Ecosystem Health and Sustainable Agriculture

Rural Development and Land Use

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An Urban-Rural Civilisation History

The Roots of Urbanisation
Today it is clear that the fossil fuelled urbanisation is one of the main drivers of global change (UNHabitat, 2007; IGBP, 2004; Aleklett, 2008). Also a massive depopulation and decomposition of local rural functions and livelihoods – and the effects of the modern industrialized agriculture – adds to severe planetary reverberations: more frequent droughts, floods, changes in atmospheric concentrations of gases and greater variations in temperature and moisture across the planet (IGBP, 2004). A common denominator for this development is an ongoing separation of urban and rural development. This separation is partly geographical and physical – as a quite recent breach in the place-bound co-evolution of urban and rural systems (Saifi & Drake, 2007). The separation is also partly functional and conceptual as our civilization has now lost its overview, control and understanding of resilient life support (food, fuel and fibre) and its relation to present human culture.

During practically all of its 7,000-years of history – since the foundation of Eridu, Ur and other early urban-like settlements around Euphrates and Tigris in present Iraq – the cities of the world were always closely intertwined with agricultural-, fisheries- and herding ecosystems. And through the millennia – old cities and conglomerates of Neolithic villages in pre-historic Americas, in ancient Turkey, along the Nile, by the Indus delta and in early Yangtze cultures – the urban and rural were perceptionally, geographically and functionally integrated – hence featuring the fundamental essence of a sustainable urban principle (Sinclair et al. 2011; Hyams, 1976). Even during modern time’s industrialization, our current city cultures were in principle physically co-evolving with its life-support hinterlands and micro-regions (Saifi & Drake, 2007). The full separation of urban and rural has mainly been a post-modern invention of the last 60 years – through globalized markets for labour, food, fibres, fuel...
and minerals. And even more: this current time era with food specialization and extreme international trade may have reached its peak. And the necessary *sustainability transition* in our current civilisation – fuelled by the climate-, environmental- and resource crises of the globe – today features a modern re-integration of urban and rural structures (Saifi & Drake, 2007; Gaffron et al. 2005; Itoh, 2003).

In an envisioned more robust future human culture, the *cities* will probably not be exclusively urban, but also encompass rural functions and a high consciousness about its life-support systems (Gaffron et al., 2008). For new rural human habitats – reformed for global survival – the *countryside* will most possibly link more efficiently to urban communication, urban transport systems and urban culture. Such partly new human habitats may be called *Resilient Citylands* (see below and Berg, 2010).

In this chapter we will discuss the process of urbanization as well as how cities and its surrounding rural landscape depend on each other and how their interaction is important - even crucial - for sustainable development.

**Urban-rural Co-generation Until Second World War and After**

During its 250-year history probably starting with Coalbrookdale in Western England – newly industrialized cities received its basic life support from its embedding productive fields, forests and waters. The industry cities grew initially along railway settlements as star rays into the surrounding landscape (Carstensen, 1992, Hall, 1988; Geddes, 1904). In the opposite direction, fibre- and energy yielding forest-, productive farmland- and fish-rich water landscapes reached inward towards the centre of cities in the form of green-blue wedges. The urban and rural interlocked structures were *co-evolving* all the way until the beginning of the 1930-ies in central Europe and until the 1950-ies in the Nordic countries (Berg, 2010; Saifi & Drake, 2007, Helmfrid, 1994; Carstensson, 1992). Already in the beginning of the 20th century attempts were made in England to extract the magic, the labour markets and the cultural excellence out of the unhealthy, coal smoke-stricken cities and combine it with the healthy nature outside the city in Ebenezer Howard’s *garden city movement* (Howard, 1902). Even in our own time, in the most radical examples of emancipation of nature from the urban fabric – the American sub-division – was paradoxically created as an effect of human private cravings for both the city and nature (Mumford, 1961). As the continuous villa-mats spread out throughout the private motorism-fuelled and land-consuming suburbs – eradicating any natural- or cultivated landscapes – wealthy citizens a few decades later desperately sought the new frontier and started to settle in *edge-cities*, in the new urban fringe between wilderness and urban structures (Garreau, 1985).

