives and strategy-making (NeT-TOPIC 2011).

EXAMPLE

**REPAIR: Regeneration of abandoned military sites**

The REPAIR project has reviewed European policy (the Lisbon strategy, the European Sustainable Development Strategy and the Leipzig Charter) against key challenges for re-use of military heritage sites. Apart from suggestions for some modification of EU frameworks to address existing policy gaps and barriers to effective local action, the project also proposes integration across four "pillars" for sustainable regeneration of abandoned military sites:

1. How to achieve the sustainable re-use of the built heritage and heritage sites, through maximising energy efficiency, the better management of waste production, energy consumption and greater use of renewable energies.
2. How to develop alternative site uses and techniques, which best secure the long term preservation of the military heritage.
3. How to maximise access to military sites by sustainable modes of transport which minimise car use and decouple transport growth from local GDP growth.
4. How the socio-economic re-use of the sites can maximise local jobs for local people and therefore sustainable communities and greater social cohesion.

In relation to these Pillars, the REPAIR partners suggests the following:

- In the area of heritage conservation, commitments which national governments have made in signing up to Council of Europe Conventions (especially to promote holistic and integrated approaches to site conservation) need to be more effectively implemented at national, regional and local levels.
- There is enormous scope for action in the fields of energy and waste management in renovation schemes involving protected historic buildings and structures need to be taken into account.
- In the area of sustainable transport local authorities need to establish citywide urban mobility plans which emphasise co-modality and dealing with problems of access to military sites which may not be connected to modern transport networks.

- Regarding the creation of local jobs and support for sustainable communities through the re-use of military sites, distinctions need to be made between approaches that create "high value" and "low value" jobs, where both are needed and can be mutually reinforcing.

However, one of the most important lessons from REPAIR is, in fact, that attention to the interaction between the pillars has the most impact in terms of sustainable outcomes. The most effective and elegant solutions are those delivering multiple benefits in resource-efficient ways. (REPAIR 2011)

## 8.4 Rethinking urban infrastructures

Urban infrastructure development policies and planning in the 19th and 20th centuries have tended to deal with cities as "machines" for supply of services. This has become tremendously accentuated through the transport paradigm in the second half of the 1900s, largely giving priority for cars over all other modes of transport, resulting in excessive use of land for motorized transport. Additionally, in many cities, transport infrastructure (i.e. roads and rail) has been laid out first and the city itself has been left to develop itself in the leftovers and in-between spaces. In many cases, urban transport infrastructure has turned out a self-reinforcing system creating more and more (often car-based) traffic but without reducing travel time (Newman and Kenworthy 2011). Additionally, roads and infrastructure networks tend to split and fragment urban territories, not least in metropolitan suburbs with little internal cohesion (NeT-TOPIC 2011).

EXAMPLE

**Copenhagenize.com**

The blog Copenhagenize.com is promoting "bicycle urbanism for modern cities". The post to the right problematizes how traffic planning has promoted car mobility at the expense walking and biking during the last 60 years.



http://www.copenhagenize.com
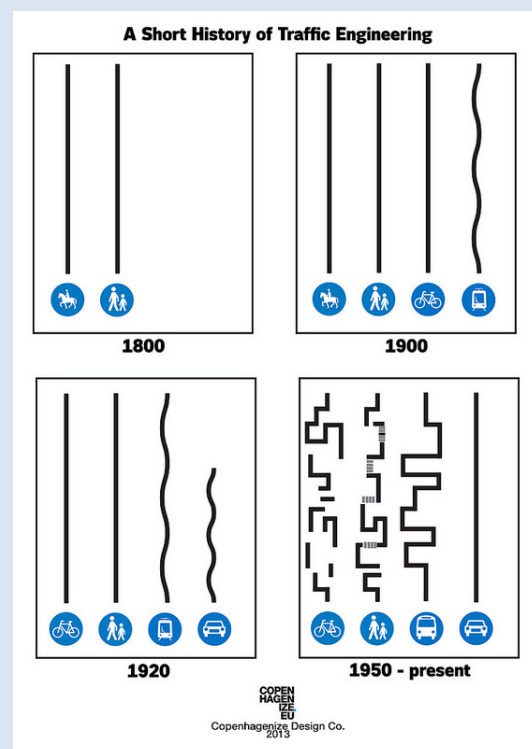
Urban and traffic planning is currently shifting rapidly towards facilitating less car-dependent societies. The reasons for this are growing concerns for environmental degradation, resource constraints and, not least, climate change. From an economic perspective, investment in transport infrastructure will both enable higher densities and even out housing prices, making the city a more attractive location for both (commuting) workers and companies. In that way, infrastructure investments will affect both the urban economy's spatial organization and the urban GDP, as "agglomeration effects" increase productivity (CIRED 2012).

