Urban Ecovillages

David Schwartzman and Peter Schwartzman
October 3, 2021

> Around 3,500 million people — that's 50% of the world population — live in cities. According to the United Nations, this number will have risen to 5,000 million by 2030. According to this organisation, the metropolis — barely 3% of the world's land area — uses between 60% and 80% of total energy and produces 75% of carbon emissions. The United Nations warns that urbanisation is also threatening fresh water supplies, waste water and public health. The international community fears that the damage may be irreversible, which has drawn attention to the sustainable model in ecovillages. They set an example of how to make progress without endangering the future of the planet (Iberdrola, 2021).

Is urbanization the enemy of sustainability as Iberdrola cites the UN as claiming, or rather should the source of current unsustainable urbanization be seen in the context of its dependency on fossil fuels as a source of energy and industrial agriculture? And critically, this dependency is embedded in a world largely dominated by the political economy of capitalism with its absence of real social management of society. Nevertheless, even now the highly concentrated density of big cities does generally result in lower energy use and CO_2 emissions/population than lower population density settlements, noting however that their resources now come from outside the urban areas (Day and Hall, 2016).

We argue that another world is still possible requiring radical changes in both the physical and political economies at all spatial scales (Schwartzman and Schwartzman, 2019), consistent with the recognition that radical changes in society are imperative to keep warming below the 1.5 deg C target identified by the historic IPCC Report of 2018. And another future for urban communities is still possible, green cities, powered by renewable energy supplies and deriving its food from regenerative agriculture (i.e., agroecological) as recognized as ecological principles of the Global Ecovillages Network which include the following:

Grow seeds, food and soil through regenerative agriculture
Clean and replenish sources and cycles of water
Move towards 100% renewable energy and transport
Innovate and spread green building technologies
Work with waste as a valuable resource
Increase biodiversity and restore ecosystems
(Global Ecological Village, 2021).

A major challenge confronting urban centers is what Marx pointed to in Capital, cited by Barry Commoner (1971) in his seminal The Closing Circle (p.280, 325-326), namely the break in the cyclical return of human wastes to the soil with the workforce migration to cities in the birth of industrial capitalism:

> Capitalist production… disturbs the metabolic interaction between man and the earth…All progress in capitalist agriculture is a progress in the art, not only of robbing the worker, but of robbing the soil… Capitalist production… develops the technique and the degree of combination of the social process of production by simultaneously undermining the original sources of all wealth—the soil and the worker (Marx, 1967, pp. 505-506).

Precapitalist China did not break this physical cycle:

> The Chinese agricultural system, which was also applied in Korea and Japan, is zz American soil scientist F.H. King. The book was published in 1911, around the time of the discovery of the Haber-Bosch process that would lead to the breakthrough of cheap artificial nitrogen fertilizer. King devoted an entire chapter to the collection and use of human fertilizer by the Asians. Joseph Needham also gives an account of the method, in volume VI:2 of "Science and civilization in China", citing various earlier sources. More recently, Duncan Brown talks about the Chinese system in his book, “Feed or Feedback: Agriculture, Population Dynamics and the State of the Planet" (Decker, 2010).

But this tradition of precapitalist mode of production and consumption not surprisingly continues now in socialist/capitalist China, notably in Shanghai urban farming:

> Green ring generates half of city’s food. Shanghai has preserved and expanded a green agricultural zone around the city, where nutrients from waste are recycled to help produce more than half the city's vegetables. A gigantic rubbish dump in Pudong contributes with compost, as well as generating electricity at Laogang, China's largest landfill biogas power plant. Urban farming is widespread in China (Jacobson, 2012).

Note that Shanghai is one the world’s most populated cities with 27 million in 2021 (Worldatlas, 2021). However, the widespread consumption of genetically modified foods (GMO) in China should be noted (Zhao et al., 2019), as well as the critique of GMO technology regarding its negative ecological and health impacts (e.g., Schwartzman and Schwartzman, 2019).

The future of truly green cities can draw on the prescient wisdom of Barry Commoner who proposed a sewage pipeline system closing the cycle of food consumption in the city by returning nutrients back to the soil for agricultural production (Commoner, 1971, pp. 186-187).

