



Wageningen University – 100 Years Celebration

“Access to Healthy Food in Metropolitan Cities in Africa”

REPORT



Wageningen Alumni Day in Addis Ababa, Ethiopia

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Agri
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1. Introduction

On the occasion of its 100th birthday (1918-2018), the Wageningen University & Research (WUR) in The Netherlands invited its alumni around the world to organize a Worldwide Alumni Day. With the support of Ethiopian WUR alumni, The Netherlands Embassy and the WUR-'Bilateral Ethiopian-Netherlands Effort for Food, Income and Trade (BENEFIT) Partnership', the AgriProFocus Network in Ethiopia organized this Alumni Day on Saturday 23 June 2018 at ILRI, Addis Ababa. Since WUR has a unique understanding of the entire food chain, the central theme of the Alumni Day was 'Access to Healthy Food in Mega Cities'.

The Dutch-based AgriProFocus Network within the AgroFood sector in Ethiopia ensured that the Alumni Day in Ethiopia consisted of a true multi-stakeholder exchange between the public, private and civil society sector on access to healthy food in Africa's mega cities; Ethiopia's mega city Addis Ababa in specific. About 120¹ people showed up to listen to the keynote speakers and take part in the group discussions around food safety, food waste, urban agricultural activities and private-sector engagement in making healthy food accessible and affordable. Besides, a food fair was organized to provide the alumni and AgriProFocus Ethiopia's local members, mainly start-ups and young agri-entrepreneurs, a chance to showcase their healthy food products. Fifteen local private-sector actors² were given this platform in order to support them in their active contribution to improve access to healthy food for urban dwellers in Ethiopia. Also, five research poster presenters were selected through a call for abstracts prior to the Alumni Day to share their evidence-based research related to the central theme of the day.

Keynote speakers Dr. Jan Willem Nibbering, the Senior Food Security Policy Officer at The Embassy of the Kingdom of The Netherlands (EKN) and Dr. Alberto Giani from FAO Ethiopia, spoke about the need for a food system approach in order to effectively increase the sustainability, accessibility and affordability of healthy food products for urban dwellers. They stressed that by 2030 more people worldwide will live in cities than in rural areas; including in Ethiopia. Keynote speaker Mr. Teferra Abraha, a WUR Alumnus himself and currently working for the Urban Agriculture department of the Addis Ababa administration, gave a concise overview of the policy strategy regarding urban agriculture in Addis Ababa. This policy framework encourages the engagement of gender and youth in urban agricultural activities and the need for strong multi-stakeholder collaborations to make urban food systems work for healthy food intake of urban dwellers.

All the ideas exchanged by the participants during the day were used as an input for the [online worldwide dialogue](#) organized to invite prominent alumni from Africa, Asia, South America, the US and Europe, to discuss the challenges and opportunities around access to healthy food in metropolitan cities worldwide. The WUR Alumni Day in Ethiopia was selected as one of the venues for the online dialogue, and represented the voice of Africa. The event ended with a networking reception with live music from the environmental protection youth club of Mentesinot Urban Agriculture, a grassroots movement that promotes sustainable urban agriculture and environmental protection within underdeveloped communities in Addis Ababa.

The WUR is one of the world's leading universities with a strong focus on sustainable agriculture and food & nutrition security. The WUR has helped spur the agricultural development in Ethiopia. WUR has also provided scholarships for many Ethiopians for a short course, MSc or PhD study and has around 20 WUR projects on-going in Ethiopia of which '[BENEFIT-partnership](#)' is the most prominent due to its strong collaboration with key local agricultural knowledge institutions/public sector actors.

This report provides an overview of the main outcomes of the different sessions held during this event, including the keynote speeches, presentations, food fair, research posters, group discussions and online dialogue. Finally, the report describes the way forward in which several opportunities are listed for continued joint action on ensuring access to healthy food in Ethiopia's mega cities.

¹ See appendix 3 for the list of organizations that attended this event.

² See appendix 2 for the list of healthy food providing organizations that promoted themselves at the food fair.

2. Keynote Speeches

2.1. The role of Wageningen University & Research in Ethiopia and the world



Figure 1. Mr. Remko Vonk (WUR) provided the opening speech by elaborating on the strong position of the Wageningen University in the world.

achievement in the last 100 years and even a better starting point for the next 100 years.

When it comes to the central theme of this day, 'access to healthy food in Africa's mega cities', Mr. Remko Vonk stressed that there are six issues that should be addressed, namely:

1. **Land:** Feeding is not the problem of cities only but it is the concern of the population as a whole. The amount of arable land per capita is decreasing with the growing number of population. Taking Kenya for example, data shows us that the number of farmers per urban dwellers has not changed since independence. Land available for rural farmers has decreased greatly because of population growth.
2. **Water:** There is a huge negative water balance in many countries around the world. Many countries extract more water from the ground than they get from rain. This means that there is less water and a large gap in water availability for agriculture. This is also true for drinking water and other consumption needs. So the number of people living under water stress is going to increase.
3. **Climate change:** The impact of climate change is non-linear and disproportionate. There are countries that will benefit from climate change, and there are also others that will suffer dearly because of it.
4. **Malnutrition:** The challenge we have is not only the supply of food, but also a lack of nutritional intake. Africa has cases where hunger and starvation persists next to an increase in obesity.
5. **Food losses:** Even though there are many who lack food access, the reduction in post-harvest losses throughout the value chain could play a critical role in increasing food availability.
6. **Rapid urbanization:** Data shows that by 2030 the number of urban dwellers will be greater than that of rural dwellers for the first time as more and more people will lose the interest to stay in rural areas to grow food.

Mr. Remko Vonk argues that understanding the big picture and the context of a country is crucial in order to strategize for the future. It indicates that one needs to rethink the concept of global food systems. He ends his speech by explaining the eagerness of WUR to enter the debate regarding all these issues since there is no single solution to solving them.

