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# Farming in cities: Potentials and challenges of urban agriculture in Maputo and Cape Town

Erik Engel, Karin Fiege and Anja Kühn (eds)



August 2019



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Urban Agriculture for Food Security and Income Generation in South Africa and Mozambique (UFISAMO)







## UFISAMO

Urban Agriculture for Food Security and Income Generation in South Africa and Mozambique

UFISAMO is a research project financed by the German Federal Ministry of Food and Agriculture. The project is the result of international and interdisciplinary cooperation between the following partners:



Humboldt-Universität zu Berlin, Thaer-Institute of Agricultural and Horticultural Sciences, Berlin, Germany



Humboldt-Universität zu Berlin, SLE-Centre for Rural Development, Berlin, Germany



Freie Universität Berlin, FAO Reference Centre for Veterinary Public Health, Department of Veterinary Medicine, Berlin, Germany



University Eduardo Mondlane, Faculty of Arts and Social Sciences  
University Eduardo Mondlane, Faculty of Veterinary Sciences  
Maputo, Mozambique



University of the Western Cape, Institute for Social Development  
University of the Western Cape, Department of Geography, Environmental Studies & Tourism, Bellville, South Africa



Frankenförder Forschungsgesellschaft mbH, Luckenwalde, Germany



Association for sustainable development, Maputo, Mozambique



Technical Secretariat for Food Security and Nutrition, Maputo, Mozambique



Abalimi Bezekhaya, Cape Town, South Africa



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The Centre for Rural Development (SLE) is affiliated to the Albrecht Daniel Thaer Institute for Agricultural and Horticultural Sciences in the Faculty of Life Sciences at the Humboldt-Universität zu Berlin. Its work focuses on four strands: international cooperation for sustainable development as a post-master degree course, training courses for international specialists in the field of international cooperation, applied research, and consultancy services for universities and organisations.

The views and opinions expressed in this Discussion Paper are those of the authors and do not necessarily reflect the official position of the SLE.

# Preface

The German Federal Ministry of Food and Agriculture (BMEL) has supported the research project **UFISAMO – Urban Agriculture for Food Security and Income Generation in South Africa and Mozambique** in Cape Town and Maputo since March 2016. The overall objective of the project was to contribute to the research discussion on whether and how urban agriculture (UA) could enhance food and nutrition security among certain segments of the urban vulnerable population and increase their income by optimising the production, processing and marketing of agricultural and livestock products.

The applicability of the research results takes centre stage: the project components were expected to generate information that can be 'translated' into good practice examples, extension material, demonstration plots, and capacity development. The project conducted research on a broad variety of topics:

- Urban agricultural value chains;
- Opportunities and challenges of urban horticultural and livestock production and marketing;
- Urban agricultural research and education networks;
- Local capacity development and knowledge exchange through transfer of the research results into policies and practices.

Universities in Maputo (Mozambique), Cape Town (South Africa) and Berlin (Germany), as well as NGOs and government structures active in urban agriculture cooperate closely in the UFISAMO project. An international interdisciplinary team unites practitioners and scientists embedded in the institutional landscape of the partner countries.

The aim of the present report 'Farming in cities: Potentials and challenges of urban agriculture in Maputo and Cape Town' is to give an overview of the UFISAMO project findings to the commissioner of the research, the German Federal Ministry of Food and Agriculture (BMEL) represented by the Federal Office for Agriculture and Food (BLE), the research partner organisations, and the urban farmers in Maputo and Cape Town involved in the study, but also to researchers, practitioners, political and administrative actors associated with urban planning and development processes, urban farmers and associations in general, and all those who actively participate or have an interest in urban agriculture.

The present report summarises the UFISAMO project research results. At the same time, the project saw the elaboration of many more products and outputs, such as:

- Academic studies to complement and consolidate research results (on value chains in Maputo and Cape Town, on food security and UA in Cape Town or on home production in Maputo);
- Four Ph.D. thesis (in progress, one Ph.D. paper on sustainable urban food systems);

- Bachelor and master studies (on compost production or salinisation);
- SLE study on dialogue, networks and future urban agricultural scenarios;
- ASA study on demonstration plots in Maputo;
- Guidelines and manuals (urbanGAPs) in both cities;
- Collection of good practices in urban agriculture in other cities;
- Briefing papers (on urban agriculture in Maputo and Cape Town);
- Video documentary on urban agriculture in Maputo;
- Policy recommendation briefs for both cities;
- Conference presentations and posters;
- Journal articles;
- Demonstration plot;
- Outline for academic module on urban agriculture ;
- Facilitation of the establishment of local urban agriculture networks;
- UFISAMO – Webpage /platform, Quarterly UFISAMO newsletters;
- Database on urban farmers and associations in Cape Town and Maputo.

Many of these products appear on the UFISAMO and SLE webpages and a detailed list of outputs/products is presented in Annex 5.

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Frankenförder Forschungsgesellschaft

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Special thanks go to the urban farmers in Maputo and Cape Town. Their daily struggle to farm the city gave meaning to our research, which was based on their willingness to share their knowledge and experience with us.

The research would not have been possible without the many contributions of local key informants, specialists, politicians, academics and all those involved in urban agriculture in Maputo and Cape Town who acted as interview partners or research farmers and participated in workshops or focus group discussions.

Thank you for welcoming us so warmly, for your openness and cooperation, for sharing your experience and expertise with us, for your time and patience in answering our countless questions, phone calls and emails, and for your untold support for our work in general.

Finally, the research team would like to thank all the minds and hands that supported the project logistically and administratively, as well as those who worked on the translation, language editing and formatting of the report. Our grateful thanks for your patience and attention to detail in finalising this publication.





# Summary

## Research background

There is a marked process of urbanisation around the globe, accompanied by multiple challenges for new metropolitan areas. In discussions on the future of the world's cities, urban agriculture (UA) has garnered attention for its potential to contribute to the food supply (of specific, mostly horticultural food products), to income generation for urban producers, and to the multiple benefits of 'green cities'. A number of cities have begun to acknowledge this potential and incorporate urban agriculture into their spatial planning, sector strategies and policies, such as Belo Horizonte in Brazil, Rosario in Argentina, Toronto in Canada – and Cape Town in South Africa. At the same time, urban farmers find their activities frequently ignored by urban planners and politicians, who give priority to a more profitable land use, sometimes even forcing urban farmers to abandon their agricultural activities.

The overall objective of the research project *UFISAMO – Urban Agriculture for Food Security and Income Generation in South Africa and Mozambique* – was to contribute to the discussion on whether and how urban agriculture could enhance food and nutrition security among certain segments of the vulnerable urban population and increase their income with reference to the improved production, processing and marketing of agricultural and livestock products.

This report provides information on the project background, the concepts and methodology applied, as well as in-depth project results and recommendations for the research packages implemented by the different UFISAMO partners.

## Overview of research findings

The role of urban agriculture for income generation and food and nutrition security depends strongly on the historical, political, economic and social context.

Urban agriculture in Maputo is the main source of income for a relevant proportion of the population. In addition, the cultivation of horticultural products contributes to a more balanced diet, mainly for the producing families themselves:

- More than 10 000 people and their families (equivalent to almost 5% of Maputo's population) earn their living directly from agricultural production in the so-called green zones of the city. Another estimated 40 000 people depend on activities around urban agriculture. For 70% of urban farmers<sup>1</sup>, however, the income they generate from vegetable production does not cover the cost of purchasing the monthly food basket compiled by the Ministry of Health (7 500 MZN, approx. €110).

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<sup>1</sup> The over 14 000 urban farmers in Maputo are small-scale farmers, of which over 11 000 are organised in associations and cultivating vegetables mainly in the 'green zones', a peri-urban area surrounding the inner city. They cultivate on average 250 m<sup>2</sup> for which they (mostly) have land use titles they obtain through their associations. Some association farmers rent 'their' land to subcontractors/tenants.

- Urban farmers in Maputo produce almost exclusively cabbage and lettuce in several production cycles per year, both of which are in high demand. These vegetables are grown in a pure farming pattern without adequate crop rotation, thereby promoting massive pest infestation. Pests and diseases are countered with the unregulated use of pesticides, some of which are banned (products containing Metamidofos and DDT). Lettuce and cabbage in urban fields thus bear the risk of contamination.
- As a legacy of the socialist era, the majority of these producers are organised in associations. The associations, however, fail to exploit their potential for product marketing, pesticide regulation and the disseminating of innovation.
- The city government supports urban agriculture and plans to protect it in the future, as the economic segment creates income opportunities for producers as well as for other professions such as middlemen and market sellers.
- An estimated 80% of the population of the districts bordering the production areas cultivates home gardens with more diversified crops than on the association fields. The products of these kitchen gardens are used for home consumption and small-scale sales. They thus contribute to the nutrition diversity of the producing families by providing diverse nutrients from pulses, fruit and diverse vegetables and leaves.
- UFISAMO recommends continued support for and protection of urban agriculture in Maputo. In the long run, city officials, supporting NGOs and associations should promote diversification of production systems in the green zones as a means of reducing pest pressure and the use of pesticides. A switch to organic or agro-ecological methods is recommended in order to cap the risk of contaminated crops and to establish higher priced niche markets for quality products. This, however, would require a marketing campaign for 'organic products'. Such a campaign could be designed in a concerted effort by the associations, the city administration and NGOs.

Urban agriculture practised in the townships of Cape Town on small plots with sandy soils plays a negligible role when it comes to income and food and nutrition security in Cape Town. This is partly due to weak market links within the townships and the difficult marketing routes to the city centre, which are usually organised by NGOs or 'social businesses'.

- Both backyard and market gardens can, however, provide producers with an opportunity to earn a meagre income and to produce vegetables for self-consumption. Farmers in general found it difficult to calculate the income from and cost of gardening: about 45% of 105 interviewed farmers earn no money at all from their gardening activities. Another 25% estimate having a gross monthly income of less than 2 000 ZAR (approx. €115), i.e., prior to deducting investment costs. 24% have a gross monthly income of between 2 000 and 4 000 ZAR (approx. €115 - 230), and approach or slightly exceed the official poverty line of 3 500 ZAR/month (approx. €205). In short, over 90% of all the interviewed farmers earned nothing at all (45%) or less than/just about the official poverty line (47%). Investment costs (seeds/seedlings, mulching materials, manure etc.) have not yet been deducted from these figures. Farmers who documented their weekly investment costs and earnings from vegetable production over one year made (on average) either no profit or incurred negative

profit, i.e., their gardens had to be cross-financed. Although exact numbers are difficult to obtain: the income generated is far too small to sustain an average family of five, but can be a welcome addition to social grants, the principal source of income for over 60% of urban farmers. In districts with an official unemployment rate of over 40%, any income is a contribution to the household budget.

- The gardens and their surrounding structures (e.g., training centres) offer the possibility of networking, self-organisation and joint action. They are thus sites with high social potential, which is highly appreciated by farmers. In the context of post-apartheid, opportunities for people to bridge social divides and work together to improve their living conditions and enhance their living environment are of great importance, with food and farming as just one opportunity. In the same vein, social networks – established through farming – are crucial to food access strategies for vulnerable households in Cape Town.
- UFISAMO recommends further promotion of urban agriculture despite its current negligible contribution to food and nutrition security and income. The social potential of this activity is vital to farming communities and their surroundings, as is the potential for (greater) economic benefits to producers. Interventions should focus on improving direct marketing in the townships as that is where the greatest potential for earning an income is seen. This calls for stronger self-organisation (which should be encouraged without interference in these processes), but also more 'business thinking', from production plans to post-harvest handling (e.g., bookkeeping, planning investments based on expected benefits). Since NGOs play a major role in knowledge transfer, they should offer more business training and promote independent marketing by producers.
- Cape Town is regularly affected by droughts, most recently in 2017/18. Cultivation methods for water-scarce regions must be spread more widely, including long-term soil development, mulching, wind breaks. In order to invest in these activities or structures, however, producers need long-term land use rights, which are currently denied them despite the city's urban agricultural policy. In addition, a long-term strategy to secure and better manage water resources in Cape Town should be a priority and implemented by policy-makers – regardless of their position on urban agriculture.

In the end, urban agriculture in both cities fails to provide an income that will cater for a balanced, healthy and nutritious diet. Addressing food and nutrition insecurity in the cities of Maputo and Cape Town is a topic for poverty reduction programmes. Focusing solely on the promotion of urban agriculture is not enough.

### **Selected research findings**

#### ***Organisational structures and networks of urban agriculture in Maputo and Cape Town***

Cape Town and Maputo each host a wide range of urban agricultural forms: individual home gardens, farmer associations, cooperatives, school gardens, and community/food gardens. Despite a similarity in their diversity, the differences prevail, mainly due to the historical developments in each city that continue to shape the structure and significance of UA.

Maputo suffered a severe food crisis following the exodus of Portuguese farmers after the Declaration of Independence in 1975. The outbreak of civil war in 1977 and the isolation of the country by western states intensified the crisis. In an attempt to overcome it, the Mozambican socialist government fostered agricultural production by small-scale farmers, cooperatives and associations in the green zones in the urban and peri-urban area of Maputo. Thus began a vibrant urban agriculture that has maintained its importance to the present day. Vast numbers of small-scale farmers organised in associations engage in horticulture for the local market. Income generated from this practice is the main source of revenue for over 80% of the households involved. Production is largely commercialised and plays a key role in the provision of specific horticultural products (cabbage, lettuce). The state guarantees and formalises land access and provides extension services for association members. The associations are democratic in structure and members come together regularly for meetings and activities. The association is still the most important organisational UA structure in Maputo today and consists of individual farmers who decide on their own production and marketing. Despite their great potential, several shortcomings and dysfunctions hamper the efficiency of these associations as promotional vehicles for healthy production, joint marketing, innovation, and knowledge transfer.

Understanding the evolution of UA in Cape Town calls for a close look at the history of apartheid, a system that divided the city into vast areas where 'black' and 'coloured' South Africans lived in precarious economic and social conditions, and a wealthy, attractive area reserved for 'whites' only. NGOs were the first to initiate UA during apartheid. They are still active and support unemployed and vulnerable residents by strongly encouraging organic horticultural production and organising produce marketing. Working towards social cohesion is a key NGO objective and offers a perspective in an extremely complex urban environment. NGOs promote both individual home gardeners and community gardens and decide on the production process and marketing procedures. Despite these efforts, the contribution of UA to income generation and the food supply of vulnerable households is marginal: for about 70% of interviewed market farmers, gross income generated from UA remained around or below the official poverty line of 3 500 ZAR/month (approximately 200 €) for an average household. When deducing investment costs, many farmers seem to lose money with gardening. Decades of NGO support have established dependencies in a treacherous comfort zone for the farmers, who depend on these structures for inputs, marketing and the acquisition of new knowledge. Farmers encounter numerous obstacles for direct marketing, ranging from lack of transport and packing material, insufficient connections to retailers and limited business skills to establish such relationships.

Women are the chief urban agricultural protagonists in both cities. In times of economic crisis and job loss in the formal sector, however, more and more men are now entering the field. Most of the farmers are elderly but captivating youth for this field is not an easy task.

Although Cape Town has a UA policy, it has never been fully implemented and is currently being reviewed. Maputo has no UA policy. Nevertheless, the state has intervened in the sector in a number of ways, providing associations with access to land and their members with extension services.

Both cities dispose of a wide spectrum of UA related networks, each with its specific characteristics. Whereas networks in Maputo are formalised, those in Cape Town tend to be informal. Ma-

puto networks do not focus solely on UA but include topics such as agro-ecology, resource governance, and food and nutrition sovereignty. Several Cape Town networks focus on UA. Actor integration, on the other hand, seems to be quite difficult. This is partly due to the strong dominance of NGOs in the sector and their simultaneous search for funds and the resulting competition for limited resources. Another aspect is the absence of state actors on all platforms and networks, thereby frustrating the effective search for solutions in the UA sector.

More research institutions focus on various aspects of urban agriculture in Cape Town than in Maputo and research in Cape Town has a more direct link to the UA sector.

### ***Vegetable production and marketing in Maputo and Cape Town***

Although climate conditions in Maputo and Cape Town differ, the impact of climate change and extreme weather events on production is increasing rapidly in both areas, with heavy rainfalls and floods in Maputo and severe droughts in both cities. Urban agriculture must consider the risk, for example, of contamination by industrial or human settlements or of theft and vandalism.

Both cities use a variety of production systems ranging from home/backyard production, small-scale farming systems to commercial farms. The level of farmer organisation differs greatly, with associations in Maputo and individual farmers or informal groups in Cape Town. Farmers in Cape Town produce a wide range of vegetables and fruits, while Maputo is characterised by low crop diversity and concentrates primarily on vegetable crops such as cabbage and lettuce for a quick turnover. The fact that these two crops are cultivated in pure cultures (field pattern) without adequate mixed or intercropping or crop rotation leads to extreme pest pressure. This is countered by the high and often unregulated use of pesticides, some of which are banned. As a result, cabbage and lettuce sourced from urban agriculture bears the risk of contamination – two people died in 2018 and 28 were hospitalised after consuming cabbage grown in the green zones, allegedly due to pesticide residue.

The availability of and access to adequate inputs for vegetable production are key factors in both cities. Input costs are rising steadily and pushing up production costs, so that farmers can barely afford to buy inputs without external support. Against a backdrop of pressure from growing urbanisation and the transformation of agricultural land into housing developments, securing sufficient farmland for production is a major issue. Access to affordable quality seeds, the largest input cost, is a huge challenge for farmers.

In Maputo, associated farmers have access to land through their associations. These obtain land use rights (DUAT) from the government, which owns all the land in Mozambique. In the townships of Cape Town, UA is carried out either on public or private land: land is leased (often free of charge) for five-year periods from institutions such as schools, or barren land is claimed from municipalities, which is albeit a lengthy process. Leases are usually short term and do not encourage investment in soil improvement or perennial plants. Home gardeners cultivate in small spaces and use all kinds of containers as plant beds. Secure land use titles are a major challenge for urban farmers.

A number of similarities in production methods and the challenges involved in farming are evident in both cities: there is little or no record-keeping or production planning aligned to market

demands, self-production of seedlings is widespread, high pest and disease pressure in the fields leads to crop losses, and knowledge of pest and disease identification, prevention and protection is poor. The main difference in terms of production methods is the trend in Cape Town to revert to more agro-ecological production and soil-building techniques, while in Maputo conventional production for a rapid turnover is predominant, as is the intense and often unsafe use of pesticides.

In both cities, market access for small-scale farmers is frustrated by inconsistent and unreliable produce quantities and quality, and by the non-observance of market demands. Whereas access to local markets is easier in Maputo, there are very few local markets in the Cape Flats of Cape Town. Farmers in both cities depend heavily on intermediaries and lack knowledge of and experience in pricing, marketing and administration.

Agro-processing is rare in both cities but has potential. Promising instances of success could serve as examples of good practice.

### ***Food habits and food and nutrition security in Maputo and Cape Town***

Food insecurity is mainly a rural but also an urban problem: while the incidence of food insecurity in both cities is lower than the overall country average, the population in the research areas – vulnerable townships in the Cape Flats of Cape Town and the population adjacent to the green zones of Maputo – show higher food insecurity figures than the overall city average: in Cape Town, for example, the township of Khayelitsha shows average to severe food insecurity levels of 89%, compared to 26% of the overall population regularly being victim of hunger and another 36% being at risk.

Urban farmers in the vulnerable districts of both cities – not unlike their non-farming neighbours – are overall moderately food insecure. Limited accessibility (poverty) and availability (lack of shops with healthy and affordable products, i.e., food deserts) means that these households cannot eat the food they need in the quantities and quality they desire. In Maputo, only 34% of respondents were food secure. All others were either anxious of not having enough food to eat (45%), had to sacrifice food quality (13%) or did regularly not have sufficient food (8%). In both cities, seasonal peaks and low seasons bode hungry seasons for the producers in periods when they cannot generate income from their gardens and are forced to purchase food elsewhere at high prices. These hungry seasons are equally correlated to the non-availability of temporary job opportunities, e.g., in construction. As Cape Town farmers rely to a greater degree on other income sources, the correlation is stronger there.

Hidden hunger caused by diets composed mainly of carbohydrates and the insufficient intake of protein, minerals, vitamins and micronutrients is a phenomenon reported from Cape Town. The nutrition transition to sugar and fat rich foods combined with less physical exercise contributes to the high occurrence of obesity in Cape Town and its mounting occurrence in Maputo. In terms of diet diversity, the vulnerable urban population in Maputo seems slightly better off than their counterpart in Cape Town (greater consumption of nutritious food such as fish, fruit and groundnuts).

Dietary preferences of the population in both cities also follow a generational divide: the young prefer bought oily food (e.g. deep fried “fat cakes” or fast food) and sweetened drinks, while the

elderly tend to cherish cereals as staples accompanied by vegetables and sauce – and on special occasions, meat. A specific characteristic of Cape Town is the preference for supermarkets (where available) compared to the strong reliance on corner shops or open-air markets in Maputo.

Urban agriculture has more impact on the food and nutrition security status of urban farmers in Maputo than in Cape Town: in Maputo about 5% of the population depends directly on their income from urban agriculture, for 70% of farmers and their households this activity is the only source of income. In addition, an estimated 80% of the population surrounding the green zones cultivates home gardens with a broad variety of vegetables and fruit, accompanied by some ducks or chickens for home consumption. UA products in Maputo are successfully commercialised, they penetrate the local markets and are likewise consumed by the producers themselves. Hence UA contributes significantly to the income and purchasing power of urban farmers, and not least to the consumption and dietary diversity of the households concerned. Nevertheless, income generated through UA is on average insufficient to purchase the monthly food basket that costs around 7 500 MZN (approx. €110) as defined by the Ministry of Health. The food basket is a component of a consumption-based national poverty line.

In Cape Town, on the other hand, urban horticultural products mostly leave the townships where they were produced, since they are first and foremost produced for markets located in the prosperous (mainly white) areas of the city – people who can afford organic products and purchase with a social conscience. Consequently, UA is – if at all – an additional source of income for the farmers concerned, who depend to over 60% on social grants. Over 90% of all interviewed farmers earned nothing at all (45%) or report a gross monthly income from their gardening activities of less than/just about the official poverty line of 3 500 ZAR/month (approx. €205) (47%). This refers to income prior to investment cost deduction (e.g., seeds/seedlings, mulching materials, manure). Farmers who documented their weekly investment costs and their earnings from vegetable production over one year made (on average) no profit or negative profits, i.e., their gardens had to be cross-financed. Although precise figures are difficult to obtain: income generated (if income/profit is generated) is too small to sustain an average family of five, but is a welcome addition to social grants, the primary source of income for over 60% of urban farmers. In districts with an official unemployment rate of over 40%, any income is a contribution to the household budget.

As further analysed in the study, these unequal benefits are linked in part to the decision-making powers: Maputo farmers make their own production decisions, have access to local markets through intermediaries and enjoy the high demand for their products. In Cape Town, food garden production is basically mediated by NGOs. They dictate the production and establish the market link. Accordingly, producer incomes depend on NGO contracts and NGO demand.

### ***Dissemination of knowledge and information in Maputo and Cape Town***

The principal actors in the urban Agricultural Innovation System in both cities are urban farmers and their organisations: a high degree of farmer organisation in Maputo (associations, union of cooperatives, very few NGOs) compared to Cape Town with farmer groups directly linked to NGOs and little or no informal farmer networks - a remnant of apartheid segregation policies.

Maputo has a high public extension worker coverage: a ratio of 1:250 compared to 1:3000 in the rural areas. *Casas agrárias* (local offices of the municipality) exist in districts with urban agricultural production. At the national level, the Ministry of Agriculture in Maputo defines the pillars of the extension service – the chief information broker. In Cape Town, the public extension service is limited to input provision for farmers on request, while agricultural knowledge dissemination is predominantly carried out by NGOs.

Training material is available in both cities but less effective as a dissemination tool than on-farm training, personal advice and, most importantly, continuous follow-up by the extension service. Farmers are prominent advocates of face to face communication. In Maputo and Cape Town, demonstration plots are used as a dissemination tool. Most associations in Maputo have demonstration plots for trainings conducted by extension officers. NGOs in Cape Town use their garden centres to showcase production techniques and carry out trainings. The learning process and farmer to farmer exchange are crucial to knowledge dissemination and highly valued. Informal networks in Cape Town contribute in particular to ongoing knowledge exchange and allow actors to disseminate bottom-up innovation. Farmer to farmer exchange also takes place within the framework of NGO trainings, although exchange in this case is frequently confined to the NGO group and does not cover cross group exchange or interaction between townships. In Maputo, regular formal meetings are held in the associations and facilitate farmer exchange.

Both cities use diverse communication and dissemination tools, albeit to a different degree. In Cape Town communication via (social) media and the internet is vital, and NGOs provide training and workshops on a regular basis. Extensionists in Maputo organise meetings and trainings in the associations. Although the use of media and ICT for knowledge and information dissemination is expanding in both cities, it is more widespread in Cape Town than in Maputo and also favoured by NGOs in their extension work. Farmers in both cities prefer to communicate in their local languages and opt for radio as their preferred information medium.

## **Main conclusions and selected recommendations for urban agriculture in Cape Town and Maputo**

Conclusions were drawn and recommendations made, based on existing good practices and challenges identified during the research. The conclusions are city-specific and address specific actor groups.

### ***Main challenges and opportunities of urban agriculture***

#### **Maputo: production systems and markets**

Markets and market access pose challenges to producers in Maputo and tend to boost unsustainable methods of crop production. The main challenge to cultivating healthy urban products is the excessive and unsystematic use of pesticides coupled with an underdeveloped market for healthier or organic products. Producers have little incentive to change their production methods, leaving markets for organic pesticide-free products still in the niche market position. In addition, mechanisms to control the sale and application of pesticides are weak. Besides the risk of a direct threat to the health of the applicant and the consumers concerned, the unregulated application of pesticides has environmental consequences, since residues enter the food chain, leach into soils and groundwater or are washed into the sea where they can affect marine life.



Enhanced production techniques along Good Agricultural Practices for the urban context (urbanGAPs) should therefore be applied in the interests of cultivating uncontaminated crops and reliable quantities in line with existing markets and consumer habits, and of delivering quality that meets certain standards. Extension service officers, NGOs and heads of production in the associations should encourage the use of GAPs. If pesticides continue to be applied (which is likely in the short to medium term), farmers need to consider Maximum Residue Levels (MRL), use authorised products only, follow the dosage instructions carefully on the packaging, always wear protection gear and a mask, and dispose of packaging material correctly. An incentive and control system shared by the associations and the public sector (extension workers, municipality) must ensure observance of these basic rules.

Campaigns advocating healthy products have been launched by ABIODES, a UFISAMO partner, and the municipality of Maputo and should be sustained if consumer behaviour is to change. The higher price for organic products must be made transparent to consumers and the latter must be willing and have the wherewithal to pay for them. A growing urban middle class (frequently those who work in international organisations) and the increase in health consciousness both constitute the economic basis for such a niche market. Transforming the green zone production system to introduce the basics of environmentally friendly or agro-ecological crop cultivation calls for a long-term strategy that involves a sequence of interrelated steps, including the introduction of other crops, the identification of markets for these crops, and knowledge transfer to the producers.

It will take political will and support to facilitate the transition as well as the institutional capacity of the associations and the willingness of farmers to comply with these new, more sustainable techniques. Customer awareness and preferences will add to the incentive to shift to more holistic and less harmful production methods.

