

# URBAN AGRICULTURE MAGAZINE

25



RUAF 10 years

International Conference on Urban Agriculture for  
Resilient Cities in Almere, The Netherlands



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The RUAF Foundation, the International network of Resource centres on Urban Agriculture and Food security, is celebrating its tenth anniversary. The RUAF partners saw this as the right moment to organise a conference in Almere, the Netherlands, to share experiences. The papers presented at this conference are included in this issue.

*Photo: Urban Agriculture in Rosario, Argentina  
by: H.P. Reinders*

# RUAF 10 YEARS: Achievements and challenges

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Henk de Zeeuw  
Director RUAF Foundation

**The RUAF Foundation, the International network of Resource centres on Urban Agriculture and Food security, is celebrating its tenth anniversary. This special issue of the Urban Agriculture Magazine will highlight the development of the RUAF network, the type of activities developed during the past years, some of the main results achieved at city, national and international level, and strategic challenges in the coming years in a number of thematic articles and case studies.**

The RUAF partners saw its tenth anniversary as the right moment to organise a conference in Almere, the Netherlands, to share experiences gained in the context of RUAF programmes in the South with organisations in Europe that support development efforts in the South or undertake similar activities in their own countries. Through this conference, RUAF aimed to generate more support for urban agriculture initiatives in developing countries, stimulate cooperation between like-minded partners in Europe and Southern countries and discuss key challenges for urban agriculture research, policy development and practice in the coming years in general and for RUAF in particular.

Most of the papers presented at this conference are included in this issue (some have appeared already in a recent issue of the UA-Magazine).

## Development of the RUAF network

RUAF is an international network of eight resource centres on urban agriculture and food security, consisting of one international advisory organisation (ETC, the Netherlands), three regional NGOs (IPES, Lima, Peru; MDP-ESA, Harare, Zimbabwe; and IAGU, Dakar, Senegal), two regional offices of an international research organisation IWMI-Ghana, Accra and IWMI-India, Hyderabad) and two regionally operating university institutes IGSNRR, Beijing, China, and AUB-ESDU, Beirut, Lebanon).

The initiative to create the RUAF network and programme was taken by the Support Group on Urban Agriculture (SGUA), a loose cooperation between some 30 development organisations with an active interest in this subject (also see the contribution of Mougeot on page 11), in response to the call of Southern partners to enhance information



*Urban gardens around Lisbon, Portugal (photo: Jorge Castro Henriques)*

exchange, networking and capacity development on urban agriculture in the South. The potential for urban and periurban agriculture (UPA) to contribute to reducing urban poverty and food insecurity, improving social inclusion of disadvantaged groups and improving the urban environment (through urban greening, reuse of urban wastes, storm water management, mitigation of the effects of climate change, reduction of urban heat and dust) was increasingly recognised at that time. However, many constraints hampered the development of safe and sustainable urban agriculture, including restrictive municipal bye-laws, and many national and city authorities, urban planners and even scientists were not aware of the advantages of UPA – or had biased views on it – and lacked the capacities to engage in dialogue with urban farmers and to design adequate policies and programmes on urban agriculture.

In view of this situation, the RUAF Foundation partners saw it as their mission: *“to create enabling conditions for safe and sustainable urban and periurban agriculture by empowering urban farmers, raising the awareness and capacities of local authorities and facilitating the development of facilitating policies on urban agriculture and its inclusion in urban land use plans.”*

The RUAF network makes optimum use of the relative strength of each of its partners and the reciprocal exchange of knowledge and experience between partner organisations working in different parts of the world at international, regional and city level. The RUAF network is a highly innovative organisation that seeks to link hitherto unconnected spheres: the urban and the agricultural spheres. Traditionally these two spheres and



their related institutions have had clearly distinct mandates, concepts, focus, methodologies, and even cultures. The existence of an agricultural sector in the urban economy and ecology has only recently been recognised and rural-urban linkages (nutrient flows, cash flows, human resources, linked land and animal assets) are now also receiving more attention from both urban- and rural-focused institutions.

A guiding principle in the RUAF Foundation is that all its activities should be shaped in close cooperation with local organisations and in interaction with the local society in all its social, economic and cultural aspects. A demand-driven, participatory and gender-sensitive approach is consistently applied in programme development and implementation. The RUAF programmes are characterised by a strong emphasis on local capacity building, producing tangible and sustainable results and paying close attention to institutionalisation and up-scaling / mainstreaming of project results. The RUAF partners periodically reflect on the experiences gained and results obtained in order to enhance the self-learning capacity of the RUAF partners as well as to identify possibilities to improve the RUAF strategies and to enhance the relevancy and efficacy of the RUAF programme. Leadership and coordination of the RUAF programme activities at the different levels are divided among the partners, and supported by institutional and individual capacity building.

#### 1999 - 2004: Networking and exchange

The RUAF network began operating in 1999, enabled by a grant from the Dutch Ministry of Development Cooperation (DGIS) and a grant from the International Development Research Centre (IDRC) in Canada. During its first years, RUAF operated as an international project administered by ETC Foundation. During that period the RUAF network was gradually built up with the addition of two new Southern regional partners each year.

Activities during the first years focused on the following aims:

- Establishment of regional resource centres on UPA and capacity development of staff.
- Documentation of experiences by commissioning case studies and the preparation of fact sheets on the presence, benefits and risks of UPA.
- Facilitation of networking and exchange on urban and periurban agriculture. To that end we organised regional thematic workshops (on reuse of wastewater in urban and periurban agriculture, Ouagadougou 2002, and on the role of urban and periurban agriculture in the fight against HIV/Aids, Cape Town 2007) and international electronic conferences on various aspects (with FAO in 2000, with UN-HABITAT in 2001, and with the Consultative Group on International Agricultural Research (CGIAR) in 2001) as well as study visits between different cities and countries.
- Awareness raising through dissemination of fact sheets to decision makers and the organisation of sessions on UPA at international conferences (WHO world conference 2000, FAO Food Security conference 2001, UN-HABITAT World Summit 2002).
- Enhancing access to information on UPA by decision makers, researchers, urban planners and practitioners in the South through establishment of a bibliographic and other resource databases (accessible on line), publication of the Urban Agriculture Magazine (three issues a year, now distributed in six languages; also online), establishment of the RUAF website on global and regional level and preparation and dissemination of peer-reviewed publications.

### The RUAF Foundation

*In May 2004 the RUAF network was formalised as an independent not-for-profit development support organisation with its own legal status and governing structure, the RUAF Foundation, which is legally based in the Netherlands.*

*The RUAF Foundation is managed by the RUAF Board consisting of the legal representatives of the eight RUAF partners and two independent Board members (chair and secretary). The Board defines the general policies and strategies of the Foundation and approves the annual plans and reports and supervises the functioning of the Director.*

*The larger programmes are run by a Programme Committee, which is chaired by the global programme coordinator and consists of all regional programme coordinators. The Committee prepares programme strategies, workplans and budgets. The RUAF Foundation makes use of the infrastructure, staff and administrative systems of the RUAF partner organisations for the implementation of the RUAF programmes in the various regions.*



City stakeholder formulated and accepted a City Strategic Agenda, such as in Freetown, Sierra Leone (photo: René van Veenhuizen)

### 2005 - 2008: *Cities Farming for the Future*

Most of the Foundation's global and regional information and networking activities continued during this period. In addition, *Cities Farming for the Future*, a major new programme of intensive activities in 21 cities (3 per region) in 17 countries, was launched (again with support from DGIS and IDRC). In these cities RUAF partners undertook the following activities in close cooperation with local municipalities, NGOs and universities:

- capacity development (development of training materials, training of 200 trainers, training of about 1700 staff of municipalities, NGOs and universities);
- establishment of a multi-stakeholder forum (MSF) on UPA in each of these 20 cities;
- (re-) formulation of local policies and regulations on UPA;
- design and implementation of 32 UPA projects;
- establishment of adequate monitoring mechanisms to enhance learning from practice and stimulate institutional change (process documentation, results/outcome mapping, impact measurement, annual participatory reviews).

The articles in this UA-Magazine explain in more detail the multi-stakeholder approach applied by RUAF (see pages 17-25), with concrete experiences in the articles on Belo-Horizonte, Brazil and Western Province, Sri Lanka.

### 2009-2011: *From Seed to Table*

In this period RUAF has continued its networking and exchange activities as well as policy influencing at city level, but in a less intensive way. In addition a new major programme was launched focusing more directly on urban farmer groups. Most small-scale urban producers are not well organised (if at all), their access to credit and agricultural extension services is often very limited and their experience with marketing their produce is generally restricted to sales of surpluses "over the fence" in their own neighbourhoods. Moreover, most government organisations and NGOs working in the city have no experience in agriculture, while the organisations working in agriculture are not working in the city; hence there is limited capacity to support urban producers.

To tackle these issues the RUAF partners initiated the *From Seed to Table Programme* (FSiT; again with support of DGIS and IDRC).

The following main activities have been implemented in the context of this programme:

- Training of NGO staff in participatory market analysis, business planning and urban producer field schools (UPFS).
- Strengthening of producer organisations (SWOT analysis, training of group leaders, group building, training of members in planning, marketing and bookkeeping skills).
- Participatory design and implementation of 20 innovative projects by urban producers supported by the trained NGOs. These projects were aimed at raising the producers' capacity to produce high-quality organic produce and to establish linkages with urban consumer groups and other actors interested in buying such products.



*Combining food, education and leisure, Grant Park in Chicago* (photo: Bert Lof)

- Enhancement of urban producers' access to finance and credit (through group savings schemes and revolving funds, analysis of the offer of relevant existing credit and finance institutions, lobbying to improve access of small producers to such institutions and/or to improve their conditions and procedures, joint design of innovative local financing mechanisms).
- Support to initiatives to formulate national policies and programmes on UPA.

The article on pages 49-51 in this UA-Magazine and the cases on Agrosilves in Lima (piglets) and the Iraq al Amir women's cooperative society in Amman (green onions) shed more light on the FSiT approach and its local effects. The article on access to financing (on page 30) discusses the experiences gained in the FSiT programme regarding innovative ways to finance small-scale urban agriculture.

### *Other RUAF projects*

The development stages of the RUAF network, as described above, have been defined in large part by its core programmes. However, in addition to these multi-regional activities, RUAF Foundation continues to develop smaller projects focusing on a specific theme or on a specific country or region.

Some examples:

- A project on UPA and "green jobs" creation for youth in Freetown, Sierra Leone, with COOPI (EU funding, started in 2009).
- Twin projects on UPA and food security in Monrovia, Liberia, with CARE & Welt Hunger Hilfe (EU funding, 2010 – 2012).
- A project on low-space UPA technologies in low-income areas and schools in Antananarivo, Madagascar (IMV funding).
- A study on the socio-economic effects of urban agriculture in four cities for the World Bank.
- A study on the impacts of the 2007/2008 financial crisis on the urban poor (five cities) for IDRC and UN-HABITAT.



- Collaboration in the DGIS-funded WASH alliance (DWA) on productive reuse of wastewater for UPA with WASTE, SIMAVI, RAIN, ICCO and AKVO (started in 2011).

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### Results

The results achieved in the past years by the RUAF partners can be summarised as follows.

#### At city level

In (most of) the 20 RUAF partner cities progress has been made in the following areas:

- Enhancing the knowledge of stakeholders on the potential and risks of UPA.
- Acceptance of UPA as a legitimate urban land use category and its integration in local urban land use planning.
- Improvement of communication and cooperation between local stakeholders.
- Formulation and adoption of a city strategic agenda on UPA by the multi-stakeholder platform, leading to the development of new policies, regulations and programmes on UPA by local authorities and other local actors.
- Inclusion of UPA in the municipal institutional structure and in the annual budget of the municipality as well as in the regular programmes of various other institutions.
- 52 local UPA projects have been implemented involving over 9000 poor urban households. These projects have improved livelihoods and have provided opportunities for learning and demonstration.
- 18 agri-businesses with their own marketing channels have been established with/by groups of urban poor.



Dissemination and international awareness at the World Urban Forum, 2008 in Nanjing (photo: René van Veenhuizen)



RUAF regional trainers of the MPAP (photo: René van Veenhuizen)

#### At national level

RUAF contributed to institutional capacity building through the “training of trainers” in UPA in 17 countries. Many national institutions were involved in the multi-stakeholder policy formulation and action planning (MPAP) processes in the cities. And in several countries RUAF partners assisted in laying the groundwork for inclusion of UPA in national policies and programmes (by synthesising available data, sharing examples of and experiences with policies and programmes on UPA in other countries, organising exchanges between actors at city and national level, etc.). They also facilitated multi-stakeholder participation in the formulation of such policies and programmes (e.g. in Brazil, Peru, India).

#### At regional and global level

RUAF has been instrumental in getting UPA on the agendas of many development organisations, including international organisations. IWMI, a partner in RUAF since the network's establishment, has included UPA in its programmes on Water for Agriculture and more recently on Resource Recovery and Reuse (see the article on page 64). In addition, RUAF actively supported the process that led to the inclusion of UPA in the agenda of the FAO and establishment of the priority action “Food for the Cities” (based on which RUAF has undertaken several joint activities with FAO at global and regional level). RUAF is involved in similar processes with UN-HABITAT, the World Bank and more recently the International Labour Organization (ILO), and it has been cooperating closely with the “Urban Harvest” programme of the CGIAR.

RUAF activities also have greatly improved access to data and publications on UPA for users in the South (and North). The RUAF websites attract 800,000 visitors each year by providing online access to a bibliographic database with 10,000 entries, among many other features. A large number of publications have been produced, including 24 thematic issues of the *Urban Agricultural Magazine* (which is available in 6 languages and consulted by 7500 readers in hard copy and 10,000 online), and a large number of peer-reviewed articles and books, among which: *Growing Cities Growing Food* (DSE, 2000), *Cities Farming for the Future* (IIRR, 2007), *Women Feeding Cities* (PA, 2009), and *Cities Poverty and Food* (PA, 2010).

RUAF developed and tested innovative approaches like the multi-stakeholder policy formulation and action planning (MPAP) approach and the From Seed to Table (FStT) approach,

which are now used by many other organisations. We were also instrumental in introducing *effective monitoring methods* (including IDRC's Outcome Mapping) and *gender-sensitive diagnosis and planning methods* into many organisations in the South.

In terms of *knowledge generation*, the RUAF partners have contributed substantially to the study of important topics such as reducing health risks linked to the reuse of wastewater in urban agriculture while enhancing its socio-economic and ecological benefits, identifying the socio-economic benefits of urban agriculture, and analysing the opportunities and constraints for including urban agriculture in urban land use plans.

### New challenges; RUAF's strategic aims for 2011-2015

In interaction with local actors in the 20 RUAF partner cities and organisations with which we cooperate at national, regional and international level, the RUAF partners have selected a number of key challenges that we will seek to tackle in the coming years:

- A financing study undertaken by the RUAF Foundation has indicated the need to stimulate local financing institutions to create adequate funding windows for small-scale urban producers. RUAF is preparing a *co-funding facility on UPA and resilient cities* in order to stimulate local financing for UPA and enhance urban producers' access to finance and credit (from various sources). We welcome the participation of funding organisations interested in supporting this initiative.
- Next to our continued work at city level we will intensify our support for *national policy formulation* on UPA and adaptation of existing legal frameworks. City partners have indicated that their mandates are often restricted in certain areas or aspects and they need the legal support of national entities to install and implement effective policies and bylaws at local level. For example, cities cannot regulate the reuse of urban wastewater at local level, or accept UPA as a formal urban land use, if national laws prohibit this. Also more technical and budget support by national organisations for local initiatives is needed. RUAF partners will coordinate their actions at national level with city partners that are already actively facilitating UPA. Integration of UPA in agricultural policies and in national poverty reduction and food security strategies will also be promoted.
- RUAF will facilitate the *integration of UPA in city climate change mitigation and adaptation strategies*. UPA can play an important role in making cities more resilient to climate change (see my article on page 37). However, attention in climate change strategies to UPA and "green infrastructure" in general is still limited. That is why RUAF in cooperation with major international climate change programmes (such as UN-HABITAT's Cities and Climate Change Initiative – CCCI) will undertake activities



The RUAF regional team for South Asia at an international RUAF meeting  
(photo: René van Veenhuizen)

to enhance the knowledge of the cities participating in these programmes regarding UPA and its potential (and limitations) for climate change adaptation and mitigation and to facilitate its inclusion in city climate change strategies.

- RUAF will also seek to support the integration of UPA in *slum development and social housing programmes* in cooperation with third organisations (e.g. Cordaid's integrated slum development programme). We will also continue our work regarding the use of UPA as a means to create green jobs for young unemployed urban youth and as an alternative or compliment to food distribution to disadvantaged people (e.g. low-space food production in refugee camps; home or community-based food production with/for HIV/ Aids-affected households).
- RUAF partners will also participate in studies and local initiatives aimed at sustainable, socially responsible and climate-smart urban/regional food systems (in cooperation with ETC and Wageningen University in the Netherlands, among others).

### RUAF Books

*Growing Cities, Growing Food: urban agriculture on the policy agenda*. Bakker, N., Dubbeling, M., Guendel, S., Sabel-Koschella, U., Zeeuw, de H. (eds). 2000. Feldafing (Germany): DSE.

*Cities Farming for the Future, Urban agriculture for Green and Productive Cities*. Van Veenhuizen, R. (ed.). 2007. Los Banos. IIRR, RUAF, IDRC.

*Women Feeding Cities – Mainstreaming gender in urban agriculture and food security*. Hovorka, A., De Zeeuw, H., and Njenga, M. (eds), 2009. RUAF. UK. Practical Action.

*Cities, Poverty and Food; Multi-stakeholder Policy formulation and Action Planning in Urban Agriculture*. Dubbeling, M., De Zeeuw, H. and Van Veenhuizen, R., 2010. RUAF. UK. Practical Action

# International Conference “Urban Agriculture for Resilient Cities: Lessons Learnt in Policy, Research and Practice”

Marco Serena  
René van Veenhuizen

**To mark its tenth anniversary, the RUAF Foundation organised this international event on 19 and 20 May 2011 in cooperation with CAH University Almere. The conference took place, in a multi-functional urban farming estate in Almere, the Netherlands, with financial support from the International Development Research Centre, Canada and the Economic Development Bureau of the City of Almere.**

The aim of the conference was to share and discuss the results of research, planning and implementation experiences gained in RUAF programmes implemented over the last 10 years. These experiences shed light on the *potentials and limitations of urban and periurban agriculture in answering key urban challenges and building city resilience and vitality* and to look at future trends and challenges in this field. Several papers presented at the conference are included in this special issue of the *Urban Agriculture Magazine*. The conference brought together policy makers, researchers and practitioners involved with multi-stakeholder policy formulation and strategic planning on urban agriculture and food security, the development of short producer-to-consumer value chains, safe productive reuse of urban wastes and wastewater, the use of urban agriculture in city climate change adaptation and mitigation strategies and the integration of agriculture in the design of residential areas.

The event was attended by 65 participants from over 20 countries, including representatives from provincial and city authorities, farmers' organisations and NGOs from the South, international development organisations as UN-Habitat, Food and Agriculture Organization (FAO),



*Group work on the future of RUAF facilitated by Theophilus Larbi.*  
(photo: René van Veenhuizen)

International Labour Organization (ILO), International Development Research Centre (IDRC), Canada, NGOs, donor organisations from Europe, and universities and research institutes, including University College London and Wageningen University.

## Discussing the state-of-the-art

The conference was organised in eight sessions spread over two days.

In the first session, *Bram Huijsman* (Director of International Programmes, Social Sciences Group, Wageningen University and Research Centre, and Chair of the Board of the RUAF Foundation) opened the conference, highlighting that the world's urban population is quickly growing (to 60 percent of total population by 2030). In the context of volatile food prices, peak oil and climate change, this poses huge challenges in terms of urban poverty, food access and environmental sustainability. Urban and periurban agriculture (UPA) is receiving increasing attention at all levels as one of the strategies to reduce the vulnerability

“At a time when urban agriculture, local food supply, and sustainable urban food systems have become fashionable subjects, we decided to take stock with our partners from around the world of the substantial experience in conducting research, developing policies and implementing solutions on urban agriculture. The challenge of developing inclusive, food-secure and resilient cities is a universal one, so it is particularly important that a network of cities like the one developed around RUAF in the past 10 years shares lessons for everyone to learn and pushes this thinking forward in more cities, including in Europe and North America” RUAF Director: Henk de Zeeuw.



of the urban poor and enhance city resilience. *Luc Mougeot* (Senior Programme Specialist IDRC, and one of the pioneers of urban agriculture research) reviewed the **history of urban agriculture** and *Henk de Zeeuw* (Director RUAF Foundation) reviewed the **activities and results of RUAF in the last 10 years**.

The second session dealt with **multi-stakeholder policy development and action planning (MPAP)** on urban agriculture. *René van Veenhuizen* (Senior Advisor in the ETC-RUAF team) gave an introduction to the MPAP approach as applied in the RUAF “Cities Farming for the Future” programme. Subsequently the experiences gained with this approach in three cases were presented: in Bulawayo (Zimbabwe) by *Job Jika Ndebele* (Dep. Director of Engineering Services and Town Planning, Bulawayo), in Belo Horizonte (Brazil) by *Flávio M. L. Duffles* (Municipal Secretary for Food Security of Belo Horizonte), and in Western Province (Sri Lanka) by *Uddya Gammanpila* (Minister of Agriculture of Western Province).

The third session focused on **participatory innovation in small-scale urban farming, processing and marketing**. *Marielle Dubbeling* (Senior advisor in the ETC-RUAF team) presented the methodology applied in the RUAF “From Seed to Table” Programme. A selection of three cases was presented: *Bridget Impey* (Manager of Harvest of Hope) presented the Abalimi Bezekhaya experiences gained in setting up a fast developing organic vegetable box marketing scheme, sourcing from and offering services to groups of urban farmers in Cape Town townships in South Africa; *Xiaoding Zan* (Manager of the Huairou Vegetables Cooperative) presented (by video) her cooperative’s business of producing and marketing mushrooms at the outskirts of Beijing and *Anaam M.F.Sakarneh* (Chair of the Iraq al Amir women’s cooperative society), presented their work of green onions value chain development in Amman, Jordan.



Panel discussion, with *Florence Egal* of FAO, *Yves Cabannes* of DPU, *Mark Redwood* of IDRC, and *Remi Kahane* of *UrbaHort* (photo: René van Veenhuizen)

The fourth session looked at **safe, productive reuse of urban wastes and wastewater in urban agriculture**. *Pay Drechsel* (Theme Leader Water Quality, Health and Environment of the International Water Management Institute, Sri Lanka) introduced the topic; *Julio Moscoso* (Senior Consultant Wastewater and Sanitation, IPES) presented (by video) experiences in Lima with evidence-based policy development related to multi-functional reuse of urban wastewater; and *Olofunke Cofie* (Volta Basin Leader for the Challenge Programme on Water and Food of the CGIAR, Ouagadougou, Burkina Faso) talked about advances in the recovery of municipal waste resources for improved productivity in urban agriculture, with examples from Accra, Ghana. She also presented results of a recent review conducted by IWMI and commissioned by the Bill & Melinda Gates Foundation.

The fifth session showcased recent research regarding the **socio-economic impacts and financing of urban and peri-urban agriculture**. *Mark Redwood*, MSc (Programme Leader Climate Change and Water, International Development Research Centre) introduced the topic and mentioned a recent study by ODI that sought to quantify the economic impacts of UPA in the form of: (a) expenditure substitution,



Official welcome by RUAF Board member and ETC Director *Frans Verberne* and RUAF Director *Henk de Zeeuw* (photo: René van Veenhuizen)

(b) income through marketing, (c) income through labour and (d) price impacts that benefit urban consumers. **Henk de Zeeuw** (Director, RUAF Foundation) presented the results of a recent study by RUAF for IDRC and UN-HABITAT on the effects of the 2007/8 financial crisis on food security and the livelihoods of the urban poor in five cities (Colombo, Rosario, Bogota, Kitwe and Accra). **Gordon Prain** (Senior Researcher, CIP) presented the early results of a RUAF study for the World Bank on the socio-economic impacts of urban agriculture in four cities (Lima, Accra, Nairobi and Bangalore). **Yves Cabannes** (Chair of the Development Planning Unit of the University College London) presented the RUAF study on financing of small-scale urban/periurban agriculture based on case studies in 18 RUAF partner cities and also introduced the concept of a global funding facility for UPA, to ensure its survival and the fulfilment of its potential.

The sixth session explored the **contributions of urban agriculture to building city resilience**. Introductory presentations were given by **Gaston Remmers** (Chair Eco-effective Entrepreneurship in Urban Environments, CAH Almere), who discussed some key concepts and an evolutionary approach to the development of vital and sustainable cities, and **Marielle Dubbeling** (Senior Advisor, ETC-RUAF team), who discussed the potential and limitations of urban agriculture in enhancing cities' resilience against the effects of climate change. Subsequently a number of cases were presented:

- **Jan-Eelco Jansma** (Senior Researcher Applied Plant Research, Wageningen University and Research Centre) presented the design principles and processes applied in the development of the plans for Agromere (a new residential area of Almere), which integrated agriculture in city design.
- **Laura Bracalenti** (Professor, Faculty of Architecture, Planning



*The Director Economic Development, Henk Weyschede and Gaston Remmers of Almere University at the Conference (photo: Marco Serena)*

and Design of the National University of Rosario and member of the Technical Support Team of the Urban Agriculture Programme of Rosario, Argentina) presented the participatory development of productive green spaces in Rosario as a strategy for slum and livelihood improvement.

- **Gunther Merzthal** (Coordinator of the Urban Agriculture Programme, IPES, Peru) presented the participatory design and implementation of multi-functional urban agriculture in Bogota, Colombia, and Lima, Peru.
- **Ming Liu** (Director, Agricultural Committee Minhang District, Shanghai, China) presented the multi-stakeholder development of recreational agriculture in Minhang District, Shanghai.

### Looking ahead

In the final two sessions the emphasis was on discussing new challenges and future priorities for urban agriculture research, policy development and implementation.

In a "World Café" session the participants shared ideas and built a consensus around three main questions:



*Members of the RUAF family at the Conference (photo: René van Veenhuizen)*



- “What are the key priorities for future work on cities, agriculture and resilience?” Participants mentioned the role of UPA in adaptation to climate change; migration, food self-sufficiency of cities; financial mechanisms; green job creation; urban design; and emphasised the need for information and (continued support to) city platforms.
- “What is missing to address these priorities?” Participants mentioned the need for a systems approach in UPA studies; more articles in peer-reviewed journals; more funds and proper branding of (different systems/functions of) UPA; better incentives for entrepreneurs to invest in UPA; continued capacity building; and the need to convince governments to see UPA as being integrated in city development.
- “What opportunities are available for cooperation with RUAF and/or each other?” The participants identified local and national policy development; joint learning, sharing and dissemination of good practices; training and education; collaborative research; and the identification and use of urban indicators to assess UPA’s contribution to urban resilience.

The final session of the event was a **panel** discussion chaired by **Yves Cabannes** (Chair of DPU at University College London and member of the Board of the RUAF Foundation). Representatives of international organisations were asked to comment on these main themes and the priorities that emerged during the World Café.

**Rafael Tuts** (Chief Urban Environment and Planning Branch, UN-HABITAT) focused on three points: integration of UPA in small- and medium-sized cities in developing countries; the need to operate and view food and energy flows at city-regional level (50-100 km radius around cities); and the need for collaboration in lobbying policy makers, financing organisations and others, for example by linking UPA to their priorities. As an example of the latter, Mr Tuts announced that the UN-HABITAT Cities & Climate Change programme is planning to embark on joint actions with RUAF network to promote integration of UPA in cities’ climate change adaptation/mitigation strategies and plans. He also discussed the need to look at how the shape and morphology of cities affect both urban agriculture practices and their socio-economic impacts.

**Florence Egal** (Co-secretary of FAO-“Food for Cities”, FAO) suggested that FAO and RUAF continue to collaborate and seek to link UPA to the following agendas: sustainable diets that are compatible with sustainable environmental management and biodiversity; and disaster risk management. The two organisations also need to ensure that UPA is included in the main programme of the next World Urban Forum 6 (in 2012). Ms Egal also suggested RUAF to push local partners to lobby their country representatives to bring up UPA in FAO governing bodies; and that FAO and RUAF seek decentralised cooperation at regional level.

**Mark Redwood** (Programme Officer Climate Change and Water Programme, IDRC) made a plea to focus on further mainstreaming of UPA in national policy making, in city climate change and resilience plans, and in territorial development plans. He challenged RUAF to take up a lead role to make this happen.



Alderman Ben Scholten of Economic Affairs of Almere (Gaston Remmers)

**Remi Kahane** of Global Hort (a global facility for coordinated horticultural research) discussed the important link between rural and urban development; the need to better characterise the various UPA (food) systems; and the environmental services that UPA/H can provide.

**Rajendra Paratian** (Senior Socio-economist, ILO) expressed the urgent need to further explore the role of UPA in job creation, especially of youth, and he suggested that the (30) ILO instruments addressing agricultural workers be linked to UPA.

*In his closing remarks, Yves Cabannes, revisited some key issues from the afternoon discussions, emphasising:*

- the need to link to the private sector and banks to gain support for UPA as a business;
- the challenge of rebranding UPA in the context of regional food systems and ongoing debates on climate change using evidence-based data from scientific research, and based on agreed targets and indicators;
- the need for coordination between stakeholders at each level of scale (local up to global) to unfold the potential of urban farming for city vitality.
- the importance of being committed to and focused on the poor and socially excluded;
- the need to develop conceptual models tailored to specific cities (of different sizes, ecosystems, densities, etc.), and
- to continue capacity building, while also training professionals at master’s and PhD levels in UPA/FS.

*He recognised the challenge in the near future of maintaining RUAF’s role by sustaining and continuing to finance these efforts. He ended by noting that over the last 10 years about USD 100 million has been spent on UPA, which is very little if put in perspective (compared to the costs of for instance a major infrastructure project in a city). UPA needs more financing and serious investment to fulfil its potential, and the proposed RUAF international financing facility for urban agriculture therefore should be high on the agenda.*

# International Support to Research and Policy on Urban Agriculture (1996-2010): achievements and challenges

Luc J.A. Mougeot

**In the last 15 years urban agriculture has become a research and policy field in its own right, thanks to an unprecedented growth of interest and action by a widening spectrum of sectors and actors within local, national and international arenas.**

Agriculture has been practised in cities for at least 7000 years, and while there has been a resurgence of unregulated urban agriculture since the 1970s, formally recognised urban agriculture has only recently made it to the international agenda. Urban agriculture is now visible in all its diversity, thanks to pioneering initiatives. These have triggered interest and mobilised resources for tackling key management issues in urban agriculture (UA). Local and national governments include urban agriculture in urban development policies in much the same way as they have started to recognise informal housing and employment systems. While the spotlight moment for UA was prepared by the efforts of many organizations over the past 15 years, the switch has been turned on by the rapid succession and compounding of crises in recent years, linked to rising energy costs, food prices, food safety issues, water shortages, and others, which has given urban agriculture renewed impulse. Demography and human resourcefulness are challenging outmoded conventions and norms, forcing technocrats to re-invent the city for all who live in it. This paper outlines the achievements of the last fifteen years, describing the main international players involved in the process and some of the key issues and new challenges that require attention from policy makers, researchers, development practitioners and funding agencies<sup>1</sup>.