This recycling of nutrients must confront the current challenge of contamination of sewage by a multitude of chemicals including antibiotics, hormonal disrupters, etc. (Kumar et al., 2020).

Future vertical farming in cities powered by wind and solar energy can provide very significant supplies of organic food to urban residents (Schwartzman and Schwartzman, 2019; Steffen, 2020; Federman and Zankowski, 2021). We emphasize that this potential can only be fully realized in truly green cities coupled with the near complete termination of fossil fuel consumption in a robust global ecosocialist solar energy transition. We take note of the critique of current vertical farm proposals as “socially insensitive techno-fantasies” (Engel-Di Mauro and Martin, in press) in the context of capitalist political economy. For a comprehensive analysis of

urban food production informed by an ecosocialist perspective we point to the forthcoming book by Engel-Di Mauro and Martin (in press), as well as the earlier critical perspective of Biel (2016).

It is unrealistic to expect or require urban populations to significantly migrate to rural areas, especially as the impacts of climate change continue including flooding, sea level rise, droughts and fires in rural areas, even if the 1.5 deg C warming target can be achieved. Hence, migration to rural areas is not a plausible option to confront the challenges of urbanization, rather both the current physical and political economies of cities must be radically transformed.

Cities close to the equator are already experiencing severe heat stress affecting millions of people (e.g., BBC News, 2021) and even meeting the 1.5 deg C warming target will result in even more extreme temperature conditions. Even cities in temperate climates are now also having dangerously hot summer nights (Bhatia and Katz, 2021). We can visualize the near future potential by reading the opening of Kim Stanley Robinson's science fiction masterpiece *The Ministry for the Future* which begins with the description of the horrific mass death of 20 million in India from a climate change–induced heat wave (Robinson, 2020).

The challenge of extreme heat in these urban areas can be confronted in the transformation to green cities with more trees as in the case of Karachi (BBC News, 2021), making dark surfaces white, and of course air conditioning powered by renewable energy. In addition, a promising new technology, polymer film applied to building that radiates heat through the atmosphere to outer space, can potentially result in dramatically cooler conditions than its surroundings (Folger, 2021).

The highly populated urban areas with more now than 50% of the world's population can be transformed into green cities as a necessary complement of lower population density ecovillages. The Cuban experience of promoting agroecologies coupled with cooperative ownership and management is instructive in this regard although the ongoing and globally condemned U.S.-imposed embargo and sanctions regime continues to undermine the real potential of the Cuban revolution on the cutting edge of ecosocialist development (Schwartzman and Schwartzman, 2019; Schwartzman, 2021). To meet the challenges of eliminating global energy poverty, along with climate mitigation and adaptation (especially in the global South), more energy than currently consumed (primary consumption corresponding to 19 TeraWatt) will be needed globally in a rapid transition to 100% renewable supplies, mainly wind, photovoltaics and Concentrated Solar Power in deserts (Schwartzman and Schwartzman, 2019). This renewable infrastructure must be created on all spatial scales from large concentrated sites, globally managed, to small decentralized production managed by rural ecovillages.

The green cities vision is now receiving a lot of attention both before (Biello, 2011) and now in the current pandemic:

> Researchers have long said that increasing urban density is the fastest way for cities to shrink their carbon footprints. With tighter living comes less driving, more walking, more transit, and more energy-efficient homes and offices. And also more contagion during a pandemic. (Cusick, 2020).

The remarkable success of highly urbanized China, the country of apparent origin, in confronting the pandemic should be noted, with her death rate far lower than that of the U.S. (China: 0.35; U.S. 201.06 deaths/100,000 population (Coronavirus, 2021)).

Another continuing future challenge confronting many global cities is their location on tectonic plate boundaries. Since these large cities are earthquake-prone (Worldatlas, 2021b), the greening of cities must include "new construction in known seismogenic zones …designed to withstand shaking" (Bilham, 1999).