There is also a growing interest in "the urban" as a form of culture that promotes specific urban values, such as democracy, sustainability, efficiency and openness – argued to become more prominent in less car-dependent societies (Chamber of Local Authorities 2009; Newman and Kenworthy 2011). Such concerns are, increasingly, pointing away from urban sprawl and towards re-urbanization – and densification – of the different nodes of our urban environments (Curtis 2006). All in all, this shift away from transport and mobility planning entails more emphasis on the equitable and just access to different urban qualities, instead of discussing mobility and accessibility (Kain et al. 2011).

If a new urbanity is to be promoted that focuses on liveability, well-being, access and innovation, then the abovementioned priority given to land use for motorized transport has to be shifted towards land use set aside for other modes of transport. Precedence for walking, biking and public transport will also liberate urban land for housing, business or public space. Measured as land demand over time, car traffic (including the parking spaces needed) consumes 30-90 times more than walking, biking and public transport (Apel 2000).

Increased walking and cycling thus play a crucial role for a less car-dependent city. Since more than 30 per cent of the car trips in Europe are less than 3 km and 50 per cent are less than 5 km (EC 1999), the potential for modal shift is huge. In addition to less dependency on fossil fuel, increased walking and cycling would lead to better health as well as an increase in local shopping activities.

EXAMPLE

**Good, Better, Best: The City of Copenhagen's bicycle strategy 2011-2025**
The goal "Copenhagen must become the world's best bicycle city" was set by Copenhagen's city council as an integral part of the vision of Copenhagen as an Environmental Capital. This ambition is also an important element in the city's goal of having a good city life and for turning Copenhagen C02 neutral by 2025, as well as for the city's official health policy (City of Copenhagen 2011).

To turn the goal into reality, the city has focused on four main themes:

- City life
- Comfort
- Speed
- Sense of security

(www.kk.dk/cityofcyclists)

The project **Active Travel Network** (2012) has however indicated major problems related to the lack or inadequacy of infrastructure with regard to cycling tracks, parking facilities, and bicycle racks on public transport. It points out that only "hard" infrastructural measures are not sufficient to make people cycling and that "soft" measures for mobility management (information, organisation, promotion, awareness raising activities etc.) are a perfect complement.

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EXAMPLE

**Policy recommendations by Active Travel Network**:

**Awareness** raising:

- Increase acceptability among politicians and planners
- Inform stakeholders and foster their commitment

**Strategies** and accompanying measures:

- Both push and pull strategies are crucial to influence travel behaviour
- Reduce and enforce speed limits and introduce limited and paid parking
- In case of strategic planning conflicts decisions should be in favour of walking and biking
- Funding of walking and biking policies, strategies and measures must be guaranteed
- Budget should go to both "hard" and "soft" measures

**Managing** projects:

- Clear objectives and responsibilities are needed.
- Inter-departmental and inter-disciplinary work as key to success
- A pedestrian and cycle network in city/town is most appreciated, but not necessarily separate cycle tracks
- Pedestrians and cyclists should have highest priority – higher priority than car traffic
- Develop a specific communication strategy for cycling/walking

http://urbact.eu/fileadmin/Projects/Active_Travel_Network/news_media/final_brochure_end2_korr_kl.pdf

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For distances longer than 3-5 km, walking and cycling is not an option for most people, especially during the more challenging weather conditions throughout winter. Here, a shift from cars to collective transport becomes critical for combating congestion, poor air quality, noise exposure and road accidents, as well as $CO_2$ emissions in favour of a "virtuous circle" for public transport modes (EC 2011). In addition, public transport systems can be test beds for new vehicles, technologies and (intelligent) system solutions. Proper demand management and land-use planning can also lower traffic volumes and favour walking and cycling. Once again, Copenhagen provides a good example. The city has, historically, been developed according to the famous Finger Plan from 1947 defining urban development along five "fingers" and allowing green space to reach in towards the city core. Today, Ringbyen is an extensive development project that aims to link the five fingers further out from the city centre through a light rail system.

EXAMPLE

**Ringbyen (The Loop City), Copenhagen, Denmark**

Ringbyen links Copenhagen's five green fingers through a light rail system that bridges the 37 kilometres from Lundtofte in the North via Lyngby, Gladsaxe, Herlev and Glostrup to Ishøj, Brøndby and Avedøre Holme in the South. This connection will not only link these city districts with each other and with the sea, but also with the Øresund Bridge and the Helsingborg ferry – both of these linking Denmark and Sweden and creating a full circle loop also including Malmö and other Swedish cities.

http://www.realdania.dk/Projekter/Byen/Ringbyen.aspx



Denser neighbourhoods are not only efficient for reducing car travel and increase cycling and walking, but also for retrofitting outdated infrastructural services for urban water and energy provision. Vancouver has a target to bring down their community-based greenhouse gas emissions to 5 per cent below the 1990 levels – and this in a city which has grown with 27 per cent in population and 18 per cent in jobs (Vancouver 2012). Currently, the city's electricity is generated in British Columbia and 93 per cent from renewable sources. Neighbourhood-scale renewable energy projects are being developed and further conversion to renewable sources will create new green jobs. The City has also claims to have implemented the greenest building code in North America.