The opening speech was provided by Mr. Remko Vonk, a WUR alumni and the current program coordinator for two WUR projects ongoing in Ethiopia named 'CASCAPE' and 'REALISE'. He came to Ethiopia to open the Wageningen University Alumni Day.

In his opening speech, he explained that WUR is ranked as the best agricultural university in the world. It is also the 4th best environmental university. In the Netherlands, it is ranked as the best university in terms of diversity, and 3rd best university in development studies. The university integrates agricultural research and agricultural education. This is a great

2.2. The role of the Netherlands Embassy in supporting food & nutrition security in Ethiopia



Figure 2. Dr. Jan Willem Nibbering explaining the role of The EKN in promoting access to healthy food in Ethiopia.

The second opening speech was provided by Dr. Jan Willem Nibbering, the Senior Food Security Policy Officer at the Embassy of the Kingdom of The Netherlands (EKN). He gave a brief insight into the role of The Netherlands in supporting the access to healthy food in mega cities and sustainable urban food systems in general. Dr. Jan Willem explained that “the issue of access to healthy food is a major area of focus for The Netherlands. A large part of its development budget in Ethiopia goes to projects that are expected to contribute to food & nutrition security. In its food security program, it strives to support Ethiopia in a way that is in line with

the government’s policies to achieve food and nutrition security. It funds and co-funds projects that increase the production and commercialization of smallholders, develop agriculture value chains, support of agribusiness, provide social safety nets and strengthen the livelihoods of rural populations.

He continues: “The Dutch-funded food security projects have a more rural focus than urban and work with smallholder farmers. From a national food security perspective, this is logical, since most of the food produced comes from smallholder in rural areas and, up until now, most Ethiopians live in rural areas. However, urbanization in Ethiopia is rapidly increasing. The urbanization rate for Ethiopia is twice as high as the population growth rate. Most of these urban dwellers do not grow their own food. They have to buy both fresh and processed food. The Netherlands supports the development of the dairy and horticulture sector since most of their produce goes to urban dwellers. Dairy products, fruits and vegetables are lacking in the diet of many Ethiopians as they are very expensive. This is because they are not produced efficiently until now. But at the same time, the demand for these products is increasing while supply is lagging behind. This has led to the increase of consumer prices. By increasing the productivity of dairy and horticulture production, consumer prices may come down. Because of this, increased productivity is what we are trying to achieve. There is also a need for strong supply chains that will bring the produce to consumers in a cost-effective and safe way. To achieve this, The Netherlands Embassy and Dutch-funded projects use a value-chain development approach and try to attract Dutch private investors who can help boost the dairy and horticulture sector in Ethiopia. In addition, The Netherlands supports river-based authorities and smallholder farmers to develop their capacity in integrated water-resource management in order to use Ethiopia’s water resources in a sustainable way.

2.3. Insights into urban food system challenges worldwide



Figure 3. Dr. Alberto speaking about sustainable urban food systems for the mega cities of Africa.

Dr. Alberto Giani is currently working as the International Expert for Pastoralists Resilience at the Food and Agriculture Organization (FAO) in Ethiopia. He has also worked at the Wageningen University & Research Center for Development Innovation (CDI) for 4 years during which he gave a CDI short course on ‘Food Security in an Urbanising Society’. Dr. Alberto shared a short summary of this short course during the event and mainly focused on providing insights in sustainable urban food systems and its challenges around the world. He argued: “The reason for the need to address the challenges of urban food systems in mega cities in Africa is because in the past,

people lived near areas where food was produced and they were the food producers themselves. But now people are living further away and they are not the producers any more. With this, consumption has grown”.

Dr. Alberto also stated that “cities and infrastructure networks in Europe were established centuries ago. But in Africa, there are only a few modern cities. This means that most cities lack proper infrastructure and services to accommodate rapid urbanization.

Dr. Alberto shared his 5 suggestions to ensure a sustainable urban food system in Africa. Each of these suggestions are shortly described below:

Suggestion 1: *Attention and development efforts should not be concentrated in urban areas alone. Governments should also look at the rest of the country.* Development should also address other cities in the country to avoid the existence of varied levels of services between Addis Ababa and other regional cities. Solving the food system challenge also requires that we understand that rural areas, urban and peri-urban areas all have a role to play. This is because rural areas produce most of the food consumed.

Suggestion 2: *Develop strategies for cities that consider the different spaces and threshold.* Circular metabolism and circular economy are crucial elements in sustainable urban food systems. These concepts show us that sustainable urban food systems should be based on a different form of agriculture, including the recycling of all kinds of waste like organic waste and water waste which can be converted into compost for farmers. This can be done both in urban and rural areas. Using urban spaces for urban agriculture whereby urban habitants can use their backyards or rooftops to grow their own food.

Suggestion 3: *Build a sustainable urban food strategy by including the variety of food production systems without focusing on only one.* Having only one solution means that there is a risk of losing everything if that solution fails. Multiple solutions means alternative choices and the ability to avoid the risk to lose it all.

Suggestion 4: *Take into account the formal and informal agrofood sector.* The informal agrofood sector is believed to be of low quality and safety. The formal sector is thought to be of high quality and safety. The perception of the formal sector, e.g. supermarkets, has to do with standards and regulations imposed on them. However, in Africa, almost 80% of the food is purchased from the informal sector.

Suggestion 5: *Quality & Safety standards should be achievable by the producers and designed together.*

2.4. Addis Ababa Urban Agriculture Policy Framework: Six focus areas highlighted



Figure 4. Mr. Teferra elaborating on the AA urban agriculture policy framework.

