

Edited by
Henk de Zeeuw and Pay Drechsel

Cities and Agriculture

Developing resilient urban food systems



First published 2015
by Routledge
2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

and by Routledge
711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

© 2015 RUAF Foundation and International Water Management Institute

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

Trademark notice: Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

Library of Congress Cataloging-in-Publication Data

Cities and agriculture : developing resilient urban food systems / edited by Henk de Zeeuw and Pay Drechsel.

pages cm.—(Earthscan food and agriculture series)

Includes bibliographical references and index.

1. Urban agriculture. 2. Sustainable agriculture. 3. Food supply. 4. Food security. I. Zeeuw, Henk de. II. Drechsel, Pay.

S494.5.U72C566 2015

338.1—dc23

2015007324

ISBN: 978-1-138-86058-2 (hbk)

ISBN: 978-1-138-86059-9 (pbk)

ISBN: 978-1-315-71631-2 (ebk)

Typeset in Bembo

by Apex CoVantage, LLC

CONTENTS

<i>Preface</i>	<i>vii</i>
<i>Foreword by HRH The Prince of Wales</i>	<i>xi</i>
<i>List of abbreviations and acronyms</i>	<i>xiv</i>
1 Urban food systems <i>Johannes S.C. Wiskerke</i>	1
2 Urban food policies and programmes: an overview <i>Lauren Baker and Henk de Zeeuw</i>	26
3 Process and tools for multi-stakeholder planning of the urban agro-food system <i>Henk de Zeeuw and Marielle Dubbeling</i>	56
4 Agriculture in urban design and spatial planning <i>André Viljoen, Johannes Schlesinger, Katrin Bohn and Axel Drescher</i>	88
5 Urban agriculture and short chain food marketing in developing countries <i>Paule Moustier and Henk Renting</i>	121
6 Urban agriculture's contributions to urban food security and nutrition <i>Maria Gerster-Bentaya</i>	139

vi Contents

7	Productive and safe use of urban organic wastes and wastewater in urban food production systems in low-income countries	162
	<i>Pay Drechsel, Bernard Keraita, Olufunke O. Cofie and Josiane Nikiema</i>	
8	Urban agriculture and climate change	192
	<i>Shuaib Lwasa and Marielle Dubbeling</i>	
9	Urban horticulture	218
	<i>Hubert de Bon, Robert J. Holmer and Christine Aubry</i>	
10	Urban livestock keeping	255
	<i>Delia Grace, Johanna Lindahl, Maria Correa and Manish Kakkar</i>	
11	Urban forestry and agroforestry	285
	<i>Fabio Salbitano, Simone Borelli and Giovanni Sanesi</i>	
12	Urban aquaculture for resilient food systems	312
	<i>Stuart W. Bunting and David C. Little</i>	
13	Gendering urban food strategies across multiple scales	336
	<i>Liam Riley and Alice Hovorka</i>	
14	Financing urban agriculture: what do we know and what should we know	358
	<i>Yves Cabannes</i>	
15	Role of urban agriculture in disasters and emergencies	387
	<i>Andrew Adam-Bradford and René van Veenhuizen</i>	
	<i>List of contributors</i>	411
	<i>About the RUAF Foundation</i>	421
	<i>About the International Water Management Institute (IWMI)</i>	422
	<i>Index</i>	423

ROLE OF URBAN AGRICULTURE IN DISASTERS AND EMERGENCIES

Andrew Adam-Bradford¹ and René van Veenhuizen²

¹ CENTRE FOR AGROECOCLOGY, WATER AND RESILIENCE, COVENTRY UNIVERSITY, ENGLAND

² RUAF FOUNDATION, THE NETHERLANDS

Introduction

More than 1 billion people live in unsafe and unhealthy conditions in slums, refugee camps and informal settlements. And these numbers are growing. Over 50 million of them are refugees living in camps or temporary illegal settlements. If these forcibly displaced people had their own nation, it would be the world's 26th largest country.

(Buscher 2011)

Natural hazards, civil conflicts, wars and economic crises can all have a profound impact on generating unstable and unsafe conditions, and placing immense pressures on communities and local support mechanisms. These emergency scenarios often result in people fleeing their homes to safe areas or crossing borders to other countries, thereby creating mass refugee situations. Many of these refugees or internally displaced persons (IDPs) not only remain in refugee camps for extended periods but also increasingly in and around urban areas (often illegally). Consequently, many people living under the harsh conditions of refugee life will try to improve their livelihoods, including improving their access to food by establishing some form of agriculture, such as small-scale gardening or livestock husbandry.

In this chapter the linkages between urban agriculture and disasters and emergencies are explored, by providing a broad illustration of the potential role that urban agriculture can play in “disaster risk management”. Disaster risk management is an overarching term that covers all aspects of disaster management, including *pre-disaster* activities such as “disaster risk reduction” (DRR) programmes that aim to build resilience, as well as *post-disaster* activities such as working with refugees in camps or urban areas, linking relief, rehabilitation and development (LRRD). The pre-disaster and post-disaster phases are commonly referred to as the “disaster management cycle”. The core message is that enhancing the role of urban

agriculture, both in pre- and post-disaster situations, may assist in increasing the resilience of communities, prevent (some) disasters from happening in the first place, and improve effective responses at local, national, regional and international levels when disasters do strike.

Increasingly, refugees seek their refuge in cities, and many camps gradually develop into settlements. Urban agriculture has been identified by many organizations as a component of that response, illustrated by a number of guidelines seeking to mainstream local food production into disaster and emergency programmes. The Humanitarian Charter and Minimum Standards in Humanitarian Response, for example, recommends the protection of local food production systems while also promoting kitchen gardens and agroforestry in refugee camp settings (The Sphere Project 2011).

The chapter starts with looking at different disaster and refugee situations, finding that there is an increasing need to look (differently) at urban areas to find solutions. It then continues by describing the role of urban agriculture in different settings, and the existence of guidelines on the issue. It ends by looking at disaster risk reduction, and concluding that urban agriculture can play a role in all aspects of disaster management, which increasingly is urban and hence should take an urban focus.

Disasters and emergencies and the immediate demand for food

There is no shortage of examples that illustrate the graphic and often horrifying impacts that disasters and emergencies can have. Despite the different hazards and geographical settings, many of the impacts at the location where the disaster strikes, and where people seek refuge, are similar, such as food and water shortages, insecurity and a collapse of the normal (urban) functions. The level of vulnerability determines the actual impact of a hazard, and the disaster risk is a function of the intensity of the hazard and the level of vulnerability, often expressed as: $risk = hazard \times vulnerability$ (Wisner et al. 2004).

