

# 10

## The Role of Urban and Peri-urban Agriculture in Food Security and Resilience

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### Introduction

In Chapter 8, it has been suggested that urban agriculture is a potential means by which to address the issue of food security. Utilising any available space within urban areas would not only increase the land available for production but would also produce food in the locale in which is predominantly consumed. In this next chapter, the issue is examined in more depth and places a question of the extent to which the solution is realistic.

The Anthropocene period, a term used to define the epoch in which human activities have started to have an impact on the Earth's geology and ecosystems, has been deemed to have begun at the start of the Industrial Revolution (Rockstrom, 2009). It is now seen to have reached a point beyond the 'safe operating space' threshold, a term which refers to a point at which certain natural systems have become irreversibly destroyed and lost. These events have placed increasing pressure on the resilience of the food system, particularly where there is increasing competition for resources, such as land.

Urban agriculture is defined as the production of crop and livestock goods within cities and towns, and has been one of the ways in which policy makers have sought to address these problems. Indeed, it is suggested that the sector is growing rapidly with some 200 million people employed within the sector, contributing food to around 800 million urban dwellers.

Rigorous empirical research into the reality of benefits generated by urban agriculture is sparse, yet intuitively it makes sense to put into food production otherwise waste land that is in close proximity to populations to increase the availability, when we are faced with issues of population growth and land constraints and the ecological impact of feeding people. Yet, it is important to note that there is limited existing literature that examines in any depth the impact of urban agriculture on food poverty. There is little research into the volume of production, the impact of seasonality and the implications of periods of glut and of fallow. This chapter examines these issues in the context of developing and developed countries and further suggests that without training, practitioners may misuse pesticides and other chemicals and adopt poor sanitary practices, contributing to phytosanitary risks. It is possible that urban agriculture may throw up more problems than it solves.

## Defining the problem

It is widely accepted that in the current epoch, the Anthropocene period, human activity has placed many ecologies in a position of potential near-destruction. Until the advent of the Industrial Revolution, the boundaries between where food was produced and where it was consumed (Rockstrom, 2009) were not clearly delineated. Food production has always taken place in a gradient of geographical land use from urban/peri-urban, to farmland on the edge of the urban area, remote rural areas either indigenous or in international spaces. In certain regions, urban areas are expanding, taking over valuable agricultural land, in line with population growth and the continuation of the exodus of rural populations to urban areas. In many regions, the boundaries between rural and urban are blurred as the growing population competes with agriculture for land resources.

These events present challenges for the distribution of sufficient accessible food. Food is supplied from outside the urban sprawl to be distributed through various marketing channels, such as street markets, grocers, corner stores and supermarkets. In such circumstances, as the urban landscape spreads, food production is not only pushed further away but, in a globalised world, food is also being sourced from thousands of miles away.

Furthermore, highly populated urban areas, where often the landscape is dominated by buildings and other infrastructure, have in many cases little vegetation. Inhabitants are frequently subject to high pollution levels, which are injurious to health. In addition, the high intensity of living conditions may lead to social problems, including substance abuse, which can also be linked to poor diets and health.

It is within this context that authorities, pressure groups and society in general have started rethinking some of the dynamics of the exploitation of the natural world, especially regarding the production and consumption of food. These dynamics are changing because of complex issues such as global warming, population growth and an over-reliance on global food networks (FAO, 2009). Indeed, these problems are expected to place ecological systems under even greater stress over the next decades.

On the other hand, in many cases, farmland also does not represent a healthy space. The over-utilisation of land has caused problems in the soil such as compaction, erosion and destruction of the natural balance within it, further heightened by pollution from excessive use of artificial fertilisers (phosphate and nitrogen) not to mention the cumulative effect of heavy metals and agrochemical residues.

Human use of land and other natural resources has wrought intense changes to the planet's climate, which has highlighted the fragility of some food production systems. Climatic change is evidenced from a rise in temperature, at a greater extent than in normal temperature fluctuations found in interglacial periods. Such climatic changes have in turn caused more land to be less suitable for agriculture (FAO, 2009). Furthermore, rising sea levels will also cause loss of agricultural land as saline water is likely to flood coastal plains, which, added to the projected population growth by 2050, will put a lot of stress on existing food production systems (FAO, 2009). Urban dwellers are more and more distanced from the source of food production and might be at risk of not having enough food at affordable prices, as it was the case in the food crisis of 2008 and 2009.

The recent food inflation crisis has led policy makers, activists and researchers to pay more attention to ways of building food resilience. As a result, alternative food production activities have surfaced as solutions to reduce vulnerability in the most needed communities, which also are felt to deliver sustainable food supply systems and offer food with a higher nutritional value to consumers, thereby meeting the challenge of addressing food security.

The shift in the emphasis of food production systems away from distanced and global towards more local supply chains has gained prominence in many policy and industry forums. For many the focus is on initiatives promoting fair, healthy and sustainable local food systems through a network of local, mainly organic, produce sold through farm shops, farmers' markets and pick-your-own farms, which have all grown in popularity in more economically developed countries (MEDCs). Such alternative food marketing channels also offer a social value and the support of strong local communities in the quest of accessing fresh healthy food (Food Links UK, 2015). On the other hand, in less economically developed countries (LEDC), local food production solutions have also been fostered to improve both nutrition and economic resilience.

The issue to be addressed is whether the production of food in an urban/peri-urban area offers greater food resilience within MEDCs and LEDCs, and whether urban/peri-urban agriculture has the capacity to safely and sustainably feed an urban population. An analysis of existing research in this area suggests that there is limited objective analysis of the benefits and drawbacks of urban production and its ability to deliver.

With the reputed 200 million city dwellers supplied through urban farms, it is notable that in African countries 40% of urban dwellers are said to be engaged in some sort of agricultural activity and this percentage rises to 50% in Latin America. If these numbers are accurate (and they may well not be), urban agriculture may have a role to play in addressing urban food insecurity problems in developing regions. The estimate is that about a quarter of the developing world's poor live in urban areas (Ravallion *et al.*, 2007). Numbers of urban poor are increasing in line with the expansion of urban areas (Gomez and Barton, 2013) resulting in the appropriation of vast areas of ecosystems and the elimination of productive land from cultivation (Gerster-Bentaya, 2013).

Although by no means a new phenomenon (Rockstrom *et al.*, 2009), the expansion of urban areas creates a conflict of interest between rural areas and cities for economic and political rights and privileges (Graue, 1929). In urban agriculture, an activity that infringes upon the traditional activity of rural areas and thereby in itself presents a source of conflict, there is a particular need to understand its role in urban planning, particularly whether urban agriculture might act as a vector for rejuvenation – environmental, economic and social.

## Impact on the ecology

In the MEDCs the emphasis is placed on preserving a healthy environment, a verdant landscape and a habitat for birds and other species (Pollans and Roberts, 2014). The role of urban agriculture in MEDCs is to enable more of an intrinsic connection or reconnection of consumers to the land and access to pleasant recreational areas (Morrison, 2006), offering residents more greater access to open spaces as well as beautiful and pleasant landscapes for recreation or leisure (Gerster-Bentaya, 2013).

Such access to open spaces has the added benefit of food cultivation, thus allowing for more food security, resilience and promoting healthy and tasty eating, and it also enables good social behaviour. This is in line with the ecological public health model proposed by Lang and Rayner (2012), who consider ecological public health in context of four aspects namely: material, biological, cultural and social or institutional. It is suggested that urban agriculture delivers a structural