Mr. Teferra Abraha, a Wageningen University alumnus and a representative from the Addis Ababa City Administration Urban Agriculture Department, gave a concise overview of the urban agriculture policy strategy (2013) in Addis Ababa. This policy highlights six focus areas:

1. **Access to land:** The objective of the policy is to ensure suitable land is made available and used for urban agriculture in the city.
2. **Access to water:** The objective here is to make the current polluted water sources of the city safe and sustainable in order to utilize it for urban agriculture.
3. **Access to support services:** The objective is to provide quality support services (extension services, financial services and technical support) for urban farmers to enhance their productivity and economic viability in the city.
4. **Health and environmental issues:** The policy points to the need to integrate urban policies with environmental policies, recycle organic waste in urban agriculture, promoting urban agriculture risk reduction strategies and conduct environmental impact assessments.
5. **Improve the urban agriculture legal framework:** The objective here is to ensure the establishment of a sound legal framework that will support all urban agricultural activities in the city; including the use of urban space for urban agriculture.
6. **Gender and social issues:** The policy guarantees the inclusion of gender and social issues within urban agriculture. It aims to safeguard gender equality and enhance the access for women to land and financial services. It also aims to decrease the number of unemployed youth by strengthening small and medium enterprises (SMEs).

Additionally, the policy targets multi-stakeholder involvement for the purpose of successful implementation. It plans to do so by creating multi-stakeholder platforms of governmental, non-governmental and private-sector actors by improving active participation and address the gap between them.

3. Question & Answer Session

Following the insights provided into the global challenges related to urban food systems and the Addis Ababa urban agriculture policy framework, there was room for three short questions for clarification purposes:

Question 1: Presently, farmers from rural areas who supply food for urban areas have food deficiency themselves. Even when they produce foods like eggs, they do not consume it themselves. Rather, they sell it in order to get money. How do you see this problem?

Answered by The Embassy of the Kingdom of The Netherlands (EKN): We see this as a big problem. Food security is also nutrition security. People can increase their production to increase their income paying little attention to their own and their children's nutrition needs. But, we can't tell the farmers what to do. What we can do to solve this problem is raise awareness about nutrition and malnutrition. We have worked with many institutions and agencies regarding this issue. For example, in the Amhara region, some dairy cooperatives are encouraging their members not to sell all their milk. The farmers had been selling all their milk in order to make money. But, the cooperative encouraged them to save a portion of their milk for the consumption of their own household. So we will encourage such things as well.

Question 2: Enjera has not been discussed today even though it is one of the staple foods in Addis Ababa and a significant amount of energy is spent on baking it. The demand for it is also increasing annually with the growing population, but the supply of wood to bake it is decreasing. Is there a focus on Enjera as part of food supply to cities?

Answered by the Addis Ababa Urban Agriculture Department: In the past, we had problems because the productivity of teff was very low when compared to other crops like maize. But thanks to the effort of researchers who are working to increase the productivity of teff, we believe the supply of teff will increase, and we will be able to meet this demand.

Question 3: How can we integrate research outcomes to schools? How can we use school gardens to educate students how they can grow food and encourage growing food in urban areas? How does the urban agriculture policy address this issue?

Answered by the Addis Ababa Urban Agriculture Department: One of the targets of the policy in terms of increasing availability of land is to make use of land owned by institutions. This is stated in the policy, but it has not been implemented so far. We have to include urban agriculture in school curricula. It is not stated clearly in the policy, but we are thinking of including it in the future.



Figure 5. A successful and true multi-stakeholder knowledge exchange around access to healthy food in mega cities.

4. Group Discussion Outcomes

The afternoon program started with an interactive discussion session whereby four different groups were formed to talk about the challenges and solutions related to one of the four topics:

1. Food safety: How to create an enabling environment to ensure urban habitants eat safe food products?
2. Urban agricultural activities in Addis Ababa: What is needed to create an enabling environment for the practice of urban agriculture (e.g. home gardening, community gardening and small-scale livestock rearing in specific) in Addis Ababa?
3. The role of the private-sector in access to (affordable) healthy food products: How to create an enabling environment for private-sector actors – especially young agri-entrepreneurs – to provide healthy food products to urban dwellers (lower segments of society) against affordable prices?
4. Food waste management: How to create an enabling environment to use waste as a source of energy or (agricultural) input?

A short description of the outcomes of the four group discussions can be found below.

4.1. Outcome Group Discussion 1: Food safety



Figure 6. Group discussion 1 about food safety.

This group concluded that “Addis Ababa has nothing to eat or drink because of the many safety issues”. Two of the main challenges regarding food safety are:

1. The lack of strong regulatory systems (e.g. quality control) at national level and within agrofood processing industries for food products and water as food is produced and processed unsafe (misuse of pesticides & chemical fertilizer) without any repercussions.

2. The lack of awareness among the urban inhabitants with regards to food and water safety.

The solutions discussed in the group are:

1. Awareness creation by integrating the issue water and food safety into school curricula and the need for better cooking practices to reduce food poisoning issues.
2. Stakeholder collaboration between the government (e.g. Ministry of Agriculture, Education, Health, and Environment), traders, agrofood industries, civil society to create an effective regulatory framework and better functioning value chains. Consumers should be made aware of food-related dangers in order to start demanding access to healthy food products.

4.2. Outcomes Group Discussion 2: Urban agricultural activities in Addis Ababa



Figure 7. Group discussion on urban agriculture.

The major challenges identified here were:

1. Limited understanding of the concept of and the need for a focus on urban agriculture: Often city residents do not believe or think food can be produced in cities; also because there is space and water scarcity. The different creative options to tackle these scarcity issues are not widely known. In addition, people do not want to purchase food grown inside Addis Ababa for fear of pollution. This leads to a lack of focus on urban agriculture production.

2. Lack of technological and service-related inputs needed for urban agriculture: E.g. improved seeds, improved breeds, credit, water lifting devices, drip irrigation facilities (in peri-urban areas), waste treatment options and research & extension services.