Urban water is another significant competitor for urban land use. Today – as a result of urban expansion – many waste water treatment plants (WWTPs) are situated on sites that are becoming increasingly more attractive for other land use. Building projects are moving closer and relocation of entire WWTPs is sometimes being considered. Moreover, management of both fresh water and storm water is requiring considerable areas of urban land, not least in relation to the foreseen increase in flooding due to climate change (see also Chapter 7 on ecosystem services). The extensive land use for motorized transport on impermeable surfaces has significant consequences for storm water run-off and retention, as well as for generating flows of polluted water. Protection areas for fresh water prohibits certain types of development initiatives and buildings need to be kept away from areas prone to flooding or from areas needed for storm water retention and as effluents in case of heavy rainfall (Thysell and Lundgren 2012). All in all, to manage conflicting land use interests, "water interests" need to be reshaped into "common interests" with the help of relevant actors, in

order to better succeed when conflicting with other interests, such as environmental protection or housing projects (Karlsson 2009).

This last observation points towards the need of seeing urban infrastructure as a mix of physical structures of different kinds, on the one hand, and institutional structures and stakeholders, on the other – as sociotechnical fusions of network hardware and software where planning and management is increasingly turning into negotiations between different interests (Graham and Marvin 2001; Kain 2003).

## 8.5 Smart Cities

The urban innovation discussed in Chapter 6 is often linked to the concept of "smart cities", where the term "smart" has gained importance in urban planning through the ideas of "smart growth". Instead of submitting to market dictated laissez faire planning resulting in urban sprawl or exaggerated densification, smart growth argues that greater efficiencies can be accomplished by coordinating transportation, land speculation, conservation, and economic development. It is thus about synthesizing hard infrastructure with the availability and quality of knowledge communication and social infrastructure, where the latter is critical for a city's competitiveness. However, it may also be argued that smart cities can – or have the potential to – improve competitiveness in ways that also strengthen community and improve quality of life for all. (Batty et al. 2012; Caragliu et al. 2011)

EXAMPLE
**Green Tech Valley: Smart City Graz**
In the project area close to the Graz main station, more than 400 hectares in the districts of Gries, Lend, Eggenberg and Wetzelsdorf are to be transformed into a widely-used urban district with the latest energy technologies. As an environmentally friendly, smart, vibrant and liveable neighbourhood with minimal or no $CO_2$ emissions and low energy consumption, it will prove the commercial viability of new technologies through renewable energy, building technologies, green mobility, social mix and community participation.

www.eco.at/cms/307/7967/Smart+City+Graz/

A specific and narrower niche in the smart cities landscape are the so-called smart grids:

> "Smart Grids can be described as an upgraded electricity network enabling two-way information and power exchange between suppliers and consumers, thanks to the pervasive incorporation of intelligent communication monitoring and management systems." (Giordano et al. 2011:7)

A smart grid is thus an electric grid that uses computers and other technology to gather and act in an automated fashion on information, for example regarding the behaviour of suppliers and consumers. There are several foreseen benefits, such as the improved efficiency, reliability, economics and sustainability of the production and distribution of electricity. Another benefit would be the possibility to store energy from temporary sources in a distributed and decentralized system. As an example, energy from wind power could be stored in the batteries of electric vehicles and then be fed back to the grid when the need arises, during peak consumption or calm winds. However, smart grids are not only a matter of developing physical infrastructure, but also need to be complemented

by novel business models and practices, stakeholder cooperation, new regulations, and potentially also by changes in consumer behaviour and social acceptance (Giordano et al. 2011).

Regarding the wider notion of smart cities, Batty et al. (2012:505) have identified six types of initiatives within the smart city movement:

1. "The development of new cities badging themselves as smart. These are proliferating in rapidly growing countries. Masdar outside of Abu Dhabi is being developed by GE as the world's first carbon neutral city, Paredes in Portugal is where Microsoft are wiring an energy efficient city, Dongtan in the Yangtze Delta is being developed by Arup as a smart green eco-town, and Songdo in South Korea is where Cisco are building a town wired at all levels.
2. The development of older cities regenerating themselves as smart. In much more bottom-up fashion, which include many cities which are embedding new ICT as a matter of course. Examples of best practice are to be found in world cities where spontaneous developments of new technologies are emerging in places such as Silicon Alley (New York City), Silicon Roundabout (London) and Akihabara (Tokyo).
3. The development of science parks, tech cities, and technopoles focused on high technologies. Silicon Valley and Route 128 are the classic examples but the science park idea is still highly resonant with respect to local economic development where high tech production merges with its consumption in making such areas smart.
4. The development of urban services using contemporary ICT. In the form of networked data base, cloud computing and fixed and mobile networks, a force which is more central to our concerns here in coordinating diverse interests and sectors which will make the city smart in its design and planning.
5. The use of ICT to develop new urban intelligence functions. These are new conceptions of the way the city functions and utilise the complexity sciences in fashioning powerful new forms of simulation model and optimisation methods that generate city structures and forms that improve efficiency, equity and the quality of life.
6. The development of online and mobile forms of participation. In which the citizenry is massively engaged in working towards improving the city alongside planners and designers from government and business. Decentralised notions of governance and community action are central to these new forms of participations which use extensive ICT."

