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## Fostering the Urban-Rural Continuum to Design Resilient and Sustainable Cities

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Traditionally, sustainable urbanization is identified with the historical model of European cities, with their dense center and their suburbs. Thus, the “compact city” is often perceived as the universal model of urban transition to sustainability (Neuman M., 2005). Such a claim raises two very simple questions: Is it feasible? Is it desirable?

For over half a century, whatever huge efforts were made by public authorities wherever in the world to limit urban sprawl, they failed miserably. Sprawl has become the usual mode of production of the contemporary city, whatever its size, its institutional and administrative configuration or its policy choices. Even “shrinking cities” and those facing decline and abandonment, have to deal with fragmentation and urban sprawl. It has proved impossible to prevent urban sprawl with the classical urban regulation tools (Mancebo F., 2008).

Besides, in the compact city, sustainability generally means making a better use of what is already there, by recycling the urban fabric and urban functions without going through phases of obsolescence and degraded neighborhoods, and without squandering soils (Swart R. et al., 2003). This is all well and good, but there are other aspects of urban sustainability, which cannot be addressed within the limits of the compact city. For example, any city — be it sustainable or not — has to provide water and energy to its inhabitants, while reducing pollution and processing all the urban waste. Beyond all the well-known technical solutions — smart grids, selective sorting, urban heating, wastewater treatment plants, intelligent buildings, etc. — the energy, the resources, the water, the food still come from outside the city limits. Sewage plants and garbage dumps are also outside. More than that: Even a large number of people working in the city live outside, when they cannot afford to live anymore in the expensive — and sometimes gentrified — compact city. Well, when a place looks sustainable by giving to other places the burden of its transition to sustainability — exporting pollution, waste, polluting activities, while siphoning their resources — this place is not really sustainable. It benefits from what David Pearce calls imported sustainability (Pearce D., Markandya A., Barbier E. B., 1989); a major bias against the implementation of sustainability policies.

Maybe it is time to start thinking different: No, high urban density and compact city are not the be all and end all of transition to sustainability. No, it is not possible to address urban sustainability issues by considering only urbanized areas and urban centers. Yes, it is crucial to design sustainability across or integrating areas large enough to include most of the fluxes of the urban metabolism, which mean areas encompassing suburban, periurban, and dependent rural or natural places (Wheeler S., 2004). As a matter of fact, why on earth are we supposed to set up a false dichotomy between urban and rural areas? Indeed, the social, economic, scientific, technical and cultural transformations

of the last few decades have produced deep changes in how society relates to space. Today, urban areas have either no boundaries or very fuzzy ones. Given that lifestyle, facilities and amenities are not so different between urban and rural areas, is it still worth separating them with an imaginary border? Such a perspective compels us to cast a fresh eye on what is going on with the sprawl, one eye without prejudice, which does not consider from the start only the negative aspects. Naturally urban sprawl has many pervasive effects. It goes without saying that urban sprawl is unsustainable for at least three reasons: the development of estates and the phenomena of urban segregation all conspire to degrade the quality of life with ever-longer commuter travel, accessibility problems; the cost of connection to public service networks is much higher than in urban centers; urban sprawl leads to an exponential waste of land, not only because urban density is low, but also because many cumbersome transport infrastructures need to be built. It must be accepted nevertheless that sprawl does have its advantages. It reduces the concentration of nuisances and pollution, and lowers the density of urban centers that are sometimes on the brink of congestion. Besides, it is geographically impossible for everyone to live downtown. In any case, there is the idealization of an urban life in the countryside, which even if completely illusory, is a myth that fuels the desire. And well, eventually, it is not possible to impose a residential choice when this choice contradicts the deep motivations of a population; this is the reason why all the policies developed to contain urban sprawl have failed.

Thus, to foster urban transition to sustainability the solution is not to oppose urban sprawl but to guide it. After all, low-density urbanization was rather the rule than the exception for centuries all around the world: In villages and hamlets small communities have had a very dynamic social and cultural life. Besides, climate policies introduce new arguments for low-density urbanizations. Green, neighborhoods planted with trees presenting a high water loss coefficient can lower the local temperature. In low density areas more square-meter of roof per household are available than in high-density areas: Thus, generalized photovoltaic roofs can be a significant source of clean energy. Finally, making low density areas sustainable is possible and it obliges to think new lifestyles, in which the improvement of environmental conditions *stricto sensu* (water quality, air, biodiversity, prudent use of resources, land and energy, etc.) lead to improved living conditions (Mancebo F., 2015). For — let there be no mistake about it — addressing sustainability also means recognizing and promoting that cities and urban regions have an unexplored potential in adaptability.