The practice of intertwining built and green/blue structures is now gradually degraded in Nordic cities but in our time this is instead developing in central European cities: Stockholm’s *green wedges* (Florgård, 2004) and Copenhagen’s *green finger plan* is now inspiring Paris, London, Berlin, Rome and Barcelona to find a new integration between urban and rural: For the *health and recreation* of its citizens; for improving the *ecosystems services* and even increasingly for slowly expanding the *primary production* in, near and over the free land areas surrounding the city (Bokalders & Block, 2010; Egnor, 2009; Gaffron 2005; 2008; Bolunda & Hunhammar, 1999).
Primary Drivers and Dark Clouds of Urbanisation
The first urban structures were built as market places for food and commodities, trade and labour, business, and communication. Functionally the first cities were densely populated settlements and legally they became organizational entities with exclusive rights. Socio-politically they got the preconditions for the establishment of a military-protected ruling class, living on the primary production surplus, created by the farmers outside and the craftsmen inside the fortified towns. The densely populated towns, eventually nurtured emergent cultural systems and art (Sinclair et al. 2011; Ahlberg, 2005). Even today people and business move to cities to find jobs, trading partners and housing. And both the traditional and the new sustainable city with its mixed-use, short-distance, walkable structures – could save time, money and resources for travel and transport, service and cultural experiences (Gehl, 2010; Gaffron, 2005). Living in cities also permitted individuals and families to take advantage of its human diversity, excellence in art, traditions, the magic of the city, sports and education and of specialized market commodities (Alexander, 1977; Jacobs, 1961).

Through an efficient, egalitarian and democratic governance, cities may also deliver broad education to all its inhabitants, an inclusive participation in the development of communities, a high quality health care and other public and commercial services for all citizens and a versatile transit system. Inside the cities, commodities, convenience and culture may be exchanged more efficiently than in sparsely populated areas simply because of scale and proximity (Gehl, 2010; Bokalders & Block, 2010; Gaffron et al. 2005; 2008).

If this is the positive vision of the city, the reality in the world cities is however a growing slum formation, social degradation, violence, drug abuse, poor and unhealthy housing, decreasing job opportunities, car-invaded streets or long-distance uncomfortable travel to work. In the Baltic Sea region such problems are less prominent but the suburban problems typically include segregation, high unemployment and social unrest. The intrinsic drawbacks in all modern urban areas are also always a relative deficit of nature, clean air, healthy environments, ecosystem services and basic life support with energy, water, food and matter (Berg 2010; Bokalders & Block, 2010).

Moving To the Cities – the Modern Urbanisation History
Up to the end of the 19th century most people in the world lived in the countryside. With few exceptions cities were small compared to today and in 1900, even in Europe, they housed less than 15% of the population.

A wave of urbanisation started when growing industries needed a larger and specialized workforce in the beginning and middle of the 19th century (Mumford, 1961). The fastest growing cities were found along rivers and by coasts where transport were easier. With the development of railroads, industrial cities were established also inland. During the decades after the 2nd World War, a new wave of labour induced urbanization occurred in new “sleeping” suburbs (Alexander, 1977; Schorske, 1963).

After the 2nd world war, agriculture were increasingly industrialized and mechanized and needed less labour. In many countries, the farm size gradually increased and smaller farms were abandoned. In the West this development started already after the 1950s while it occurred much later in Central and Eastern Europe. Still in the
early 1990s there were more than a million small farms in Poland (Kronenberg & Bergier, 2010; Maciejewski, 2002; Rydén et al. 2003).

Another strong driver for urbanization in the Baltic Sea region (BSR) was population growth. During the 19th century and up to the first World War, a growing part of the population couldn’t find life support and therefore emigrated to the Americas, e.g. to the United States. After that the Baltic Sea region population roughly doubled during the 20th century – this time swallowed by the growing cities. From the 1990s the urban share of the population in the West has typically reached 85% while in the East just above 70% (Rydén, 2003; Kronenberg & Bergier, 2010). For the world, currently the largest wave of urban growth in human history is taking place. Since 2008, more than half of the world’s population – 3.5 billion people – live in towns and cities. By 2030 the projections are 5 billion people in cities, mostly in Africa and Asia (UNHabitat, 2007).

