

# Building Urban Resilience

Assessing Urban and Peri-urban Agriculture in Tamale, Ghana





Published by the United Nations Environment Programme (UNEP), November 2014

© 2014 United Nations Environment Programme (UNEP)

ISBN: 978-92-807-3372-3 DEW/1784/NA

This publication may be reproduced in whole or in part and in any form for educational or non-profit services without special permission from the copyright holder, provided acknowledgement of the source is made. UNEP would appreciate receiving a copy of any publication that uses this publication as a source.

No use of this publication may be made for resale or any other commercial purpose whatsoever without prior permission in writing from the United Nations Environment Programme. Applications for such permission, with a statement of the purpose and extent of the reproduction, should be addressed to the Director, DCPI, UNEP, P.O. Box 30552, Nairobi 00100, Kenya.

#### Disclaimers

Mention of a commercial company or product in this document does not imply endorsement by UNEP or the authors. The use of information from this document for publicity or advertising is not permitted. Trademark names and symbols are used in an editorial fashion with no intention on infringement of trademark or copyright laws.

We regret any errors or omissions that may have been unwittingly made.

© Images and illustrations as specified.

#### Citation

Gyasi, E.A., M. Fosu, G. Kranjac-Berisavljevic, A.M. Mensah, F. Obeng, G.A.B. Yiran and I. Fuseini. (2014). Building Urban Resilience: Assessing Urban and Peri-urban Agriculture in Tamale, Ghana. [Padgham, J. and J. Jabbour (eds.)]. United Nations Environment Programme (UNEP), Nairobi, Kenya.

A digital copy of this report along with supporting appendices are available at www.start.org/upa/tamale.pdf

Managing Editor: Jon Padgham Associate Editor/Production Coordinator: Jason Jabbour Assistant Editor: Katie Dietrich Copy Editors: Bart Ullstein and Kristie Bates Layout and Design: Jennifer Odallo and Audrey Ringler Printing: UNON Publishing Services Section, Nairobi-ISO 14001-certified/D1 No. 14-00107/250 Cover Photo: © Peeter Viisima

#### **UNEP** promotes

environmentally sound practices globally and in its own activities. This report is printed on paper from sustainable forests including recycled fibre. The paper is chlorine free, and the inks vegetable-based. Our distribution policy aims to reduce UNEP's carbon footprint.

# Building Urban Resilience

## Assessing Urban and Peri-urban Agriculture in Tamale, Ghana

Edwin A. Gyasi, Mathias Fosu, Gordana Kranjac-Berisavljevic, Adelina M. Mensah, Francis Obeng, Gerald A.B. Yiran and Issahaka Fuseini



### Preface

Food production in and around cities is an integral part of the urban fabric in much of the developing world. In these regions, urban and peri-urban agriculture (UPA) plays an important role in diversifying urban diets and providing environmental services in urban and peri-urban areas. As such, there is growing interest in UPA as a strategic component of urban resilience and climate change adaptation planning. However, advocacy for UPA in this capacity is outpacing the body of evidence regarding important stressors and drivers that act on UPA. Such knowledge is especially critical in the developing world where urban areas are experiencing rapid growth and transformation. In these regions, UPA is facing intensifying pressures from urban encroachment, waste disposal, pollution, and climate change that may undermine the sector's long-term viability.

The need to better understand these critical sustainability dimensions provided the impetus for city-level knowledge assessments of UPA, whose main findings are contained in nine underlying assessment reports including this one. The assessed cities were Dakar (Senegal), Tamale (Ghana), Ibadan (Nigeria), Dar es Salaam (Tanzania), Kampala (Uganda), Addis Ababa (Ethiopia), Dhaka (Bangladesh), Kathmandu (Nepal) and Chennai (India). All of the reports and the synthesis report can be found at *http://start.org/programs/upa*. The assessments were conducted in 2012, with initial stakeholder engagement beginning in 2011. The assessments were led by city-based teams, the composition of which varied, with some of the teams being comprised predominately of researchers and other teams comprising of a mix of researchers, city officials and urban NGO representatives.