The following solutions were given:

1. To establish organizations that facilitate sustainable urban agriculture: Currently, the Urban Agriculture Department of the Addis Ababa City Administration is organized under the Addis Ababa Bureau of Trade (due to its focus on increased production). Hence, it needs to move to a more appropriate government office; e.g. Bureau of agriculture. Besides, the Urban Agriculture Department has to be considered in the overall city planning. It is not yet mainstreamed across the range of governmental bureaus/institutions. A relevant institution (e.g. Bureau of Agriculture) should ensure it is mainstreamed and run in a coordinated and effective manner.
2. Incorporate urban agriculture in formal environment and agricultural education curricula.
3. Improve access to technology, extension and research.
4. Actively involve women and youth in urban agricultural activities to ensure access to healthy food for their households and provide business opportunities for urban youth.
5. Stakeholder collaboration to promote sustainable urban agricultural activities and improve access to finance for urban agripreneurs. The following stakeholders should be involved: Bureau of Land administration, Water and sanitation, Bureau of Agriculture, Bureau of Environment, private sector (feed processors and suppliers, input suppliers, financial institutions such as credit & saving institutions, commercial banks, etc.).

4.3. Outcomes Group Discussion 3: The role of the private sector in access to healthy food



Figure 8. Group discussion 3 about the role of the private sector.

getting the healthy food products to the consumers.

3. Among urban consumers, there is limited awareness about the need to eat healthy food.

The solutions proposed were:

1. Regarding healthy food production, policies need to be in place that support the private sector in terms of facilitating access to resources like land and inputs.
2. There should be shorter value chains (better connection between producer and consumer) and quality and safety standards should be established and monitored strictly.
3. Awareness creation is needed through awareness creation campaigns and building trust between consumers and producers (as currently products sold as healthy or organic does not guarantee to be healthy or not since there are no standards or strict monitoring of quality).
4. Capacity of healthy food producers should also be built in order to enable them to reach consumers effectively by using strategic approaches.
5. The government is the major stakeholder to create an enabling environment for producers, processors, traders to provide affordable healthy food products to the consumers.

This group identified three main challenges related to private-sector engagement in making healthy food products accessible and affordable:

1. Regarding healthy food production, the challenges are availability of land, raw materials and support from the government as urban agriculture is currently not a priority.
2. Throughout the value chain, the main challenge is infrastructure when it comes to

4.4. Outcomes Group Discussion 4: Food waste management

The major challenges regarding food waste management discussed were:

1. The lack of awareness about the value of waste as a resource; both in urban and rural areas. There is also a lack of awareness about how to manage waste in order for it to become a resource.
2. Knowledge and inputs for different types of waste management (like vermicomposting) are lacking.
3. There is a lack of standards regarding the quality of waste. However, in order for it to be a resource, waste needs to be carefully sorted, which people have little interest or awareness to do (even though there may be policies requiring this). There is also a lack of infrastructure for sorting waste. Lack of clear responsibility amongst bodies dedicated to monitoring, management; lack of incentives for effective waste management at many different levels.
4. There is a higher demand for than supply of quality sorted waste and organic agricultural inputs.
5. It is very difficult to transport organic inputs (like compost) in bulk to the people who want to use it.
6. Persistent pesticides and heavy metals accumulate in waste, jeopardizing the quality of organic inputs.
7. Addis Ababa has significant and growing problems with air and water quality as waste is often burned.
8. There is a misconception among many farmers that inorganic inputs are more effective than organic. In reality, organic inputs are very effective, and integration of organic and inorganic inputs also yields positive results.

This group came up with the following solutions:

1. Awareness raising is needed on the production side so that waste can be sorted and used as input. Farmers need to be aware of the effectiveness of organic agri-inputs and the benefits of using them in an integrated way. One way of achieving this is through awareness campaigns, using social media, documentaries, animations, branding and role models, building on social networks like idir and iqub and door-to-door domestic waste management awareness campaigns.
2. Develop a forum for the creation of multi-stakeholder collaboration to create a conducive environment for agricultural inputs from organic waste. Perhaps this forum could be hosted under the Ministry of Agriculture's Soil Fertility Directorate Soil Health and Fertility Platform, because the new Soil Strategy stipulates that in ten years' time it seeks to have systems in place for ensuring circular movement of urban waste to agri-inputs. Since Ethiopia is urbanizing fast, it is recommended to start thinking about the systems for developing circular nutrient movement ahead.
3. There should be standards in place to ensure that only quality waste can be transformed into agricultural input for agricultural production activities, thereby identifying who is responsible for the monitoring of the quality of waste. Incentives should be offered for people who are willing to divide and sell quality food waste, and use it as an input. International best practices could be used as benchmarks.
4. For the mismatch between demand and supply, market system development analyses and strategic interventions need to be done to make value chains function.
5. Clear regulatory framework for waste management should be developed with multi-stakeholder input, including the identification of responsible bodies, appropriate incentives and checks and balances at every level of government need to be put in place.
6. Subsidize organic waste management through revenue generated with water bills: Currently, a fee for waste collection is charged with public water bills. The government could add a few birr to this water bill dedicated specifically for organic waste management, which could be used for proper sorting in regional community compost hubs. The government could provide inputs (like handcarts/trucks for transportation) as an incentive for social enterprise / youth associations to make compost from local organic waste, and deliver it to local urban agriculture. The excess could be distributed through agricultural cooperatives and unions together with chemical fertilizer.

5. Addis Ababa - Africa's Voice in Worldwide Online Dialogue



Figure 9. Dr. Laurent Sedogo, WUR alumnus was our panelist during the online dialogue.