For the Baltic Sea region the population dynamics is more complex: Some central large cities, e.g. Stockholm, St Petersburg and Warzaw grow steadily, whereas remote smaller towns and communities are depopulated (Hanell & Tornberg, 2007). Some cities, e.g. Riga, decrease in size as many leave to find jobs elsewhere. Urbanisation in the BSR is however also expected to reach 85%. An opposite weaker sub-trend is re-ruralisation – when families move to the surrounding countryside to find primary production jobs and a new lifestyle.

The Vision of a Good City

Patterns of Urban Cultures
What is a good city? Cities were during most of its history environmental disasters, with air pollution, contaminated waters and epidemics. During industrialization, life expectancy in cities was much lower than in the countryside. The post-industrial era featured an improved sanitation, hygiene and housing standards but was instead followed by a new plague: excessive motorism again fouling the air, polluting the waters and contributing to accidents and an increased crime rate (Gehl, 2010; Hall, 1988; Alexander et al. 1977).

In city planning all through history – there has been a struggle for understanding and implementing a functional and attractive urban environment for its citizens creating wellbeing, security and support (Lynch, 1981). For its life-support, all dense human habitats must handle challenges of energy-, water- and food provision for its inhabitants as well as an efficient waste and waste-water management (Bokalders & Block, 2010). For any urban human habitat, also its wealth distribution, accessibility for citizens to public transport and other public and private services, culture, parks and waterfronts are important issues (Gehl, 2010; Alexander, 1977). The social aspects of a city are equally important, such as high quality relations between citizens, good education, strong local communities, a sense of security and what classic urbanist Jane Jacobs referred to as a “caring citizenship” (Jacobs, 1961). If the ambition is to include all the citizens’ needs and demands – also mechanisms for public participation are crucial for creating the good city (Gaffron et al. 2005; Day, 2002; UNCHS, 1996).

Parallel with a new urban-rural integration as one basic principle for sustainable cities and rural areas, the understanding of the flows and communications within the urban
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environment has undergone a fast development. The walkable city with short-distances to all urban functions was the historic norm, whereas spread-out, zonated new world car-cities had up to now been the exceptions. It is only during the past 60 years that the cities have been increasingly invaded by private motorism – a plague currently spreading in all third world- and newly industrialised cities. At the same time many e.g. European cities now try to re-conquer the walkable city. Another influence during the past century still boosting the land-consuming, car-dependent city is the modernistic project including large-scale housing areas and sprawling villa areas, tied together with motorway arteries, junctions and an all over the cityscape covering iron-grid network of accessible streets. The garden city proponents: e.g. Ebenezer Howard (1902), Patrick Geddes (1904) and later Ian McHarg (1969) and Johan Rådberg (1982) argued in favour of more green-covered and healthy cities as a reaction to the coal-fired, disease-spreading hardscapes of the industrial towns.

The green healthy city ideals also included various aspects of urban farming (Wagner, 1921; Geddes, 1904). Another group of city planners, architects and debaters focused on the need to create social, equitable and inclusive cities: e.g. Lewis Mumford, (1961), Jane Jacobs (1961) and Christopher Alexander (1977). Only in the past few decades, attempts were made to combine urban green principles with the social and organizational function of urban areas in the emerging Ecocities plans and principles (Bokalders & Block, 2010; Gaffron et al. 2005).

From Declining Countrysides to Complete Communities

What are good rural towns and communities: As the countrysides’ organization and livability are increasingly secondary to the needs in the urban areas – its citizens increasingly abandon its fields, forests and waters – as well as its small towns and spread-out communities, i.a. in the Baltic Sea Region (Hanell & Tornberg, 2007). And as the regions are drained of its brain- and practical experience powers in the countryside – also the urban environments get more impoverished (Alexander, 1977). The living community countryside with all its life support, ecosystems services and recreational capacities are gradually degraded due to its step-by-step loss of maintenance and caretaking.