Environmental and natural disasters impact upon millions of people globally in the form of drought, flooding, hurricanes and earthquakes. Unlike natural disasters, many *man-made emergencies* are deliberate and intentional acts that cause significant population movements (internal and cross border). These situations involve an intricate web of volatile and often hostile military and political forces. Disasters can be rapid-onset, such as the 2004 tsunami in South Asia, or slow-onset, the latter building up over a period of months, such as the Ebola outbreak in West Africa, or even years as was the case with the global spread of HIV (human immunodeficiency virus). If the crisis is characterized by conflict, political instability or high levels of violence, it is often referred to as a complex emergency, as is occurring in Iraq and Syria.

In the first decade of this second millennium, *economic crises* have resulted in rising food prices, declining real wages, redundancies in the formal labour market,

and cuts in food subsidies, affecting vulnerable people. Reduced public expenditure also has its impact on basic services and infrastructure. As a result, a mix of IDPs, refugees and migrants adds up to the urban poor and resort to non-market (informal sector) livelihood activities, including urban agriculture. Economic crises often have a social or political origin. Probably the best known example of a country adopting a national urban agricultural policy in response to such economic and political constraints is Cuba. Other examples of cities that have promoted backyard gardening, rooftop gardens, institutional and school gardens as a standard component of emergency agricultural response include Harare, Zimbabwe; Jakarta, Indonesia; Lagos, Nigeria; Rosario, Argentina; and Gaza in Palestine.

BOX 15.1: CIENFUEGOS, CUBA

Cuba is often presented as an example of effectively supportive government policies that encouraged urban agriculture. Major national measures were taken in response to the economic crisis in the 1990s affecting the agriculture and food sector, like the conversion of large state-owned farms into new cooperatives, or Basic Cooperative Production Units, and the granting of land to people and organizations to produce food. The National Urban Agriculture Programme started in 1993, and proposed to stimulate food production in available urban and peri-urban spaces, taking advantage of the opportunities offered by the availability of labour and the close proximity between producer and consumer. Within 15 years of implementation, the National Urban Agriculture Programme led the municipality of Cienfuegos to unprecedented levels of production, along with other favourable results.

Source: Socorro Castro 2009.

Global food prices increased over 80% in the period 2006–2008 (RUF Foundation 2008). Net food-importing countries – such as most countries in Africa – were hit hardest by these rising prices. Although the prices of main commodities have come down, the prices of most food items are still high and often double what they were before the increase. Tackling the complex causes of the food and agriculture crisis requires a comprehensive approach (Hovland 2009), at international, national and local levels. Urban agriculture has a clear role to play in contributing to urban food security. Agricultural production in and around cities reduces food transportation costs, and can improve access to (cheaper) fresh food, thus reducing vulnerability in the poorer sections of the city, while also improving the general urban ecology and environment.

Complex emergencies are frequently found in fragile states. Many of the fragile states, a group of 30 to 50 countries depending on the definition used, are low-income countries characterized by weak state institutions that are largely ineffective, leading to bad governance and corruption. Their economic, social and political institutions have a diminished capacity to absorb shocks and they are therefore more susceptible to conflict and crisis. As the level of vulnerability determines the actual impact of a hazard, the impact will be more extensive in these countries than in countries characterized by security and stability, thus highlighting the increased attention needed for these fragile states.

Refugee camps and settlements

Insecurity in specific regions can continue for many years resulting in refugee camps gradually converting into “shanty towns” or becoming permanent settlements (Adam-Bradford et al. 2009). Many of these “camps” are difficult to distinguish from surrounding towns. Many displaced people will never return to their original “home” areas for a variety of reasons, and would rather seek new livelihood opportunities in and around nearby cities. While displaced people are entitled to support themselves in obtaining food and other basic needs (for instance, in Kenya and Jordan), they are often not allowed to work or fully integrate with the host society, a constraint that is often compounded by a lack of access to land for productive uses. Although displaced people have a certain protective status, the reality on the ground often shows that they do not have the right to use land or undertake productive activities. Refugees are initially completely dependent on aid from the international community. In addition, land is scarce and not always of good quality, hampering the development of gardens.

Dispersed refugees in urban areas

Although camps are clearly different, similarities exist between agriculture in camp settings and in urban (slum) areas. Many refugees become “urbanized” by the experience in these refugee camps, or because they seek refuge in urban areas (Buscher 2011; UNHCR 2012 and 2014) and when they return they do not want to go back to the rural areas. Consequently, an increasing number of refugees live in urban areas, usually in slum areas, or otherwise face similar challenges as the urban poor. More than 50% of the refugees live in urban areas, and at greater distances than before. The majority of these people stay unemployed, live in poor and overcrowded areas, and depend on international and/or non-governmental organizations. The growth of these urban refugees is much larger than the growth in humanitarian financial assistance, and as the average length of displacement is 17 years (Buscher 2011), continued feeding and providing direct services to these populations is not possible. This is increasingly recognized, although still many refugee organizations are not equipped to work in the highly complex urban areas.

Refugees, who migrate to urban areas, are looking for access to better housing, health care, education and economic opportunities, sometimes after having been in camps. They are, on the whole, higher educated and more resourceful, and under the right conditions would be able to become self-sufficient. In Kampala, for example, a study found that most of the urban refugees are educated and self-selection often brings the most entrepreneurial and educated to the cities (Buscher 2011). Most countries and cities, though, are ill equipped to host this large number of refugees. And when the large number of refugees that arrive in urban areas exceeds the ability of local urban authorities to effectively manage their integration, then pressures on services and local resources soon emerge, bringing tensions between the refugees and the host communities.

Furthermore, most host governments are reluctant to allow refugees to work. They fear competition and worry that with jobs and income, refugees will de facto locally integrate, never to return to their countries of origin. It appeared that refugees with cash in pocket and marketable skills are more likely to return home, as was the case with the Liberian Buduburam camp in Ghana (Crowell and Nutsugah 2013). Hence, refugees residing in cities are often very vulnerable as most of them are single women heads of households. This is due to the consequences of the international food crisis, which results in increased unemployment, rising food prices, increasing difficulties in paying rent and lack of access to education and healthcare. But also due to the fact that in some areas, like East Africa, and in countries like Jordan and Lebanon, there are simply too many refugees and the cities cannot cope. An increasing number of them are requesting to be moved to the camp as they are unable to pay rent, or send their children to school.