All the ideas exchanged by the participants during the day were used as an input for the online worldwide dialogue organized to invite prominent alumni and experts from Africa, Asia, South America, the US and Europe, to discuss the challenges and opportunities around access to healthy food in metropolitan cities across the globe and to identify a common ground when discussing scenarios and transitions. The Wageningen University Alumni Day in Ethiopia was selected as one of the venues for the online dialogue, and represented the voice of Africa. Dr. Laurent Sedogo, Wageningen University Alumnus and former Burkina Faso Minister of Agriculture, Water Resources and Fishery, was invited by The Wageningen University to be present at our event in Ethiopia as the only African panelist in this online dialogue.

Challenges for Africa's mega cities

During this online dialogue, Dr. Laurent Sedogo argued that the major challenges Africa has are food availability and food security. Many countries have large numbers of malnourished people and a growing population which needs to be fed. This is especially true in urban areas. With the growing number of urban population and enlarged cities, people have to travel further away to obtain food. This raises the issue of infrastructure and road systems, and increased food prices. Population growth also results in less available land for farmers in rural areas, which will drive them to migrate to urban areas.

Solutions for Africa's mega cities

Food availability is less of a problem in other countries/continents. For example, a survey conducted in Europe showed that food availability/accessibility was the least problem for 70% of the participants. This is because Europe has been able to achieve this by significantly increasing efficiency in food production. Furthermore, it has been able to grow more food through better use of resources like water and inputs. Africa needs to adopt best practices and collaborate with its partners.

Food waste management in Africa's mega cities

Food waste is not as much of a problem here as it is in Europe, America and Asia. There are ways of managing waste that can be of use. It can be re-used as fertilizer or transformed to be used in a niche market and to generate electricity. Waste should be integrated in a circular manner into value chain.

Food quality regulation in Africa

Another major issue is the lack of strict food quality regulations. With the growing number of cities and urban dwellers, we have to start looking at what people are eating. In line with this, food safety regulation policies need to be in place together with awareness raising on this issue as most urban dwellers do not comprehend the dangers associated with consuming unsafe or fast food. During the event, it was discussed that a strong multi-stakeholder engagement is required to create an integrated way of solving these issues.

Insights from other countries that participated in the online dialogue

Food availability is not a challenge in the rest of the world. The panelist from North America argued that some of the challenges prevalent are overconsumption of food in general, mainly fast food, and the lack of availability of organic food. The panelists from China and Latin America explained that the challenges in their countries are obesity and overconsumption of fast food as well as food safety. The effectiveness of sugar taxing was discussed as a possible option to tackle the issue of obesity and overconsumption (of fast food).

6. Food Fair

A food fair was organized to provide the alumni and AgriProFocus Ethiopia's local members, mainly start-ups and young agri-entrepreneurs, a chance to showcase their healthy food products. Fifteen local private-sector actors were given this platform to support them in their active contribution to improve the access to healthy food for urban dwellers in Ethiopia.

Below a few testimonies about how this event was perceived by the food fair presenters:

"Thank you for providing us with the space to promote our organic farming movement. We are delighted to have participated and aim to continue working with AgriProFocus Ethiopia on urban agriculture"
(International Institute for Sustainable Development; IISD)

"Food-related problems are everywhere. Access to healthy food is a global challenge, but it is a problem that can be solved and we all should work together towards that end."

I am happy to be part of that change"
(Nutridense Agroprocessing Plc.)



"People should not only have the right to get adequate food but also quality and nutritious food. Therefore, access to quality and safe food needs critical awareness in developing nations like Ethiopia. Urban agriculture can play a great role in attaining safe and supplementary food for urban areas"
(Oil Seeds Research Program, EIAR)

"As being part of the private sector, I have learnt that the food system in Ethiopia is very complex. It is also a problem that is present in other countries, but for others the challenge is overconsumption as opposed to food availability. We should focus on how to bring a solution to this challenge whereby each of us continue to play our part"

Magic Mitad (Magic Ventures)

7. Research Posters

Based on the Call for Abstracts for research posters five abstracts were selected and the research authors were invited to come to the event to present their research poster. Below, an overview of the five selected abstracts.

7.1. Research Poster 1

Title: The need for leveraging urban home garden agro-biodiversity for food security and nutrition: The case of Bahir Dar city, Amhara region of Ethiopia.

Abstract: Much as in rural areas agro-biodiversity could play a critical role in addressing food security, and nutrition and health in Cities by providing a variety of plant and animal foods. An exploratory study has been undertaken to assess the agro-biodiversity of home gardens, and its contribution to food security and nutrition, in the city of Bahir Dar, Ethiopia in 2011. Interviews were administered to 178 sample households residing in 7 Districts, and inventories made on higher plant and livestock species. Results revealed that the city home garden enterprise portfolio consist of trees, annual crops and livestock. The plant component dominates with 58 higher plant species of diverse use; 17 fruit (28.8%), 12 miscellaneous-use (20%), 11 vegetable (18.6%), 11 medicinal (18.6%) and 8 spices/condiments (13.6%). The most abundant perennial plant species was mango (20.8%) followed by guava (13.4%) and avocado (11.6%). Especially, the city gardens were found to offer a unique opportunity for preservation of medicinal & aromatic plants that are in the verge of extinction in rural areas which is worthy in terms of indigenous knowledge and species conservation. Nonetheless, vegetables and livestock are less represented. Unfortunately, the economic function of urban farming is not well exploited. Cultural and tree management practices are generally poor, the quality of planting material used is second-rate and its supply far from adequate. Garden management and resource use efficiency is below optimal. Growers lack basic farming skills. Access to land and water,

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lack of improved technologies, diseases and pests and extension support are among the major hurdles of urban farming reported by growers. It is therefore recommended that, in order to unleash the immense potential of city gardens, it is required to provide all-inclusive support especially technical backstopping for urban gardeners. Urban farming development should also be an integral part of research, and city development planning of Municipalities.

7.2. Research Poster 2

Title: Nutritionally improved mashed food from haricot bean and orange-fleshed sweet potato for pre-school children.

