

## 1. Introduction

*This chapter informs about urbanization in Africa in general and Ghana in particular, the general role of urban agriculture and the common use of polluted irrigation water. It describes our focus on irrigated smallholder vegetable production and our understanding of the terms “urban” vs. “peri-urban” and “wastewater”. It also gives an overview on the chapter of the book, the origin of the data and the objective of this publication.*

### 1.1 The urbanization challenge

The world has entered the ‘urban millenium’ as Kofi Annan, UN Secretary General, stated. Taking Africa as an example, its population will almost triple by 2050 and this will be primarily in the urban and peri-urban areas. The projection is that by 2015 there would be 25 countries in sub-Saharan Africa with higher urban than rural populations; by 2030 this would be already 41 countries (UN-Habitat, 2001). Already today, about 44% of the population in the West African subregion lives in urban areas (UN Population Division, 2004), compared to only 4% in 1920. The same 44% applies to Ghana, and this number will rise rapidly as some of Ghana’s (peri)urban areas have annual growth rates of more than 6 to 9% (Ghana Statistical Service, 2002; see Chapter 2). One cause for the increasing urban population is the influx of migrants from rural areas in search of better livelihoods. The migrant influx into the city resulted in shanty suburbs and slums, mostly in the center of the city.

### 1.2 Urban and peri-urban agriculture

Central to the urbanization phenomena are quantitative and qualitative changes in urban food demand. These changes challenge food production, rural-urban linkages, transport and traditional market chains. Specialized urban and peri-urban farming systems appear, like large-scale poultry production or urban and peri-urban agriculture.

Urban and peri-urban agriculture can be broadly defined as the production, processing and distribution of foodstuff from crop and animal production, fish, ornamentals and flowers within and around urban areas (cf. Mougeot, 2000). Although the terms “urban agriculture” and “peri-urban agriculture” are often used synonymously, we will use these terms as appropriate as possible. A major question for quantitative studies is where the peri-urban area ends and the rural hinterland begins (Brook and Davila, 2000; Simon et al., 2006). In our context we will refer with “**urban**” to the administrative city boundary while “**peri-urban**” is

used for lands outside the immediate perimeter of the city but within a radius of up to 40-km of the city center (see Chapter 2).

In Ghana, *urban* crop farming comprises of two forms: (i) open-space production for the urban market, and (ii) backyard gardens cultivated mostly, but not only, for home consumption (Table 1.1).

**Table 1.1:** The two major categories of urban and peri-urban crop farming in Ghana.

Farming systems	Urban areas	Peri-urban areas
<b>1. Market production</b> (cultivation on undeveloped urban land)	Irrigated vegetables (year-round or seasonal), flowers and ornamentals; rain-fed cereals	Irrigated vegetables (mostly seasonal), fruits; rain-fed cereals
<b>2. Subsistence production</b> (cultivation at the house)	Backyard or front yard farming	Home gardens; farming around homestead

Source: Drechsel et al. (2006a; simplified).

In this book, we will focus on the first category, i.e. **smallholder vegetable production for city markets** with more emphasis on urban than peri-urban areas. These farming systems are usually found in lowlands or along streams, which are unsuitable or forbidden for construction purposes, but favourable for seasonal or year-round irrigation.<sup>1</sup>

The United Nations Development Programme estimated in 1996 that about 800 million people are actively engaged in urban agriculture worldwide and 200 million are considered to be market producers (UNDP, 1996). Market gardening focuses in many regions on easily perishable crops with short shelf life, which complements rural food production where cold transport to the cities and cold-storage facilities are not available. In Ghana, urban vegetable farming dates back to the arrival of Europeans. It is likely that the vegetables were grown in the gardens created around the castles and forts along Ghana's Gold Coast from the 16<sup>th</sup> century onwards (Anyane, 1963). Today, nearly all perishable vegetables consumed in Ghana's cities are also produced in their urban and peri-urban areas (see Chapter 4). The same applies to Dakar, Bamako, Dar es Salaam, and other cities, where depending on crop and season, between 60 and 100 % of the consumed leafy vegetables are produced within or close

<sup>1</sup> For a general baseline study of vegetable production in Ghana see Nurah (1999).

to the respective cities<sup>2</sup> mostly on irrigated open spaces (Mbaye and Moustier, 2000; Drechsel et al., 2006b; Smith, 2002). This indicates that urban agriculture could be an important means of attaining a balanced local food supply. Apart from increasing food security through a direct supplement of households' food, urban agriculture in developing countries can also increase employment and income, which in turn, will enable people to purchase food to improve their diet or increase their general food security.

