

Peri-urban agriculture

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Peri-urban agriculture is generally defined as agriculture undertaken in places on the fringes of urban areas. There is no universally agreed definition, and usage of the term generally depends on context and operational variables.^[1] The Food and Agriculture Organization of the United Nations defines peri-urban agriculture as "agriculture practices within and around cities which compete for resources (land, water, energy, labour) that could also serve other purposes to satisfy the requirements of the urban population."^[2]

The term “peri-urban” used to describe agriculture, while difficult to define in terms of geography, population density, percentage of labor force in agriculture, or any other variable, often serves the purpose of indicating areas along the urban-rural continuum. These are places with dynamic landscape and social change and are often invoked in conversations about growth of cities.

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History

The concept of peri-urban has become prevalent as a result of limitations in the dichotomy between rural areas and urban areas. Historically, rural and urban land have been viewed as two separate economic systems with few interactions. Often, these arguments refer to the disappearance and urbanization of rural land. Peri-urban land falls along the continuum of urban to rural land and recognizes links between the two.^[3]

Implementation

Urban and peri-urban agriculture is expected to become increasingly important for food security and nutrition as rural land is built up. It is predicted to be particularly key for growing perishable produce accessible to the approximately 700 million urban residents already living in developing countries, especially because most growth is expected to take place in urban areas of developing countries.^[4]

Urban and peri-urban agriculture tend to differ in their form and their purpose. "Urban" usually refers to small areas such as vacant plots, gardens, balconies, containers within cities for growing crops and raising small livestock or milk cows for own consumption or sale in neighbourhood markets. Peri-urban farming more often consists of units close to town which operate intensive semi- or fully commercial farms to grow vegetables and other horticulture, raise chickens and other livestock, and produce milk and eggs.^[5]

Peri-urban livestock production is often based on small ruminants such as goats and sheep, which occupy less space than cows and bulls, are subjects of virtually no religious taboos, can provide both meat and milk, and generally reproduce at two to three years old.^[6]

Benefits

Environmental

Peri-urban agriculture provides environmental benefits by preserving or creating urban open space in city edges where green space may be threatened by expanding urbanization. In addition to aesthetics, preservation and creation of green space has positive climatic effects including augmenting carbon sequestration, reducing the urban heat island effect, and providing a habitat for organisms.^[7] Peri-urban agriculture may also help recycle urban greywater and other products of wastewater, helping to conserve water and reduce waste.^[8]

Social

Studies have shown that urban gardening and farming, particularly when done in a community setting, have positive effects on nutrition, fitness, self-esteem, and happiness, providing a benefit for both physical and mental health.^[9]

Closely related to health is food security, or dependable access to adequate and nutritious food. Urban gardening may be an opportunity for the urban poor to produce food for themselves or to sell their products for income, adding to income security.^[10] Localized agriculture can also improve resilience by ensuring that there will be a more certain food supply in times of shortage, instability, and uncertainty.

In addition, residents who share a plot of land may benefit from social interaction and recreation with others.^[11] Agriculture is often an effective strategy for poverty reduction and social integration of disadvantaged groups, with the aims of integrating them into the urban network, providing a decent livelihood, and preventing social problems such as drugs and crime.^[12]

Economic

Beyond providing productivity to vacant land, treated wastewater and recycled waste, urban and peri-urban agriculture is an important source of income for many urban poor. Farming households lower their food costs substantially and can generate income by selling excess produce, which is significant, as urban poor commonly spend 50-70% of their income on food.^[13] In addition to farming jobs, peri-urban agriculture can spark a need for traders, input suppliers, processors, marketers, and others. Peri-urban agriculture gives women and other non-heads of household a low-barrier occupation through which to support their families, adding to household productivity and giving women an outlet to assert themselves.^[14]

Producing food in areas nearby to cities shortens supply chains, which aids quality and cost. The proximity of peri-urban farms to urban areas incurs cost savings compared to those in rural areas, as farms are still able to take advantage of economies of scale, to an extent, and require less transportation infrastructure to bring food in from city outskirts.^[15] Perishable products are more easily preserved. Peri-urban farms are also able to flexibly respond and market themselves to urban consumer demands, since they are able to be closer and more specialized, and are tightly linked to the urban economy.^[16]

Challenges

Challenges for peri-urban agriculture, like its benefits, arise from its proximity to densely built urban areas. Competition for resources with other urban sectors, aspects of agriculture that may be unpleasant for city dwellers, and quality of inputs must all be monitored.

Wise resource allocation is a quintessential struggle for agriculture, and is especially greater for peri-urban agriculture than rural agriculture due to its proximity to greater numbers of people and to existing stresses on the urban environment. Peri-urban agriculture uses land, water, labor, and energy that might be used by other urban economic sectors.^[17]

Outputs

Peri-urban agriculture produces some aspects that may be unpleasant for urban residents, including smells, noises, pollution, and disease.

Management of animal waste can be challenging, since manure may contain chemicals and heavy metals unsuitable for use as fertilizer – and may even be hazardous. Runoff from facilities leads to overnutriented soils and water, which can in turn cause eutrophication and algal blooms in nearby water supplies.^[18]

Pathogens are often spread from wastewater reused for irrigation, from live animals in close proximity to dense human populations, and the disposal or sale of manure. Crops are an opportunity to reuse urban waste productively, and wastewater as an irrigation source in particular has been explored by some cities to conserve water. If not treated properly before application, this wastewater can contaminate crops or

surrounding vegetation with pathogens that make them unsafe for human consumption. This is a food safety concern especially in markets with unlicensed vendors and missing enforcement of safety regulations, which are common venues for small urban and peri-urban farmers.^[19]

Animals raised in a peri-urban agriculture setting are by nature in close proximity to dense human populations and are often sold live or processed at food markets. Animal production is not allowed in some city centers – for example, in Beijing it is not allowed within the borders of a certain road that delineates the city center, but on the outskirts of cities it is growing as an industrial production system particularly as diets change to demand more meat.^[20] This has been a major factor in the avian influenza epidemics that have heavily affected Hong Kong, Nigeria, and Egypt. During outbreaks, people are advised to avoid open poultry markets.^[21]

The disposal of manure is a concern as well, since manure from industrial livestock systems may contain levels of chemicals such as nitrogen, phosphorus, and heavy metals which characterize it as a solid waste when used in excess.^[22] This is not only a concern in urban and peri-urban areas, but also faces rural farms as well.^[23]

Insufficient or inferior inputs

Due to its competition for resources and pressure to shift to industrial systems that will meet urban demand, inappropriate or excessive use of agricultural inputs including pesticides, nitrogen, phosphorus, and raw organic matter containing undesirable residues such as heavy metals, is a concern.^[24] The nature of the environment nearby to urban areas can be hazardous to agricultural production. There are physical, chemical, and fungal threats in the form of roadway exhaust and debris, dense urban populations, water and soil pollution by organic pollutants, industrial chemicals, heavy metals, and antibiotics, and fungal and secondary metabolites.

Uncertainty of land ownership

Another major challenge to the viability of both urban and peri-urban agriculture is land availability due to changing land rights, uses, and values. High population densities lead to competition and conflicts over land and natural resources as land is converted from agricultural to residential and business uses, and as the intensity of agriculture practiced on scarce spaces available increases.^[25] In addition, many urban and peri-urban farmers are urban poor and are frequently women, who tend to be economically vulnerable.^{[26][27]}

See also

- Urban agriculture

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