BOX 15.2: SOMALI REFUGEES IN NAIROBI

Mark Yarnell of Refugees International illustrates the precarious situation of urban refugees as he describes the situation of Somali refugees in Nairobi (*adapted text by the authors*):

Tens of thousands of refugees from Somalia and elsewhere live in urban centres throughout Kenya, where they are able to provide for themselves, send their children to local schools, and access health facilities. Over the years, Nairobi's Eastleigh developed into one of the most dynamic parts of Nairobi's economy, with shoppers going there from all over the city to take advantage of the competitive prices and range of goods available there. It is a far cry from life in the sprawling Dadaab refugee camp in arid north-eastern Kenya, where over 350,000 Somalis live in tents provided by the United Nations High Commission for Refugees (UNHCR) and remain dependent on monthly food rations. However these days,

the streets of Eastleigh are unusually quiet. In March, Kenya's Cabinet Secretary for Interior ordered, on the grounds of 'emerging security challenges in our urban centres,' all refugees to report to the Dadaab and Kakuma refugee camps.

Source: Mark Yarnell at <http://urban-refugees.org/debate/category/non-classe/>.

Crisis situations therefore have a higher impact in vulnerable areas and a disproportionate impact on the urban poor, especially women, children and the elderly. Building resilience, or reducing this vulnerability, is paramount. Urban agriculture can play an important role and hence needs to be integrated in disaster mitigation strategies. Mitigation is a collective term for all actions taken prior to the occurrence of a disaster (pre-disaster measures), including preparedness and long-term risk reduction measures. New insights in the field of disaster risk reduction have demonstrated the strong connection between resilience and the sustainability of socio-ecological systems. The costs of restoring communities back to something resembling their original states are much greater than the costs of investing in a community or urban disaster risk reduction programme and increasing its resilience before a disaster strikes.

The role of urban agriculture

Urban agriculture has always been used as a food security strategy during economic and emergency situations. Examples include the extensive "Dig for Victory" campaign in Britain during the Second World War, and more recently "Operation Feed Yourself" in Ghana during the 1970s. Similarly, in many other countries, backyard farming, and institutional and school gardening have all been encouraged during times of food instability.

Urban agriculture, with its emphasis on space-confined technologies, use of composted organic waste and recycling of grey wastewater, offers good options for the provision of fresh vegetables, eggs, dairy products and other perishables to the population of these "new settlements" in addition to generating some income, and other benefits. Growing nutritious crops requires a limited growing period and low investments, and the use (often available) of traditional knowledge and skills and local resources (minimal land of low quality, recycled organic waste and wastewater, local seed, etc.).

Increasingly these potentials of vegetable gardening and other agricultural production activities (e.g., eggs, mushrooms, medicinal herbs, etc.) in protracted refugee situations are being recognized, in addition to the need for higher calorie intake (The Sphere Project 2011). In addition to food, becoming involved in constructive activities may help people regain dignity, hope and self-respect and enhance overall well-being. Home or community gardening activities help increase self-reliance,

allowing people to grow their preferred crops and varieties, and can improve their skills and knowledge, while additionally reducing operational costs for humanitarian agencies and potentially contributing to restoring the social fabric of disaster-affected communities. Urban agriculture can play multiple roles in different phases of the disaster management cycle. Instructions for developing and protecting primary food production are given in a number of guidelines, which also contain planning and design recommendations for allocating small plots of land for use as kitchen gardens.



FIGURE 15.1 Cultivation tower (India)

However, in reality NGOs seldom provide such technical assistance but rather resort to the provision of food aid which is often implemented with no exit strategy and thus in the long-term building dependency on food aid.

When developing agriculture-based interventions and projects in urban refugee settings, the following issues should be taken into consideration:

- Physical characteristics of the local setting, such as infrastructural capacities, basic social services (water, sanitation, waste use, health), land availability and energy supply (wood, kerosene).
- Social characteristics, such as IDP/refugee rights, security, social fabric and cohesion (race, tribe, gender), uncertainty, traumas, labour supply (abundant but weakened), and possibility of conflict among refugees and IDPs.
- Food availability, food quality, balanced food basket, culture, income, etc.
- Political issues that can inhibit interventions.

The development of livelihood strategies, including agriculture and animal husbandry, will depend not only on the availability of, and access to, land, irrigation water, seeds and natural resources, but also on freedom of movement. Humanitarian agencies may provide refugees with seeds, tools and, when necessary, technical support, but access to land and common resources is often constrained by the policies implemented by the host country, which may restrict their freedom and mobility. In particular, access to land is limited by the traditional land tenure system and laws concerning landownership and rights of usufruct. Hence the host governments need to take a more positive attitude to the planning and management of refugee camps and settlements as in the case of Uganda (van Rooij and Liem 2009; Betts et al. 2014). Likewise in the process of slum development, attention to increased self-reliance is important. Protecting and supporting livelihoods can be instrumental in safeguarding food security and minimizing relief aid dependency among beneficiaries.

Beneficiaries' interest in agricultural activities may evolve over time, as their immediate needs start to be met. But some may not wish to start growing vegetables as this might trigger the impression that they have to settle at that location for an extended period of time. For many, agriculture still has a permanent character. During the first period of emergency relief, agricultural production is unlikely, but the planning of future production sites must be taken into account in the camp layout or the housing reconstruction plans. We will discuss here the importance of food production versus solely distribution, the role of urban gardening in refugee camps, and the role of urban agriculture for urban refugees.

Food distribution versus food production

Despite some successful examples of small-scale food production in refugee camps, many relief aid strategies still focus on food distribution as the main response mechanism (Adam-Bradford et al. 2009). In a disaster aftermath the emphasis is

on fast and effective food distribution. But when food distribution programmes are viewed over the long-term, secondary issues such as food dependency, corruption, and programme costs come into play. Despite being effective for its purpose, i.e., saving life, food distribution remains a highly inefficient food security tool due to high food and fuel prices and often extensive logistical costs. Of course, there are situations when food production is not a viable option, for example when agricultural land is contaminated or mined. Food distribution with no or minor attention for gardening initiatives (not as part of the longer-term strategy) would result in major lost opportunities, as the implementation of food production can play an important role in mobilizing and rehabilitating communities following the impacts of a disaster or emergency.

Therefore, food distribution, as part of immediate relief, should be planned in conjunction with food-producing options, as part of the rehabilitation and development strategies, so that transitions from food dependency to food security can be made at the earliest opportunity and with minimum risk to the beneficiaries. The reasons to support agriculture-related activities in the early stages of the post-disaster phase are numerous, such as the need for fresh and diverse food (in addition to the supply of staple foods).