#### Maputo: associations and networks

Associations in Maputo have great potential to disseminate knowledge, organise production, market access and the purchasing of inputs, standardise certain procedures, but they also face challenges in the functioning of their structures. For this latter reason they frequently lag behind their potential and are mainly used to access land use rights (DUAT) and organise basic tasks such as cleaning irrigation canals. Furthermore, the average age of association members is high and associations find it difficult to convince young farmers that UA is a viable option.

Hence the association movement needs to be revitalised and develop its full potential, and to encourage young people to become members. Associations and their leadership should be more transparent, and members need to see the inherent advantages of competent self-organisation.

Selected concrete recommendations for the associations in Maputo refer to the size and composition of structures, the legal framework and internal regulations, and the role, function and responsibilities of leaders and members of the associations, e.g., re-sizing associations to enhance member integration, become more dynamic, boost cooperation and mobilise young people, as well as working on the running of the associations, e.g., via member involvement in decision-making, the obligation of accountability and transparency, a more advanced communication system.

Networks across actor categories are almost non-existent, thereby impeding synergies between interventions and actors. The UFISAMO project supported the creation of a network between NGOs, associations and research representatives. This will thrive if the actors concerned see added value in their meetings and plans, given that maintaining a network requires time, energy and financial resources. More formalised networks between research and the UA context, notably in agro-ecology, would increase the functionality of intersectoral networks and improve the information flow in all directions.

#### *Cape Town: market access and production*

Market access for urban products in Cape Town is currently limited: affluent customers reached by box schemes and organised by NGOs or social businesses constitute the major outlet. Producers have rarely explored local township markets. Access to inputs is mostly mediated by NGOs. They provide seeds and seedlings sold in their marketing schemes and promote products consumed by box-scheme customers rather than by township residents. As a result, urban producers have become dependent on NGOs.

Market diversification is therefore vital if farmers are to become empowered entrepreneurs, either individually or as groups. Marketing, business planning and cost-benefit analysis have so far not been part of the training content offered by NGOs. A resilient urban farmer system, however, demands steps towards empowerment – ideally driven by the farmers themselves.

Farmers need to produce what their families and neighbours like to eat, what they are sure to sell, and/or what can easily be conserved or processed (e.g., cabbage to *Kimchi*). Market-oriented production planning is crucial to market production: ideally producers have agreements with customers/retailers prior to the harvest as well as with diverse market outlets to increase selling opportunities.

Market access will always depend on good production practices, e.g., urbanGAPs. Their application is thus advised, namely water-saving production techniques, soil-building measures and composting, as well as strict field hygiene to prevent the spread of pests and diseases.

#### *Cape Town: weak organisational structures*

NGO interventions and support structures have created dependencies (on inputs, innovative knowledge, markets) and discouraged the self-organisation and pro-active efforts of farmers. Dependency is undemanding and beneficial as long as the support structure functions. The long-term functioning of NGOs along the given lines cannot be guaranteed, however, bearing in mind the volatility of donor interest and the financial constraints of NGOs.

Promoting urban farmer empowerment should thus be paramount to NGOs and donor agencies, e.g., by involving farmer representatives in NGO decision-making structures and encouraging self-organised links to secondary actors. Since self-organisation cannot be promoted or kick-started externally, supporting actors should fuel self-organisation and independent economic action by farmers/farmer groups with training in entrepreneurial skills and organisational development.

In addition, farmer networks have proved weak and are inhibited by time constraints, distances within the communities, lack of transport resources and occasionally by farmer disputes (some of which derive from antiquated segregation policies). Here, too, the result is a heavy reliance on NGOs and the absence of an independent farmer network.

Hence, there is room for improvement when it comes to the efficiency of informal urban farmer networks and joining forces. There is strong potential for the emergence of urban farmer organisations, with existing food/community gardens providing a solid basis for the formation of producer groups, all of which would feed into higher level associations. Farmers have begun to self-organise and network with other groups. These are promising steps on the way to more self-confident urban farmers creating networks and finding solutions to issues and challenges in ways they themselves deem appropriate.

The main recommendation to farmers is to organise themselves, to look for common objectives (e.g., marketing, knowledge exchange, social benefits, pooling of resources), and to assess costs and benefits of the organisational process: starting locally and not too big keeps financial needs small, but bigger structures could bring higher benefits. Farmer self-organisation at municipal/ward level could trigger the creation of a more formal network from community level upwards to a 'farmers union', which in turn would represent the various farming communities. This would help to position urban farmers as a stronger lobby group at the political level and facilitate access to resources and funds.

### ***Dissemination and knowledge transfer***

Supporting actors in both cities have created structures that are crucial to disseminating knowledge, innovation and information. In Maputo, knowledge transfer is mainly organised by state actors, i.e., public extension workers. In Cape Town, NGOs are the chief information brokers. Both capacities face numerous challenges related to training material for and information dissemination to a vast number of people with different educational backgrounds, interests and problems, and with varying degrees of agricultural knowledge. In many instances, trainers and extension workers have no specific knowledge of aspects identified as essential (e.g., production planning, administrative skills, marketing, nutrition) and need systematic refresher courses to remain up to date on new developments in the agricultural sector. They should be more enabled to train farmers to conduct their activity as a business.

Maputo's extension service should improve its outreach, mainly to ensure continuity and regular follow-up visits after trainings in the associations. The successful employment of demonstration plots in the associations should be maintained and farmer to farmer exchange and mutual learning within and between the associations promoted. In addition, the use of social media and messenger services should be encouraged, e.g., market prices via SMS, radio information on climate or pesticides.

NGOs in Cape Town should customise their training content to farmer needs (e.g., production planning, marketing skills), establish agri-hubs and offer one-year training courses adapted to agricultural education curricula (instead of offering a multitude of workshops). The use of farmer-appropriate, practice-oriented training methods, trainings at farmer gardens, farm visits and regular follow-ups on trainings seems crucial.

Training material in both cities should be adapted to the urban context with a vision to achieving sustainable agricultural production. Winning over young people by offering special programmes and promoting small agriculture-related businesses (e.g. compost-making, seedling production) is another very important step.

Close cooperation with universities and a reciprocal information flow are recommended if farmers are to benefit from research projects and further innovation is to be promoted. Research should be aligned to farmer needs and open to farmer requests for information. Most importantly, researchers should present and discuss their results with the farmers concerned.

### ***Appropriate policy support***

Policy support for urban agriculture cannot replace social security programmes or policies geared to food security/food sovereignty and poverty alleviation. This research, along with many other scientific publications, concludes that urban agriculture has the potential to impact on income and food security but that a large-scale positive impact calls for specific conditions. Policy support should focus on land tenure rights, on promoting products and production techniques that enhance public health, and on providing interested farmers with the appropriate knowledge.

An urban agricultural policy does not per se translate into policy support. Nor does it necessarily strengthen the position of urban farmers: in Maputo there is no explicit UA policy, but state support for this activity is far more relevant than in Cape Town. Policies can generate an environment that stimulates certain types of urban agriculture and help to create markets and sensitise customers to the benefits of urban products.

Very few promotional campaigns on UA have been implemented so far. They should be scaled up to transmit nutritional messages, foster more sustainable and integrated production techniques and encourage switching to organic agricultural practices. The potential public health effect of greater nutrition would justify the expense of these campaigns. If policy makers have visions of a 'sustainable city', then urban farmers should be part of those visions.

### ***Does urban agriculture play a role in the current urban food systems of Maputo and Cape Town?***

The contribution of UA to the food system is – until now - low in Maputo and still negligible in Cape Town. Small-scale urban agriculture produces a narrow range of products in limited quantities. The overwhelming amount and assortment of food in both cities is sourced from rural production or imported. The comparative advantage of the rural areas is substantial (available land, soils and water, targeted policy support) and makes penetrating the urban food system a major challenge for urban producers.

In Maputo, most fresh food products available at local wholesale and retail markets or at supermarkets and corner stalls are imported from South Africa. Lettuce and cabbage produced in Maputo are, however, prominent at local markets. The current production system without mixed cropping, intercropping or crop rotation leads to greater use of pesticides. The often inappropriate application of pesticides (types, quantities, timing) can lead to contaminated vegetables and pose health risks. In Cape Town, small-scale horticultural township products fail to penetrate local markets, regardless of the type or size of shops and stalls.

The food system in Cape Town is still highly segregated, with the affluent city centre and prosperous neighbourhoods well-endowed with shops that stock a broader variety of better quality products. The major source of food products in the townships are small *spaza* shops that sell all kinds of items for daily use but only a small selection of fruit and vegetables. Supermarkets are not interested in buying from urban small-scale farmers due to small and inconsistent quantities and unreliable quality. Horticultural township products only serve niche markets, which are in turn driven by the social choices of their more affluent customers (individuals and restaurants).

***Does urban agriculture generate income for urban producers?***

Urban agriculture is no panacea that will solve the issues of unemployment and low income. Neither can the promotion of UA be a substitute for a social security system. When producers succeed in gaining access to the markets, however, they manage to generate income that adds to their household cash and overall financial resources. Again, the financial benefits in Maputo are very different to those in Cape Town, which is primarily due to the size of and access to the markets, but also to production conditions (soil quality, water availability, input costs, climate and the resultant production cycles).

In Maputo, the assessment is different. Up to 80% of the 11 000 association farmers generate most of their income from urban agriculture. Apart from the producers and their families (ca. 40 000 people), actors such as intermediaries, service providers and employee farmers also derive an income from green zone production. All told, this amounts to a further 40 000 people according to the literature. In conclusion, between 4 and 8% of the population of Maputo depends on agriculture in the green zones for income. These earnings, however, are far too low to allow producers to step up, since they barely cover basic needs ('food basket', housing, electricity, clothes etc.). This is the reason why young people find the agricultural sector unattractive, choosing it only as a last resort. Numerous farmers and their family relatives are obliged to look for secondary occupations or additional income opportunities in low-qualified jobs.

Cape Town small-scale farmers generate almost no income from their horticultural activities. Consistent book-keeping even suggests that input costs and the labour investment exceed the income from sales. There are, however, exceptions. Some farmers manage to add to their other sources of income – mostly in the form of a pension. Yet, the overall income effects are negligible. This sobering assessment is true even of more successful farmers who are well connected to the box schemes that organise sales to niche markets in the affluent parts of town. Working poor soils with unreliable market access is not an appealing prospect for most young people in the townships. Indirect income benefits arise when farmers succeed in producing for home consumption and can thus spend cash on items other than food.

***Does urban agriculture contribute to the food and nutrition security of producers?***

UA contributes to FNS of producers by providing income and food products that substitute purchases. These contributions are, however, on a different scale in the two city contexts.

The income generated by urban farmers in Maputo allows them to purchase food and cater for other needs. In addition, urban farmers usually cultivate small plots at home for self-consumption. They produce a wider variety of vegetables on these plots (pulses, fruits, leafy vegetables, tubers), increasing the dietary diversity of family meals.

In Cape Town, the main effect of UA is dietary diversity for the urban farmers themselves and their families. It is the vegetables produced and consumed by the producers and their families (and neighbours) rather than the income generated that allows for a more balanced diet and less dependence on meals rich in sugar, oil and starch.

In the end, urban agriculture in both cities fails to provide an income that will cater for a balanced, healthy and nutritious diet. Addressing food and nutrition insecurity in the cities of Maputo and Cape Town is a topic for poverty reduction programmes. Focusing solely on the promotion of urban agriculture is not enough.

(Lack of) nutritional knowledge is another aspect put forward to explain poor food and nutrition habits. Nutrition education approaches exist (community gardens located in schools and food gardens in the communities as hands-on experience for children and other residents), but are not systematic, and too few to counter the nutrition transition.

### ***What other positive impacts result from urban agriculture?***

Farmers in Maputo plant predominantly for income, especially in the associations. When they set up gardens around their homes, self-consumption, leisure and aesthetic motives become equally important. There is an awareness of the beneficial health effects of freshly grown, untreated vegetables and of the positive impact of the green zones – islands of acoustic peace – on air circulation and climate. Despite the many challenges involved, the organisation of farmers in associations provides a framework for information sharing, mutual support and public representation.

Producers in Cape Town highlight the social benefits of farming and exchanging. Unlike Maputo, social interaction is by no means institutionalised here, and the politics of apartheid made thorough work of durably disrupting the social tissue and social cohesion of the city. Exchange between different language groups, between people categorised under apartheid as 'black' and 'coloured' is difficult and subject to cultural and political reservations. Racial prejudice and structural racism are still widespread, often unknowingly. Meetings and interaction can help to overcome some of the apprehension involved. Being an active part of a training group is a start when it comes to bonding, building friendships and, in the long run, strengthening the social tissue of the community in the interests of mutual support.

The ecological and health benefits of farming should also be highlighted: the many faces of the townships in Cape Town range from informal shacks to neatly planned neighbourhoods. All of them, however, lack parks, green spaces and areas for relaxation. Community and market gardens are small havens of green in an otherwise densely built-up environment.

### **Key words**

urban agriculture, urbanisation, urban development, food system, food and nutrition security, organisational structures, food and consumption habits, good practices, (urban) Good Agricultural Practices, (urban) Agricultural Innovation System, dissemination, networks/networking, value chains

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## Abbreviations

ABIODES	Association for sustainable development, Maputo
ACC	African Centre for Cities
ACDI/VOCA	Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance (merger of two US non-profit organisations)
AFSUN	African Food Security Urban Network
AGIR	Programa de Acções para uma Governação Inclusiva e Responsável (Action Programme for Inclusive and Responsible Governance)
AIS	Agricultural Innovation System
APROC	Agremiação para o Progresso Comunitário (Association for Community Progress)
BFAP	Bureau for Food and Agricultural Policy
BLE	German Federal Office for Agriculture and Food
BMEL	German Federal Ministry of Food and Agriculture
BMI	Body Mass Index
BPD	Banco Popular de Desenvolvimento (People's Bank for Development)
CAVA	Comércio, assistência e valorização agrícola (Trade, support and valorisation of agriculture)
CBOs	Community Based Organisations
CCOM	Caixa Comunitaria de Operadores de Microfinanças (Microfinance Operators)
CDR	Campos de Demonstração de Resultados (Demonstration Plot)
CIA	Central Intelligence Agency
CMM	Concelho Municipal da Cidade de Maputo (Municipal council of the City of Maputo)
CoCT	City of Cape Town
CONSADC	Comissão Nacional de SADC em Moçambique (SADC National Committee in Mozambique)
CONSAN	National Council of Food and Nutrition Security
DAE	Departamento de Actividades Económicas (Department of Economic Activities)
DASACM	Direcção da Agricultura e Segurança Alimentar (Directorate of Agriculture and Food Security)
DDT	Dichlordiphenyltrichlorethan
DELC	Division of Environmental Law and Conventions (UN Environment)
DFDTT	Directorate of Training, Documentation, and Technology Transfer
DMMF	Direcção Municipal de Mercados e Feiras (Municipal Directorate of Markets)

	and Fairs)
DMPUA	Direcção Municipal de planeamento e urbanização (Municipal Directorate of Planning and Urbanisation)
DNEA	Direcção Nacional da Extensão Agrária (National Directorate of Agricultural Extension)
DNSV	Direção Nacional dos Serviços de Veterinária (National Directorate of Veterinary Services)
DoA	Department of Agriculture
DPASAN	Departamento de Plano de Acção de SAN-Segurança Alimentar e Nutricional (Department of Action Plan of Food and Nutritional Security)
DSCM	Direcção de Saúde da Cidade de Maputo (Directorate of Health of Maputo)
DSU	Dutch Sustainability Unit
DUAT	Direito do Uso e Aproveitamento da Terra (Right to Use and Exploit the Land)
EC	Electrical conductivity (salinity)
EMC	Escola na Machamba do Campônes (Farmer Field School)
ESP	Exchangeable sodium percentage (sodicity)
ESSOR	Association de Solidarité Internationale
EU	European Union
FACS	Food Advisory Consumer Service
FANTA	Food and Nutrition Technical Assistance Project
FAO	Food and Agriculture Organization of the United Nations
FAO COAG	FAO Committee on Agriculture
FFS	Farmer Field School
FNS	Food and Nutrition Security
FOSCAM	Forum for Marine and Coastal Areas in Mozambique
FRELIMO	Frente de Libertação de Moçambique (Mozambique Liberation Front)
FU	Freie Universität Berlin
GAPI	Gabinete de Apoio e Consultoria a Pequenas Indústrias (Small Industry Support and Consultancy Office)
GAPs	Good Agricultural Practices
GDP	Gross Domestic Product
gfras	Global Forum for Rural Advisory Services
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GMO	Genetically modified organism
HDDS	Household Dietary Diversity Score
HEIs	Higher Education Institutions

HFIAS	Household Food Insecurity Access Scale
HoH	Harvest of Hope
HU	Humboldt-Universität zu Berlin
CIPE	Centre of Insect Physiology and Ecology
ICT	Information and Communication Technologies
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IIAM	Instituto da Investigação Agrária de Moçambique (Agrarian Research Institute)
IES	Instituições do Ensino Superior (Higher Education Institutions)
INE	Instituto Nacional Estatística (National Statistic Institute)
INSS	National Social Security Scheme
IOF	Inquérito ao Orçamento Familiar (Survey on family income)
IPEME	Instituto para Promoção de Pequenas e Médias Empresas (Institute for the promotion of small and medium enterprises)
IPM	Integrated Pest Management
ISA	Innovation System Approach
MASA	Ministério de Agricultura e Segurança Alimentar (Ministry of Agriculture and Food Security)
MDER	Minimum Daily Energy Requirement
MIC	Ministério da Indústria e Comércio (Ministry of Industry and Commerce)
MINEDH	Ministério da Educação e Desenvolvimento Humano (Ministry of Education and Human Development)
MISAU	Ministério da Saúde (Ministry of Health)
MITADER	Ministério da Terra, Ambiente e Desenvolvimento Rural (Ministry of Land, Environment and Rural Development)
MITESS	Ministério do Trabalho, Emprego e Segurança (Ministry of Labour, Employment and Security)
MoH	Ministry of Health
MoU	Memorandum of Understanding
MRL	Maximum Residue Level
MSG	Mestrado em Sociologia Rural e Gestão de Desenvolvimento (Master course on Rural Sociology and Development Management)
MZN	Metical Moçambicana (Mozambican Metical)
NCDs	Non-communicable diseases
NGO	Non-Governmental Organisation
NHS	National Health System
NOP	National Organic Program (US)



OCS	Organizações da Sociedade Civil/UNICEF Mozambique
OECD	Organisation for Economic Co-operation and Development
OZCF	Oranjezicht City Farm
PACSA	Pietermaritzburg Agency for Community Social Action
PAPAP	Plano de Acção Agraria e Pesqueira (Agricultural and Fisheries Action Plan)
PARPA	Plano de Accao para a Reducao da Probreza Absoluta (Action Plan for the Reduction of Absolute Poverty)
PEDI	Philippi Economic Development Initiative
PEDSA	Plano estrategico para o desenvolvimento do sector agrário (Strategic Plan for the Development of the Agricultural Sector)
PGS	Participatory Guarantee Scheme
PHA	Philippi Horticultural Area
Ph.D.	Doctor of Philosophy
P.ITTA	Integrated Programme for Technology Transfer
PLAAS Institute	Institute for Poverty, Land and Agrarian Studies at UWC
PRONEA	Programa Nacional de Extensão Agrária (National Plan for Agricultural Extension)
PSF	Peninsula School Feeding
PVP	Plant Variety Protection Law
R&D	Research and Development
RM	Radio Mozambique
ROSA	Rede de Organizações para a Soberania Alimentar (Network of Organisations for Food Sovereignty)
RPM	People's Republic of Mozambique
RUAF Foundation	Resource Centres on Urban Agriculture and Food Security Netherlands Enterprise Agency
RVO	Netherlands Enterprise Agency
SADC	Southern African Development Community
SANAC	South African National AIDS Council
SAP	Structural Adjustment Programme
SCAGA	Siyazama Community Allotment Garden Association
SDG	Sustainable Development Goal
SEA	Serviço de Extensão Agrária (Agricultural Extension Service)
SEED	Schools Environmental Education & Development
SETSAN	Secretariado Técnico de Segurança Alimentar e Nutricional (Technical Secretariat for Food Security and Nutrition, Maputo)
SFL	Soil for Life

## xxx Abbreviations

SLE	Seminar für Ländliche Entwicklung (Centre for Rural Development)
SMEs	Small and Medium Scale Enterprises
StatsSA	Statistics South Africa
SUN	Stellenbosch University
ToRs	Terms of References
TV	Television
T&V	Training & Visit (Approach)
UA	Urban agriculture
UAACM	Uniao das associacoes dos agricultores da cidade de Maputo (Union of farmers' associations of the City of Maputo)
uAIS	urban Agricultural Innovation System
UCT	University of Cape Town
UEM	University Eduardo Mondlane, Maputo
UFISAMO	Urban Agriculture for Food Security and Income Generation in South Africa and Mozambique
UGC	União Geral das Cooperativas (General Union of Cooperatives)
UN	United Nations
UNAC	União Nacional de Camponeses (National Peasants Union)
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UN HABITAT	United Nations Human Settlements Programme
UNICEF	United Nations Children's Fund
urbanGAPs	urban Good Agricultural Practices
URF	Urban Research Farmers
USAID	United States Agency for International Development
UWC	University of the Western Cape
VC	Value Chain
WFP	World Food Programme
WHO	World Health Organization
WP	Work Package
ZAR	South African Rand

# Report structure

The project report consists of an introduction followed by the research findings in Maputo and Cape Town, initial implementation experiences, main characteristics of the two cities, good practices, challenges and recommendations, and final conclusions.

The report is a compilation of articles provided by the different UFISAMO researchers. The editors have aligned the articles in a way that takes the reader from the project background, conception and methodology to the specific findings in each city. To facilitate the independent reading and understanding of individual chapters, selected contents are intentionally repeated in various parts of the report.

Chapter 1 introduces the UFISAMO project and its project partners and describes the conceptual and methodological approach. Chapters 2, 3 and 4 describe project results, beginning with an overview of urban agriculture and urbanisation in Maputo and Cape Town (see Chapter 2), and continuing with two chapters on the research findings in each of the cities (see Chapters 3 and 4). The focus here is on UA as part of the urban food system, the actors involved, framework conditions, the farmers themselves and their organisational structures, vegetable production and marketing, consumer habits, dissemination channels, and the role of UA for food and nutrition security.

Chapter 5 contains first implementation results – i.e., the development and introduction of urbanGAPs or farmer to farmer knowledge exchange in Cape Town. Chapter 6 presents a summary of the main characteristics of urban agriculture in Maputo and Cape Town, the challenges and good practices identified and the conclusions and subsequent recommendations on anchoring sustainable urban agriculture in both cities. Chapter 7 provides some final considerations and conclusions.

The findings on livestock production and marketing in Maputo will be published in a separate report by the UFISAMO partners concerned.



# 1 Introduction

*Karin Fiege & Anja Kühn*

There is a marked process of urbanisation in progress around the globe, accompanied by multiple challenges for new metropolitan areas. These range from food provision, building and infrastructure design and maintenance (housing, traffic, social infrastructure), environmental and waste management, to the management of conflicts arising from cracks in the social cohesion of (new) urban agglomerations.

In discussions on the future of the world's cities, urban agriculture<sup>2</sup> has garnered attention for its potential to contribute to the food supply (of specific food products), to income generation for urban producers, and to the multiple benefits of 'green cities'. A number of cities have begun to acknowledge this potential and incorporate urban agriculture into their spatial planning, sector strategies and policies (see Chapters 3.2 and 4.2).

At the same time, urban farmers<sup>3</sup> find their activities frequently ignored by urban planners and politicians, who prefer to give priority to a more profitable land use, forcing urban farmers to abandon their agricultural activities.

## 1.1 Project partners and objectives

The German Federal Ministry of Food and Agriculture (BMEL) represented by the Federal Office for Agriculture and Food (BLE) financed the research programme **UFISAMO – Urban Agriculture for Food Security and Income Generation in South Africa and Mozambique** with the aim of providing relevant information for action in urban agriculture that will improve food and nutrition security and income options in Southern Africa (see Chapter 1.3.1).

The research project ran from March 2016 until February 2019 (with a partial extension until September 2019) and was implemented by a partner consortium comprised of universities, research institutes, a state agency and NGOs from Germany, Mozambique and South Africa: Humboldt-Universität zu Berlin, Thayer Institute of Agricultural and Horticultural Sciences, Centre for Rural Development; Freie Universität Berlin, FAO Reference Centre for Veterinary Public Health, Department of Veterinary Medicine, University Eduardo Mondlane, Faculty of Arts and Social Sci-

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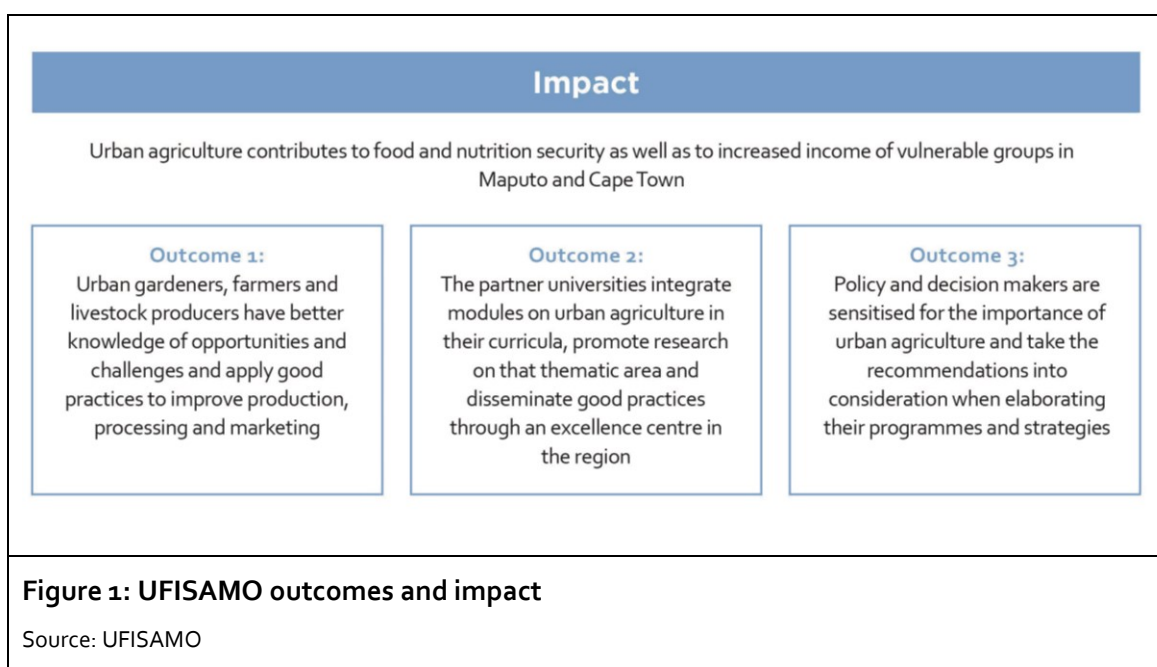
<sup>2</sup> "AGRICULTURE (a term which encompasses FARMING) is the process of producing food, feed, fiber, fuel, and other goods by the systematic raising of plants and animals." ([https://www.newworldencyclopedia.org/entry/Urban\\_agriculture](https://www.newworldencyclopedia.org/entry/Urban_agriculture) [1]) Urban agriculture is a term describing this activity when it takes place in urban or peri-urban spaces (see Chapter 2.1 and definition by Mougeot, Chapter 1.2). It includes most commonly small-scale vegetable production and small-scale livestock rearing.