*A women's cooperative producing vegetables for Istanbul market*  
(photo: René van Veenhuizen)



*Urban agriculture in Cuba* (photo: Hans Peter Reinders)

## Foundations - up to 1996

The developments in UA before 1996 include at least 30 years of scholarly interest, although the UNCED summit held in Rio in 1992 sparked its growth into a recognised field of activity. Early (mostly social science) surveys in large cities in the South lead to publications by individual academics in the 1970s and 1980s (1). Research was done by individuals with little institutional support; networking was weak and links with policy were almost non-existent.

The early body of **research** examines UA from an informal sector perspective, and draws on literature on migration, nutrition, land tenure and livelihoods. When a second oil shock hit developing countries in the early 1980s, researchers turned their attention to the link between rising energy costs and food security (as would happen again between 2008 and 2010), from the perspective of eco-development and self-reliance. Between 1983 and 1987 the United Nations University Food-Energy Nexus programme (26 country/city reports) examined the growing practice of UA around the world (2). Building on this research, now from a sustainability angle, the UN's Brundtland Commission on Sustainable Development issued a report in 1987 calling on governments to promote UA to help cities recycle their waste (3). As local governments took on more responsibilities with fewer resources in a period of economic reform and fiscal austerity, UNCED's Agenda 21 encouraged local governments to take initiative on urban environment management. UA became



one of the ways in which cities could tap into their own resources to support local development (4). Building on these messages, the UNDP world survey and report on UA by The Urban Agriculture Network (TUAN, 1992-1996) stressed the current and potential contribution of UA to the multiple goals of urban food security, employment and environmental management (5). Surveys by the UNU and IDRC revealed that local governments in many parts of the South were already introducing innovations through municipal regulations. A good example is Dar es Salaam's Town and Country Planning Ordinance (CAP378) Urban Farming Regulations of 1992, probably still today one of the more explicitly defined bodies of regulations on UA in Sub-Saharan Africa.

Despite these studies, **bilateral agencies** - which control most development assistance funds - were quite slow in putting UA on their own agenda. After its world survey in 1992, UNDP invited IDRC to take the lead on UA, and IDRC stands out as an organisation where UA progressed quickly from a research sub-programme (under its Urban Environment Management Programme from 1993-6) to a full programme (two phases of its Cities Feeding People Programme were carried out from 1996-2005), building on its project experience of the late 1980s. IDRC published research funded in the late 1980s in Africa (6); jointly with UN-Habitat's Sustainable City Programme (SCP), it funded an UA component of SCP's Sustainable Dar es Salaam Project on participatory urban environment management. This first experience of research embedded in a policy process on UA was the precursor of a longer period of collaboration between IDRC and the UN Habitat Urban Management Programme (UMP) on policy research for UA which started in 1997.

This period also saw the initial inclusion of UA on the agenda of **local government international forums, including** IULA's 1993 Congress in Toronto, Global Forum Manchester in 1994 (IIED), and UNDP Colloquiums of Local Government Officials in New York (Declaration on Social Development 1994). During the 1990s the status of local governments in UN summits rose from one of NGOs and observers to that of direct interlocutors as members of country delegations. This shift resulted in the UN system becoming better informed about challenges faced on the ground and innovations being tested by local governments. The 1980s were a period of trying out new things for cities on the social and economic front. And without a doubt local governments became much more open to, and the UN system more supportive of, inclusive policies than previously, when policy-making was more centralised and most UN policies were implemented by central governments. During this period, regional networking on UA started to take place in Latin America and the Caribbean, a more urbanised developing region, leading to the creation of AGUILA in 1995 (7) and the launch of its secretariat by ETC International in La Paz in 1997.

So by 1996 some descriptive information on UA had been gathered, and, increasingly, information on its linkages to social, economic and environmental (urban) issues.



*A vision for agriculture in Metro-Vancouver, by Michael Marrapese*  
(photo: composite image)

International actors were becoming informed and increasingly linked with one another in the international support group (SGUA). From 1996 on these actors start to seek conscious collaboration one with another to tackle issues and support strategies that would enhance UA's contribution to urban development in the South.

### Recognition, outreach and alliances - 1996-2010

The last fifteen years have seen an unprecedented increase and convergence in competence and capacity building, networking and advocacy for regional and global research and policy initiatives. This process was led by a few international development organisations, which decided on a plan of action at a meeting of the SGUA, convened by IDRC at its headquarters in Ottawa in March 1996<sup>2</sup>. Under the leadership of this group several initiatives would unfold over the period, which in turn would trigger others:

- \* UA made its way into the programming of bilateral and major UN development agencies, mostly through joint projects (IDRC, DGIS, DFID, SIDA, GTZ, Swiss and French Cooperation, FAO, UN Habitat, WHO, WMO, and more recently also USAID and EU);
- \* A Support Group on Urban Agriculture (1996-2003) periodically brought together the main partner organisations and helped to coordinate partners' work on various fronts, from research training to public policy formulation;
- \* IDRC's steadfast support to applied research on UA throughout this period (through its Cities Feeding People Programme until 2005 and its Urban Poverty and Environment Programme until 2010);
- \* With DGIS-IDRC funding mainly, ETC and regional partners built a global network (the RUAF Foundation), which drew on IDRC's portfolio and progressed, over a decade, from an information hub to a capacity-

building network for policy planning, farmer organisation and business development in UA (8);

- \* IDRC supported graduate fieldwork by a new generation of Canadian and global South researchers on UA (via Agropolis 1998-2004/Ecopolis 2005-10 graduate fieldwork grant programmes) (9);
- \* IDRC jointly with national institutions and multilateral agencies (CIRAD, CGIAR's Urban Harvest, RUAF and UN Habitat's Urban Management Programme) organised and ran regional courses for city teams (2000, 2001, 2003, 2005) (10);
- \* IDRC, UN Habitat and its regional partners co-funded innovative policy research projects (1997-2006) under a participatory governance approach (city consultations, action planning, policy and planning instruments and guidelines) (11);
- \* IDRC worked with WHO to revise norms and standards for the treatment and reuse of grey water in agricultural applications, and with research organisations in Latin America, sub-Saharan Africa and the Middle East to test the mitigation of risks associated with wastewater reuse in UA (12);
- \* Two key UN agencies clarified their policy regarding UA. FAO recognised UA as part of its mandate and created a Food for the Cities Programme Area for Inter-Disciplinary Action in 2000, with research co-funded by IDRC on urban producers' organisations, and with RUAF on national data surveys (13). And having supported joint projects since the early 1990s, UN Habitat clarified its policy on UA as a valid alternative wherever this does not compete with more productive urban land uses. (14)
- \* International research and training networks were created. The two best known are: the RUAF global network (1999 - present), which crafted a multi-stakeholder participatory action planning protocol and developed four distance learning modules on UA (15); and CGIAR's Strategic Initiative on Urban and Periurban Agriculture (SIUPA), later renamed Urban Harvest (2000-2008) which undertook research in sub-Saharan Africa on health and resource recovery dimensions of UA in selected cities (16). Before then, UA had not been on the agenda of most



Group work on the future of RUAF with Luc Mougeot third from left  
(photo: René van Veenhuizen)



Aquatic production of leafy vegetable water convolvulus (*Ipomea aquatica*) in Hanoi urban district (photo: René van Veenhuizen)

national and regional agricultural research organisations and networks in Africa.

- \* Innovative institutional mechanisms were tested, mostly at municipal level, but some at national level, as in Brazil. These included declarations, budget provisions, regulations, incentives, multi-sector coalitions, working groups, committees, offices, programmes, pilot projects and support services. UN-HABITAT's "Dubai International Award for Best Practices to Improve the Living Environment" was granted to the Urban Agriculture Programme of the municipality of Rosario in Argentina in 2004<sup>3</sup>. And cities in North America (Toronto, Vancouver, Chicago) and later Europe (London) took the initiative to analyse their (regional) Food Systems and develop Food Policies.
- \* In 2009 the Overseas Development Institute conducted a review for IDRC on the data available on links between urban agriculture and urban poverty reduction (via expenditure substitution, income from marketing, income from labour and price impacts) and recommended further research to deal with information gaps (ODI, 2009).
- \* In recent years UA has been included in the mission of professional organisations, such as the American Planners Association and the American Society of Agricultural and Biological Engineers.

Undoubtedly, applications of UA for productive greening of public spaces, reducing dependence on remote food sources, mitigating food staple price rises, and engaging people in healthy recreational activity, have been receiving support from growing segments of urban populations in high-income and increasingly in middle and low-income countries (linked to our need to assess public appreciation of UA).

### Achievements

The initiatives mentioned above have together resulted in the following:

#### Marked growth in research capacity and leadership:

beyond research by individual academics in universities with social science expertise, more research on urban agriculture is now being led by multi-disciplinary groups in academia and UA programmes are underway in international research organisations and in bilateral and multilateral development agencies. In academia, those





*Fresh produce sold at a farmers' market in Chicago (photo: Growing Home)*

who graduated in the early 2000s are now supervising a new generation of researchers. A broader range of disciplinary fields are active in UA (including urban planning, landscape architecture and engineering) and there is a larger and better set of tools available for collecting data and informing policy scenarios for scaling-up. Dedicated reference centers now exist in all major world regions; Northern universities are creating centres and research stations, offering certificate programmes, (distance education) courses, and a few (urban) producers' field schools are operational. Special issues of journals are being produced in a wide range of areas, and there has been exponential growth in the number of entries on UA over the last decade (a Scirus search done in July 2011 for the term "urban agriculture" yielded over 60,000 journal sources).

**Marked shift in approach to policy research:** from single to multi-city projects and programmes (SSA, LAC), from academic to multi-sector and multi-stakeholder research teams and 'city teams', from informative research to policy-responsive research.

**Marked rise of government engagement:** from laissez-faire to pro-active policy making (city selection, city consultations, priority scoping, networking, pilot projects, official declarations, policy guidelines by UN Habitat, WHO). On the policy front, positions for UA experts are opening up in public administrations; UA is being embedded into a broad range of policies and programmes (community agriculture, youth training, food security, civil rights, waste management, climate change adaptation, etc.); there are more diverse funding sources for UA research (private foundations, municipal and national ministries); and UA has become a regular item on the agenda of UN summits (Istanbul +5 in 2001, Global Urban Forum 2002, 2004, 2008, 2010).

**More problem-solving research and policy:** although research on specific economic impact is still highly relevant,

there is a shift from proving benefits only to tackling risks and constraints. These include access to resources, health issues, financing, urban design, regulatory frameworks, producer organisations, business development and partnerships.

**More inclusive strategy for sustainability:** the focus has shifted from pro-poor/agriculture objectives to explicit multiple urban objectives; from opportunistic accommodation to planned integration; from rigid (prohibiting) to flexible management approaches (regulation, adaptation, staggered abidance); from ignoring to dialoguing with organised producers, and supporting their capacity to do so.

Mainstreaming is still underway: UA is becoming a valid currency in academia, civil society and government.

### The way forward

Dismissed by many a generation ago as an oxymoron, and an acute case of arrested development destined for extinction, urban agriculture has resisted rejection, expanded and evolved, resurging even where it has been more suppressed. Promoted often (and wrongly) as legitimate in its own right, agriculture in the city is coming into the spotlight, as it learns to negotiate its legitimacy within the city, and its role in the development of climate-smart and resilient cities. In order to become and remain meaningfully urban, instead of being a burden on cities, urban agriculture must enable a city and its surroundings to better cope with its own needs. Here we list some of the challenges and opportunities facing UA research and policy, and which will require more systematic attention by the many actors mentioned above.

- **UA and Urban Food Supply Systems:** "David and Goliath". Beyond self-provisioning, how can market UA expand its niche in an urban food-retail system (fresh, chilled, frozen, dehydrated, canned) that is increasingly dominated by corporations in the major Southern cities?

- **UA and Household Food Supply:** many roads lead to Rome. Surveys typically estimate UA's contribution to urban households' food supply based on households' own food production. But food grown in the city can also be acquired by households through gifts, barter, or purchase of fresh or processed food from others. How can we more fully account for these supply channels when estimating a household's reliance on food grown in the city?
- **UA and Urban Ecosystems:** scaling up the loops. The share of resources going to waste is typically much more than UA has been able to absorb, and more so in some sectors of a city than in others. If UA's ability to help the city close its resource loops depends on proximity of waste provider and user, then how can UA help the city close its resource and energy loops on a larger scale?
- **UA and Urban Design:** buildings that grow. Going beyond horizontal, ground-level landscaping with UA, prototypes of vertical farms are being developed. How can we viably embed UA systems (livestock included) into new buildings and other urban structures, but even more so into the existing building stock? What are UA planting solutions that will make our cities more climate-smart? And what about opportunities and constraints?
- **UA and Urban Planning and Management:** interconnecting the grid. UA faces many constraints and risks because it has had to improvise its insertion into the urban fabric rather than fit in by design. Design must adapt to city growth and so must UA. How do we make these urban material flows, which UA should tap into, shorter, cheaper and safer, among UA uses themselves and between these and other urban land uses with which UA interacts?
- **UA and Local Policy:** the many neighbours one should satisfy. Self-provisioning, market and multifunctional agriculture are often seen as different goal-specific types



production assessment in Cagayan de Oro, Philippines (photo: Robert Holmer)

of UA. But can self-provisioning and market UA really be sustained in cities without themselves having to turn increasingly multifunctional, or without having to also create some public good for the city? Is food sovereignty, security or safety alone a sufficient (or even a necessary) leading argument for a city to incorporate agriculture within its boundaries?

- **UA and politics:** from field to city hall. More urban producers are organised than was originally thought, and some are better organised than others. But what are the political/economic conditions under which these organisations actually operate, and how effectively do they do so? Who are their supporters, allies, partners, both at city and national level? Who are not? How well do these organisations accommodate others' priorities?
- **UA and Economic Value:** no more short-changing UA. Economic benefits of UA are manifold: (a) Direct and indirect jobs and income (see 17) - Since UA value chains start with raw material, they can become quite extensive and elaborate in any city. Improvements along the way can increase significantly the market value of products and related services, so how can we better estimate UA value chains' contribution to the urban economy? (b) Cost avoidance - UA can contribute to a city's economy (public and private) not only by generating revenues but also by preventing costs of all sorts, by using people, land and resources productively. How can we calculate such net savings? (c) Valuing public appreciation - Willingness to Pay (WTP) and Willingness to Accept (WTA) methods enable us to monetise the overall value that people attach to owning or having access to a specific good or service. These methods have only been applied to a very limited extent so far to UA. How can we estimate the value that people attach (or not) to particular UA land uses, and in particular to UA functions?
- **Mainstreaming Under Way:** trickling deep down and local. The era of large grants to few organisations for



Farmers group producing nutritious vegetables in Durban (photo: Ubuntu)



policy/research innovation seems to have peaked, at least for a while. The field is more crowded today and mainstreaming is evident in many activities that have UA components. New funders are entering the stage at national and local levels. As activity centres become fragmented, will networks become decentralised from regional down to national and local

levels and, if so, what role should a global network such as RUAF play?

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## Notes

Opinions and views expressed here do not reflect necessarily IDRC's own and are the author's sole responsibility. The author thanks both his colleague, Mark Redwood, and the editor, René van Veenhuizen, for their helpful comments on a draft.

- 1) The perspective is subjective, thus incomplete, as every major agency involved in the process over the period could tell its own story on why and how it came to engage in UA. This article hopefully will be enriched by testimonials from other sources and perspectives in the future.
- 2) Participants included: UNDP, WB, FAO, Netherlands Ministry of Foreign Affairs, GTZ, IDRC, ETC International/India, World Sustainable Agriculture Association, International Food Policy and Research Institute, Natural Resources Institute, TUAN, University of Ghana, Canadian Bureau for International Education, Developing Countries Farm Radio Network, CARE Canada, City Farmer, York University, Royal Ontario Museum, Toronto Food Policy Council and York University (Toronto).
- 3) This prize was won again in 2008 by Dakar's micro-gardens project (Senegal), developed through a partnership with the City of Milan, Italy, and with FAO field assistance. See Thomas Forster (2011) 'Food, agriculture and cities', FAO Food for the Cities – Multidisciplinary Initiative, draft 2 August.

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# Multi-Stakeholder Policy Formulation and Action Planning on Urban Agriculture

Marielle Dubbeling  
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Multi-stakeholder processes are increasingly considered to be an important element of policy design, action planning and implementation. By involving multiple stakeholders in decision-making, it is much more likely that more inclusive policies and programmes will be developed that also achieve a greater degree of success in implementation. Urban agriculture touches on a large number of urban management areas and involves a large diversity of systems and related actors. Only by coordinating policy and planning on urban agriculture between these different actors and sectors can these endeavours be successful.

Multi-stakeholder processes have been widely promoted in different sectors of development, for example water and catchment management, rural development, and information and communication management. They are becoming a very popular mode of involving civil society in debates and decision-making on resource management, as they provide a negotiating space for a diversity of interests (Dubbeling, Merzthal and Soto, 2010). When a government collaborates—preferably from an early stage—with other stakeholders such as citizens, farmers, civic organisations, private companies, and other governmental entities in the preparation, implementation and evaluation of policies and related action plans, we speak of multi-stakeholder policy formulation and action planning (MPAP).

As part of the Cities Farming for the Future (CFF) programme (2004-2008), RUAF implemented Multi-stakeholder Policy Formulation and Action Planning platforms in urban and periurban agriculture (UPA) in 20 cities. The characteristics, benefits and challenges involved in setting up and managing these processes are summarised in this article<sup>1</sup>.



*Meeting of Multi Stakeholder Forum in Pikine, Senegal* (photo: IAGU)

## RUAF's steps toward MPAP

RUAF followed the following general steps in implementing the MPAP processes. The approach was adapted to each local situation. The duration of the MPAP also varied widely, and was influenced by the degree of commitment of the local partners (especially the local government), the complexity of the issues, and other factors. Sometimes tangible results became visible within a relatively short time period (two years), whereas in other cases it took up to four years before things started falling into place.

### Step 1. Development of training materials and training of regional trainers

A set of training materials on the background and different steps of the MPAP was prepared by the RUAF global coordinating group. Around 10 regional trainers were trained in each region on the MPAP and regarding adult-teaching methodologies. Regional trainers were subsequently responsible for organising training for local MPAP teams (see Step 2).

### Step 2. Stakeholder analysis

A stakeholder inventory was carried out and visits paid to key organisations, to gain an understanding of their views on UPA, their mandate, their interests in UPA, actual/planned activities, and available resources.

### Step 3. Key organisations sign cooperation agreement

It proved crucial to establish a formal agreement to ensure participants' commitment to implementing a MPAP. However, this was often very difficult to achieve since at this stage the local authorities and other key stakeholders were not yet always fully aware of UPA and its potentials.

### Step 4. Establishment of the local MPAP team and training in UPA and MPAP facilitation skills

A local MPAP team was formed to implement the subsequent steps in the process. This team included representatives from the local government, researchers and support organisations, and urban farmer leaders. The team was guided by a local RUAF facilitator, who needed to have good facilitation skills (including breaking down prejudices, creating trust and open communication, building commitment, conflict resolution, guiding negotiations). The key objectives of the training were to transfer facilitation skills to the team, increase subject matter knowledge on UPA (types of UPA, associated benefits and risks) and improve skills and knowledge regarding diagnosis of the actual



situation and strategic planning of UPA. Training generally consisted of 10 modules each lasting two days, though each region organised things differently.

#### Step 5. Exploratory survey of UPA in the city

The exploratory survey consisted of a review of secondary data, mapping of actual agricultural land use, a Participatory Rapid Appraisal of problems and opportunities of main urban farming systems, and a critical review of actual policies. In each city the implementation of the diagnosis was organised in a different way. Best results were obtained where the members of the MPAP team themselves realised parts of the study assignments, as this required that their organisations included this in their task description and work planning rather than it just being an extra activity. They were usually supported by hired staff for field data gathering and GIS mapping.

#### Step 6. Building political awareness and institutional commitment (policy briefs, policy seminar, study visits)

Decision makers, municipal and NGO staff, and university representatives in partner cities participated in awareness-raising activities on UPA and MPAP. This helped them gain a better understanding of urban agriculture and its effect on food security, incomes and a greener urban environment. It also reinforced their commitment to the multi-stakeholder planning process. The preparation of the policy briefs based on the local diagnosis and general facts on UPA and discussion of these in a workshop with councillors and high officials of various municipal and national departments and scientists often played a crucial role in this process. But personal contacts with one or more “champions” within the institutions also proved to be very important for enhancing political awareness and commitment.

#### Step 7. Establishment of a Multi-Stakeholder Forum (MSF) on urban agriculture

The composition of the MSF varied, but the core partners in the MPAP team were often complemented by a large number of CBOs, NGOs and other civil society organisations, as well as private actors (usually between 20 and 50). Tasks of the forum included: (1) bridging the communication gap between direct stakeholders and the institutional actors in urban agriculture; (2) functioning as a more permanent platform for information exchange and dialogue; (3) coordinating the planning, implementation and monitoring of a concerted city agenda on urban agriculture; and (4) stimulating the institutionalisation of such activities.

#### Step 8. Strategic planning on UPA

The MSF was given the mandate of developing a strategic action plan based on a common vision of the development of urban agriculture in the city. This was done by (1) discussing the results of the exploratory survey; (2) developing a vision on desired development and role(s) of UPA; (3) identification of key issues to be attended to and changes required and (4) identification per key issue of strategies to be applied, main actors, resources required and potential sources of financing. The strategic planning often was organised as interplay of preparations by the MPAP team (where the work was often



*Seeking commitment with members of the community garden in Lima*  
(photo: IPES)

divided among task groups) and meetings of the wider MSF to discuss proposals and take decisions. It turned out to be very important to apply a systematic, stepwise approach to the planning and to communicate clearly any agreements made with all actors involved in the MSF. Maintaining a certain speed and building up institutional commitments and concrete contributions to the process were crucial.

#### Step 9. Implementation of pilot projects

For each of the cities participating in the RUAF-CFF programme a small fund for local pilot (early implementation) projects was available, to stimulate action orientation and to keep the participants motivated during the strategic planning process. Local partners contributed with half of the project funds. Decisions on activities and actors were taken by MSF, but formulating criteria for approval and technical screening were done by RUAF.

#### Step 10. Formalisation of the City Strategic Agenda on UPA

The joint planning work in the MSF resulted in a City Strategic Agenda on UPA, which then was forwarded to the municipal council or one of the council committees for discussion and approval, so that it could be incorporated in the municipal policies and budget. Adoption of the Strategic Agenda often also led to the creation of a UPA unit with the municipal structure. In Amman an Urban Agriculture Bureau was established within the municipality and urban agriculture land use included in land use planning, with 15% of the new development permits to be given out for green and urban agriculture spaces. In Bulawayo, Zimbabwe and Cape Town, South Africa an Urban Agriculture Unit was established within an existing municipal department, and staff and an annual budget was allocated to this unit.

#### Step 11. Making the City Strategic Agenda operational

Having a City Strategic Agenda on UPA does not automatically lead to change. The vision and strategies identified by the MSF need to be made operational and implemented. To do this, specific projects need to be designed and included in the institutional budgets. In addition, existing policies, laws, norms and regulations have to be adjusted or reformulated. Some examples of the projects on urban agriculture that have already been developed and implemented by the partners in the MSF in RUAF partner cities are:

- Setting up and supporting community gardens and nurseries (Bulawayo, Zimbabwe and Bobo Dioulasso, Burkina Faso);
- Establishing farmer markets (Villa Maria del Triunfo, Peru);
- Promotion of space-confined technologies in school gardens and high-density low-income settlements (Hyderabad, India and Gampaha, Sri Lanka);
- Supporting community based agro-tourism enterprises (Beijing and Chengdu, China);
- Design and promotion of rooftop gardens (Bogota, Colombia).

Examples of policies and plans included the integration of urban agriculture into the city development and zoning plans (e.g. Beijing, China) or into sectoral policy documents (e.g. Ghana, China); the revision of outdated and/or formulation of new bye-laws and ordinances on urban agriculture (e.g. Accra and Bulawayo) and the inclusion of urban agriculture in a City Master Plan (e.g. Ndola, Zambia and Bobo Dioulasso, Burkina Faso).

#### Step 12. Implementation and monitoring of projects by MSF partners

Formalising and making the City Strategic Agenda operational was often a long process that needed continuous attention and encouragement. Partners in the MPAP team tend to return to their normal duties once the City Strategic Plan is on the table, but the proof of the pudding is in making it operational and institutionalising it in local policies, budgets, programmes and land-use planning. In some cities this was done successfully; in others the process slowed down and in one or two cases stopped altogether.

#### Step 13. Periodic meetings of the MSF to coordinate implementation and monitor progress and results

To encourage learning from practice, novel monitoring methods were introduced (process documentation, Outcome Mapping) and the impacts of the pilot projects were monitored, involving a local university.

#### Step 14. Updating the City Strategic Agenda

It is expected that the MSF will revise and update the City Strategic Agenda every 3-5 years, by defining priorities for the coming years and eventually including additional policy goals and strategies. During the implementation of the City Strategic Agenda, new strategic needs or opportunities for development of urban agriculture will emerge, which can be taken up in the City Strategic Agenda. In other cases, monitoring and evaluation showed that the initial Agenda mainly focussed on certain types of urban agriculture (for example the promotion of home and community gardening) and needed to be broadened to also include strategies for the development of other types of urban agriculture.

### **Lessons learned**

We learned that in each city one has to look for the easiest entry point at political level and at the level of the urban community. In some cases local government develops an interest in UPA because it fits well in its social policy, which may involve seeking inclusion of disadvantaged categories of the population and enhancing their food security. In other

cities the interest in UPA is mainly due to its potential contributions to urban greening, recycling of urban wastes, storm water management and adaptation to climate change. And in yet other cities, the attention and cooperation of the local authorities is only likely to be captured when one reveals the potentials of UPA for local economic small-scale enterprises and value-chain development.

Local producer and community groups - who tend to be the city's most excluded groups - need to be recognised as legitimate actors in urban management and decision-making. This in turn can help them to become more professional and accountable in their trade, and thereby increase their contribution to the local economy, through partnerships and alliances with other stakeholders.

Other important elements of a successful MPAP process proved to be:

- Enhancing awareness in participating organisations. Before starting a multi-stakeholder policy and action planning process, one should first reflect on questions.
- Capacity building among stakeholders for the development of participatory processes.
- Continuous building of trust and cooperation among the main actors during the process.
- Policy making as well as joint action planning and implementation.
- Shared budgeting and resource mobilisation.
- Early implementation of initial actions (such as pilot projects, new techniques) at local level.

*The following articles on Belo Horizonte and Gampaha will describe local implementation of an MPAP and outline results obtained.*

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#### **Note**

1) More experiences of RUAF with MPAP is published in:

UAM 16, Formulating Effective Policies on Urban Agriculture, October 2006, RUAF Foundation, Leusden, The Netherlands  
 Dubbeling, M. H. de Zeeuw, 2009. Working Paper 1, Multi-stakeholder Policy Formulation and Action Planning for Sustainable Urban Agriculture Development, RUAF Foundation, Leusden, The Netherlands  
 de Zeeuw H., M. Dubbeling, 2011, Working Paper 3, Cities, food and agriculture: challenges and the way forward. RUAF Foundation, Leusden, The Netherlands  
 Dubbeling, M. H. de Zeeuw, R. van Veenhuizen, 2010. Cities, Poverty and Food ; Multi-Stakeholder Policy and Planning in Urban Agriculture. RUAF Foundation, Leusden, The Netherlands

*All these publications can be found at [www.ruaf.org](http://www.ruaf.org)*



# Creating the Urban Agriculture Forum in Belo Horizonte: a multi-stakeholder experience

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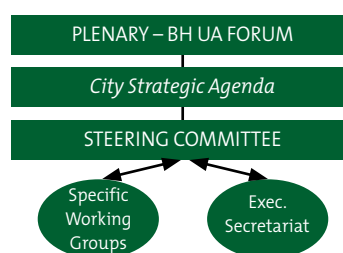
**This paper summarises work attempting to answer two apparently simple questions: Can urban agriculture reduce urban poverty? And, if it can, in what ways can poverty be reduced? It also explores the role of value chain analysis in understanding better the role of urban agriculture.**

Since the election of the first democratic and popular administration in Belo Horizonte (BH), Brazil, in 1993, urban agriculture has steadily increased in this metropolitan area<sup>1</sup>. In 2005, the NGO REDE and the municipality of Belo Horizonte (PBH) worked together in creating the conditions for the RUAF Cities Farming for the Future Programme (CFF). The main result of the CCF Programme in BH was the development of a planning and management instrument, the City Strategic Agenda (or Action Plan) on urban agriculture, which encouraged a dialogue between the public sector and civil society and created space for dialogue and management (implementing, reviewing and monitoring the impacts of the agreed activities).

The multi-stakeholder Forum on urban agriculture in Belo Horizonte was created during CFF and officially inaugurated during the seminar entitled *“Belo Horizonte Farming for the Future: Urban Agriculture as an Instrument for Managing the City”*, on June 2, 2008. It currently consists of 49 institutions.

Management of the Forum is illustrated in figure 1. The **Plenary** is the highest-level decision-making institution, made up of all those interested in working with the Forum. The Plenary approves, monitors and evaluates the Action Plan (or City Strategic Agenda); it further defines the priorities for each biennium, and also elects the Steering Committee and the Working Groups. The **Steering Committee** (*Grupo Gestor*) is made up of institutions selected by the Plenary, together with the Executive Secretariat. It coordinates the Working Groups, implementation of the Action Plan and the various government sectors and civil society groups whose work is related to urban agriculture, whether they are participants in the Forum or not. The Steering Committee is currently made up of the municipality of Belo Horizonte (PBH), represented by the Deputy Municipal Secretariat of Nutritional Food Security (SMASAN) and the Municipal Park Foundation, IPES-

Brazil and the Network for the Interchange of Alternative Technologies (REDE). The **Executive Secretariat** has the role of leading the deliberations of the Plenary and the Steering Committee and mobilising the different institutions to carry out the planned activities and to implement outreach/dissemination efforts. Finally, **Working Groups** are executive and operational bodies related to the strategic objectives of the Action Plan. SMASAN has been serving as the Executive Secretariat since May 2010.



