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Governance of rural-urban linkages - urban agriculture as a relevant contribution to sustainable urban livelihoods

Linden[a], Alexandra and Dr Heike Ostermann[b]

a Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Sector Programme Sustainable Development of Metropolitan Regions, Dag-Hammarskjöld-Weg 1-5, 65760 Eschborn, Germany. Email: alexandra.linden1@giz.de
b Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Sector Programme Sustainable Agriculture, Dag-Hammarskjöld-Weg 1-5, 65760 Eschborn, Germany. Email: heike.ostermann@giz.de

Introduction

Due to rising and unstable food prices, food security has been high on the political agenda since 2008. Violent protests in towns and cities against increasing food prices are clear evidence that urban populations also feel their food security is significantly threatened. Low-income urban families in developing countries spend up to 80% of their total income on food. In urban areas, it is more difficult for people to substitute their food supply with subsistence agriculture when they are faced with food shortages. The urban poor are therefore most affected by price hikes. What role can urban agriculture play in this respect? And how can we ensure urban agriculture becomes a firm fixture on the urban development agenda?

By 2030, it is expected that five billion people will live in cities, the equivalent of the world's total population in 1987. Their demand for water, energy and food will determine how resources are used in future. Rural-urban interaction will further intensify, with an increased flow of people, goods, resources, and capital. Rural lands will become urbanised, as will lifestyle and consumption patterns. Through the proliferation of urban lifestyles, urban land use will triple by 2030 according to the World Bank. The increase in resource consumption per capita contrasts sharply with overall resource availability. Growing competition and conflict over the use of land and resources are increasingly to be observed. Around 40% of the world's population will have insufficient access to water by 2030. At the same time, global energy consumption and food production are both expected to see a 36% increase by 2025. Even now, the demand of urban areas often exceeds the production capacity of surrounding regions.

Observations – the relevance of urban agriculture for sustainable livelihoods

Urban and peri-urban agriculture, i.e. cultivation and livestock farming in and around cities, is not a new phenomenon, but it takes on a new importance in light of the rapid urban growth the world is experiencing. Today, around 800 million people are engaged in urban agriculture and related enterprises across the globe. According to the Food and Agriculture Organization of the United Nations (FAO), up to 40% of the urban population in Africa was engaged in the sector in 2012.

About 20% of the food consumed by urban populations is produced in and around cities. Globally, 34% of meat and 70% of eggs are produced in urban and peri-urban areas.

Urban agricultural products are produced for subsistence as well as to be traded. No clear line can be drawn between urban and peri-urban agriculture, as their respective characteristics depend highly on the local context. Small-scale urban agriculture within cities is mostly practiced by poor urban dwellers, frequently women. The land used is either publicly owned, including hazardous land unsuitable for construction, road reserves, plots along railways or beneath electricity lines; or private, including vacant residential, industrial or institutional plots. These farmers very rarely hold formal land titles. Livestock is kept in buildings, backyards or simply on streets. Large-scale urban agriculture on the other hand is mainly practised in peri-urban areas by commercial farmers, with women in this case playing only a minor role. These farms are well equipped and mainly hold formal land titles.

New trends in urban agriculture include rooftop farming and vertical farming. Rooftop farming mainly involves vegetable growing and to a certain extent animal husbandry (poultry, rabbits, guinea pigs). It requires no additional space and can be found in industrialised, newly industrialised and developing countries. Vertical farming is practiced in a highly technical, artificial environment and requires significant investment. No additional space is required and the water and nutrient cycle is almost closed. This technology is still in its infancy and more research is needed. It may initially be of most interest to countries with limited natural resources for agricultural production, such as Golf States, or dense cities and megacities in Asia.

Increasing the economic resilience of poor urban households through income generation and diversification is one goal of urban agriculture. Poor urban dwellers in African countries spend up to 80% on food, while the figure is 60% in Asia. This makes them highly vulnerable to price spikes such as those that have occurred over the last 4-6 years. Production for home use or for nearby markets can reduce this vulnerability and help poor people to withstand periods of high food prices. Income gained through urban agriculture helps households diversify their economic activities and lower the risk of running into financial difficulties.

Furthermore, urban farming and gardening can produce vegetables and crops high in vitamins and minerals and can therefore be important in ensuring a balanced diet. Accompanied by awareness and capacity building, this has the potential to help reduce obesity rates, which have been rising particularly rapidly among urban populations due to unhealthy food consumption habits and lifestyles. Small-scale urban agriculture, often practised by women and socially fragile groups (e.g. the unemployed and the poor), represents a way of empowering marginalised urban people and improving their quality life. The main driving forces behind urban agriculture in developing economies are income generation, food security and tradition. In emerging and industrialised countries it tends to be driven by green municipal development agendas and leisure and social inclusion initiatives.

Growing metropolitan regions: challenges and resource conflicts

Growing urban agglomerations have a significant impact extending far beyond city boundaries. Overexploitation of resources, loss of biodiversity and increasing carbon emissions are all reflected in the ecological footprints of burgeoning cities. Urban and rural areas are highly interdependent, as is illustrated by the example of food security. Rural areas depend on urban markets, while cities rely on agricultural areas for their food supply. Measures to ensure that ecosystems in the countryside surrounding cities remain unspoiled not only preserve those areas for recreational purposes but also generate natural capital for resilient and productive cities.