The term "urban agriculture" is used throughout this report, in accordance with local vocabulary and the terminology used in the scientific debate. The UFISAMO project worked on plant (vegetable) and animal (broiler) production.

<sup>3</sup> Farmers are the main actors in agriculture. There can be large-scale land owners, or subsistence farmers on common pool lands. In this report, we use the term "farmer" to describe small-scale producers who are partly or fully integrated in the market economy, i.e. they produce (partly) for commercialisation.

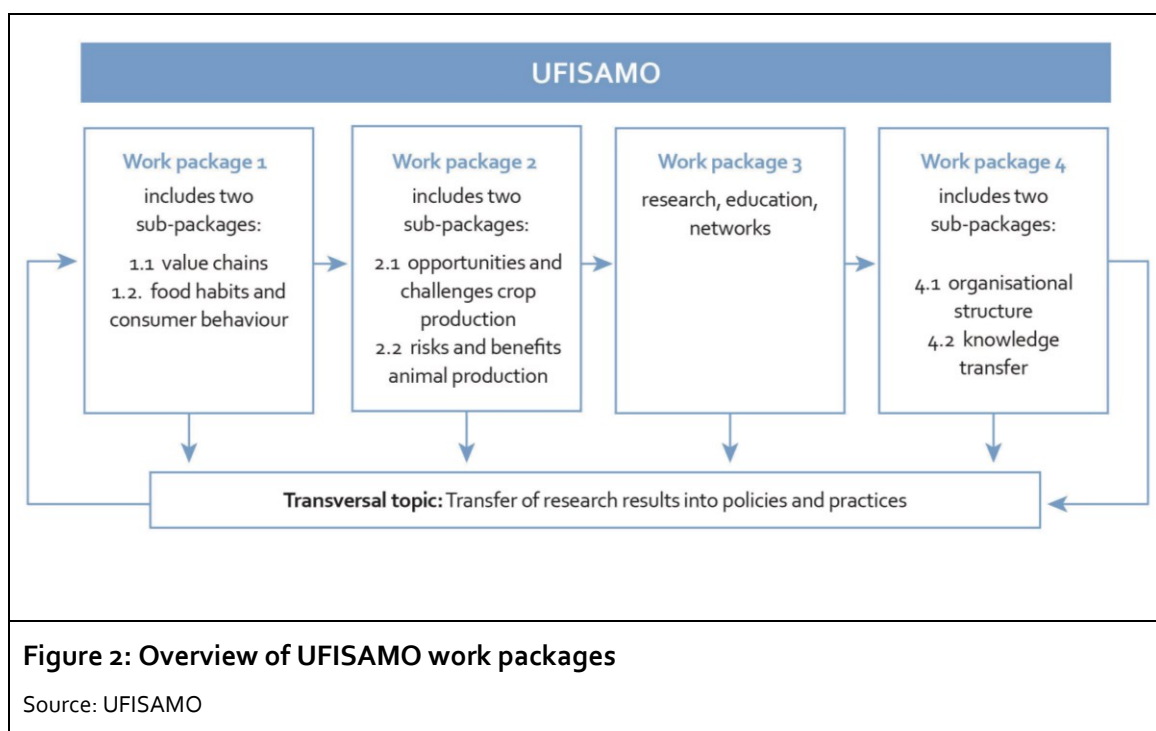
ences; University of the Western Cape, Institute for Social Development; University of the Western Cape, Department of Geography, Environmental Studies & Tourism; Frankenförder Forschungsgesellschaft (Luckenwalde/Berlin); SETSAN – Technical Secretariat for Food Security and Nutrition and the NGO ABIODES (Association for sustainable development) in Maputo and the NGO Abalimi Bezekhaya in Cape Town.

The UFISAMO project sees three major outcomes (see Figure 1 below) to enhance research on food and nutrition security in segments of the disfavoured urban population and improve income generation by optimising the production, processing and marketing of agricultural and livestock products<sup>4</sup>. The research project follows a multi-level approach. Consequently, the results target different users ranging from individual urban farmers and extension services to ministries, municipalities and universities.



To achieve these outcomes the UFISAMO project was divided into four work packages as presented in Figure 2 below. Each work package (WP) considers a multi-sectorial and multi-dimensional approach. Work packages 1 to 4 gather baseline data, conduct in-depths data collection, analyse data, present, discuss and consolidate findings, formulate good practices and strategies for dissemination and make recommendations to optimise the issues at hand. The recommendations feed into policy briefs, manuals and share back dialogues which ensures that the research results of all four work packages reach the individual target groups at farm, extension, academic and policy level.

<sup>4</sup> German and Mozambican researchers formulated the outcomes, expected results and impact of the research during a two-week workshop in Maputo in October 2016. In the course of the workshop, the researchers worked on their individual research concepts and integrated them into one overarching concept. The South African partners and other consortium members involved agreed on the 'logical framework' for the research at the annual meeting in Maputo in November 2016. The framework leans on the project proposal developed at Humboldt-Universität zu Berlin but was elaborated and adapted in line with input from the project partners. The result was shared with the funding agency in January 2017 in an Inception Report.



The objectives of the individual work packages are as follows:

- WP1: To study food habits, consumer behaviour and to analyse UA value chains in the vulnerable urban areas of Maputo and townships of Cape Town. Based on the results, value-adding options following improvement and diversification of the UA system are explored;
- WP2: To investigate the opportunities and challenges of horticultural and livestock production, processing and marketing in Maputo and Cape Town;
- WP3: To extend the current agricultural research and education network of the partner universities and to include the topic of urban agriculture into their curricula;
- WP4: Producers, merchants, consumers, policy-makers, scientists and practitioners are well aware of the significance of UA and good practices. The stakeholders are familiar with the various information systems and dissemination channels, and dispose of training material and curricula to promote UA.

Each work package drew up research questions and/or hypotheses to guide their approach and presented them for discussion in a two-week workshop in Maputo at the onset of the project in 2016. A key hypothesis was: the specific environment created by the urban context makes urban agriculture essentially different from other forms of agriculture (see Annex 2 and Annex 3 for detailed research questions and hypotheses and assumptions).

## 1.2 Underlying concepts, theories and definitions

In accordance with the multi-dimensionality of urban agriculture (Tornaghi, 2014), the researchers considered relevant concepts and theories to guide their specific research approaches. These

are briefly defined in this chapter; some are elaborated in greater detail in the chapters mentioned.

### **Food and nutrition security**

Food security exists when at all times people have physical, social and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. The four pillars of food security are availability, access, utilisation and stability. The nutritional dimension is integral to the concept of food security (Committee on World Food Security, 2017a).

### **Food system**

A food system combines the elements (e.g., environment, people, inputs, processes, infrastructure, institutions) and activities associated with the production, processing, distribution, preparation and consumption of food, and the outputs of these activities, including socio-economic and environmental outcomes (Committee on World Food Security, 2017b).

Ericksen (2008, p.234) describes a food system as “a set of activities ranging from production through to consumption [...] a well-functioning urban food system can be regarded as one that ensures a high level of food security to residents, while simultaneously contributing to sustainable social and economic development”.

### **Urban agriculture**

According to Mougeot (2001), urban agriculture is plant cultivation and animal husbandry in various forms in an array of production systems in the urban and peri-urban areas. Van Veenhuizen (2006) adds that urban agriculture complements rural agriculture and increases the efficiency of national food systems (see also Chapter 2).

### **Sustainable urban development/SDG Goal 11: Sustainable cities and communities**

“More than half of us live in cities. By 2050, two-thirds of all humanity - 6.5 billion people - will be urban. Sustainable development cannot be achieved without significantly transforming the way we build and manage our urban spaces. The rapid growth of cities - a result of rising populations and increasing migration - has led to a boom in mega-cities, especially in the developing world, and slums are becoming a more significant feature of urban life. Making cities sustainable means creating career and business opportunities, safe and affordable housing, and building resilient societies and economies. It involves investment in public transport, creating green public spaces, and improving urban planning and management in participatory and inclusive ways (UNDP, 2019; SDG 11).”

### **Food and eating habits**

Food habits are defined as the way in which producers and households acquire and use food, the frequency of food consumption, and the dietary composition that determines the pattern of food consumption. Eating habits refer to the durable disposition acquired by frequent repetition of an act, use or custom (Abreu et al., 2001). Eating habits “depend, on the one hand, on the possibility



of accessing food: production and consumption depend on the position individuals and groups occupy in the productive process. On the other hand, they depend on cultural contexts precisely because feeding is a socio-cultural phenomenon. In other words, eating habits have symbolic and cognitive contents relative to the perception of the human organism and the relationship between the sensations and substances ingested" (Freitas et al., 2008, p. 25).

### **Malnutrition**

Malnutrition includes undernutrition (wasting, stunting, underweight), inadequate vitamins or minerals, overweight, obesity, and resulting diet-related non-communicable diseases. It refers to deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients. The term malnutrition addresses 3 broad groups of conditions:

- Undernutrition, which includes wasting (low weight-for-height), stunting (low height-for-age) and underweight (low weight-for-age);
- Micronutrient-related malnutrition, which includes micronutrient deficiencies (a lack of important vitamins and minerals) or micronutrient excess; and
- Overweight, obesity and diet-related noncommunicable diseases (such as heart disease, stroke, diabetes and some cancers) (WHO, 2019a).

### **Overweight and obesity**

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters ( $\text{kg}/\text{m}^2$ ).

The World Health Organisation (WHO) definition is:

- a BMI greater than or equal to 25 is overweight;
- a BMI greater than or equal to 30 is obesity.

Common non-communicable diseases associated with obesity include cardiovascular diseases (mainly heart disease and stroke), diabetes, hypertension, musculoskeletal disorders and some cancers (endometrial, breast, and colon). Overweight and obesity are linked to more deaths worldwide than underweight (WHO, 2019b).

### **Undernutrition**

Undernutrition is defined as the outcome of insufficient food intake and repeated infectious diseases. It includes being underweight for one's age, too short for one's age (stunted), dangerously thin for one's height (wasted) and deficient in vitamins and minerals (micronutrient malnutrition) (UNICEF, 2019).

## **Value chain approach**

VC development seeks to support market-driven economic development that is inclusive of the poor and other vulnerable social groups and provides them with better income opportunities.

It is important to adopt a holistic view along all VC segments of the actors and functions at micro, meso and macro levels, their linkages and power relations, the relevant financial and support services and framework conditions with the aim of identifying strengths, constraints and needs along the whole VCs. The next step determines adequate responses that will tackle these challenges and support VC development. The classic instrument used in this process is a value chain analysis (see Methodology) (adapted from GIZ, 2018).

## **Organisational structure**

Organisational structure can be seen as an established structure in which individuals interrelate on the basis of norms and regulations that specify their behaviour to achieve previously defined objectives at different levels. The structure of an organisation stipulates the allocation of tasks, the mode and scope of communication among its members and the formal mechanism of operation, coordination and control of the whole, all of which combines to form a structured whole aimed at precisely determined goals. It is a formal instrument of power sharing. The most significant symbol of this formal power-sharing instrument is the organisational chart (Dias, 2012).

The functional structure of the organisation describes the relationship between individuals and/or groups in positions that are distributed in a certain order to form a whole. Although formal organisational structures exist, they are marked by a constant process of change as a result of interaction or external influences. The connections between and within the parts of the whole are the social relations of the people concerned and find expression in their interaction and communication.

Two organisational substructures coexist: the formal and the informal. The formal structure can be defined as a set of functional norms, rules and standards that guide the behaviour of individuals defined by the members of the organisation to maintain cohesion and to unite and guide the performance of the members to achieve previously defined objectives. Organisational charts, manuals and statutes are some of the instruments applied. The informal structure, on the other hand, emerges when individual members of the organisation demand that their needs be met, and their interests considered. Here the members' spontaneous emotional behaviour generates informal communication (oral, rumours and codes known to members) accompanied by a hierarchy that does not result from distributed authority (Dias, 2012).

## **Good practice**

According to FAO (2014), a good practice is not only a practice that is good, but a practice that has been proven to work well and produce good results and is therefore recommended as a model. It is a successful experience, which has been tested and validated, in the broad sense, which has been repeated and deserves to be shared so that a greater number of people can adopt it. General criteria determining, whether a practice is a good practice are for example: being effective and successful; environmentally, economically and socially sustainable; gender sensitive; technically feasible; inherently participatory; replicable and adaptable etc.

The UFISAMO project identified good practices for several topics and work packages, i.e., good agricultural production practices, good dissemination practices and good practices for organisational structures. Since these depend on the context and topics involved, specific practice definitions and/or characteristics are described in the respective chapters. Good Agricultural Practices (GAPs) are briefly defined below, as they constitute an international concept. Good agricultural practices that concentrate on the urban context (urbanGAPs) are likewise introduced and can be understood as an innovative extension of the GAPs concept.

### **Good Agricultural Practices (GAPs)**

GAPs are guidelines composed of recommended sustainable agricultural cultivation principles and methods for production and post-production processes. They are applicable to all kinds of crops and a wide range of farming systems at different scales, and are suitable for conventional, environmentally friendly, organic, agro-ecological production (with and without certification).

GAPs usually follow the production cycle, starting from site selection and farm planning to harvesting and post-harvest handling, and ensure that crops are produced, packed, handled, and stored as safely as possible to minimise the risk of microbial food safety hazards and deliver good quality produce. Seen from this perspective, GAPs boost productivity by using inputs efficiently and preventing loss and waste, all of which serves to enhance market access through production of the required quantity and quality at the right time. The general aim is to produce sufficient, safe, healthy, diverse and nutritious food of good quality in an environmentally sustainable way (adapted from FAO COAG, 2003; FAO, 2010 and Ministry of Food and Agriculture Ghana, 2005).

The urbanGAPs drawn up in the UFISAMO project adapt Good Agricultural Practices to urban conditions and provide the knowledge and practice base for more agro-ecological methods (see Chapter 5.1.1).

### **Innovation and dissemination systems**

The UFISAMO project pursues a research approach that is practice oriented and aims at contributing to a safer, more diverse and competitive urban agricultural sector. Hence the key issues here are the creation of innovation and dissemination systems, and the design of dissemination instruments and communication activities specific to the target group.

“Agricultural innovation is the process whereby individuals or organisations bring new or existing products, processes or ways of organisation into use for the first time in a specific context in order to (...) contribute to food security and nutrition, economic development or sustainable natural resource management” (FAO, 2018, p. 5). According to FAO, agricultural innovations (or new knowledge) can be classified in three types:

- Technological innovation (i.e., implementation of a new product such as organic plant production);
- Organisational innovation (i.e., a new marketing method such as organising farmers to sell their product with a certification scheme based on the PGS system, organising women farmer groups). Also classified as a social innovation;

- Institutional innovation (i.e., a new policy to promote more sustainable urban agriculture or support smallholder access to bank loans) (Gevorgyan et al., 2018; gfras, 2018; OECD/EUROSTAT, 2005).

Innovation in this case often involves a combination of the above.

The Innovation System Approach (ISA) analyses the innovation process itself and the stakeholders involved with reference to their roles, networks and applied knowledge exchange mechanisms.

An Agricultural Innovation System (AIS) is an analytic framework to assess the drivers and barriers enabling farmers to adopt – or not to adopt – new techniques and to make recommendations specific to the target group, notably in terms of communication patterns and dissemination instruments. The AIS looks at the stakeholders involved in the innovation process and analyses knowledge exchange mechanisms and the steps towards innovation adoption.

There is a tendency in research on agricultural innovations to concentrate on the rural areas. In contrast, the UFISAMO project highlights the urban context. Thus, the urban Agricultural Innovation System (uAIS) takes account of specific urban settings such as:

- Better access to services (education, finance, extension service);
- Proximity to knowledge providers (university, extension service and other training providers);
- Better access to goods and inputs;
- Higher coverage of broadcasting media and internet;
- Proximity to the relevant actors, policy-makers and opportunities for exchange.

Dissemination plays a crucial role in the spreading of new practices in the field of agricultural innovation. Dissemination instruments and channels are diverse and offer practitioners a wide range of tools, e.g., extension services that target individual farmers or extension worker/specialist associations, the media, demonstration plots, training, written material as manuals, films and videos (Parchmann, 2015).

### **1.3 Methodological approach**

The following chapter presents an overview of the UFISAMO regional and thematic research focus, the research areas in Maputo and Cape Town, and the survey units and methods applied. It also describes the three data gathering phases – basic data collection, consolidation, and action research and implementation. The chapter concludes with remarks on research conditions during the project.

### 1.3.1 Research focus

Urban agriculture in Maputo, Mozambique (focus on vegetables and chicken), and Cape Town, South Africa (focus on vegetables), was selected for the following reasons:

- The UFISAMO project was developed in response to a call for “Nutrition – Diversified Agriculture for a balanced nutrition in Sub-Saharan Africa” by the German Federal Ministry of Food and Agriculture (BMEL) represented by the Federal Office for Agriculture and Food (BLE), and thus focuses on Sub-Saharan Africa;
- With its multiple dimensions and functions, urban agriculture (UA) has the potential to contribute to the process of sustainable urban development. UA plays a crucial role in both cities: Maputo and Cape Town;
  - The agricultural sector in Maputo is a major employer and an integral part of the city’s gross income. More importantly, it supplies numerous households with leafy vegetables, for the most part those in vulnerable communities;
  - UA in Cape Town plays a vital multi-functional role, ranging from food provision to building communities and creating spaces for environmental education. The city has a diverse urban agriculture scene with a variety of actors and production systems. It covers home and community/food gardens with a wide spectrum of horticultural products for self-consumption and to a lesser degree for local markets and extends to large-scale commercial market production;
- Vegetable production is typical for the urban context and thus became focus of the project. Urban chicken production as representative of urban livestock farming was chosen for its significant role in Maputo (see extra report on chicken production in Maputo);
- Essential to the selection of Maputo and Cape Town was the difference rather than the similarity of each city in terms of urban agriculture. The two cities represent very different types of UA and are embedded in different historical contexts. They also differ greatly with reference to the level of urbanisation, framework conditions and actors involved, and not least to the impact of UA observed in each city (see Chapters 3 and 4). This makes them perfect examples when it comes to a critical analysis with regard to the potential and constraints of UA;
- Since 2007, there has been intense cooperation between the SLE/HU and the UEM in Maputo, which saw the joint design and implementation of a master programme and a Ph.D. programme on rural sociology and development management. This fruitful cooperation and the ensuing structures served as a hub for the integration of two Ph.D. students in the academic research of UFISAMO.

UFISAMO research aims for three outcomes (see Figure 1), which, taken together, should impact positively on the food security and income generation of poorer households and small-scale producers. The project therefore selected disfavoured zones in both cities where urban agriculture is practised. The research understands disfavoured urban areas as city areas inhabited by people with below-average monthly incomes, difficult access to formal employment and social services

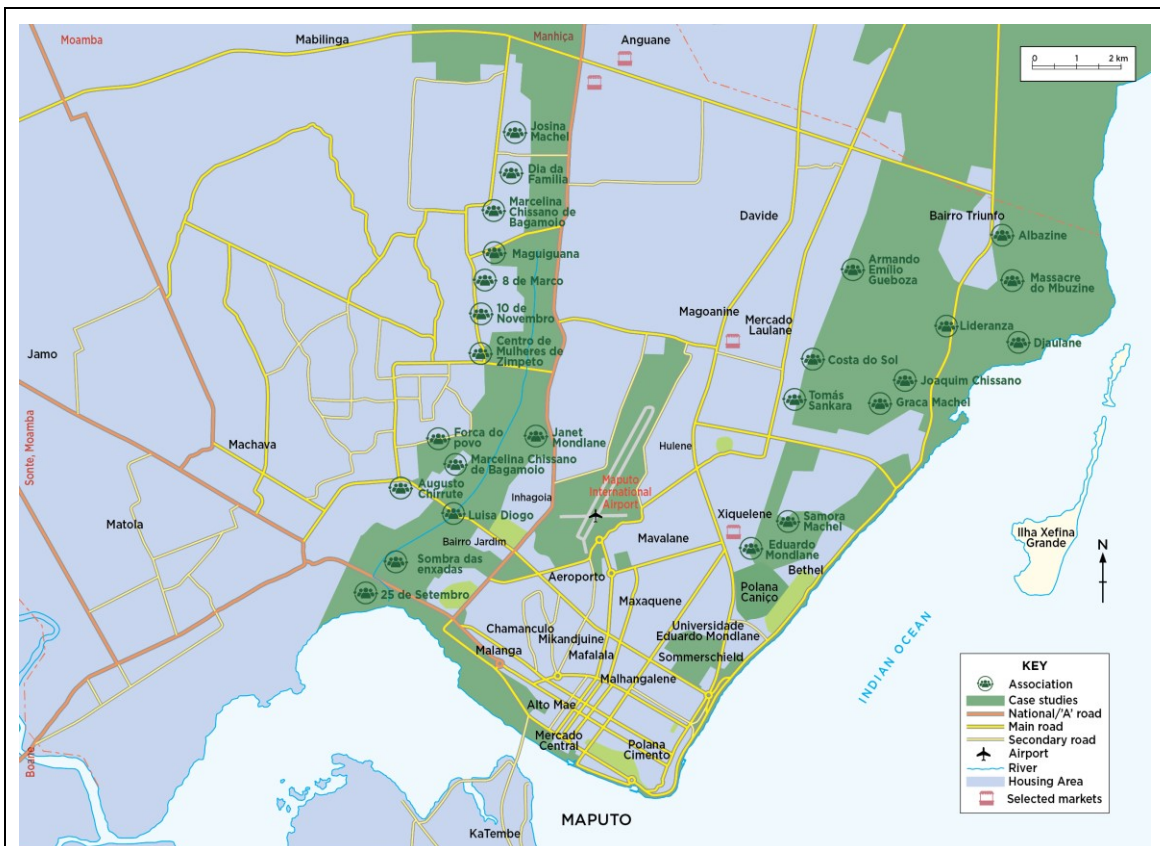
(education, health), and low levels of political representation. Due to the specific characteristics in the two cities in terms of frame conditions, urban agricultural production (e.g., livestock), organisational structures, the availability of researchers and existing scientific evidence, the project emphasised different topics/research areas in Maputo and in Cape Town.

### 1.3.2 Description of research areas

#### Maputo

Maputo is the capital of Mozambique, with approximately 1.1 million inhabitants and a total area of 300 km<sup>2</sup> (INE, 2011). One particularity of Maputo are the *zonas verdes* (green zones): extensive green zones in the urban and peri-urban area. Over 10 000 farmers currently work on small parcels of land, producing for both self-consumption and income generation.

Agricultural production is mainly concentrated in four of the seven municipal districts, namely, KaTembe, KaNyaka, KaMubukwana and KaMavota (Barghusen et al., 2016; DASACM, 2017). The last two districts were chosen for the UFISAMO project research because most urban agricultural activities take place in the green zones there. The peninsula KaTembe and the island of KaNyaka are characterised by rural structures and a small number of households involved in farming. They play a minor role in the wider food system of Maputo. More detailed information on the Maputo results can be found in Chapter 3.



**Figure 3: Research areas in Maputo**

Source: Paganini

## Cape Town

Cape Town is the second-largest city and the seat of parliament in South Africa, with an area of approx. 2 500 km<sup>2</sup> and over 4.17 million inhabitants (2017 estimates - CoCT, 2018<sup>5</sup>).

The main zone for commercial urban agricultural production is the Philippi Horticultural Area (PHA), a core horticultural zone measuring 1,100 ha and marked by rural features in an urban setting. Approximately half of the vegetables consumed in Cape Town are produced here by no more than 36 commercial farms (Harrison, 2018).

The primary focus of the UFISAMO project, however, was on the Cape Flats, a sandy area east of the city centre with a high proportion of informal settlements and the largest numbers of vulnerable people in the Cape Town Metropolitan Area.

From the 26 suburbs of the Cape Flats, Khayelitsha (the largest and fastest growing township in South Africa with 391 741 inhabitants according to the 2011 census (CoCT, 2013) – a figure estimated to be far higher in 2018 (over 1 million according to some) due to in-migration, natural population growth and informal structures not being accounted for in the census), Nyanga, Gugulethu and Mitchells Plain were selected for the research. Additional data for in-depth surveys was also collected in other suburbs (Mfuleni and Ottery). More detailed information on Cape Town can be found in Chapter 4.



<sup>5</sup> The actual figure may be far higher, as informal settlements and informal structures within formal settlements are not systematically counted in the official figures.

### 1.3.3 Survey units

The UFISAMO project researchers gathered data on the following groups, entities, issues and dynamics ('survey units', e.g., individuals, groups, organisations but also entities such as extension services, agricultural policies):

- Individual small-scale producers active in urban agricultural (for self- consumption and income generation);
- Associations, cooperatives and producer groups with market-oriented production but low-income level;
- Production sites and required inputs (water, seeds, fertiliser);
- Marketing actors, markets and marketing channels;
- Processing units;
- Consumers and consumption habits;
- Livestock producers;
- Extension services;
- UA-related institutions (NGOs, consulting companies, donor agencies, municipalities);
- UA-related policies;
- Information and dissemination systems;
- Demonstration plots.

### 1.3.4 Overview of applied methods

In general, the researchers applied a mix of methods in order to cross-check and validate the results, which included:

- Literature review to boost existing knowledge and avoid research duplication;
- Structured interviews (baseline, in-depth) in the research regions with urban farmers and livestock producers;
- Semi-structured interviews with:
  - Farmer associations and cooperatives, input suppliers, traders and middlemen, as well as with consumers;
  - Urban planners and other decision-makers and the relevant operators in the administration and social services (e.g., health workers) at various levels of administration; and
  - Researchers, NGO staff, extension workers, retailers and consultants;



- Case studies to highlight specific issues, e.g., backyard gardens or demonstration plots in Maputo;
- Observation and participation (trainings, in-field activities, food buying, consumption), including soil, water and plant sampling and testing;
- Development of participatory research approach to assess food system questions through the farmer lens (establishment of a research farmer group in Cape Town);
- Participatory development of guidelines and training materials, and the testing of their appropriateness and their impact (research farmer approach);
- Workshops with farmers to discuss and consolidate research findings;
- Design of a monitoring system for further adaptation when the project ends;
- Development of or contribution to demonstration/experimental plot in Cape Town;
- Multi-actor workshops (e.g., stakeholder dialogue, scenario workshops, GAPs development).

### 1.3.5 Phases and content of data collection

A research concept developed for each work package defined the research objectives and intended results systematically and contained hypotheses and guiding questions, the research content and a suitable set of methods. Further details of these approaches can be found in the UFISAMO inception report (UFISAMO-Project, 2017).

The methodological concept of the project sees three phases: basic data collection, in-depth data collection, and action research and implementation.

The surveys and studies are described in the following sub-chapters. To facilitate attributions from interview statements or quotations (in Chapters 3 and 4) to the various data collection components, the main surveys received the following identification codes.

Code	Name of survey	Period	Sample size = n <sup>7</sup>
16_IS_MP	Innovation systems Maputo	October - December 2016	45
17_IS_MP	Innovation systems Maputo	March 2017	3
17_AS_MP	Associations Maputo	January – March 2017	26
17_B_MP	Baseline Maputo	March – November 2017	369
17_B_CT	Baseline Cape Town	May – August 2017	112
17_M_CT	Market Gardens Cape Town	October – November 2017	57

<sup>6</sup> All other codes used refer to interviews and group discussions by Ph.D. students for their thesis and can be obtained on request.