Abstract: Protein-energy malnutrition and vitamin A deficiencies are among the major public health problems in Ethiopia. To address these problems, food-based strategies are necessary. The objective of this study was to assess the consumption of orange-fleshed sweet potato (OFSP) and haricot bean, and to formulate mashed food from OFSP and haricot bean in 70: 30, 80: 20, 90: 10 and 100: 00 proportions. A cross-sectional school-based survey and experimental study designs and purposive sampling technique were employed. Structured questionnaires were used to collect survey data. Standard methods were used to evaluate the proximate composition, mineral contents and their bio-availability (Ca, Zn and Fe), anti-nutrients (phytate and tannin), β-carotene and microbial loads (yeast and mold counts, and Enterobacteriaceae) of formulated mashed foods. Sensory evaluation was carried out using five-point hedonic scales with 17 consumer panelists in triplicates. Data from the survey and experiments were analyzed using SPSS version 16.0 and SAS version 9.0 software, respectively. Completely randomized design was used to see the effect of different proportion on proximate composition, minerals, anti-nutrients, bio-availability of minerals and β-carotene contents. Likewise, the factorial (CRD and RCBD) experimental design was employed for microbial load and sensory analysis, respectively.

Results: The results showed that preschool children were not consuming protein and vitamin A rich food frequently to meet their RDA of protein and vitamin A. All the formulated foods were accepted by mothers

and preschool children for sensory attributes of color, taste, flavor, mouth feel and overall acceptability. As the proportion of haricot bean increased, only moisture and carbohydrate contents decreased from the proximate composition. In contrast; Ca, Fe, Zn, phytate and tannin increased as the proportion of haricot bean increased. All phytate to minerals molar ratios were below the critical limits. There was no significant difference ($p<0.05$) between the formulated foods in total yeast and mold as well as Enterobacteriaceae count for the same storage time. The formulated foods were safe to be consumed within 24 hours of formulation.

Conclusions: Formulation of mashed food from OFSP and haricot bean can be used for improvement in RDA

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of protein and vitamin A of preschool children. Nutritionally improved and acceptable mashed foods can be prepared from OFSP and haricot bean at 70:30 proportions, respectively. Nutrition education using food-based interventions are also recommended in the study area to improve the nutritional status of preschool children.

7.3. Research Poster 3

Title: Effect of Environmental Factors on Proximate composition: Essential and toxic heavy metal contents of some commercially Important Fish Species of Oreochromis niloticus and Clarias gariepinus from Lake Ziway, Lake Hawassa, Alwero River and Abay River, Ethiopia.

Abstract: This study investigated the chemical composition and concentration of heavy metals fish flesh. This is necessary to ensure that it meets requirements for food regulations and commercial specifications. Over the past 20 years, there has been a growing recognition of the food safety for public health worldwide. The demand of food safety has inspired research concerning the risk associated with consumption of foodstuffs contaminated by fertilizers, heavy metals and/or toxins. Therefore, the present study was more concerned on safety of fish consumption for C. genepinus and O. niloticus, under four different ecosystems: The fish samples were analyzed to determine the proximate composition and level of heavy metal accumulation in their gills and muscles tissues using the standard procedures of AOAC (2000) and Inductively Coupled Plasma-Optical Emission Spectroscopy (ICP-OES) respectively. Data was analyzed using one way ANOVA. Lake sources of fish species has significant effect ($p<0.05$) on proximate composition. Fish sources lake verses river were compared and highest protein content observed (72.44%) in and (67.27%) in C. gariepinus respectively, in addition for gill tissues protein content were (59.47%) and (45.47%) from two water bodies respectively. The concentrations of 12 elements in both fish species also identified in dry based ($\mu\text{g/g}$). Tissues and fish source had significantly ($p< 0.05$) affected heavy metal accumulation. The accumulation mercury in O. niloticus from Lake Ziway was high (7.59 $\mu\text{g/g d.w}$) and also significantly ($p< 0.05$) varied from the same and different fish species found in three remain fresh water bodies ($p \leq 0.05$). Except Sn and Hg Rives sources of fish species had higher concentration in all elements than Lake Source of the same fish species. Gill tissue of fish species was observed as a major site for

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accumulation of heavy metal than muscle in both species in all water bodies. The study points out that both tissues (gill and muscle) of the investigated fresh water fish species contain appreciable levels of nutrients. Furthermore, the consumption of contaminated fishes is one of the main exposure routes to toxic metals for humans.

7.4. Research Poster 4

Title: Rain water-based safe planter for home gardens

Abstract: To solve the challenges of getting safe green produce in cities such as Addis Ababa, this new rain water-based cost-effective and durable pot/plot model enables the soil system to self-water, self-drain, self-aerate and make compost by itself. The model is a set-up of a two chambered planter; the bottom water

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reservoir and the upper soil-bed. The two-chambers are connected by a “water tower” (pioneer to this innovation) that enables wicking of water, nutrients and essential soil micro-organisms upwards and downwards by the capillary effect of geotextile belt / thread wound at 45 degrees on a hollow tube. Six of the prototypes showed significant potential of water use efficiency and safety for mega cities home gardening activities.