Refugee camps and settlements

Despite many ongoing conflicts, in some countries there are opportunities to rebuild communities and to facilitate the return of refugees and other displaced populations. This is also still the basic assumption in the political standpoints and hence of refugee strategies (Adam-Bradford et al. 2009). Due to prolonged stay in camps, humanitarian aid is often not enough to sustain basic needs, and refugees are forced to find other ways to support themselves. Refugees make a living through (illegal) trade, small businesses and agricultural production. A typical refugee camp will, after some years, have several visible activities of this nature (Jansen 2009). However, refugees face restrictions that ordinary citizens do not face in conducting business, which makes earning a livelihood difficult. Examples are the restriction of free movement, work permits, and high costs of all kinds of services, especially market information (although many black markets develop). Land is not always of good quality, hampering the development of gardens, while access to this land and water of good quality, as well as seeds, construction material, etc., is also restricted. The United Nations High Commissioner for Refugees (UNHCR) estimates that more than half of the refugee camps in the world are unable to provide the recommended daily water minimum of 20 litres of water per person per day (UNHCR 2012 and 2014). The application of micro-finance in refugee camps is difficult, since many refugees are reluctant to start a business, and repayment is low.

Most refugee camps do not have sufficient food to provide for their populations, and refugees are frequently dependent entirely on humanitarian aid. Besides, the quantity of food is often insufficient and the lack of calorie-rich and

nutritious food causes many refugees to suffer from deficiencies in essential vitamins and minerals, which can lead to a variety of diseases. Guidelines do exist and refugees are encouraged to grow their own food in small gardens or sacks (Corbett 2009), ensuring the consumption of some vegetables. These gardens serve as a supplement to food rations, though in most cases refugees are not allowed to sell surplus. For over two decades the official government policy in Uganda is that refugee settlements are designed and planned around agricultural livelihoods. Once a refugee is registered in a settlement, they are allocated a plot of land and issued seeds and tools to farm their plots. In addition, they also receive extension and support in the rearing of chickens and pigs, and the planting of home gardens. Many of the settlements, such as Nakivale, have become so productive they now export crops to local and regional markets (Betts et al. 2014).

BOX 15.3 GUIDANCE ON AGRICULTURAL INTERVENTIONS IN THE SPHERE GUIDELINES

The minimum requirement of surface area per person in a planned settlement is 45 m², so a camp for 1,000 refugees would have to be 4.5 hectares (ha). This includes space for household plots, roads, footpaths, sanitation, and other infrastructural inputs, but moreover it also allows for “limited kitchen gardens for individual households” (page 257). On a 4.5 ha site and using an average household plot size of six persons, this would result in the implementation of 166 small kitchen gardens. The Minimum Standards in Food Security and Nutrition provide the bulk of practical guidance for practical agricultural interventions with key aspects being addressed in Chapter 4 Food Security (page 175), which includes three components: 4.1 Food security – food transfers; 4.2 Food security – cash and voucher transfers; and 4.3 Food security – livelihoods. For example, primary production mechanisms should be protected and supported through local capacity building measures and, where appropriate, with the distribution of seeds, tools, fertilizers, livestock, fishing equipment, hunting implements, credit and loan facilities, market information, transport facilities, etc.

Source: The Sphere Project 2011.

During the prolonged period, these micro-gardens, provide livelihood and even income-generating opportunities, but may also contribute to wider social and economic rehabilitation, in protracted camps, and in and around cities, where levels of unemployment and urban poverty may be particularly high.

Refugees may also arrive at a camp or settlement with their own livestock and seeds and, once settled, start their own agricultural activities. Examples include IDP camps in Iraq where Kurdish refugees were keeping goats and sheep in livestock pens built from scrap materials, and growing vegetables and even small plots of wheat which were processed on site and then used for traditional bread-making (Adam-Bradford et al. 2009). In Banda Aceh, many of the survivors from the 2004 tsunami have planted home gardens around their temporary shelters; two years later, these gardens had matured into highly bio-diverse home gardens with multiple layers and, in some cases, with over 30 different crops being grown on small plots of land measuring just 3x5 metres (Adam-Bradford and Osman 2009).

Stimulating small-scale gardens for groups, or community gardening, can also help build different forms of capital (social, human, financial, economic, physical, natural, etc.), and contribute to longer-term resilience. To be able to build sustainable, shock-resistant communities, the active engagement of people themselves throughout the process is crucial. In cases where food growing systems are introduced as project activities, it is important to use participatory processes to ensure the technologies are appropriate to the local context and to the culture of the beneficiaries themselves. Rather than implementing what may become complicated technical solutions, such as hydroponics or even rearing livestock, efforts should be directed at building the foundations first, such as developing compost-production plants utilizing camp organic waste that will then feed into horticultural projects or planting fodder trees as camp windbreaks, which will then increase availability of fodder before livestock are introduced (SAFIRE and UNHCR 2001).

Also the use of grey water is propagated, although this needs to be done with care, needs risk minimization strategies and proper management (Dalahmeh and Almoayed 2009). These initial activities can also be used to galvanize community-based groups, share knowledge and identify early innovators or experienced farmers who can then serve as community role models using demonstration garden and livestock sites.

Insecurity in specific regions can continue for many years. Refugee camps tend to gradually convert into “shanty towns” or become permanent settlements. Many of these “camps” are difficult to distinguish from surrounding towns. Many displaced people will never return to their original “home” areas for a variety of reasons, and would rather seek new livelihood opportunities in and around nearby cities. More than 50 million people live in camps or temporary settlements. The average lifespan of a refugee camp is close to 20 years, and the average stay of a refugee in such a camp is up to 12 years (UNHCR 2012 and 2014). It is clear that a new and integrated approach to designing and managing these camps is required. Consequently, the status of refugees and IDPs needs to be improved and implementing agencies need to give adequate attention to human rights and entitlements, such as access to land for gardening and farming.

BOX 15.4 REFUGEE CAMPS IN JORDAN

More than 50 million people in the world live in camps or temporary settlements. The average lifespan of a refugee camp is close to 20 years, and the average stay of a refugee in such a camp is up to 12 years. Various organizations are discussing and working on a change in humanitarian aid, and are stimulating innovation, and developing an integrated approach in designing, managing and financing refugee camps.