This rural flight can only be countered through a development of the rural areas and towns based on their own opportunities and requirements. The necessary upgrading of the rural areas include tailor-made solutions for combining services, for a place and situation adapted tax system, for a higher revenue from its natural resource capital and for the local provision of food, waters, fibre, minerals and other natural resources (Kahiluoto, 2006; Svensson, 1993).

For reversing the rural flight trend also a development and maintenance of complete rural communities need to take place. Complete communities include all necessary ingredients for sustenance of the rural communities (Berg, 2010). And the definition of complete communities must be done from the rural perspective: what does the rural community need? What can they not survive without? Even a non-profitable shop or pre-school may need to remain since they are deeply connected to all other rural systems (SOU, 2005; Leader, 2000; Svensson, 1993). And one particularly important measure for reversing the rural flight is to connect more closely the rural culture with the urban.
The Emergence of Ecocities

Major approaches to achieve urban sustainability has for the past decade been to address its energy efficiency, the form of the city and the organization of its mobility. The simple hypothesis is that if the city is densified – there will theoretically be shorter distances between dwelling and various functions (Thwaites, 2007; Gaffron, 2005). Initially the critics identified the modernistic project as the main problem and the compact city as the main remedy for creating the sustainable city. This is – however – nuanced in more advanced ecocity architecture and planning where advantages and drawbacks of both models are discussed (Ibid). In times of fast expansion and growth of cities, waves of unreflected densification are typically the universal strategy to cope with a growing population, with a growing resource turnover and with the need for a higher capacity of the city machinery (Berg et al.2012, submitted; Rådberg, 1988).

A series of modernistic waves can be distinguished: e.g. within the first industrialization wave during the 19th century; at the expansion of suburbia and the car-society after 2nd World War – and today at the turn of the new millennium when densification is an economically motivated strategy for the transformation into resource efficient cities. The Ecocityprojects (2003-2008) in seven EU cities from Northern Tampere to Southern Barcelona have all emphasized that dense is better for the environment (Gaffron et al. 2005; 2008).

But the compact European city also exhibits “qualified density”, a “balance of centralization and decentralization” and presupposes that apart from houses – also green areas, squares, commercial plazas and other public spaces are included in the densification strategy. Therefore, important part-goals for the formation of ecocities are also short distances, mixed-use planning, integration of infrasystems and a city for all inhabitants (Ibid). On the move in international ecocity planning is also the Gehl Architects call for cities for people, with human scale and human psychologically adapted streets and functions as key drivers for the new cities. And the potentially most radical transformation is from the car-dependent hardscape city to the walkable green city. This transformation is currently underway in a range of European cities: e.g. in southern Germany, in Holland and Denmark.
The New Urban Rural Co-operation

Cities’ Eternal Dependency on Rural Production

Rural areas and nature’s land and waters always and without exception provided and will provide the life support of the city with nutrients, energy, fibres, metals, other materials and clean water. The primary production inside the city was always limited, although city cultivation and the use and reuse of physical resources may occasionally have been quite efficient (Sinclair et al. 2011; Berg, 1993; Rådberg, 1992). However, today’s relationship between town and country is invisibly global and is characterised by two major trends and their corresponding challenges.

First our way of organising and managing cities has led to a need for giant life support areas – including recycling areas – typically 1000 times larger than the corresponding surface unit of cities (Bokalders & Block, 2010; Berg, 2010; Folke et al. 1997). Secondly the depopulation of rural areas and towns has led to a new distribution between small settlements, medium-sized and large cities, with the latter becoming increasingly dominant (see Persson & Bro, 2002 and Alexander, 1977). The result has been higher energy consumption, increasingly resource-demanding food and materials production systems and a strong increase in long-distance travel and transportation of goods and commodities all over the globe (Bokalders & Block; Berg, 2010; IGBP, 2004).

