

HIGHLIGHTS



Growing food in the cities: Successes and new opportunities

Brussels Development Briefing No. 50

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On 10th April 2018, CTA organised the 50th Brussels Development Briefing – part of a series of bi monthly development briefings on ACP-EU rural and agricultural issues. Around 140 participants at the ACP Secretariat debated the status, opportunities and challenges, which face urban agriculture in Africa, the Caribbean and the Pacific (ACP).

“Growing food in the cities: Successes and new opportunities”

This Briefing looked at the main trends in urban and peri-urban agriculture and the various ways of growing food in the cities across the ACP and in Europe, and shared some successes from the field, which show that growing food in the cities can offer opportunities for young entrepreneurs. Recommendations were also made as to how urban agriculture policy and practice can be scaled up and replicated in ACP and EU countries.

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Isolina Boto



Viwanou Gnassounou



Leonard Mizzi

Isolina Boto, Manager of the CTA Brussels Office and coordinator of the Briefings provided the context of this Briefing, which would address urban and peri-urban agriculture, as well as all the other soilless forms of agriculture such as hydroponics, aquaponics, vertical farming, rooftop gardens, noting that in an increasingly urbanised world, these forms agriculture would become more prevalent. She added that the first panel would explore that the latest trends in urban agriculture, whilst the second panel would provide examples of successful urban agriculture approaches from various CTA countries and entrepreneurs.

Viwanou Gnassounou, Assistant Secretary General at the ACP Secretariat, expressed his pleasure at having a discussion on urban agriculture, which is now considered as a new opportunity, allowing policies to be brought together on food and nutritional security, preserving the environment and town and country planning. Gnassounou alerted that urban farmers may not have the same knowledge and background as rural farmers, and may

risk carrying out harmful activities, hence the need to support awareness and capacity building on food safety and technology issues. There can be different approaches between EU and ACP countries in terms of the use of urban agriculture for nutrition security. Jobs are an important priority for urban agriculture in ACP countries, as is the transition from traditional models of agriculture towards agribusiness, and opportunities beyond production such as services and ICT support.

Leonard Mizzi, Acting Director Devco C, Planet and Prosperity and Head of Unit Rural Development, Food Security, Nutrition, Europeaid at the European Commission remarked that whereas urban agriculture is often discussed in the context of the rural-urban agenda, it has a cross-disciplinary and cross cutting dimension, whether discussing migration, health or human capital. This topic was very high on the agenda, being the focus of the *communiqué* of the 8th Berlin Agriculture Ministers’ Summit in 2016, linking progress since the Milan Expo 2015. The main driver of urban



Henk de Zeeuw



Dr Axel Timpe



agriculture is urbanisation, with 65% of the global population expected to reside in urban areas by 2050. Mizzi went on to note the impact of climate change, which is also a consideration for the nexus context, and agroecology, as a complementary model to feed urban populations. He emphasised innovation and research as key sectors able to generate employment and greening cities. He highlighted the issues of food safety, change in dietary patterns due to urbanisation, food affordability, of the new opportunities in ICT and e-commerce, and the role of urban agriculture in addressing malnutrition – from stunting to overweight and obesity. These issues are critical for inclusion and opportunities for women and youth. Finally, Mizzi noted that the land use dimension is central to urban agriculture.

Isolina Boto concluded by discussing CTA's focus and priorities and their relationship to the topic of urban agriculture, notably with respect to the issues of youth and women entrepreneurs, digitalisation to increase the profitability of smallholder farmers, and responding to climate change through proven climate smart approaches. Food security and nutrition also feature in terms of availability in cities of fresh produce. The importance of hearing from urban agriculture entrepreneurs, especially young ones succeeding in ACP countries, was also noted. The social function of urban agriculture, to bring together different communities was highlighted, and its role in addressing vulnerable communities.