The Al Za'atari camp in northern Jordan opened in mid-2012, and it is unknown how long the community will have to live here. Currently there are around 100,000 refugees, more than 50% children, who live in close to 30,000 tents and caravans. Its envisaged lifespan is five years, costing over all 14 million Euros a month (already half a million on electricity). Infrastructure is already deteriorating, for instance the WASH (water, sanitation and hygiene) centres that did not meet cultural contexts were destroyed and need rehabilitation.

The refugee community is making the best of available opportunities, innovating while trying to find solutions to their day-to-day struggle. Governance structures are emerging, childcare and theatre are organized, and informal commerce has started: the market of Al Za'Atari is the fastest growing in the region.

More efficient, effective and sustainable planning is required, based on the local situation and a vision on (urban) development of the entire Mafraq Region. Linkages need to be made between the ever-increasing urban refugees of the region of Mafraq and the huge impact this has on the host communities. The efforts of the many relief organizations and private initiatives need to be coordinated and formed into multi-stakeholder planning processes with longer-term perspectives, with the objectives of building resilient settlements.

The former UNHCR camp commander of Za'Atari invited many key experts in the world to bring innovative solutions for the transition from emergency aid into development. The Dutch Government asked VNG-International and the City of Amsterdam to step in. The Dutch mission operates via the Jordan Government and UNHCR. With integrated planning as an overarching theme, the project focuses on solutions in key aspects as transport, WASH, waste, ambulance, food and governance. Planning is addressing and connecting three levels of scale: *Region, Camp and Shelter*. This is based on the philosophy that any confrontation between refugees and host communities causes problems but this can also lead to local solutions. The aim is to deliver flexible planning instruments, supporting expertise and design assistance, with process-driven participation and implementation that ensures project activities are connected with local procedures and social cultural patterns, and facilitate community building and self-reliance.

Planning investigates scenarios which both the area of Mafraq and the camp might overcome in the near future. At any scale, key drivers are resources, production, connectivity and existence. Key design principles are synergy, adaptability and prototype. Solutions and interventions are developed together with stakeholders for the short-, middle- and long-term: direct interventions, development and empowerment.

Sources: Oral information by AlZaatariWorks, City of Amsterdam and RUAF Foundation.

Dispersed refugees in urban areas

An increasing number of refugees live in urban areas, usually in slum areas, or otherwise face similar challenges as the urban poor. More than 50% of the refugees live in urban areas, and at greater distances than before (UNHCR 2014). The majority of these people stay unemployed, live in poor and overcrowded areas, and depend on international and/or non-governmental organizations. And many refugees become “urbanized” by their experience in camps (Buscher 2011).

Organizations like UNHCR and the International Committee of the Red Cross (ICRC) are changing their policies, but host government legislation and NGO services are slowly adapting to the ensuing situation (and restrictions of movement, access to land and developing businesses still occur). Creating economic opportunities for refugees in urban areas is a challenging and complex undertaking. There are many similarities in working with urban refugees and the urban poor, but as mentioned, also differences. In addition, hostilities may arise between refugees and the local community.

A first step is bringing parties together and to lobby and advocate for recognition of refugee rights in local policy and practice. Support is required to empower vulnerable refugee groups to build small businesses to support themselves and other vulnerable refugees in the community. For this, (short-term) financial assistance is required, until they become more self-reliant. Identification of, and facilitating access to, existing business development services could build refugees’ financial literacy and entrepreneurial skills (Betts et al. 2014).

While economic programming in urban environments is complex and local markets and opportunities are often limited, starting with and building on what exists both within the refugee populations and with the local economic service providers would facilitate better practices and ultimately should lead to better outcomes (Buscher 2011). The ability to provide for themselves allows urban refugees to address their own needs without substantive further assistance from the humanitarian community, and thereby also restore some of the refugees’ dignity. Thinking in urban development would use humanitarian assistance more effectively and sustainably – supporting local economic development or improving government health and education facilities.

BOX 15.5 ENHANCING URBAN AGRICULTURE IN THE GAZA STRIP

Gaza Strip is a physical, social and economic environment that is almost unique in the world and that is determined by a political deadlock where access to land, sea, water, markets, and human resources is restricted by an intransigent Israeli blockade and isolation politics. Since the second Intifada (2000–2001), access and mobility restrictions have been imposed on Gazans. Since 2007, the Gaza Strip has been even more tightly closed off, resulting in exceptional conditions where both imports and exports of goods are very restricted and irregular. Coupled to the closure and destruction of the tunnels that allowed the traffic of goods to and from Egypt, and a high population growth, the resulting complex socioeconomic situation has dramatically increased poverty and unemployment in the Gaza Strip.

As 90% of all agriculture in Gaza can be considered urban or semi-urban, there is increasing national recognition for urban agriculture to be promoted as a complementary strategy for enhancing urban food security and nutrition, income and employment generation to improve the market. There are production opportunities and demands for locally produced, good-quality produce. However, urban agriculture and especially more market-oriented urban agriculture in Gaza is challenged by various constraints, such as limited access to land and low quality of service providers.

Source: authors.

Guidelines and frameworks

Several frameworks and guidelines have been developed to integrate food productions systems in the planning and design of urban agricultural intentions in post-disaster and emergency situations.

The Livestock Emergency Guidelines and Standards (LEGS) provide a set of international guidelines and standards for the design, implementation and assessment of livestock interventions to assist people affected by humanitarian crises. The guidelines aim to improve the quality of emergency response by increasing the appropriateness, timeliness and feasibility of livelihoods-based interventions and can be found at: www.livestock-emergency.net/.

Instructions for developing and protecting primary food production are given in the Sphere Project Guidelines (The Sphere Project 2011), which also contain the planning and design recommendations for allocating small plots of land for use as kitchen gardens. These Sphere Project Guidelines are often used by donors to indicate the minimum required standards in the development of humanitarian interventions and programmes and have become an important and influential tool for the justification of programme funding. In addition, some UNHRC handbooks



FIGURE 15.2 Rooftop garden, Gaza Strip

have been developed that address the environmental management of refugee camps and settlements with additional livelihood guidelines addressing agriculture, forestry and livestock (UNHCR and CARE 2002 and 2005; UNHCR 2012).

In addition, various organizations like ICRC, the UN Food and Agriculture Organization (FAO), the International Water and Sanitation Centre (IRC), etc., have developed manuals. Applying a combination of these frameworks and guidelines would ensure the participatory design and implementation of appropriate interventions that maximize the benefits of integrating urban food production in emergency responses while minimizing the associated environmental risks. However, the implementation in the harsh reality of refugee situations is a different ball game altogether.

