

## **Foodscales in urban and regional planning**

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**Daniel Bwanika**

**info@siup.ac.ug**

Title: Urban neighbourhood production and the possibility of for production technologies

Abstract:

Public health, unhealthy food consumption and production, health costs, urban poverty, food wastage, urban flows, environmental issues are all variables that are forcing a new thinking about food production. The derived action plan is the establishment of foodscales on unused urban spaces. It is a radical urban space transformative and urban philosophy, with implications on urban architecture, physical planning, overall infrastructure design and engineering. This article studies the prerequisites for urban foodscales and attempts to draw attention to hidden variables that need to be considered in foodscale infrastructure and food production novelty.

Introduction:

This article is looking at requisite urban infrastructure needed for urban food system production. The premise for urban food system discussion is based on changes in–Walter Christaller's central place theory<sup>1</sup>. The theory is based on two assumptions:

1. the average population required for the supply of the provision of certain good or services
2. The average distance people travel for the supply of a range of goods or services

Walter Christaller attempted to design an urban rural pattern based on population densities and rural-urban needs in consideration to the distance travelled that shaped the current food system infrastructure. He considered the hinterland to be the supplier of certain goods (food) and services to the city. Whereas this is true, Steel, (2009 pg.8) narratives describe food production evolution in a dramaturgical way, with the history of food production changing with scientific innovations: cities have moulded nature, she writes. Is it time then for nature to mould the cities with urban foodscales that a once upon time, the nomadic hunter gather, will grow her own food atop her dwelling, severing her rural and global link?

Foodscales is derived from different negative assumptions about current food production systems and need for transformative urban agendas based on the parameters below namely:

- a. Urban populations are ever expanding hence food deficit, land is not expanding.
- b. Ecological issues i.e., mechanised farming is not good for conservation purposes
- c. Necessity to change urban form from dependence to self sufficiency
- d. Health concerns (obesity, chemically poisoned food) are forcing alternative food production
- e. Agriculture technology development
- f. Reconnection of urban dwellers with the rural
- g. Alternative food networks

The question therefore is how to structure urban infrastructure needed for urban food system with all the varying arrays within the different historical time frame, population densities and technological evolution to make urban foodscapes possible?

The technologies are providing the logic, with which the urban foodscapes is ever emerging to become a highly possible venture, with highly technological installations in food production. The tested technologies are listed below:

- a. aquaponic systems
- b. Green Houses
- c. Roof hydroponics

These technologies are presaged on; urban climate (housing heat and cooling), urban compactness, and population densities. Agriculture has changed from extensive to intensive agriculture that is now informing the new trends in urban foodscape and urban food system. Ester Boserup, (1981 pg. 15) writes that different parts of the world have different food supply system. Going by the level of urbanisation in the global south majority population are still rural and providing for themselves with food provisions. Even those in urban areas, some are regularly supplied with food from rural areas. Intensive agriculture remains the preserve of the global north though it is also emerging in urbanised regions of the global south – particularly for vegetable and poultry farming.

Kontothanasis, (2017) notes that urban agriculture is a component of cultivation of plants, tree crop, livestock, aquaculture, mycoculture, apiculture and floriculture. This though implies looks at foodscape in more refined details of urban scales, as nested redundancy Keeffe, (2014) aimed to scatter productive infrastructure from individual dwellings, streets, and neighbourhoods, and then the city and finally the bioregion. It sounds innovative to reclaim the village-ness of the urban environment if the negative consequence of intensive urban farming is put into serious considerations.

Reading from Boserup, (1981) there is also some level of naivety in Keeffe, (2014) assumption of urban agriculture vis á vis technological determinism that is driving urban agriculture. It is not s long ago that what are cities today, were trading centres and largely depended on food supply from nearby small food producer gardens and farms. Just exactly as Steel, (2009) observation of over reliance on biochemical based food production, is a development that instead of producing health food stuffs resulted in chemically poisoned food supplies. How current technologies form urban food production, should be a major research area.

#### Foodscape infrastructure and scales

The transition in agriculture should not be cast aside as mere technological fad. All the forms of food production from smallholders' gardens, extensive and intensive agriculture have their range in geographical scales determined by population densities and distance in place theory thus creating different and varying production scales. The reason for looking at infrastructure and scales, is based on an idea that technological development is implicitly determining what is termed as foodscapes and urban food systems rather than reasons given in the literature review i.e., CO<sub>2</sub> emission, health foodstuffs, remediation of food waste, environmental concerns etc, as described by Kontothanasis, (2017).

There is necessity to understand the reasons and process through which agriculture has developed over time and maybe a pointer to the reasons why and in that case the emergence of food production infrastructures that had been created in each epoch. From hunter and

gather, the infrastructure accrued, is based on the open untapped natural spaces that allows to gather what meets the need. With settlers' agrarian development, land use becomes confined to given individual populations at defined scales enabled with given rudimentary technologies like oxen ploughs. The technology thus far determines the volume, quantity, quality, and extent of production. Urban growth derived extensive and intensive food production with its mechanised tools created extensive transport and logistic infrastructure for food production, storage, and distribution to service compact urban industrial populations. But even then, this can be attributed to statutory laws in zoning practices of the 1900. Zoning meant that human individuals were confined away from freely roaming around in nature and their food needs will therefore be met through the institutions of the state or those attached to it, specifically, the market.

Development in technologies have necessitated urban technologies that inspires intensive food production at a far smaller scale. Here there are green houses, hydroponics, green houses, aquaculture, mycoculture, apiculture as the novel urban infrastructure scale away from their natural state for urban food production system that yet reduces food production to scales never experienced before in human history. What is learnt is that urban agriculture involves activities to produce food, i.e., cultivation of plants, tree crop, livestock, aquaculture, mycoculture, apiculture and floriculture. Kontothanasis, (2017).