<sup>7</sup> In the following chapters, the sample size shown differs in part because only valid answers were evaluated. The real sample size is noted in each of these cases.

17_FH_CT	Food habits Cape Town	October 2017 – April 2018	60
18_O_CT	Organisations Mitchells Plain, Cape Town	April - October 2018	60
18_F_CT	Fence Cape Town (Focus Interview)	April – May 2018	87
18_FH_MP	Food habits Maputo (households)	April – July 2018	30
18_FG_MP	Focus groups Maputo	April – July 2018	6
18_CDR_MP	Demonstration Plots Maputo	August – October 2018	38
18_AE_MP	Agroecology Maputo	May 2018	23
Source: UFISAMO			

Further codes used in the following chapters on the findings refer to interviews, multi-actor workshops, meetings and field observation by the researchers in the course of the project.

For reasons of clarity, almost all (percentage) figures in the report were rounded, both those from UFISAMO surveys and those from external sources.

### 1.3.5.1 Collection of basic data

In a first project phase, the UFISAMO research focused on the collection of basic data in both cities. Apart from a review and analysis of the literature, this included value chain analyses and baseline studies on production systems of urban farmers in Maputo and Cape Town, all of which provided data on socio-demographic and socio-economic facts, as well as data related to income, food habits, media use and organisation.

#### Value chain analysis in Maputo and Cape Town

In November and December 2016, value chain analyses were carried out in Maputo (Schmidt, 2017) and in Cape Town (Dolch, 2017). A value chain analysis is a situation analysis of the specific value chain at stake, comprising a structural analysis and the different dimensions of sustainable development – economic growth, environmental sustainability and social inclusion. Conventional elements of VC analysis include VC mapping, market analysis and the assessment of chain governance (adapted from GIZ, 2018).

The aim of the UFISAMO studies was to obtain a first overview of the general situation of urban agriculture in both cities focusing on vegetable and broiler value chains (only in Maputo) – and in both cases on small-scale producers. Emphasis was therefore given to the structural part of the value chain analysis. Key aspects were the identification of the relevant actors involved, their functions and roles, as well as the framework conditions concerned. Economical, ecological and social aspects of the value chain analysis were integrated where relevant and where data was available at this early stage of the research.

In contrast to the conventional value chain analysis, several vegetable commodities were considered as one entity. This was justified by similar inputs, production methods, distribution and marketing channels of most urban produced vegetables.

## Baseline studies in Maputo and Cape Town

The value chain analysis documented the key potentials and constraints for UA in both cities. The first fact-finding missions of WP researchers led to the research area definition for baseline studies subsequently carried out in 2017:

- Study on producer associations in Maputo (January to March 2017). Data collection in all 26 associations in KaMubukwana and KaMavota; semi-structured interviews with association presidents on the association's history, membership structure, activities, land use, marketing, functioning and challenges (Code: 17\_AS\_MP);
- Based on the results of the association study, associations were selected for further research on their members (producers) according to specific criteria, i.e., primarily access and availability to take part in the survey and secondarily, number of members, location, length of existence, gender composition, NGO support. A household survey with a total of 369 producers in 19 associations (28% of the farmers interviewed in KaMabukwana and 72% in KaMavota were women) was carried out in the selected associations between April and June 2017. The survey included quantitative data on demography, income, household equipment, production and marketing, and division of labour, and qualitative data on their perception of the association and the benefits, problems and challenges of urban (organic) agriculture. The survey was conducted by the four UFISAMO Ph.D. students and a SETSAN consultancy, data was collected by 14 students from different faculties of UEM (Code: 17\_B\_MP);
- Survey on home and food garden farmers in Cape Town (May 2017), a total of 112 farmers, conducted by UWC researchers. The questionnaire was adapted to the local Cape Town context by German Ph.D. students from the UFISAMO project and a UWC senior researcher. Data was collected by UWC students in equal numbers from home growers in Mitchells Plain and Khayelitsha, market farmers trained by Abalimi, Soil for Life and the extension service, and farmers associated with the 100 homes project (Code: 17\_B\_CT).

The base line surveys included a set of general data vital to all work packages. In addition, interviews with key informants and additional focused questionnaires were applied, notably for WP 2 and 4.

Baseline data was anonymised, processed and analysed with the SPSS programme.

### 1.3.5.2 Consolidation phase

In subsequent steps, researchers verified, endorsed and substantiated the information gathered during the basic data collection. In addition, specific topics were selected and researched by students and consultants in both cities.

#### Survey on food habits in Maputo

An indicator-based survey on food habits was carried out from April to July 2018 with 30 households in Maputo to measure the level of food insecurity in the previous four weeks (HFIAS - Household Food Insecurity Access Scale) and analyse household coping strategies in the wake of climatic, economic, social and cultural shocks. The study also focused on the food consumption

of urban agricultural producers and their households, the products they consumed, the number of meals per day, the composition of the meals, and how much of their income was spent on food. The contribution of UA to income generation and the access to food was also examined (Code: 18\_FH\_MP).

### **Study on home gardeners in Maputo**

A study on 'Backyard horticulture in Maputo' (Flores, 2018) focused its empirical research on the districts of KaMubukwana and KaMavota. It described the characteristics of the backyard horticultural landscape (home gardens) and explored aspects such as production, purpose, economic impact, selling mechanisms, and the challenges entailed. The aim of the study was to understand the dynamics of home gardening, its contribution to urban agriculture in the city of Maputo and the impact on the families concerned. In May and June 2018, a context analysis, literature review and nine key informant interviews were conducted, followed by field visits and semi-structured interviews with 34 home gardeners. Of these, 14 were selected as case studies due to their diversity and specific features. Six different types of home production were identified across the 14 case studies in an effort to classify home gardens in Maputo despite their diversity.

### **Focus group discussions in Maputo on the challenges of UA**

From April to July 2018, six focus group discussions with men and women of different ages were held in KaMavota and KaMubukwana on the organisational structure and functioning of associations, production and marketing challenges, consumption habits, and the producers' perception of the future of UA (Code: 18\_FG\_MP).

### **In-depth surveys on market gardeners in Cape Town**

An in-depth survey focusing on good production practices and the changes and challenges in cultivation and marketing was conducted with 57 market gardeners in Cape Town for the purpose of quantitative analysis and qualitative content analysis (Code: 17\_M\_CT).

### **Local market surveys 'Over the fence' in Cape Town**

In the surrounding neighbourhood of five food/market gardens in Khayelitsha, Gugulethu, Mitchells Plain and Ottery, 20 dwellers were interviewed about their consumption habits, their perception of food and their food sources. The aim was to understand the notion of urban gardens as an 'over the fence' local market (Code: 18\_F\_CT).

### **Semi-structured interviews with key informants**

Semi-structured interviews were carried out with key informants, including agricultural extensionists, researchers, consultants, influencers, politicians, NGO staff, union presidents, retailers, teachers, artists and religious leaders.

### **Ph.D., master and bachelor theses**

The UFISAMO project and the research partner cooperation created a set of Ph.D., master and bachelor theses and carried out other student research projects, all of which contributed to in-

depth data collection and analysis. Refer to Annex 5 for a complete list of products and documents.

- Four Ph.D. theses on 'Sustainable urban food systems', 'Innovation and knowledge exchange systems for sustainability', 'Food and consumption habits of urban producers', and 'Organisational structures in urban agriculture' were launched in the UFISAMO project and will be concluded after the end of the project;
- A total of eight master theses were facilitated within the scope of the project: three in Cape Town on the organisation of urban agriculture in Mitchells Plain, consumer perspectives and preferences of local food systems, urban agriculture as a sustainable livelihood strategy; as well as five in Maputo on soil salinity and its effects on the peri-urban vegetable production system, on welfare of broiler chickens, on environmental influence of keeping broiler chicken, on microbiological quality of broiler chicken carcasses and of chicken meat;
- Two bachelor theses covered the analysis and evaluation of composting methods in Cape Town and good urban agricultural practices in the global South;
- Student study projects were carried out in Maputo on the status quo of urban agriculture, demonstration plots and knowledge transfer, the importance and challenges of urban agricultural cooperatives, and the potential and impact of micro gardens on food security in Berlin Neukölln.

### **1.3.5.3 Action research and implementation**

The third project phase was characterised by action research for the implementation of measures /activities to boost urban agriculture in Maputo and Cape Town.

#### **Visions and recommendations for the future of urban agriculture in Maputo and Cape Town**

A study entitled 'Perspectives of urban agriculture in Maputo and Cape Town – dialogue, networks and future scenarios' was conducted from June to November 2017 by a team of five SLE postgraduates and a team leader (Halder et al., 2018). The study saw the initiation of a participatory multi-stakeholder dialogue about the future of urban agriculture in Maputo and Cape Town.

One of the main objectives of the study was to strengthen dialogue between the key actors in Maputo and Cape Town as a means of fostering their cooperation, creating a common understanding of their individual aims and interests, and outlining a joint vision for urban agriculture. Another important goal was to draw up recommendations for strategic interventions that would support the integration of urban agriculture into a sustainable development process in the cities of Cape Town and Maputo.

#### **Research farmer approach in Cape Town**

Participatory in-depth research with a group of 20 farmers (urban research farmer group) took place in Cape Town from October 2017 to June 2019, accompanied by 16 focus group discussions, more than 90 field and home visits, farming diaries, photo diaries, participatory mapping, excursions and biographic interviews. The farmers were between 25 and 60 years old, had different

cultural backgrounds and lived in different neighbourhoods and townships of the Cape Flats. The research farmer group was involved in the development, testing and implementation of urbanGAPs, research on innovation, qualitative research on food security from the farmers' perspective, and an assessment of their perception of the urban food system. The research farmer group was tested as a knowledge transfer tool within the context of UFISAMO research (Paganini et al., 2018).

### **Good Agricultural Practice workshops in Cape Town and Maputo and the development and testing of urbanGAPs**

The multi-actor workshop conducted in Cape Town (March 2018) and attended by farmers, researchers, experts from the department of agriculture and certifying agencies identified good agricultural practices in the urban context. The results were converted into guidelines for Good Agricultural Practices for vegetable production, i.e., urbanGAPs (Kühn & Paganini, 2018), and a farmer manual (Paganini & Kühn, 2018). Both the guidelines and the manual cover topics associated with good agricultural practices in the urban context with the explicit aim of enhancing the quality and volume of urban produce and ensuring continuous and demand-oriented production.

A second workshop on urbanGAPs was conducted in Maputo (July 2018) with over 50 participants including the ABIODES NGO, the municipality, Ministry of Agriculture, associations and researchers. The Cape Town workshop results were presented and discussed, and similarities and differences to Maputo identified. An urbanGAPs manual (Paganini et al., 2019) for vegetable farmers was also designed. The urbanGAPs guidelines for Maputo have been adapted to the local context in cooperation with the municipality and the partner organisation ABIODES.

The first implementation of urbanGAPs by research farmers in Cape Town was monitored and evaluated by a South African consultant (Khan, 2018) with the intention of encouraging farmers to assess their own activities with the urbanGAPs checklist and to identify and record the benefits of using urbanGAPs, the challenges involved and lessons learnt. This procedure served to modify and finalise the guideline document.

### **Analysis of the urban Agricultural Innovation System (uAIS)**

Analysing the Agricultural Innovation System in the urban context (uAIS) meant exploring the stakeholders, dissemination instruments and communication patterns involved in an effort to identify successful methods of disseminating more sustainable production techniques. For this purpose, the Innovation System Approach (ISA) was applied and saw analysis of the stakeholders with regard to the innovation process itself, their roles, networks and knowledge exchange mechanisms. Research was based on qualitative and quantitative data obtained from urban farmers and key stakeholders involved in urban agriculture and began with a situation analysis in both cities, followed by semi-structured interviews with key informants in 2016 and 2017 (Codes: 16\_IS\_MP and 17\_IS\_MP). Analysis of the innovation and dissemination system made it possible to identify the drivers and barriers of successful dissemination and ultimately good practices.

### **Survey on association demonstration plots in Maputo**

For the purpose of gaining an in-depth view of selected good practices for dissemination, a survey on demonstration plots from 10 associations (in total 38 interviews with farmers, extension-

ists and NGO representatives) in Maputo was carried out between August and October 2018 (Code: 18\_CDR\_MP).

### 1.3.6 Research conditions

Despite the UFISAMO project achievements and the constructive support of the partners involved, various circumstances frustrated progress and led to several adjustments.

The reasons are manifold and vary from the occasionally poor quality of the available data, external frame conditions (e.g., security situation and drought in Cape Town or floods and avian influenza in Maputo), and internal project snags such as personnel and partner changes. It should be remarked that circumstances in the field are unpredictable at times and an initial delay can affect subsequent activities:

- A survey of the urban farmer associations in Maputo was to culminate in a systematic sample of households for the baseline survey. Numerous constraints arose in the course of collecting data, however, delaying the research process, e.g., registered associations were non-existent and membership lists in unregistered associations were incomplete;
- In retrospective, the time calculated to finalise and analyse the association survey was too short, as was the time to discuss the questionnaire for the baseline survey;
- The research on broiler production in Maputo was delayed as a result of avian influenza in June 2017 in Southern Africa (Zimbabwe, South Africa, Kingdom of Eswatini/Swaziland). Day-old chicks were not supplied to Mozambique and the production cycle was interrupted, putting a temporary stop to field research on animal welfare. Other activities were also affected: an inventory of the laboratory capacity, administrative difficulties and a delay in the ordering process (e.g., availability, quotations without transport/import taxes), the sampling itself, and the master students' training and proposal writing;
- A student strike in South Africa at the end of 2016 hindered the work of professors and students at UWC, causing a delay in project activities scheduled for this period;
- Security issues had to be considered during the research in the townships in Cape Town during the whole project phase;
- The severe drought that affected Cape Town, Western Cape provinces and parts of the Eastern Cape in the summer of 2017 and 2018 forced urban agricultural actors to reassess their approach and emphasise water-wise production or in many cases even cease production;
- A demonstration plot was set up in Cape Town as planned, but encountered several problems, amongst others the drought and the fact that the school, on which it had been established, reclaimed the land for extending its class rooms. Lack of capacities and partners in Maputo made it impossible to establish a demonstration plot. Instead, research was carried out on association demonstration plots;

- Staff power in Maputo differs from that of Cape Town due to the project design of UFISAMO. In Maputo, four research fellows and four master students were involved in the research. In Cape Town, only two of the research fellows and two master students from UWC took part;
- Administrative and personnel difficulties in the partner organisations in Maputo and Cape Town led to stumbling blocks in the project flow:
  - Management issues of the project partner SETSAN at the onset of the research hampered the support of the SETSAN employee assigned to the project. In search of a new implementing partner for project findings, the ABIODES NGO active in natural resource management and agro-ecological agriculture was approached in May 2018;
  - Abalimi Bezekhaya, the NGO partner organisation in Cape Town, also had to overcome severe management crisis. Due to a near stand-still of activities caused by funding issues, Abalimi struggled to fulfil its role as implementing and support partner within the scope of UFISAMO. The marketing sub-structure of Abalimi – Harvest of Hope – was forced to cease its activities, which in turn led to a collapse of the box scheme to sell township vegetables to the more affluent neighbourhoods of Cape Town. As a consequence, producers were unable to sell their produce and hundreds of kg of fresh vegetables were left to rot in the fields. Abalimi is now back on track with new personnel to enhance their internal skills and increase their portfolio;
- The project leadership and coordination in Berlin also experienced personnel changes. This notwithstanding, the project outline and remaining project partners did much to ensure continuity of the research approach.







Figure 5: Aerial view of township plus neighbouring garden and street vending in Cape Town

Source: Paganini 2019

## 2 Urban agriculture, urbanisation and the link to food systems

*Nicole Paganini*

The latest food crisis (2007/08) put food security back onto the political agenda as food prices increased significantly within just a few weeks and showed the world how vulnerable food systems are, particularly in cities. The international community made a commitment to achieving the Sustainable Development Goals (SDG) by 2030. 'Zero Hunger' (SDG 2) and 'Sustainable Cities' (SDG 11) are key goals towards mitigating the impacts of increasing urban food insecurity (Paganini et al., 2018).

Despite all known challenges of food insecurity and urbanisation in Southern Africa, food is not a central pillar of the urban agenda. However, as Battersby argues, "an intervention (and adaptation) of food systems can have a significant impact on urban poverty" (Battersby & Haysom, 2016).

Urban food insecurity is influenced by a wide spectrum of actors, dynamics, policy regulations and power relations, and further aggravated by the lack of strategies for climate change adaptation, as well as by historical and spatial challenges.

The following introductory chapters take a brief look at urban agriculture and its multifunctionality, provide an overview of the urban food systems approach and introduce the cities of Cape Town and Maputo with an urban development focus.

### 2.1 Urban agriculture

*Severin Halder<sup>8</sup>*

Organic farms and yard sales in the midst of apartment blocks in Havana, rooftop gardens with beehives on the skyscrapers of New York City, community gardens with compost heaps in a former airport space in the middle of Berlin, school gardens and an agro-ecology centre in the slum barrios of Rosario, self-harvest gardens with medicinal herbs on the top of communal markets in Medellin, guerrilla gardening with seed bombs in the streets of London, agroforestry and backyard gardens in the Favelas of Rio de Janeiro, urban fields and chickens in the middle of the townships of Cape Town, extended small-scale agriculture in the green zones of Maputo.

There are countless ways of cultivating cities. Studies estimate that over 800 million people practise urban agriculture worldwide (Hoorweg & Munro-Faure, 2008). But how can such a widespread and colourful phenomenon be framed? It seems that "[t]here are many different interpretations for what they [the words "urban agriculture"] actually mean. This openness alongside

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<sup>8</sup> Based on Halder et al., 2018

specific interpretations is healthy and inclusive, opening ways to speculate” (Viljoen et.al., 2005 in Bellows & Nasr, 2010, p. 20).

One way of grasping urban agriculture is to consider it an umbrella term comprised of different types of agriculture and horticulture within (intra-urban) or on the fringe (peri-urban) of the city, where a diversity of food and non-food products is grown, processed and distributed. It (re)uses largely human resources and products in order to provide services to the local environment with a multi-functional ecological, socio-cultural, sanitary and economic impact (Halder, 2018; Mougeot, 2000).

The RUAF Foundation states that urban agriculture’s most distinguishing feature, which also differentiates it from rural agriculture, is its role as an integral part of the urban economic and ecological system. This is one reason why urban agriculture generally complements rather than competes with rural agriculture (Mougeot, 2000).

Urban agriculture is as old as urban development itself. Cities around the globe have an agricultural background (Smit et al., 2001) and their historical growth is interlinked with food growing at or close to the urban edge. So, urban agriculture reminds us of the fact that cities have always been an urban-rural hybrid. In the course of the industrial revolution in Europe, the urban poor had to partly rely on food production in allotment gardens to make ends meet, serving as a substitute for non-existent social security systems. The importance of urban agriculture tends to increase in times of crisis when supply chains are disrupted: allotment gardens and even parks in England and Germany served as a crucial subsistence supply for urban citizens during and after World War I & II (Crouch & Ward, 1988). And during the economic crisis of the 1990s, Cuba’s *organipónicos* gradually became the most productive and most popular form of urban agriculture in modern times (Altieri et al., 1999).

But urban agriculture is not just a response to crisis: the proximity of producers and consumers can minimise transport costs and the possible losses incurred. Particularly products sensitive to handling and those that need to be kept fresh and cool have a comparative advantage for urban producers, notably in regions with inadequate transport, storage, cool chains and distribution networks.

Besides the economic potential and its significance for resilience, urban agriculture can serve multiple functions in the modern urban setting. In Africa and around the globe, urban agriculture has gained wide currency with city authorities, citizens, academics and the media, reflecting the growing importance of this multi-faceted phenomenon as one component in the quest for sustainable and resilient cities.

### **The multi-functionality of urban agriculture**

In Belo Horizonte urban agriculture produces 200 000 meals a day for public school and popular canteens (FAO, 2014). But besides its importance for greater access to locally produced fresh food, urban agriculture should always be approached from a multi-functional perspective, as it encompasses a variety of dimensions, including social, ecological and economic aspects (Halder, 2018).

- From a **social** perspective, urban agriculture can contribute to coping with some of the current social issues in cities (e.g., marginalisation of migrants, lack of social cohesion and violence). Human interaction with the environment opens spaces for the interaction and cooperation of humans beyond the limits of language, class, race, gender or cultural imprint (Halder, 2018). Community gardens can help to raise awareness of social problems in multi-ethnic societies and create the opportunity for intercultural dialogue (Müller, 2002). Urban gardens in Berlin and Medellín have improved the quality of urban life by stimulating social interaction in the neighbourhood, which can in turn lead to self-organisation and community building (Halder, 2018).

Urban green spaces also offer opportunities for recreation and education by touching on issues such as nutrition, environment and the right to the city. Referring to this last aspect, a number of (community) gardens have been established and maintained by schools and universities, using these spaces to raise awareness among the urban population about the importance of re-connecting with the source of their diets, showing students and other citizens the value of nature and the responsibility of taking care of a common good. According to Avila & Veenhuizen (2002), the benefits that spring from these efforts, albeit non-monetary, are of primary importance – particularly to the poor.

Agricultural spaces within the city are often used as a platform to discuss a wide range of issues related, for example, to urban development, agriculture, environment and health. So, the discussion and educational processes within and around these places form the core of an interwoven network of functionalities and are guided by a 'learning by digging' attitude (Halder, 2018);

- From an **ecological** point of view, urban agriculture contributes to closing the urban nutrient cycle. It often uses materials already in place and engages in waste (nutrient) recycling in the process of cultivation and of reconstituting urban soil for cultivation. Moreover, since urban landscapes tend to be greatly fragmented and land-use competition is high, green spaces in the city are a 'last resort' for numerous animal and plant species. This means that vegetative land promotes the biodiversity of cities (Lin et al., 2015).

Urban agricultural spaces and their individual management forms make it possible to recognise high levels of biodiversity and environmental benefits, including crop pollination, heat island prevention, enhanced air quality, less soil sealing, better water regulation and less transport of goods (Lin et al., 2015; Van Veenhuizen, 2006; Viljoen et al., 2005). Combined with other green urban spaces, urban agricultural land can therefore become part of an urban climate mitigation and adaptation strategy (Demuzere et al., 2014);

- From an **economic** position, urban agriculture can help to reduce living costs with subsistence production (Golden, 2013) by offsetting produce expenditures (Hagey et al., 2012). As part of a local and subsistence-oriented economy, urban agriculture can even "subvert the capitalist logic of the industrial agri-food system [...] [by re-embedding] the agri-food system within the social relations (between producers and consumers)" (McClintock, 2014, p. 152). Although research shows that urban farmers habitually struggle to access productive inputs such as land and water in the city (Hagey et al., 2012), the diverse ways in which urban agriculture is practised gives residents the opportunity to cultivate "in-

between” (Spada & Bigiotti, 2017), vertical and very small areas for food and non-food products (e.g., cosmetic and cleaning products).

Furthermore, where conditions allow, urban agriculture can also take part in processing and marketing activities (De Zeeuw et al., 2011), as well as input (e.g., seeds and compost) and service provision (e.g., veterinary services). This would contribute to job creation and income generation (Smit et al., 2001), affecting not only those engaged in production but also along the entire value chain.

Apart from these positive multi-functional aspects of urban agriculture, awareness should be raised to ensure that impacts are questioned, especially when it comes to economic benefits for households with the highest level of food insecurity:

- Numerous case studies show evidence of limited positive effects on the income of food-insecure households. Specific framework conditions may promote the desired effects, but often enough the economic impacts are underwhelming (Haysom & Battersby, 2016);
- Urban products are frequently outcompeted by similar rural or imported products: as a rule, the small-scale agricultural structures of the urban setting have difficulty accessing markets (reliability of quantity and quality) and are disadvantaged compared to rural procedures, which benefit from product scale effects, as long as these can overcome transport issues and meet consumer demands;
- Research has shown that the contribution of urban agriculture to food security may not be as significant as sometimes believed (White & Hamm, 2017; Crush & Frayne, 2011). The proportion of urban products in household diets should not be overestimated, notably due to the limited amount produced in urban and peri-urban spaces. There may, however, be a positive impact on the quality and diversity of diets in households that benefit from urban products;
- Over-reliance on urban agriculture as a measure to improve self-sufficiency as a substitute for social security systems is not risk free, particularly when it targets the most vulnerable in the urban population, such as women and female-headed households. It carries the risk of relieving officials and governments of their duty to respond to the needs of those who are marginalised. It also perpetuates existing inequalities by keeping women in low-paid activities in the informal economy (White & Hamm, 2017; Hovorka, 2006);
- Whether urban agriculture is the best possible use of resources is arguable – urban spaces are limited and different uses compete with one another. Power relations are relevant here: who decides on the ‘best possible use’ and what indicators give one use the advantage over another?
- Urban agriculture faces an array of challenges specific to the urban context: soil contamination (e.g., heavy metals, residue from industrial use or roads, dumpsites, latrines), water contamination (greywater, wastewater, E. coli), competition for land, vandalism and theft. These factors can affect product quality and safety, as well as the reliability of production and delivery. On the other hand, urban settings and the “proximity between different stakeholders – urban producers, urban markets, and urban consumers - provides

opportunities and can create short value chains or niche markets. Cities provide a very dynamic surrounding that creates interactions between different actors and networking facilities. Urban agriculture therefore is not only a source of food production or income generation, it is also a catalyst for social interaction, re-connecting people with nature, and providing education on food and ethical value chains" (Paganini et al., 2018, p. 404).

The role of urban agriculture on the path towards resilient cities and sustainable urban food systems will only carry weight if the shortcomings raised above are discussed, if the actors concerned acknowledge the multiple and interrelated dimensions involved and if framework conditions are compatible with the challenges and benefits of this highly specific form of agriculture. But urban agriculture is not the universal cure for the ills of the modern urban crisis. Hence it should neither be over- nor underestimated. "Urban agriculture is only one component of a complex [...] system, practised in various ways, at various scales depending on the goals, opportunities and constraints of urban cultivators" (White & Hamm, 2017, p. 14).

### **The role of urban agriculture in city food systems**

*Nicole Paganini*

Urban agriculture is gaining increased global attention in discussions on the future of world cities: "There has been little policy attention paid to the governance of the urban food systems in African cities. The only area where there has been significant policy and NGO interest has been urban agriculture" (Toriro, 2018, p. 154). Nevertheless, the contribution of urban agriculture to the urban food system is controversial and should not be exaggerated. A city's food system is highly complex, as an array of layers shapes the cultivation, transformation and consumption of food. As Crush & Frayne (2011, p. 299) describe, "research on urban agriculture has tended to be isolated from analysis of the urban food supply system as a whole". Thus, adopting a systems approach that enables a breakdown of complex dynamics and structures allows for a more comprehensive understanding of urban agriculture within each city's food system (Paganini et al., 2018).

## **2.2 Urbanisation affects urban food systems<sup>9</sup>**

*Nicole Paganini*

Food systems describe farm-to-fork processes, pathways and dynamics of interlinked actors and are embedded in a spatial context. Looking at cities through the food lens enables an understanding of the dynamics and challenges of the food system as well as other urban systems entailed. The food system approach applied in this research gives insights into the role of urban agriculture and the attendant challenges of each city in the context of local food production, retail, marketing and consumption, as well as into the stakeholders, organisational structures and information flows involved.