BOX 15.6 THE SPHERE PROJECT GUIDELINES

The Sphere Project guidelines consist of a Humanitarian Charter and Minimum Standards in Disaster Response that are presented in a book format aimed to assist humanitarian relief workers in delivering high-quality and an accountable disaster response (The Sphere Project 2011). The initiative was launched in 1997 through an international collaboration that includes the Red Cross and Red Crescent movements. The collaboration currently consists of over 400 organizations

in over 80 countries which have all adopted the Sphere consensus, including donor organizations which now request that emergency funding proposals be written in the context of the Sphere Guidelines.

The combination of food production with food distribution is clearly advocated in The Sphere Project guidelines, which is a handbook designed for use in disaster response situations but has an equal role in disaster preparedness and broader disaster risk reduction programmes, applicable in a range of scenarios, including natural disasters as well as armed conflict in both slow-onset and rapid-onset situations, and urban refugee situations. The Sphere Handbook provides appropriate guidance for agricultural interventions in a range of the key sectors from food security to physical planning of settlements. Important guidance notes are also provided on the viability of primary production, technological development, improving choice, timeliness and acceptability of primary production, seeds, local purchase of inputs, monitoring usage and unforeseen or negative effects of inputs. The guidance notes also address complex issues to ensure programmes are well designed, appropriate to local conditions and sustainable.

Source: The Sphere Project 2011.

The Sphere Handbook highlights that food security responses should aim to meet short-term needs, “do no harm”, reduce the need for the affected population to adopt potentially damaging coping strategies, and contribute to restoring longer-term food security. Thus in urban areas a priority may be the re-establishment of normal market conditions, but equally important are small kitchen gardens and primary production methods: such strategies may be more appropriate than food distribution because they uphold dignity, support livelihoods and thereby reduce future vulnerability (The Sphere Project 2011).

Integrating gardening in slum upgrading or in the design and development of new neighbourhoods will support the development of more food-secure and inclusive human settlements. Even in a slum or a densely built settlement, there is space for, and presence of, food growing. Agriculture can be integrated in lane upgrading by leaving small stretches of soil for growing on either side of the road or by applying vertical growing and container gardening along lanes.

Agriculture can also be integrated in housing improvements and design. For instance, housing should cover no more than 50% of a lot area to provide adequate space for growing food. Exterior house walls can be used for agriculture and all windows could have a shelf or window box to accommodate container gardens. Fencing could support growing and rooftops can be designed for water harvesting. Furthermore, the productive use of public areas (multifunctional parks, roadsides, flood zones, waterfront/canal areas) within slums can also be utilized. Urban agriculture can also be integrated in the sanitation systems of a settlement through

wastewater recycling for gardening or organic solid waste recycling for growing vegetables.

In the longer-term, gardening also generates income and improves associations and linkages with other refugees or local communities, while contributing to the broader development of the area and building resilient cities, where refugees are hosted by stimulating local markets and trade. In addition, natural resources can be conserved and protected by promoting sound agricultural practices and introducing waste-recycling systems appropriate to the local conditions. In this context the project aims may start initially as conflict-prevention, with secondary objectives including improvements in environmental sanitation and food production. Generating livelihoods and youth employment has been identified as a key strategy to prevent the radicalization of the youth and this is not only important in refugee camps but also with refuge and host populations in many urban centres, particularly in North and East Africa and in the Middle East.

Despite the above-mentioned guidelines and calls for innovative local food production solutions, the mainstreaming of urban agriculture in disaster and emergency response settings is still woefully inadequate, thus resulting in lost opportunities to protect and promote, and when necessary rehabilitate, local food production systems, thus building resilience at a wider local level.

Integrating urban agriculture and planning for resilience

Insecurity in specific regions can continue for many years. Refugee camps gradually convert into “shanty towns” and are better seen as becoming permanent settlements, allowing planning and using resources accordingly. Many displaced people will never return to their original “home” areas for a variety of reasons, and would rather seek new livelihood opportunities in and around nearby cities. Urban agriculture can play an important role in all aspects of the disaster management cycle and is a multifunctional policy instrument and tool for practical application; it is valid for integrated design and management of refugee camps, as well as in creating resilience in urban areas.

Various approaches in preventing and coping with disasters have developed in the course of time. In the text below two project-based disaster risk management approaches are briefly discussed, which are already applied to urban and peri-urban areas and are including urban agriculture in planning for resilience and disaster risk management programmes.

Linking relief, rehabilitation and development

As illustrated in the disaster management cycle (see Figure 15.3), emergency interventions are still too often delivered in isolation and fail to address longer-term development goals. The need to fill the gap between humanitarian aid and development is frequently debated and is addressed in an approach called Linking Relief, Rehabilitation and Development. The European Union (in its European

Commission Humanitarian Aid (ECHO) programme) emphasizes the importance of this linkage. The primary objective of LRRD is to address the gaps between emergency relief and longer-term development aims and objectives. In this LRRD process attention to self-reliance is also important: this is the capacity of a community to produce, exchange or claim resources which are necessary to ensure its sustainability and resilience against future disasters.

The introduction of the concept of sustainable livelihoods also moves away from perceiving disaster victims and/or refugees as vulnerable people entirely dependent on external relief aid. For example, a livelihoods approach in emergency settlement camps focuses on strategies that facilitate beneficiaries to meet their basic needs, while also identifying the constraints that prevent them from enjoying their (human) rights and thus developing their livelihoods. The concept of human security finally promotes a shift from focusing on state security (i.e., mainly on the protection of state territory), to focusing on human issues and rights (e.g., the right to food, and the right to shelter).

In doing so, it widens the scope of interventions from governments and international organizations and addresses issues such as increasing access rights of displaced people to land, rather than just addressing food security and human protection. Human security further pays attention to the array of issues behind the complex international causes of population movements, explaining the causes and linking them to development and poverty. Increasingly, there is an emphasis on preventive strategies, such as the development of good governance.