## The Urban Agriculture Action Plan

The Action Plan has six strategic objectives to be reached through operational objectives and strategic actions in the short, medium and long term. It covers a period of 10 years – from 2008 to 2018. The Action Plan requires constant dialogue and planning of actions, so that all those involved can agree on the short-term objectives and seek alternatives as needed.

The Action Plan itself has no specific budget, but consists of actions proposed by the stakeholders of the Forum, which can be already-planned activities or new projects. In the 2009-2010 period, the Forum implemented actions at a total cost of USD 800,000 (see table 1). In addition to the resources listed in the table, the Action Plan is also supported through the efforts and resources of other actors, like the participating organisations of the Metropolitan Urban Agriculture Organization (AMAU), the University of Minas Gerais, other NGOs and departments of the PBH, and through the work done and hours spent by the farmers participating in the productive groups.

Table 1 - Investments in the Belo Horizonte Urban Agriculture Forum– (USD) 2009-2010

Items/ Institutions / Projects	SMASAN (SMAAB)	FPM	Reg. Barreiro Admin.	SWITCH Project	From Seed to Table Project (FStT)	CAAUP-RMBH	REDE	TOTAL
Training	0.00	0.00	0.00	0.00	22941.18	81236.71	74411.76	178589.64
Technical Assistance	128573.60	137031.80	0.00	0.00	48676.47	51550.03	115270.58	481102.48
Monitoring	0.00	0.00	0.00	0.00	20588.24	44673.70	5294.12	70556.06
Inputs and equipment	3716.47	0.00	0.00	0.00	33088.24	0.00	0	36804.71
Infrastructure	0.00	0.00	2328.82	7058.82	0.00	0.00	0	9387.65
Water	4129.41	13764.71	3352.94	0.00	0.00	0.00	0	21247.06
Electric power	3730.24	3867.88	0.00	0.00	0.00	0.00	0	7598.12
<b>TOTAL</b>	<b>140149.72</b>	<b>154664.39</b>	<b>5681.76</b>	<b>7058.82</b>	<b>125294.12</b>	<b>177460.44</b>	<b>194976.46</b>	<b>805285.71</b>
Exchange rate used: USD 1.00 = R\$1.70								

Biannual plans include a prioritised list of activities for each period, and a division of responsibilities among the members of the Steering Committee and other stakeholders participating in the Forum. Each local stakeholder has implemented some activities in the Plan, in line with their own institutional priorities.

In the period 2008-2010, 25 percent of the strategic actions were implemented and 33 percent were in the process of being implemented. Particular progress had been made related to **institutionalising a policy on urban agriculture in Belo Horizonte**. In the period 2009-2010 three proposed laws related to urban agriculture were discussed by the City Council. Law No. 9.959/10, related to the City Conference, a participatory process in city planning, was approved and included a review of the Master Land Use Plan, which recognises urban agriculture as an accepted form of non-residential land use. Law No. 274/2009, on establishing a municipal urban agriculture policy, was discussed in 2009 and 2010 within meetings of the Steering Committee of the Forum, and in an expanded meeting held in the City Council, which led to substantive changes in the proposed law; the revised version was approved on 9 June 2011. Other noteworthy achievements in the area of institutionalisation are the initiative of the Northeast Administrative Regional Office to hold a series of debates about urban agriculture activities in 2010, and the Let Onça Drink Clean Water Movement, which incorporated urban agriculture concepts as one of its main elements for planning land use to revitalise the Baixo Onça stream and to transform the local reality.

Among efforts to **strengthen the organisation of farmers**, AMAU's activities are worth mentioning. Throughout 2010 AMAU had a well-diversified representation, especially among community groups and grassroots organisations, housing movements, land and agrarian reform movements, feminist groups, and permaculture and food collectives acting in eight municipalities in the region. The RUAF From Seed to Table Project (FStT) was able to strengthen production and commercialisation by organising three groups (Jardim Produtivo, Vila Pinho and the Grupo Macaubas/CEVAE Capitão Eduardo) to grow vegetables for municipal public schools. The work was done along with the municipality of Belo Horizonte (PBH), which offered technical assistance, water, electricity and inputs for the groups of urban farmers. The farmers were

registered as micro-entrepreneurs, which provided them with official documentation that made it possible for the public schools to buy their products. This commercial initiative was unprecedented in Belo Horizonte.

With the objective of **training** farmers, public officials, community agents, and the university community in **urban agriculture, agro-ecology and economic solidarity**, the Rede-MG carried out a number of activities under the auspices of the CAAUP-RMBH – Urban and Periurban Agriculture Support Centre of the Belo Horizonte Metropolitan Region. These activities became part of a broad-based and ongoing training programme.

The FStT Project and the CAAUP-RMBH were monitored through the Federal University of Minas Gerais (UFMG), based on the pioneering initiative of the Cities Farming for the Future Programme (CFF). The preliminary dissemination of the impacts of urban agriculture led to the production of academic publications (articles, monographs, master and doctor theses) and specialised journals. The next evaluation of the implementation of the Action Plan on urban agriculture is scheduled to take place by mid-2011, with a municipal seminar, during which participants will evaluate what was done during the previous two-year period (2011-2012) and select a new Steering Committee.

### Lessons Learned

Developing and agreeing on an Action Plan with a variety of stakeholders was an important step in realising collective action that involves civil society and the public sector. The joint definition of priority objectives and actions was important to avoid duplication of efforts and the defence of isolated institutional and organisational interests. In addition, as Lovo (2011) states, the effectiveness of a certain strategic action depends on the interests and priorities of each institution. Therefore, the Action Plan focused not only on collective investments and actions, but also on the activities and priorities of each individual institution. Each organisation incorporated and committed itself to the strategic objectives agreed on within the context of the Forum, thereby maximising the potential of the points of convergence among the different participants, creating synergies, and not emphasising the differences between them. Furthermore, including actions in the short, medium and



long term made it possible to engage in ongoing dialogue and planning, and to focus on the agreed objectives.

The Forum also provided an opportunity to experiment with new ways of relating, primarily through the work of its Steering Committee and the creation of the Working Groups. Especially important is the work of institutions which have historically promoted urban agriculture in Belo Horizonte, but that did not communicate or enter into dialogue with other institutions about their work. However, experiences with the Forum also showed that there are limits in connecting civil society and government, such as those caused by differences in political priorities and expectations in terms of the timelines of project and programme execution. On several occasions, habitual reactions prevailed, such as the authoritarian postures of the government, or civil society merely making demands.

Initially the role of facilitator under the CFF programme (and as continued under FStT) was important, but increasingly the participating institutions themselves became interested in continuation of the forum, and now see it as an important platform for dialogue and planning, as supported by Article 07 in Law 274/2009. However, implementation of actions and spending is still done in an isolated manner in most cases. Each institution applies resources in their area of responsibility, without discussing how to do this within the Steering Committee or the plenary meetings of the Forum. Achieving

a more holistic discussion about the set of activities that each stakeholder carries out could be one way to improve, integrate and maximise the available resources within implementation of the Action Plan for urban agriculture.

One challenge in expanding urban agriculture in Belo Horizonte is to emphasise mechanisms that encourage the involvement of the productive groups, so that they take ownership of the Action Plan and prioritise their participation in its planning, monitoring and execution.

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#### Notes

- 1) It was also around that time that the School and Community Garden Programmes and Pro-Pomar (a programme on fruit trees), all coordinated by the Deputy Municipal Secretariat for Food Supply, were created. Another initiative that stood out at that time (and lasted until 2001) was establishment of the Agro-Ecological Experience Centers (CEVAE), which addressed the challenge of preparing and implementing the local Agenda 21. The CEVAEs received international recognition.

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## National Urban Agriculture Policy and Programmes in Brazil

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*A complete version of this article has been published in the "Zero Hunger" collection, A Brazilian Story, published by the Ministry for Social Development and Hunger Combat, in 2011.*

Urban and periurban agriculture is not new to Brazil. A study carried out in 2007 by IPES/RUAF and REDE for the MDS/SESAN in the 11 Metropolitan Regions in Brazil identified more than 600 experiences, some of them functioning for more than 20 years (Santandreu and Lovo. 2007) and practiced in all the regions in Brazil, in a wide range of contexts. The study also demonstrated that urban agriculture is important at the local level improving food security and nutrition as well as generating employment and income.

Brazilian urban farmers are conventional family farmers – even though many of them are in the process of transitioning to agro-ecological and organic farming (including certification) – located in periurban areas, indigenous and quilombolo groups, poor urban residents located in inner and periurban areas, and especially female heads of household and older adults between 30 and 50 years of age. In Brazil, the government (local, state and federal) is important in financing urban and periurban agriculture experiences, implemented by both municipal governments and by civil society. Community organizations and social movements, who implement urban and periurban agriculture activities by mobilizing their own resources, is also a characteristic of the Brazilian experience.

## The urban and periurban agriculture policy in Brazil

Of the 12 million families attended to by the *Bolsa Família* Programme, more than 7 million live in urban areas, and it is for this reason that its efforts are focused in the cities and metropolitan regions of Brazil. Within this programme and as part of its Zero Hunger strategy, the Ministry for Social Development and Combating Hunger (MDS) implements the *National Urban and Periurban Agriculture Policy* focusing its actions on the urban and periurban population, linking them to its Social Protection Network and its Network of Public Food and Nutrition Establishments, which involves Soup Kitchens, Food Banks, Community Kitchens, Food Fairs and Popular Markets.

The national policy for urban and periurban agriculture is based on the principles of the Food and Nutritional Security Law (LOSAN) and forms part of the recently passed National Policy for Food and Nutritional Security (PNSAN) which promotes the “*development of sustainable and de-centralized food production, extraction, processing and distribution systems based on agro-ecological systems*” in order to strengthen “*family agricultural processes and urban and periurban food production*”

The policy is based on a set of policy principles and guidelines that include: i) promoting the production, processing and commercialization of urban and periurban products; ii) strengthening urban and periurban farmer’s social organizations; iii) high quality training and technical assistance for urban and periurban farmers; iv) training for those that implement policy; v) support for agro-ecology techniques and economic solidarity; and vi) the formation of the Public Services Network.

As from 2006, IPES and RUAF have been in contact with the MDS and have supported the processes of forming and implementing policy together with other national and regional stakeholders, like the NGO Network for the Exchange of Alternative Technologies (REDE) and the FAO’s Regional Office.

The MDS created an office of the General Coordinator of Urban Agriculture, and since 2004 has been funding public tenders which, as of 2009, had resulted in the spending of over US\$34 million on promoting gardens in municipalities (from 2004), implementing Support Centres for Urban and Periurban Agriculture in Metropolitan Regions (from 2008), support for the development of urban agriculture economic solidarity projects with the Technological Incubators of Popular Cooperatives (16 Brazilian Universities) (from 2007), direct local commercialization through Popular Market Fairs (from 2007) and various actions to improve food security in areas that have experienced agrarian reform (from 2005).

The Urban and Periurban Agriculture Centres (UPAC) are important in the implementation of a *decentralized* operational system that supplies services to urban farmers, coordinating initiatives and social stakeholders interested in supporting urban agriculture. A large part of the funds for the UPACs have been used to provide high-quality, free public services for urban farmers, emphasising the social and public nature of the policy, and helping to reinforce the role of the State in policy implementation. The UPACs seek to



coordinate the actions of other stakeholders who carry out interventions at the local level – such as NGOs, universities, research institutes, municipalities and states, among others – who are considered to be policy implementers.

Virtual and on-site training courses have been offered in partnership with IPES/RUAF and the FAO/RLC, designed to improve the capacities of experts and managers who work for the Support Centres and the MDS team.

The *National UPA Group* is a forum for participation and consultation, strategy planning, monitoring and evaluation of policy implementation. It operates in close coordination with the Office of the Urban Agriculture Coordinator and is made up of representatives from the Centres.

Since 2006, the promotion of urban and periurban agriculture has also been part of south-south cooperation. The MDS has been part of the RUAF and IPES Regional Advisory Council for Latin America and the Caribbean, and as part of its outreach activities has participated in International UPA Seminars organized by the FAO, IPES, RUAF and various national and local governments held in La Paz (2007) and Medellín (2009). The MDS presented its experience at the 2008 World Urban Forum in China and co-organized a special event for the 2010 World Urban Forum in Rio de Janeiro in conjunction with the RUAF Foundation, IPES, the World Bank and the FAO. Finally it has carried out technical support actions in the cities of Rosario (Argentina) and Lima (Peru), as well as providing support for the urban agriculture cooperation agreements with the Cuban and Ecuadorian governments.

The design and implementation of Brazil’s urban and periurban agriculture policy demonstrates the importance of developing specific policies, which can contribute to policies already in place, like food and nutritional security policies.

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# Developing Institutional Synergies for Effective Urban Agriculture Development in Sri Lanka

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**Agricultural development towards food, nutrition and livelihood security is high on the political agenda in Sri Lanka. A number of national programmes (e.g. Api Wawamu Rata Nagamu 2007-2010<sup>1</sup> and Divi Neguma) have focussed on achieving greater self-sufficiency at household level in order to reach a higher GDP in the agricultural sector with higher economic returns. Recently, national priorities have included the development of food-secure resilient cities, and in this regard, the Western Province has been a forerunner, having commenced its urban agriculture campaign already in 2000.**

These urban plans have been further strengthened by complementary programmes aimed at curbing the effects of rapid urbanisation (see box 1), high food prices, and extreme climate events. One of the cities in Western Province, Gampaha, was the first start of a process of design and revision of urban and periurban agriculture policies, bringing together stakeholders and partners for synergistic actions and to consolidate the multi-stakeholder action planning process. The RUAF Foundation, together with its regional partner the International Water Management Institute, facilitates these linkages and further development of national programmes on urban and periurban agriculture, through their global programmes CFF and FSSt.

## Urbanisation in the Western Province

*The Western Province of Sri Lanka is the most developed province on the island, contributing 48 percent of the national GDP. It hosts a population of 5.4 million (28 percent), and an additional floating population of 1.5 million. With a population density of 1458 per km<sup>2</sup>, it is one of the most congested regions in the country, and its agricultural land is gradually being lost to development. Increased migration to cities is putting pressure on many*

*sectors, thereby also increasing Western Province's dependency on food from other regions. Rapid urbanisation has also led to an alarming increase in pollution levels. This province accounts for 60 percent of the number of vehicles in the country, 70 percent of industries, 88 percent of thermal power plants, 62 percent of fuel usage, 85 percent of heavy fuel usage and 60 percent of solid waste generation (Manapperuma and Basnayake, 2007). Urban poverty is believed to be rising as well. The province encompasses the administrative districts of Colombo, Gampaha and Kalutara, which together form a commercial hub linked with a major airport and the harbour. It also includes 48 administrative bodies, 6 municipal councils, 13 urban councils and 29 Pradeshiya Sabhas, all of which assist in the administration of their respective levels.*

## Developing a sustainable urban agriculture programme

Selected cities in the Western Province were the first to promote urban agriculture (as early as 2000), when the Western Province's Department of Agriculture launched its home gardens and Family Business Gardens (FBG) programme (Ranasinghe, 2009) to meet the nutritional needs of the population, generate income for underserved communities and contribute to the greening of the city. Utilising horizontal and vertical spaces, the FBG programme introduced the income generation potential of urban agriculture, especially for underserved communities. In one of these cities, Gampaha, with over 300,000 permanent inhabitants and an additional 100,000 who travel daily to the city (DCS, 2001), municipal garbage collection (55 tons per day) was successfully reduced by recycling fresh organic waste for floriculture and home gardens (Amerasinghe, 2010). The FBG and RUAF programmes





*The Minister of Agriculture of Western Province, Hon. Udaya Gammanpila, visits an urban garden in Colombo (By IWMI-India)*

have promoted the introduction of awareness and educational programmes in schools on how home gardening and food security can contribute to a clean, green and food-secure city. Positive results have been achieved by establishing school gardens, which serve as models to encourage students to participate in agricultural activities from a young age. A government-led initiative has provided over 1100 families living within the city of Gampaha with inputs for home gardening, while an additional 25-30 families are estimated to practice more commercial (small-scale) forms of agriculture (personal communication Department of Agriculture, 2009). Gampaha's poverty indicators are among the lowest in the country (8.7 percent; DCS, 2008), but urban poverty is rising (Sunday Times, 2008; DCS, 2008). Since 2005, RUAF has assisted in establishing a process of institutionalisation of urban agriculture, which involves strategic steps to consolidate the ideas across the participating sectors and bring about policy change/revision, first under the CFF programme (see box 2) and later under the FStT programme (see box 3). These activities have been coupled with the development of marketing capacities among urban farmers, a group often neglected in agricultural development.

#### **RUAF, Cities Farming for the Future (CFF), 2005–2008 main activities**

- *Formation of a Multi-Stakeholder Forum (MSF): Gampaha Nagarika Haritha Balakaya – Urban Green Force*
- *Situation analysis – identifying issues for a clean and green city*
- *Staff training – assessing the urban context (PRA, GIS, policy review etc.)*
- *Strategic planning – institutional collaboration and CSA road map*
- *Demonstration projects – Gampaha city (pilot), Colombo city (dissemination), home gardens for city dwellers including underserved communities*
- *Special projects – budgets for urban agriculture activities (waste recycling, compost making, up-scaling of home gardens)*

#### **The City Strategic Agenda – A five-year plan**

Under the RUAF CFF Programme, the Urban Green Force (the core team in the MSF) developed the City Strategic Agenda

(CSA) on Urban Agriculture (Amerasinghe, 2010). It identified four major objectives:

- Promote and support a culture of sustainable urban agriculture in Gampaha municipality.
- Revitalise the (abandoned) paddy farming systems; develop strategies to improve productivity through innovative farming practices that harmonise with nature; and improve access to paddy lands for those who are keen on farming.
- Reduce environmental pollution and health concerns through proper management of the city's drainage infrastructure.
- Strengthen marketing of urban agriculture products – both within and outside the city.

The CSA outlined different interventions and activities for each of these objectives, delegated responsibilities and identified local as well as external funding sources. The agenda was formally accepted by the MSF steering committee in April 2009.

#### **RUAF / From Seed to Table (FStT) Gampaha, 2009–2010 main activities (also see articles in this issue)**

- *Institutionalisation of the MSF and adoption of the City Strategic Agenda*
- *Development of policy statements*
- *Strengthening of farmers' organisations and their marketing capacities*
- *Formation of urban agriculture producers' organisation – Seemasahitha, Krishi Nishpadana Samagama*
- *Green Agro Products: organisational strengthening, credit and financing systems, marketing strategies*

*The RUAF-FStT programme was launched - by IWMI India and Practical Action<sup>2</sup> - with two aims: 1. Institutionalisation of an MSF on urban agriculture, leading to development and implementation of a CSA. 2. Strengthening of farmers' organisations and their marketing capacities. Comprehensive discussions led by the MSF and experiences gained by adopting the CSA have highlighted vital policy issues related to promoting urban and periurban agriculture in the cities. Forming a producers' organisation to strengthen marketing capacities for urban and periurban agriculture was a novel concept. The formation of Seemasahitha, Krishi Nishpadana Samagama – Green Agro Products of Gampaha was highly successful owing to the strategic planning implementation processes in the key areas of organisational strengthening, credit and financing systems, and marketing strategies.*

#### **Policy statements formalised at provincial level**

RUAF and its partners have facilitated the operationalisation



of urban and periurban agriculture activities at national and provincial level. Urban and periurban agriculture is mentioned in three national (agricultural) policy documents, with special reference to the establishment of city home gardens and provision of the necessary capacity building support to women in cities (Ranasinghe, 2009; Amerasinghe, 2010). In this context, several promotional activities, including awareness and training programmes, have been developed by the Department of Agriculture under various funding schemes. Unfortunately, the approach to date has been mostly project based with limited focus; and as a result many issues related to urban and periurban agriculture have not been dealt with in a comprehensive way.

Newly proposed policy statements, however, point to the need for action in a wide variety of areas that encompass the requirements of urban and periurban development in the country. Specific features, such as limited space, use of common land, availability of different low-space technologies, recycling of household waste and water, and disease and pest problems have been discussed at length by a special committee of the provincial council. Stakeholders have also debated special needs at a provincial level and policy statements focussed on urban agriculture have now been approved by a cabinet of provincial ministers, which allows the adoption of these policies within the province (pending gubernatorial approval). Adoption of these policies will require interactions between various institutions and stakeholders, as illustrated in figure 1. The Western Provincial Council has identified a process for incorporating these policies into the National Policy on Agriculture; and debate on this issue is expected to take place in the near future.

The following urban agriculture policy statements have been approved at the provincial level.

1. Improve urban/periurban agriculture using modern and traditional technologies to enhance nutritional security, household income and livelihoods of urban people.
2. Strengthen urban/periurban agriculture activities through government/non-government/private partnerships.
3. Apply eco-friendly technologies in urban/periurban agriculture: recycling of garbage for compost production, safe use of city water, reuse of city water after purification, harvest rainwater, optimal use of vertical and horizontal spaces.
4. Utilise unused spaces to improve urban/periurban agriculture – urban houses, government premises, schools, army camps.
5. Develop credit and finance facilities and insurance schemes for urban agriculture activities.
6. Promote the sale of produce through agri-tourism.
7. Include urban agriculture in the curricula of primary, secondary and tertiary education programmes.
8. Develop local and international entrepreneur programmes to improve urban/periurban agriculture.
9. Form multi-sector institutional support systems.

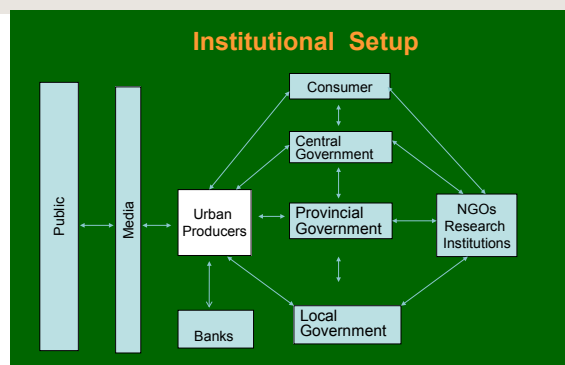


Figure 1: Interactions between institutions and stakeholders required for the successful adoption of urban agriculture policies

## Conclusion

Adoption of urban and periurban agriculture policies at different levels of government is key to establishing sustainable programmes within countries. Such policies enable easy access to funds within provincial or national systems, as they identify key areas of economic development. Good policies can only be developed if viable processes are institutionalised and lessons learned from on-the-ground experiences. The Gampaha programme highlights key steps that need to be taken, and how synergies can be built to complement the expertise of diverse sectors that need to come together for successful adoption of policies within a city environment. This case also demonstrates that the city municipality, as a service provider to urban residents, can play a pivotal role in providing complementary support for urban agriculture practices, especially in waste recycling. Convincing multiple sectors, identifying a champion and funds, and close supervision stand out as being very crucial. Finally, the involvement of key decision makers from the very start streamlines the process.

### Notes

- 1) <http://www.mimrd.gov.lk/pages.php?page=40> - accessed on 21 September 2011
- 2) <http://practicalaction.org/sri-lanka>

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# Agromere: Integrating urban agriculture in the development of the city of Almere

J.E. Jansma  
A.J. Visser

The objective of Agromere, a planning concept for an area situated in the rapidly growing Dutch city of Almere (185,000 inhabitants), was to explore opportunities to re-integrate agriculture into modern Dutch city life, while at the same time inspiring stakeholders to incorporate urban agriculture in the city's actual development plan. Through a combined stakeholder and design process, a virtual city district on 250 ha was designed which integrates living space (for 5,000 inhabitants) with urban agriculture. This concept design contributed to the municipality of Almere's own development plan, which was launched in 2009. The city's plan highlights urban agriculture and is in this regard a unique system innovation in Dutch urban planning.

## Agriculture and the city

Since WWII the main Dutch spatial planning policy has been to concentrate or cluster urbanisation, with the aims of keeping the landscape open and undeveloped, limiting travel distances and supporting amenities (Van Remmen and van der Burg, 2008). This policy has led to extremely sharp fringes between city and countryside and a growing (mental and physical) distance between the city (and its citizens) and the countryside (and its agriculture). Consumers in the city have become estranged from food production, nature and the basic values of rural life, such as quietness, darkness and the rhythm of the seasons, while farmers in the rural areas produce food and products for the world market with hardly any connection to their neighbouring cities (Slingerland *et al.*, 2003).

Urban agriculture produces food and food-products within the city, or in the city's fringes and simultaneously provides non-food products and services for city dwellers (Mougeot, 2000). It is as old as our cities, but lost its role in the 19th century mainly due to new means of conservation and transportation of food (Steel, 2008). In our modern world, urban food production is receiving increasing attention once again in both developing and developed cities worldwide, including in the Netherlands (Van der Schans, 2010; Van Veenhuizen, 2006). In addition to its importance for food



*Less than 10 percent of the municipality of Almere is still in agricultural use, and this percentage is decreasing rapidly (By Arjan Dekking)*

production, urban agriculture can have an added social, economic and environmental value. Urban agriculture operates within the urban system, and the resulting connection between the city and urban agriculture benefits both city inhabitants and producers (Visser *et al.*, 2009).

The innovative design of Agromere, in the Dutch city of Almere, shows that it is possible to re-integrate agriculture in city development in the Netherlands and thereby contribute to a more sustainable and liveable city.

## Almere

Almere is a new and rapidly growing suburb, 30 km east of Amsterdam, with 185,000 inhabitants in 2009 (figure 1). The original poly-nuclear design of Almere is unique in the Netherlands. Implemented in the 1970s, it consists of a city centre surrounded by several satellite towns, between forests, parks, canals and ponds. Urban agriculture was also part of the original design (Zalm and Oosterhoff, 2010). This poly-nuclear structure is still evident today, and the city has much more green and blue within its borders than average Dutch cities, but urban agriculture was never developed properly, aside from one commercial city farm in the city's fringe (figure 2; Dekking *et al.*, 2007).

Almere is expected to expand to 350,000 inhabitants by 2030 (and become the fifth largest city of the Netherlands), because of the growing need for new housing in the Amsterdam area and the absence of locations on which to build. In its plans for this large-scale expansion, the city council of Almere included ecology and sustainability as central themes. The so-called *Almere Principles* (Almere,

2008) consist of seven starting points for sustainable urban development: cultivate diversity, connect place and context, combine city and nature, anticipate change, continue innovation, design healthy systems and empower people to make the city.

Northeast of Almere 15,000 new houses are planned on approximately 4,000 ha, which is now fertile agricultural land (figure 3). In this so-called Almere Oosterwold area about 50 farmers, mostly large-scale arable and dairy farmers, currently produce for the world market. Part of this land belongs to the neighbouring municipality of Zeewolde.

### Stakeholders

Agomere started in 2005 as a research project but evolved into a combined design, research and stakeholder process. The objective was to explore opportunities to re-integrate agriculture into modern city life in Almere, while simultaneously inspiring the city council of Almere and local stakeholders to include urban agriculture in city development plans. In this project it was seen as essential that all key stakeholders participated right from the beginning and fully contributed to the final results. We used different methodologies and approaches in the consecutive phases of the DEED framework: **Describe**, **Explain**, **Explore** and **Design** (described in: Visser *et al.*, 2009).

We combined the DEED framework with the stakeholder management approach (Freeman, 1984), which involves communicating, negotiating, contracting, managing relationships and motivating. The stakeholders involved in the Agomere process were representatives of local farmers (of the Almere Oosterwold area), the city councils of Almere and Zeewolde, the province of Flevoland, nature and environmental organisations, the board of small and medium-size businesses in Almere, the Ministry of Agriculture and commercial city developers.

### The design of Agomere

Before starting the design process, a number of design principles were developed and agreed upon with the stakeholders (see box).

#### Design Principles

1. Nutrient cycles both within the farming systems and the urban systems have to be closed.
2. Energy must be produced locally, resulting in a climate neutral or an energy-producing district.
3. For the calculation of the different farming systems we assumed that 50 percent of the produced food and food products could be consumed in the district.
4. The district will not be an autarky for human food or animal feed.
5. Traditionally in any new district, a large part is reserved for public green areas and public services like schools,

*shopping malls, elderly care, etc. In the Agomere approach, the public area will be used for urban agriculture. Therefore urban agriculture has to provide these facilities.*

6. Housing and agriculture are integrated in this concept. Production and processing of food is therefore located directly next to the area's inhabitants, leading to the assumption that organic farming is more appropriate to Agomere.
7. Since the farms exchange material, the consequence of principle 6 is that all farming systems should be organic.
8. Farms are commercially healthy enterprises exploited by entrepreneurs.

Based on data of average district sizes in Almere (provided by the municipality of Almere), Agomere was designed as a city district of 250 ha with an area of 70 ha for houses and infrastructure, and 180 ha for agricultural activities. The district would cater for approximately 5,000 inhabitants (or 2,300 households) resulting in 30 households per ha, which is a normal figure for new districts in the Netherlands.

We designed four different urban farms, based on the households' needs for food and other products. The reference point used was the daily food intake of an average Dutch person (Van Akker, 2006; CBS, 2009). The production of fresh vegetables was the starting point for the urban agriculture design. The farms would use or reuse rest products, labour, raw materials and waste. A large part of the produce would be sold directly to customers through the common local supermarket. The farms would potentially earn more than similar farms producing for the world market, mostly because of higher prices paid to the producer (due to shorter supply chains and distribution channels) but also because they could generate additional income through the provision of services such as energy, elderly care, recreation and education. The four farms were designed as follows:



*The urban farm of Almere focuses on maintaining a good relationship with city dwellers* (Photo Arjan Dekking)





*An additional 15,000 new homes are planned for Almere Oosterwold, northeast of the city, and currently occupied by arable and dairy farmers that produce largely for the world market (Photo Jan Eelco)*

#### *Vegetables and fruits, with chickens and cereals*

Based on the average consumption of 5,000 inhabitants, approximately 9 ha of vegetables and 4.5 ha of fruit would be sufficient. To maintain a good crop rotation, the farm would also cultivate cereals, which would be fed to the hens (the manure of which would be used to fertilise the vegetables crops). The number of chickens kept would depend on the volume of cereals grown in this system, but the result would be one egg for each citizen every week. The total area of the vegetable and fruit farm would be about 25 ha.

#### *Greenhouses, with community services*

With new technologies, modern greenhouses could become net energy producers. It was calculated that approximately 6 ha under glass would be needed to meet the energy needs of the 2,300 households in Agromere. Of this area, 3.5 ha would be used for the production of vegetables and flowers, while the remaining 2.5 acres would be used for community functions like the elementary school, a restaurant, a meeting place, etc.

#### *Arable farming with beef cattle*

The scale of arable farming would be determined by the need for two basic food products: bread and potatoes. Based on average consumption, approximately 15 ha of potatoes and 45 ha of grain would be needed to cover the district's needs. The mineral demand (manure) of both crops would determine the number of beef cattle (approximately 150 adult animals) on this farm. The forage for this livestock would come from outside the district (a nearby nature reserve). The rest product of the grain crop, straw, would be used in the barn. Together with land for the two crops and a livestock stable this farm would need 61 ha.