The two case study areas, Cape Town and Maputo, are currently in a process of rapid urbanisation, a phenomenon that will impact heavily on the food system. According to the United Nations

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<sup>9</sup> Parts of this chapter were already published in Paganini et al. (2018)

Human Settlements Programme, UN-Habitat (2014, p. 225), the population growth forecast for Cape Town in 2030 is 11.4% and for Maputo 15.4%. This burgeoning urbanisation across the African continent means that by 2050, 56.5% of Africans will live in cities (UN-Habitat, 2014, p. 268). South Africa – with 60% of the population already living in urban areas – is expected to reach an urbanisation rate of 80% by mid-century (Todes et al., 2010, p. 331), whereas Mozambique’s urbanisation rate is estimated to reach 50.5% by 2050 (UN-Habitat, 2014, p. 269).

The Food and Agriculture Organization (FAO) claims that the future of food and nutrition security lies in understanding the complex relationships between food security and nutrition, the food systems in which they are embedded and the social, political and economic forces shaping them (FAO, 2017). The design and implementation of sustainable (urban) food systems plays a crucial role predominantly in the fast-expanding informal urban areas and is one of the biggest challenges facing policy makers, the population, civil society, city planners and, of course, urban farmers. Without policy intervention, the uneven distribution of food markets and/or purchasing power can lead to ‘food deserts’, defined as “areas of relative exclusion, where people experience physical and economic barriers to accessing (healthy) and enough food” (Reisig & Hobbiss, 2000, p.138).

The discussion on the contribution of urban agriculture to food and nutrition security and to the urban food system in general is controversial, as briefly outlined earlier. UFISAMO researchers have taken a close look at urban agriculture from a food system and production perspective, assessed organisational structures, observed eating habits through the food lens, analysed communication channels and existing innovations, and have in conclusion identified good practices and made recommendations to relocate urban agriculture in the urban food system to a more prominent position.

## 2.3 Urban development in Maputo and Cape Town

*Erik Engel & Samuel Quive*

Urban development in both Maputo and Cape Town is strongly linked to the colonial history of Mozambique and South Africa (see text box below). Historical and ongoing urbanisation patterns set the spatial frame for urban agriculture and shape the food systems established in the respective contexts of the two very different countries.

**Maputo**, the capital of Mozambique, is situated at the southernmost tip of the country. Maputo Bay is formed by the estuary of the River Matola on the Indian Ocean and hosts an international harbour that is vital to Mozambique and the land-locked countries of the hinterland. With its strong service sector and strategic infrastructure, Maputo is the economic hub of the country. November 2018 saw the construction of Africa’s longest suspension bridge that connects Maputo with KaTembe and South African cities.

The Maputo mainland consists of the five urban districts of KaMpumfu, KaMayaquene, Nihamankulu, KaMavota and KaMubukwana. Other districts are KaNyaka island and the KaTembe peninsula. The population amounts to 1.1 million (2017, see Table 2), while urban growth rates are high with 3.3%/year (CIA, 2017 in Halder et al., 2018), especially in the less built-up districts of



KaMubukwana and KaMavota, both of which host large parts of the so-called *zonas verdes* (green zones), as well as the newly connected district of KaTembe.

Urban agriculture has a long history in Maputo. The green zones were established in colonial times as farmland for colonialists. The farms were occupied by the 'Black' South-African population after Independence in 1975 and witnessed a major influx of internally displaced persons in the course of the civil war (1977 – 1992) that devastated most of the rural areas further north. The socialist government fostered agricultural development in the green zones for self-sufficiency in an effort to render the city's population less vulnerable to war-related disruptions in the food supply chain.

As a result of the country's socialist history, farmers in Maputo are well organised in cooperatives and associations. While most urban farmers worldwide are not organised or only loosely linked through NGOs or networks, in Maputo we find a sophisticated structure with over 10 000 farmers organised in 34 associations. The associations serve diverse political, social, legal, educational and economic purposes (see Chapter 3.6). In addition, numerous households with sufficient space conduct home gardening activities.

After the war, Maputo continued to attract migrants in search of economic opportunities. As a consequence, and despite (inconsistent) government support, agricultural land is in growing competition with other uses: previously cultivated land is sold and used for settlements and the attendant infrastructure.

The warm tropical climate is expected to become more unpredictable, with extreme weather events such as droughts and floods on the increase (DSU, 2015). Even now, low lying fields are flooded regularly by overflowing rivers of doubtful water quality.

Once a fishing village, Maputo was finally conquered and fortified (under the name of Lourenco Marques) by the Portuguese in the 18th century, primarily for the purpose of trading with the British colonialists of Southern Africa. It was declared the capital of Mozambique in 1898 and expanded rapidly as a port city and the closest outlet for South African precious minerals. Maputo mirrors its colonial past with its highly urbanised 'cement' city (*polana cemento*) opposed to a 'reed' city (*polana caniço*), with many constructions built in adobe and reed, as well as its peri-urban areas.

The 'cement' city was originally built for the colonial elite, complete with residential buildings, infrastructure and economic functions. Colonial buildings in the art deco style and tropical modernist architecture mixes with contemporary representative buildings often built by Chinese enterprises (Jenkins, 2015). Access to the cement city was restricted for 'non-whites' up to Independence in 1975 – they worked during the day in the inner-city neighbourhoods but were not allowed to settle there.

The 'reed' city is marked by informal settlements established without an urbanisation plan. The area is dense with horizontal buildings and highly congested. Spaces for service provision are few and far between, as are electricity and safe water sources. Reed buildings are gradually being substituted by structures of more permanent material.

The peri-urban areas are the spatial response to urban expansion and only partly adhere to urbanisation plans. In neighbourhoods like Zimpeto, an area with an urbanisation plan and some urban infrastructure, remnants of rural habitations can still be seen beside more solid concrete buildings and structures spontaneously built by recent informal in-migrants.

**Cape Town** is the legislative capital of South Africa, the capital of the Western Cape Province and an economic hub for the Southern African sub-region. As such it attracts migrants from within and outside the country. With the ongoing rapid urbanisation trends, the population of Cape Town Metropolitan Area is constantly growing and with an annual growth rate of 1.6% has exceeded the four million counted in the 2016 community survey (see Table 2).

Job opportunities and urban infrastructure fail to keep pace with urban growth, and social and economic inequalities persist despite the post-apartheid advent of multi-party democracy and majority rule. Spatial segregation and social inequality (with a Gini Index of 62.5%, South Africa is one of the most unequal countries in the world in terms of income distribution) are the result of the politics of apartheid and still have a huge impact on everyday life today. Almost 36% of the population lives below the official poverty line of 3 500 ZAR/month, and despite being an innovation hub for the continent, including for IT, half the population of Cape Town has no internet access (CoCT, 2018).

The Cape Flats, where the predominantly so-called 'coloured' and 'black'<sup>10</sup> townships of the apartheid era are located and approximately two thirds of the population lives, are particularly prone to informal growth, lack of formal employment opportunities, poverty and food-insecurity rates, poor social infrastructure, competition for space and – as a result – a high potential for social conflict and high crime rates in the communities (Battersby, 2012 in Swanby, 2018). Unemployment rates often exceed 35%, e.g., in the 'black' suburbs of Khayelitsha (38%), Gugulethu (40%), Nyanga and Crossroads (both 45%) (CoCT, 2013). Approximately 10% of the over one million urban households counted in 2011 live in informal structures (given the character of informal settlements, the real number may be far higher), and up to 40% of the residents of vulnerable 'black' suburbs like Khayelitsha and Gugulethu have no access to piped water in their houses or yards (CoCT, 2013).

The Cape Peninsula and Western Cape have been inhabited by humans at least since the middle stone age (South African History, 2011). Early European sailors traded cattle and sheep with the local Khoer pastoralists (Huffman, 2010). Cape Town was established as a relay and magazine for fresh vegetable and meat for sailors of the imperialist powers ever since the first Portuguese sailed around the Cape of Good Hope in the late 15th century and dislocated the local inhabitants. Under Dutch dominion since the 17th century, Cape Town was handed over to the British in 1814. Each imperial power forced and lured people from their other colonies to settle and work in

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<sup>10</sup> The authors of this report are fully aware of the racist concept underlying the categories created by the apartheid bureaucracy ('white', 'black', 'coloured', and sub-categories). These categories describe groups of people along socially constructed and erratically highlighted differences and commonalities. They are still used in South Africa today despite a repeal of the 1950 population registration act by the South African parliament in 1991 in order to redress economic and social imbalances. As authors we apply the terms without judgement, based on what we observed in the daily conversations of the people concerned. The inclusion of these terms highlights our use of them as quotes, i.e., as they occur in national statistics and in the vernacular (see Glossary in Annex 1).

South Africa. In addition, religious minorities from war-torn Europe sought refuge from persecution with the mainly protestant 'white' population.

The originally multi-racial character of Cape Town's suburbs was destroyed during the rule of apartheid. Suburbs were purged of 'illicit inhabitants' and settlements built to relocate the non-'white' population to less attractive, distant suburbs, the Cape Flats. During apartheid, the Cape region was considered a 'coloured' labour preference area to the exclusion of the 'Black' South Africans.

The end of apartheid did not eradicate the centuries of racism and divide-and-rule politics. Even today, cooperation across townships, neighbourhoods, between people of different mother languages or 'racial profiles' remains challenging. Economic and social cleavages persist, and diverging political affiliations sporadically add to the potential for conflict tangible throughout the city – particularly in the townships.

Apart from the central business district and some isolated high-rise buildings, the majority of the population lives in individual horizontal houses ranging from fancy post-modern villas with a vista of the ocean or Victorian houses surrounded by well-kept gardens (in the northern and southern suburbs) to rugged tin shacks with partly no private toilet or running water in the Cape Flats and eastern suburbs. A network of highways criss-crosses the settled areas and serves as a separator rather than a link between the neighbourhoods. Public transport is chronically inadequate and most local railway lines and buses are considered unsafe.

A number of township households and public buildings (schools, hospitals) or parkland dedicated some space to horticultural production. Although production here plays a minor role in the food system of the city, it serves a niche market in the affluent centre of town and contributes to the household dietary diversity of the families involved in this activity. Cape Town government established an urban agricultural policy framework in 2007 and hosts a high level of academic debate, political institutionalisation and a vast number of institutions involved in urban agriculture (see Chapter 4.2). Despite – or because – of this, farmers depend heavily on NGO and government support and there is no formal farmer to farmer network to speak of.

A particular case is the Philippi Horticultural Area (PHA): 3 000 hectares with high quality soils and access to water all year round allow for five crop cycles per year, making the PHA one of the most productive areas in the country – not surprisingly it is predominantly in the hands of medium and big commercial 'white' farmers. The area is currently contested: the city's developer plans to establish a new housing area (see Chapter 4.2).

Located in a Mediterranean climate zone with winter rains and a distinct endemic vegetation, Cape Town has been subjected to extensive drought with a peak in early 2018, when strict water rationing became compulsory. Repeated dry spells met population growth, generous water-consumption habits, and a lack of contingency planning by decision-makers, culminating in empty dams and water restrictions. Extreme weather events of this kind are expected to become more regular with unabated climate change.

	Population (2017 estimates)	Population (projection for 2030)	Urban area (km <sup>2</sup> )	Urban growth rate (%/year)	% below the poverty line <sup>11</sup>	Unemployment rate
Maputo	1 101 170	1 484 209	300	3.3	11.6%	22.4%
Cape Town	4 174 510	5 467,695	2 461	1.6	35.7%	23.8%

Sources Maputo: INE (2019a); (2019b); Halder et al., 2018

Sources Cape Town: CoCT, 2018, 2013; World Population Review, 2019; Statistics South Africa, 2016; Halder et al., 2018

Despite a series of local particularities, researchers should not overlook parallels in Maputo and Cape Town to cities in Latin America or Europe: Urban farmers are mostly women; urban gardens and fields have multi-functional uses and serve as a platform for the discussion of a range of urban and rural topics; similar crops such as lettuce, tomatoes or carrots are cultivated and similar (recycling-)techniques such as compost or raised beds are applied (see Chapters 3 and 4); urban farmers tend to be (rural) migrants; urban plantations are often threatened by eviction, short-time land-use contracts or real estate speculation; leading economic and political actors frequently attempt to co-opt urban gardens and their positive image; the organisational process is in many instances more challenging than the farming practice itself.

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<sup>11</sup> Poverty for Cape Town households was defined in 2018 as households earning ZAR 3500 or less per month (CoCT, 2018, p.12). In Maputo, the poverty line is reflected for 2014, based on multi-dimensional poverty indicators. With economic growth fueled by the end of the civil war, poverty rates dropped rapidly from 47.1% (1996) and 29.9% (2008) (Ministério de Economia e Financas, 2015)





Figure 6: Fields (*canteiros*) in the green zones and street vending in Maputo

Source: Paganini 2019

## 3 Results Maputo

Chapter 3 gives an overview of the research results in Maputo as explored and analysed by the four UFISAMO Ph.D. students from Mozambique and Germany and UFISAMO researchers.

The subchapters give an introduction to urban agriculture in the Maputo food system (Chapter 3.1), the relevant primary and secondary actors, and the policy framework (Chapter 3.2). The next section focuses on vegetable production and marketing in Maputo, looking at production and climate conditions, vegetable production, distribution and marketing, and summarises the challenges and opportunities in Maputo (Chapter 3.3). Chapter 3.4 deals with Maputo farmers themselves, their household structures and goods, income, gender and age structure, education, communication etc. This is followed by a short economic analysis of vegetable production in Maputo (Chapter 3.5) and a description of the organisational structure of urban agriculture in Maputo and the history of UA development and its influence on these structures, the producer organisational forms, i.e., the associations and their characteristics and functioning (Chapter 3.6). The next two chapters deal with the food and consumption habits of urban farmers and households in Maputo (Chapter 3.7) and the role of urban agriculture for food and nutrition security and income generation, looking at Maputo's food and nutrition security status and the factors influencing food and nutrition security (Chapter 3.8). The last subchapter (3.9) is about communication, information and dissemination channels in the context of urban agriculture in Maputo. It discusses Maputo's urban Agricultural Innovation System (uAIS), dissemination instruments and communication patterns, and summarises good practices and the drivers and barriers for dissemination.

### 3.1 Urban agriculture in Maputo's food system

*Nicole Paganini<sup>12</sup>*

National policies, debates on land access and reforms, marked income inequalities and social vulnerability have had a strong impact on Maputo's City-regional food system. In addition, Mozambique's recent history has led to changes in the production of and access to food. The civil war (1977–1992) tied up almost all of the nation's agricultural sector and created dependency on neighbouring countries, food banks and donor organisations (Raimundo et al., 2014).

According to national statistics, the agricultural sector generates 23% of the GDP (2014) (FAO, 2019) and absorbs 74% of the labour force (CIA, 2019). Country-wide smallholder farmers provide 95% of the agricultural production, mainly for subsistence, focusing on cassava, maize and sorghum, the country's main staples (FAO, 2019). Although large-scale production is rare compared to the neighbouring countries of South Africa, the Kingdom of Eswatini (Swaziland) and Malawi, there are some signs of international investment, e.g., tea and cotton estates in the north of the country.

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<sup>12</sup> Parts of this chapter were published in Paganini et al. (2018)

The government attributes high priority to agricultural development along value chains and its concentration in growth corridors (Ilal, 2016), with cashew, cotton, tobacco and citrus among the top export goods (CIA, 2019), all of which are mainly produced by the country's 400 commercial farms.

Agricultural productivity is low in general and vulnerable to shocks: smallholder farming is primarily rain-fed and practised in flood- and drought-prone areas, where farmers find it difficult to access credits and markets, and rarely make use of enhanced inputs (FAO, 2019).

The food system in Mozambique depends largely on imports. Wheat is imported from South Africa, rice from Thailand and Indonesia. Only the area around Marracuene (Province of Maputo) close to the northern boundaries of Maputo City produces small quantities of rice. The leading import country is South Africa, which supplies refined sugar, soups and broths, raw sugar cane, food preparations and sauces (Crush et al., 2016). Referring to a study from 2015 on informal trade from South Africa (cross boundary), Crush et al. conclude that the most common goods carried by traders include groceries, meat/fish/eggs, and fresh fruit and vegetables. The five major products bought by Mozambicans in South Africa are cooking oil, eggs, alcohol, mealie meal and fresh fruit and vegetables (Crush et al., 2016, p. 26). In addition, "most [...] of the fresh fruit and vegetables, processed food and junk food are imported from South Africa" (Crush et al., 2016, p. 29).

The influence of South Africa on Maputo's food system is visible: cheap bulk vegetables are imported from South Africa, while its supermarkets supply Maputo with staple and industrialised foods. This prevalence of South Africa's contribution to the food sector in Maputo is accompanied by a rapid change in traditional staple foods, i.e., from maize (*Xima*) to rice and bread. Raimundo et al. (2014) describe the diet of the poor in Maputo as 'relatively diverse', since proteins from chicken and mainly imported frozen fish are combined with staples and, if affordable, with vegetables. The vast dependency of consumers on imported food, however, renders them highly vulnerable to price fluctuation and the economic dynamics of both the providing countries and the world market.

Only 23% of interviewed households purchase food in supermarkets compared to 79% of South Africans (Crush et al., 2016, p. 27). Hence Crush et al. conclude that the informal food economy is the most relevant food source in Maputo. "Almost all households regularly obtain food from informal sellers; over 90% at least once a week and many on a daily basis" (Crush et al., 2016, p. 28). Raimundo et al. (2014) agree that the informal food economy in Maputo is 'viable and extensive'.

Food sold at formal and informal markets is largely imported from South Africa. Research on local markets has shown that locally grown food has to compete with international imports. Onions, tomatoes and potatoes imported from the Western Cape in South Africa are cheaper compared to locally grown and locally transported sweet potatoes and onions or seasonally grown tomatoes from Boane region or Maputo's green zones.

Urban agricultural products are primarily channelled through informal markets and retain certain niches in the urban food system, namely livestock (chicken) and leafy vegetables for local communities and farmers' self-consumption.



Since the colonial era, Maputo has been in possession of agricultural land – the so-called green zones (*zonas verdes*) – in the peri-urban low-lying river flood areas. Here, over 10 000 farmers organised in associations cultivate more than 1 300 ha of mainly leafy vegetables to generate a quick turnover (João, 2018). Approximately 40 000 farmers, traders and intermediaries, to name but a few, benefit economically from this zone (Sitoe, 2010). Around 7 000 dwellers have been trained to garden in their backyards and up to 20% of households in Maputo are involved in some form of urban agriculture.

Similar to the general vulnerability of the country's agricultural production, Maputo is challenged by climate variability: heavy rainfalls between January and March cause periodic flooding and the city's water dependency on the Umbeluzi River leads to water shortages in the summer, which in turn impact on productivity, prices and pest pressure: Farmers further state, that due to the large-scale sugarcane production in the Kingdom of Eswatini (Swaziland), the Umbeluzi is highly contaminated. The high use of mineral fertiliser and chemical pesticides in the local production constitutes a serious challenge to environmental and consumer health, leading to the clash between environmental and conservation challenges and the need for farmland, water for irrigation and large quantities of pesticide.

The pressure of real estate development, population growth and urbanisation, all of which increasingly require land for infrastructure, reduces the space available for agricultural production in Maputo, mostly in the area of Costa do Sol (KaMavota). Historically it has been experienced in the former production area of the population of *polana caniço*.

Urban agriculture is a vital albeit vulnerable component of the food system in Maputo and part of many city dwellers' daily lives. The following chapters take a closer look at urban horticultural production systems and their specific challenges, organisational structures and food habits, as well as their impact on food security. In a consecutive step, existing instruments and channels for knowledge and innovation dissemination are analysed. Strengthening the role of urban agriculture in Maputo's food system, so the assumption, will have a positive impact on the availability of locally grown fresh food and increase the income of urban farmers.

## 3.2 Policy framework and urban agricultural actors in Maputo

*Severin Halder*<sup>13</sup>

This chapter gives a general overview of the policy framework and the actors involved in urban agriculture in Maputo. It clusters people or institutions into primary and secondary actors. Primary actors are those actively involved, while secondary actors play a background role, such as framing policies, analysing activities, collecting and providing data and information or teaching and consulting primary actors. More detailed actor information can be found in the chapters on urban farmers and their production and marketing (see Chapters 3.3 and 3.4).

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<sup>13</sup> Adaption of Halder et al., 2018 and Schmidt, 2017.

### 3.2.1 Primary actors

#### Farmers

Over 14 500 small-scale farmers currently cultivate small parcels of land, producing both for self-consumption and income generation. Agricultural production is concentrated in four of the seven municipal districts, namely, KaTembe, KaNyaka, KaMubukwana and KaMavota (Barghusen et al., 2016; DASACM, 2017). Urban agriculture in Maputo provides food for 22% of households (White & Hamm, 2017). The authors estimate that about 70% of farmers and gardeners in the capital city are women.

Home gardening is likewise a widespread activity in Maputo. Apart from its value as a leisure activity, it primarily serves food production for self-consumption but is also carried out for commercialisation purposes. It is estimated that 80% of the population of KaMubukwana and KaMavota invest time and resources in backyard/home horticulture (Flores, 2018), (see Chapters 3.3 and 3.4).

#### Farmer associations

The majority of farmers in Maputo (approx. 11 200 out of 14 500 farmers) are organised in 34 associations and cooperatives (DASACM, 2017), thereby facilitating access to plots and land-use titles (*DUAT - Direito de Uso e Aproveitamento de Terra*). The associations are headed by a board, which is elected every three to five years by the general assembly. All associations in one district are organised in a union. Regular meetings ensure constant information exchange (Barghusen et al., 2016) (see Chapter 3.6). District unions are in turn members of the recently established umbrella union of Maputo City, a member of the National Union of Peasants UNAC (*União Nacional de Camponeses*), an alliance that seeks a greater role and presence of small-scale farmers in Mozambican society (see Chapter 3.6).

#### Agricultural extension workers

Agricultural extension workers on the Maputo municipality (CMM – *Conselho Municipal de Maputo*) payroll are the central actors in urban extension services. They are based in the *casas agrárias* in the municipal districts. Their role is to provide information, distribute free inputs (provided by the government or companies), give technical support, and rent out tractors or other mechanised instruments for agricultural activities. Furthermore, they organise markets in the city to enable producers from nearby associations to market their products at public events. Although extensionists work closely with associations, they are also encouraged to work with non-associated producers. The Research Institute for Agriculture in Mozambique (IIAM – *Instituto de Investigação de Agricultura de Moçambique*) trains extensionists regularly in animal production, crop production and the processing of agricultural products. The number of extension workers (currently 34) is considered insufficient to cater for the needs of 14 500 urban farmers in Maputo (see Chapters 3.6 and 3.9).

#### NGOs and international organisations in support of UA in Maputo

Several NGOs and international organisations have integrated urban agriculture into their approaches, e.g., in addition to sustainability or community development:

ESSOR is a French NGO that supports agro-ecological production, including the introduction of a participatory certification scheme. The project entitled "Sustainable agricultural development in urban and peri-urban areas in Maputo and its surroundings" ran from 2013 to 2016. ESSOR handed over certain elements of the project to ABIODES.

ABIODES (*Associação para Desenvolvimento Sustentável*) is an NGO which implements projects related to environment, climate impact, value chain and agroecology all over Maputo. The organisation took over urban agriculture extension for agroecological production in 2017 from ESSOR until 2018 and has re-started a program in early 2019.

The NGO AfriCarte assist home gardeners with container growing and backyard urban agriculture. The organisation is closely linked to the Catholic Church. The focus is on natural agriculture to reduce the use of pesticides and mineral fertilisers.

The NGO KULIMA seeks to improve the socio-economic situation of vulnerable communities. KULIMA specialises in food security and nutrition. The founder and national director of KULIMA, was involved in the process of creating green zones in Maputo with Mozambique's first president, Samora Machel. KULIMA has been working with home growers in cooperation with FAO.

A relevant international NGO is ACDI/VOCA. It fosters economic growth by providing technical and management assistance in the agricultural sector, e.g., the introduction of new techniques. They also seek to improve the workings of farmer associations and extension services, and their organisational issues. The organisation stopped these operations in 2017.

Establishing the methodological strategy of the extension service in Mozambique was strongly supported by the FAO in the 1980s, which accompanied the implementation process of the 'Training and Visit System' and the introduction of Farmer Field Schools (FFS) in the rural areas. Farmer Field Schools are to be set up in Maputo in 2019 (see Chapter 3.9).

### **Input providers**

The basic inputs offered by input providers for vegetable production in Maputo are seeds, seedlings, fertiliser and pesticides. As a rule, farmers obtain these items from mobile agents, who sell them directly in the field. Furthermore, private street or market vendors sell a number of inputs for vegetable production. Both vendor types offer the products in small packages and thus in quantities suitable to farmer needs.

A variety of retail input stores in Maputo, notably *casa dos agricultores* and *agrifocus*, offer a wide range of products for vegetable and animal production. These formal providers import their products mainly from South Africa. City-based companies like Mozasem or Lusosem provide seeds only. Apart from selling inputs, stores also give agricultural advice. Informal providers play a significant role in Maputo. Furthermore, the commercial farming company *Agro-mahotas* and ACDI/VOCA (stopped in 2017) also produce seedlings. A number of farmers produce seeds and seedlings in their own fields.

### **Intermediaries and distributors**

Informal intermediaries are habitually women. Known as *magueva*, they purchase and transport goods from the field to the markets. The tasks and customers involved vary significantly and

more than likely they also perform other income-generating activities. Some farmers, for example, work part-time as *magueva* if they do not have sufficient products of their own to sell. Also, cases of intermediaries exporting vegetables, e.g., pumpkin leaves, to South Africa have been recorded.

Three formal intermediaries that distribute vegetable products from the green zones of Maputo were identified. ComOrganico and SlowFood promote local produce of quality in order to enhance the market for organic products with fair prices. They distribute and sell agro-ecological produce from Maputo, e.g., to markets like *Mercado da terra*. SlowFood also works as a caterer for organic products, a unique occurrence in Maputo. CAVA (*Comércio, assistência e valorização agrícola*) is an organisation that promotes the production of national vegetables, connecting producers to restaurant chains and supermarkets such as Shoprite. It meets the expectations of these target groups, selecting, washing and delivering the produce. Although lettuce and cabbage are the principal crops in Maputo, they are of little value to supermarkets, which is why CAVA helps farmers to diversify their crops. CAVA supports the inclusive and sustainable growth of local produce.

### Markets

Three supermarket chains operate in Maputo, all of which have their headquarters in South Africa. These are Mica (Spar), Woolworth and Shoprite. The supermarket Foodlovers in Matola plays a major role when it comes to selling local products. Evidence shows that at least three supermarkets carry products produced in or around Maputo. Supermarkets also sell frozen nationally produced chicken and halal chicken.

Maputo boasts a variety of formal (76 in the city) and informal markets. Zimpeto is the biggest market in the Maputo area and has the lowest prices. Most of the products imported from South Africa and those from other regions in Maputo are brought here to be sold to consumers, retailers or intermediaries. The Zimpeto market operates seven days a week.