EXAMPLE

The **FuturICT** research project on smart cities has defined seven goals for their research:

- "A New Understanding of Urban Problems. Cities are complex systems par excellence, more than the sum of their parts and developed through a multitude of individual and collective decisions from the bottom up to the top down.
- Effective and Feasible Ways to Coordinate Urban Technologies. Rapid advances in building information technologies into the very fabric of the city while at the same time using these technologies to integrate and add value to the provision of urban services provide the mandate for the sustained development of new methods.

- Models and Methods for Using Urban Data across Spatial and Temporal Scales. Much data which is being generated in real time in cities needs to be merged with more traditional cross sectional sources but built on simulations that link real time, more routine problems to longer term strategic planning and action.
- Developing New Technologies for Communication and Dissemination. New sources of urban data, the articulation of urban problems, plans and policies, and all the apparatus used in engaging the community in developing smart cities require new forms of online participation.
- New Forms of Urban Governance and Organisation. New ways of re-engineering cities to make them smart, responsive, competitive and equitable will require new forms of governance for an online world.
- Defining Critical Problems Relating to Cities, Transport, and Energy. FuturICT is focussed on defining critical problems that emerge rapidly and unexpectedly in human society, some of which reveal critical infrastructures. The analysis of such problems and their identification is crucial to the sustainability and resilience of smart cities.
- Risk, Uncertainty and Hazard in the Smart City. A much more informed understanding of risks in urban society is required which involves new data, new technologies, and new collective approaches to decision-making."

(Batty et al. 2012:483-484, see also http://www.futurict.eu/)

However, Robinson (2012) argues that just being "smart" is not sufficient and that smart technologies should be used to transform cities into "future cities":

- "A Future City is in a position to make a success of the present: for example, it is economically active in high-value industry sectors and able to provide the workforce and infrastructure that companies in those sectors need
- A Future City is on course for a successful future: with an education system that provides the skills that will be needed by future industries as technology evolves
- A Future City creates sustainable, equitably distributed growth: where education and employment opportunities are widely available to all citizens and communities, and with a focus on delivering social and environmental outcomes as well as economic growth
- A Future City operates as efficiently and intelligently as possible: so that resources such as energy, transportation systems and water are used optimally, providing a low-cost, low-carbon basis for economic and social growth, and an attractive, healthy environment in which to live and work
- A Future City enables citizens, communities, entrepreneurs and businesses to do their best; because making infrastructures Smarter is an engineering challenge; but making cities Smarter is a societal challenge; and those best placed to understand how societies can change are those who can innovate within them"

Universities play a specific role in innovation for sustainable urban development, and currently so-called "urban living laboratories" are being promoted widely by policy-makers, research funders and the universities themselves. When academics from various disciplines engage with real world

sustainable urban development challenges – activities taking place in particular spaces in cities or on university campuses – involved cities can position themselves as being innovative while the universities become able to link research to real world impact. Apart from helping to address specific local challenges, living laboratories can also serve as platforms for wider visioning and knowledge production processes with potential to stimulate urban change outside of their borders. In this way, such laboratories become important for how universities may contribute to a wider societal transition towards sustainability. (König 2013)

In the wider discussion on how cities may gain a competitive edge, the collaboration between a city and its universities becomes decisive for success:

> "It is widely recognised that we live in a 'knowledge economy'. Knowledge is seen as central to economic and social development, competitive success and the wealth and health of the nation. The role of universities as knowledge producers is increasingly valued in this climate with an emphasis upon their relationships with businesses, governments and society in general. Priority is increasingly being given to 'social robustness', 'relevance', 'user engagement' and 'knowledge transfer'. (…) On the one hand research needs to be conducted at an international level in order to meet criteria of world-class excellence. On the other hand it also needs to be embedded in local and regional contexts if the kinds of economic, social and environmental benefits expected from knowledge are to be realised." (May et al. 2009)