#### *Dairy and community services*

The remaining 88 ha designated for agricultural activities

would be used for an animal husbandry farm with dairy cattle (approx. 60), sheep (approx. 70), goats (approx. 120) and riding horses (approx. 40). Milk production on this farm would be sufficient to meet the district's need of fresh dairy products like milk, butter and cheese. These 88 acres would not be sufficient to meet all the forage needs. Part of the forage for the livestock would be collected from the commons in the district and from outside the district (a nearby nature reserve). Besides production, the farm would have an educational purpose and could deliver all kinds of services for the district and people living in or visiting the district.

### **Discussion**

The design of the virtual district of Agromere is shown in figure 4. Because all stakeholders were involved from the beginning, they remained fully committed throughout the design process. All stakeholders present at the final workshop stated that the most important result was the development of and consensus regarding design principles, which ultimately influenced the municipality's development plans for Almere Oosterwold.

Like many multi-stakeholder processes, the Agromere project required careful, solid and energetic management. At the start, stakeholders were not familiar with the idea of urban farming nor the role it could play in urban planning. The DEED framework was helpful in structuring this multi-stakeholder process. A key step was the stakeholder analysis, which identified each stakeholder's interests and motivations so that solutions could be provided that link urban agriculture to the interests of these stakeholders. For instance, the city's budget is heavily burdened by the need to maintain city greenery. We showed that urban agriculture could be part of the city's green environment, resulting in lower management costs. The farmers in Almere Oosterwold also want to continue their farming activities. Normally city

development would force farmers to move, but the Agromere concept shows the opportunities offered by urban agriculture, and how the farms could be adapted in order to stay in the region and maintain their agricultural activities. All stakeholders in the area now recognise the added value of urban agriculture and are committed to the concept.

Installation of a new city board in 2006 provided an unexpected advantage for the Agromere project. The new ambitious alderman responsible for the city's development plans became the initiator of the Almere principles. Right after taking office, he was presented with the first copy of a brochure on the Agromere project. This intervention, and his speech afterwards, in which he embraced the idea of reconnecting city and farming, were crucial in generating more support from the city's civil servants.

The design of Agromere inspired the city planners to include urban agriculture in their plans for the Almere Oosterwold area. In the draft Strategic Vision for Almere (called Almere 2.0), urban agriculture is highlighted as one of the driving forces for the Almere Oosterwold area (Almere, 2009). The city's ambition is to develop this area towards a so-called continuous productive urban landscape producing food, energy, resources and water within and for the city (based on Viljoen, 2005). Through entrepreneurship and citizens' initiatives this conventional agricultural polder area should be transformed into a rural urban area by 2030 (Van Oost and De Nood, 2010). This would make Almere Oosterwold a unique innovation in Dutch urban planning. The city of Almere is now developing a strategy to realise this transfor-



*An artist's impression of the Agromere district* (By Emiel Geerding and Mieke Vuijk)

mation. Part of this development strategy will be the design of the infrastructure needed to realise the ambition of local food production and distribution, local energy production and the reuse of waste.

The Agromere project is finished, but the promotion of urban agriculture in the area continues through the Development Centre for Urban Agriculture (in Dutch: Ontwikkelcentrum Stadslandbouw Almere) established in 2011 by a group of stakeholders. Its ambition is to direct, initiate and connect initiatives in order to stimulate further development of urban agriculture in Almere.

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# Financing Urban Agriculture: Current challenges and innovations

Yves Cabannes

Urban agriculture requires financial and political legitimacy to increase its contribution to feeding cities. While there is increased political support for urban agriculture in many parts of the world, financial support for urban growers remains quite limited. Most urban producers lack access to credit and investment schemes and develop their activities with limited resources. From 2008 to 2010, local teams from 17 cities in the “Global South” carried out applied research, coordinated by the RUAF Foundation, on financing of small-scale urban and periurban agriculture.

This paper focuses primarily on innovative ways that the cities and some actors such as farmers, producers’ organisations, local governments, micro finance institutions (MFI), banks and NGOs are facilitating small-scale urban producers’ access to financing. The full synthesis of the research findings will be published in the near future, which will be announced on the RUAF web site.

Three key issues were examined in the 17 cities:

- (i) How public and private institutions finance, or could possibly finance, urban agriculture.
- (ii) Needs and demands for finance from urban poor engaged in urban agriculture, agro-processing or marketing. A central objective was to understand how and through which mechanisms these urban farmers all along the value chains are financing and expanding their activities.
- (iii) Ways to bridge the gap between existing and potential financial resources (the *supply* side) and the needs and demands of small-scale urban farmers (the *demand* side).

## Background

The cities studied are a selective sample of primarily large cities where some form of urban and periurban agriculture is being practiced (see figure 1). Most of these cities have a population beyond one million inhabitants (Bulawayo, Accra, Ibadan, Amman, Sana’a, Cape Town, Belo Horizonte, Freetown) and four of them are megacities (Bogota, Lima, Shanghai, Beijing). Apart from the small municipality of Magadi, at the periphery of Bangalore, the remaining cities have between 500 000 and one million inhabitants (Ndola, Bobo Dioulasso, Porto Novo, Gampaha).

Most of the cities are either national capitals (Accra, Aman, Sana’a, Porto Novo, Bogota, Lima, Freetown, Beijing) or regional ones (Ibadan, Bulawayo, Ndola, Cape Town, Bobo Dioulasso, Belo Horizonte and Gampaha). Districts from Shanghai (Minhang), Beijing (Huairou, Tangzhou) and Magadi were chosen because they are positioned at the periphery of large metropolises and offer a more periurban perspective.

In this article, the concept of financing is not limited to micro-credit or credits delivered by banks and MFIs, as is the case in most of the scarce existing literature. *Financing is considered here as a highly complex and changing combination of: resource mobilisation, both monetary and non-monetary + savings + subsidies + credits.* One central argument is that this equation needs to be taken into account and serves as a basis for any consolidation of the financing system for urban agriculture. Approaches only focusing on credit are very limited and may only be useful for a small minority of the various producers.



*Women farming group in Freetown, Sierra Leone who should be eligible soon to a loan, once they got a collective lease from the Government*  
(Photo Marco Serena)



The lessons learned from the study are divided into two parts: those related to the practices of public and private financing institutions, dealing essentially with credits and subsidies, and those related to the practices of urban farmers for resource mobilisation and savings.

### 1. Credits and subsidies

Based on the results of the study, three main conclusions can be drawn regarding the practices of public and private financing institutions.

a) Based on the results of a previous UN Habitat / UMP / RUAF investigation of 13 cases (also located on the map<sup>1</sup>), it was originally assumed that credits for urban agriculture were the exception and not the rule. But the more recent study showed that micro-credits for small-scale urban farmers do exist in various cities even if they are generally limited in scope and in number. Moreover, they are granted mostly for commercially oriented activities such as raising animals, agro-processing or marketing. These loans are relatively common in, for instance, Lima, Ibadan and Amman. This unexpected conclusion deserves further research.

(b) However, most credit institutions are reluctant to give loans to urban farmers for a long list of (good and bad) reasons (the details of which will be in the full report). The most common reasons given are: (i) a high rate of default; (ii) too-high risk because of possible crop failure, essentially for climatic reasons (e.g. Gampaha); (iii) limited financial management capacities of farmers (e.g. Ndola) and (iv) lack of proper title deeds or collateral.

(c) One conclusion common to various cases is that high interest loans provided by MFIs and conventional banks have had limited positive impact on the situation of poor farmers shifting from subsistence to more market-oriented activities. Central and local governments play a major role in the success and failure of city-level financing systems for urban agriculture. Their role is primarily to deliver subsidies (in some cases of significant value, such as in Cape Town). One key finding is the creative range of ways through which local



Seville, Community gardens in low income neighborhood, have received support from municipality, through the participatory budgeting process (Photo Yves, Cabannes)

governments are using their scarce resources. In addition, they tend to play a role in setting up public finance strategies covering a wide range of financial interventions that complement the banking and micro-finance system. Some of these interventions are presented below.

### 2. Urban farmers' financing practices

A first key finding is that most poor urban farmers stand outside the formal institutional landscape. They usually self finance their activities through a rich array of solutions:

- (i) Loans from families and friends, or (less commonly) from remittances sent by some members of the family working abroad.
- (ii) Rotating savings systems are present under different names in different cities. Called *tontines* in Porto Novo, Osusu in Ibadan, *group savings* in Bulawayo or *banquitos* in Lima, they share the same basic principles with some local variations: small groups of persons saving; voluntary adhesion; each member receives the sums saved on a weekly and fortnightly or monthly basis.
- (iii) Cross subsidies from one item that is highly valued in a specific period (for instance raising and selling goats in Sana'a), which makes it possible to take risks on less profitable or risky products. These forms of multiple commodities produced at the same time on a family scale recall the quite resilient and traditional polycultivation and animal raising (polyculture /élevage in French) of family-based rural farming systems.
- (iv) Informal credits from input suppliers of seeds, pesticides or fertilisers who are willing to receive payment once the products are sold.

A second key finding is that urban farmers, in most cities, express a high level of need but at the same time are quite reluctant to ask for loans or even subsidies (where available). There are many reasons for this expressed by the urban farmers, the most important of which are briefly mentioned below:

- (i) The loans offered are generally not adapted to agricultural and animal raising cycles: *"the loans to be paid back in one year are not sufficient for livestock (Beijing)"; "timing is too short for reimbursement, and too long to be made available"* (Bobo Dioulasso - referring to the need for resources at a specific sowing time in the year, usually at the beginning of the rainy season).
- (ii) *"Too much bureaucracy"...."the process is onerous"...."lots of paperwork"...."no clear procedures"* are opinions expressed in cities as different as Porto Novo, Ndola, Sana'a and Bobo Dioulasso, highlighting the difficulties encountered with financial institutions.
- (iii) It is impossible to get loans without formal land titles required by banks as collateral or a guarantee. This was expressed by urban farmers in a large number of cities such as Magadi, India. Farmers are reluctant to apply for "impossible loans" or even subsidies that might require a proof of ownership of the land cultivated, which poor farmers usually do not possess.
- (iv) Much too high interest rates, primarily those imposed by MFIs, is a recurrent argument, even if some of the

loan takers accept the rates due to a lack of other options. Interest rates as high as 60 percent per year are offered in Accra, making it quite difficult for a poor urban farmer to reimburse the loans.

- (v) Loans are not small enough: for instance in Bulawayo, urban farmers report that the loans offered start at 1000 dollars and are therefore beyond the farmers' repayment capacities. Similarly, other farmers argue that the financial products offered are not in proportion to their (limited) incomes.
- (vi) Many of the interviewed farmers are reluctant to engage because of their limited capacity to complete funding applications, whether to obtain subsidies or a loan. For instance, the Freetown report indicates that "there is a lack of knowledge on how to obtain credits".

### 3. Bridging the gap between limited demand and restricted offer

In several of the 17 studied cities and in various more beyond the scope of the study, quite innovative solutions are currently improving the access of poor urban farmers to finance as it is defined below:

*Urban agriculture finance = monetary and non-monetary resource mobilisation + individual and collective savings + subsidies in different forms + micro-credits and conventional loans.*

These local experiments relate to the financial sector itself and to the enabling environment.

#### *Improving the financial sector*

The study documented five cutting-edge innovations for the financial sector itself. They are briefly mentioned here and will be more developed in the final report.

- (i) Diverting or channeling **mainstream financial resources** to urban agriculture. Particular emphasis is given to four different sources:
  - a. rural agriculture loans;
  - b. housing loans and subsidies, to be used for the development of "productive" housing, encompassing the house itself as well as its immediate productive surroundings, e.g. a garden to cultivate vegetables or sheds to raise animals or develop home-based agro-processing activities.
  - c. income-generating and job-creation loans and subsidies that marginally benefit the urban farmers;
  - d. slum improvement resources and programmes that again very rarely consider urban agriculture.
- (ii) **Evolutionary loans** with decreasing levels of subsidies that allow the urban farmer to pass through a couple of lending cycles from a high level of subsidy to a conventional banking loan.
- (iii) Creation of **community banks** and creation of **local and regional currencies**, such as the Banco Palmas, in Fortaleza Brasil (<http://www.bancopalmas.org.br/>).

- (iv) Credits for consumption (in local currencies) of locally produced or transformed food, such as in the case of the Banco Palmas. These credits were crucial to generate a locally sustainable financial system and are unfortunately very rare.

#### *Generating an enabling financial environment*

These innovations, despite not being of a financial nature, do have a direct impact on the sector:

- (i) formal organisations and confederation of the various productive sectors
- (ii) security of tenure
- (iii) technical support (formulation of business plans)
- (iv) participatory budgeting
- (v) urban agriculture insurance system.

#### *Formal organisations and confederations*

One of the challenges faced by urban farmers and producers is that they are often not legalised and considered informal. As a result they are not eligible for support from most of the formal banking systems and public institutions.

*Agrosilves*, an organisation that represents a couple of hundred pig raisers in metropolitan Lima (see also article on page 56) has been successful in attracting the attention of two banking institutions and negotiating individual loans as a result of a collective approach. The credit institutions recognise the benefit of getting a critical mass of clients already "pre-selected" by Agrosilves. One of the most difficult obstacles to obtaining a mortgage is getting a proper land title that will guarantee the loan. This requirement can be by-passed in this case as Agrosilves issues a certificate of residence that is accepted as a proxy by the banks.

In the city of Ibadan, Nigeria, 21 of the 28 sectors that compose the All Farmers Association of Nigeria are locally organised in "*commodity associations*". These associations provide the farmers with increased legitimacy, while at the same time identifying specific risks and specific financial needs of the different producers in terms of amount of loans, possible guarantees offered, grace period or duration of the repayment in relation to the cycle of production. Becoming organised is seen as important not only by the urban farmers themselves, but also by public and finance institutions.

#### *Security of tenure*

The lack of formal land titles appears to be one of the key obstacles to increasing the accessibility of urban farmers to finance. An on-going practice developed in Freetown, Sierra Leone, is a good example of how to address this bottleneck. "*The Freetown Urban and Peri Urban Agriculture Forum, involving key political institutions, credit institutions and farmers, designed an innovative financing mechanism in 2010. The new programme relies on authorities for the permanent allocation of valleys, slopes and low lands for UPA use. Land is allocated to registered and functioning farmers' groups for a period of five years for a token rent provided that they abide by the Agreement regulations. The group receives technical training and monitoring and, for farmers' groups participating in the scheme, four credit institutions (First*



*Farmer group in Freetown* (Photo Marco Serena)

*International Bank, Access Bank, Luma Micro Finance Trust Limited, Salone Micro Finance Trust*) have agreed to accept such land agreement together with the group's existing savings or current account as collateral for two purposively designed credit products (Personal comment, Marco Serena, 2011). The first is a microcredit of between 100 and 400 euros (repayment period 1 year); the second is a loan between 1000 and 2000 euros (repayment period 2 years) with a yearly interest rate of 24 percent. The number of households that could potentially benefit from the scheme once fully established is estimated at 2500."

#### *Positive impact of technical support to urban farmers for formulation of business plans*

One of the main reasons urban farmers are reluctant to try to get loans is their limited capacity to put together an application and more importantly a business plan that does not go against their own interests. At the same time, the financing institutions repeatedly mentioned the limited capacities of urban farmers at that level. The RUAF FSST programme, such as in Porto Novo, Benin, addresses this need. As a result, a first batch of 19 loans was approved by a locally established MFI to around 130 tomato growers.

#### *Participatory budgeting*

Participatory budgeting (PB) is a mechanism (or a process) by which the population defines the destination of part or all public resources<sup>2</sup>. It emerged in 1989 in Brazilian municipalities, of which Porto Alegre became the most emblematic. By 2010, at least 1400 municipalities in more than 40 countries had adopted PB as a means to define their financial priorities.

Some cities, such as Seville in Spain, Rosario in Argentina and Porto Alegre in Brazil have included urban agriculture projects as part of their chosen priorities. The results have been excellent as PB is a way to finance urban agriculture in a regular and endogenous way. This approach thus deserves much greater attention. The most interesting aspect is that PB offers a permanent and endogenous source of funding for organised urban farmers to finance what they exactly want and need.

#### **4. Concluding remarks and looking forward**

Findings from the research in 17 cities confirm and expand on previous findings in 13 cities, and can be summarised as follows: financing urban and periurban agriculture, in its broader

sense, is and will be a major bottleneck to maintain, expand and scale up affordable and accessible food production in cities. Therefore, governments, banks and International aid agencies need to support urban farmers, all along each one of the steps of the value chain. They might want to concentrate on supporting, consolidating and transferring the innovations that are currently taking place in various cities and that are quite promising for the future.

On the other hand, urban and periurban agriculture cannot survive only through market forces. It needs serious support, which does not exist today. Therefore strategic decisions with a strong financial significance should be taken. For example: (i) national and municipal urban agriculture policies should have a strong and clear subsidy component aimed at unlocking the key bottlenecks of the finance system; (ii) specialised training courses and modules, both academic and vocational on the financial dimension of urban agriculture should be put into place as they do not exist today; (iii) support should be provided for the creation of a powerful funding facility (at RUAF international level) that could channel a mix of funding and subsidies to the sector, including small grants for subsistence agriculture, revolving local funds, grants for technical advice and support to business plans, guarantee funds and insurance facilities.

These steps are needed to effectively expand urban and periurban agriculture and increase the capacity of cities to produce affordable nutritious food, not only for those who are better off, but also for the poor and the oppressed.

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**RUAF Board member**

#### **Notes**

- 1) Cabannes Yves, Financing and Investment for Urban Agriculture, Chapter 4, pp 87-123 (incl. cases), in: *Cities Farming for the Future, Urban Agriculture for Green and Productive Cities*. Edited by René van Veenhuizen, 2006, Leusden, Netherlands
- 2) Cabannes, Yves. 72 Frequently Asked Questions About Participatory Budgeting. Quito, 2004, UMP-LAC, UN-HABITAT, UNDP, 46p, downloadable from <http://ww2.unhabitat.org/campaigns/governance/documents/FAQPP.pdf>



# Effects of the Global Financial Crisis and Food Price Hikes of 2007/2008 on the Food Security of Poor Urban Households

Henk de Zeeuw  
Gordon Prain

**The financial crisis of 2007/2008 had far-reaching impacts on developing countries, especially in cities which are more directly embedded in the global economy. Declining economic activity, negative effects on the terms of trade with the rich world and consequent job losses, as well as reduced remittances from family members working abroad, disproportionately affected urban households (Natali 2009).**

In 2009 the International Development Research Centre (IDRC), UN-HABITAT and the RUAF Foundation agreed to cooperate in a study whose aims were to:

- generate data that can help determine:
  - o the extent to which the financial crisis and rising food prices impact on malnutrition levels in cities, and
  - o the way national and local policy and institutional contexts have been mitigating or exacerbating problems of food insecurity;
- provide local actors with valuable information for the design of adequate policies and programmes to counteract the effects of the financial and food crises.

## Background

The recent financial crisis came at a time when most countries were struggling with the impacts of sharply rising food and fuel prices. Despite the decline in international cereal export prices from their peaks in the first half of 2008, improved cereal production in 2008 and policy responses by governments, food prices have remained at high levels in many developing and low-income, food-deficit countries compared to midway through the decade. As of December 2008, the World Bank estimates that the high food and fuel prices alone have increased the number of extremely poor in the world by at least 100 million (Baker, 2008, Cohen and Garret, 2009). In most cases, domestic food prices remained higher after the peak in 2008 and subsequent price spikes occurred in late 2010 and early 2011 with food prices now above the peak level of 2008. According to a recent report by OXFAM (Hossain and Green 2011) the recent price hikes had

more uneven effects than during the financial and food crises of 2008, especially adversely affecting badly those that had been already hit by the 2008 crises.

Although hunger is most often associated with low agricultural output, drought and famine in rural areas, UN-HABITAT studies (see for example UN-HABITAT, 2003) have shown that hunger is not always related to food production or availability; rather, in urban areas, other factors, such as low and irregular income, inadequate access to basic services and poor living conditions, play more significant roles. Among those at greatest risk are the urban poor, because they are dependent on the market to access food and the share of food in their total expenditures is much higher than that of wealthier populations. Food represents about 10-20 percent of consumer spending in industrialised nations, but as much as 50-80 percent among the urban poor in developing countries (as was confirmed by the study results summarised below).

## Study design

As part of the joint RUAF/UN-HABITAT/IDRC study, a nutrition survey was undertaken. The survey was designed by UN-HABITAT in 2009, and pre-tested in Nairobi. RUAF Foundation coordinated the implementation of five case studies in 2009 and 2010 (see box for the cities) and the production and publication of the final report (synthesis report and five case reports; accessible at [www.ruaf.org](http://www.ruaf.org)). The study was made possible by a financial grant from IDRC.

### The five cities and lead researchers

- *Accra, Ghana: Agbeko P.D. Mattah, Humanity Focus Foundation*
- *Bogota, Colombia: Claudia Marcela Sanchez, IPES-Colombia*
- *Colombo, Sri Lanka: Sunethra Atukorala, Faculty of Medicine, University of Colombo*
- *Kitwe, Zambia: Jacob P. Mwitwa, School of Natural Resources, Copperbelt University*
- *Rosario, Argentina: Natalia Yavich, Investiga Mas. Estudios de Salud y Sociedad*

Four types of data were collected:

- *Anthropometric measurements indicating the nutritional status of children under six years of age and fertile women (between the ages of 15 and 49 years).* Three standard indices of physical growth were used to describe the nutritional status of the young children: height-for-age (stunting), weight-for-height (wasting) and weight-for-age (underweight) were calculated and compared to a standard reference population. The body mass index (BMI), a simple index of weight for height, was used as the standard measure of underweight, overweight and obesity in the adult women. Two neighbourhoods were selected: one slum area (poor-poor) and one (slightly) better off area (poor-middle income). In each neighbourhood 300 households were included in the sample. In autumn 2009, about eighteen months after the onset of the financial and food price crises, anthropometric measurements were taken of the different sample populations of children and women.
- *Anthropometric data reported from earlier studies.* To understand the extent to which nutritional status of children and/or women had worsened since the financial and food price crises began, primary anthropometric data were compared – as far as possible – with earlier nutritional assessments, e.g. Demographic and Health Surveys (DHS) or Multiple Key Indicators Cluster Surveys (MICS) as have been implemented in most countries since the nineties.
- *Data on the current livelihood assets, food intake and coping strategies of poor and middle-income households in the two areas, in response to the crises.* This information was obtained by interviewing the mother or other primary caretaker in these 600 (300 + 300) households, including a 24-hour recall of food consumed.
- *Data on the economic, policy and institutional context affecting urban food security (measures taken before and during/after the crises).* This information was collected through a review of policy documents and interviews with experts. The following questions guided the analysis of the policy responses to the crises in each city/country:
  - o Are there policies in place which are designed to mitigate adverse consequences of rising hunger levels? Since when have they been in place? Are these national and/or city policies?
  - o What kind of policy responses to the financial and food crisis are in place and what has been their impact, effectiveness and sustainability?
  - o Have there been conflicts (labour, violent) that have motivated a policy response with regard to food in this city?
  - o How have prices of essential food items fluctuated in the last two years in this city and what political events, market forces and/or policies have influenced the fluctuations? What should/could be done to reduce this fluctuation and rising food prices?
- Focus Group Discussions with local informants (e.g. local community leaders and health workers) were organised in each of the two neighbourhoods to obtain the informants' *perceptions regarding the impacts of the financial crises on household livelihoods, coping strategies adopted*

*by poor households in response to the crises and the effects of governmental responses to the crises.*

## Main findings

In all five cities the prices of key food commodities were much higher in late 2009 than they had been in 2007 (in many cases by more than 100 percent), but not all had remained as high as during the peak in 2008.

All households in this study were overwhelmingly dependent on purchased food as their main source of food security. For a majority of the city populations, in both the poorer neighbourhoods and the better-off areas, food accounted for half or more of all expenditures. Although the households' own food production was underreported because of the way the survey was set up (no specific questions were asked on this topic), it does not appear to play a major role in the sites selected, with the exception of Kitwe, where the important consumption of leafy vegetables derived primarily from own production

Consumption data based on 24-hour recall revealed that the diets of the urban poor have quite low levels of diversity and involve limited consumption of leafy vegetables, legumes or beta-carotene-rich vegetables and fruits. Consumption of fats, sugars and (low-quality) processed foods is widespread, however, as is the presence of animal source foods (ASFs) in the diets, especially in the Latin American cities and in Sri Lanka. The combination in several cases of presence of ASFs in the diet with child malnutrition (see below) suggests that portion sizes of these ASFs were very small, but the survey was unfortunately unable to measure this variable.

The collected anthropometric data showed disturbingly high levels of stunting (chronic malnutrition) and wasting (acute malnutrition) among children in both the lowest income and the poor-middle income populations especially in Kitwe (Zambia), Colombo (Sri Lanka) and Accra (Ghana). In addition to underweight, incidences of overweight and obesity were found, especially among fertile women but also in some categories of children due to widespread consumption of fats, sugars and cheap processed foods. This finding indicates a double burden of malnutrition among the urban poor and the need for intensive nutrition education.

Food accounted for more than 50 percent of all household expenditures of the urban poor and middle-income households. In Kitwe, Accra and Colombo some 20-30 percent of the households in the low-income areas spend almost 100 percent of their available income on food. As a consequence, variations in income or food prices directly translate into rising rates of malnutrition in poor-income urban areas (as is confirmed by the collected anthropometric data; see below). Low household income levels limiting access to food is the main cause of food insecurity, not the food availability as such.

The study shows how the differential availability of household assets influences income generation and the capacity



of households to ensure food security and cope with stresses and shocks. Households that have a high proportion of non-producing members (the young and/or the old), as in Kitwe, are particularly vulnerable as greater demands are placed on each income source. Many households in other cities, however, had access to more than one income source, with nearly 20 percent of households in the better-off areas of Colombo reporting three or more sources of income.

Comparison of the anthropometric data collected in this study with nutrition assessments from 2008 and earlier showed that the nutritional status of the urban poor has deteriorated under the impact of the financial crisis and high food prices and in the context of limited access to employment, high living costs and dependence on purchased food. Cutting down on the costs of food was the most important coping strategy applied by the poor urban households in response to the food and financial crises. The households often reduced both the quantity of food consumed (e.g. fewer meals a day and smaller portions) and the quality of the food consumed (e.g. eliminating consumption of higher value wheat and rice as complementary staples in Colombo and Accra respectively in favour of increasing consumption of the cheaper basic staples, or shifting to cheaper cuts of meat, as in Rosario). There appeared to be limited knowledge among these households about opportunities for reducing the costs of food without reducing its nutritional content, for example by reducing consumption of relatively expensive ASFs and replacing them with legumes and leafy vegetables.

The assessment of policies on food security that had been implemented either prior to or in response to the crises, supports the view that policies and social protection mechanisms in place before a crisis strikes, as in the case of Rosario, are more effective than those hurriedly implemented during a crisis. In part this is because the latter often result in poor targeting and unfair distribution of benefits, a criticism levelled at some of the measures taken in Accra.

Time-bound income transfers for the very poor, as used in Rosario, seem to be an effective mechanism to provide the most needy households access to enough nutritious food during a period of crisis, and this is advocated by several authors (eg Cohan and Garrett 2009). However, social protection programmes, also introduced in Rosario seem to cultivate a culture of dependency and inhibit local-level initiatives (e.g. local rearing of animals, vegetable gardens, joint purchase of nutritious food, community kitchens). Targeting the extremely vulnerable proved to be difficult in urban areas, where there is considerable fluidity of residence, high variability of socio-economic indicators within “types of neighbourhoods” and limited clustering of food insecurity indicators.

### Recommendations

- Effective food security policies and social protection mechanisms have to be in place before a crisis strikes.

- Nutrition interventions are urgently needed, especially in low-income areas, to show the population possibilities to reduce the costs of food without reducing its nutritional content.
- However, nutrition interventions need to be part of broader policies on urban food systems which make nutritious foods available (or improve access to nutritious food) in low-income settlements and facilitate access to natural resources and technical knowledge so increased numbers of people can use their own food production to contribute to household food security.

More information is available at [www.ruaf.org](http://www.ruaf.org) or from the authors.

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# Cities, Climate Change and Urban Agriculture

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Henk de Zeeuw

**The current challenge posed by climate change and its interaction with urban poverty and food security is recognised globally. As highlighted in the international conference organised by UN-Habitat (2009) “Cities are a major part of the cause and are suffering the most impacts and therefore play a primary role in finding the appropriate solution.” This article will discuss the potential contributions of urban and periurban agriculture and forestry to climate change adaptation and mitigation, and the role and approach of RUAF.**

## Cities and climate change

Cities produce about 70 percent of greenhouse gas emissions worldwide. It is expected that the urban population will double by 2030, and that 90 percent of the urban growth will take place in developing countries. Accordingly about 90 percent of the expected increase in greenhouse gas emissions will be from the rapidly growing cities in developing countries (World Bank, 2010).

The World Bank argues in its 2010 report that cities not only are main contributors to climate change and suffer most of its impacts (see below) but also hold important competencies to act on climate change (e.g. authority over land-use zoning, regulation of energy supply and industrial emissions, waste management and water services). Moreover, the co-benefits of climate change adaptation measures are largest in cities: in cities climate change adaptation actions can more easily be linked with local development aims and have more positive effects on, for example, poverty reduction, improved sanitation and basic health, enhanced food security and nutrition. The report identifies cities as major players in the effort to establish “low carbon” growth as well as to help their populations prepare for climate uncertainty and natural disasters. The report also makes a plea for innovative “outside-the-box” solutions to climate change adaptation and points out that environmentally sustainable solutions for food, water, energy and transport as integrated components of a city climate change adaptation and disaster risk management plan are needed (World Bank, 2010).

Urban agriculture is one of these “outside-the-box” solutions currently being considered, as urban agriculture can play a strong role in enhancing food security for the urban poor, greening the city and improving the urban climate, while stimulating the productive reuse of urban organic wastes and reducing the urban energy footprint.



*UPA can reduce the impacts of higher rainfall* (Photo Marielle Dubbeling)

While attention to adaptation in urban areas has been grossly inadequate to date, urgent action is required since (it has been suggested that) the earlier risk reduction and adaptation efforts are incorporated into city investment and development plans, the lower the unit costs will be (Reid and Satterthwaite, 2007).

## Effects of climate change on cities

### *Increased risk of floods and landslides*

Areas where climate change will lead to higher rainfall or a rise in sea level face an increased risk of floods and landslides, leading to infrastructure damage, economic losses and to more poverty and epidemics. Many cities in low-lying areas in coastal areas and along rivers are at risk of flooding and extreme precipitation and storm events. UN HABITAT identified 3,351 cities in 2009 that are situated in low-elevation coastal zones worldwide. Together these cities hold 10 percent of the world's total population, and 64 percent of them are located in developing regions (UN-HABITAT, 2009).