Informal markets are found in all urban areas. Other sellers offer a range of products on the streets close to informal markets. Horticultural products and chickens are generally sold in designated areas. Most of the vendors are women. According to the Horticulture and Potato Market Study (RVO, 2014), there is only a slight difference between formal and informal markets with reference to organisation, inspections and the enforcement of general rules. Street vendors sell their vegetables on sidewalks throughout the city during the day or in the evening. They either sell from small mobile stalls or directly from the ground. Although the activity itself is illegal and can be prosecuted, it is very common and largely tolerated.

### 3.2.2 Policy framework and secondary actors

#### Policy framework

Several policy papers address rural agriculture, poverty, and food and nutrition security but none of them focus specifically on urban agriculture. There are no clearly defined institutions in charge of urban agriculture in Mozambique, either at national or municipal level. The debate on urban agriculture is still recent in Maputo, despite the early institutionalising of green zones following

Independence. A number of institutions and programmes nevertheless touch on the topic indirectly.

On the national level, the Ministry of Agriculture set up PEDSA (Strategic Plan for the Development of the Agricultural Sector 2011-2020), which contains four keystones (MASA, 2011): (i) to increase agricultural productivity, (ii) to enhance infrastructure for market access and investment, (iii) to improve the sustainable use of natural resources, and (iv) institutional empowerment. Supporting agriculture per se has an indirect effect on urban agriculture, although this comprehensive document does not mention urban agriculture even once.

Despite the existence of a political plan for agriculture in Mozambique, i.e., the PAPAP (Action Plan of Agricultural Production and Fishing), no specific efforts have been made to adapt national rural programmes to the urban context (Governo da Cidade de Maputo, 2016). However, although there is no specific urban agricultural policy, a number of programmes target agriculture in the city, of which the Extension Service Programme is the most important.

### **Government institutions**

National government institutions set the policy framework for urban agriculture. The Ministry of Agriculture and Food Security MASA (*Ministério da Agricultura e Segurança Alimentar*) in cooperation with the affiliated Technical Secretariat for Food Security and Nutrition SETSAN (*Secretariado Técnico de Segurança Alimentar e Nutricional*) focuses on the promotion of agriculture for food security, among other topics.

The Ministry of Land, Environment and Rural Development MITADER (*Ministério da Terra, Ambiente e Desenvolvimento Rural*) and the Ministry of Industry and Commerce MIC (*Ministério da Indústria e Comércio*) established the framework for land use and financial support for farmers through IPEME, an institute belonging to MIC that supports small and medium enterprises to formalise, professionalise and grow. Their key services are to provide management trainings, to assist in developing business plans, packaging and barcodes, marketing strategies and access to finance, and to support small producers in legalising their businesses. IPEME reinforces the importance of value addition to vegetable production in the city, such as cleaning, packaging and adding barcodes for product placement in supermarkets.

A glance at the city level shows that specific characteristics of Maputo are related to political decisions at national level. When the ruling party decided to establish national government structures in cities, the state department DASACM (*Direcção da Agricultura e da Segurança Alimentar da Cidade de Maputo*) began to collaborate with the Municipality of Maputo CMM on urban agricultural issues. Despite the smooth running of this horizontal coordination, the Municipality sees an occasional lack of clarity in the distribution of responsibilities. Those who wish to raise awareness about the political legitimacy of urban agriculture must involve the bodies concerned at the national level (in this case the director of DASACM).

The Department of Economic Activities DAE (*Departamento de Actividades Económicas*) coordinates economic and agricultural activities at city level and is also head of the *casas agrárias* in Maputo. The department promotes organic agriculture and urban agro-ecology, and seeks to create urban agricultural actor networks. Furthermore, they are in constant contact with farmers

through *casas agrárias*. The economic activities unit merged with the Municipal Directorate of Markets and Fairs DMMF (*Direcção Municipal de Mercados e Feiras*) in early 2019, incentivising vendors to sell locally at formal markets.

*Casas agrárias* are the local institutions responsible for policy implementation, as well as for animal and crop production. They are coordinated by the Directorate of DASACM and the DAE. *Casas agrárias* are located close to production sites and each district has its own *casa agrária*.

One further municipal actor is the Municipal Directorate of Planning and Urbanisation DMPUA (*Direcção Municipal de planeamento e urbanização*).

### **Research institutions**

The Agrarian Research Institute IIAM (*Instituto de Investigação Agrária de Moçambique*) belongs to MASA. It generates and disseminates knowledge on technological solutions in the interests of sustainable agricultural development, food security and nutrition. IIAM consists of technical directorates for agronomy, animal sciences, education and planning. It is responsible for research and the training of extensionists and farmers, and has one training and research centre in Chokwé, near Maputo. It also tests and authorises seeds, pesticides and animal drugs, and carries out research on the socio-economic impact of farming.

The University Eduardo Mondlane UEM (*Universidade Eduardo Mondlane*) hosts four faculties pertaining to research in agricultural production and its relevance in the urban context. These are the faculties of agronomy, veterinary medicine, geography and arts and social science. Agricultural research at the agronomy faculty is divided into four departments: plant protection and sanitation, extension, soil, and production. The soil department in particular has conducted surveys in the Maputo green zones. Students are sent twice a year to producers in the various districts, where they receive training in agricultural practices. Similarly, the veterinary faculty is involved in research and training. The faculty of arts and social sciences is part of the department of sociology and carries out research on urban food systems, food security and urban agriculture. The department of sociology hosts a master course on rural sociology and development management (MSG), which is a UFISAMO partner.

International research institutions play a vital role in agricultural research in and around Maputo. In addition to the institutions mentioned earlier, the International Food Policy Research Institute (IFPRI) and the International Centre of Insect Physiology and Ecology (ICIPE) are of interest for the exchange of information.

### **Financial services**

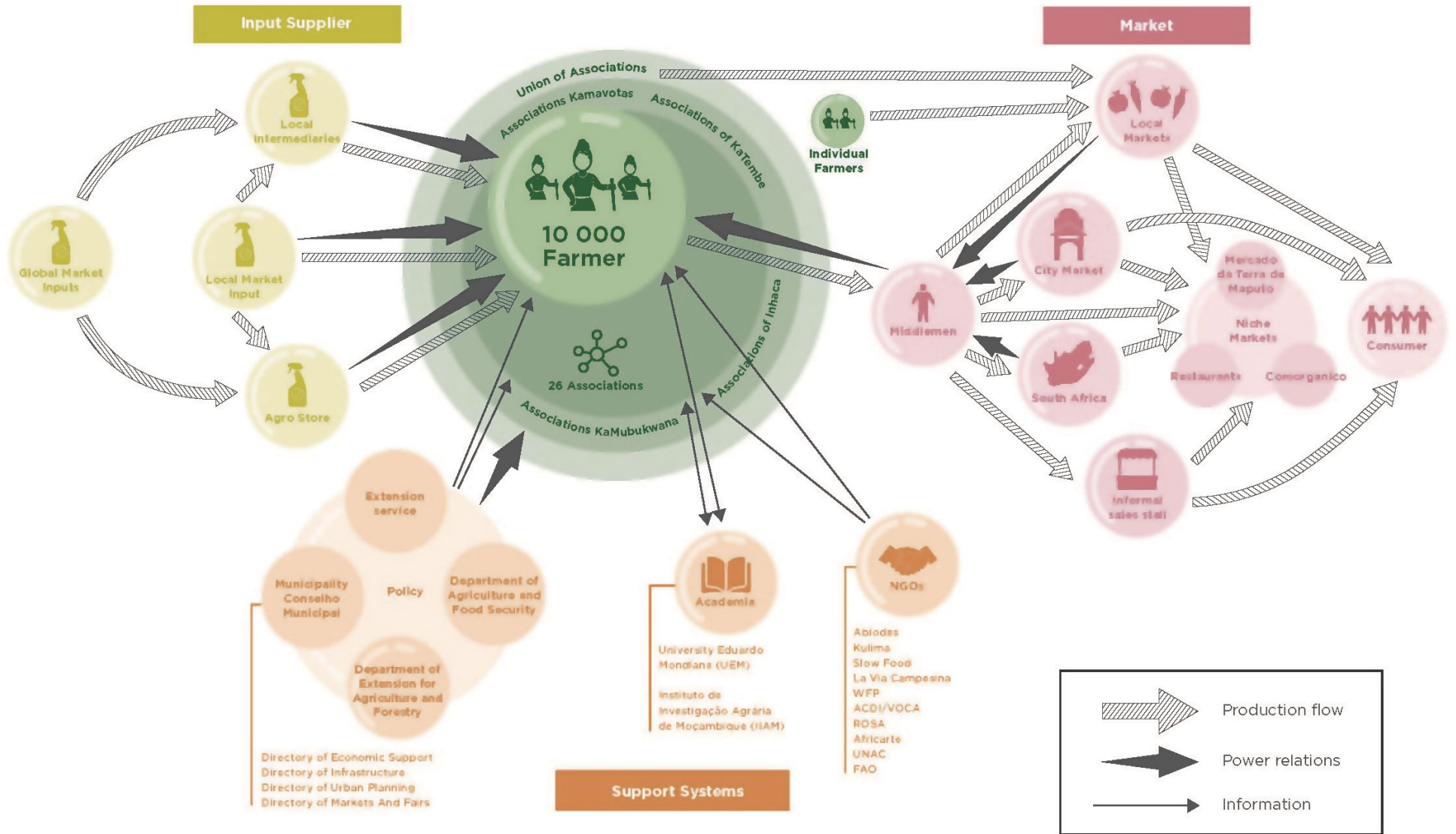
Maputo hosts several commercial banks, development banks and microfinance institutions. Only microfinance institutions are of particular importance to small-scale producers. CCOM and Chevau are two such institutions. Both are financed by ACIDI/VOCA to provide farmers with credit.

Access to credit is limited, since some producers have neither a bank account, nor assets to serve as collateral, nor accounting records. Added to this is the vulnerability of the activity (not mechanised and dependent on climatic conditions). Hence credit lines to producers are rare due to the

internal dynamics of the local market, which increases the risk of non-repayment of the loan. In most cases the investment is private, whereby costs and production risks rest solely with the farmer. This in turn reduces the investment in farming activities.

**Figure 7: Actors map Maputo**

Source: Paganini, Engel, Chicamisse, Cumbana 2019





### 3.3 Vegetable production and marketing in Maputo

Nicole Paganini<sup>24</sup>

In the *zonas verdes*, about 10 000 farmers organised in 34 associations (in the four municipal districts with UA) are registered with the urban agricultural section, *Conselho Municipal de Maputo*, CMM (João, 2018). Further, around 7 000 dwellers have been trained by different NGOs (KULIMA, AfriCarte, FAO) to garden in their backyards or close to their homes (18\_MP\_I). New registers will be released by the CMM end of 2019, which are likely to show an increasing number of farmers.

Baseline interviews were conducted with a total of 369 farmers in 19 associations (28% of the farmers interviewed in KaMubukwana and 72% in KaMavota were women). Most farmers farm to secure food (25% necessity, 20% self-sustaining, 10% food production) or generate income (23% income, 9% poverty) (17\_B\_MP, n=367).

Considering the farmers' socio-economic status (see Chapter 3.4), the results from the baseline survey indicate that urban agriculture is a way of making a living in the city with particular reference to vulnerable communities. Almost all interviewed farmers produce their three main crops for economic reasons (income generation 97%, self-consumption 74%) (17\_B\_MP, n=666, multiple response). 91% sell their products directly from their land to intermediaries (n=366); few sell at local community markets (16%) and 9% around their neighbourhoods (17\_B\_MP, n=365).

This chapter describes production techniques, production systems, challenges and opportunities in the context of small-scale urban agriculture in Maputo and looks at the relevant marketing channels. It focusses on the *zonas verdes* but also reflects the situation of urban agriculture in the backyards and the municipal districts of KaTembe and KaNyaka. The results of this chapter are based on field research findings on value chains (Schmidt, 2017) and the authors research on vegetable production, the baseline survey, in-depth interviews with farmers who apply agro-ecological techniques, field observations, interviews with key informants and multi-actor workshops conducted in 2018 and 2019.

#### 3.3.1 Production and climate conditions in Maputo

Maputo is located in the tropical wet climate zone<sup>15</sup> and has an average temperature of 22.7°C, summer rainfalls and dry winter months. Recent years have shown that extreme weather conditions are on the increase, with droughts and floods impacting on farm production. Maputo is further challenged by climate variability: heavy rainfalls between January and March cause periodic floods and the city's water dependency on the Pequenos Limbobo Dam about 40km from the city and the Umbeluzi River that originates in Kingdom of Eswatini (Swaziland) leads to water shortages in summer, which in turn affects agricultural productivity, prices and pest pressure.

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<sup>14</sup> Parts of this chapter were already published in Paganini et al. (2018)

<sup>15</sup> According to the Koeppen-Geiger classification

The impacts of climate change are a huge farmer concern. 77% of the interviewed farmers stated that climate change causes production pressure (n=368). 91% of the producers mentioned that the main impact was a decrease in production due to either droughts or heavy rainfalls (n=318). 7% felt that climate change had led to an increase in pests (MP\_B\_17, n=318, multiple response).

### 3.3.2 Vegetable production in Maputo

The following chapter observes the value chain and describes production and climate conditions, the cultivated commodities, production systems and methods, inputs and their distribution channels, and the distribution and marketing of vegetables in Maputo.

#### 3.3.2.1 Commodities

Cabbage (variety tropic giant), lettuce and pumpkin (for its leaves) are the most commonly cultivated crops in the investigated areas together with local leafy vegetables, which serve as basic ingredient for *matapa* (sauce from cassava leaves with peanuts and coconut). The market demand for these products is high, production costs are affordable, and the production cycle is short. The fast turnover (30 to 45 days for lettuce) makes them a rewarding cash crop. Crops such as green beans, onions and white cabbage are also sought after on the market, but the production cycle is comparatively long (90 days), production costs are higher and pests occasionally challenge their cultivation. White and green cabbage is mostly imported from South Africa, in winter Maputo's farmer produce Choumellier Kale. The humid conditions of Maputo's production areas challenge the scaled production of fruit vegetables such as tomatoes, peppers and aubergines. Few farmers cultivate beans or peas, kale, root vegetables, mostly beetroot, broccoli or cauliflower and herbs like basil or chives. Diversification of large-scale production thus remains weak, with production essentially concentrating on the same crops over and over again.

According to a study by Cachomba et al. (2016) 99% of growers produce cabbage, followed by lettuce (94%), kale (44%), carrot (22%), beetroot (21%), green beans (21%) and the indigenous pumpkin (leaves) (18%). The UFISAMO baseline survey showed similar results (mainly diverging for pumpkin): 100% cultivate lettuce, 99% cabbage and 85% pumpkin leaves (17\_B\_MP, n=369). Fruit crops like tomatoes are only produced by 62%, onions by 77% of the farmers (n=369).

Fruit trees (e.g., citrus, mango, papaya) are cultivated on association plots but also at home. In ancient Mozambican belief, a fruit tree in the backyard brings the family luck. 74% of farmers had fruit trees in their *machambas*, 51% had papaya trees (n=344) and 36% mango trees (n=343), (17\_B\_MP). The fruit VC was not assessed in the research, since most farmers grow fruit trees for their own consumption. In the peak seasons, street vendor prices decrease by 50% compared to the rest of the year, when most fruit is imported from Kwazulu Natal or Mpumalanga in South Africa. Processing fruit to juice is carried out at Compal Juice (a Portuguese factory) in Boane.

#### 3.3.2.2 Production systems

Based on field observation (2016, 2017, 2018, 2019), different types of production systems can be distinguished in Maputo:

Table 3: Overview of production systems in Maputo

Overview of production systems in Maputo	
	<p><b>Home gardeners</b> carry out gardening activities for multiple purposes. It is widely practised and provides people with direct and indirect benefits. It is estimated that approx. 80% of the population of KaMubukwana and KaMavota conduct backyard/home horticultural activities, compared to 20% in Maputo as a whole (McCordic, 2018).</p> <p>Home gardens are typically more diverse in terms of crops and production methods than plots in the green zones, but likewise focus on leafy vegetables. Most households also have at least one fruit tree (mango, papaya, avocado). Many households keep a small number of livestock (ducks, chicken, pigs or fish) (Flores, 2018).</p>
	<p><b>Public Space producers</b> make use of derelict areas in the city that are easily accessible, such as public land close to settlements or roads, but also private land around hospitals, the university or the airport. The latter is often used as maize plantations, but also cassava (leaves used for basic staple food matapa).</p>
	<p><b>Small-scale producers organised in associations.</b> Farmers have one or more marketing channels. They sell to local markets or through intermediaries directly from their field. They share the land (divided into beds) with other farmers and benefit from the association's organisational structure.</p>
	<p><b>Small-scale producers not organised in associations.</b> The production site is mainly the green belt of Maputo. These farmers supply local markets and neighbourhoods or sell via intermediaries. They are not organised in associations and thus face land insecurity and don't receive extension.</p>
	<p><b>Commercial producers in associations</b> possess larger landholdings (200 beds and more) and have more opportunities to market their products. They usually own a vehicle, employ a higher number of laborers and live close to their fields. The transition from small-scale to commercial producer is not clear-cut. These farmers are mostly part of associations and have leading roles, i.e. president or production manager.</p>
	<p><b>Farming companies.</b> The Agro-Mahotas farming company is the only one known to practise commercial vegetable production on 20 ha of land in Maputo. It sells to supermarkets, hotels, restaurants and private companies.</p> <p>Between Matola and Boane/Namaachea there are several farms, which produce tomatoes, onions, potatoes and leafy vegetables on scale.</p>

Source: Paganini 2016-2019

### 3.3.2.3 Inputs and distribution channels

The relevant inputs for urban agriculture in Maputo are land, seeds and seedlings, fertiliser, pesticides, water, tools, transport, labour and knowledge. The constant increase in input costs pushes up production costs and makes it more difficult for producers to buy suitable and sufficient inputs. Due to their limited financial resources and lack of storage facilities, small-scale farmers tend to buy according to need rather than in advance. 65% see a great challenge in the lack of access to micro-credits and finance (17\_B\_MP, n=288).

**Land** for production is primarily available in the *zonas verdes*, in backyards and on fallow public land all over the city. The production area in the *zonas verdes* consists of 1 300 ha of farmland and was originally set up to feed the city during the civil war (1977 – 1992). Prior to this, Maputo had a food production belt in the peri-urban area, stretching to Matola, Boane and Namaaca in the east to Maracuene in the north of Maputo. Existing farmland is under pressure, however, due to growing urbanisation and housing disputes, salinisation and somewhat vague urban food plans for the future. Using agricultural land to create housing has become a serious problem in many parts of the green zones and led to enormous pressure on arable land. Even during the relatively short UFISAMO research period, this could be seen along the coastline '*costa do sol*', where arable land has been turned into construction sites for malls, hotels and upper-class housing investment areas.

On average, producers use their own land for production, which is organised into so-called *canteiros* (single beds). These single beds average 2-4 sq. metres in size and are cultivated by farmers within the association frame. Two per cent of farmers cultivate on less than 10 *canteiros*, 51% farm on 10–50 *canteiros*, 21% cultivate more than 50 *canteiros* and 26% produce on more than 100 *canteiros* (17\_B\_MP, n=338). As a rule, *canteiros* are farmed for several years and inherited by the children. Between the associations and in the peri-urban area, government land is still available and has not yet been developed. Neither has it been categorised as agricultural land. Associations have been approaching the city to develop land in the area of KaMubukwana for agricultural use.

When asked how long production had taken place on their plots, farmers replied that around 4% of the plots were established prior to 1970, 15% were initiated between 1971 and 1980, 18% between 1981 and 1990, 26% between 1991 and 2000, 22% between 2001 and 2010 and 16% started since 2011 (17\_B\_MP). This shows that urban agriculture in Maputo is a growing activity and not simply a historical phenomenon. Land titles are not given to individuals but instead to associations that represent legal entities and are involved in the process of applying for DUATs (*Direito do Uso e Aproveitamento da Terra*). Currently, 18 of 25 associations in the research areas have valid DUATs, allowing producers to use the land for agricultural purposes (João, 2018).

Most land is used by families and the production rights are handed down to the next generation.

**Seeds and seedlings** offered in agricultural stores, so-called *lojas*, are supplied for the most part by Stark Ayres, Mozasem, Lusosem and a few other companies. They are usually imported from South Africa, China or India. Mozasem and Lusosem repack imported seeds in Mozambique, all of which are chemically treated GMOs and patents by large international companies. These imported seeds are expensive (400 MZN for 20 g) and labelled (in English) 'toxic', 'not edible' or

'treated with venom'. Most local farmers, however, fail to understand the English instructions. For 38% of farmers, the *lojas* are the main seed source, while 57% state that they buy them informally, 33% use the *casa agrárias* (local office of the municipality) as their source, 10% buy seeds from other farmers and 16% produce their own seeds (17\_B\_MP, n=369). Organic certified seeds are not accessible in the context of urban agriculture in Maputo. 62% of farmers state that they produce their own seedlings, with some selling to other farmers (17\_B\_MP). *Agro-mahotas* and the NGO ACDI/VOCA (until 2017) produce larger amounts of seedlings (17\_MP\_I). Few associations have greenhouses and aim to set up nurseries.

Farmers stated in in-depth interviews that the poor seedling germination rate, the growing cost of small quantities and dependencies on agro-dealers are huge problems. *La via campesina* and UNAC are lobbying for local seed libraries and looking to strengthen traditional varieties. Farmers further claim that most consumers prefer products from imported seeds. In other words, they find local lettuce too curly and crispy compared to (imported) *battavia* and butter lettuce varieties. Independent farmers in KaTembe outside of the CMM and MASA extension network produce local seed varieties on scale for their own production. In these locations, full beds are used to grow seeds. Most farmers in Maputo have a poor knowledge of seed harvesting.

**Fertilisers:** 97% of the interviewed farmers use chicken dung as a fertiliser (17\_B\_MP, n=369). It is purchased by intermediaries in the fields or directly from chicken producers. The common chicken dung is mixed with sawdust. Alternatives are chicken dung mixed with rice husks, dung from cattle and litter made from the leftovers of oil extraction from the *mafura* tree. The quality of the fertiliser in operation is difficult to rate, as its principal source is commercial agriculture. Information on the use of antibiotics in commercial livestock agriculture remains vague.

90% of farmers also use mineral fertilisers (n=367), such as liquids (34%) or pellets, to boost growth periods. Mineral fertilisers are imported and distributed via stores and mobile agents, and sold in small quantities at local markets. Only 19% of farmers produce homemade compost, while 77% of the interviewed farmers buy their compost (17\_B\_MP, n=198), which is basically manure as most farmers do not distinguish between compost and manure. Associations have no composting areas but could supply their own producers with compost regularly and generate jobs.

**Pesticides** are used by 90% of the interviewed farmers (17\_B\_MP, n=364) and usually imported from South Africa (partly illegally), China and India. Most of the pesticides used in the fields cannot be identified, as they are bought in plastic bottles without a label. Stores offer a wide variety of pesticides. Some products are officially banned in Mozambique, e.g., pesticides containing Metamidofos and DDT, but informal agents are highly active when it comes to providing banned or unlicensed products from old stock, illegal imports or purchases at the border. These agro-dealers are highly active in the green zones. They provide direct support and carry out (costly) follow-up visits. Pesticides are known in everyday language as '*medicinas*', giving them a healing connotation.

Generally, the price per litre decreases with the purchase of large amounts. Informal traders often mix pesticides and the sprayed ingredients are difficult to trace. Farmers frequently use herbicides (Glyphosate) to avoid weeds and manual weeding. Field observation shows that empty containers are not properly disposed of but left in the fields. At least 57% of farmers use masks or

protective gloves (n=333), 51% of the interviewed farmers feel that work in the green zones is affecting their health (17\_B\_MP). Farmers mention back pain, being exhausted and pesticide risks as the chief health concerns. Spraying equipment is an additional risk as tubes are leaky or spray heads broken. This leads to the uncontrolled application of chemicals. Consumer deaths from locally grown cabbage in 2018 reopened the discussion on more public control of pesticide use and a stronger focus in extension training on their appropriate application.

The **distribution channels** for inputs are called *casa dos agricultores* or *lojas* for short. These are input retail stores that provide seeds, fertiliser, pesticides, and spraying equipment. The stores are mostly located in the production zones. Agro-dealers also retail products in the fields. These mobile agents supply small quantities and accept delayed payments, which explains why farmers tend to purchase inputs informally. The origin of the products sold by mobile agents is not always clear, however, since they are not usually sold in the original packaging, leaving the brand name unknown. Products on offer at input stores mostly come from China, India and South Africa. Some mobile agents travel between South Africa and the production sites, trading inputs. Instruction leaflets on safe handling practices and how to use these products are rarely translated into Portuguese (or English) or available from informal vendors. Informal conversations with input vendors in the course of field observation showed that some of them are not informed about the quality, use or risks of their products. The instructions mobile agents give to farmers are likewise unclear. ACDI/VOCA has supplied farmers with technical equipment, seedlings and seeds.

ABIODES is planning to set up a system to train farmers in the production of agro-ecological inputs such as organic fertiliser and organic plant protection products for selling purposes.

**Water** availability can be limited during long periods of drought and is generally scarce in the dry season at the beginning of the year. The very dry summer of 2019 forced many farmers in Maputo to postpone the production start. Where water is drawn from pit holes, dependency on reliable rainfalls is high. During the rainy season, fields in the lower areas cannot be cultivated due to very high water tables or floods. In the lower lying production sites, drainage systems are essential during this time if flooding is to be prevented.

Water quality is a concern when it comes to human safety. Water taken from the Infulene River is likely to be polluted due to nearby industrial areas, mainly 2M-Brewery and human settlements, where latrines are disposed of in the river. In addition, the cleaning of spraying tools for pesticide application is often carried out in the same water source and/or close to the fields. Salt contamination in water varies but obvious signs (salt crust) indicate risk. Water from pit holes may show a high salt content, notably in KaMavota, since some of the associations are close to the ocean.

**Labour:** Farmers usually work half days at their plots (52%) starting very early in the morning, 43% indicated that their farming activities kept them busy all day long (17\_B\_MP, n=365, multiple response). Most small-scale producers employ one or two workers for support. The more *canteiros* (beds) a farmer cultivates, the more workers are contracted. These farm workers are responsible for irrigation, harvesting and the application of pesticides and fertiliser and are also organised in associations, e.g., the watering association. In some cases, members of the family work the plots together: 60% (n=363) of farmers stated the use of extra labour (57% family support, 45% hire someone) (n=249, multiple response). Where family support exists, it comes in 45% of cases in the form of the farmers' children (17\_B\_MP, n=148).

### 3.3.2.4 Production methods

Production methods in the Maputo associations are based on simple small-scale farming practices. Those applied are determined by environmental conditions, the cost and availability of inputs, farming knowledge and advice received, as well as by the 'farmers' production philosophy' – see agro-ecological production below. As the main challenges to production, farmers stated pest pressure and lack of pesticides (26%), lack of quality seeds (23%), lack of fertiliser (23%), climate change (14%), irrigation and lack of water (12%), and the absence of markets and funding opportunities (10%) (17\_B\_MP, n=506, multiple response).

#### A) Conventional production

The majority of farmers in Maputo adhere to the conventional techniques described in the table below. The chart is organised in the eight production steps of the urbanGAPs (see Chapter 5.1.1). The focus here is on farmers organised in associations.