7.5. Research Poster 5

Title: Risk of DDT residue in maize consumed by infants as complementary diet in Southwest Ethiopia

Abstract: Infants in Ethiopia are consuming food items such as maize as a complementary diet. However, this may expose infants to toxic contaminants like DDT. Maize samples were collected from the households visited during a consumption survey and from markets in Jimma zone, southwestern Ethiopia. The residues of total DDT and its metabolites were analyzed using the Quick, Easy, Cheap, Effective, Rugged and Safe (QuEChERS) method combined with dispersive solid phase extraction cleanup (d-SPE). Deterministic and probabilistic methods of analysis were applied to determine the consumer exposure of infants to total DDT. The results from the exposure assessment were compared with the health based guidance value in this case the provisional tolerable daily intake (PTDI). The maize samples ($n = 127$) were found to be contaminated by DDT, with a mean concentration of 1.770mg/kg, which was far above the maximum residue limit (MRL). The mean and the 97.5 percentile (p97.5) estimated daily intake of total DDT for consumers were respectively 0.011 and 0.309 mg/kg bw/day for deterministic and 0.011 and 0.083 mg/kg bw/day for probabilistic exposure assessment. For total infant population (consumers and non-consumers), the 97.5 percentile estimated daily

intake were 0.265 and 0.032 mg/kg bw/day from the deterministic and probabilistic exposure assessments, respectively. Health risk estimation revealed that 97.5 percentile for consumers, and 97.5 percentile estimated daily intake of total DDT for total population were above the PTDI. Therefore, in Ethiopia, the use of maize as complementary food for infants may pose a health risk due to DDT residue.

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8. Way Forward

Live music from Mintesinot Urban Agriculture and Ecostick Band



Figure 10. The youth band singing during the network reception of Mentesinot Urban Agriculture project.

practice environmental rehabilitation in their community and on the banks of the Kebena River. Until now, irrigating their vegetables with the river water is not possible because the river is too polluted.

Next steps

Further collaboration is needed to promote healthy food systems in Ethiopia and Africa at large. In light of this event, impactful collaborations could include the following:

- Wageningen University and Dr. Alberto Giani could offer the "[Food Security in an Urbanizing Society](#)" course in Ethiopia. Partnership with local higher learning institutions would make a short course for local capacity building possible.
- Market system development for reaching urban populations with healthy food is required all over Africa. Particularly, presenters at the food festival shall continue to collaborate for improved market linkages and innovation. The several organic producers present wish to collaborate more for arranging urban markets for organic food in Ethiopia.
- To follow up on the open space discussions, multi-stakeholder learning and collaboration should continue on the subjects of urban agriculture and municipal waste management, and these should feed into systematic and forward-thinking urban development initiatives.
- Healthy food and nutrition is particularly critical for children, and women of reproductive age. It was wonderful to have the youth from Mintesinot Urban Agriculture share their voices in this event. In the future the needs, vision and activism of the youth should be integrated completely into healthy food systems development efforts.

Mentesinot Urban Agriculture is a community-based organization founded by 32 youth members from the community to create a center for environmental awareness raising and the creation of sustainable employment opportunities. The farm organically produces poultry, vegetable, honey, eggs, medicinal and herbal plants, fattening (sheep, oxen and pigs) as well as compost. About 20 children from the community came to the event and sang songs about the importance of environmental health for our food and communities. These children also

9. Appendices

Appendix 1: Program outline

Time	Activity	Responsible
09:30 – 10:00	Walk-in & registration, including coffee / tea	ILRI
10:00 – 10:20	Opening Speech by a representative of the Wageningen University's Center of Development Innovation (CDI)	Mr. Remko Vonk
10:20 - 10:40	Opening Speech by Dr. Jan Willem Nibbering about the role of The Netherlands in promoting access to healthy food in cities / sustainable food systems in Ethiopia	Senior Food Security Policy Officer of The Netherlands Embassy in Ethiopia
10:40 – 11:00	Introduction of the concept of sustainable urban food systems and the current challenges regarding access to healthy food in an urbanizing Africa by Dr. Alberto Giani	FAO Representative in Ethiopia, former Wageningen University CDI staff
11:00 – 11:25	Presentation to provide insights into the Addis Ababa urban agriculture policy strategy framework and its objectives and focus areas	Mr. Teferra Abraha, Addis Ababa City Administration Urban Agriculture Department & WUR alumnus
11:25 – 12:00	Q & A session	
12:00 – 13:30	Lunch & Food fair / poster presentations	ILRI
13:30 - 14:30	Interactive session generating lively group discussions around sustainable urban food systems in Addis Ababa to ensure access to healthy food for urban dwellers.	Addis Ababa City Administration Urban Agriculture; session is facilitated by Nina de Roo
14:30 – 15:00	Coffee / Tea break	ILRI
15:00 – 16:30	Live stream inter-continental dialogue on feeding the mega cities around the world with Dr. Laurent Sedego, Former Minister of Agriculture and Water Resources of Burkina Faso, and Wageningen University Alumnus	Our panelist will provide the perspective of the African continent, especially the Burkina Faso and Ethiopian context.
16:30 – 17:00	Closing & certificate ceremony for key organizers and key note speakers	Wageningen University
17:00 – 18:30	Networking reception with live music	Mintesenot urban agriculture community project

Appendix 2: List of Food Fair Presenters

The table below provides an overview with the organizations, mainly private sector, that were present at the food fair to promote their own innovations and research findings which all contribute to the cause of enabling access to healthy food products in Ethiopia. For more information, please contact ethiopia@agriprofocus.com

No.	Organization	Description	Type of institution
1	Grohydro manufacturing	Grohydro manufacturing SC is a startup company specialized in designing and manufacturing hydroponic farming technology. Hydroponic farming enables a 400% yield increase over traditional farming as well as year-round cultivation.	Private sector
2	Guaro Farms	Guaro Farms is committed to the production of organic and fresh vegetables, fruits & herbs using innovative technologies that significantly reduce costs & multiply productivity to create sustainable urban food supply.	Private sector
3	Feyalo technology	Feyalo technology was formed on February 2018. It is a startup with a vision to become the biggest mobile enabled animal advisory and support service provider in Ethiopia. Feyalo technology provides the first in Ethiopia service of a multi-lingual mobile advisory referral service that connects animal owners with qualified professionals according to language, specialty and proximity preferences.	Private sector
4	BENU FOODS	A startup biscuit-producing social enterprise in Ethiopia that aims to produce nutritionally high protein biscuit for children in particular, and adults.	Private sector
5	Hamburg Consultancy Services and EiABC	Consults on sustainable solid waste management and urban agriculture.	Private sector
6	MAMALLOT GARDENS	To solve the challenges of getting safe green produce in cities such as Addis Ababa, this new rain water-based cost-effective and durable pot/plot model that enables the soil system to self-water, self-drain, self-aerate and make compost by itself was innovated and prototyped.	Private sector