### *Increased urban heat*

A significant factor linking food security and climate change is the urban heat island effect. The buildings and surfaces of concrete or asphalt store enormous amounts of heat. In conjunction with the heat produced by transport, cooling systems and industrial activities, this causes cities to have temperatures that are several degrees higher than the surrounding countryside (American Meteorological Society, 2000). In areas where climate change increases the mean and peak temperatures, the urban heat island effect is enhanced, causing discomfort and greater levels of energy

consumption (for cooling and refrigeration purposes), with a side effect of additional air pollution and smog and related health problems.

#### Food supply problems

Climate change may lower agricultural production in the hinterland due to changes in average temperature or precipitation, especially in African countries. Without the adoption of crop rotation and improved water conservation techniques, agricultural production could decline 10 -25 percent by 2020 (Herren, 2009). Moreover, transport of food to urban areas may be disrupted more frequently by storms or floods, leading to higher food prices and food shortages in the urban areas.

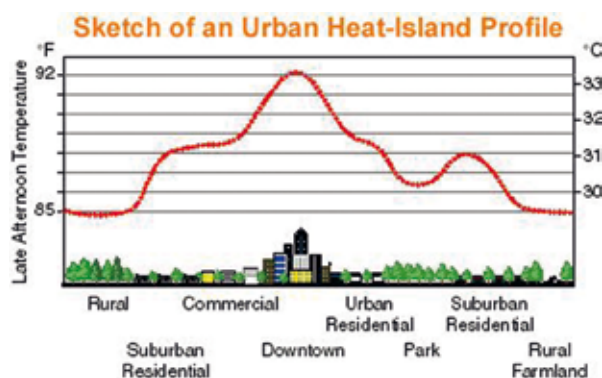
Maxwell *et al.* (2009) points out that the decline in agricultural productivity will not mainly affect the rural population: “urban and periurban areas are similarly impacted as natural causes can lead to increased (temporarily or sustained) higher food prices, food shortages, epidemics, and sudden settlement of those displaced by the shock. To make matters worse, natural causes of food crises are often cyclical, repeatedly affecting the same regions or agro-climatic zones.”

#### Water scarcity

Climate change in certain regions could also contribute to reduction of stream flows leading to problems for the hydro-power production and more difficult and costly management of sanitation, waste disposal, water supply and public health in urban areas.

### Urban poor are at greatest risk

The impacts of climate hazards disproportionately affect people “who live in slum and squatter settlements on steep hillsides, in poorly drained areas, or in low-lying coastal zones.” Often 50-60 percent of an urban population lives in slums, which often are located in such areas, lack storm drains, and have weak housing structures (United Nations Population Fund, 2007). Climate change adds to the existing problems in these slum areas, either directly (through the effects of more frequent and heavier floods and landslides) or indirectly (through higher food and water prices, inflow of migrants, more diseases). Moreover, the urban poor have a low capacity to cope with the effects of climate change. For example, the urban poor often spend 60 percent or more (up to 100 percent for the poorest!) of their cash income on food.



Sketch of an Urban Heat-Island Profile



UPA produces food close to the city, hence less energy use (Photo Hubert de Bon)

If food prices increase due to damaged infrastructure or a decline in agricultural productivity, this directly effects the urban poor who can save only on the number of meals and food quality (since rent, electricity and water have to be paid anyway), leading to a decline in nutrition and health status (Prain, 2010).

### The importance of urban agriculture and forestry

As indicated above, urban and periurban agriculture and forestry (UPA&F) is increasingly recognized as an important strategy for climate change adaptation and mitigation. For example, at the International Tripartite Conference on Urban Challenges and Poverty Reduction in African, Caribbean and Pacific countries, UPA&F was recognized as having high potential for improving the urban environment and urban adaptation to climate change (UN-HABITAT, 2009).

A review of the literature indicates that UPA&F helps cities to become more resilient in the following ways:

#### a. Reduced vulnerability of the urban poor and enhanced coping capacity

- UPA&F reduces the incidence and impacts of floods and landslides on the urban poor (see b.).
- UPA&F enhances access to nutritious food and diversifies food sources, thereby reducing the impacts of disturbances in food supply from rural areas or imports and increases in food prices.
- Income opportunities are diversified through the creation of “green jobs”, thereby providing a safety net in times of economic crisis.
- UPA&F enhances community building and acts as a source of innovation and learning.

#### b. Reduced impacts of higher rainfall (average/extremes)

- UPA&F can keep low-lying zones free from construction so that floods have less impact, storm water runoff is reduced, and excess water is stored and infiltrates in the green open spaces.
- Forestry or agro-forestry on steep slopes prevents construction on risk-prone slopes and reduces the likelihood and impacts of landslides.
- UPA&F reduces the heat island effect by providing shade and enhancing evapo-transpiration; CO<sub>2</sub> and dust are also captured.

### c. Reduced urban energy use and greenhouse gas emissions

- UPA&F produces fresh food close to the city (hence less energy is used for transport, cooling, storage, packaging).
- UPA&F enables productive reuse of organic wastes, which reduces methane emissions from landfills and energy use in the production of fertilizers.
- Reuse of urban wastewater in UPA&F frees fresh water for higher-value uses and reduces emissions from wastewater treatment.

### The way forward

Urban and periurban agriculture and forestry can play an important role in responding to a range of challenges faced by developing countries by building more resilient and food-secure cities. The size and urgency of these challenges require innovative solutions. As pointed out by the World Bank (2010), there is a need for innovative solutions that combine climate change adaptation and mitigation with attention to local development needs in order to produce meaningful co-benefits. The promotion of safe, sustainable and multi-functional UPA&F is one of the innovative strategies that meets this requirement.

Metropolitan, municipal and other local government institutions directly concerned with urban development can play a proactive and coordinating role here, and may take measures such as the following:

- Protecting and stimulating sustainable UPA&F in flood zones and wetlands and on steep slopes in order to prevent construction in such areas and to reduce run-off.
- Promoting forestry and agro-forestry in order to reduce the urban heat island effect, to reduce landslides and to enhance biodiversity and landscape management.
- Facilitating (safe) reuse of urban wastewater and organic wastes in order to reduce waste disposal into landfills and open water systems and promote recycling of nutrients. *Urban wastewater can be recycled and safely applied in a number of uses including floriculture and fruit crop irrigation, irrigation of forest plantations, combating desertification, providing fuel wood<sup>1</sup>, and turning steep slopes and low-lying lands into urban “green lungs” that can be used as recreational areas while creating flood buffers for neighbouring housing areas.*
- Integrating UPA in social housing and slum upgrading



UPA enhances community building (here in Chicago)  
(Photo René van Veenhuizen)



UPA enhances access to nutritious food (Photo IPES)

programmes by including space for home gardens or community gardens, street trees for shade and fruits, “productive parks” combining productive with recreational and educational functions.

- Making municipal land available to groups of urban poor households through medium-term lease arrangements or providing occupancy licenses to the urban poor producing informally on municipal land under the condition that they adopt safe and sustainable production practices. The land that is provided might be land that is earmarked for other uses but not yet in use as such, or land that is not fit for construction (e.g. zones prone to earthquakes, landslides, land under power lines, ecologically valuable areas, etc.).
- Involving groups of urban poor in the maintenance of open green spaces such as greenbelts, green fingers, parks and other open spaces and the collection and recycling of urban wastes (green jobs).
- Providing training and technical assistance to urban producer groups and supporting them to strengthen their organisations and improve their production, processing and marketing activities and related food safety measures.
- Facilitating preferential municipal food procurement from family- and community-based farms located within the city and its environs for government canteens, school feeding programmes, etc., and facilitating direct marketing of fresh and ecologically produced food from local producers to urban consumers (establishing farmers’ markets, special labels, support for infrastructure development, etc.)

But on the other hand, it is also required that research is done and innovative and suitable systems of UPA are developed that are resilient to climate change. Increased rainfall, floods and changes in temperature will affect crop and livestock production, so these innovative systems may include adjustment of cropping patterns, selection of adapted crop varieties, diversification of cropping and/or farming systems, improved water management etcetera.

Various cities are already including UPA&F in their climate change adaptation programmes. Three examples:

#### Toronto Live Green

Toronto’s climate change plan:

- includes financial support to community-based UPA&F projects, e.g. community orchards and gardens, home gardens;





*Community gardens in Lima* (Photo René van Veenhuizen)

- promotes composting of organic wastes and rainwater harvesting;
- seeks to double the existing tree canopy by 2020;
- seeks to reduce the city's "food print" by
  - requiring that the shipping distance is mentioned on all food labels
  - promoting regional products
  - supporting farmers' markets
  - facilitating preferential procurement of food.

#### *Amman Clean Development Plan*

Urban agriculture and forestry is one of the five components of the Amman Clean Development Strategy (supported by the World Bank: CDM City Wide Approach), which:

- identifies vacant open spaces suitable for urban agriculture and creates a land bank to facilitate owner-user contacts and contracts;
- encourages organic food production and value adding (e.g. washing/ packaging/labeling);
- promotes water harvesting and more efficient water use in agriculture;
- facilitates urban and periurban forestation (productive street/park trees; use of treated wastewater);
- promotes (productive) green roofs.

#### *Freetown Climate Smart land use zoning*

The Sierra Leone Ministry of Land Country Planning and Environment, Ministry of Agriculture, Forestry and Food Security, Freetown City Council and Western Area Rural District Council signed an agreement to map and protect valley bottoms and wetlands and allocate low-lying lands for UPA&F in order to prevent construction in the flood plains, enhance storm water infiltration, enhance urban food security and create alternative income opportunities.

### **RUAF's approach**

The RUAF Foundation has defined the following strategy in the field of climate change:

- liaise with major climate change programmes (UN-HABITAT, World Bank, Rockefeller Foundation, bilateral donors, national programmes);
- select cities that are developing a city climate change strategy and are interested in including an urban agriculture and forestry component;

- make available planning guidelines and "best practice" manuals for different types of UPA&F (e.g. community gardens, productive parks, green roofs, UPA&F in slum upgrading programmes, agro-forestry in floodplains);
- train staff of local organisations involved in the integration of UPA&F in the city climate change strategy and land use planning;
- support the design and implementation of demonstration projects by local actors; facilitate "learning in/from practice";
- develop indicators and tools to monitor the adaptation and mitigation impacts and co-benefits of UPA&F activities.

More information is available at [www.ruaf.org](http://www.ruaf.org). We welcome contact with international and national programmes, municipalities and other organisations that are to incorporate a UPA&F component (some prefer the term "green infrastructure") into their programmes.

**Ir. Henk de Zeeuw**

Director RUAF Foundation

#### **Notes**

1) In many cities attempts to decrease pressure on wood energy (fuel wood and charcoal) by subsidizing gas or electric technologies have not succeeded. The prognostic for many regions, such as in Africa, is that wood energy will continue to be the main source of energy for cooking and heating for the majority of their populations.

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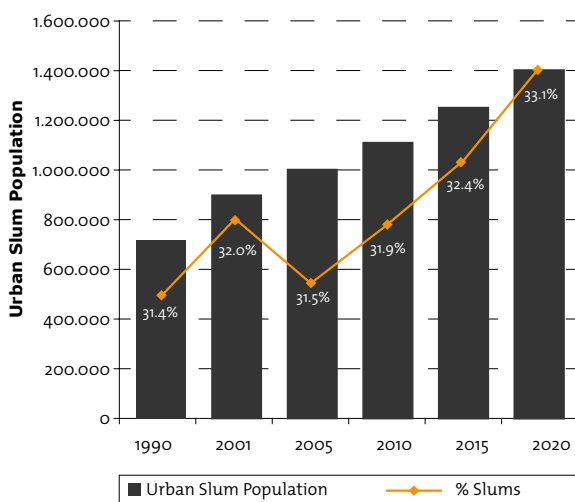
# Integrating urban agriculture in the urban landscape

43

Marielle Dubbeling

**The current global urban population is expected to double by 2050, with 90 percent of urban growth taking place in developing countries. Many cities are ill equipped to handle such large-scale expansion. Various cities are starting to recognise urban agriculture as an integral part of urban planning, upgrading and design. They are including urban agriculture in land use planning, social housing programmes and slum upgrading. This article describes some examples of their strategies.**

Urban growth, combined with limited employment opportunities in cities, is leading to a more rapid increase in poverty in urban areas than in rural areas and urban slum populations continue to grow: 69 percent of all households in Addis Ababa, 65 percent in Dar es Salaam and 50 percent in Kampala and Nairobi can be considered slum households (UN-HABITAT, 2008). In Latin America, roughly half of the urban population are considered slum dwellers. In Asia, the percentage of the urban population living in slums ranges from 24 percent in western Asia, to 37 percent in eastern Asia and 43 percent in southern Asia (UN Population Fund, 2007).



Rapid urban growth and growing urban poverty also raise concerns, particularly about urban food security, supply and distribution systems. The urban poor are particularly vulnerable to fluctuations in food and fuel prices and in income, since food (often over 60 percent) and fuel (often more than 10 percent) make up a large part of their household expenses. Variations in food prices and income translate directly into diminished purchasing power and rising rates of food inse-

curity, compromising dietary quantity and quality (see de Zeeuw and Prain on page 35 and Baker, 2008). Current food prices have now once again reached 2008 levels and OXFAM predicts they will double by 2030 (Wegner and Zwart, 2011), which will lead to a further deterioration of the food security situation in many cities.

The agenda for change of many slum dwellers (organisations) and other urban inhabitants (CORDAID Urban Matters Programme, 2010; see further: <http://www.cordaidurban-matters.com/>) reflect this focus on food security and income, in addition to the more traditional demands for housing, water and sanitation.

## Slum dwellers' "agenda for change":

- housing
- water, sanitation
- food security
- waste recycling
- work and income

## Urban Agriculture

While more urban dwellers may experience low living standards, cities are also centres of information, ingenuity and collaboration, where new approaches to housing, employment, service and food provision are being introduced and, increasingly, mainstreamed in new forms of building, working and living in the city. Urban populations are setting new standards and cities must re-invent themselves with new frameworks of reference. Urban agriculture (UA) is one livelihood strategy that the urban poor use in combination with other strategies (Mougeot, 2005). Urban agriculture (including food production, processing and marketing and related activities such as recycling and productive use of urban waste and waste water) can respond to the food needs of the local population, help set up income-generating activities that are accessible to the urban poor (including youth and women) and help improve the environment (urban greening, waste and wastewater management).

## Integrating UA in lane upgrading

Halgahakumbura is located in Ward 32, Wanathamulla, in Colombo (Sri Lanka) on approximately 10 acres of land. The settlement comprises 2,742 people living in 556 housing units. Of these, only 79 (less than 15 percent) can be considered permanent housing units. The settlement was formed by illegal occupation of an area formerly used as a dumpsite, next to a canal. In 2003, the local NGO Sevanatha proposed this settlement as a pilot site for an urban agriculture project. People in Halgahakumbura had already been growing various vegetable plants for their own consumption, and



Urban farming in the old city of Sana'a, Yemen (Photo J.W. Harnmeijer)

trees to provide shade and landscape their own housing premises. As part of the “Making the Edible Landscape Project” (2004-2006), coordinated by McGill University (Canada) and ETC Urban Agriculture (the Netherlands), urban agriculture was included along with other slum upgrading activities, such as lane upgrading. Small stretches along the roads have been left for growing and these have added to beautification, shade and improved drainage, which help to prevent frequent flooding in the settlement. Improved access roads have increased the value of houses. People themselves have named their improved lanes and house numbers are displayed at the entrance to the lane. Naming the lane and numbering the houses are important steps because they allow people to have various services provided at the household level, especially postal service and water and electricity, since the bills have to be delivered to their houses (Jayarathne, K.A., 2005; see also: <http://www.mcgill.ca/mchg/pastproject/edible-landscape/colombo> and [http://www.ryerson.ca/carrotcity/graphics/globalgraphics/\\_boards/\\_City/12%20-%20Making%20the%20Edible%20Landscape%20Colombo.jpg](http://www.ryerson.ca/carrotcity/graphics/globalgraphics/_boards/_City/12%20-%20Making%20the%20Edible%20Landscape%20Colombo.jpg)).

### Integrating UA in social housing projects

Cities like Vancouver (Canada), Colombo (Sri Lanka), Kampala (Uganda), Rosario (Argentina) and Dar es Salaam (Tanzania) are experimenting with the inclusion of space for home and/or community gardening in new public housing projects and slum-upgrading schemes.

Housing design and plot regulations can take into account (micro-)farming requirements by for example:

- designing houses in such a way that they can accommodate growing on exterior walls and window sills;
- designing balconies to maximise solar access or with growing containers already built into them;
- building concrete residential and commercial buildings with flat roofs that are designed with enough structural integrity and mechanical servicing to accommodate the use of an agricultural rooftop garden or greenhouse in the future;
- including grey water recycling in building design. The government of Jordan is now considering rewriting national building codes to ensure that all future residential construction makes use of grey water reuse systems;
- locating buildings and building accesses that ensures maximum solar access for front- or backyard growing;
- regulating plot design, limiting the amount of the plot that can be built upon, thus leaving a certain area for growing or other land uses.

In Kampala, An “edible neighbourhood” has been designed as part of the “Making the Edible Landscape Project” mentioned above (see also: <http://www.mcgill.ca/mchg/>

pastproject/edible-landscape/kampala/info). In a series of community workshops and in communication with the Ministry of Housing, Works and Communication, the following conditions for housing and plot design have been proposed to maximise the potential for growing (see box below).

### Housing and plot design: proposal developed in Kampala, Uganda

1. Housing forms must be semi-detached and situated not less than 1.5m from road frontage, (i) to maximise plot space for agriculture purposes and (ii) for easy access to road.
2. The completed housing forms should not exceed 50 percent of the plot's total area. This will leave adequate space for agriculture.
3. Exterior house walls must be utilised for agricultural and/or energy-saving activities.
4. All windows must have a shelf, window box, or similar space to accommodate container gardens.
5. All roofs must have at least a 1.5m overhang to (i) protect exterior walls from rainfall, (ii) provide shade to keep the house cool, (iii) to support climbing/creeping plants.
6. Every rooftop must be designed and constructed for water-harvesting and disinfection technologies for crop irrigation and household consumption.
7. Any patio areas should have a terrace shelter which accommodates growing.
8. All kitchen areas must have either an industrial or clay energy-saving stove.
9. The splash guard must either be constructed as a planter box using approved materials to provide permanent space for growing or used to support planted containers.
10. Peripheral fencing may be of any height provided it does not become a nuisance to neighbours or hinder roadside safety. All fencing must support growing.
11. All plots must maximise space for agricultural purposes through (i) semi-detached housing and animal shelters, (ii) vertical spaces – walls, fences, double storied poultry units, shelved seedlings units, food towers, or any other innovative technology, (iii) typically unused spaces – road frontages, compounds, or any other space and (iv) intercropping technologies (maximise garden space by growing two or more types of crops that benefit each other).
12. Any structural or plot development which has not been developed through the Edible Landscape Design Process must be approved by the Project Secretariat.

### Integrating UA in the design of open spaces

Open and green urban spaces can be designed for multi-functional urban agriculture and can combine natural habitat, food production, and educational, recreational and leisure activities. High costs of green open space management dominate the thinking of many planners and authorities, even though a more “multifunctional – combining different functions within one area” approach or public-private partnerships can help to reduce costs (Drescher, 2005). Focusing primarily on London, Viljoen, Bohn and Howe (2005) make the point that, by combining urban development planning with proper design of a “productive green grid”, tens of thousands of people could be fed from local



agricultural produce while benefitting at the same time from a pleasant landscape offering opportunities for leisure and recreation.

In their attempt to design open spaces for multifunctional agriculture, landscape architects and planners in Rosario have defined the following types of productive green structure:

Garden parks: Larger public green areas in which recreational, productive, educational and commercial activities are developed. Designs should integrate playgrounds and areas for leisure and sports, with areas set aside for vegetable and fruit production and others for medicinal and ornamental plants.

Educational-productive squares: These are neighbourhood squares designed for recreational, productive, educational-cultural and possibly commercial uses. Their structure and function will respond to community needs for playgrounds, social meeting places, urban greening and production.

Productive streets: Diverse and dynamic public spaces, designed to integrate small-scale productive activities, community meeting spaces, processing and marketing activities as well as a productive green structure (for example fruit trees). These activities will enhance the street's potential as a space for social interaction, without obstructing the normal traffic and pedestrian flow.

An example of the first type is the garden-park designed for the Molino Blanco settlement, located in the southern district of Rosario. Molino Blanco is a high-density and marginal settlement with regular flooding risks. The majority of the 3500 inhabitants (800 families) are unemployed or earn a minimal income from waste collection and community gardening. An upgrading programme included relocating almost 30 percent of the population to a new settlement, as their houses were built on area that floods. The new settlement would also be regularised and provided with basic municipal services. The flood area (just over 56,000 m<sup>2</sup>) consisted in 2005 of community gardens, illegal and marginal housing, dumpsites, trees and bushes. A garden-park has now been created there, including a playground for children and a soccer field (Bracalenti, 2011).

### Promoting low-space, no-space growing technologies

In densely built-up neighbourhoods and where availability of space often limits the size of the production unit, no-space, low space technologies offer tremendous opportunities for space-confined growing (see for more information on such



Mama Batata growing vegetables on racks (Marielle Dubbeling)

technologies also Urban Agriculture Magazine 21). Growing plants in containers, keeping small numbers of animals in cages, and vertical cultivation (cultivation towers, hanging plants, containers attached to the wall, use of trellises) are all practised. The Jardín Botánico and IPES/RUAF in Bogotá, Colombia are promoting these technologies (Merzthal, 2011). Production technologies promoted are matched on the basis of the participants' eating habits (type of vegetables consumed); space availability (patio, rooftop); availability of low-cost growing structures or containers; growing conditions (the type of crops best grown in different containers) and taking into account aesthetic considerations. Crop production has reached up to 45 kg/yr/m<sup>2</sup>, providing a substantial part of the families' vegetable consumption.

### Can neighbourhoods or cities produce a sufficiently large part of their food needs?

Some of these production systems are small in scale; others, like the one in Rosario, encompass a larger area, the garden-park is now planned to cover almost 17 ha. Many local governments tend to under-value the small-scale practices, and do not consider them a relevant support strategy. Nevertheless, their total impact on urban food security can be significant. If 5000 families in a given neighbourhood each produce 8 kg of vegetables a year, the total yield will be 4 tonnes of vegetables. If those 5000 families also keep two chickens producing 2 eggs a week, total production will amount to 520,000 eggs a year.

So can neighbourhoods (or cities) satisfy a sufficiently large proportion of their fresh vegetables (and other food) requirements from within their own boundaries and if so, under which conditions? Studies on this subject are scarce. A study by MacRea *et al.* (2010) showed that Toronto, the largest city in Canada with 2.5 million inhabitants, needs 2,317 ha of food production area if it is to meet 10 percent of current demand, where all production would be organic to fulfil other municipal environmental objectives. A total of 1,073.5 ha could be made available from existing farms, lands currently zoned for food production, certain areas zoned for industrial uses and over 200 small plots (0.4-2 ha). In addition, 1,243.5 ha of rooftop space would be required. The potentially available land/rooftop space suggests, however, that there would be difficulties meeting requirements for extensive crops such as sweet corn, squash, potatoes, cabbage, carrots and asparagus.

A major challenge to the viability of urban agriculture is land availability and access. To reconcile the needs posed by urban growth (housing, industries, infrastructure) with the need for urban agriculture activities of high economic and social value, urban agriculture should be included in urban planning and municipal development plans. Moreover, taxation rules and legal frameworks are needed to provide security and incentives for producers.

### Enhancing access to land

As the Toronto study indicates, formal acceptance of urban agriculture as a legitimate use of urban land is a crucial first step towards effective planning for, as well as regulation and facilitation of, the development of urban agriculture. Other essential steps are to include urban agriculture as a separate



*Design of the garden park Molino Blanco in Rosario, Argentina*

land-use category in land-use plans and change existing zoning categories to include urban agriculture. In addition to Toronto, other cities, including Portland (USA), Vancouver (Canada), Cienfuegos (Cuba), Dar es Salaam (Tanzania), Rosario (Argentina) and Cagayan d'Oro (Philippines), have also made an inventory of the available vacant open land in the city (using methods such as community mapping and/or Geographic Information Systems) and analysed its suitability for agricultural use (De Zeeuw *et al*, 2007). This creates a good starting point for developing a real spatial vision on urban agriculture, where the most suitable locations are identified for different types of urban agriculture in a city.

In addition, various other cities have taken innovative measures to enhance access of the urban poor to land, including for example:

- *Making municipal land available to groups of poor urban households* through medium-term lease arrangements or providing occupancy licenses to the urban poor producing informally on municipal land (under the condition that they adopt safe and sustainable production practices) as in Governador Valadares (Brazil) and Cagayan d'Oro (the Philippines). Municipal land that is provided might be land that is earmarked for other uses but not yet in use as such, land that is not fit for construction (e.g. flood zones, land under power lines), or buffer zones and land reserves for future use. Such land is given under short- or medium-term lease arrangements to organised groups of urban poor for gardening purposes (multi-annual purpose-specific leaseholds or occupancy licences). Often these contracts with farmers include conditions regarding land, crop and waste management practices and include certain restrictions.
- *Establishing fiscal and tax incentives* for land owners who lease out vacant private land to groups of urban poor people willing to produce on this land (Rosario, Argentina).
- *Enhancing land-tenure security.* Cities can address the issue of tenure by acknowledging the legal status of these communities through methods such as tacit approval of occupancy, allowing urban farmers some measure of security by providing "identity cards", "interim rights", "temporary leases" or "occupancy licences" which specify that the land is being occupied with the consent of the local government. A limited acceptance by government can influence the status of urban farmers in two ways. First, it encourages a sense of security, which will lead to self-help improvements and, secondly, it allows urban farmers to access credit and to use their land occupancy as collateral for small loans, thus overcoming the barrier

of not formally owning "property" (De Zeeuw and Dubbeling, 2009).

### Land mosaics and city regions

The cases described show that land-use planning for urban agriculture needs to be considered at various scales: at street, neighbourhood, city and city-region (50-100km) levels. The latter scale should also take into account the optimisation of urban-rural linkages and production potentials.

*Land mosaic patterns* (interspacing built-up areas that include green and productive spaces) should be promoted for sustainable development to protect valuable ecosystems (and biodiversity hotspots); to preserve natural corridors thereby preventing flooding/ landslides; and to preserve agricultural land use for food production and income generation (personal communication Raf Tuts, UN HABITAT, Bonn, July 2011).

*Regional urban food systems* will increasingly play an important role in balancing and linking urban and rural food supply, and urban agriculture should concentrate on those activities in which it has comparative advantage, such as the production of fresh, perishable foods and the production of foods that can be grown under conditions of reduced space (vegetables, small animals). Regional food systems enable regional food self-reliance to grow, imports to be reduced and can provide significant economic, social and environmental benefits to all stakeholders, both producers and consumers, in that region. For this reason ETC AgriCulture and RUAF will undertake studies in the near future to analyse the functioning of the food systems in the urban regions where RUAF is operating, and thus supporting local initiatives that can lead to more sustainable, socially responsible and climate-smart regional food systems.

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# City Resilience: Building cultural repertoire for urban farming in Almere

47

Gaston Remmers

Cities throughout the world are facing mounting pressures. In the Netherlands, increased social tensions, public health problems like obesity, increased demands for housing and quality public space, decreased financial means and climate change are all challenging the cities' ability to cope. An effective response to these challenges will inevitably include increasing city resilience; and urban agriculture is ideally suited to play a major role in this process.

This paper will not discuss how urban agriculture affects city resilience (see UAM no. 22 and the paper of Dubbeling on page 42). Instead, I argue that we need to look beyond it and take a transformational perspective focused on city *vitality*, and generate cultural practices that accommodate change and adaptation in city life, through urban agriculture. The development challenge of the City of Almere will be used to illustrate this.

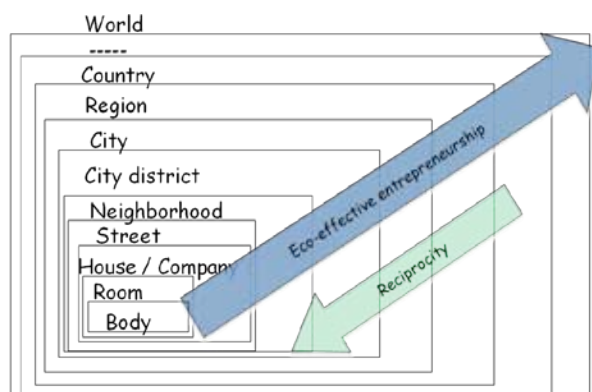
## Integral sustainability

While *resistance* refers to the capacity to withstand impact, *resilience* refers to the capacity to rebound from it, eventually regaining original form and function (Walker et al. 2004). Essential to both concepts is the notion that the impact is undesired, and, if possible, a return to the original situation is preferred. *Transformation*, however, is not so much focused on *bouncing back*, as on *bouncing forward*. It refers to the capacity to move along with disturbances in order to integrate their key qualities (or messages) in a new and more inclusive identity and organisation. Transformation thus demands awareness and the capacity to listen. For instance, in the Netherlands increased obesity among school children is expected to challenge the health system (increased costs in the long term) and affect individual capacities (which will in turn impact the labour market). A transformational approach to this problem would focus on new lifestyles (that include physical exercise, healthier food etc.) and seek opportunities to facilitate them. This can involve urban agriculture, for example by incorporating agriculture and food in school curricula. Such pilots are ongoing in the Netherlands at present, which in the end may transform the educational landscape.

A *transformational approach* can be embodied through *eco-effective entrepreneurship*. The term 'eco-effective' originates from the 'Cradle-to-Cradle' philosophy, and refers to generating maximum added value or throughput, as opposed to eco-efficiency, which is inspired by minimising resource use. (Braungart and McDonough, 2002). Hence eco-effective is also focused on *bouncing forward* instead of *bouncing back*. The intention is to redesign productive

processes to the extent that every output can be an input for a next product. 'Entrepreneurship' is understood in a broad way, referring to 'being entrepreneurial' rather than to 'leading a company'. Hence, entrepreneurs can be citizens, government officials, politicians, and businessmen alike. There is an implicit concern for the wider environment in eco-effectiveness: the output generated should not only be beneficial to the individual (or company...), but also to a wider environment. The notion of *action-habitat* (Remmers, 2009) is instrumental here. An *action-habitat* is the area for which an individual feels responsible and feels authorized to value and help manage.. Such an area can range from a person's own body to the whole globe and beyond. See figure 1.