New and simultaneously more sustainable town and country systems need to come geographically closer in the future in different scales and in a modern IT-based format. Today most foods, wood products, biofuels and biochemicals are produced for global markets. The world trade of food and other organic commodities has contributed to more people than ever in history having a sufficient standard of living – but also to more people than ever living in the utmost misery, poverty and without shelter (UNHabitat 2007). And – as many are aware of – we are living on borrowed time. The food is mainly produced with the aid of fossil oil and stored phosphates. The transport sector uses less than 5% renewable energy to move people, food, goods and raw materials over the surface of the earth. The food production systems of the world – from primary production in fields and animal stables to refined food in everyday kitchens and school restaurants – are facing a series of environmental/ethical problems and challenges. These include:

• how to manage scarce resources on a global scale and simultaneously produce food of a high quality, with acceptable environmental impact, for all people;
• how to transform food production from using stored to renewable physical resources;
• how to produce food with a minimum of environmentally hazardous chemicals;
• how to stimulate the choices of healthy food and sound eating habits;
• how to distribute healthy food according to equity principles;
• how to support reasonable working conditions, strengthening local communities in world rural areas and to prevent new waves of ruthless exploitation of land, forests, fields and waters;
• and how to find an efficient and ethically acceptable balance between biofuel and food production.

Some of the answers may emerge in how the future relationship between town and country is organised.
Uniting Two Perspectives on Town and Country

There are currently two dominant and distinct perspectives on the eternal relationship between town and country. One is the prevailing urban perspective, whereby planners, engineers and estate economics in the city regard rural non-dense areas mainly as a recipient for urban flows of waste, wastewater and foul air as well as suitable lands for industry localization (UNHabitat, 2007). Representatives of the urban perspective, however skilful they are in arranging settlement- and transport structures with a high capacity (Hall, 1988; Alexander et al. 1977), often underestimate the need for land surface, plant bio-

mass, soil and water volumes in order to transform city waste streams in a sustainable way to harmless raw materials in natural and cultural landscapes, to neutralise the contaminants in wastewater and extract its nutrients – and to decompose the particles and volatile chemicals in the city air in soil microecosystems in order to produce clear, clean air again (Berg, 1990).

The urban perspective also typically lacks a nuanced insight about the different functions of city greenery: partly contributing to the metabolism of society using cascading or coupled urban biological processes, partly providing ecosystem services to the city, and partly for
creating a *recreation* and *well-being* in the everyday life of city residents. The urban perspective, finally, even lacks an insight that rural communities need to be *complete* to survive and develop according to their own conditions (taxes, culture, profits from primary production). As a multiple reference to the urban town-country perspective, see comprehensive or master plans of i.a. Baltic Sea Region cities.

The second perspective on the town-country relationship, the *rural perspective*, is represented by the actors of rural areas – those who are committed to its *communities* including local primary production from its forests, fields and waters (Leader, 2000; SOU, 2005). The rural perspective is also carried by large land management enterprises and policy makers that are primarily interested in *production land* which is typically detached from its adjacent rural communities (Jordbruksdepartementet, 1989). These actors have – in different ways – advanced knowledge about land use and management, animal husbandry, production methods and agricultural policies. They also share a vast knowledge about agricultural, forest and water ecosystems. However, the rural experts and actors probably have more limited insights into how the city population demands food and other bio-products and how values about health and environment in the city are rapidly changing the conditions for the food production of tomorrow – for instance the growing interest for local production (Granvik, 2012).

In the rural perspective there is also seemingly a lack of active interest (or capacity?) in pushing for solutions of the organic waste disposal problem inherent in cities (Berg, 1993). There is also an apparent lack of interest to create small and large eco-cycles between town and country. Modern large-scale agriculture stake-holders also often lack the ability (or interest?) to utilise its own large nutrient flows from animal husbandry for linking it efficiently to primary production areas (Jordbruksdepartementet 1989).

**Large and Small Rurban Circles and Cascades**

Emerging attempts are now being made across Europe, within research as well as within planning to achieve a radically more sustainable urban development, among other measures to unite the two main urban-rural perspectives. An emerging ‘common’ perspective on the town-country relationship can also be expected to contain new insights that may provide strong leverage actions towards radically more sustainable cities and rural production systems in the future (see e.g. Bokalders & Block, 2010 and Gaffron et al. 2005 and 2008). Such a new common town-country perspective will be able to argue for *large-scale*, efficient recycling between city centres and dense suburban areas on the one hand and *large-scale primary production lands and waters*, characterised by resourcefulness, clean food chains and healthy food on the other (Ebbersten & Bodin 1997).