7	Nutridense Agroprocessing Plc.	Nutridense is a Private Limited Company operating in the Ethiopian grain, oil seeds and honey value chains. The company is committed to manufacture a very healthy and natural food, free of any additives of any artificial color or any food chemicals. The company only uses local ingredients and produces cereal based products to which other components such as honey, teff, moringa and oil seeds (sesame and linseed) are added.	Private sector
8	Ethiopian Institute of Agricultural Research (EIAR)	Ethiopian Institute of Agricultural Research (EIAR)'s Holetta Agricultural Research center (HARC). The research center nationally coordinate oilseeds research program that grown mid- and high altitude (1200-2800) such as Linseed, Noug, Oilseed Brassica, Sunflower and Safflower. The oilseeds research program of EIAR collaborates with Ethiopian Food, Beverage and Pharmaceutical Industry Institute.	Knowledge institution
9	Emebet Commercial Beekeeping for Environment PLC	Recognizing the market opportunity and the lack of pure honey in combination with a passion for beekeeping, ECBE was established in 2009 in the Gurage Zone. Sustainable beekeeping takes place on 10 ha land, by integrating it with coffee on 3 ½ ha. The needed biomass was developed over a few years. Reforestation of mainly indigenous trees and planting of flowers is ongoing to fill the gap of deficiency of forage for the bees occurring in the dry season. The collaboration with 130 out-growers in the Woreda provides the potential to scale up and to build the capacity of beekeepers. This allows them to supply honey and by-products in bulk to ECBE while improving the environment and addressing gender issues. ECBE offers practical advice to the farmers by engaging local as well as international experts.	Private sector
10	Menagesha Integrated Organic farm PLC	Menagesha Integrated Organic Farm (MIOF) is a commercially registered company in Ethiopia. It is operating in Menagesha City, Wolmera Woreda which is 22 kilometers away from Addis Ababa, Ethiopia. MIOF follows integrated organic farming system that	Private sector

		includes vegetable production, apple, sugar snap and snow peas production, and mushroom production.	
11	Menetesinot urban agriculture	Mentesinot Urban Agriculture is a community-based organization established by 32 youth members from the community to create a center for environmental awareness raising and the creation of sustainable employment opportunities. The farm organically produces poultry, vegetable, honey, eggs, medicinal and herbal plants, fattening (sheep, oxen and pigs) as well as compost.	Private sector
12	NEED Nutritional Services and Products plc	NEED nutritional services and products Plc. is a consultancy, counseling and communication firm focusing on creation of innovative solutions for economic development targeting both over and under-nutrition.	Private sector
13	The Slow Food Network of Ethiopia	The Slow Food Network of Ethiopia has been working with several communities and partner organizations in different regions of Ethiopia since 2010 to help develop different types of local products (honey, coffee, camel milk, cheese, seed oil, traditional culinary products, etc.) that represent the gastronomic tradition and rich biodiversity of different regions.	Civil society
14	Magic Ventures (Magic Mitad)	Magic Mitad developed a durable and fuel efficient baking plate for the Injera market. Replacing the traditional baking plate with our Magic Mitad, it becomes possible for bakeries and households in Ethiopia to reduce their fuel consumption. The good thing is: the baking quality is the same.	Private sector
15	International Institute for Sustainable Development (IISD)	IISD has a strong connection with organic farmers in four regional states. It promotes organic markets and ecological produced food in a sustainable and nutritious manner.	Civil Society

Appendix 3: List of Organizations

Below an impression of the different organizations that were present at this event. For more information related to these organizations, please contact AgriProFocus Ethiopia: ethiopia@agriprofocus.com

No.	Organization	No.	Organization
1	Wageningen University and Research (WUR)	26	Independent Consultants
2	Embassy of the Kingdom of The Netherlands (EKN)	27	Ethiopian M.P. Biofuel
3	BENEFIT-Partnership (WUR project office in Ethiopia)	28	Netherlands Embassy
4	Ministry of Agriculture and Livestock resource	29	TDA
5	Addis Ababa City Administration Urban Agriculture Department	30	Tesfaye Getachew Poultry
6	EU	31	F&S Ethiopia BD Plc
7	Tufts University - AKLDP (USAID – Feed The Future Project)	32	Ethiopian Geo-Spatial Information Agency
8	GIZ	33	BENEFIT
9	Institute for Sustainable Development (IISD)	34	Addis Ababa University Food Security Department
10	SNV	35	Addis Ababa Water and Sanitation Agency (AAWSA)
11	ICCO	36	Ambo University
12	BENEFIT-ENTAG / Resilience B.V.	37	Debre Berhan University
13	BENEFIT-CASCADE	38	Ethiopian Kale Hiwot Church
14	Bluemoon Ethiopia	39	EIABC
15	Haramaya University	40	Ministry of Mines, Petroleum and Natural Gas
16	Hawassa University	41	Ethiopian Institute of Agricultural Research (EIAR)
17	Jimma University	42	Holeta Agricultural Research Center - Ethiopian Biotechnology Institute
18	Addis Ababa University	43	JCD
19	FAO	44	Oromia Seed Enterprise
20	IFPRI	45	DAS – LSCT
21	ILRI	46	Damtit Vet Pharma Trading Plc
22	Wolkite University	47	Ethiopian Institute of Water Resource
23	East Africa Brands Industries Plc	48	Kotebe Metropolitan University
24	Agricultural Transformation Agency (ATA)	49	Hopeful River Project
25	Bahir Dar University	50	Ethiopian Food, Beverage, Pharmaceutical Development Institute