EXAMPLE

**REDIS - Restructuring districts into science quarters**

Many European cities and regions strive to promote their "knowledge economy" as knowledge is a significant source of wealth in advanced economies. The REDIS project focuses on development and management of knowledge hotspots, such as campuses, science quarters, and creative districts. The new generation of knowledge hubs are increasingly being developed as part of the urban fabric rather than being located outside of cities and also tend to be more functionally mixed. There is thus a need to handle conflicts of interests in a good way and to integrate knowledge hubs into the city in a sustainable way. (van Winden 2011)
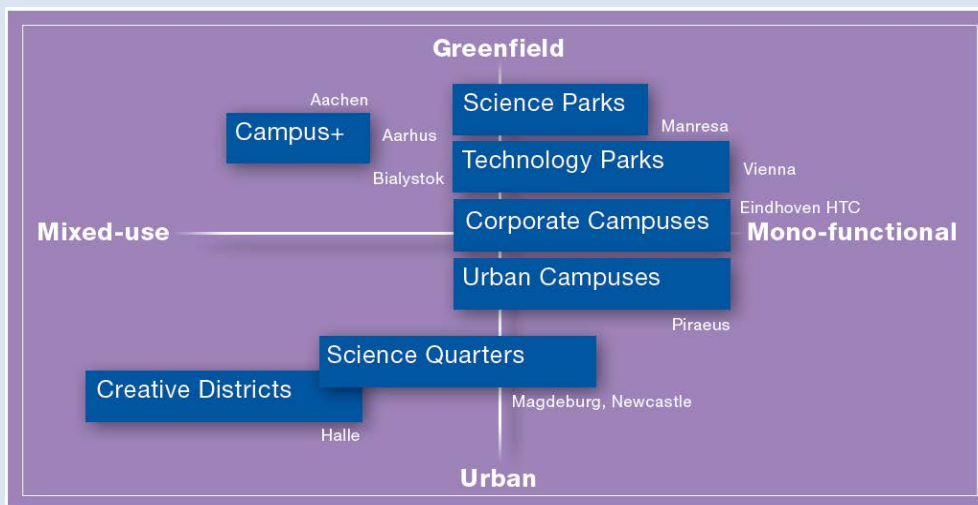
Three dimensions of integration have to be taken into account when developing an urban knowledge hotspot: the physical, the social and the economic. Stakeholders' management when promoting involvement in transformation of knowledge-driven urban development. This means that spatial, physical, functional and conceptual linkages between the new knowledge hub and the city should be addressed to identify conflicting interests at an early stage and to develop creative solutions. There are no blueprints for optimal integration as the development is highly context-specific. However, a good knowledge hotspot has at least four features:

1.  it has a joint identity,
2.  its target groups and concept are clearly defined,
3.  it is well connected to the city, and
4.  it is well managed.

Each REDIS research case is well documented in the project **Handbook**, including Aachen, Aarhus, Bialystok, Dublin, Eindhoven, Helsinki, Magdeburg, Manresa and Newcastle.

(http://urbact.eu/en/projects/innovation-creativity/redis/homepage)

As an example of how the notion of the knowledge economy drives urban development, a **large-scale university development project** is under way on the Saclay plateau to further situate the Paris region at the top 10 of the world-leading regional knowledge economies. The objective is to develop a stimulating environment for scientific and industrial projects through urban and landscape planning and economic development to create a setting of international appeal, business creation and growth, and open innovation. More than 50 000 people are planned to work and live here in a "cluster city" environment mixing academia, business, service and housing. (Paris Saclay 2012)



However, as this large-scale project is situated on fertile agricultural land quite far away from larger existing urban nodes, there may be reason to debate to what extent such a project actually represents "smart" and resource efficient urban development:

"The wind blows across the Saclay plateau, drawing patterns in the barley fields. Nadine Vilain walks along the track, pointing out what will be left of her farm. Of the existing 40 hectares, only 13 will soon be spared from new developments. Route Nationale 118, which cuts across the plateau on its way to Paris, 15km to the north-east, runs close to her fields. Beyond the road various new university buildings are going up, the forerunners of a science and technology cluster." (Boris 2012)

An interesting question is how the location and development of such a project is linked to the wider competition for urban land in the Paris metropolitan region.

## 8.6 Form and structures of urban land use

As discussed in Chapter 5, more compact urban form is widely promoted as a main response to needs for resource efficiency, social cohesion and economic development. In their "Urban planning for city leaders" the UN-HABITAT (2012) argues that urban form makes a difference regarding housing, employment, accessibility and safety – a claim that is well substantiated through decades of research on urban density, morphology and connectivity (see e.g. Newman and Kenworthy 1989; Breheny 1996; Haughton 1997; Tjallingii 1997; Williams et al. 2000; Keiner et al. 2004; Westerink et al. 2012). Above, the benefits from urban densification in terms of land consumption, environmental matters, innovation and economic development have already been discussed. Unfortunately, research shows that more compact cities may also increase rates of crime and HIV, and have other negative consequences, such as reduced living space, lack of affordable housing, and – a bit surprisingly – lower levels of walking and cycling (Burton 2000; Bettencourt et al. 2007).