The sustainable management of rural-urban linkages is likely to become an even greater challenge in the context of urban growth. Simplified models of rural and urban livelihoods are no longer appropriate. Rural-urban dependencies manifest themselves in diversified multi-spatial household structures and periodic/cyclical population movements. Poor rural migrants diversify residency and income sources in metropolitan areas and hence their overall resilience. Special attention should be given to the situation in peri-urban areas, as former rural land becomes increasingly affected by urban demand for foodstuffs and real estate. Cities frequently draw on natural and human resources in these areas, as well as using peri-urban land for waste disposal.

The challenges faced by those involved in urban agriculture are very different from those in rural areas. Access to land in densely populated urban areas is limited. Urban land is expensive and subject to stricter hygienic and environmental standards. Urban agriculture generally takes place informally without regulation. This might initially be considered an advantage, but in many cases it causes problems and conflicts in the long run as population density increases and/or cultivation practices are intensified.

Results and discussion – sustainable management of rural-urban linkages via a NEXUS approach

Urban agriculture can serve many purposes. These include the improvement of urban food security and nutrition quality, social integration, the generation and diversification of income, and environmental benefits such as the improvement of water and air quality and the productive use of organic waste. Urban agriculture therefore forms part of a NEXUS system with diverse interrelated dimensions, such as energy, environment and natural resources, nutrition, employment, social inclusion and health.

Against a backdrop of rapid urbanisation, the German Development Cooperation is helping to establish an integrated NEXUS perspective in metropolitan areas. Inherent to urban transformation is the risk of growing gaps forming in urban supply chains, particularly with regard to water, energy and land use. The NEXUS approach, which seeks to manage sectors in an integrated way, can make a key contribution to the sustainable development of rapidly expanding cities. The world's cities generally conduct their planning and management activities on the basis of sectoral responsibilities, meaning they are often unable to take advantage of cross-sector relationships and the resulting synergies. For instance, nearly all forms of energy production require water; the transport and treatment of water in turn require energy; while food production requires both water and energy.

Crucial policy gains can be achieved through adopting an integrated NEXUS perspective and fostering policy coherence to ensure beneficial sectoral synergies and fewer adverse consequences. A coordinated, human rights-based approach is embedded in sectoral strategies for enhanced resource access, especially for the poor. Increased resource productivity is fostered through the optimal allocation of scarce production resources and by stopping resource wastage. Relevant measures in this regard include developing sustainable relationships between urban consumer markets and surrounding rural regions in the field of food production, and curbing unrestricted land development. Targeted protection of areas of environmental importance, integrated watershed management and the improvement of microclimates through the management of green spaces are further NEXUS steps towards sustainable urban livelihoods. Combining wastewater treatment with energy generation and harnessing other biogas sources such as agricultural waste also contributes to a climate-friendly metropolitan region; improving air quality and helping to protect local forests.

Conclusions and outlook

Sustainable resource management is essential if we are to effectively meet the needs of a growing population and respond to changes in consumption patterns without exhausting our planet's finite resources. The responsible treatment of public goods, such as air and groundwater, plays a key role in this regard. Urban agriculture can represent a highly relevant contribution because it generally needs less energy for transport and storage than fresh products coming from remote rural areas. By recycling waste water and organic waste for use in agricultural production, urban agriculture can lower the ecological footprint of cities and contribute to a greener urban environment, for instance by creating productive green belts for fresh air provision. The above-mentioned multi-sectoral aspects of urban agriculture require appropriate urban planning and implementation procedures. Implementing urban agriculture means realising a NEXUS approach and promoting its institutionalisation accordingly.

Unclear land tenure and land rights ('guerrilla gardening') hamper sustainable investment in urban agriculture, pro-poor growth, equitable participation and ecological efficiency. Legitimate land use titles and planning security are therefore a must for development-oriented urban agriculture. Limited availability and access to land in urban areas, associated with expensive leasing rates, is a challenge for urban planners and potential private investors. Nevertheless, there is likely to be significant public interest in promoting urban agriculture, be it for its social or its ecological dimension, which should be taken into consideration when developing urban spaces. Health challenges associated with waste water, manure use, heavy metals in soil and animal husbandry (zoonotic diseases) need appropriate institutional and technical responses. Effective waste water treatment and regulations for animal keeping, slaughtering and production techniques should be established and implemented in a participatory way. Finally, demand for higher quality products by urban consumers represents both a challenge and an opportunity for urban farmers to make urban production more sustainable. Training and standard operation procedures are important tools in overcoming poor product quality while at the same time enhancing export opportunities to other cities/regions/countries.

Efficient, cross-sectoral resource management, a key feature of urban agriculture, represents a direct contribution to sustainable urban development processes. In order to manage urban development responsibly without exhausting the planet's finite natural resources, it is vital to develop integrated planning and coordination processes that overcome isolated sector approaches and initiatives. To this end, it is essential that we develop inter-sectoral NEXUS solutions that identify synergies and help to increase resource efficiency and overcome a silo mentality. Promising approaches are emerging, particularly in the NEXUS between the water, energy and food industries.

Further reading and links

The Water, Energy & Food Security Resource Platform NEXUS (15/05/2013): http://www.water-energy-food.org/

Stockholm Environment Institute (15/05/2013): http://www.sei-international.org/rio20/water-land-energy-nexus

International Food Policy Research Institute (15/05/2013): http://www.ifpri.org/blog/water-energy-and-food-security-nexus

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Tacoli (1998): Rural-urban interactions: a guide to the literature, in: Environment and Urbanization, Vol.10, No.1, pp.159/160