Boto argued that the cases from ACP countries showed that policy support was needed in terms of food safety, access to markets, organisation of value chain actors – especially in downstream activities such as processing, to also cater to niche markets – and in terms of use and application of new technologies.

The first panel was opened by **Henk de Zeeuw**, Senior Adviser, RUAF Foundation in The Netherlands, who provided an overview of the status of urban agriculture (UA), a practice that has moved from being marginal, informal or prohibited, to offering new commercial opportunities. UA is an activity that takes place in urban or peri-urban areas and can have diverse levels of sophistication of production or processing, or of food waste management. In most cities in Africa, 20% to 30% of households are involved in urban agriculture and in some cities, it may be up to 80%. The role of UA can be critical to address key urban challenges – food security and malnutrition, urban poverty and social exclusion, impact of climate change, fresh water scarcity and waste management problems. Up to 15% of total urban food consumption comes from urban and peri-urban agriculture (UPA), and is critical for the urban poor to be able to access fresh nutritious food and to enhance food security. Between a quarter and two-thirds of the income of those doing urban farming may come from UPA – a study from the World Bank showed that the most profitable and fastest growing sector in African cities is urban horticulture

and dairy. Investment in urban food production has a significant multiplier effect in terms of jobs and income in food related enterprises. In terms of lessons learnt from RUAF research and programmes, de Zeeuw noted that for UA to succeed, cities needed to create an enabling policy environment, enhance access to land for UA, and enhance the productive and economic viability of UA, to stimulate resource recovery and recycling and to reduce health and environmental risk associated with UA. In conclusion, de Zeeuw highlighted the growing partnerships, resources and developments – such as the Milan Urban Food Policy Pact – which are advancing urban agriculture at regional and international levels, and provide support.

Dr Axel Timpe of the COST-Action Urban Agriculture Europe programme presented a series of examples of best practices in urban agriculture in Europe based on the results of his research. The programme, which covered 25 European countries, looked at practices in bottom-up innovation in agriculture, and not just vertical farming or “future scenarios”. It was published in a book “Urban Agriculture Europe” which covered six themes: typology of urban agriculture in Europe, governance of urban agriculture, the business models encountered, the spatial dimension of urban agriculture, the metabolism of urban agriculture (in terms of food, water), and the future agenda of urban agriculture. For him, urban agriculture models in Europe are successful where they do more

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Richard Ballard



than produce food, but also involve people on a professional and non-professional level. In Europe there is growing pressure on agricultural land, so if farmers want to stay in place, they have to find other functions that add value beyond food production. The typology finds many different types of urban agriculture, including farmers providing social services (i.e. leisure activities), in addition to food, and farmers caring for cultural heritage or providing environmental services in urban regions, urban food gardening in allotment and collective gardening such as educational farms. He noted that urban agriculture is successful where it allies itself with urban planning, and provides green infrastructure and public open spaces for urbanites. He provided examples from Aachen and Cologne on the function of this “green infrastructure” such as green rings made up of parks and agricultural land, followed by parks in Geneva and Paris. A number of urban farms were showcased, including those which allow urban dwellers to engage with the farm through ornamental farming and leisure activities such as self-harvesting, sports and agritourism. Innovative business models that go beyond the classic agrarian markets have been a hallmark of successful European urban agriculture operations – based on differentiation, diversification, low cost, experience offers, and common land use.

The first case of successful urban agriculture was presented by **Richard Ballard**, co-founder of Growing Underground in the United Kingdom,