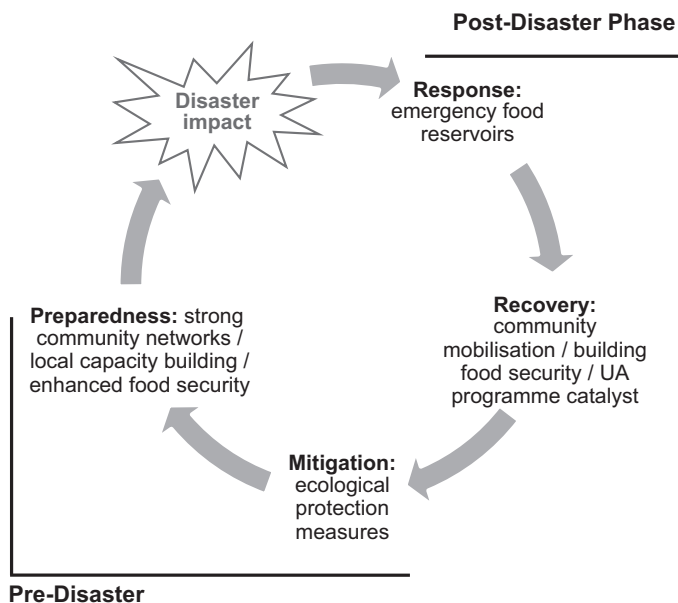


FIGURE 15.3 Disaster management cycle with linkages to urban agriculture

Source: authors.

The LRRD process involves a thorough context and political analysis with the objectives of identifying the root causes of vulnerability and poverty. The process also works directly with local institutions to build capacity so that inequality and access to resources can be addressed through continued programming and intentions. Then the linkages between relief and long-term development can be made. For urban agriculture this starts by recognizing the practice as a formal urban process and identifying the positive role it can play; this can then lead not only to policies to promote safe practices but also to practices that incorporate risk reduction measures.

BOX 15.7 THE ROLE OF URBAN AGRICULTURE IN REBUILDING LIBERIA

Since the end of the war that raged from 1989 to 2003, Liberia has suffered from chronic food insecurity. With much of its agricultural sector destroyed, over 40% of Liberians are still estimated to be food insecure. As the economy slowly recovers, the urban population is growing quickly, but a generation without education is struggling to survive and prosper amidst the wreckage of devastated infrastructure. Access to local food is paramount. This need has been aggravated by the 2014 Ebola crisis.

In Greater Monrovia, over 5,000 households are engaged in urban and peri-urban agriculture, mostly for domestic consumption (WHH/RUAF 2012). Urban farmers (75% of whom are women) generally produce vegetables and fruits, with staple crops such as rice and cassava produced on larger open spaces and swamps in peri-urban areas. But there are no clearly defined areas for urban agriculture and land rights are uncertain. Restaurants, hotels, mining companies, supermarkets and hospitals are increasingly sourcing urban agricultural produce, but improved storage facilities and post-harvest technologies are needed. Farmers also lack reliable access to proper tools, good seeds and formal credit systems.

Urban agriculture provides a strategy to help reduce urban poverty, improve food security and enhance waste management. But urban agriculture also plays a wider role in developing the city of Greater Monrovia, as well as in smaller towns like Gbarnga and Tubmanburg. Women play a critical role in the production and processing sectors and are often dynamic entrepreneurs. Therefore improving women's involvement in and access to credit, farming inputs, extension services and business opportunities must be prioritized.

RUAF Foundation, with Welthungerhilfe, collaborated with Monrovia Municipality and other stakeholders to promote urban agriculture, to develop and strengthen linkages and to support policy change, by facilitating a multi-stakeholder policy formation and action planning (MPAP) process and supporting urban farmers and processors.

Source: RUAF Foundation.

Disaster risk reduction (DRR)

Disaster risk reduction (DRR) is a systematic approach to identifying, assessing and reducing the risks of disaster. A DRR programme can be implemented at any time so that it differs from LRRD in that it may not be making strong linkages to any relief programme, although DRR programmes are also sometimes implemented in the aftermath of a disaster or emergency. DRR is a planning and implementation tool that addresses the practical issues of vulnerability through the building of resilience and local capacity to respond to natural hazards and anthropogenic disasters (Pelling and Wisner 2009). The United Nations International Strategy for Disaster Reduction (ISDR 2004) defines disaster risk reduction follows:

The conceptual framework of elements considered with the possibilities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development. The disaster risk reduction framework is composed of the following fields of action:

- Risk awareness and assessment including hazard analysis and vulnerability/capacity analysis.
- Knowledge development including education, training, research and information.
- Public commitment and institutional frameworks, including organizational, policy, legislation and community action.
- Application of measures including environmental management, land use and urban planning, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments.
- Early warning systems including forecasting, dissemination of warnings, preparedness measures and reaction capacities.

(ISDR 2004: 23)

Resilience is a measure of a household, city or nation's ability to absorb shocks and stresses. Enhancing the role of urban agriculture includes not only improving linkages to food security but also income and environmental management (see other chapters on the linkages to urban planning and climate change). Urban agriculture itself is characterized by innovation and adaptation to specific urban needs. Examples are micro-gardens, which can provide an emergency food source in the context of disaster risk management; green rooftops, which represent a built environment adaptation to climate change impacts; planting of trees, which serve as green "lungs" contributing to improved air quality; and rainwater harvesting systems, which can help lessen the effects of flooding. Urban agriculture can keep environmentally sensitive and dangerous urban lands from being used for illegal residential development. It mitigates the adverse effects on the urban poor of financial and food crises through job creation; offers opportunities for small-scale

income generation; increases food security and enables self-sufficiency; and improves nutrition and health.

DRR programmes can build capacity of urban farmers to take risk reduction measures that are integrated into their urban farming-based livelihoods, and building of local resilience in vulnerable urban communities. However, urban agriculture, in addition to other green urban infrastructures, can make wider contributions to disaster risk reduction at the landscape level through urban land-use planning and zoning. This would include the allocation of marginal land, such as steep slopes, riverbanks and flood-prone areas to agricultural land use. It is also proven that once secure land tenure is issued to urban farmers, then they become excellent land stewards who prevent urban encroachment from informal settlements and commercial enterprises. Thus marginal land such as steep slopes and flood-prone areas remain free from settlement. In addition farmers can then be supported to adopt specific land management techniques that then reduce the risk of landslides and floods through the adoption of risk reduction measures such as the planting of trees on contours, etc.

Enhancing the role of urban agriculture in building resilience

Experiences show that agriculture is not only a survival strategy for displaced people to obtain food on a temporary basis, but also a valuable livelihood strategy for those who settle permanently, and for those who eventually return to their home cities or countries. Many displaced people, both in camps and in and around cities, engage in agriculture for subsistence and market production. Increasingly, international organizations and relief agencies include agricultural production as part of their development strategies, as expressed in various guidelines. And although there are still various obstacles for refugees in terms rights and access, local and national authorities are not only increasingly allowing it but also, intentionally, supporting it.