In the short-term, such a new town-country perspective would also be able to argue for *medium-scale* and *small-scale* town-country systems that close the nutrient cycles around smaller cities and villages, near suburbs and in more genuine countryside town settings (Ibid; Berg 1993). For smaller communities, functional integration of social, organisational, economic and cultural resources within the landscapes in which they are embedded, constitutes a special survival factor, featuring *complete rural*
communities (Granvik, 2012; SOU, 2005; Berg, 2010; 2007; 2006). In the future we can expect more resource efficient production-distribution systems on all scales. Those systems are expected to use renewable energy and a modern variant of the ‘meadows-are-the-mother-of-agriculture’, which has the ability to capture the valuable nutrients in cascades of primary production land, secondary land and efficient ‘polishing ecosystems’ (Ebbersten & Bodin, 1997).

The climate crisis makes it imperative to implement a renewable energy transition within the next 40 years, to reform food production, the transport system and to introduce new comfortable but radically more sustainable everyday habits within e.g. habitation (Bokalders & Block, 2010; Edman, 2005). A decrease in cheap oil supply may also trigger radical changes in the short-term perspective (within 10 years) in the co-evolution between town and country (Saifi & Drake, 2007). Visions about a radically reformed new town-country relationships need to be developed immediately, but can only realistically be implemented over a longer time period of several decades (Berg, 2010; IGBP, 2004; Odum, 1989).

The need to reduce the ecological footprint of the cities can result in a fast relative relocation of food production systems from global markets to macro-regional (e.g. the Baltic Sea- or Mediterranean Regions) or micro-regional (within for instance EU NUTS regions such as Mälardalen in Sweden) markets (Granvik, 2012; Granvik et al. 2012).

Resilient Citylands in the Future

Combining Urban and Rural
In the beginning of the last Century the biologist and city planner Patric Geddes (1904) described a sustainable city system with both urban and rural functions – a walkable city with gardens, parks and food production - but also with efficient public transit systems and a system of socially strong neighbourhoods. It was a city with rich spaces for entrepreneurs but also aware of its cultural assets. In Germany Martin Wagner (1923) defined a range of interconnected attractive green areas in different scales for the pleasure and utility of the citizens: small-scale intimate entrance green and courtyard/garden green; Intermediary district green to denote parks, small forests and fields and waters separating city neighbourhoods; and large-scale wilderness green with its forests, arable land, wetlands, river banks and waters. The functions of public green structure, were in turn elaborately described by landscape architect Ian Thompson in his book Ecology, Community and Delight (Thompson, 1999) implicating three fundamental landscape values: for life-supporting communities (urban agriculture), for regulating the climate (ecosystems services) and for providing pleasant garden- and park settings for the recreation and wellbeing of the citizens.

Urban and Rural Citylands
Such were the roots of what we could today describe as an extended and more comprehensive vision of a sustainable city – not mainly focusing on its physical (energy and matter) resources managed in a durable economic setting: But including all seven dimensions (physical, economic, biological, social, organizational, cultural and aesthetic) of sustainable human settlements – outlined in the foundation texts of the UN Habitat agenda (Berg, 2010; UNCHS, 1996). This Cityland system thus encompassed a new and modern relation between the city and
its surrounding and interwoven countryside landscapes (Berg, 2010).

The urban cityland is not only urban but also contain rural properties; the rural cityland is not only countryside but also encompass a range of urban functions. Resilient Citylands is therefore a new version of urban-rural co-evolution with both its surrounding green areas and wedges and also with its internal green infrastructures – its systems of parks, greenways, alleys, street trees, verdure courtyards, gardens (Saifi & Drake, 2007; Florgård, 2004; Lundgren-Alm, 2001). The Cityland concept can guide us towards a deeper understanding of how biological and cultural systems can be united in different scales, with different values, with different purposes.