Figure 1. Action habitats, ranging from micro to macro



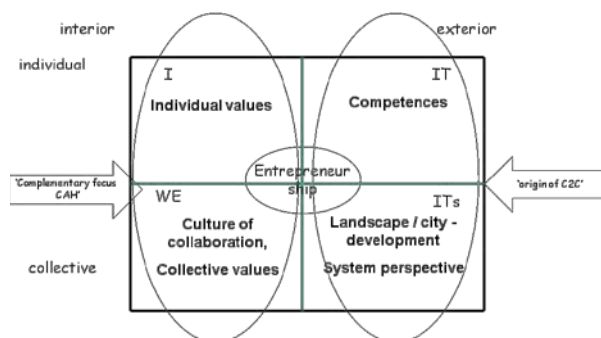
*Eco-effective entrepreneurship* is essentially the movement towards a more encompassing action habitat. It also includes a reciprocal movement, i.e. increased care for the well-being of a city or the planet as a whole should go hand in hand with appropriate care for a neighbourhood, and with an appreciation for the small efforts of someone who e.g. only has the power to tend flowers on his or her balcony. Eco-effective entrepreneurship always gravitates to one or other level of scale, but will do so aware of the added value provided at lower and higher levels. It hence transcends and includes.

Two dimensions are important in further exploring these action habitats: the polarity between the *individual* and the *collective*, and between *interiority* and *exteriority*. City Vitality shows both in material as well as immaterial manifestations of sustainability, as is shown in Wilber's integral quadrant (Wilber 2000). Eco-effective entrepreneurship is located at the intersection of the four quadrants. One cannot work integrally, if both the subjective and objective are not present in both individual and collective domains (see figure 2). Generally speaking, Cradle to Cradle focuses more on the



right-hand quadrants, the physically measurable and manageable redesign of flows of elements. Of course there is attention for the interior dimensions, but this is much less developed. But especially the crucial role of individuals and collectives in the design of *new cultural repertoire*, to promote and develop sustainable processes and results, needs examination and support. *It is this cultural repertoire that is badly needed to transform incidental successes in sustainable city development into enduring performances.* Likewise, it will facilitate the emergence of lasting eco-effective entrepreneurship at the crossroads.

Figure 2. Eco-effective entrepreneurship in an integral perspective



Finally, it is important to recognise that there are different stages of development, informed by different *value systems* (Beck and Cowan, 1996), which give rise to different expressions of sustainability in all four quadrants. An individual may be highly motivated to buy regional, organic food (upper left quadrant), but live in a neighbourhood where people prefer fast food (lower left), whilst the cities' spatial planning system is not able to anticipate changing food preferences (lower right). Or vice versa: a spatial lay-out with ample scope for urban farming (lower right), but a city business culture that is not able to transform it into profit (lower left), while many individuals proclaim to value urban farming (upper left), yet few translate values into buying behaviour (upper right). Generating congruency between value systems is a big challenge for urban farming to thrive and contribute to city vitality. In the case of urban agriculture, there is need to continuously link and rethink sustainability performances at different stages of cultural development, in order to create a more stable sustainability culture.. To underline this point, the cities in the world that, as far as sustainability is concerned, serve as a model for Almere (e.g. Copenhagen, Vancouver, Freiburg) are cities where a **culture of sustainability** is present. The goal in the realm of urban farming would be to facilitate the dynamic interplay between core value systems and life conditions at different levels (action habitats), that lead to *generative* urban farming practices, that is, practices that are open to contributions by several actors and can hence grow. Or, as Rergeer et al (2011) would put it: *that connect values*.<sup>1</sup>

### The Almere Principles

The City of Almere is a so-called New Town in the province of Flevoland, initiated only 35 years ago on the bottom of the former Lake IJssel. Since 1975, it has grown from zero to 190.000 inhabitants in 2010, and will approximately double

its size by 2030, to meet demands for housing in the western part of The Netherlands. This requires some 60,000 new houses to be built, and a 100,000 new jobs to be created in the next twenty years. The city council aims to meet this huge challenge by putting the stress to its advantage: "if we are to do it, let's do it by embracing and advancing the state of the art of sustainable city development". In 2008 the city adopted the so-called Almere Principles, created in collaboration with Cradle to Cradle guru William McDonough (see figure 3).

Figure 3. The Almere Principles

### The Almere Principles

For an ecologically, socially and economically sustainable future of Almere 2030

Almere, a new town designed thirty years ago on land reclaimed from the sea, will be a liveable and healthy city in 2030. It will continuously renew and transform itself, thereby strengthening the qualities of its polycentric structure and its environment. Almere will be a vital community with diverse living and working opportunities, within a beneficial abundance of open space, water, natural and cultivated landscapes that can grow and change over time.

The Almere Principles are meant to inspire and offer guidance to those involved in further designing Almere as a sustainable city in the next decades. The realization of this vision is an act of culture and the expression of an optimistic approach of the future.

- 1 **CULTIVATE DIVERSITY**  
To enrich the city we acknowledge diversity as a defining characteristic of robust ecological, social and economical systems. By appraising and stimulating diversity in all areas, we can ensure Almere will continue to grow and thrive as a city rich in variety.
- 2 **CONNECT PLACE AND CONTEXT**  
To connect the city we will strengthen and enhance her identity. Based on its own strength and on mutual benefit, the city will maintain active relationships with its surrounding communities at large.
- 3 **COMBINE CITY AND NATURE**  
To give meaning to the city we will consciously aim to bring about unique and lasting combinations of the urban and natural fabric, and raise awareness of human interconnectedness with nature.
- 4 **ANTICIPATE CHANGE**  
To honour the evolution of the city we will incorporate generous flexibility and adaptability in our plans and programs, in order to facilitate unpredictable opportunities for future generations.
- 5 **CONTINUE INNOVATION**  
To advance the city we will encourage improved processes, technologies and infrastructures, and we will support experimentation and the exchange of knowledge.
- 6 **DESIGN HEALTHY SYSTEMS**  
To sustain the city we will utilize 'cradle to cradle' solutions, recognizing the interdependence, at all scales, of ecological, social and economic health.
- 7 **EMPOWER PEOPLE TO MAKE THE CITY**  
Acknowledging citizens to be the driving force in creating, keeping and sustaining the city, we facilitate opportunities for our citizens to pursue their unique potential, with spirit and dignity.

The words of the Almere Principles will come alive and become meaningful through human action, by incorporating them on each level into every design for the city as whole.

From its birth in the 1970s sustainability was sought after by providing Almere with a poly-nuclear spatial structure inspired by the English Garden Cities of Ebenezer Howard. A system of urban nodes or 'villages' emerged, with large green and blue public spaces between them; a system of separate bus lanes for public transport; a decentralised health- and care system close to the individual citizen; a – at that time revolutionary – central city heating system, as well as a large underground airborne waste withdrawal structure. Its large green spaces between its urban nodes were also meant to facilitate the integration of agriculture with urban life – a kind of urban farming avant-la-lettre and Almere was the first city in The Netherlands to officially host an 'urban farmer'. Recent examples of Almere's achievements in this area, are the sustainable neighbourhoods Buitenkans, a citizens collective initiative for building an ecological neighbourhood with 75 dwellings in a collectively owned and maintained public space, and Columbuskwartier, which is more mainstream development but with high standards for sustainable building combined with a special focus on the quality of public space. A good example of technical innovation is the renewable energy installation Solar Island Almere, supplying the adjacent neighbourhood with 10.000 Giga Joules of renewable heat each year. The programme "I built my home in Almere" is a successful innovation in the realm of culture and governance, in which every individual household is empowered to build their own home, facilitated by the City of Almere with special guidance in the building process and financial arrangements.

However, making the principles work in practice demands a lot from the existing working routines, cultures and consciousness in different sectors of Almere society. How to translate the Almere Principles into new supportive municipal routines? How to co-create the aspired city sustainability with the business sector, with NGO's and inhabitants alike? Does Almere have enough critical mass to substantiate its promises? Can the city double its size, while at the same time facilitate a balanced development of the existing town?

If Almere is to develop into an icon of sustainability, it also needs to develop a *culture* that is a natural nurturing ground for iconic sustainability practices to emerge. The ambitions are set high, the blocks on the road are likewise and often invisible or unknown. To circumvent, bypass and help evaporate these blocks, an *integral sustainability* perspective can be helpful. Urban Farming is coined, by the Almere Administration, as one of the vehicles to achieve this, in the existing city, and in the city to-be-designed and built.

### Urban Agriculture in The Netherlands...

Attention to urban agriculture emerged in the late eighties, early nineties, in the context of the new relations between urban and rural areas, pursued basically by rural areas that sought new modes of existence in the face of a globalizing economy, through offering leisure services based on regional qualities, that fitted well with urban demands. Most offered new services and products to clients, some also reconstructed the relational structure between producer and consumer; such as through Community Supported

Agriculture (CSA, see UAM 24). Under the header of Metropolitan Agriculture, others searched to increase production, while reducing environmental impact and maximizing throughput by means of an optimisation of ecological loops. This has led to high-tech propositions in which different agricultural enterprises are linked, some of them serving energy to adjacent neighbourhoods.

The drivers behind these new developments were almost always farmers with new ideological horizons. Yet, it has not been until about 2005, that urban dwellers themselves became pro-active actors in the game. Citizen organizations such as Lekker Utrechts in Utrecht, Gezonde Grond in The Hague and Vereniging Boerenstadswens in Amsterdam actively sought to promote new urban-rural linkages. Amsterdam was the first Dutch city to develop policy to integrate food into the urban agenda. For the first time, the urban agenda gave shape to new urban-rural linkages, and not the rural agenda. Since then, attention for urban farming has proliferated. With it, a new generation of urban farmers and urban food entrepreneurs is developing, often with backgrounds that have nothing to do with farming.

### ...and Almere

In Almere, there is quite a strong civil movement concerned with the qualities of nature and landscape of the city. The Foundation City and Nature, and its offspring the Foundation Friends of Urban Farming, supported, in diverse ways, the continuity of the first city farmer in Almere and the city estate De Kemphaan, while at present, they are developing the Warmoezerij, an urban farming enclosure in the Almere Buiten district. The municipality of Almere aims to create, as part of its growth programme, a new neighbourhood that includes farming from the onset. (Source of inspiration for this new neighbourhood is the Agomere study by Wageningen University, see the contribution of Jansma on page 27). However, despite these experiences, the presence and contribution of urban farming to the vitality of Almere city is limited and fragmented. There is, at present, no coherent policy to address issues of neither regional food supply nor urban farming. At the same time there are a number of opportunities: a glasshouse area in decay could be revitalized from an urban farming perspective, in several neighbourhoods the maintenance of green spaces could go hand in hand with the strengthening of social cohesion; in fact, Almere has abundant, yet uncovered potential for urban farming.

Yet, this potential needs to be developed from scratch, while entrepreneurs and investors need viable business cases. All involved actors would benefit from increased synergy, joint learning, and scaling up of experiences, and an entity that is able to coordinate and facilitate this; that helps to build new *cultural repertoire*. To that extent, the *Almere Development Centre for Urban Farming* was recently initiated.

### The Almere Development Centre for Urban Farming

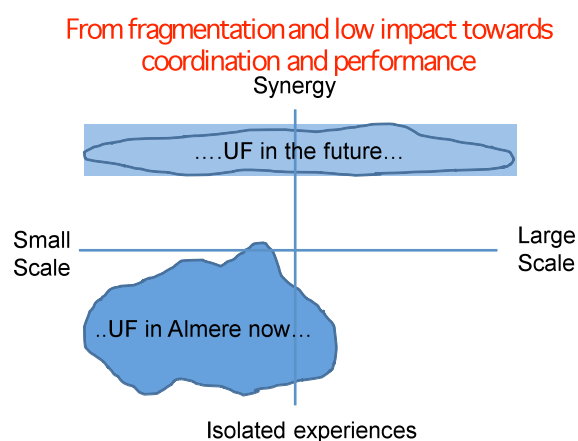
The Almere Development Centre for Urban Farming (or OSA in Dutch) is a result of the Economic Development Board

Almere (EDBA). This Board aims to generate sustainable employment in Almere, and invited several organizations to develop viable and ambitious proposals. OSA was formally launched on May 17th, 2011. It is an initiative of four partners but is open to other partners: bulleted CAH Almere University of Applied Sciences, a new educational and research facility in Almere, with a background in agriculture and biology.

- Applied Plant Research - Wageningen University, with a research station in Lelystad (Flevoland province).
- Witteveen + Bos, consultancy and engineering
- Flevoland Development Agency (OMFL), strengthening business development in Flevoland province.

OSA is coined as a vehicle to generate the cultural repertoire needed to develop sustainable and synergized urban farming practices for a healthy and vibrant Almere (see figure 5). It aims to fulfil a connecting role between practice, policy and research.

Figure 5. The development path of Urban Farming in Almere



Specific goals are:

- To develop viable urban farming businesses;
- To develop an integral urban food strategy;
- To develop a target oriented work and learning environment around urban farming in Almere;
- To strengthen environmental consciousness of citizens and professionals in Almere;

The Development Centre works with a portfolio approach. This means that at an operational level individual business cases are identified and developed – with a clear eye on coherence and mutual reinforcement of the business case. Parallel, and on a strategic level, supporting conditions in a broader sense are generated, like an urban food strategy for Almere. To adequately link both levels a Knowledge and Learning Environment is created that, at the same time is meant to generate professional capacities and competences in the long term.

The Development Centre works with a long time horizon and is aimed to be in function for at least 10 years. Initial funding is now being procured; in the future it should be self-supporting.

If OSA is to play a coordinating role, it needs to have convening power. The diversity of domains with which food and

farming can be related is immense. Hence, the choice for the term 'urban farming' is to some extent arbitrary. Many different images and expectations abound. This is difficult, yet at the same time the core of the matter. Farming in a city environment implies that it is multifunctional in nature, transcends sectors, links different levels of scale and involves a diversity of actors. Current examples comprise the whole range of small scale allotment gardens, child and educational farms and programmes, new local food webs, farm-enhanced health programmes, management of public green spaces, to high tech glasshouses delivering energy to adjacent neighbourhoods, optimizing ecological loops at industrial scale. Any other term would generate similar interpretation problems, hence the choice for 'urban farming' should be read as an invitation to a continuous rethinking of the established professional routines, in search of new, multifunctional and inclusive business concepts.

One conclusion from the RUAF-CAH conference in May 2011, is that coordination between stakeholders at all levels (local up to global) is vital to unfold the potential of urban farming for city vitality. The Almere situation is by no means unique. At present, there are a number of actors in cities worldwide that have come to the same conclusion as we in Almere with OSA. We think there is scope and urgency to engage in international encounter to inspire and help each other building both cultural repertoire and generative urban farming practices.

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#### Notes

- (1) The Chair 'eco-effective entrepreneurship in urban environments' aims to explore, identify, conceptualize, merge and communicate a diverse array of eco-effective entrepreneurship at different levels of scale. It seeks to develop appropriate methodology to do so, in collaboration with local and global partners.

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# The RUAF “From Seed to Table” Programme;

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An approach to participatory innovation in small-scale urban and periurban agriculture production, processing and marketing

Marielle Dubbeling

**Stimulating urban producers’ innovation capacity, strengthening producer organisations and linking up farmer groups with research and extension will lead to more rapid evolution of safer and more sustainable urban farming systems. The RUAF Foundation therefore initiated the “From Seed to Table” programme (RUAF-FStT) in 2009, to support groups of poor urban producers in 17 partner cities to organise themselves, analyse market opportunities, improve their production systems and develop short marketing chains for selected products, and enhance their access to credit and financing.**

Research has shown that market-oriented, small-scale urban agriculture is often more profitable than small-scale agricultural production in rural areas and generates incomes above the formal minimum wage level (Van Veenhuizen and Danso, 2007). The volume of crops and animal products from urban and periurban agriculture (UPA) brought on the urban market may represent a substantial part of the urban annual food requirement. For example, in Nakuru the figure is 8 percent, Dakar 10, Kampala 40 and Hanoi 44 percent (data cited in de Zeeuw and Dubbeling, 2009). However, urban producers who seek to produce for the market also encounter a number of constraints, including a low degree of organisation and low productivity.

Well-organised urban producer groups and associations fulfil a number of important functions. These include acquiring a stronger position in the market, engaging in direct marketing to urban consumers and/or undertaking processing activities and product quality control, representing producers’ interests in decision making and enhancing access to credit and other productive resources (including urban organic wastes and treated wastewater). Productivity in small-scale (peri-) urban production is still generally low as result of a lack of (or inappropriate) support services (extension, access to credit, infrastructure development), limited access to productive resources and secure land tenure. Often the services provided to the urban producers still apply “rural” models that insufficiently take into account the specific urban opportunities and challenges, which require specific technologies and new forms of organisation.

Insecure land tenure leads people to plant quick-yielding seasonal crops and to avoid making investments. In addition, access to water and nutrients (of good quality) often is difficult to obtain or too costly.

The RUAF-FStT programme involved producers and knowledgeable outsiders (local NGO’s and experts) in ‘:

- Organisational analysis and strengthening;
- Situation and market analysis: analysing actual production conditions, market demand and trends;
- Business planning and development;
- Practical training on technical and organisational innovations needed in the different steps of the product chain (from input supply to production, processing and marketing);
- Studying financing opportunities and demands, and design and testing of improved financial schemes (see also the article by Cabannes on page 31).

## Main results

*Eighteen farmer-led agri-businesses have been set up, though they need to be consolidated*

The FStT programme targeted low-income urban producer groups that want to engage more intensively in market-oriented production as a means of self-employment and income raising. The groups had to meet the minimal conditions for commercial farming, for example secure access to land and water. RUAF lent support to 18 producer associations (each consisting of between 50-150 producer households) so that they could implement situation and market analysis and develop a business plan for products that are or can be produced by the urban producers and that have interesting market prospects. The agro-enterprises set up in 2010-2011 are involved in a variety of activities, including:

- Improved production and direct sale of (mixed) vegetables (carrot, tomato, spring onion, cabbage). See also the article by Moussa Sy on Bobo Dioulasso.
- Processing of food crops and aromatic plants (chilli)



*Women group in Freetown selecting their vegetables by order from their customers (photo: René van Veenhuizen)*

- Raising and processing of livestock products (poultry for meat and eggs, pigs). See the article by Castro and Chavarria on Lima.
- Production and marketing of other niche products (e.g. mushrooms).



Local support groups visiting a local supermarket in Bangalore (photo: IWMI)

First impact monitoring shows that in several cases members' income has risen. Producers in Amman, Jordan (72 members) had an estimated 50-120 per cent increase in income from the marketing of green spring onions; the 90 members of the Beijing Huairou Cooperative have doubled their net actual income by producing mushrooms; while producers in Belo Horizonte, Brazil, calculated an increase of USD 50-100 monthly income, depending on their level of adoption of the improved production technologies and degree of marketing of fresh vegetables and herbs.



Raising chickens in Bulawayo (photo: MDP-ESA)

As expected (as it generally takes four to five years to consolidate a business), after the first 18 months to two years, none of the businesses has reached break-even point yet to start making a profit. This means that all businesses are still subsidised by project and local funds. More and continued support is necessary and will be provided by the local/national government (in the case of Ndola, Zambia, Shanghai, China and Belo Horizonte, Brazil), local universities or NGOs (as in Lima, Peru and Cape Town, South Africa) or channelled through new project support (Bogota, Colombia). This level of institutionalisation is an important indicator of interest and sustainability.

*Local UPA value chains can compete in the urban food retailing system, though mainly through niche markets*

Results show that local urban and periurban agriculture value chains do have a place in the urban food system, even though global products, markets and corporations increasingly dominate the system. Local, safe and healthy production are the main reasons for urban consumers to buy produce that addresses their social and health concerns. This is best done by establishing direct relations with consumers and selling products to the following niche markets:

- vegetable box schemes to schools, international organisations and offices, as is done in Cape Town, South Africa and Freetown, Sierra Leone;
- producer kiosks, fairs and markets as in Lima, Belo Horizonte and Accra.

However, as these markets are to some extent protected and dependent on a specific group of consumers, market dependency can be reduced by also embarking on sale to restaurants, market women/men and supermarkets, as is being done in Bulawayo, Bobo Dioulasso, Sana'a and Beijing. Sales through these channels benefit from marketing strategies that emphasise that the produce is local (or local varieties/breeds) and that make use of logos that stress product qualities. An example is the "Responsible Production Protocol" used in Amman and Sana'a. This guarantees that a) the produce comes from within a radius of 10 km from the centre of the city, b) ecologically sound production practices are used, c) its production did not involve any abuse of women's and no children's labour, and d) 75 percent or more of the price paid by the consumers flows back to the producers (see photo and also the article on Amman).



Farmers in Freetown produce peppers to sell it as powder (photo: René van Veenhuizen)

*Farmer innovation capacity enhanced and approach replicated*

FStT support to the urban producers focused strongly on building their problem-solving capacities (problem analysis, identification and testing of alternative solutions) as well as their capacity to identify and utilise new market opportunities (analysis of specific requirements of various market segments, crop choice and adaptation of production practices, certification and trademarks, establishing strategic alliances). Under the FStT programme, farmers participated directly in market analysis and business planning so that they developed the required analytical and innovative capacities and were directly involved in and responsible for the development and management of their own businesses from the very start. Several producer groups involved in the FStT project have started replicating the approach with other products. Examples include the Iraqi El Amir women's group in Amman that is currently improving production, processing and marketing of figs as a second product; and the producer groups in Bulawayo that have expanded the approach they first used for chickens to setting up small mushroom and rabbit businesses. Other producer groups in the cities that were not directly involved in FStT have also started applying the methodology. RUAF is currently elaborating a revised version of their FStT manual for broader sharing among these and other groups.

## Lessons learned

Systematisation of the experiences in all partner cities highlighted the following key factors for success, as well as potential pitfalls that should be considered, when replicating the FStT approach:



Responsible production logo Amman (Photo: AUB-ESDU)

*Beneficiaries should have minimum levels of organisation and conditions for commercial farming*

Participating producer organisations should have a minimum level of organisation, leadership, membership participation and relationships of trust. Starting with individual producers and forming an organisation among them requires much more time (than is available for a two-year project) and involvement of local support organisations skilled in organisational development. Producers should also demonstrate a real willingness and capacity to operate a business (which requires a different mindset than subsistence farming), have some prior experience in commercial production and should fulfil minimum conditions for market-oriented farming, the most important of which is being able to produce a sufficient and regular quantity of produce for the market (which means having access to sufficient land, labour and productive resources).

*Support organisations should steer away from “giving away things for free”*

Support organisations should have prior expertise in working on commercially oriented projects. They also should shift from “a project approach” to a “business approach” in all their activities and assistance. This implies, for example, that project funds are not given as free donations (in the form of inputs or equipment) to individual producers, but are given to the organisation to be used in a more sustainable way as a revolving fund. Money invested in the business from this fund should be regarded as starting capital that the organisation can use to invest in new projects and build up its capital base.

*The business plan should be based on a carefully selected option with positive cost/benefit expectations*

Analysis of production conditions, market options and trends should take into account realistic yield estimates (under local conditions) and harvest losses (due to pests, diseases and also adverse climatic conditions). In many of the RUAF cities, harvest losses were underestimated, while yields and market prices were overestimated. This required frequent adjustment in the business and financial plan and projections. In two cities, even the most promising option had to be changed and the entire business plan and set up redesigned.

The business plan needs to be well understood by the involved producer groups, so that they can monitor (financial) performance themselves and understand the consequences of changes in yields, products, prices, organisational structures etcetera. In Latin America a simplified farmer version of the business plan was developed for this purpose.

Risk reduction is also of key importance (especially in innovation projects) and calls for good agronomic analysis and training. In several cases, insufficient attention was given to preventing pest- and disease attacks during the first production cycle. During the second and third cycles, the best crop rotation options were evaluated (with regard to technical and marketing aspects) and the producers better trained in pest and disease management.

Insurance systems could be explored. Partners from Amman and Sana'a proposed that an insurance component be

included as part of the organisations' savings and loans device (revolving fund). In Beijing, the local government set up an insurance system for 18 different types of crops and animals that engaged over 1600 farming households in 2007.

## Remaining challenges

Though the FStT project formally ended in June 2011, results achieved in each of the 18 cases need to be consolidated and impact monitoring continued to obtain information on the real profitability of the businesses and improvements in the livelihood conditions of the participating producers. While FStT showed promising results further analysis needs to be conducted. Which types of urban agribusinesses are most profitable and under which conditions? What local business support services are required to consolidate new agro-enterprises? And what is the real potential of such businesses to create more permanent and decent income and employment opportunities, and for which type of urban farmers, or other groups such as unemployed youth?

Other producer groups in the RUAF partner cities and elsewhere have shown demand for support in setting up new FStT type businesses. An *urban agriculture co-funding facility* to enhance local financing for commercial agriculture projects could be set up by RUAF to provide start-up revolving funds and technical support to these groups. Business planning, business training and organisational strengthening should be integrated in training curricula for technical staff and extension agents to enhance the capacity of local support organisations.

Finally, systems and rules for local procurement could be set up to create new niche markets for urban agriculture products. Local procurement (buying products locally) is one of the powerful instruments that governments have at their disposal to promote local production and economies. In the USA alone USD 350 billion is spent annually on local procurement, largely allocated to school and hospital feeding (Morgan and Sonnino, 2009). With so much new market potential, urban and periurban producers could expand their production and marketing and set up more and profitable agro-enterprises.

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### Note

(1) De Zeeuw's article in the Urban Agriculture Magazine no. 24 describes the project approach and process in more detail. Here we focus on the main results achieved and lessons learned.

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# Developing Value Chains in Amman, Jordan

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The city of Amman is the capital of the Hashemite Kingdom of Jordan and lies in the northern part of the Kingdom, covering an area of 1700 km<sup>2</sup> with an estimated population of 2,200,000 inhabitants. Annual average rainfall is 275 mm. The poverty rate in Amman reached 8.5 percent in 2008 (Directorate of Statistics, 2010); 25 percent of poor reside in the capital and the unemployment rate is 12.7 percent (ibid). In this context urban agriculture can play a crucial role in positively affecting the standard of living of farming families and individuals.

The total planted area in the city of Amman is almost 32 M dounoums\* (or 3.2 M ha) representing 18.4 percent of total national production, while livestock raising in the city represents 19 percent of total production. Two types of urban crop production can be distinguished: (i) irrigated agriculture: mainly practiced in the centre of the city around the old flood path and the artesian wells and springs, Wadi El Sir and Al Mqabalain; and (ii) rain-fed agriculture: practiced in most parts of the city except in the eastern area where the larger plots range between 50 and 100 dnms\* each (whereas the areas available for home gardens range between 200 and 1000 m<sup>2</sup> each). The main products produced are fruit (about 840,260 ha of fig, grape, pomegranate, stone and pome fruits), vegetables (197,776 ha of mainly tomato, cucumber, squash, okra and various leafy vegetables), and grains (351,452 ha of wheat, barley, chickpeas, and some other grains). Cucumber, tomato, strawberry, red and yellow sweet pepper and different varieties of lettuce are also exported. Livestock production comprises 390,500 head of sheep, goats and cows (Greater Amman Municipality, 2007).

\*One dounoum (dnm) is 1000 square metres or 1/10 hectare



Women of the cooperative at the wholesale market (Photo: AUB-ESDU)



## From Seed to Table project

The region selected for the "From Seed to Table" (FStT) project is an agricultural valley (Iraq el Amir) in Amman, where farmers are organised in extended families (which form the basis for community and tribal relations). The women in these families take care of agriculture and daily household duties and seek to earn additional income through a local not-for-profit cooperative called the Iraq el Amir Women's Association, established in 1993. The men are mostly civil servants or unskilled workers. Women have a strong interest and daily involvement in agriculture, but because of the type of funding available to them before the project began they had only developed their handicraft skills (weaving, pottery, paper making, ceramics, etc.) and had established a communal kitchen and a bed and breakfast facility through the cooperative. The members of the cooperative were struggling to keep these facilities operational and to find an income-generating activity that could sustain the cooperative in the long run.

## Implementation

The project was planned and designed by the project team and a selected group of farmers (both men and women) representing the region. The team was composed of two coordinators and three members of the cooperative; and the group of farmers was composed of 10 women and 20 men. Together this team initiated an urban producer organisation (UPO) and built close relations with farmers in the area through Urban Producers Field Schools (UPFS) and other project activities.

For cultural reasons, initially only men registered to participate in the project. Therefore, disaggregated data were collected per task and activity to identify who would attend the Field Schools, and who needed to be contacted for the



*Greenhouses in the Iraq el Amir valley in Amman (Photo: AUB-ESDU)*

meetings etc. Eventually the project reached 72 families from two regions in the valley: Hay el Bassa and Hay el Karyat, and 75 percent of the project's direct recipients were women. The most significant step in the project was establishment of an urban producers' organisation (UPO) as a separate unit (with assigned and independent staff), within the women's cooperative. This UPO consists of one director, one treasurer, one secretary, and 42 members, all of whom are women. This unit manages the business, which consists of all operations related to the production and marketing of one selected type of produce (see box) together with the participating farmers. This unit manages the business through a team formed of the director, the treasurer, the secretary (all women) and 2 women for packaging and 2 others for marketing. This unit is responsible for the coordination of related activities, production and marketing, of the selected product (see box) for the business (42 farmers) and all the participating 72 families.

The FStT project coordinators initially assisted the UPO in making contacts with expert farmers, support institutions and with potential buyers and donors. The experience of the women who had already worked in the cooperative was a plus because they had already gained managerial skills and built trust with a number of institutions and with the families in the region.

The establishment of a group saving scheme to ensure financial self-sustainability was an important mechanism to enhance the role of the UPO. The terms and conditions were discussed with farmers, who agreed on an entrance fee of JD 5 to 10 (1 JD=1 Euro), depending on their capacity, and then a fee of JD 1 each month. They also pay marketing fees to the cooperative amounting to 14 percent of their gross revenue from sales, of which 6 percent goes to the UPO "revolving fund". This fund is intended to cover accident insurance, to pay for bad debts, to finance activities to improve skills, education and investment opportunities, and to build the fund. The other 8 percent covers marketing costs such as packaging, transportation and commission. Moreover, each farmer deposits 1 percent of their sales in "a reserve account" under his/her name to encourage the habit of saving, and to help control unnecessary consumption.

### Results, impacts and challenges

Through the FStT project and activities of the UPO, the farmers' and the association's capacities have been strengthened

with respect to management, marketing and networking. Improvements have been noted in:

- decision-making on the choice of marketing channels and contracts, and in building linkages and contacts with marketing institutions and the ministry of trade and commerce;
- decision-making on money expenditure;
- linking with extension service providers, mainly the ministry of agriculture for the provision of training;
- linking with institutions that provide (free) training in management and administration;
- the organisation of regular meetings to follow-up on advancement of the project and proper implementation of activities, bookkeeping for main activities and registering of data on farmers;
- exploring potential marketing channels (including in the export market) and participation in national fairs and farmers' markets, as well as promotion of urban agriculture at these venues.

