

The sustainable (compact) city: urban density and green space for a (post)pandemic urbanism

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Although still encouraged by UN Habitat (UN HABITAT, 2020; 2021), with the paradigmatic example of Barcelona, the compact city model – briefly: high density and mixed use pattern – is increasingly criticized (DAOU, 2016; BERTAUD, 2018). It is not a matter of adding controversy to the discussion here, as some studies (RUSSO, CIRELLA, 2018; UN HABITAT, 2021) have already pointed the need for a balance between density and urban green space (UGS). Urban density and compactness are desirable from the point of view of infrastructure and transport costs, but not very good for ecology and health. In this direction, a recent study by Swedish researchers, first looking at the Swedish planning practice and then comparing three hundred articles on the subject across the world (HAUPT et. al, 2020; BERGHAUSER PONT et al, 2020) practically ends the discussion. As Russo and Cirella (2018, p.1-2) note “compact cities that have an overall lower percentage of UGS demonstrate to lack ecosystem services. Moreover, such cities are the most impacted by the heat island effect and the resulting consequences from urban densification”. In this direction, the title of the last publication by UN Habitat (UN HABITAT, 2021) makes clear the way forward: “Cities and Pandemics: Towards a More Just, Green and Healthy Future”.

Anyway, at the other pole of the UN Habitat defense of the compact city model, consecrated names in the study of urban density as Shlomo Angel and Alain Bertaud, supported by empirical research, models and data analysis, point out to some aspects often neglected by the blind defense of a simplistic view of the model, the compact city as a panacea for the problems raised by urban growth and expansion – “sprawl” – in all situations, geographies and scales.

Based on quantitative models used by economists – the Monocentric City Model or Standard Urban Economics Model – Alain Bertaud, for example, writing about “order without

design”, explains the relation between transport and urban density or growth: “in countries where the price of gasoline is heavily subsidized... cities will extend much farther away from the center than in cities where the price of gasoline reflects market prices” (BERTAUD, 2018) – although that doesn’t explain the American urban sprawl. For Bertaud, markets are responsible for population densities, and planners cannot impose densities through design, only project the densities of populations based on their understanding of markets and consumer preferences

Shlomo Angel, in turn, in his book *Planet of Cities*, addresses the cases of very different cities like Seoul and Portland in their attempts to control urban sprawl in recent decades. In the Korean capital, since the 1970s, policies to contain urban expansion have led to an increase in property values and the creation of satellite cities. In the American city, in the same period, despite the positive aspect of the occupation of urban voids, there was also a rise in prices.

In addition to the observations of Bertaud and Angel, it can be said (ROCHA, 2021) that the highly dense and compact pattern of Barcelona transformed the Catalan capital into one of the cities with the lowest green indexes per inhabitant in Europe, with serious problems such as the heat island effect (ROJAS-CORTORREAL, et al. 2017; CARTALIS, 2020). Therefore, the city currently invests heavily in green infrastructure proposals and projects (BARÓ, 2016). The UN Habitat *The New Urban Agenda*, for example, in encouraging such a model, does not point out the problems mentioned above. If the density of a city like Atlanta (600 inhabitants per km²), based on the American model of suburban expansion through single-family typology, is not viable, neither is the excessive and “gray” density of Barcelona (17.100 inhabitants per km²).

Covid-19 and urban density

With the lessons of the current pandemic moment, perhaps the time has come for a new stance, without useless Manichaeism. As stated before, the need for a balance between density and urban green space (UGS) is unappealable. Urban density and compactness on the one hand, because infrastructure and transport costs must be controlled; on the other, urban green spaces connected at all scales for ecological and health reasons.

Even before the current covid-19 pandemic the growth of cities with high densities “crammed and connected” had already been criticized from the point of view of health by specialists (BERG, 2016). But as stated by UN HABITAT in “*Cities and Pandemics: Towards a More Just, Green and Healthy Future*”, in the last year there was a significant discussion about the role that the built environment, its spatial patterns and the distribution of population (density) have in relation to the spread of covid-19:

“after one year of the pandemic, it has indeed become evident that space truly matters in the response, recovery and rebuilding. But rather than density, overcrowding and access to adequate services, including health facilities, have emerged as the predominant drivers of — and critical antidote to containing — the pandemic spread in cities” (UN HABITAT, 2021, p. XX).