The assessments seek to better understand the changing nature of UPA systems, and the critical interactions at the land-water-climate nexus that influence resilience of UPA in rapidly growing developing-country cities. The audience for these assessments includes national and city-level policymakers, sectoral experts and city planners, the research community, and non-governmental organizations (NGOs) that interface with urban farmers and other actors within the broader UPA sector.

The UPA assessments are part of a larger project on strengthening understanding of critical links between climate change and development planning in West Africa, East Africa and South Asia. The premise for the project is that progress towards undertaking effective action to address climate change risks in these regions is hindered by low levels of awareness of global climate change, lack of understanding of the findings of the Intergovernmental Panel on Climate Change (IPCC) and other sources of scientific information, lack of location and sector specific knowledge, and the need for strengthening capacities to undertake integrated assessments that support decision making. This multi-year project has been a collaborative effort between the World Meteorological Organization (WMO), the United Nations Environment Programme (UNEP), START, the University of Ghana, the University of Dar es Salaam, and the Bangladesh Centre for Advanced Studies (BCAS).

Jon Padgham Deputy Direct International START Secretariat

Jacqueline McGlade Chief Scientist United Nations Environment Programme

#### Acknowledgements

We would like to thank the different individuals and institutions who in one way or another contributed to the execution of the larger European Commission-led project. In particular, the successful implementation and completion of the project, and the subsequent knowledge assessments were made possible due to the close cooperation and commitment of the International START Secretariat; the United Nations Environment Programme (UNEP) represented by the Division of Early Warning and Assessments and the Office of the Chief Scientist; the World Meteorological Organization (WMO), the University of Ghana, the University of Dar es Salaam, and the Bangladesh Centre for Advanced Studies (BCAS). Several colleagues across these organizations rendered valuable insight, expert advice, guidance and encouragement during this 4-year endeavor. We would especially like to recognize the efforts and support of Ghassem Asrar, Hassan Virji, Katie Dietrich, Clark Seipt, Chris Gordon, Pius Yanda, Atiq Rahman, Chipo Plaxedes Mubaya, Adelina Mensah, Elaine Tweneboah, Abu Syed, Salif Diop, Audrey Ringler, Jennifer Odallo, Peter Gilruth and Joseph Alcamo as well as Jon Padgham and Jason Jabbour, the project managers and editors of this series.

The overall project and the associated UPA assessments were made possible in large part thanks to funding provided by the European Commission (through project ENV/2008/149690 'Understanding the Findings of the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report "Climate Change 2007"—Integrating Climate Change Adaptation and Mitigation in Development Planning'), as well as by the United Nations Environment Programme (UNEP), and the Global Climate Change Programme at the US Agency for International Development (USAID). The editors of this series wish to thank these organizations for their financial support.

In addition to the numerous authors listed in each of the separate reports, we are grateful to the following people for providing useful insights and feedback during the early conception of the knowledge assessment, and helpful review comments on the various manuscripts: Rafael Tuts, Anna Skibevaag, Stephen Twomlow, Elizabeth Migongo-Bake, Trang Nguyen, Volodymyr Demkine, Jane Battersby, Marielle Dubbeling, Anna Kontorov, Richard Munang, Jesica Andrews, Fatoumata Keita-Ouane, Jacqueline McGlade, Keith Alverson, Stuart Crane, Martina Otto, Robert Yennah, Beverly McIntyre, and Tom Downing. We would also like to express our sincere appreciation for the generous support of colleagues at the University of Cape Town's *Climate* Systems Analysis Group who with the climate projections for six African cities.