For example, the UPO managed to get a stand free of charge at the Friday market of Amman, and it has received training on proposal writing and bookkeeping from the Queen Nour Foundation. The members of the UPO team have learned how to stay updated on market prices and how to use this information both in the planning of production and to ensure a constant supply to the market. The latter requires good communication with the farmers. They have also acquired a better business-sense and have learned that everything has a cost and a return, especially the image and branding of the produce.

The team also implemented a project on food security as an initiative on healthy food production and healthy meals for children and teachers at a neighbouring school.

During the whole FStT project, men played a limited role, and only participated in specific activities such as meetings, the UPFS, and contacts with potential buyers in some cases. There is now a better recognition of the role women can play in society: not only are they leading a business that men are engaging in, but they are gaining new information and support for their role in farming, which is an activity normally led by men when practiced beyond the household level. The participants have also gained more knowledge of credit institutions and extension services.

Challenges included difficulty in building immediate trust between the new UPO and the other urban farmers in the



*Participating women cleaning the green onions in the field before packaging (Photo: AUB-ESDU)*



*Distribution of onion seedlings trays to farmers (Photo: AUB-ESDU)*

region, especially since innovative management of agriculture was being propagated in an area dominated by traditional approaches. Also, getting the farmers to respect the conditions of planting and delivering on time took some effort, especially since these conditions were set by a group of women. Additionally the buyers were not used to working with women, and building trust was not easy initially. Once the trust was there, the UPO struggled to sustain the image of the brand and to keep the farmers satisfied with the price offered to them compared to that offered by middlemen and other marketing channels. Management of the revolving fund is still a challenge for the new UPO, especially in dealing with the different expectations of the members, and in maintaining transparency.

### Lessons learned and future perspectives

Based on the experiences in Amman, it is clear that efficiency could have been better if the programme had started with a smaller group of farmers: 20 or 30 farmers instead of the proposed 100. The project could then have started with one or two first crop cycles before adding on the next group of 20 to 30 farmers. In this way, the organisational and managerial skills and the relations and communication skills with farmers and the market could have been built gradually, and the process could have hence been less hectic and risky, especially since the newly formed team had no experience in managing such a large group.

Furthermore, creating a business plan and cost analysis were difficult for the UPO, which lacked the necessary knowledge to do this and to support the farmers. Adequate risk analysis had been done, but no alternatives in the event of failure of the business were in place. Another lesson is that working with more than one type of produce (the most promising option – see box) would allow a broader market approach and give more flexibility to the farmers.

In addition, several of the UPO meetings did not meet the farmers' expectations since they expected materialistic support rather than theoretical lectures, especially on how to get organised. They are used to working more individually. To improve the effectiveness of the approach in a context like Amman, we suggest that practical support be provided before working on organisational strengthening. Despite these challenges, the UPO has developed well, and the farmers have established a large nursery to produce seedlings to be sold to other farmers at competitive prices. For this purpose, an existing and fully equipped greenhouse (1000 square metres) has been rented for one year. The UPO is also aiming to link with neighbouring schools to sell fresh and nutritious local produce, as part of efforts to broaden its

market channels (and possible export channels).

The UPO will continue with more onion cycles and to apply the FStT approach to other crop/animal production chains, such as the production of figs and olives (which grow well in the region), production and drying of selected medicinal and aromatic plants and processing of goat cheese.

A key lesson for the farmers was the necessity to work along the various stages of the value chain rather than focusing on the production process alone. The UPA continues to create linkages with other support agencies, and it is applying for support for the further development of managerial and organisational skills as well as for funds to sustain its current activities and develop more value chains approaches.

### Most promising option (MoPO) in Amman-Jordan: Fresh green onion

*Innovations in Amman are:*

- **New variety of spring onions suited to local conditions:** does not flower early (early flowering reduces the commercial value), long shelf life, larger size, uniform produce
- **Planting onion seedlings (from nursery) to accelerate production and reduce seedling loss**
- **Year round production:** three seasons per year for the new onion variety (vs. one or at most two for local variety)
- **New harvesting and post-harvesting techniques** (dry the soil before harvesting, first cleaning in the field, sorting at household level, branding and packaging at the cooperative level);
- **Drastic improvement in packaging and marketing:** 0.5 kg and 1 kg plastic bags ready to market; label indicating "geographic origin" and "healthy produce", bypassing the middlemen chain through targeted marketing, social recognition, etc.

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# Strengthening the Production and Sale of Agrosilves Pigs in Villa El Salvador, Peru

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**Pig raising is one of the main activities carried out by urban farmers in periurban areas of northern and southern Lima, due to a lack of water for irrigation in the desert climate. The RUAF FStT programme collaborated with the producer organisation AGROSILVES to improve the productivity and profitability of its farmer members, by applying the production chain approach and strengthening their organisation.**

Villa El Salvador is a municipality located in the southern part of metropolitan Lima, with an area of 35,469 km<sup>2</sup> and a population of 388,000, of which 57 percent are poor and 16 percent extremely poor<sup>2</sup>. The municipality is one of 43 districts in Lima and is known for its good land use planning. It is divided into five zones: residential, business, recreational, agricultural and livestock, and industrial<sup>3</sup>. The 632-hectare Agricultural Zone is constantly threatened by urban expansion and the need for new residential and industrial areas has led to a reduction in agricultural activity in the zone to 26 percent of its initial extension.

AGROSILVES is one of the five active second-level producers' organisations in the Agricultural Zone and is located in the Lomo de Corvina sector, which occupies an area of 53 ha. It includes 29 associations representing in total nearly 300 producers devoted primarily to raising pigs. The RUAF partner; IPES Promotion of Sustainable Development and the local NGO; PRISMA Welfare Association, collaborated with AGROSILVES in the project *"Strengthening the Production Chain and the AGROSILVES Pig Farmers' Organisation"* as part of the "From Seed to Table" – FSTT Programme, which started in January 2009.

AGROSILVES was selected for this project because it is the largest pig producers' organisation and it has great visibility in southern Lima. Therefore the lessons learned could be used for upscaling in other areas. The project involved 101 AGROSILVES (49 women) members from 15 associations (or "productive units") interested in introducing changes in their pig raising activities and improving their conditions for participation in the pig production chain.

Most of the participating producers were born outside of Lima (77 percent), had large families (46 percent had 6 to 12



*Pig producers from Villa El Salvador in Lima, Perú* (Photo: Luis Chavarria)

members), were between the ages of 35 and 55, had a low education level (39 only completed primary and 41 completed high school) and a low income (57 percent were poor and 9 percent extremely poor). Ninety-five percent of them carried out at least one other additional economic activity, such as a business (warehouses) or transportation service (taxi, cargo or motorbike-taxi). However, for 80 percent of them, the breeding of animals (pigs and to a lesser extent other small animals) was their main activity.

## *Participatory research into the production chain*

Initial participatory research with the pig farmers included the evaluation and selection of the most promising product and an analysis of the organisation. The tools used in this phase of the project were designed for agricultural activities and products, but were adapted to the local reality and the type of production carried out in the intervention area (animal husbandry). Based on the results of a market analysis, the farmers selected suckling pigs and piglets as the products with the highest potential. A business plan was developed with the farmers, which focused on improving the quality and quantity of the animals (supply), and increasing the income of pig producers and their pig capital.

This research also helped identify the critical points in the production chain for suckling pigs and piglets that needed to be addressed in the design and implementation phases.

**Table 1. Critical points in the pig production chain of AGROSILVES farmers****Pre-production**

- Inadequate spatial distribution of the production areas on the premises.
- Individual purchasing of materials for the preparation of pens.
- Low level of technology on the farms.
- Inadequate cleaning and disinfection of the breeding areas.
- Unsuitable handling and disposal of excrement.
- Inappropriate supplies for the food preparation predominately using organic waste.
- Unsuitable use of the organic waste for feeding the pigs.
- No specific infrastructure or equipment for food preparation.
- Inadequate diets for the pigs.
- Individual purchasing of veterinarian products such as vaccines, medicines and de-worming.
- Inappropriate use of vaccines and de-worming.
- Lack of guidance on and adequate control of diseases.

**Production**

- Deficiencies in the reproductive handling of the pigs (inappropriate use of the boar, artificial insemination is not used, pregnant sows are not vaccinated, inadequate selection of males and females for reproduction).
- Deficiencies in the attention and care given to sows at birthing and post-partum and in their preparation for new reproductive cycles.
- Lack of production records.
- Poor management of suckling and weaned piglets.
- Inadequate management of piglets for breeding and fattening (weight, medical checks, application of vitamins and minerals, etc.).

**Marketing**

- Lack of production planning, which creates variable volume and quality of supply.
- Ignorance of regulations and quality standards.
- Lack of relations with regulatory and oversight organisations.
- Individual negotiations and sale to intermediaries and brokers.
- Inadequate setting of sales prices (roughly estimated by the buyers).
- Weak approach to customers and target markets.
- Lack of information on the demand for pork in the market.
- Lack of coordination with slaughterhouses for the benefit of the pigs.
- Ignorance of the production costs (lack of records).

**Organisation**

- AGROSILVES is more of a union than a business. The organisation's objective is to manage access to secure land tenure and basic services for its members.
- It lacks the expertise and motivation to carry out collective economic enterprises.
- There is no qualified internal member to assume responsibility for managing any productive enterprise.

spatial distribution). They also improved management, reduced piglet mortality and improved the pigs' nutrition (using balanced diets suggested in the training). Changes were also made to reproductive management (insemination of sows, improved selection of reproducers, better care for boars and sows and even introduction of new reproductive breeds) and in the sanitary management of the piglets and suckling pigs (vaccines, use of medications). Some farmers installed biodigesters for the handling of excrement. These changes are gradually increasing productivity, increasing the survival of the piglets and increasing pig stocks (the producers now have more animals to sell than before). For a full overview of the changes see table 2.

**Table 2. Innovations and changes in technical aspects of the production chain of the AGROSILVES producers**

Concept	Baseline (December/ 09)	Second measure- ment (March/11)	Percent Variation
Average price per sale (nuevos soles)	200	366	+83.0
- Suckling pigs	95	110	+16.0
- Piglets			
Livestock capital (number of animals)	6.4	6.7	+4.6
- Sows	13.04	21.3	+63.0
- Suckling pigs	9.7	14.3	+47.4
- Piglets			
Survival of piglets (number of piglets)	8.5	8.9	+4.7
- 48 hours after birth	8.1	8.3	+2.5
- Weaned for fattening			
Handling of piglets (percentage of producers)	4	94.4	+90.4
- Cooling operation	64	91.7	+27.7
- Teeth clipping	10	44.4	+34.4
- Tail docking	36	91.7	+55.7
- Cutting of navel (umbilical cord)	32	66.7	+34.7
- Navel disinfection			
Vaccination of animals (percentage of producers)	47.9	75	27.1
- Suckling pigs	81.2	94.4	13.2
- Sows	45.8	63.8	18.0
- Boars			
Use of floors in pens (percentage of producers)	25	36.1	+11.1
- Concrete	35.4	38.8	+3.4
- Dirt and concrete	37.5	22.2	-15.3
- Only dirt	2	2.8	+0.8
- Wood			
Source: UNMSM, April 2011			

## Implementation of the innovation project

The project focused on these critical points as part of the implementation of the business plan. The technical management capacities of these pig producers were addressed using an adapted version of the Urban and Periurban Farmers Field Schools (UPFFS). In relation to organisational strengthening, the UPFFS focused on development of an operative organisation to support changes in the chain and facilitate coordination, communication and representation of farmers involved in the project.

One innovation was the use of alternative designs for the pig pens, which allowed the producers to gradually improve their production, starting with a pilot group of animals (mainly sows and piglets) and progressively making improvements to other areas in the farms. Many farmers made changes to the breeding infrastructure on their premises, especially in the maternity and rearing areas (installing concrete floors, roofs and climate protection; improving

At the same time organisational strengthening took place at three levels: the Board of Directors, the territorial groups of producers (organised into so-called "squads" after completing the UPFFS) and at the level of the farmers, through the formation of a Pig Farmer Management Committee (CGP for its initials in Spanish) responsible for handling all links in the chain. Business and organisational management training was provided; rules for the organisation and its functions were developed and approved; a workplan was developed and a portfolio of customers and suppliers was produced. The Management Committee set up a Service Centre for the



*A producer from AGROSILVES applies his new knowledge* (Photo: Luis Chavarría)

AGROSILVES producers with a communal first aid kit that offers medicines, vaccines and de-worming and offers various services (tagging, tail docking and teeth clipping of piglets, among others).

A Marketing Plan was developed and implemented, which reduced the distance between producers and customers. In accordance with this plan, the pigs are now processed in the slaughterhouses located in the southern area of metropolitan Lima where they are sold. Sales are made collectively, the Management Committee is responsible for establishing contacts, managing the funds for joint marketing (advance preparations, transport etc.) and distributing income among the farmer suppliers. In addition, a holding and weighing area was installed for the suckling pigs, which allows for better weight control of the animals before they are sold. By December 2010, the producers' income from the sale of pigs had increased in relation to their income before the start of the project (see table 1).

In the current and last phase of the project, a group of veterinary students from the San Marcos University and the Cayetano Heredia University are working in the area. Once the project is completed, these universities will continue to provide technical assistance to AGROSILVES in the management and sanitary care of pigs, either through the work of students or by sending permanent supervisors to these areas.

## Conclusions

The FSTT innovation project in Villa El Salvador changed the pig farmers' production practices resulting in improved productivity and increased incomes. The participatory research process involving the farmers was key to this success. Members of the Pig Farmer Management Committee are fully committed to ensuring continuity through implementation of commercialisation activities (slaughterhouse, clients), management of the common infrastructure and services for farmers, and maintenance of relations with regulatory organisations (SENASA, municipality) and other actors (universities).

The first step in this change process was for the farmers to understand the importance of producing in a way that satisfies the legal and quality demands of the target markets. Only then could a strategy be designed to improve various aspects in the short and medium term, which could form the basis for an innovation project and business plan. The Field Schools provided technical assistance and made it possible to introduce improvements in pre-production and production aspects; in addition to improving the organisation and developing the skills needed to put new selling strategies into practice.

Finally, this type of project gives visibility and legitimacy to the producers vis-à-vis other stakeholders in the pig production chain, such as the municipality, NGOs, CBOs in Villa El Salvador and also other pig producers' organisations. By strengthening the pig farmers' capacities, the project improves their self-esteem, increases recognition from other key players in the chain, and strengthens their position and bargaining power. It also facilitates the coordination of actions (mainly commercialisation) and the involvement of support institutions such as universities, in the short and medium term through different agreements.

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## Note

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# Urban Agriculture development in Minhang, Shanghai

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**Urban agriculture development in China is still dominated by municipal and local government, and other stakeholders play a comparatively less important role. This situation is changing however. The MPAP (Multi-stakeholder Policy Development and Action Planning) and FS&T (From Seed to Table) programmes of the RUAF Foundation have contributed to a fundamental shift over the last ten years, particularly in the RUAF China network cities, which include three pilot cities and ten dissemination cities. Minhang district in Shanghai is a good example of a newly emerging approach in China of government-led, but participatory urban agriculture development.**

## Urban agriculture in Minhang

Minhang is one of Shanghai's 18 urban districts and the city's second-largest economic entity. Located in the centre of Shanghai Municipality (see figure 1), Minhang has a well-developed traditional manufacturing and hi-tech industry, such as aerospace technology and biopharmaceuticals. Most of the district's farmlands are located in the southeast alongside the Huangpu River, and these plots have been reduced to a total of around 5,000 ha, accounting for less than 13.5 percent



Figure 1 Location of Minhang in Shanghai Municipality

of the district's land area (farmland accounts for 32 percent of Shanghai Municipality as a whole). A total of 77,000 farmers in Minhang generate an agricultural output value of USD 70.5 million per year, accounting for only 0.4 percent of the district's GDP (the average for Shanghai districts is 1.9 percent). But the farmers' net income per capita in Minhang is much higher than for farmers in the municipality as a whole (respectively USD 2470 and USD 1890).

Urban agriculture in Minhang is facing both the constraints and opportunities of its location. Major constraints are: 1) decreasing availability of arable land (a reduction of 7.6 percent in 4 years); 2) relatively lower productivity on farmland compared to other land uses (the input-output rate in agriculture is only 1/6 of other economic sectors, while that of small-scale farming is even worse); 3) increasing labour cost and high competitiveness of other jobs (making educated young people reluctant to become engaged in farming); 4) general small-scale of production, which makes it difficult to attract (commercial) finance for investment (such as for upgrading technologies).

However, the context also provides some good opportunities: 1) The multifunctional role of urban agriculture in the urban system is increasingly recognised by the city government. 2) There is a huge market and high demand among urban citizens for fresh and healthy food and for other niche products such as tourism destinations. 3) The protection of farmland and the practice of urban agriculture provide employment for vulnerable groups such as migrants and the elderly. 4) Increasing financial support, particularly through government subsidies, makes multifunctional urban farming interesting for some young entrepreneurs who are willing to invest time and efforts in this potentially high-return business.

## The intervention and implementation of MPAP and FS&T programmes

At the time RUAF started its MPAP programme in Shanghai in 2005, it was recognised that a number of changes were necessary in order to develop urban agriculture. To start with, urban agriculture requires more and diverse actors than traditional (rural) agriculture. RUAF introduced the MPAP programme in Minhang to help the district government identify major stakeholders and encourage them to become involved in the development of urban agriculture. In Minhang, at least three categories of stakeholders should be included: 1) *government authorities*, at municipal, district, town/township, and village levels; 2) *practitioners*, such as farmers, collectives and enterprises; and 3) *support organisations*, including universities, research institutes and market organisations. District government, village commissions (including cooperatives and some key agro-enterprises),

Jiaotong University and the Agriculture Service Extensions were selected as key players in the MPAP programme and formed the core team. Through the RUAF, external linkages were created to other cities in China, such as Beijing and Chengdu, as well as to cities in Europe, Japan and Taiwan.

RUAF continued to support this multi-stakeholder process of action planning under the subsequent FStT programme, but added support to practitioners in improving their income and efficiency through technical and organisational changes. These changes were identified by a local team, consisting of RUAF China Regional Centre based in Beijing, Minhang Agriculture Commission, Jiaotong University, China Agriculture University and the two towns Maqiao and Pujiang, which have been intensively involved in RUAF programmes and government agro-schemes in the last five years. In Minhang, *five key areas of interventions* were adopted by district government departments, agro-focused towns, villages and cooperatives. These interventions were: 1) joint strategic master planning both in sectoral and spatial dimensions by inviting high-profile institutions and experts to become involved; 2) establishment of cooperatives (to realize economies of scale and gain government support for training, finance, insurance, technologies, and marketing); 3) provision of innovative technical assistance to urban producers, such as by introducing a system in which each technician takes care of 7-10 farm households; 4) innovative financing schemes for urban agriculture based on a diversification of financing resources, such as mobilizing more social capital into urban agriculture businesses by establishing some preference policies; and 5) introduction of a tracing system to improve food safety. This latter system encompasses the whole chain, including production, transportation, trading, and the consumer market. The tracing and certification commitments are usually carried out by a third party such as municipal inspection departments.

### Major changes and progress

Through these RUAF programmes, participatory government-led urban agriculture in Minhang district has developed significantly in the last five years.

#### Strategic planning

The government in China continues to play a dominant role in development; and strategic planning is therefore still important, particularly for urban agriculture in the relatively better-off district of Minhang. Unlike before, much attention is now given to the multi-functional role of agriculture in the peri-urban settings, its sectoral and spatial restructuring, and the participation of key actors in this process. In addition, external planners have been invited to participate in this planning process. Traditionally government planners focused predominantly on production and completely ignored the actors involved.

This change is demonstrated by the latest Minhang Spatial Plan for Urban Agriculture Development (2010-2020), which was jointly developed in 2009 by RUAF China at the Chinese Academy of Sciences and local government. The focus in this comprehensive development plan is on high-quality produc-

tion, environmental protection and recreation, and on stakeholder participation. Two agricultural zones have been identified and designed (see figure 2): a recreational agricultural zone close to residential areas, with room for agro-tourism, and a so-called “Pujiang Modern Agriculture Industrial Zone”, which incorporates both more intensive production and a modern design for sightseeing for urban residents. This large-scale green farming landscape is located close to the grounds of Shanghai World Expo 2010.

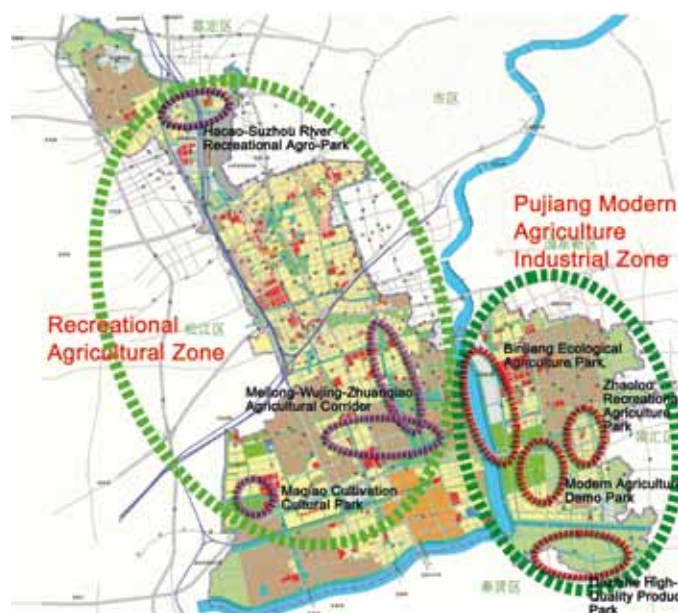


Figure 2 Minhang spatial plan of urban agriculture development (2010-2020)

Planning is also well coordinated with other major policy frameworks and regulations, such as the *Agriculture Industrial Policy*, in which urban agriculture is seen as a way to enhance profit and farmers' income and facilitate the development of specific niche agricultural products, and the *Small Town (peri-urban) Planning Framework*, in which urban agriculture forms part of integrated urban-rural planning and development.

As part of these plans, a series of *infrastructural improvements* for agricultural development have already been carried out. By the end of 2010 more than 1,527 ha of farmlands had been improved in terms of increased production (through the use of machinery for paddy rice, which increased from 42 percent in 2008 to 98 percent in 2010), ecological production and the introduction of irrigation systems for vegetables.

### Formation of cooperatives and agro-enterprises

The importance of cooperatives was emphasised during the FStT programme in Minhang district. They are seen as an effective organisational step in urban agriculture development. The formation of cooperatives was based on villages or on agro-practices. The government enthusiastically encouraged this development and provided support in capacity building related to management, organisation and technological innovation. As a result, the number of agro-cooperatives in Minhang more than doubled from 38 in 2008 to 84

in 2010. The income of farmers in the cooperatives was also 3-5 percent higher than that of the un-organised farmers. Overall farmer household income per capita in Minhang in 2010 reached 18,500 RMB (about 2,000 Euros), which was a 20 percent increase compared to 2008.

Besides the formation of cooperatives, the government also encouraged the development of large-scale agro-enterprises, and supported farmers especially in acquiring land and obtaining financial support. Many agro-enterprises were thus able to expand their businesses in Minhang. Some 9,000 additional jobs in agro-related activities have been generated in the last two years. Currently there are 26 large-scale agro-enterprises in the district, six of which are very large.

Thanks to the improved peri-urban infrastructure in Minhang and the relatively rapid increase in farmers' income, the growth in income disparity between urban and rural areas in Minhang has gradually slowed down. According to an independent third-party evaluation of the performance of local government in 164 counties in China (in strengthening urban-rural integration and reducing the gap between them), Minhang ranked No.1, and 81.4 percent of the farmers in Minhang are satisfied with the government services.

### Provision of effective technical assistance

Currently in Minhang 88 agro-service stations with 288 extension teams provide **technical assistance** to farmers related to agro-technologies, marketing, food quality control and recordkeeping. Under the RUAF programmes an improved technical assistance scheme has been developed, in which each technician provides services to 7-10 farm households throughout a full production period. In the past, technicians were not specifically appointed to certain farm households, so none took responsibility for improving farmers' skills and performance. During the period 2008-2010, various training courses on agricultural planning and management were organised, and up to 8,000 cooperative farmers received technical training.

In collaboration with Shanghai Agricultural College, Jiaotong University and the Minhang Agricultural Institute, new farming experiments were developed and served as demonstrations for the farmers, on testing and dissemination of high-quality seeds for paddy rice, vegetables and horticulture.

### Design of innovative financing schemes

A series of innovative financing schemes was developed under the RUAF FStT programme and suggested by the RUAF financing study. Box 1 provides an inventory of the financing schemes developed so far in Minhang.

#### Inventory of government-led financing schemes on urban agriculture in Minhang, Shanghai

1. Provide a guarantee fund and interest discount for a general agriculture production loan.
2. Grant up to 10,000 Euros plus a computer to any newly established cooperative.
3. Provide unemployment insurance and pension to farmers in

cooperatives.

4. Provide production insurance for large-scale farmers: 2 ha in vegetable production, 7 ha in grain production.
5. Stimulate financial institutions and relevant enterprises to set up "small village banks" to provide financial support services to cooperatives.
6. Grant an additional salary of 65 Euros to each farmer working in a cooperative.
7. Provide a subsidy on equipment, such as trucks and cool storage, for cooperative alliances in order to stimulate chain development and up-scaling.
8. Encourage cooperatives to sell their products directly to communities and working units by giving a free ground rent.
9. Encourage cooperatives to improve the quality of products by granting 150 Euros per ha per year if products are approved as green products.
10. Provide facilities (greenhouses, tools) to support fairly large-scale cooperatives: 0.7 ha for vegetable production and 3.5 ha for grain products.
11. Encourage cooperatives through various incentives to develop their brands and involve them in the municipal contest for best brand.
12. Provide free customised training based on cooperative requirements.
13. Grant an award to those who are excellent at providing technical help and services to farmers.

Sources: Collected and compiled by research team of the RUAF FStT programme in Minhang

### Improvement of food safety

Based on the assessment conducted under the FStT programme and the high standards related to food safety set at the Shanghai World Expo 2010, Minhang established a good system for monitoring food safety in the production and supply of agricultural products for the Expo. Given its location near the Expo sites, Minhang was designated as the food supply base in Shanghai during the event. The quality tracing system for all Minhang agricultural production and the certification system set up for entering the market in Minhang district are still in operation. Up to 20 percent higher income can be obtained by selling certified products.

In 2010, the satisfaction rate for quality vegetables was 99.8 percent for all the markets in Minhang. Green Certification increased from 400 ha in 2008 to 1,300 ha in 2010 and 39 cooperatives were approved to sell green products. Farmer collectives are encouraged to explore markets, adapt their production to the quality criteria in new markets and to establish or improve their marketing channels, preferably directly to consumers. The Minhang government assists in branding locally grown food (quality labels) and in stimulating consumers to eat locally produced quality food. The number of communities and working units involved in the former has increased from zero in 2008 to 30 in 2010.



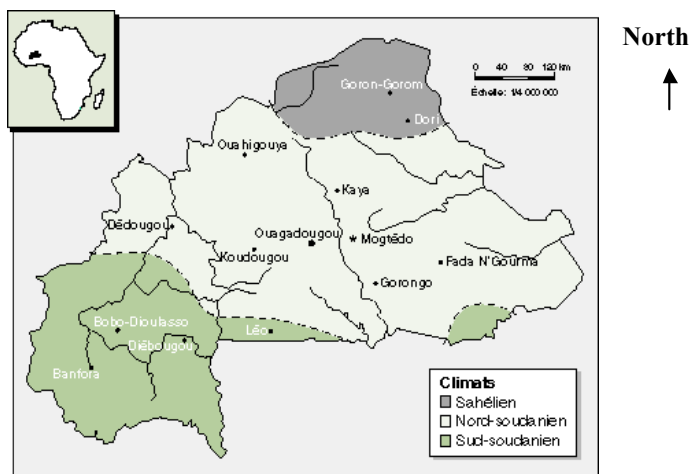
# The Kibidoué Cooperative in Bobo-Dioulasso, Burkina Faso

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Moussa Sy

With almost half a million inhabitants in 2006, Bobo-Dioulasso is Burkina Faso's second largest city. It is located 360 km south-west of Ouagadougou. Agricultural activities are important in the socio-economic life of Bobo-Dioulasso, and seven percent of the population grows cereals in the suburbs and vegetables along the Houet River.

There are several vegetable production sites, such as Kôdénî, Sakabi, Kuinima, Dogona, Koua, all along the Houet backwater, and Tondogosso and Léguéma (IRD, 2006). In each of these sites, cabbage is the most dominant crop, followed by onion, lettuce and aubergine. Total production of vegetables within the borders of Bobo-Dioulasso has been estimated at about 50,000 tons in the marketing year 2004-2005, of which almost 75 percent was consumed in the city itself (Traoré, 2006).



Bobo-Dioulasso in Burkina Faso. (www.izf.net)

The African Institute for Urban Management (IAGU), a RUAF partner, supported farmers of the Kibidoué Cooperative at the Kuinima site to improve their cabbage production as part of the "From Seed to Table" (FSTT) Programme.

## Kibidoué cooperative

The cooperative started in 1999, and currently counts 600 members, 165 of whom are so-called market gardeners (producing vegetables for the local market). The other members mainly produce cereals.

The cooperative has an Executive Committee composed of six members, a Control Committee composed of two members and a General Meeting of 26 members. The elected officials have a mandate to serve for three years, and they can be re-elected once. The current Executive Committee members have largely exceeded this term, however, and the current chairperson has held this office since official recognition of the cooperative in 1999.

At the Kuinima site, 47 women produce vegetables on plots that vary from 0.25 to 0.75 ha. These farmers have an agreement with the military authorities allowing them to utilise these plots, but they do not possess official deeds and can be evicted at any time. The 47 women sell their own crops, as well as those of the other producers of Kuinima. The women usually pay the other producers in advance, but sometimes buy the products on credit and pay after sale. The other producers also sell to private vendors and to individual consumers.

RUAF collaborated with 85 farmers at the Kuinima site, including these 47 women, all of whom are members of the Kibidoué cooperative. Some organisational aspects of the cooperative had to be taken into account, particularly the commitment of the members, which was linked to the process of democratic decision-making, and the organisation of the farmer groups, their linkages and operational management. Strengthening the administrative and financial management of the cooperative was also an important aspect to consider, especially its (lack of) documentation and transparency.

## RUAF FSTT

The MoPO (or Most Promising Option) can be one product, but it can also consist of several products having the same or a similar value chain. Initially the farmers at Kuinima opted for the latter, since they preferred to receive support for all their farm activities (as had been the case in previous agricultural projects). The process of defining the MoPO therefore took a long time. The producers eventually settled on the production and sale of cabbage (see box).