<b>Table 4: Overview of production cycle status quo in Maputo</b>
<b>Farm vision and site selection</b>
All plots within associations have a similar structure. The sole distinguishing factor is the size of the farm land available and thus the number of <i>canteiros</i> involved. The aim of most farmers is to produce with a quick turnover and sell complete beds. Alternative farm layouts are hard to find. One demonstration plot ( <i>Associacao Eduardo Mondlane</i> ) promoted intercropping. Some farmers use the edges of the beds to plant chillies or herbs for self-consumption.
<b>Production and crop planning</b>
49% of the interviewed farmers plant according to season and 45% always plant the same crops (17_B_MP, n=367). As cash crops, lettuce and cabbage determine the planning. To avoid financial losses, farmers clean the soil straight after the harvest and begin planting for the next cycle.  Crop rotation is practised by 81% of growers but not systematically (n=366). In other words, soil fertility is not strengthened (e.g., with legumes), nor do light feeders follow heavy feeders. Further, green manure is also not considered in the crop rotation. Lettuce basically follows cabbage and cabbage follows lettuce. In the hot summer months, farmers primarily plant lettuce. Farmers tend not to keep records, with only 9% stating that their production planning is recorded (17_B_MP, n=368).
<b>Seeds and seedlings – Nursery and transplanting</b>
According to an IIAM study, seeds represent the largest input cost for farmers in the green zones (Cachomba et al., 2016). That said, very few producers with spare land produce their own seeds for lettuce or cabbage. Seeds are usually covered for germination with straw or palm leaves for 15 to 20 days, after which the seedlings are transplanted to the beds. In many cases, the ideal time for transplantation is exceeded. During the warm season in particular, many pricked out seedlings die. The risk of failure is even higher after heavy rain or hail, e.g., in the transition period between the cold and warm seasons, as well as during the rainy season. The use of nets to protect seedlings has been observed in a few cases but is too costly for most farmers and not promoted by the local extension service. Farmers state that the seed quality in terms of germination is poor. Further, traditional seeds are hard to come by and only a small number of farmers continue to plant local varieties. 57% of farmers buy seeds from informal vendors, 38% state local stores as their source, 33% obtain the seeds from the <i>casa agrárias</i> , 2% from NGOs, 16% produce their own seeds, and 10% buy seeds from other farmers (17_B_MP, n=369).
<b>Land and soil preparation</b>
After each production cycle, farmers lay out new beds ( <i>canteiros</i> ), shape the soil, equilibrate the level and work in manure. This technique prevents both the natural build-up of organic matter and the establishment of soil rich in nutrients, micro-organisms and bacteria. Mulching is a rare occurrence despite the availability of mulching material around the associations (i.e., reed, grass, leaves and sheets).  Inputs such as compost, raw manure or organic fertiliser (pellets) are expensive. Hence farmers usually decide to

<p>use chemical inputs subsidised by the government.</p> <p>85% of farmers think their soils are fertile for production. Manure is used by 97% in the course of preparing the soil (17_B_MP, n=369).</p>
<b>Soil management and soil fertility</b>
<p>Farmers do not use machinery: Tilling, planting, weeding and harvesting are all done by hand with the support of simple picks. Herbicides are used for weeding.</p> <p>Soils have no humus layer. In the lower areas close to the river, soils have an increased loam content. Salinity and acidity are a problem and a key factor in limiting plant growth (Tostao, 2009), which can in turn lead to the abandonment of production (see box on salinity below). Farmers use chicken dung for fertilisation, usually after planting and integrating crop leftovers into the soil (which can be questionable in terms of pest control). Soil building and soil fertility are rarely taught in the context of urban agriculture in Maputo. At the same time, 85% of the interviewed farmers consider their soils good, a perception that seems at odds with the use of mineral fertiliser to boost crop growth (17_B_MP, n=366).</p>
<b>Fertilisation</b>
<p>97% of the interviewed farmers use manure to fertilise their soils, 53% apply compost and 34% use mineral liquid fertilisers (17_B_MP, n=369). The term compost is unknown in the <i>Changana</i> language and the words manure and compost are often used as synonyms.</p> <p>Only 19% of farmers have their own compost heaps (n=198). Farmers using agro-ecological techniques, apply homemade liquid fertilisers. This is mostly manure mixed with water to strengthen plant growth.</p>
<b>Water management and irrigation</b>
<p>Watering is labour-intensive. It is done manually with water poured from watering cans directly onto the plants. The water itself comes from pit holes, streams, the Infulene River or tanks, some of which are filled by generator-driven pumps. Wells are few and far between and expensive to boot. They also require official permission via application. Irrigation is carried out individually and frequency changes depending on temperatures. Observation has shown that farmers irrigate throughout the day, even in the heat. 99% of interviewees use manual irrigation techniques (watering can, mostly without a sprinkling filter) (17_B_MP, n=368). Drip irrigation is rarely practised by small-scale producers due to lack of technical equipment. ACIDI/VOCA has been promoting the use of drip irrigation on demonstration plots. The implementation of drip irrigation systems in the associations would reduce water usage immensely, decrease water stress (mainly with lettuce), minimize labour and increase production efficiency. A study conducted by IIAM pointed out the advantages of drip irrigation: apart from plant growth advantages, the material (hose pipes) is cheap and available in South Africa. One hindering factor of implementation is the individual farmer structure in the associations and the irrigation association's fear of losing jobs.</p>
<b>Pest and disease management, field hygiene and weed management</b>
<p>Farmers have little knowledge of pest and disease prevention or plant protection. Field hygiene is a major challenge, e.g., farmers leave rotten and infested leaves or roots in the beds after harvesting.</p> <p>Interview results indicate that 90% of farmers use pesticides (17_B_MP, n=364). Due to high pest pressure, notably on cabbage in the warm season, both legal and banned pesticides (Metamidofos, DDT) are applied liberally without safety measures. No producer, small or large, was found to be using the appropriate protection when spraying. This is due to the high price for equipment. Mixing pesticides is a common practice when it comes to making pest control more effective. Insecticides are used frequently in the area and in large doses, primarily on cabbage plants. A study by Cachomba et al. (2016) shows evidence of a positive correlation between the quantity of insecticide applied and the financial situation of the producers. The latter claim they stop spraying five to seven days before the harvest. Calling compliance with these requirements into question would not be unreasonable. Further techniques to strengthen plants and to make them more resistant against pests are not incorporated into the production system.</p> <p>One of the few examples of non-chemical protection is the distribution of tobacco leaves around the beds to protect plants from snails, the use of piri-piri and garlic teas or a liquid based on papaya leaves.</p> <p>Pesticide drift from conventional production areas into agro-ecological spaces is, however, a common cause for concern.</p> <p>Residue control is carried out by the municipal authorities on a highly irregular basis if at all.</p>



Harvesting and post-harvest handling
Harvesting is done manually and farmers harvest the <i>canteiros</i> completely. If they sell to <i>maguevas</i> – which is usually the case – the latter do the harvesting. The products are mostly sold without on-site washing. The production areas have no storage facilities. Neither is there post-harvest handling of the principal crops – cabbage and lettuce. Very few farmers dry chillies for self-consumption.
Source: Paganini

## B) Agro-ecological production

The term 'agro-ecology' was introduced to the Maputo context by the French NGO ESSOR in 2010. In the last eight years, ESSOR has trained approximately 1 000 farmers (see Chapter 3.9) in agro-ecological principles and techniques.

Altieri, one of the main researchers in this field, describes agro-ecology as an approach that integrates ideas and methods of several subfields, ranging from ecological movements to agricultural science and indigenous and traditional knowledge (Altieri, 1995). Agro-ecology is a research field, a set of principles and foremost a social movement. The movement goes beyond food and nutrition security and reclaims food as the right of every human being. Food is seen as political and not merely in terms of availability or the number of calories required for survival. It incorporates the freedom to choose what kind of food, the variety, and the origin (Kühn & Paganini, 2018).

The project implemented by ESSOR was taken over by the local NGO ABIODES, a UFISAMO partner in Maputo. The NGO continues to train farmers in agro-ecological techniques. Sixty farmers actively apply agro-ecological principles in the field. This figure dropped during a short extension stop in late 2018 but increased again in 2019. The crops are sold through the intermediary ComOrganico or at local markets and fairs. Longer growth periods mean higher production costs for farmers and consequently higher prices for consumers. The ABIODES training includes learning how to apply organic plant protection to the products, so-called bio-pesticides. Farmers use a mix of chili and ginger, soap and chili, papaya leaves and garlic in order to wash leaves and protect the harvest from pests. Application of these techniques by farmers is mostly performed with a strong extension service and accompanied by technicians. Very few farmers are convinced of solely concentrating on agro-ecology. These farmers have also established their own marketing channels.

In 2018, an in-depth survey was conducted with farmers connected to ABIODES. Nine farmers were interviewed in KaMubukwana (three males, six females), 14 farmers in KaMavota (all female). 57% of these farmers state necessity and 39% income as the chief motivation for their farming activities (18\_AE\_MP, n=29, multiple response). The baseline survey conducted with all farmers shows a similar tendency. Neither is there any difference in the main crops cultivated, i.e., lettuce and cabbage, with beet root mentioned as a third crop. These are the crops that sell most and whose market demand ranks highest in agro-ecological production. 76% of these farmers nevertheless plan to increase crop diversity (n=21). The key challenges mentioned are: pests (25%), heavy rainfalls and floods (18%), lack of equipment (18%), absence of markets for agro-ecological produce (15%), and lack of finance (10%), (n=23).

As a production system, agro-ecology plays only a minor role in Maputo's green zones. Production in areas that have not been the focus of UFISAMO, i.e., KaTembe, KaNyaka or the production belt from Matola to Boane and Namaacha, are based on organic methods to a greater extent. The movement has, nonetheless, been introduced by ESSOR and UNAC to small-scale farmers, thousands of whom have received training. Training centred on production techniques related to organic pest management (application of chili suds, spraying of liquids with papaya leaves or the use of soap-water to wash off pests) and plant fertilisation (application of manure). A holistic concept of a range of agro-ecological principles and the strengthening of the social and political component of agro-ecology needs to be reinforced. During this research, the perception of agro-ecology was assessed in different interviews. Interviews with 15 presidents of associations with conventional production methods confirmed this understanding: 84% of presidents had heard about organic agriculture (n=25), 68% understand agro-ecological agriculture as farming without chemicals, 4% interpret organic agriculture to be farming without manure, while another 4% have no grasp of organic agriculture (17\_P\_MP). Farmers belonging to the agro-ecology group (trained by ESSOR and ABIODES) explain agro-ecology as natural agriculture without chemicals (47%), a production improvement (16%), and a betterment of their own health (15%). 11% admitted they had no idea what agro-ecology means (18\_AE\_MP, n=20, multiple response).

These results indicate that farmer and president perceptions of agro-ecological agriculture by no means adhere to the principles involved, i.e., holistic techniques, a strong focus on soil-building, let alone the social and political component. Instead, this perception and the in-depth survey with trained farmers is primarily based on agriculture that forbids the use of pesticides (17\_MP\_P & 18\_MP\_AE).

Demands for a farmer-based seed system, strict control of chemicals, drip irrigation systems and cooperation rather than competition between associations did not arise among the interviewees. Despite the many years of NGO support, there is still a considerable need for awareness training, the empowerment of small-scale farmers and policy lobbying for consumers and knowledge brokers if the *zonas verdes* are to shift towards a more agro-ecological production area.

The *zonas verdes*, however, are dominated by conventional and commercial agriculture, with more sustainable production found in the area outside the two green zones. The island KaNyaka strictly prohibits chemical imports and around 1 000 farmers practise organic production methods for self-consumption and local markets on the island. The same applies to KaTembe, where the government extension service, agro-dealers and *maguevas* fail to reach a great many farmers. As a general tendency, production for self-consumption or local markets is far more sustainable than commercial agricultural activities in the *zonas verdes*, which aim for a quick economic turnover. Also, farmers are extremely disconnected from consumers through the *magueva* system.

### 3.3.3 Distribution and marketing of vegetables in Maputo<sup>16</sup>

#### Markets, distributors and marketing channels

Produce selling in Maputo works for the most part through the *magueva* system (Paganini & Fernanda 2019), an informal system of intermediaries. Most farmers sell their three main products through two or three *maguevas*, who then bring the produce to local markets, stalls and restaurants. The baseline survey shows that only 15% bring their own produce to local markets, while 9% sell it within the communities (n=360), 91% through intermediaries (n=366) and 36% directly from the field (n=65) (17\_B\_MP).

Small-scale farmers in particular depend heavily on intermediaries. Informal intermediaries are the principal channel for farmers to market their products directly in the fields. As stated by Cachomba et al. (2016), farmers work part-time as *maguevas* to augment their income. *Maguevas* are mostly young men and women, while the selling is done by female traders. They mostly work in family structures, especially when they have a fixed market stall. Several intermediaries also export vegetables from Maputo to South Africa, e.g., pumpkin leaves and lettuce.

The *maguevas* visit the fields in the mornings, some of them on a daily basis. The sale unit for cabbage, lettuce and pumpkin leaves is one bed (*canteiro*). If a deal is made, intermediaries harvest the crop, sort out poor quality produce and occasionally cut the roots before taking the produce to markets or customers. Products are transported to other places in the city in wheelbarrows, on *bakkies* or bundled in cloth and carried on the head. They are sold directly to consumers or retailers, mostly at informal markets and street stalls in the afternoons and evenings. It is estimated that the number of *maguevas* (middlemen) is equal to the number of farmers, although there are no reliable figures to support this claim. Their highly informal business causes complications in the value chain through daily price speculation, informality and lack of hygiene and safety.

Throughout the city, farmers sell their produce in their home communities at weekly local markets, either from small mobile stalls or on the ground.

Street markets exist in the whole city and throughout the day. They are also found close to other markets. The markets are crowded, and goods are usually exposed to sun, sand, dust and traffic emissions. Some stalls provide protection from the sun with a simple awning. Vegetables are occasionally dipped in water to make them look fresh. In general, the products are washed prior to selling them, although the origin of the water is not clear. As a rule, products left over from the previous day is sold first, before fresh produce is offered to customers.

Formal intermediaries such as ComOrganico and CAVA were established by NGO projects in Maputo and are one main marketing channel for farmers who adhere to agro-ecological principles. Since the cultivation cycle of their crops is longer, these farmers look for higher prices. The small community of mostly expats working for embassies or international NGOs in Maputo are willing to pay more. ComOrganico (founded by ESSOR) retails products from agro-ecological

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<sup>16</sup> This chapter has been translated from a research report on Maputo markets. Paganini & Fernanda (2019): Mercados Locais na Cidade e Província de Maputo. Relatório de Pesquisa Qualitativa

production directly to customers. Alternatively, consumers can order from an online shop. In the beginning, ESSOR set up a Participatory Guarantee System (PGS) to certify producers and sell their crops labelled in small stores or deliver them directly to customers per order. The system, however, suffers from insufficient customers and inconsistency in the quantity and varieties delivered. Consumers can purchase agro-ecological products directly at the Friday market in Laulane and the *Mercado da Terra*, a monthly event in the wealthier part of the city. The selling points established by ESSOR are no longer in operation. CMM could provide a market stall at the central municipal markets for NGOs and farmers who lack capacity. This, however, has not yet been implemented.

The NGO ABIODES has begun to link producers to restaurants and cooperates closely with ComOrganico. A number of farmers have established their own selling networks and advertise their produce in WhatsApp groups.

Another niche market is KOSMOZ, a holistic eco-centre. KOSMOZ uses urban produced agro-ecological crops in its own restaurant and intends to establish a weekly stall to sell the crops of farmers associated with ABIODES (18\_MP\_I) in the Embassy area of the city.

Fairs are organised on a regular basis in the suburbs or at key points in the city by *casas agrárias*, NGOs or the City of Maputo. Growers are provided with a platform to sell their produce free of charge and promote agro-ecological practices. CAVA (ACDI/VOCA) buys vegetables from farmers in the field and sells these products through their partners. The *Mercado do Terra* fair takes place every first Sunday of the month in an affluent area of the city. Some farmers stated selling at a Sunday market was challenging due to church activities. One focus group discussion tackled the notion of relocating the Friday market for agro-ecological farmers in a local community (Laulane) to another area with the potential for more customers.

There are more than 63 markets and five fairs within the city, ranging from the large wholesale market (Zimpeto) to formal markets and small local markets. Of the 63 markets, 30 are formal and 33 informal. Maputo City has 18 000 registered traders. The 'Mercado e Ferias' City Council (CMM) has seen a decline in the number of concessionaires from 24 000 in the last five years (Paganini & Fernanda, 2019). On the other hand, informal street commerce has increased. People sit on street corners and crossroads on the ground and sell small units of fruit and vegetables. Hygiene conditions are poor, with products exposed to the sun, exhaust fumes and dust all day long. In the Mozambican context, marketing is a low-income business. The goal is to make a daily profit that is spent directly on food, transportation or energy.

Maputo markets can be divided into five categories. Wholesale markets, formal retail markets, informal *magueva* markets, local farmer markets, and informal street markets. Special markets such as fairs and the *Mercado do Terra* (special market once a month with agro-ecological products) are not included in the categorisation. There are three wholesale markets in Maputo: Zimpeto, a permanent and mainly wholesale market, and Malanga and Fajardo, both of which play a subordinate role to the Zimpeto market. The wholesale markets are retail points between producers and consumers. In Maputo City, at least one intermediary (*magueva*) is inserted between the producer and the wholesale market, and between the wholesale market and the consumer. Retail markets are set up in buildings or market places. They have fixed market stalls and tables, and infrastructure that includes ATMs, toilets and food stalls. Here permanent booth owners buy

their *magueva* products. Many stands are small containers offering dry products and staple foods. Alcohol and cigarettes are likewise sold at these markets. Many of them have bars. Markets such as Janet or Malanga have small tailor shops or wig shops with natural hair. Producers who sell at these markets are a minority. Zimpeto supplies the largest amount of products and depending on the distance to Zimpeto, prices can increase by 50%. Informal *magueva* markets are found on the streets or outside the official markets. Here, sales operate mainly on the ground and traders sit on *capulanas* (kind of sarong) or plastic bags (locally known as *dumba-nengue* - 'trust your feet' - stalls that can quickly disappear if officials or police come around to check licenses or collect fees). The products, which are sold in small units, are exposed to dust and exhaust fumes. As a general rule, the traders are *maguevas* who resell their daily purchases in small portions. The traders here sell leafy vegetables bought from the fields or Zimpeto products (tomatoes, potatoes, onions, peppers and citrus fruits). The largest informal retail market is Xique-lene. Fresh and dried fish and seafood are also sold along the street. Compared to formal markets, the number of producers is higher. As in the case of informal markets, informal street markets are individual stalls or *dumba-nengue* vendors offering products as individuals on street corners. The vendors are divided into *maguevas*, who sell products from the green zones or *maguevas* who sell Zimpeto products. There are also numerous informal stalls for chips, sweets and fruit. Prices are similar to informal markets, small units are about 50% more expensive when extrapolated to retail quantity. Food safety and hygiene are a very big risk in these sales channels.

In the past five years, some 5 000 retailers have switched from formal or informal markets to '*dumba-nengue* street stalls'. The municipality of Maputo is planning to counteract this informality and integrate traders back into market structures, notably for safety reasons and not least because of the link to child prostitution and drug trafficking.

The green zones also have local farmer markets. The only regulated market is the open-air Friday market next to the Laulane market. This is the local selling point for farmers involved in the ABI-ODES agro-ecological value chain. Variety depends on the season. Due to the divergent cultivation, however, the supply is greater than that of *maguevas*, who mainly sell local vegetables. Local community prices are slightly higher than those for conventional vegetables (e.g., 40 MZN conventional cabbage, 50 MZN agro-ecological cabbage). Farmers are being asked to relocate to another space where they can sell their own products once a week or every two weeks.

A market assessment drew the following conclusions:

- The table shows that the further away from Zimpeto, the more expensive the product. Local production is cheaper than imported production;
- Even distant markets like Boane and Marracuene depend on the Zimpeto market;
- Prices vary considerably according to season. During the national production peak between August and October, prices are about five times less than during the main import season in January;
- The smaller the unit resold, the more expensive it is. This affects especially the poor, who buy in small portions and do not buy in bulk (10 kg bags);

- Depending on the season, a farmer receives between 200 and 600 MZN – in mid-summer 1 200 MZN – for a salad bowl containing about 30 heads of lettuce weighing about 10 kg. That is, between 10 and 30 MZN per kg. One kg of lettuce is sold for an average of 40-60 MZN. This is a price increase of 200% which remains mainly for the various *maguevas*;
- The more *maguevas* are involved between the *canteiro* and the consumer, the more expensive the product. From Zimpeto to the Malanga market and informal street markets means a gradual price increase along the way. A similar trend has been observed from the Janet market to Zimpeto and/or Zimpeto to the Laulane market.

The relocation of informal street traders is a political objective. This would increase hygiene and, so the view of city officials, counteract the side effects of informality, such as crime. In search of work, many take the informality path – to the detriment of producers and consumers.

The involvement of more intermediaries from the field to the client leads to an increase in the price of products (as each *magueva* wants a margin), but not to higher income for the farmers. *Maguevas* determine prices on a daily basis. In this case, the union is also obliged to establish price transparency at the level of the entire association and, if necessary, to sell as an association to a retail market.

The Zimpeto market is the largest wholesale market in Mozambique, where products arrive from different parts of the country and South Africa. Wholesale products are sold directly from trucks and *bakkies* (South African name for pick-ups) to the retailer (*magueva*), who repackages the products and sells them to local markets or from stalls. Zimpeto market is located in the northern part of Maputo and was founded in 2006 with the objective of supplying Maputo City and its surroundings with different types of products grown by local associations. It sells wholesale and retail products from the provinces of Maputo (Boane, Namaacha, Moamba, Manhiça), Inhambane (Inharrime), Niassa (Lichinga), Nampula (Malema), among other national points, South Africa and China (Paganini & Fernanda, 2019). Local production peaks between the end of August and the end of October. During this time there are practically no products from the neighbouring country, prices are cheap and, apart from the Green Zones, products are available from Moamba, Chókwè, Chibuto and Boane. Producers repeatedly demand that the border with South Africa be closed. The short period of high production in Mozambique, however, would not be enough to feed the population. The municipal administration also promotes imports, since products tend to be more hygienic despite long transport routes and as they are grown according to production standards.

Markets differ in formality and informality. Around 18 000 traders are active, a number that has declined in the last five years, coupled with growing street trade activity. The City of Maputo is in the process of reworking the value chain system towards the former wholesale market system.

Zimpeto market is one of the central markets in Maputo, where vegetables from the surroundings of Maputo, other parts of Mozambique or South Africa arrive first. It is the cheapest market in town. Initially, Zimpeto was organised as a wholesale market, but has gradually become a mix of wholesale and retail market. Numerous petty traders purchase their wares there. Some traders at Zimpeto sell their products in bags or crates directly from the trucks. In general, products from South Africa are bigger in size, of higher quality and well packed in comparison with local

products, which are poorly packed or not at all. Intermediaries from all over the city come to the Zimpeto market to buy vegetables in large or small quantities and sell them elsewhere in town or directly to their customers. Due to peak production in Mozambique, the Zimpeto market is a key source of food to counteract food insecurity. Government is attempting to open the market further to include South African producers in order to overcome food shortages.

Three (South African-based) supermarket chains operate in Maputo: Spar (also through Mica), Woolworth and Shoprite. In Matola, the Foodlovers supermarket plays a significant role in the advertising and promotion of national products. Good Trade, in the centre of Maputo is the only organic store, which provides mostly South African and few local products. Most of the Portuguese owned supermarkets import EU-certified organic products. Spar actively tries to increase the range of local products offered in cooperation with SOLIDARIDAD. Supplying supermarkets calls for suitable storage facilities, basic washing, disinfection, and packaging of the required varieties and quality. Continuous provision all year around of high quantities of consistent quality is also a requirement. This is one of the main reasons for the inability of small-scale producers to sell through supermarkets.

### **Market prices and units**

Market prices vary according to season and market type, and depend on factors such as the complex negotiation process between producers and intermediaries: intermediaries usually argue that producers set the prices, while producers claim that intermediaries do so. Prices can vary even throughout the day. Field observation and focus group discussions have shown that a bed of lettuce, for example, costs 200 MZN in the winter season and can increase to 1,200 MZN in the summer season. Also, the sale per unit (as in the case of root crops or selling at the agro-ecological market) might ultimately be more profitable than the sale per bed (18\_MP\_FGD).

In general, profit margins are low, especially in the winter and it is unlikely that they are sufficient to ensure a reasonable income for most producers.

### **Adding value**

The processing of vegetables is not common in Maputo, primarily because lettuce and cabbage as the principal crops cultivated are usually not processed. IIAM and ABIODES promote vegetable processing for commercialisation and as an incentive to increase product income. Juices, chutneys, jams and salads are promoted at special markets to attract potential customers. Cakes made of vegetables are marketed to encourage farmers to enhance the nutrition of both children and adults. Elefante Piri-Piri, a South African company, supplies hot sauces containing chillies and tomatoes. The crops were produced by farmers trained by ACDI/VOCA (17\_MP\_I). These products are offered at special fairs and the monthly *Mercado da Terra*, where farmers and NGOs active in the food area present their products.

### **3.3.4 Maputo: Challenges and opportunities in vegetable production and marketing**

In general, agricultural production in the city has the potential to create windows of opportunity, networks, and access to markets, inputs and knowledge. The proximity of actors allows for the generation of short value chains, greater access to niche markets and economic opportunities

such as job creation, income and increased exchange. At the household level, urban agriculture can contribute to diet diversity with additional nutrients (vitamins and minerals). It is also instrumental in greening the urban environment. Agrobiodiversity, for example, is higher in many cities than in the monocultural rural areas (see Chapter 2.1).

The urban context, however, is far from risk free. It begins with site selection and the need for research on the land use prior to its conversion into agricultural land. The previous land use must be taken into account (e.g., was it a dumpsite, military land, a construction area?) and its proximity to possible contamination by hazardous industrial areas or roadways. Urban spaces harbour the risk of contamination by, for example, heavy metal residues, industrial pollution, human settlements and traffic. Health risks associated with urban agriculture are often the consequence of inadequate sanitation such as the use of polluted water, untreated greywater and wastewater leading to pathogenic organisms, which in turn affects crops.

The risks, challenges, benefits and opportunities of urban agriculture vary from city to city and should be explored with care.

The following table analyses the benefits and opportunities, as well as the risks and challenges of urban agricultural production in Maputo. These results of a baseline survey and the multi-actor workshop on urbanGAPs conducted in July 2018 in Maputo were validated throughout the research with field observation and interviews with key informants.