The most recent development in foodscapes and production has several pathways from which it derives: sustainability, reduction of pesticides and herbicides use in food production, concerns of general human health, natural plant genetic manipulation and biodiversity lose etc., (see Steel, 2009). Yet the scale remains at variances in these types of explorative scenarios and how meeting the required nutritional and health foodstuffs at quantities that meets demand can be met on the urban scale. Intensive and extensive agriculture was a response to market demands and population dynamics. Sonnino, (2016 pg. 190) observes that food production is bimodal, encompassing issues of quantity and quality, under and overconsumption, .....and that food has particular spatial configurative features, since its production and consumption embody essential (and uncontrollable) natural and metabolic processes.

The changing manner in how foodscapes is described, yet still influences the requisite infrastructure where it is being produced and these are quite novel and futuristic. Keeffe: Roggema ,(2019) writes that urban agriculture differs from conventional agriculture not only in the way it engages with the technologies of growing and food production, but also in the choice of which crops to grow. Reflecting on the concept of diversity – the normative scenarios understood in the localisation concept of foodscapes might be innovative but also disruptive of the world of food production, food eating customs and habits as currently known. Anderberg (2012 pg. 6853-6864) in *Natural Resource Flows and Sustainability*, urbanisation comes into a conflicting dilemma since sustainability requires a sustainable urban transformation including food supplies. How this transformation in regard to foodscapes and production scales evolves, can only be understood if the infrastructure scales are defined.

Even if the baselines are clearly to cause circularity, sustainability and ecological food productions it appears to conflict with urban spatial typologies. If for example the assumption is that urban dwellers are in need of pork, eggs , fish or poultry meat current disruption of urban structure and patterns will be fundamental, and informs that the requisite

infrastructure needs for urban food production (see Roggema, 2019 pg. 2.), will reconfigure the urban scales. Not least, it will require changes in public health, animal husbandry laws that eliminated pre-industrial small scale neighbourhood gardens and individual production. The idea in the key literature review appears to assume that the rural is no longer necessary if urban farming succeeds. This view appears to be supporting the existing status quo of the separation of the rural from the urban yet urban foodscapes is an idea that looks at other forms of food processing along the food supply-demand chain in a mixture of peri-urban and urban-rural relationship.

### Sustainability, Circular economy, and Ecological farming

Pothukuchi and Kaufman, (2000) criticism of planners for not bringing the foodscapes in the urban space, is over ambitious and unrealistic. It falls short of blaming planners for not being: urban architects, urban street designers, urban civil engineers with food production knowledge etc., in whose professional frame, detailed manuals of their work description, for new urban foodscape system infrastructure design does not fall.

The foodscapes conceptually, have to define how sustainability, circularity in urban food system economy and ecological farming interpolates with each other. Urban foodscapes thus far are shrouded in technological determinism and appears to be driven with intensive technological food production processes that are specifically not befitting the geographical spaces and scales as defined by Roggema (2019 pg. 3) table of scales. Keeffe: Roggema, R. (2019 pg. 17-18) writes that urban agriculture is not as agriculture in the city per se, but as a multilayered urban design strategy. This insistence to urban design, does not urge well with traditional food production, and once again confirms that for urban foodscape to be a reality, the urban infrastructure for its possibility has to be put in place.

Whereas Pothukuchi et al., (2000) views are quite innovative, land use laws are exclusively driven by the divisions of labour, and space functionality: industrial, residential, and recreational. It is preposterous to imagine vegetable or chicken production on a city flat balcony, even if in urban foodscapes vision frames this is a possibility. The urban food system is a set of processes along a timeline. If one's balcony can produce enough vegetable and the requisite infrastructure, processing the same might fail given land use, sanitation and zoning urban laws. The specificity of current urban configuration is not for agriculture but rather residential, industrial, commercial, trade and commerce. This will have to change and requires technical know-how.

The infrastructure needed for self-food provisions production, in the urban landscape is yet still clearly unformulated and also the outline of the regulatory frame is absent. This should not be of critical concern since, in some nations, the modern state is just a few hundred years old. Implying urban foodscape can readily tap into what existed before industrialisation. The drivers for the above approach to happen are already in place i.e., desire for health food, environmentalists reasons, technological input, agronomy sciences in urban foodscape etc., Whereas Walter Christaller's central place theory becomes irrelevant and the implicit geometry in his design is scaled down to a local residential facility or dwelling as outlined in the *Table 1.1* types of urban foodsystem production and their typical scale (see Roggema, 2019 pg. 3) is an infrastructure description that is on scale, but short of what types of food

that can be produced on those scales i.e. a street, community garden, city square, urban centres and so on. Yet still these scales should not be presaged on old urban forms that have different configuration due to population centration and densities, implying derived sanitation, public health, space, geometry, network, transport logistics etc., are radically different. It would be better to offer some scenarios of spatial topologies re-streets, building designs, rooftops befitting the urban food systems.

## Conclusion

While urban foodscapes is inspired by Research through Design (see Larjosto, 2019) a powerful methodology for new urban functions and morphology, it will be essential to converge eco-system with ecosystem functions, sustainability and circular economy also with a focus on socio-economic dynamics, landscape spatial patterns and spatial attributes as to how it will be affecting land-use sciences in spatial planning and food production localisation either in the city or peri-urban areas.

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<sup>i</sup> <https://www.britannica.com/topic/central-place-theory>