In fact, it is possible to consult studies with different conclusions.

A Brazilian research on the role of urban size and density, which sample includes 291 cities, investigates the number of cases and the number of victims by Covid-19 in all Brazilian municipalities with more than one hundred thousand inhabitants – data from the period from March 28 to June 1 of last year (2020) – and concludes: “We find empirical evidence that larger cities are more susceptible to the pandemic” (NETTO et al., 2020).

Another research, carried on in China, collected data for 284 Chinese cities on two relevant indicators, the number of confirmed coronavirus cases per ten thousand people and the population density in the built-up urban area. The researchers indicate: “The evidence we’ve found does not support the argument that density is a key determinant of coronavirus transmission risk” (FANG, WAHBA, 2020).

If these two (serious) density/ covid-19 surveys, in two different countries – the first to face the pandemic and one of the ones that suffer most from it – carried out in the same period last year, point in two different directions, leading to the conclusion that recent research on the subject is not conclusive, in fact we are facing a false question. The problem is not density but density without enough urban green space. In other words, if there is no empirical evidence that urban density is a problem from the point of view of the spread of the pandemic, the density/ green balance in urban spaces – as shown in the case of Barcelona – is still an unavoidable issue.

Conclusions: some points about Urban Green Space (UGS)

The latest UN HABITAT document on “Cities and Pandemics” says: “To mitigate the emergence and spread of future infectious diseases and enhance long-term health and resilience, emphasis in land use and environmental planning should be put on preserving and restoring blue-green networks and landscape corridors across regions” (UN HABITAT, 2021, p. 11). Green networks and landscape corridors across (urban) regions are increasingly receiving importance and attention. An article in the *Journal of Ecology* calls attention to a new aspect:

“Floral resources (nectar and pollen) provide food for insect pollinators but have declined in the countryside due to land use change (...) We quantified the nectar supply of urban areas, farmland and nature reserves in the UK...allowing us to compare landscape types...The mag-

nitude of nectar sugar production did not differ significantly among the three landscapes (...) Gardens provided the most nectar sugar per unit area and 85% of all nectar at a city scale” (TEW, et. al, 2021)

French scientific literature in the area has also begun to debate the issue of the ecological importance of urban gardens. The work of Riboulot-Chetrit (2015), for example, shows how private gardens in Paris, despite their fragmented character, are spread across the entire urban fabric. If “the majority of UGBS are limited in size, occluded within the built-up matrix and separated from each other by harsh and often inhospitable developed areas” it is necessary to readapt the general notions of Landscape Ecology (ROCHA, 2021): street trees can function as “corridors” linking “patches” of vegetation composed of squares, gardens, informal green spaces (IGS) etc., because these “small patches”, despite their fragmentation, establish a certain continuity among the largest, such as parks.

Private and community gardens thus can have an important role in increasing green networks (edible green infrastructure) and landscape corridors across (urban) areas, “encouraging urban agriculture through community allotments and rooftop gardens, as well as organizing farmers markets to bring local produce directly to urban consumers, can serve as stopgap solutions during crises” (UN HABITAT, 2021, p. 17).

It is not the case that cities somehow replace an ecologically diverse countryside. The proposition defended here is the relevant aspect of urban green spaces at all scales, “cities can be compact as well as ‘green,’ with meticulous attention paid to every aspect of the urban greening complex” (RUSSO, CIRELLA, 2018, p. 11). There is no doubt about the importance of parks, but it is necessary to draw attention to the complementary importance of vegetable or community gardens and private or allotment gardens (these maintained by ordinary people). It is clear that they must be part of a green space system, as “urban ecology” only complements countryside. As an article in the *Yale Environment 360* points out: “cities abound with a ‘wonderfully diverse’ array of unconventional habitats that can provide important habitat or resources for native biodiversity,’ ... These range from remnants of native ecosystems such as forests, wetlands and grasslands, to traditional urban green spaces like parks, backyards and cemeteries, as well as golf courses, urban farms and community gardens.” (MARINELLI, 2021)

This perspective combined with the Goldilocks principle – not too dense but dense enough – or the Sustainable Densities Proposition by Shlomo Angel (ANGEL, 2012) is a key understanding to “support” (enable) urban green infrastructure in urban areas.

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