**Functional Densification and Mobility in Urban Citylands**

An urgent and current matter concerns how we can build or evolve current urban environments to become green compact cities. Functional or qualified densification signifies an urban development where townscape includes all functions for a more efficient land use: houses, streets, pathways, squares, plazas, nodes, parks, gardens, schoolyards, pedestrian avenues, greenways and commercial and public service (Berg et al. 2012; Berg, 2010; Thwaites, 2007).

The new compact city has – according to Gehl Architects’ characterization (Gehl, 2010) and Alexander et al. (1977) – transformed its former practical public spaces being transit zones between home and work to instead become the public living room for citizens’ experience of the “magic of the city” (Ibid). The new compact green city also exhibit a transport modal shift – from dominating car-traffic, car-adapted spatial planning and adjustment of citylands to a bike-pedestrian-public transit dominated transport system (Bokalders & Block, 2010; Bach, 2002).

This new or renewed cityland transit network is created in close encounter or integrated with green links, along blue waterfronts, across parks, supported by new bike-pedestrian service nodes (with storage, renting, repair, rest, coffee-shops and utilities for the pedestrians and bicyclists (Bokalders & Block, 2010; Thompson, 1999).

The new bike-pedestrian-public transit networks and nodes are furthermore supported by intelligent transport systems (ITS) with information, guidance and tips in smartphone applications, on information boards at traffic nodes and distributed as small information screens throughout the urban landscapes of tomorrow (Gullberg et al. 2007; Bach, 2002).

**Cityland Ecosystem Services**

Green areas, water surfaces and flows in urban and rural communities are potentially important for the wellbeing of its inhabitants (Cooper-Marcus, 1997; Kaplan & Kaplan, 1989; Eriksson & Ingmar, 1989). These ecosystems services (Oberdorfer, 2007) can be measured e.g. by self assessment of citizens, using questionnaires but also more objectively in clinical studies where physiological effects in individuals can be estimated (Mitchell & Popham, 2008; Stigsdotter & Grahn, 2003).

An often used indicator for city development is that the inhabitants should live no more than 250-300 meters from a green area to actually go there (Lisberg-Jensen, 2008; Alexander, 1977). It is also established that apartments close to surface water or green areas are more expensive than those further away, reflecting the value of this asset in a city (Andersson, 1998).

Greenery in cities is not only important to humans. It contribute considerable to biodiversity. Thus birdwatch-
ERS have reported that Berlin – that has a very high percentage of green areas – has the largest number of bird species in Germany (Oberdorfer, 2007). It is also notable that many species which were earlier only found in the countryside today is increasingly moving to the cities for finding food, which is less accessible in industrialised agriculture, that “too” efficiently takes care of the harvest (Ibid). For children and adolescents, the parks, green playgrounds and plazas in cities are more easily available than far away countryside. It is a highly valued resource for getting children acquainted with nature, for learning about nature protection and for play and moving the body (Uppsala kommun, 2002; UNICEF, 1989).

Greenery and water bodies also has an influence on the microclimate and air quality in a city (Ibid). A diverse green structure is important for breaking strong winds and for inviting in the sun in park glades, courtyards or other solar pockets. The urban temperature is reduced in parks, along green corridors or rivers, thus allowing ventilation of the city air. Green roofs have become more common also in large cities for their buffering of rain- or melting water flows but also for temperature regulation of buildings. Green elements also contribute strongly to the moisturizing of the city air – and the soil in green areas are instrumental for cleaning foul smells in the city air. Urban gardening and agriculture has a potential of reducing the ecological footprint of the cities. Houses may be designed so as to allow considerable areas for gardening in courtyards, along walls, on roof-tops or in greenhouses or balconies connected to the apartment buildings (Lundgren Alm, 2001; Thompson, 1999).

The monetary value of the ecosystems services of cities have been studied in several research projects and found to be considerable (Anderson, 2008; Lundgren Alm, 2001). To insert the rural in the urban is thus one way to decrease the ecological burden of cities.