The UN-HABITAT (2012) emphasizes that density is city-specific and that cultural factors and lifestyles impact on what is seen as good urban patterns and acceptable density. Even so, high population density reduces costs for urban services, such as waste management, water supply, sanitation, and police and fire services. UN-HABITAT summarizes the advantages of compact urban patterns as:

- Better accessibility reduces both the need to travel and the trip distances
- Lower infrastructure cost and more efficient use of urban services
- Preserved land resources for agriculture, green lands and water and energy provision
- Lower cost of economic transactions, as proximity reduces costs of taking part in economic transactions
- Social integration leads to awareness of different cultural and social groups and thus has a social cohesion function

However, with very high densities, the economic benefits become less significant if infrastructure demand rises beyond the infrastructure capacity and where health problems, congestion, pollution, and loss of green space starts to add up (UN-HABITAT 2012). The debate on compact cities has, therefore, also included how cities are structured and interconnected through different means of communication linking sub-cores and neighbourhoods. Although the LINKS project presented above argues strongly for the benefits of focusing on the main (and historic) core of cities, there is also a strong case for polycentric cities for promoting use of public transport. Such polycentrism may take on many different shapes, such as finger/corridor cities, star cities, linear cities, satellite cities, galaxies of settlements, polycentric nets, or fractal cities (Frey 1999; Adolphson 2010; Batty et al. 2012). A common trait to them all is that they seek to deliver the benefits of both sprawling and

compact cities, while minimizing their detriments (Echenique et al. 2012). Recently, Spanish research has tested the hypothesis that a polycentric city is more environmentally efficient than a monocentric city (Roca et al. 2011). The study is grounded upon two major Spanish cities, Madrid and Barcelona, focuses on land use and shows that polycentric Barcelona has a more efficient use of land and a lower degree of sprawl than monocentric Madrid, even though Madrid actually has the better geographic conditions.

**EXAMPLE**

UN-HABITAT identifies three main policy options (or combinations thereof) for accommodating urban population growth:

*Intensification:* Increase the current carrying capacity through infill development, regeneration of brownfields and replacing existing buildings with new ones with more capacity. Establish regulations to preserve no-development zones and to control trends towards decline in density.



*Extension:* Expand the boundaries to stimulate development at the fringes of the city. Extensions should be integrated with existing infrastructure and transport systems and urban services of new areas should be calculated to also serve residents living in deprived districts in the existing city.
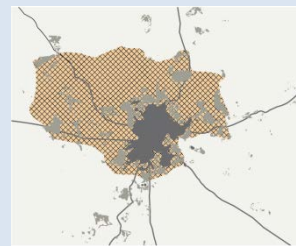


*Multiplication*: Create a spatial system with many new satellite towns. Such urban nodes should be physically separated and to some extent independent administratively, economically and socially from each other and from the main urban core, but still coordinated to capitalize on synergies and economies of scale.



http://www.unhabitat.org/pmss/getElectronicVersion.aspx?nr=3385andalt=1
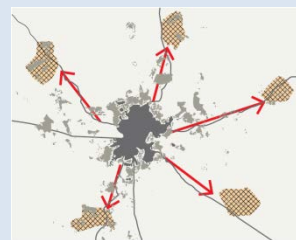
Furthermore, by combining the dynamics of growing and shrinking cities with different governance contexts the research project **Urbanization, Biodiversity and Ecosystem Services (Urbes)** has presented yet another typology of urban development patterns (Urbes 2010):

| Drivers | Urban growth (increasing population, GDP etc) | Urban decline (decreasing population, GDP etc) |
|---|---|---|
| *Laissez-faire – weak planning and governance structure* | Sprawling growth | Urban doughnut |
| *Strong hierarchical planning and governance structure* | Compact city | Ruralising fringes |
| *Low hierarchy multi-level planning and governance* | Dense polycentric | Urban archipelago |

Such a typology is helpful for starting a discussion on potential links between urban governance styles and a city's spatial configuration. However, it risks missing out on a more detailed understanding of how urban morphology develops in growth and shrinkage situations and how that may affect urban life. For example: How does size matter; is a compact city of 100 000 inhabitants the same as one with one million or one with ten million inhabitants? What other structural distortions and shapes may the "doughnut" situation (i.e. a vacant centre) exhibit? How deep is a "fringe" and what urban characteristics does it have apart from the rural? And what is actually an "urban archipelago"? Here, IBA Stadtumbau has presented additional scenarios for urban shrinkage (IBA Stadtumbau 2010, see also Chapter 6):