## **Acronyms and abbreviations**

CALID	Center for Active Learning and Integrated Development, Ghana
CAPD	Community Action Programme for Development
CMIP3	Global Model Intercomparison Project Phase 3
CSAG	Climate Systems Analysis Group
DeCo	Decentralised Composting Company
ENSO	El Niño –Southern Oscillation
EPA	Environmental Protection Agency, Ghana
FASDEP	Food and Agricultural Sector Development Policy
GFDRR	Global Facility for Disaster Reduction and Recovery
GHS	Ghana Health Service
GMA	Ghana Meteorological Association
GSS	Ghana Statistical Service
ICRISAT	International Crop Research Institute in the Semi-Arid Tropics
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
ITCZ	Inter-Tropical Convergence Zone
IWMI	Integrated Water Management Institute
MADU	Metropolitan Agriculture Development Unit
METASIP	Medium Term Agriculture Sector Investment Plan
MoFA	Ministry of Food and Agriculture
MM5	Meteorological Model version 5
NADMO	National Disaster Management Organization
NCAP	Netherlands Climate Assistance Programme
NGO	Non-governmental organization
NPC	National population commission
PCMDI	Program For Climate Model Diagnosis and Intercomparison
RUAF	Resource Centres on Urban Agriculture and Food Security
SARI	Savanna Agricultural Research Institute
START	global change SysTem for Analysis, Research, and Training
TaMA	Tamale Metropolitan Assembly
TMA	Tamale Metropolitan Authority
UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UPA	Urban and Peri-Urban Agriculture
UDS	University for Development Studies
WMO	World Meteorological Organization
WRI	World Resources Institute

Contents
·····Executive summary
Objectives and methods
Urban and peri-urban agriculture in Tamale
Overview of UPA in Tamale
Characteristics of the urban and peri-urban producers
Crops, livestock and other production elements
Institutions and policies influencing UPA
Institutions involved in UPA in Tamale
The policy landscape for LIPA in Tamale
Influence of urban growth on LIDA in Tamala
I when growth in Temple 12
Urban growth in Tamale
Zonation of Tamale
Land resources for UPA in Tamale 16
Urbanization and impact on the community 18
Water resources and UPA 18
Climate factors and UPA in Tamale
Climate trends
Climate projections
Observations of climate change
Response options and recommendations
References

#### **Executive summary**

 $\cdot T$  (UPA) for the city of Tamale, Ghana, that was conducted in 2012. It examines the state of UPA in the city through the lens of intensifying urban pressures and increasing climate risks with the objective of identifying how these and other drivers potentially interact to affect the long-term sustainability of UPA, and what response options are needed to address existing and emerging challenges. The assessment is intended to:

- 1) describe the dominant characteristics of urban and peri-urban agriculture, and identify key knowledge gaps in these UPA systems;
- 2) explore the array of stressors that contribute to vulnerability of UPA systems to climatic and other environmental changes; and
- 3) identify critical areas for strengthening policies and institutional capacities that contribute to sustaining the UPA sector within the larger context of resilient cities and food systems.

The city of Tamale, an important urban hub in the semi-arid savanna region of northern Ghana, is experiencing rapid expansion resulting from internal population growth and in-migration from surrounding rural areas as well as from neighbouring regions. The resulting urban sprawl is encroaching on land used for agriculture, which is a dominant livelihoods source in peri-urban areas of Tamale.

Urban pressures on the peri-urban landscape are being further aggravated by increased land insecurity driven by changes in the traditional land distribution system of the indigenous people of Tamale (the Dagombas). Under this system, land is held in trust for the people by chiefs and distributed to family heads who in turn distribute it among individual family members. In recent times, the high demand for land for more lucrative ventures other than agriculture has enticed chiefs to allot and sell lands previously given to family heads and individuals for farming purposes, to developers; this is usually done without consulting with farmers. Urban expansion into the valleys bottoms around Tamale is of particular concern as this is productive land for agriculture and these lands also play an important

## 预览已结束,完整报告链接和

https://www.yunbaogao.cn/report/index/report?re