Statistical data on cabbage production and on the various segments of the market were not available, so as part of the market research primary data needed to be collected. This was undertaken in relation to the various targeted markets and not on the city level.



Some of the participating farmers during a session of the UPFS (Photo: IAGU)

### The MoPO: Improved production of cabbages

*The selected option was the improved production and sale of cabbage heads.*

#### Main improvements

- Selection of a new variety: the KK Cross variety (high in demand and seeds available on the market)
- Expanded sales: to the Ranch of Koba (a restaurant), to the (women) vegetable retailers of the various city markets, and to institutional restaurants and women exporters

#### Technical and organisational innovations

- Protection of seedbeds with mosquito-net veils
- Use of the KK Cross variety
- Biological treatment of seedlings with extracts of *Azadirachta indica* (Neem)
- Introduction of a standard unit for the sale of cabbages
- Installation of wells equipped with barrels and PVC pipes
- Improved management: execution and control bodies for the implementation of the MoPO

Market research indicated a potential demand of 210 tons per week. The business plan started with an expected yield of 81 tons of cabbages per cropping cycle, while the break-even point was calculated at a production of 18.2 tons of cabbages per hectare (total 1.47 ha), per cropping cycle, with an expected price of 197 FCFA<sup>1</sup> per kg (footnote 1). The business plan projected that the cooperative would reach this break-even point after the first production cycle.

Under FStT the local NGO, the IAGU-AU office, supported development of the business with training and organisational strengthening. For the first production cycle the urban producer field school (UPFS) focused on the following topics:

- techniques for the preparation of seedbed;
- land preparation;
- biological treatment of seedlings with extracts of *Azadirachta indica* (Neem);
- several market-gardening practices, such as crop rotation, land management, identification of parasites and pest management, and water-saving irrigation practices;
- harvesting: of the first leaves and of the cabbage heads;
- improved marketing.

### Results and impacts

The analysis below relates to the first two production cycles of cabbage in 2009 and 2010.

#### Income but no profitable business yet

The results of the first crop cycle were on the whole satisfactory, with a production of 28.6 tons per hectare

(substantially higher than the required 18.2 to break even). With a price of 150 FCFA<sup>2</sup> per kilogramme, the income generated was 6,300,000 FCFA, or on average 74,117 FCFA per household. After deducting the various expenses this resulted in a profit of 5,405,514 FCFA, or on average 63,594 FCFA per household. Compared to the previous production cycle, an increase of generated income between 10-15 percent was noted. Incomes could have been higher if negotiations with the Ranch of Koba had been more successful, and if the producers had been able to overcome internal conflict and sell as a group. Still the production was profitable, and the producers were able to carry out their activities without any external financial support. It was also clear to them that higher prices could be obtained through better organisation.

Due to abundant rain, but also the producers' failure to respect the farming calendar and suggested treatment methods, the second production cycle encountered significant parasitic attacks, which resulted in a yield of only 1.67 tons per hectare (far below the break-even point). However, the producers were not discouraged, and learned important lessons.



UPFS session on seed bed preparation (Photo: IAGU)

#### Increased organisational awareness

Within the cooperative four specific committees had been set up to help guide the cabbage-production business: Supply, Production, Marketing, and a Gender and Development Committee. At the end of the first cycle, the participating producers suggested that these committees be combined into a Supply and Production Committee and a Marketing, Gender and Development Committee. These various committees did function, but not as well as had been expected. A major reason was the behaviour of those in charge of the Kibidoué cooperative, who regarded these new committees as a threat to their leadership. Inviting the Chairperson of Kibidoué to participate in the NGO-FStT local team did not settle this issue. On the other hand, the farm groups participating in FStT became aware that the cooperative, which should be servicing their interests, is in fact serving the interests of its leaders. They now also see the possibility of making their business more profitable themselves, and they have demonstrated the will to become emancipated.

#### Increased capacity to innovate

The FStT capacity-building activities helped the producers to

innovate their production system. More than 90 percent of the producers took part in the training provided by the field schools. All of them were able to describe these innovations (IAGU, 2010) and they are now using pesticide treatment with Neem and planning their crop year activities better. Moreover, the producers have improved their marketing and their network. They are aware that they can generate more income by working with new actors, like the Ranch of Koba. The producers requested a continuation of the UPFS.

#### Empowerment of women

The FStT programme allowed the women of the Kibidoué cooperative to play a significant role on all the levels of the process. They were in the majority on the committees and all of the women producers got access to the resources put at the farmers' disposal by the programme, in particular the agricultural inputs and equipment. Their behaviour changed significantly, in particular at meetings: at the beginning they were very fearful and embarrassed to speak, but now they are more expressive and defend their positions better.

#### Lessons learned and future perspectives

Several important lessons were learned during implementation of the FStT programme in Bobo-Dioulasso.

The *choice of producers* is important, especially considering the relatively short time span of the programme. It was agreed to select somewhat organised producers with a clear market orientation. A preliminary organisational analysis is therefore necessary to better understand the organisational dynamics, and the strengths and weaknesses of the organisation at different levels (especially the members' sense of belonging to the cooperative). Also, an understanding of the sociology of the beneficiaries is essential.

A clear *differentiation* must be made between the *participating farmer groups* (as direct beneficiaries) and the *association* (the cooperative). There is tension between the cooperative's wish to direct implementation of the activities (without taking into account the interests of the farmer groups in this case) and the farmers' entrepreneurial spirit, which the FStT programme promotes. It is important to emphasise the different functions at these two levels and to design *specific interventions of organisational strengthening* that establish clear and beneficial links between farmer groups and between these two levels. The cooperative should continue to lobby decision makers, financing institutions and technical support services, identify markets and support the farmer groups in their negotiations, while the operational choices (choice of land, production methods, financial resource management, etc.) should be carried out and managed by the farmer groups. And although FStT can provide support to the cooperative as well, the farmer groups should be the principal interlocutors of the FStT programme.

The systems of production are in a process of *continuous change*, which is an important issue to realise for the producers. Although the emphasis is on specific improvements, the business plan should consider the full production and marketing cycle, including risks. Although the production of



UPFS session on use of biological pest management (Photo: IAGU)

cabbages seemed quite easy for the producers, since they were accustomed to this type of production, the appearance of new parasites surprised them. Less dependency on a monoculture, and strategies for risk aversion and diversification are needed.

More than 50 percent of these producers are *illiterate*, which means that the business plan needs to be simplified and illustrated through images and graphs to be understood by producers. However, the project plan needs to contain a robust business plan and support activities.

The local situation and the diverse needs of the market might require a *MoPO consisting of several products* that have the same or similar market channels. Adequate attention (requiring more time or funding) to each of the production processes was necessary.

The planning, implementation and follow-up of FStT activities require very *committed teams qualified* in agriculture as well as in adult learning techniques, participative methods and negotiation techniques. Developing entrepreneurial thinking among farmers, which is the main aim of FStT, is an iterative process involving continuous analysis, learning, and trial and error. The supporting local NGO team must therefore have ample experience and be well trained in the mentioned domains.

In the case of Bobo-Dioulasso, the business will only be sustainable when relevant and effective organisational provisions are functional. Establishing an entrepreneurial agricultural culture requires more than two years.

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#### Notes

- 1) Euro = 655.957 FCFA
- 2) 655.957 FCFA = 1 Euro

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# Recovery and Reuse of Resources: Enhancing urban resilience in low-income countries

Pay Drechsel, Olufunke O. Cofie, B. Keraita, P. Amoah, Alexandra Evans and Priyanie Amerasinghe

**Poor sanitation presents not only risks but also opportunities for urban and periurban agriculture. In many cases farmers accept the risks in anticipation of the benefits, which include low-cost access to waste resources that are rich in nutrients and water. RUAF has a long tradition of carefully examining the interface of agriculture and sanitation. It has analysed case studies, trends and emerging priorities where RUAF partners, like IWMI, and the RUAF network can play a pivotal role.**

Urban centres are enormous hubs of consumption of all kind of goods including food. This in turn makes them major waste generation centres. If this waste remains in the urban area, cities will also become vast sinks for the resources that make up the waste. These include water, nutrients and organic matter. This waste is not only the number one environmental and health challenge that growing cities face today. Where waste management is not financed through taxes and fees, as it is in most developed countries, it also represents an economic challenge. In developed countries, not only waste collection but also resource recovery from organic and inorganic waste fractions is common. Households can reduce their waste collection fees by separating for example old glass, used paper, plastic waste and organic kitchen residues into dedicated collection systems. Where there is space, backyard composting of kitchen residues for urban farming is also encouraged. For liquid waste (i.e. grey water from kitchens and bathrooms, and black water from toilets) the common target is to remove it from household premises through sewer systems and resource recovery generally only happens after treatment at community scale.

This system is found today in urban and rural communities in many developed countries. As a result, cities and their environment are less polluted, resources are reused, and, as the overall system is more self-sufficient, the lifespan of landfills is extended.

In developing countries, collection of solid waste and the separation of different solid waste streams are still a major

challenge. Most households are poor, while waste management cannot rely on fees and taxes alone. In fact, expenditure on waste management often takes up much of a municipal budget and even then is seldom enough. The possibility of increasing household fees is not only limited by poverty, but also because of low levels of education, and environmental awareness and responsibility. If the fees are raised, households are likely to start dumping their waste in the street or drains. Waste collection coverage rarely exceeds 75% and the remaining waste is a severe public health hazard. Increasing collection coverage is most local authorities' highest priority, much more so than introducing resource recovery activities, which often remain at pilot scale. Recycling takes place, but is more poverty driven than done for environmental reasons, waste scavenging being an example. However, an increasing number of entrepreneurs are engaged in activities such as commercial plastic recycling and the reuse of faecal sludge.

While urban and periurban food production and especially food safety clearly suffer from poor sanitation, urban farmers do often take advantage of underutilised solid and liquid waste resources. This may be waste from agro-industrial production, such as cotton husks or poultry manure, composted market waste, domestic wastewater or faecal matter. Although the aim will always remain complete waste collection, treatment and controlled reuse, so far only a small percentage of most urban areas (e.g. in sub-Saharan Africa) are connected to sewers. This therefore limits formal reuse, while informally treated and untreated wastewater and excreta continue to be used wherever nutrients or water are in short supply.

When it comes to reuse, we need to consider two waste 'streams': the waste that passes through the system on its way towards treatment or disposal; and the waste that bypasses formal systems, leaking out or never getting there in the first place. The captured streams (i.e. those passing



*Transportation of urine to the farmers in Ouagadougou, Burkina Faso (Photo: Linus Dagerskog, CREPA)*



Wastewater irrigation in Hanoi (Photo: Montangero)

through the system), have the largest potential for **planned resource recovery**, such as irrigation using treated wastewater or compost production. The streams that bypass the system are however, in most developing countries, at least as large (Scott et al., 2010, estimate for example that the area under informal wastewater use is ten times larger than that under formal wastewater use) and often support various informal-sector enterprises. Both streams have to be addressed where the ultimate target is planned management and safe reuse.

It is important to note that waste reuse bypassing the formal system not only concerns waste from the un-served population but also from those served by on-site systems, and even those connected to sewerage systems, as many storage and treatment facilities do not function properly. Much sewage in developing countries does not end up in functional treatment plants but in streams or lagoons.

Depending on the service provision level per country, the volumes of the waste streams, collected or uncollected, treated or untreated, can vary significantly. The same is true for the level of reuse in agriculture and aquaculture. The absence of data on the informal reuse sector presents a big challenge. Location, however, is a characteristic common to most reuse cases. Waste products, such as compost, urine or biogas, are usually reused close to their places of generation, as transport costs are a major factor. As a result, urban and periurban areas are hot spots for various resource recovery options, and urban and periurban farmers the main target group. Other target groups are urban departments in charge of landscaping or the private sector engaged in housing (and garden) development.

While resource recovery from waste streams appears to be a classic win-win for public-private goods and services around waste management and agriculture, success stories of planned waste collection, treatment and reuse are rare, and often of small scale, hardly viable and seldom surviving their pilot stage. A typical example is composting: common business and management strategies are rarely applied, largely because the sanitation sector has traditionally been a fully subsidised public service domain (Koné, 2010; Rouse et al. 2008). Many donors are in favour of private sector participation and support a paradigm shift towards cost recovery. This development facilitates a second paradigm shift from treatment for disposal to treatment for reuse, as the latter offers options for cost recovery (Murray and Buckley, 2010).

## Household dependency on waste resources: Hyderabad, India

*The metropolitan area of Hyderabad generates close to 0.6 million m<sup>3</sup> of wastewater daily. Of the volume generated, about 40% is collected and up to 23% treated, but only 5% is treated to secondary level. Treated and untreated wastewater is discharged into the Musi River, which flows through the centre of Hyderabad city and is used extensively for irrigation downstream of the city. In the dry season, downstream flow of the Musi River is mainly wastewater. The wastewater irrigated area has risen over the years to about 35,000 ha, which supports more than 60,000 households specialising in paddy rice or fodder grass. Significant efforts are being made to increase wastewater treatment coverage, thereby addressing possible environmental and health concerns (Mekala 2006; Van Rooijen et al., 2010).*

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A recent review (Evans and Drechsel, 2010; Cofie and Murray 2010) commissioned by the Bill & Melinda Gates Foundation looked at a variety of existing reuse cases in low-income countries involving household wastewater, excreta/faecal sludge (FS) and separated urine and faeces. The review specifically looked at technologies that have been proposed or piloted in developing country cities, or are in the process of being up-scaled to manage, treat and use waste products. The aim of the review was to identify potentially replicable reuse technologies with sustainable operating models that ideally can co-finance waste collection and treatment (Table 1).



Recovery of valuable resources (Photo: Pay Drechsel)

Table 1: Summary of promising reuse options (Evans and Drechsel, 2010)

Option	Why is it interesting?	Revenue potential	Likely model for implementation	Demand and scalability
Raw-sludge use in cereal production	Boosting food production with limited risk while generating revenue for septic truck business	Profit for farmers; surplus for sanitation chain	Private sector (farmers, transport)	Limited; seasonal application
Use of treated faecal sludge or wastewater in aquaculture	Can take advantage of existing treatment pond infrastructure	Best bet for profit generation to the advantage of sanitation chain	Private sector, private-public partnerships (PPP)	Variation with region and season possible; depending on available ponds
Co-composting	Promising technologies for waste volume reduction and/or value creation	Operational cost coverage possible	Public sector	Transport cost to farm challenge
Biogas		Operational cost-recovery	Private sector	Regionally high
EcoSan (nutrient recovery from separated excreta & urine)		Long-term cost-recovery if household have farm nearby	Private (household); community level under testing	Transport cost to household external farms a challenge
Use of untreated or diluted waste-water using alternative safety measures	Promising on-farm and off-farm safety measure that supports existing farm businesses	Profit for farmers (limited capital costs)	Private sector (farmers only)	Cases report around 10-50% of total wastewater supply used
Use of treated wastewater from treatment plants designed for reuse	Paradigm shift away from treatment for disposal	Considerable capital costs; profit for farmers could give cost-leverage for treatment	PPP with farmers	Location specific 10-100% of treated wastewater
Nutrient recovery from urine at community level	Low-capital cost models possible without dependence on separating toilets (UDDT)	Profit for farmers; cost recovery for operator if volume reduction possible	Public or PPP	Fertiliser demand not constant and lower than supply; storage and transport volumes are key challenges

## Outlook

From the review of the various technologies and empirical cases, two main recommendations for future work can be highlighted:

- 1 A key issue cutting across the review is the lack of data on the **economics** of waste management and reuse in developing countries. External or public funding does not generally support the development of capacities to analyse and model possible business processes for the various waste streams. Even though many community initiatives and pilot schemes exist, and good tools are available, there are few basic financial analyses of operational aspects or monetary comparisons between different treatment systems, or for different market segments. Very little is known about costs and revenues of smaller or even larger enterprises, the public sector or processes linking the sanitation value chain; and most waste reuse pilots lack any demand and willingness-to-pay analysis. Consequently such projects rarely survive beyond the end of subsidised operations.
- 2 Another common challenge constraining the out-scaling of waste reuse is the lack of **context-relevant risk information**, which could guide appropriate support for SMEs and proposals for adequate regulation and legislation. Without this type of information, reuse takes place in an informal interface between farmers' needs, cultural concerns and sophisticated standards imported from developed countries. This gives ample space for misconceptions and prejudices, which further constrain the official recognition of urban farming and reuse entrepre-

neurs, access to credit or support from extension officers, and most of all, jeopardise official support for the implementation of context-specific safety measures for risk reduction.

In addition, future work should also address **technical challenges**, such as the most appropriate way to dehydrate urine without nutrient loss, which would greatly facilitate its storage and transportation (Pronk and Kone, 2010). This would increase its market value beyond the immediate urban environs, as farming space will be limited within cities. Indeed, for each waste product there are a variety of reuse options and conditions. Each of them requires a different land area and different investments in capital and running costs. Each has different health risks, but also revenues for a standardised number of waste generating households. Cities



The Ecosan circuit on a gate in Ouagadougou, Burkina Faso  
(Photo: Linus Dagerskog, CREPA)



## Box 1: Waste reuse and system resilience in the urban-rural corridor

- Recovering water, nutrients and energy from otherwise wasted resources is a high priority objective where **resources for agricultural production are already limited** or increasingly limited under progressive climate change, diminishing global phosphorus reserves and rising fertiliser prices.
- Recovering resources from domestic waste is particularly important where global drivers create a strong **geographical disconnection between areas of food production and food consumption**, as local nutrient loops are broken. These drivers are also affecting the water cycle by increasing fresh water demand while returning marginal quality water with an often overlooked value for food production.
- From the perspective of **food security and poverty reduction**, domestic and agro-industrial waste products offer an endless stream of highly valuable resources for agricultural production that are more reliable and easily available in many regions than other water and nutrient sources.
- From the perspective of **urban waste management**, 'reuse' reduces the unwanted waste volume and offers public and private entrepreneurs viable business development options for cost leverage, recovery or even profit along the sanitation service chain, i.e. higher chances for sustainability and going at scale.
- From the **environmental perspective**, the productive reuse of waste resources can be considered a crucial and lasting ecosystem service, preceding and complementing technical treatment options and preventing pollution.
- From the **system perspective**, the closed-loop concept is a central component of natural resources management, a pillar for enhancing system resilience, and most critical for all non- or slowly-renewable resources. This concerns in particular the looming phosphorus crisis.

with less free space might opt for one reuse option, cities with more space or a different technology or investment potential for another. To support decision makers in this regard, **efficiency indicators** could be created (Murray et al., 2011).

A first outcome of the analysis was the establishment of a new research division within the new CGIAR Research Programme on Water, Land & Ecosystems (CRP 5) on Resource Recovery & Reuse. The overarching objective of this division is to increase the scale and viability of the safe and productive reuse of water, nutrients, organic matter and energy from agricultural and domestic waste streams for food security, livelihoods and more resilient rural-urban interactions (Box 1). One focus is on institutional collaboration across

administrative boundaries. Another is the analysis of reuse business models for emerging entrepreneurs and public-private partnerships in the agriculture-sanitation interface. The RUAF network, which has partners looking at enterprise development as well as waste valorisation, is in an excellent position to contribute to this task.

The planned activities will build on current research supported by multi-stakeholder platforms, on safe wastewater irrigation, co-composting and organic fertiliser management in urban and periurban agriculture. The work will have a strong link to the emerging sector of waste entrepreneurs to increase the business implications and application potential across scales.

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# Urban Agriculture for People Affected by HIV/Aids

Andrew Adam-Bradford

**Over the last decade, urban agriculture has played a steadily increasing role in improving the quality of life for people affected by HIV/Aids. Already in 2004, RUAF, together with CTA and Abalimi Bezekhaya, organised the first international urban agriculture and HIV/Aids workshop in South Africa entitled Gardens of Hope: Urban Micro-Farming as a Complementary Strategy for Mitigation of the HIV/Aids Pandemic<sup>1</sup>.**

Participants at the workshop presented 20 case studies from Botswana, DR Congo, Kenya, Mozambique, Namibia, Swaziland, Uganda, Zambia and Zimbabwe as well as 7 projects in the host country South Africa. Most of these interventions started out as kitchen gardens, or micro-farms, implemented by local community groups, many examples of which can be found throughout South Africa, which has a rich history of such practices. In 2003, Ronnie Kasrils, the then Minister of Water Affairs and Forestry in South Africa, highlighted the importance of food gardening as a food security measure for poor people, particularly women (Butterworth et al., 2004). This is particularly important for those poor people, again particularly women, who are facing the enormous challenges caused by the HIV/Aids pandemic. Over time the above-mentioned interventions have been adopted in mainstream development programmes; donors and international NGOs in partnership with community-based organisations and local NGOs now implement micro-farming projects throughout sub-Saharan Africa. In East Africa, USAID has funded micro-farming and urban garden projects for vulnerable people living with HIV/Aids along transboundary highway routes, where the risk factors remain particularly high (USAID, 2008). The range of programmes includes community-based market gardens, small ruminant, rabbit and poultry keeping, micro-gardens, drip-irrigated home gardens and mushroom production.

## Rationale for urban agriculture

Urban agriculture has an important role to play in both HIV mitigation (avoiding initial exposure) and HIV/Aids treatment (complementary to anti-retroviral drug therapies). It is highly relevant for all people affected by HIV/Aids, including both those who are infected and those who are at increased risk of exposure.

An important rationale for stimulating household or community food gardens in urban areas and schools is to provide an

alternative source of food for people who engage in high-risk sexual behaviour in order to obtain food or a small amount of money with which to purchase food. This preventive approach based on income generation and micro-farming equally applies to homeless children, particularly street children and orphans who may face higher social vulnerability due to extreme poverty and harsher urban living conditions. Such children can be mobilised to join community-based urban gardening groups, as in Ethiopia (see box below).

## Ethiopia

*Through USAID-funded urban garden programmes vulnerable children and orphans in Ethiopia have learned how to grow organic vegetables. Local NGOs and community-based organisations have provided technical assistance and training, and using small vacant plots of land, local orphan groups have been mobilised and trained in vegetable cultivation.*



A second rationale for stimulating household or community food gardens is to help improve the quality of life for people already living with HIV/Aids. Many of the potential benefits of urban agriculture become even more paramount for people suffering from suppressed immune systems or who require nutritious diets to accompany what can be aggressive anti-retroviral drug therapies. The direct benefits of engaging in urban agriculture are plentiful and can be *physiological, nutritional, psychological or economic* (Leake et al., 2009). Examples respectively include: low-impact multi-muscular exercise (improving cardiovascular function); consumption of fresh produce rich in vitamins and trace elements (improving immunity); sense of community and belonging (addressing HIV stigma and social isolation), and income generation (sales of surplus garden produce)<sup>2</sup>.

## Planning and design of projects

While planning and designing urban agriculture interventions special consideration has to be made for people living with HIV/Aids to ensure that the beneficiaries' wellbeing is maintained throughout the programme. For example, although exercise and some load-bearing activities are seen as having positive health benefits, they must remain within

achievable limits. Thus gruelling activities such as carrying irrigation water in containers, heavy digging and the slashing and removal of bushes in land preparation must all be avoided. Labour-saving techniques such as drip irrigation, treadle pumps and mulching should be adopted to remove any potential drudgery from urban farming. People living with HIV/Aids may also have weakened immune systems, so the inclusion of specific nutritious plants should be considered (Yang and Keding, 2009), while the use of agricultural chemicals should be avoided – routine and heavy exposure can have greater health implications for infected people (Judge, 2002). Low-external-input and sustainable agriculture (LEISA) techniques, such as organic agriculture, can eliminate the need for hazardous application of chemical fertilisers and pesticides. Recent farming interventions have included community-based market gardens, small ruminant, rabbit and poultry keeping, micro-gardens, drip-irrigated home gardens and mushroom production, but a multitude of innovative designs are possible. In the hilly city of Kigali, Rwanda, the author has been working with the international NGO *Family Health International* in partnership with local NGOs and community-based organisations in a pilot project on urban agriculture and HIV/Aids. Three types of urban food production systems are being developed: small-scale kitchen gardens, wetlands cultivation and agroforestry on wetland plots.

Of course such programmes need to be well planned and designed to maximise local resources and synergies, build strong capacity amongst the urban farmers and most importantly to maximise the social inclusion of participants. Training is required for new urban farmers and this needs to be delivered in short user-friendly workshops preferably delivered on established urban agriculture demonstration plots (see the box for suitable modules for an urban agriculture and HIV/Aids training workshop).

### Suitable modules for an urban agriculture and HIV/Aids training workshop

#### **Vulnerability reduction and HIV/Aids**

- *HIV/Aids & nutrition basics – nutrition needs in all stages of life*
- *Services for people living with HIV – national policies and community resources*
- *Care for orphans & vulnerable children – community resources and standards for care*
- *Life skills training & educational services*
- *Recognising & addressing stigma and discrimination*

#### **Urban agriculture**

- *Micro-gardening & soil bed cultivation, raised beds, soil fertility, seed nurseries*
- *Water resources – rainwater harvesting, domestic wastewater use, other waters, drip irrigation*
- *Composting & mulching techniques*
- *Integrated pest management & vegetable cultivation*
- *Small livestock keeping (rabbits/poultry)*
- *Fruit gardening / beekeeping / mushroom production*
- *Food harvesting, preservation, storage & processing*

#### **Entrepreneurial skills**

- *Basic bookkeeping*
- *Micro-loans & small saving groups – how to get started*

(Source: Andrew Adam-Bradford)

### Future perspective

The effects of the recent economic and food crisis are felt strongly by increasing numbers of the urban poor and people affected by HIV/Aids. Innovative solutions will be required to ensure that vulnerable people maintain a reasonable level of food and nutritional security. Urban agriculture will continue to play an important role in such a strategy. Recent studies have indicated that allowing more HIV-positive people access to anti-retroviral drugs right after diagnosis, rather than waiting until their health declines, can cut the risk of the disease spreading to uninfected partners by 96% (BBC News, 2011). Such research findings could stimulate a marked increase in the distribution of anti-retroviral drugs, but for these to remain effective the beneficiary must maintain a good nutritional level. Urban agriculture programmes are designed to maximise the nutritional benefits by including carefully selected vegetable and fruit crop regimes. They can also play an important role in cases where infected people develop anti-retroviral drug resistance. In such cases, medicinal plants can be grown in urban gardens to allow home treatment for many of the ill effects associated with the later stages of Aids. For example, comfrey compresses are used to treat skin rashes and other associated skin diseases, and comfrey teas are used for gastroenteritis and other problems associated with the digestive system.

#### **Notes**

- 1) Visit [www.ruaf.org](http://www.ruaf.org) for the workshop proceedings “Gardens of Hope: Urban Micro-farming as a Complementary Strategy for Mitigation of the HIV-Aids Pandemic.” Johannesburg and Cape Town, South Africa 17-25 August 2005. A report is also available in UAM 18.
- 2) Contact the author for a comprehensive list.

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For online resources visit UN-FAO HIV/Aids and Food Security at <http://www.fao.org/hiv/aids/>



## The Urban Agriculture Magazine in the Future

In collaboration with strategic partners RUAF will continue publishing the UA-Magazine in English on the RUAF website and in a hardcopy version. Translations in French, Spanish and Portuguese will continue to be published electronically on the RUAF website.

The next issue of the UA-Magazine will combine the presentation of cases related to financing urban agriculture with the role of UPA in sustainable WASH programmes.

## No. 26: Financing of Urban and Periurban Agriculture and its role in Enhancing Financial Sustainability of WASH (water, sanitation and hygiene)

**Deadline for contributions: 1 December 2011**

The Dutch WASH Alliance was formed by six civil society organisations that have extensive experience in water, sanitation and hygiene: Simavi, Akvo, AMREF, ICCO, RAIN and WASTE. They are backed by a much broader group of southern and northern civil society organisations (CSOs) that cooperate within the Alliance. The main objective of the WASH Alliance's five-year programme (2011 - 2015) is to provide women and other marginalised groups with sustainable access to safe water and sanitation services and improved hygiene practices. RUAF, through ETC, is a partner in the WASH Alliance. It works with WASTE on the use and reuse of water and organic waste for small-scale agricultural production activities directed toward securing household consumption and improving nutrition and/or generating income by bartering or selling the surplus produce.

Increasingly there is agreement on the need for paradigm shifts from subsidies towards cost recovery in sanitation and from treatment for disposal to treatment for reuse (see Drechsel, in this UA-Magazine). Challenges remain with respect to: the economics of waste management and re-use; (the generation of) context-relevant risk information to guide the involvement of various actors -including the private sector; with the development of appropriate regulation; and with technical aspects of making re-use more profitable. Issue no. 26 of the UA-Magazine seeks to address these issues *with a focus on sustainable financing*.

Most urban producers still lack access to credit and investment schemes and have to develop their activities with limited resources. Financing is considered to be a highly complex and changing combination of resource mobilisation (both monetary and non-monetary), savings, subsidies and credits. From 2008 to 2010, local teams from 17 cities in the "Global South" carried out applied research, coordinated by the RUAF Foundation, on financing of small-scale urban and periurban agriculture. The results will be published in this upcoming issue (see for example the article by Cabannes). Papers will focus primarily on innovative ways that cities and some actors, such as farmers, producers' organisations, local governments, micro-finance institutions (MFI), banks and NGOs, are facilitating small-scale urban producers' access to financing.

The second issue of the UA magazine we will develop in 2012 is:

## No. 27: The contribution of urban agriculture to climate-smart urban development

This UA-Magazine will focus on the following topics:

1. The impacts of climate change on urban food security and resilience
2. The contributions of urban agriculture to climate-smart urban development
3. What cities can do to make optimal use of urban agriculture and forestry to build resilient and climate-smart cities
4. Innovating urban agriculture to make cities more resilient to climate change

*We are interested to receive articles with your well-documented experiences, for example on:*

- assessment of impacts of climate change on urban food security and resilience and related monitoring methods;
- assessing / demonstrating the potentials of urban agriculture (local food systems) for building resilient and climate smart cities;
- how cities are including urban agriculture and forestry in their climate change strategies and action plans;
- local innovation in urban and periurban agriculture to adapt it better to climate change.

UA Magazine is published two times a year by the Network of Resource Centres on Urban Agriculture and Food Security (RUAF), under the From Seed to Table Programme, which is financed by DGIS, the Netherlands, and IDRC, Canada.

UA Magazine is translated into French, Spanish, Portuguese, Chinese, and Arabic, and distributed in separate editions through the RUAF regional networks, and is also available on [www.ruaf.org](http://www.ruaf.org).

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#### Editors, No. 25

This issue is the report of the International Conference "Urban Agriculture for Resilient Cities" Lessons learnt in Policy, Research and Practice", held on 19 and 20 May in Almere, the Netherlands. It is compiled and edited by René van Veenhuizen.

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