Schrumpfungsszenarien
scenarios of shrinkage

Konzentration
concentration

Perforation
perforation

Archipelago
archipelago
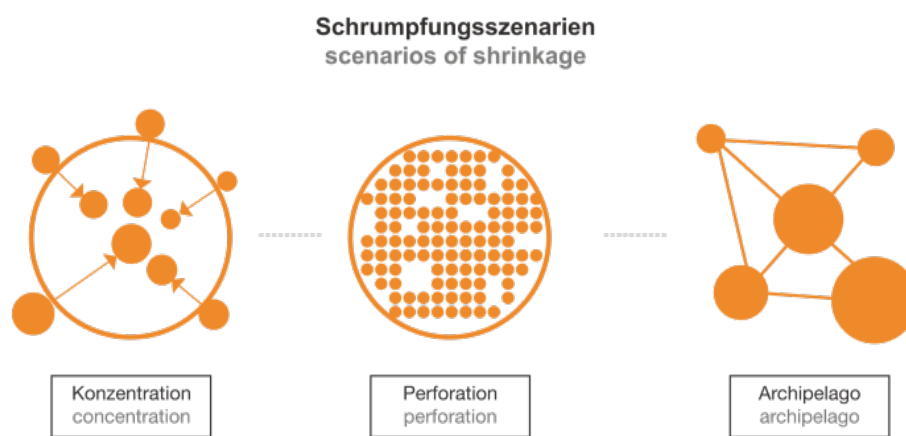
In many cities development opportunities and drivers have resulted in cities sprawling out onto arable or unsafe land. As seen above, research and policy build quite a strong case for counteracting such sprawl by, in different ways, concentrating the built environment into compact or polycentric structures. However, it is also argued that we need to focus more on developing and maintaining ecosystem services inside cities in the near future, to further decrease encroachment on arable and natural land (TEEB 2011, see also Chapter 7).

If followed through, such policies will result in more limited access to land for construction and more intensive vertical densification is an obvious response. In some cities – such as New York, Singapore and Hong Kong – strong geographical or political boundaries have already created incentives for dense high-rise development. However, excessive future vertical densification may result in vertical

sprawl, with skyscraping suburbs dependent on elaborate transport systems evolving into vertical cul-de-sacs and gated communities (Hwang 2006). One can quite easily imagine gloomy and unhealthy environments on the lower levels and expensive condominiums on the upper floors with access to sunlight and fresh air.

Vertical densification is evidently nothing new but rather a fundamental property of all cities. However, during the last decades we have seen a shift from seeing buildings as concrete, bricks and technical systems towards a more integrated perspective where urban green (and their ecosystem services) is increasingly being integrated into buildings. Here, the architect firm MVRDV was one of the pioneers, through the Dutch Pavilion at the Hannover Expo in 2000, but many others have followed.

EXAMPLE

**Bosco Verticale (Vertical Forest)** is a contemporary project for metropolitan reforestation aiming to contribute urban ecosystem services through vertical densification of nature within the city. The first Bosco Verticale – two residential towers of 110 and 76 meters height – is under construction in the centre of Milan, on the edge of the Isola neighbourhood, and will host 900 trees (each measuring 3, 6 or 9 m tall) apart from a wide range of shrubs and floral plants. Each Bosco Verticale equals, in amount of trees, an area equal to 10.000 m$^2$ of forest. According to the architect, it optimizes, recuperates and produces energy, creates a microclimate, reduces noise and filter dust particles. (Boeristudio 2013)



http://www.stefanoboeriarchitetti.net/?p=207
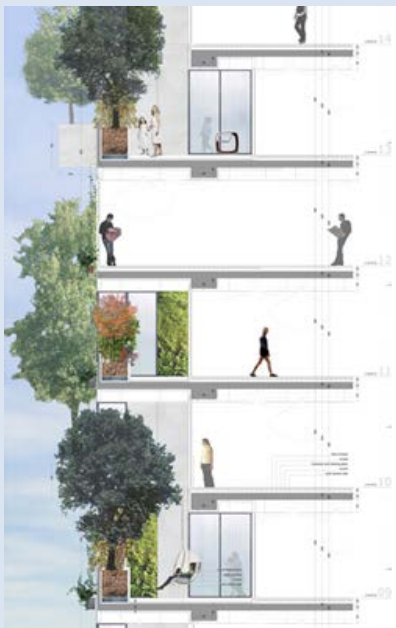
Another response to the competition for urban land and vertical densification is to go downwards. Although many infrastructure systems traditionally have been located underground, there are pressures for further increase of such installations and hence strong incentives for planning the urban underground in a more consistent manner (Maire et al. 2012). Additionally, there is a strong interest worldwide for underground construction also for shopping, leisure and industrial activities.