Considering such a perspective, how to design sustainable cities keeping in mind the rural-urban continuum? Is there already any type of urban arrangement that if generalized would deeply transform urban systems while contributing to a more sustainable future. Yes, there is one, and its name is urban agriculture. It postulates that some type of agriculture can flourish within the city. It considers that urban multifunctionality should also include farming. But urban agriculture is both an oxymoronic and elusive term. What are the differences between urban and non-urban agriculture? Urban agriculture is not only about food and landscapes, and urban agriculture production can certainly not be sufficient to feed a whole urban area, anyway. The question then becomes: What specific services may urban agriculture bring to a city and what nuisances and unexpected consequences may result — an important though too often dodged issue—. Indeed, urban agriculture is not such



a fresh idea. Moreover it is certainly not an offspring of sustainable development. Urban agriculture has existed for centuries in very different places around the world, such as the *chinampas* in Tenochtitlan — the actual Mexico city — since the 15th century or sooner (Torres-Lima P. et al., 1994), the *hortillonnages* in Amiens — a French city north of Paris — for more than twenty centuries (Clauzel C., 2008), or the interstitial gardens (*agriculture d'interstice*) of Yaoundé — Cameroon's capital — which accompanied the foundation of the city in the 19th century (Dauvergne S., 2011).

But what do we really call urban agriculture? And what are its different objectives? Community gardens, kitchen gardens, food farming, for example, are three different things, completely. The types of urban agriculture that exist in a city vary a lot according to the climate, the cultural background, the economic and social situation of the city, etc. In many urban areas of Central America or India, urban agriculture is essentially a food security issue, related to fight against poverty and malnutrition ([http://www.fao.org/fileadmin/templates/FCIT/PDF/UPA\\_-WBpaper-Final\\_October\\_2008.pdf](http://www.fao.org/fileadmin/templates/FCIT/PDF/UPA_-WBpaper-Final_October_2008.pdf)). The situation is quite different in European or North American cities. Since the 90s, there has been a growing proliferation of projects promoting urban farming architectures, such as *Agriitecture with Tree-Like Skyscrapers* (<http://agriitecture.com/>), or *Vertical Farming* (<http://www.verticalfarm.com/>) — cultivating plants or breeding animals within tall greenhouse buildings or vertically inclined surfaces (Hough M., 1995). At the same time, urban rooftop farms are epitomized by the mainstream medias as the paragon of urban agriculture. There, urban agriculture is mainly seen as a social innovation that contributes to improving the quality of life, fostering social links among neighbors, and enhancing urban landscapes. But what is the real productivity of such a farming? Don't forget that a single cow needs more than 1,5 ha of grassland in his life: There is obviously a huge discrepancy between the dream and the reality. In European and North American cities urban agriculture is not so much about food, really. Its main expressions are community gardens and kitchen gardens. This being said, the complex interactions that food production and distribution has with the urban metabolism should be considered when trying to design a sustainable and thus multifunctional urban fabric (Andraos A., Wood D., 2010).

But, as mentioned by Ulf Sandström (Sandström U., 2002) these gardens as well as urban food farming are often temporary —not to say ephemeral— and eventually they disappear sooner or later under the pressure of urban growth, urban densification and increased property value.

We definitely have a long way to go in including agriculture in urban planning on a permanent basis. Connecting all the types of urban vegetated places from the very center of the city to its outskirts, and beyond to the more rural neighboring areas, would be a good start — as proposed by Andre Viljoen and Joe Howe (Viljoen A., Howe J., 2005). It would establish productive lands as the core as a key component of urban design. Moreover this capillary network, which would penetrate the smallest nooks and crannies of the urban fabric, should be a wonderful tool to link the different components of the city, while providing other ecosystem services such as walking and leisure activities.

Besides, such a network would improve greatly urban resilience, by linking formerly scattered vegetated places within a consistent system. Squares, parks, gardens —community gardens and kitchen gardens, as well as public gardens— and more generally all vegetated urban public

spaces, are obvious components of this network. But forests, wetlands, ancient wastelands and brownfields, slopes and talus, or farmlands may also be part of it. The banks of a river running through an urban area may absorb floodwaters naturally, while being used seasonally as horticultural gardens as it is the case in Amiens with the *hortillonages*.

In this way, urban agriculture can be the cornerstone that helps reconfigure urban areas, and the backbone of a new and more sustainable urban arrangement to foster urban transition to sustainability in the urban-rural continuum.

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