### 1.3 Sanitation, water quality and irrigation

Other than increase in urban food demands, the upsurge of urban populations has far outpaced urban sanitation infrastructure. This does not only apply to Ghana. About 2.4 billion people in the developing world lack access to basic sanitation and about two-thirds of the population in developing world have no hygienic means of disposing of excreta with even a greater number lacking adequate means of disposing of wastewater (UNDP, 2002; Niemczynowicz, 1996). Basically, 85% of wastewater generated from urban centers worldwide ends up in the environment in its untreated form. Also in Ghana only a minor share of the wastewater is treated and less than 5% of the population has sewerage connections. Most domestic grey water passes through storm water rains into streams and/or the ocean (Chapter 6). Urban and peri-urban smallholders in search of irrigation water hardly find any unpolluted surface water or end up using water from drains. Thus the discussion of irrigated urban and peri-urban agriculture in Ghana is also a discussion of wastewater use and food safety. In the context of this book we refer to the term “wastewater” as the continuum from **raw wastewater** to domestic wastewater in drains [seasonally diluted by surface run-off after rains], partially treated wastewater or **polluted stream water**. All these forms are used in urban vegetable production, and the last one is most common in peri-urban Ghana (Chapter 7). Keraita (unpublished) estimated for Ghana an area of about 3,300 ha irrigated with “wastewater” as defined above, mainly during the dry seasons. This is an equivalent of about 60% of the total area currently under formal irrigation (schemes) in the country.

Wastewater use in agriculture is not new, and with the general global increase in water scarcity, it is seen as a key component of Integrated Water Resource Management (IWRM) supporting water savings for domestic purposes. However, the use of (raw or diluted) wastewater in its untreated form could have negative impact on public health and the environment. In Ghana, like throughout the subregion, the major health concern has

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<sup>2</sup> Some data, like “90% of ‘all’ vegetables” (Accra, CENCOSAD), are persistently cited although they are wrong. High percentages only apply to certain leafy vegetables.

specifically been with **microbiological pathogens from domestic sources** (Drechsel et al., 2006a; Chapter 9). The flow of industrial effluents into urban and peri-urban streams is relatively seldom as most industries are along the ocean. Thus water pollution from heavy metals does in most cases not exceed common irrigation standards (Cornish et al., 1999; Keraita and Drechsel, 2004). Possible exceptions in Ghana are streams passing gold mining areas.

It is in this context of low irrigation water quality that we studied urban and peri-urban vegetable production. Topics included its general importance, farm practices, economics and externalities, gender, wastewater use, produce quality, stakeholder perceptions, etc. as reflected in the Table of Contents.

#### **1.4 Objective and overview of the book**

The purpose of the book is to summarize different studies initiated and supported by IWMI in Ghana over the last five years on urban and peri-urban agriculture in general, and irrigated urban and peri-urban vegetable production in particular. About 10 university departments representing various disciplines contributed to this product by involving about 40 BSc, MSc and PhD students from Ghana and abroad. The book complements as Ghana country case study the related West Africa overview provided by Drechsel et al. (2006a).

The book starts by giving a short description of the main farming sites and characteristics of urban farmers involved in wastewater irrigation in Ghana's major cities. A special focus has been placed on gender issues in Chapter 3 while Chapter 4 and 5 describe financial, economic and marketing aspects. This is followed by a detailed description of the urban wastewater management and sanitation situation in Ghana, water quality used in farming and the quality of vegetables found in Ghanaian markets (Chapters 6 to 9). Chapter 10 focuses on stakeholders' perceptions of urban agriculture and wastewater use. Institutional and legal aspects are discussed in Chapter 11. The book ends with Chapter 12 highlighting options for appropriate health risk reduction strategies and remaining crucial research gaps from different perspectives.