In conclusion, we submit that another mode of city life is still possible, that the struggle to create truly green and just cities must be on the agenda of the global climate and energy justice movement.

References

BBC News (2021) Pakistan: How to cool Karachi as temperatures rise. https://www.bbc.com/news/av/world-asia-58557995.

Bhatia, A, Katz, J (2021) Hot Summer Nights Get Hotter,, and More Dangerous. *New York Times,* September 16, A12 Print Edition.

Biel, R (2016) *Sustainable Food Systems: The Role of the City.* London*:* UCL Press.

Biello, D (2011) How Green Is My City. *Scientific American*. https://www.scientificamerican.com/article/how-green-is-my-city/.

Bilham, R (1999) Millions at risk as big cities grow apace in earthquake zones. *Nature* 401: 738.

Commoner, B (1971) *The Closing Circle: Nature, Man & Technolo*gy. New York: Knopf.

Coronavirus (2021) https://coronavirus.jhu.edu/data/mortality, September 14.

Cusick, D (2020) Denser Cities Could Spare Climate but Also Increase Virus Transmission, *Scientific American*, E&E News on March 27, https://www.scientificamerican.com/article/how-green-is-my-city/.

Day, JW, Hall, C (2016) The Myth of the Sustainable City. *Scientific American,* https://www.scientificamerican.com/article/the-myth-of-the-sustainable-city/.

Decker, KD (2010) Recycling animal and human dung is the key to sustainable farming. https://www.lowtechmagazine.com/2010/09/recycling-animal-and-human-dung-is-the-key-to-sustainable-farming.html.

Engel-Di Mauro, S, Martin, G (in press) Urban Food Production For Ecosocialism: Cultivating the City. Oxon: Routledge.

Federman, S, Zankowski, PM (2021) Vertical Farming for the Future, August 2, USDA, https://www.usda.gov/media/blog/2018/08/14/vertical-farming-future.

Folger, T (2021) This new technology could help cool people down—without electricity. *National Geographic*, August 5, https://www.nationalgeographic.com/environment/article/this-new-technology-could-help-cool-people-down-without-electricity.

Global Ecological Village. (2021) https://ecovillage.org/projects/map-of-regeneration/.

Iberdrola (2021) Ecovillages as an ecological alternative. https://www.iberdrola.com/environment/ecovillages-alternative-ecological-communities.

Jacobson, M (2012) Shanghai urban farming. https://wwf.panda.org/wwf_news/?204455/Shanghai-urban-farming.

Kumar M, Sarma DK, Shubham S, Kumawat M, Verma V, Prakash A and Tiwari R (2020) Environmental Endocrine-Disrupting Chemical Exposure: Role in Non-Communicable Diseases. *Front. Public Health* 8:553850. doi: 10.3389/fpubh.2020.553850.

Marx, K (1967) *Capital Vol. I.* New York: International Publishers.

Robinson, KS (2020) *The Ministry for the Future*. New York: Orbit.

Schwartzman, D (2021) Cuba and Degrowth? Global Ecosocialist Network, http://www.globalecosocialistnetwork.net/2021/07/13/cuba-and-degrowth/

Schwartzman P, Schwartzman D (2019) *The Earth is Not for Sale: A Path Out of Fossil Capitalism to the Other World That is Still Possible.* Singapore: World Scientific.

Steffen, AD (2020) This Wind-Powered Vertical Farm Will Produce 2 Million lbs. of Greens Annually, *Intelligent Living*, December 23, https://www.intelligentliving.co/wind-powered-vertical-farm-2m-lbs-greens/.

Worldatlas (2021a) The Largest Cities In The World By Population. https://www.worldatlas.com/articles/the-10-largest-cities-in-the-world.html.

Worldatlas (2021b) The World's Most Earthquake-Prone Cities**.** https://www.worldatlas.com/articles/cities-most-likely-to-be-hit-by-an-earthquake.html.

Zhao, Y, Deng, H, Yu, C et al. (2019) The Chinese public's awareness and attitudes toward genetically modified foods with different labeling. *npj Sci Food* 3, 17, https://doi.org/10.1038/s41538-019-0049-5.