Urban agriculture can play an important role in all aspects of the disaster management cycle and is a multifunctional policy instrument and tool for practical application. It is also valid for integrated design and management of refugee camps, as well as in creating resilience in urban areas.

Policies and interventions to promote agriculture by refugees need to be included in planning and design. At the camp level this should include the following:

- a. Adequate camp and slum arrangements (such as the Sphere Project guidelines).
- b. Promotion of low-space crops and animal production and water saving technologies.
- c. Organizational support and training, both in technology and marketing, as well as in reintegration and rehabilitation activities.
- d. Provision of inputs and financial support (which becomes especially important in longer-term settings, and when farmers move towards producing for the market) when displaced persons want to move from self-consumption to market production.

- e. Maximize the safe utilization of organic wastes for compost production and grey water for the irrigation of gardens and trees.

Income generation from agriculture-based livelihoods will play an increasingly important role in developing economic self-reliance amongst refugee populations, and will help create an effective transition between emergency relief and longer-term development. It is likely that the availability of capital equipment or loan capital for small businesses will improve the ability of displaced people to pursue livelihoods and food security, and it is likely that the benefits will eventually also reach the host community.

The choice of food relief strategy must be made to suit the conditions on the ground rather than external factors such as donor influence, NGO technical expertise or lack of access to basic, appropriate food aid. Food distribution must be planned in conjunction with food-producing options so that transitions from food dependency to food security can be made at the earliest opportunity and with minimum risk to the beneficiaries that the food distribution supposedly serves.

Facilitating the change from emergency relief operations towards rehabilitation, sustainable development (by building resilience) requires innovative approaches and changes in current rules and legislation. It requires putting in place participatory mechanisms, such as farmer or gardening groups and farmer field schools, bringing refugees and host communities together, and enhancing a sense of community. Multi-stakeholder processes involving public and/or non-government actors can help build governance, which is especially important in fragile states that lack government capacity and willingness to perform key functions and services.

Growing food in camps and cities, when appropriate to the local conditions, reduces dependency on external food supplies, improves the availability and access to more nutritious food, and in the longer term may increase the resilience of people and cities. Both refugee camps and urban refugee settlements and slums require integrated planning approaches with a long-term perspective, and doing so would make humanitarian assistance more effectively and sustainably.

References

- Adam-Bradford, A.; Hoekstra, E.; Veenhuizen, R. van. 2009. Linking relief, rehabilitation and development: A role for urban agriculture? *Urban Agriculture Magazine* 21: 3–10.
- Adam-Bradford, A.; Osman, M. 2009. Tsunami aftermath: Development of an indigenous home garden in Banda Aceh. *Urban Agriculture Magazine* 21: 29–30.
- Betts, A.; Bloom, L.; Kaplan, J.; Omata, N. 2014. Refugee economies: Rethinking popular assumptions. Humanitarian Innovation Project. Oxford: Refugee Studies Centre, University of Oxford.
- Buscher, D. 2011. New approaches to urban refugee livelihoods. Women's Refugee Commission. Available from: <http://womensrefugeecommission.org/press-room/journal-articles/1614-new-approaches-to-urban-refugee-livelihoods>.

- Corbett, M. 2009. Multi-storey gardens to support food security. *Urban Agriculture Magazine* 21: 34–35.
- Crowell, M.; Nutsugah, E. 2013. Status of the Liberian refugees: The leftovers of Buduburam. *Modern Ghana* 12 August 2013. Available from: www.modernghana.com/news/481422/1/status-of-the-liberian-refugees-the-leftovers-of-b.html.
- Dalahmeh, S.; Almoayed, A. 2009. Health risk assessment of children exposed to greywater in Jerash Refugee Camp in Jordan. *Urban Agriculture Magazine* 21: 41–42.
- Hovland, I. 2009. The food crisis of 2008. Impact assessment of IFPRI's communication strategy. Washington, DC: International Food Policy Research Institute (IFPRI).
- ISDR. 2004. Living with risk. A global review of disaster reduction initiatives. Volume I. International Strategy for Disaster Reduction. Geneva: United Nations International Strategy for Disaster Reduction (ISDR).
- Jansen, B. J. 2009. The accidental city: Urbanisation in an East-African refugee camp. *Urban Agriculture Magazine* 21: 11–12.
- Pelling, M.; Wisner, B. (eds.) 2009. Disaster risk reduction: Cases from urban Africa. London: Earthscan.
- Roos, A. van; Liem, L. 2009. From dependence to self-reliance: Experiences from northern Uganda. *Urban Agriculture Magazine* 21: 13–15.
- RUAF Foundation. 2008. Urban agriculture for resilient cities: Green, productive and socially inclusive. DVD distributed at the World Urban Forum in Nanjing, China, November 2008. Leusden: RUAF Foundation.
- SAFIRE and UNHCR. 2001. Permaculture in refugee situations: A refugee handbook for sustainable land management. Harare: Southern Alliance for Indigenous Resources (SAFIRE); Geneva: United Nations High Commissioner for Refugees (UNHCR).
- Socorro Castro, A.R. 2009. Addressing the crisis in Cienfuegos, Cuba. *Urban Agriculture Magazine* 21: 4.
- The Sphere Project. 2011. Humanitarian charter and minimum standards in humanitarian response. Rugby: Practical Action Publishing.
- UNHCR. 2012. Livelihood programming in UNHCR: Operational guidelines. Geneva: UNHCR. Available from: www.unhcr.org/4fbdf17c9.pdf.
- UNHCR. 2014. Statistics database. Geneva: UNHCR Operation Data Section. Available from: <http://data.unhcr.org/>.
- UNHCR and CARE. 2002. Livelihood options in refugee situations: A handbook for promoting sound agricultural practices. Geneva: United Nations High Commissioner for Refugees (UNHCR); Washington, DC: CARE International. Available from: www.unhcr.org/406c2fae7.html.
- UNHCR and CARE. 2005. Livestock-keeping and animal husbandry in refugee and returnee situations. Available from: www.unhcr.org/4385e3432.html.
- WHH/RUAF 2012. Enhancing urban and peri-urban agriculture in Liberia: City strategic agenda on urban and peri-urban agriculture in Greater Monrovia. Monrovia: Welt Hunger Hilfe and RUAF Foundation.
- Wisner, B.; Blaikie, P.; Cannon, T.; Davis, I. 2004. At risk: Natural hazards, people's vulnerability and disasters. Second Edition. London: Routledge.