with a specific focus on innovation in vertical agriculture. He set the context by pointing out the UN's estimates that up to 70% more food would have to be produced by 2050, with scarce agricultural land, fewer resources and an aging rural workforce. Growing Underground believes one solution comes in building farms that shorten the distribution cycle of fresh produce. Based in a World War Two disused underground air-raid shelter in Clapham, South London, Growing Underground uses hydroponics and LEDs to produce microgreens, which are packed onsite and shipped to New Covent Garden Market a short distance away, from where they are distributed to restaurants, food service and retails. Growing Underground is wholly powered through renewable energy and works towards carbon neutrality. The shelter is made up of an extensive network of tunnels occupying 6000m², and Transport for London (TFL) owns it. Environmental and social impact are big priorities for the business – they use 70% less water than conventional agriculture and avoid nutrient leaching through their closed-loop hydroponics system, and offset their carbon footprint by having their hydroponics substrate waste recycled. All this has benefits beyond the environment, as it is also more efficient. The philosophy of Growing Underground is to produce food for the city, in the city, which reduces food waste among other benefits. The tunnel allows the producers to create a controlled environment that is has optimal conditions for the plants year round. Since its founding in 2012, the business has grown

through investment, including via crowdfunding, which helped attract more finance, and through innovation. In 2015, they started to supply the New Covent Market, and in 2017 they grew into the retail market, including Ocado, Farmdrop, Marks and Spencer, Whole Foods and Planet Organic. Plans for the future include automation, as the current system is quite hands on. On a greater scale, concluded Ballard, gains in efficiency – especially in terms of abundant access to cheap energy – could revolutionise the potential of vertical farming and hydroponics to address food security in a more significant manner by enabling the growth of staple crops.

The **Questions and Answers** session of the first panel saw the audience raise a variety of topics. They included blurring between rural and urban spaces, what the role of cities should be (production or value addition), and about the nutritional value of hydroponically grown produce, the affordability of land, including those in urban spaces, given limited supply and the potential of beekeeping in urban agriculture. **Henk de Zeeuw** clarified that there is little competition between urban and rural farming, as they grow different produce (horticulture / dairy vs staples). **Richard Ballard** explained that research will be carried out on nutritional content of microgreens, but they tend to have a more enhanced flavour as they grow for less time than plants grown in the soil. In terms of price, Growing Underground gets a good price for the tunnels, as they do not have any other application given the planning rules in place

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Angel Adelaja



in London. **Axel Timpe** explained that food councils are an important means of ensuring dialogue among stakeholder in relation to urban agriculture. **De Zeeuw** added that although many cities may think urban agriculture is not in their mandate, the role is for national government to empower city authorities to develop urban agriculture planning. He added beekeeping as an important contribution to urban agriculture.

Angel Adelaja intervened to emphasise the link between academic research on the needs of plants and the private sector who are developing approaches and instruments to enable the growth of plants according to their needs. She added that in many developing countries like Nigeria, the issue of land availability is less of a factor.

The second panel on successes in urban agriculture was opened by **Angel Adelaja**, a young female entrepreneur, CEO and founder of Fresh Direct (FD), Nigeria, who shared her business model of creating a sustainable, off grid urban farming campus in Abuja, using stackable container farms. Her inspiration to transition from a successful city career into agriculture came from former Nigerian minister of agriculture, Dr Akinwumi Adesina. She noted a gap in the market for locally produced perishable products such as salads, explaining that the FD business model centres around getting the products to market as quickly as possible, avoiding postharvest losses and other risks related to imported or rural

grown supply chains. The solution came through hydroponics, which Adelaja developed with her plumber, who is now a business partner, first at home using trial and error, then applying research and knowledge gathered through volunteering. They became aware that there were many empty shipping containers, which could be successfully remodelled into hydroponic units. After obtaining a five-year lease on an unused site, they used the containers to create vertical farms, which allow FD to maximise their yield, and enable commercial production that could take place within a 15-minute radius of the customers. The first prototype was built in December 2015, the second container in April 2016, and the business grew to a small team of four, through the addition of two young women who they trained on hydroponic farming. It became apparent that this could be an attractive opportunity for youth, particularly those who had left rural places with limited skills or opportunities, especially women. Each container costs approximately \$1000 with all the equipment included, and they are able to produce 15 times higher yields than conventional farming, growing 3000 vegetables in a 20-foot container – lettuce, kale, arugula, Swiss chard, cucumber, tomatoes etc. FD eventually grew to 12 staff, added a 3000-capacity chicken house, four fishponds, and an upgraded ISO compliant kitchen. Significantly, they scaled their customer base with two new major grocery stores, two hotels, and seven