In more futuristic projects, underground construction can be given properties more fully approaching the vision of the good urban life combining social and environmental qualities, and also including ecosystem services in the same way as the Bosco Verticale. One such example is the Earthcraper suggested for a square in Mexico City (BNKR Arquitectura 2013).
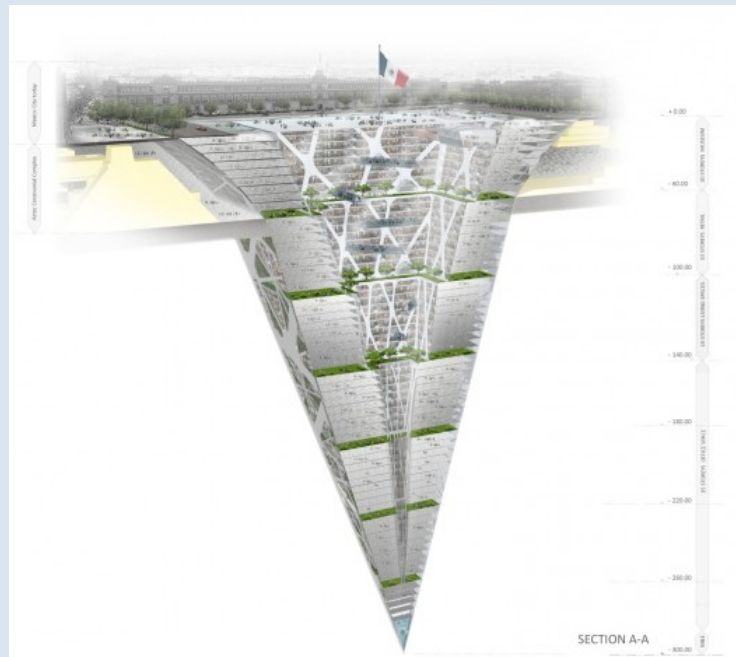


The BNKR Earthscraper, Mexico City (BNKR Arquitectura 2013)
http://www.bunkerarquitectura.com/

In a more down-to-earth approach, the City of Rotterdam carried out a study for the International Architecture Biennale Rotterdam 2012 by involving a range of partners: such as the Interreg IVB project MUSIC, TNO, Doepel Strijkers, Sander Lap, and Drift. Compared with the average Dutch City, only half as many inhabitants live in Rotterdam's inner city. The aim of the study has been to look at strategies to double this number from 30 000 to 60 000 inhabitants over a period of thirty years – strategies for the densification and greenification of central Rotterdam to become a more sustainable city. This richly illustrated project report explores the hypothesis that Densification + Greenification = Sustainable City, and presents the findings, supported by input from inhabitants, developers and specialists. Two sets of strategies for attaining sustainable development were developed (Tillie et al. 2012). In order to increase clarity and expressiveness of the city's sustainability profile, nine indicators were also identified and used to show that urban densification can improve sustainability: physical activity, facilities, noise, employment, congestion, market value, heat islands, energy use and urban green.

EXAMPLE

**Rotterdam: Densification + Greenification = Sustainable City**

Seven strategies for densification with the overall goal to improve quality of life for both existing and new inner-city dwellers:

- *Ground-based dwelling* to increase the liveability of neighbourhoods.
- *Water dwellings* that make use of the central expanses of water.
- *High-rise dwellings* that build on Rotterdam's famous skyline.
- *Transformation* to deal with extensive short- and long-term vacancies in the inner-city offices.
- *Skyborn projects* on top of existing buildings, from individual penthouses to roof villages.
- *Infill projects* to make use of gaps and undeveloped plots.
- *Do–it-yourself solutions* that allow people to remake interiors to make room for more inhabitants.

Seven green strategies promoting a pleasant living environment that attract more people to the city centre:

- *Boulevards* are increasingly becoming public spaces, and their trees and greenery are both useful and attractive.
- *Quays* have turned from industrial areas to primary recreational green areas, which connect the city to the water.
- *Squares,* where trees and plants can help in creating an individual character an identity.
- *Parks,* in various sizes, are planned for everyone to have one within walking distance.
- *Playgrounds* that encourage children to play and make central Rotterdam child-friendly.
- *Green roofs and facades* are planned, for both ecological and recreational purposes.
- *Glamorous green* are busy outdoor spaces of excellent quality, forming prime social arenas.

http://www.tno.nl/downloads/making_city_en.pdf

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## Chapter 8

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# 10. About URBAN NEXUS

URBAN-NEXUS enables knowledge transfer and stimulates dialogue to form long-lasting partnerships amongst researchers, practitioners, policy makers, civil society and SMEs. It promotes integrated approaches to sustainable urban development.

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| **FORMAS** – Swedish Research Council for Environment and Spatial Planning, Sweden | | **ADVANCITY** French Ministry of Industry, France |
| **UWE** – University of the West of England, UK | | **SIRS** – Information System and Spatial Reference, France |
| **AASDE** – Agency for Sustainable development and Euro-Integration, Bulgaria | | **Bauhaus Dessau Foundation**, Germany |
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