Cities as Regional Cityland Centres

In comprehensive planning, there has been a shift from only planning for one (very urban part) of a city and within a comparatively short term future horizon (5-10 years). This was the situation in the early 1990-ies in Swedish planning (Nilsson, 2003). In newer comprehensive planning also other neighbouring cities are taken into account. Joint labour markets, common land, waters and other environmental resources enrich all participating cities. Intercity communication and transport can be improved and the futures horizons expand to 10, 20 and/or 40 years. And yet there has – up to now – been limited care in comprehensive planning for the region surround-
ing the cities. City planning has still focused on urban infrasystems and settlement patterns and less interest has been devoted to the regional towns and smaller communities. Instead county councils (the government’s local representatives) have targeted the landscape communities outside the cities (Gaffron et al. 2005; Helmfrid, 1993). A stronger commitment is needed, to see the values of surrounding towns and hamlets, to appreciate their often creative solutions for combining various countryside services, to acknowledge the need for tailor-made logistics and governance systems – e.g. rural laws and tax-systems (Svensson, 1993). A typical feature which need special solutions in the rural areas are informal economic methods.

The next logical step is, therefore, to include also issues about both the city and its surrounding communities in the comprehensive plans of tomorrow. Regional planning has started to take this course in several Swedish and Norwegian city-regions (see e.g. SLL, 2009) but also in several European Ecocity projects (Gaffron et al. 2005), as well as in Canada (Moffat, 2003) and New Zealand (Frame & Brown, 2009). For hundreds of years the functional regions were defined by their current transport means: they were not larger than it was possible to travel from one end to the other, often by foot or by horse and carriage, in one day (Carstensen, 1992). Today travel by car or public transport has expanded the regions now depending on efficient train- or bus traffic. With a full inclusion of all communities of different sizes – modern cities can again finally become real regional centres of resilient citylands, co-ordinating environmental resources, nature protection areas, transit systems, local economies, health care, public and commercial services and culture, for towns, small towns and hamlets in the countryside (Berg, 2010; Alexander et al. 1977).
The Strategic Boundary Zone between Town and Country

One of the new features of resilient citylands is the built/green-blue interface zone between more urban and more rural functions. Nordic cities had traditionally, and still have, a very long green/blue interface line between settlements and human cultures on the one hand and glades, meadows, forests, parks, arable fields, lakes, seas and rivers on the other (Berg, 2010). Throughout the history of civilization, edges between town and nature have proved to be the most preferred locations for habitation (Roseland, 2005; Berg, 1993; Odum, 1989). For citylands the edge line is expanded to a wider zone: in this zone will be the important district green areas for neighbourhood recreation (district parks, play grounds, sports grounds, orchards, stables for sheep, cows, horses and pigs); in this zone there could be room for urban agriculture with green houses and community gardens, where fruit and vegetables can be grown for urban and sub-urban dwellers; in this zone there is room for clean companies and clean micro-production; in this zone there is land for industrial combinates, refining the primary produce into food, fuel, fibre, boards and other building material; in this zone there is room for new recycling of waste industry; and in this zone there is room for the new generations or renewable energy (wind and wave power, Photovoltaics and solar heat collectors and bioenergy cultivations) and energy carriers (storage of bioenergy and electricity – see e.g. Bokalders & Block, 2010).

The future town-country relationship will therefore rely strongly on the organization and design of both inner boundary zones of the cities (settlements turning towards parks and community forests, fields and waters), but also between settlements and the outer nature, and between built areas and outer cultural landscapes. Preliminary theoretical research and map studies of the morphological dynamics of city growth indicate that a long and winding interface zone between urban and rural functions are strategic for creating resilient citylands accessible for many citizens to experience urban and rural recreation, urban and rural culture and urban and rural production (Berg, 2010).

Furthermore, supplementary small-scale, peri-urban production systems for food and bioenergy and urban agriculture may play a more important role than previously. It is reasonable to assume that world trade will continue to play a role in life support of world cities, but a relocation to relatively more local eco-cycles – where a larger proportion of basic bio-production and consumption may occur – seems to be a logical consequence of global change, the need for food security and local labour markets supplementing the global. An advancement of current knowledge about urban-rural: soil-plant systems; resilient crop production systems; forest ecosystems; microbial systems; ecotechnology systems; and resilient food systems (Berg, 1993; 1990) in different scales will play key roles in the long-term survival and development of the renewed cities, countrysides and citylands in the future.
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