different restaurants and cafes. They opened an online grocery store platform to allow direct delivery to customers, and started producing freshly pressed juices. Beyond the production, they began an Urban Farmers' Network, with over 2,000 members representing many parts of urban agriculture value chain (retail, processing). The business has faced many challenges, notably in relation to urban regulation and land use, but most problematic has been reliable access to electricity. A significant development has been the training of youth, with skills including on leadership and technology. In the pipeline is a management and production mobile app, to allow investment in containers but also provide guidance to facilitate more youth to take up urban agriculture.

Ms Coumbaly Diaw, FAO sub regional coordinator in Senegal, presented the micro-garden projects in West Africa. These emerged from the Food for the Cities Programme “Growing Greener Cities Concept” aimed at addressing malnutrition and poverty arising from rapid urban population growth – as African cities are some of the fastest growing in the world. A micro-garden is a production unit that is adapted to high-density environments with no space around dwellings. They mainly benefit landless poor urban families, particularly women, youth and the elderly, by allowing them to access fresh fruit and vegetables for daily domestic consumption and additional income from sales of surplus produce. The only criteria is

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Ms Coumbaly Diaw



Peter Chege



for a 1-10m² space, which is exposed to six hours minimum sunlight daily and a clean water supply. Recycled material is provided to the families, including tabletops, flowerpots, buckets, peanut shells and other inputs for the soil. The Milan-Dakar project contributed to these micro-gardens, with the first table arriving in 1999, accompanied by training to households to enable them to use their tables, and then the mayors of Milan and Dakar implemented the project with the FAO and other stakeholders. The third phase of the project (2014-2016) saw the ambition to scale up the project regionally to Burkina Faso, Niger and Gambia, and in 2017, the launch of the Dakar-Douala-Praia City-to-City initiative, a pilot which took the micro-garden concept to Cameroun and Cabo Verde respectively, through South-South cooperation. Results have been impressive: 24 new trainers in micro-garden techniques, over 9,000 beneficiaries trained, over 8,000 tables provided to beneficiaries (80% being women, and 50% youth under 36). Furthermore, 49 Community Production Centres, 12 Training and Demonstration Centres were created around the 19 communities of Dakar, and one micro-garden purchasing organisation established to allow greater access to inputs needed by beneficiaries. An important factor for success was ownership at political, institutional and structural levels, which Dakar invested in significantly, and which it has expanded at the sub-regional level through a “training of the trainers” programme. Results in the five cities show that 242 people

have been trained in micro-gardening, and support has been provided in many areas related to urban agriculture including development of strategies, plans, ownership etc. Future prospects include expansion of the micro-gardens across African cities and further support to cities for urban food planning. Finally, she linked micro-gardens to solutions for current development concerns including migration, crises, waste and vulnerability.

Peter Chege, an entrepreneur, CEO and founder of Hydroponics Kenya, presented Hydroponics Africa, which operates across a number of neighbouring countries and promotes vertical hydroponics for households. The systems uses 30 litres of water per day, on a space of 20m² and can grow up to 720 crops – with the possibility of feeding a five-person family, and also have enough surplus to sell for income to repay the system, which can be done within 18 months. The units have an operational period of 10 years based on the lifespan of the pipes. The farmers make a one-off payment covering 25% of the price, and the rest is paid from sales of produce, after which the money generated contributes to the farmer’s income. To date, over 10,000m² of vertical hydroponics have been installed in rural and urban households. The first pilot was to benefit 200 women in Nairobi, using the “hydro-wall” model, which is mounted on the walls of a house or building. Another pilot was with primary school students in the middle of the city, as a learning

exercise, using a vertical unit, with the advantage in Africa that there is plenty of natural light, so the 2-meter long vertical units do not need artificial lighting. Another system developed by the company is “set it forget it”, which consumes 80% less water, using a timer and reservoir, with minimal labour and the possibility to be placed on a rooftop. Hydroponics systems can grow six times more crops per square meter than conventional methods, and so presents a promising approach to feed cities. The commercial aspect of the business started with the production of fodder for livestock, which grows within seven days, in an economical manner. Some important lessons of the business were also shared. These include the need for an integrated approach for the implementation of activities at household and communities, and advocacy to increase the impact of interventions. Working with the Ministry of Youth has also been beneficial to bring in youth to urban farming. Training is needed to introduce urban dwellers to farming, and to overcome challenges faced by new and unfamiliar technologies. Furthermore greater automation and a mobile app for hydroponics systems will encourage youth to participate. Another important issue is the need of certification for hydroponic production, as there is no organic label for hydroponic products.

The second panel saw **Questions and Answers** from the participants around the levels of success achieved, the distinction between conventionally

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grown crops versus those grown via hydroponics, and in terms of its adaptation to climate change, the opportunities for youth in agriculture in Africa, and the major constraints they would face, and what could be done to replicate successes. Further questions related to livestock production in urban areas, including aquaculture to supply the urban market, and ensuring the cleanliness of water for irrigation in urban areas. **Coumbaly Diaw** emphasised the importance of training centres in the success of the micro-gardens, and their project was able to achieve its objectives in terms of nutrition and food security. **Angel Adelaja** noted that access to capital is the biggest constraint, as land is used as the main collateral, but youth should be using other assets as collateral as they lack land. Furthermore, youth do not need high levels of education, urban agriculture can be learnt with training and hands-on experience. Additionally, she emphasised the need to advertise the availability of space for production and for youth to be organised in cooperatives and other systems, and finally, the innovative use of technology to access support, investment and other resources e.g.

for crowdfunding, entry into new markets etc. should be exploited. Central to this approach is the fact that technology also provides data, which is critical in today's decision-making processes. Training of farmers underpins the transition away from unclean water, argued Adelaja, but the Fresh Direct system is closed loop and uses a borehole. In terms of nutrition, Adelaja pointed out that hydroponics is highly informed by science, avoiding the use of often dangerous or unregulated fertilisers or pesticides that may be used in conventional farming in Africa. Fresh Direct also grows a variety of livestock. **Peter Chege** emphasised the role of policymakers in enabling the expansion of hydroponics across Africa, as there are no common standards. He noted the need for demo farms to enable youth to learn about it, but equally important is for youth to be involved in the whole value chain so they can operate in areas other than just production, and get access to credit. **Henk de Zeeuw** argued that potable water is not the only form of water for urban agriculture – wastewater can be supplied for urban agriculture provided there is proper training

on wastewater for agricultural production.

Isolina Boto closed the Briefing by outlining some recommendations and actions that emerged from the discussions. UA plays a multifunctional role and offers economic opportunities. The innovation, ICT and technology component as well as short production cycles (i.e. Horticulture) attract young entrepreneurs in the sector. It is necessary to map, document and share successful urban farming business models, looking at the innovations, technologies and other enabling factors needed to replicate and scale them up. More efforts need to be done at policy level to bring regulations and conducive frameworks for the value chain actors involved in UA activities. More attention should be paid to new promising markets for urban agriculture in Europe and Africa, such as agritourism, organic agriculture, and linkages to supermarkets, restaurants, hotels, schools, underlining the importance of partnerships with the private sector in order to sustain future development of urban agriculture.

Further information available online:

- Brussels Briefings: www.brusselsbriefings.net
- Reader: <https://bit.ly/2HKnUth>
- Report prepared by Lebo Mofolo, Policy Development Briefings Officer and Isolina Boto, Manager, CTA Brussels Office
- Resources on Urban Agriculture: <https://bit.ly/2H9jikZ>