<b>Table 5: Assessment of urban agriculture in Maputo</b>	
<b>Benefits and opportunities of producing in the urban context</b>	
<b>Benefits</b>	<b>Opportunities</b>
<p><b>Food and nutrition security</b></p> <ul style="list-style-type: none"> <li>▪ Farmers add nutrients to staple diets, farmers contribute to household income and reduce food costs. Improve diversity in daily diets</li> <li>▪ Farmers increase household income with urban agriculture activities, which supports food security</li> </ul>	<p><b>Food and nutrition security</b></p> <ul style="list-style-type: none"> <li>▪ Include more farmers in home garden programmes to increase nutrition security. Empowerment of association farmers as independent producers could increase income</li> <li>▪ Increase the production of staples in peri-urban areas, i.e. rice in Maracuene, sweet potatoes, corn in Maputo</li> </ul>
<p><b>Local economy, markets and marketing</b></p> <ul style="list-style-type: none"> <li>▪ Fresh produce is sold locally, Informal economy increases. Short distance between consumers and producers (mainly important for perishable products)</li> <li>▪ Farmers are well connected in their neighbourhoods to establish local markets and enter direct value chains</li> <li>▪ Farmers benefit from <i>maguevas</i> system, as marketing activities is sourced out</li> <li>▪ Marketing of agro-ecological products to wealthier markets is still at the beginning</li> </ul>	<p><b>Local economy, markets and marketing</b></p> <ul style="list-style-type: none"> <li>▪ Maputo has huge potential to increase local marketing in the communities through diversification. Increase of niche markets, direct producer-consumer relations could enhance farmers' income. This needs support for local farming, as prices for imported goods outcompete locally grown crops</li> <li>▪ Transport as the main challenge could be an opportunity to increase local food in local markets, if a system to reduce transport costs in the City of Maputo is found</li> <li>▪ Growing demand for niche products</li> <li>▪ Growing demand for local ethical support of small-holder farmer</li> <li>▪ Growing desire of chefs and restaurants to link directly with urban farmers</li> </ul>
<p><b>Greening the city</b></p> <ul style="list-style-type: none"> <li>▪ <i>Zonas verdes</i> are green zones that attract animals</li> </ul>	<p><b>Greening the city</b></p> <ul style="list-style-type: none"> <li>▪ Fruit trees, perennials or hedges could increase the quality</li> </ul>



<p>and insects, adding diversity to the urban context. Urban agriculture creates a healthy environment, reduces pollution and increases oxygen. These positive environmental effects are curtailed by the use of pesticides and fertilisers</p> <ul style="list-style-type: none"> <li>Green zones are an important water receiver during the rainy season, particularly in the 'cimento' area of the city, where a drainage system is lacking</li> </ul>	<p>of urban green</p> <ul style="list-style-type: none"> <li>The green zones will play a future role as air exchange corridors</li> </ul>
<p><b>Production</b></p> <ul style="list-style-type: none"> <li>More than 14 500 farmers (11 200 of whom are in associations) can make a living and contribute to Maputo's urban food system with their production (see Chapter 3.5)</li> </ul>	<p><b>Production</b></p> <ul style="list-style-type: none"> <li>Production increases that consider staples could stabilise food prices in the future</li> </ul>
<p><b>Community building</b></p> <ul style="list-style-type: none"> <li>Farmers are organised in associations, which helps to access the land use title as a community</li> </ul>	<p><b>Community building</b></p> <ul style="list-style-type: none"> <li>Local community markets could strengthen producer-consumer relations at local level and provide healthier food in urban food deserts</li> <li>Moving associations to cooperatives could increase farmers community power in terms of marketing, access to other markets and common sourcing of inputs</li> </ul>
<p><b>Knowledge, Exchange and Networking</b></p> <ul style="list-style-type: none"> <li>Farmers obtain traditional knowledge</li> <li>Poor network activities between farmers</li> <li>Poor network activities between NGOs</li> <li>Poor network activities between policy units</li> <li>Poor network activities between research</li> <li>Poor network activities between actors</li> </ul>	<p><b>Knowledge, Exchange and Networking</b></p> <ul style="list-style-type: none"> <li>Overcoming silo structure of NGOs and departments could encourage knowledge exchange and extension service to have frequent and much required follow-up visits in the field</li> <li>Potential to increase agro-ecological training of farmers</li> <li>Strengthen the link between traditional knowledge and crops by using simple techniques (e.g., drip irrigation) so as to increase production and move it towards more sustainable practices</li> <li>Strengthen multi-actor networks to foster exchange of knowledge, resources and finances</li> </ul>
<b>Risks &amp; challenges of producing in the urban context</b>	
<b>Risks</b>	<b>Challenges</b>
<p><b>Land access</b></p> <ul style="list-style-type: none"> <li>Land rights are not secured and DUAT system remains a policy power tool, urbanisation stresses long-term planning</li> <li>Individuals and farmer groups outside of cooperatives face land use insecurities</li> <li>Much farm land has already been lost in the area of <i>polana caniço</i> and Costa do Sol due to construction</li> </ul>	<p><b>Land access</b></p> <ul style="list-style-type: none"> <li>Securing land rights by lobbying at policy level</li> <li>Securing land rights calls for other organisational forms and farmer networks beyond associations</li> </ul>
<p><b>Contamination</b></p> <ul style="list-style-type: none"> <li>Punctual soil samples have shown that risk of contamination by heavy metals is given, notably close to industrial area</li> <li>Risk of contamination by inadequate use of pesticides remains high. Cases of food poisoning through pesticide contaminated cabbage reported in 2018.</li> <li>Salinisation of soil, particularly in areas close to the</li> </ul>	<p><b>Contamination</b></p> <ul style="list-style-type: none"> <li>Applying alternative techniques in contaminated spaces such as raised beds, soil exchange to produce safely and avoid contamination by human latrines, livestock, industry and inadequate use of chemicals.</li> </ul>

<p>sea</p> <ul style="list-style-type: none"> <li>▪ Contamination of irrigation water due to industrial areas close to the River Infulene and agricultural land use close to the River Umbuluzi</li> </ul>	
<p><b>Climate Change and Water Use</b></p> <ul style="list-style-type: none"> <li>▪ Farmers face the challenge of floods and droughts</li> <li>▪ Little research done on impact of climate on small-scale agriculture in Maputo and Mozambique</li> <li>▪ Little or no funding to compensate harvest losses due to climate impact</li> </ul>	<p><b>Climate Change and Water Use</b></p> <ul style="list-style-type: none"> <li>▪ Greywater use needs to be trained and other water smart techniques implemented, all of which calls for investments</li> <li>▪ Shift to drip irrigation would reduce water consumption</li> <li>▪ Drainage systems could help to avoid floods during rainy season, especially in the lower lying fields</li> <li>▪ Strengthen research on climate adaptation</li> <li>▪ Increase funding of climate adaptation projects</li> </ul>
<p><b>Pest and Diseases</b></p> <ul style="list-style-type: none"> <li>▪ Lack of knowledge on pest and disease management hinder consistent quality and quantity of produce</li> <li>▪ High use of pesticides</li> <li>▪ Weak soils and weak plants due to ongoing monoculture increases pest pressure</li> <li>▪ Use of prohibited products leads to human health risks</li> </ul>	<p><b>Pest and Disease</b></p> <ul style="list-style-type: none"> <li>▪ Field hygiene should be constantly pursued by farmers to avoid increasing pest and disease pressure</li> <li>▪ Pest and disease monitoring is essential</li> <li>▪ Natural pest management techniques must be implemented correctly</li> <li>▪ Natural pest management techniques should be constantly trained and encouraged by the local extension service</li> </ul>
<p><b>Production Challenges</b></p> <ul style="list-style-type: none"> <li>▪ Inputs are rarely affordable</li> <li>▪ Difficult to obtain organic seeds</li> <li>▪ No record-keeping or evaluation of production process by urban farmers</li> <li>▪ No soil-building techniques applied</li> <li>▪ No diversification in the production plan</li> <li>▪ No proper crop rotation plan in place</li> <li>▪ No crop rotation applied</li> <li>▪ No or very limited cultivation of legumes like beans and peas</li> <li>▪ No GAPs in place (yet)</li> <li>▪ Weak nutrition value of soil, partly contaminated by chrome, lead, copper</li> <li>▪ Pest pressure leads to high use of chemical pesticides</li> </ul>	<p><b>Production Challenges</b></p> <ul style="list-style-type: none"> <li>▪ Implementation of local seedbanks, nurseries, compost production (which works well up to a point)</li> <li>▪ Production planning to increase profitability</li> <li>▪ Lack of tools, inputs, seeds to achieve crop rotation</li> <li>▪ Introduce new varieties for rotation</li> <li>▪ Introduce legumes to feed soils</li> <li>▪ Theft and vandalism</li> <li>▪ Association structure hinders new production principles, i.e., intercropping instead of <i>canteiro</i> system, drip irrigation instead of manual watering, crop rotation instead of turnover production</li> </ul>
<p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>▪ Farmers lack knowledge of pricing, administration, marketing</li> <li>▪ Transport costs are high, very few farmers have a driving licence and owe vehicles</li> <li>▪ Urban farmers depend on middlemen or local markets</li> <li>▪ Urban farmers compete with commercially grown cheaper crops and supermarkets</li> </ul>	<p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>▪ Production of reliable quantity and quality to address markets needs</li> <li>▪ Production planning according to seasons and consumer needs</li> <li>▪ Improve access to markets, transport, finance, labour</li> <li>▪ Improve access to high-end or niche markets</li> <li>▪ Maputo has only a small number of wealthier, ethically aware customers interested in supporting urban agricultural farmers</li> </ul>
<p>Source: Paganini</p>	

### 3.4 Being a farmer in Maputo<sup>17</sup>

*Luisa Chicamisse-Mutisse*

The green zones of Maputo have been used for agricultural production since the colonial era. Today, they are mainly cultivated by more than 11 200 farmers currently organised in associations and registered at the urban agriculture section of the Municipality of Maputo (DASACM, 2018). Apart from these association farmers, the green zones also accommodate individual small-scale producers and numerous home gardeners who – as in other parts of the city - produce primarily for self-consumption. Overlaps between the different types of agricultural producers are the rule rather than the exception. Members of associations frequently have home gardens and households organised in associations tend to have access to plots outside of their homes.

Urban agriculture and farmers in Maputo, however, refers for the most part to the first type, i.e., the green zone associations.

#### **Urban agriculture: occupation and income**

Although farmers may be organised in associations, they use their land and decide individually on production and marketing. They produce horticultural products for local markets on plots of different sizes (see Chapter 3.3) and frequently cultivate more than one plot. For most of them, farming is a profession, not a side-line: 80% of the interviewed farmers in the baseline study stated that agriculture has been their main source of income in the last five years (17\_B\_MP, n=368). This is perhaps a unique characteristic of Maputo, since urban agriculture in other cities tends to be a complementary source of income.

About 20% of surveyed producers indicated that their main income in the last five years was generated by activities other than UA (17\_B\_MP, n=368). They nevertheless recognised the added value of being linked to this activity, since the product surplus from UA during the cool season (May - October) is tantamount to a partial saving of their income.

UA is a survival strategy for farmers and a rather fragile income basis. Living from urban agriculture is not an easy task. The income is volatile and strongly depending on the season and for many farmers not sufficient to satisfy household needs. Due to low income, 23% of producers carry out other activities, for the most part as informal merchants, security guards or construction workers (17\_B\_MP, n=369).

Despite the unstable income gained from UA, 70% of producers think they might earn more money from UA in the future (17\_B\_MP, n=56). This producer optimism could materialise if certain challenges are overcome (training, raising the level of schooling, attracting more young people to the activity and greater intervention in the decision-making process).

#### **Household structure and income**

The average farmer household is composed of six people (17\_B\_MP, n=369), although there are households with a minimum of one and a maximum of 28.

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<sup>17</sup> All figures, unless otherwise noted, are from the baseline study Maputo (17\_B\_MP)

<b>Table 6: Size of farmer households in associations and households in Maputo City</b>						
	Number of people in households					
	1	2	3-4	5-6	+7	Total
Percentage of farmer households in associations (17_B_MP, n=368)	1.6	4.3	23.4	29.3	41.3	100%
Percentage of households in the City of Maputo (INE, 2015)	6.2	8.8	29.7	31.0	24.2	100%
Source: Chicamisse-Mutisse						

41% of households are composed of seven or more people, which in itself can mean greater availability of labour and opportunities for income diversification in the household (17\_B\_MP, n=368). At the same time, where very few family members work in paid jobs, this creates pressure on the limited resources of the family. A look at data on Maputo City shows a prevalence in the case of farmers of large households.

According to the household income survey (INE, 2015), the largest families tend to be poor due to expenses and obligations. The poorest households spend approximately 50% of their income on food and 32% on housing, leaving very little room for other expenses or investments in the future (Tvedten et.al., 2013). In contrast, the richest households spend 38% of their income on housing, 24% on other expenses and only 18% on food (ibid.).

Although urban agriculture constitutes the main source of income in more than two-thirds of farmer households, individual members of the household contribute to the household income with activities other than agriculture. The diversity of these activities is part of the survival strategies that families develop to optimise resources and meet family needs. 11% work in the public service, while others work as merchants, guards or domestic servants, i.e., low-paid jobs that usually require no specific qualifications.

### **Gender and age structure of urban farmers**

Both men and women are active in urban production, although women outweigh the presence of men by far. For many years, female presence in UA was close to 80% of all producers (Malauene, 2002; Cruz e Silva, 2003; Sumbane, 1988). The changes brought about by the Structural Adjustment Programme and the privatisation of public and state-owned enterprises led to increased unemployment of the male population, some of whom embraced UA, which they saw as an alternative means of survival and income diversification, not unlike activities such as masonry, carpentry, informal commerce, and domestic work (Mosca, 2005; Siteo, 2010).

The age of farmers in associations varied from 20 to 98 years. Almost 72% of producers are over 45 years of age, with 42% over the age of 65 (17\_B\_MP, n=357).

The age structure of farmers or, more precisely, the fact that less than 28% are under the age of 45 constitutes a challenge to the development of urban agriculture in Maputo and the survival of the associations (17\_B\_MP, n=357). Low production and diversification rates limit income and reduce the availability of food, which in turn has implications for food and nutrition security. The challenge for older farmers is the physical effort urban agriculture requires, given the absence of

mechanisation and the cost of hired labour. Although a significant number of elderly farmers should be in retirement, they are not integrated into the National Social Security Scheme (INSS). A study by Francisco & Sugahara (2015) shows that the situation of elderly producers in Maputo is representative of Mozambique in general, where the quality of life for people over sixty leaves much to be desired. This is a cause for concern, since Mozambique is one of the countries with the largest number of elderly people (70% of this group still work) and considered the third worst country for the elderly in terms of living out their lives.

There are several reasons for this. In general, the elderly have been unable to put away a reserve during their adult lives, nor did the country undergo a transition from modes of production to forms of capital accumulation. This foiled any attempt at accumulating savings to sustain a social protection system consistent with the demographic reality (Francisco & Sugahara, 2015).

The presence of young people (aged 20 to 34) in farming is extremely low (10%). In the focus groups conducted in KaMavota and KaMubukwana (18\_FG\_MP), the weak presence of young people was explained as follows:

“The main problem is that young people see agriculture as one of the last alternatives for those who cannot find an opportunity on the labour market. They farm for a certain period of time and then abandon it to go looking for other activities.”

“We are looked down on for this activity...the young people who are not with us think that we are in another world because we are farmers...they look at agriculture with a certain disdain and also as an alternative activity.”

“Sometimes they think that we are dirty because we are always on the farm and do not do our nails. They also think that agriculture is an activity for the elderly. But one thing is certain, we young people in the field, we do it for love, we grow up in this environment and we are passionate about taking care of the plants.”

UA is not yet a valid alternative for most young people in the city, despite high unemployment: almost 43% of youth in Mozambique is unemployed. Youth unemployment in Maputo is as high as 60% (MITESS, 2017). There is a visible presence of young people in the fields, mainly as family or casual workers. It is seen as a temporary occupation while waiting for opportunities in other areas.

Interviewees mentioned the need to make the sector more attractive, modernised, mechanised and sustainable through training, information, access to credit, inputs and markets, and specific legislation for the sector that values national products more than imported goods. Moreover, according to those interviewed, there is a need for greater oversight and accountability of the actors involved in the value chain from production to consumption.

### **Provenance of producers and languages spoken in households**

Urban farmers organised in associations are patrilineal and mainly from southern Mozambique, namely, the City of Maputo (39%) and its provinces (12%), Gaza (32%) and Inhambane (14%), (17\_B\_MP, n=170). In patrilineal societies, the public space is predominantly masculine, with women more connected to the domestic sphere, to family life, and more often than not to tasks

related to the reproduction of the domestic unit (Loforte, 2000). This role model is dissolved in the associations (see Chapter 3.6).

The main mother tongues spoken in households are: *Changana*, which is spoken by more than 64%, followed by *Rhonga* (20%), *Chope* (3%), and *Bitonga* (4%), (17\_B\_MP, n=369). *Changana* is the most common language used in the associations in order to facilitate communication and the circulation of information. The fact that these languages have the same origin makes for smoother communication among farmers.

### Formal Education

Only 24% of producers interviewed are fully literate in Portuguese ('read it well'), while 18% can neither read nor write in that language (17\_B\_MP, n=347). In comparison, the country's average literacy rate in Portuguese is of 60% according to UNESCO (2017).

Level of schooling	%
1st elementary school complete/incomplete	47
2nd elementary school complete/incomplete	15
Secondary (complete/incomplete)	11
Higher education (tertiary)	1
Vocational training	2
Literacy course	1
Other	23
Total	100

Source: Chicamisse-Mutisse

Despite basic literacy, the low level of schooling makes it difficult to follow training in Portuguese and renders published information inaccessible to many. Male language proficiency is higher owing to their greater involvement in public life (school, labour market) compared to women.

This language disadvantage limits the general access to information with negative implications for the producers, since almost all actors in the value chain and the media communicate, share information and knowledge in Portuguese. It also excludes the producers concerned from debates on UA. Furthermore, documentation on the internal functioning of the association is in Portuguese, which in the context of non-Portuguese-speaking farmers impacts on these internal processes.

Education is a key instrument for the enhancement of living conditions and fundamental to the realisation of civil, political, economic and social rights, as well as to the reduction of inequalities in the population.

### Information and communication system

Concerning mass media and information, most farmers own a television set (90%), a mobile phone (84%) and a radio (44%), (17\_B\_MP, n=369). Access to UA programmes or interest in re-

search on this subject, however, is limited. 40% (n=337) of TV owners watch agriculture programmes and 27% (n=155) of those with radios listen to programmes on agriculture (17\_B\_MP). Television was cited as the main source of news and information. In everyday life, on the other hand, the exchange of information in the associations is carried out either in person or by telephone.

Access to books (10%, n=109), computers (19%, n=360) and newspapers (7%, n=359) to obtain knowledge on agriculture is low (17\_B\_MP). Most producers ask other producers, members of the household or extension workers for information on techniques, prices, access to inputs and to improve their knowledge of agriculture.

### **Household goods**

Regarding access to goods and services, 91% of the interviewed farmers live in their own homes, built with conventional material, 69% have a rest room, the remaining 31% use latrines (17\_B\_MP, n=369).

64% of households have access to piped water, with the remaining households dependent on private providers (17\_B\_MP, n=367).

Almost all producers use electricity for lighting but prefer to make use of coal and firewood when it comes to preparing food (17\_B\_MP).

Perishable food products are kept in freezers in 56% of homes, while 45% have fridges (17\_B\_MP, n=366). The rest manage on a buy and cook basis, which makes it difficult to preserve what they produce and increases their monthly expenses. Possession of an item does not always mean it is used on a regular or permanent basis. Families with fridges/freezers occasionally turn them off to reduce costs and save electricity for lighting. In general, families develop a series of strategies to confine spending to a minimum.

### **Means of transport**

About 61% of producers use public transport. Only 13% own a car, 3% a motorbike, and 3% have a bicycle (17\_B\_MP, n=366). Producers see lack of transport as a crucial barrier to market access. According to the producers, a car to transport their products to the various markets and consumers in the City and Province of Maputo would reduce their dependence on *maguevas* (resellers), avoid direct competition with South African products, and place the product where there is a deficit, giving the producer monetary advantages.

### **Conclusion**

Maputo's urban farmers in the green zone associations are mostly full-time farmers and their households depend largely on the income generated by farm production. Their economic situation makes them vulnerable. Hence to supplement their low incomes, farmer households work out supplementary income strategies and sources.

Another characteristic that renders farmers vulnerable is the high age of numerous producers and their low level of formal education, both factors that hinder their entrance to the formal job market. Farmer households are larger than the city average, which proves simultaneously to be

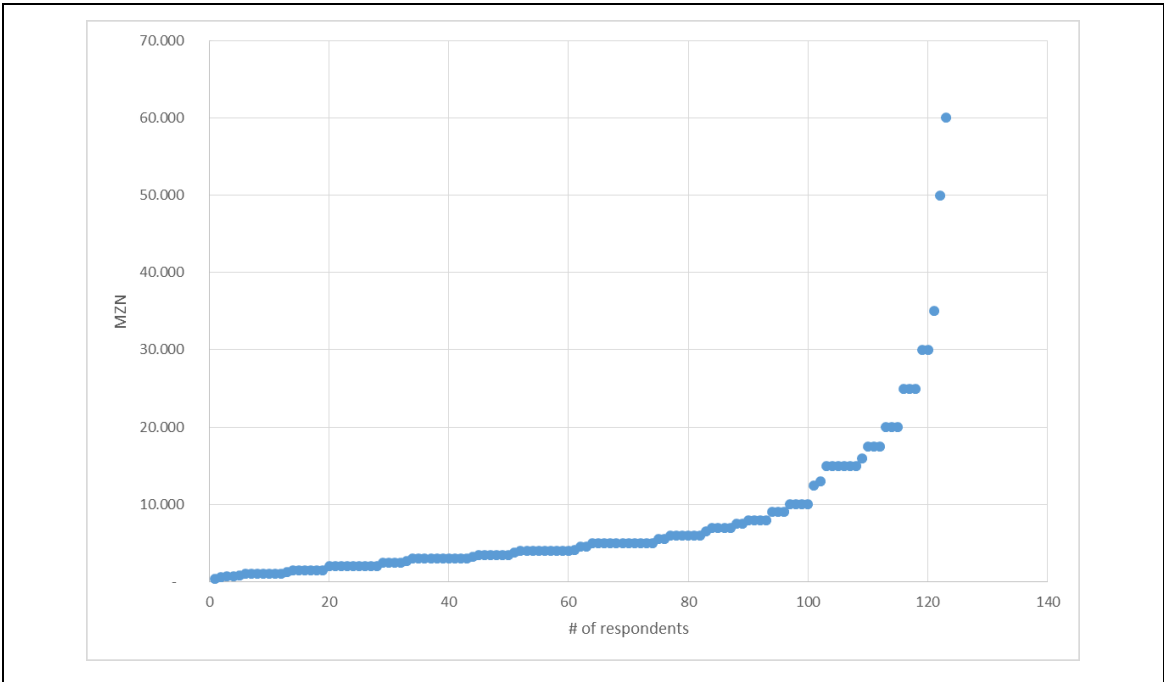
an advantage (family labour) and a challenge (more relatives to be sustained). Most of the farmers live in their own house and are in possession of a television set and a telephone.

Despite the restriction imposed by their socio-economic conditions (low level of formal education, inability to read or write Portuguese, lack of means of transport), they continue to practise UA because it is vital to their income and a source of fresh food.

### 3.5 Brief economic analysis of vegetable production in Maputo

*Erik Engel*

Farmers earn varying incomes from vegetable production, depending on the number of beds (*canteiros*) they cultivate, the season, the quality and price of inputs, and the market prices they can obtain. Despite this volatility, 80% of the interviewed farmers in the baseline study stated that agriculture had been their main source of income in the last five years (17\_B\_MP, n=368). UA is merely a survival strategy for farmers who lack other income opportunities, and a rather fragile income basis at that. Figure 8 shows the range of incomes from crop sales. 124 interviewed farmers reported a monthly average (17\_B\_MP), with incomes ranging from below 1 000 to 60 000 MZN (approx. €15 – 880)<sup>18</sup>. On average, farmers earned 7 500 MZN (approx. €110), most nominations (11) were for 6 000 MZN (approx. €88), 5 respondents said they earned between 350 and 999 MZN (approx. €5-15).



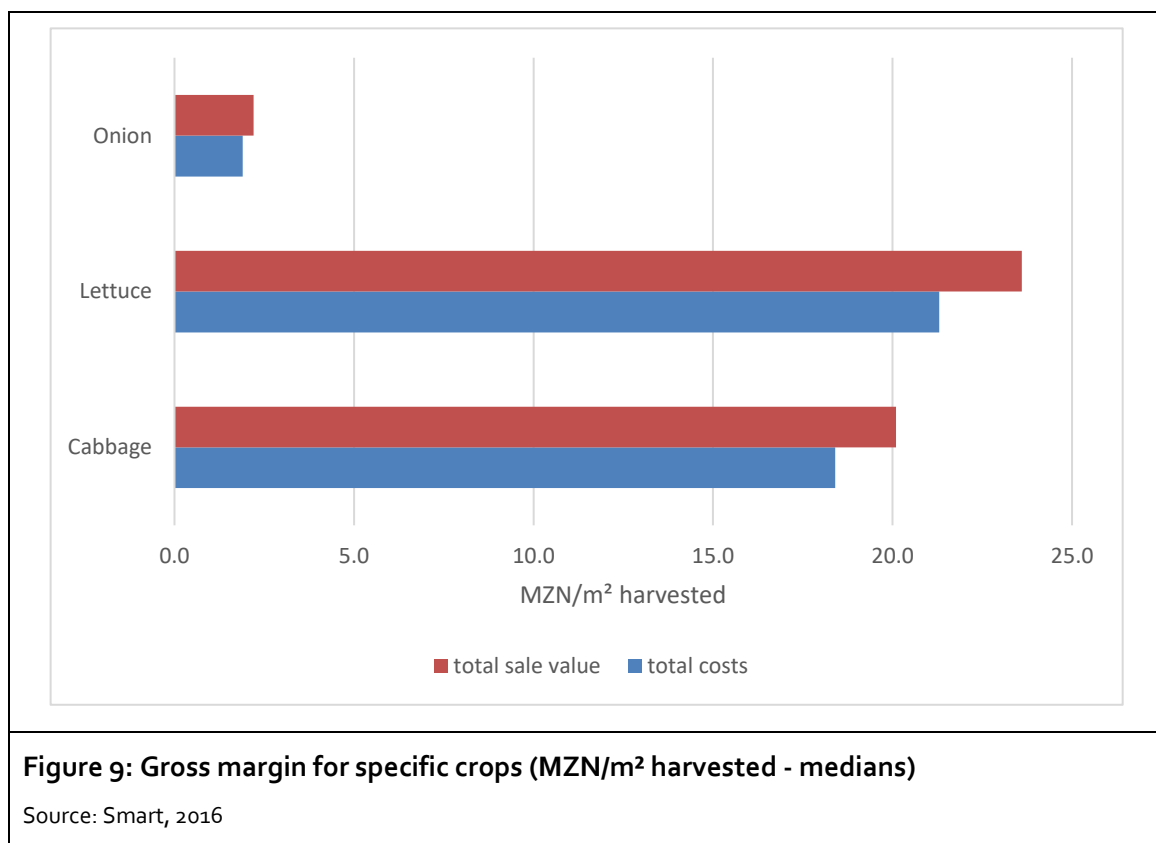
**Figure 8: Estimated average monthly income of farmers in Maputo**  
Source: UFISAMO (17\_B\_MP)

<sup>18</sup> Income data should be treated with caution, as most farmers do not keep income records. It is further unclear whether they refer to income (= turnover) or profit (= total earnings minus production costs). The figures do, however, give an indication of the range and scale of urban farming incomes.



As described in Chapter 3.3.2.3, association farmers cultivate *canteiros* measuring 2-4 m<sup>2</sup>. On average, a farmer works 80 *canteiros* (n=338): 51% cultivate 10-50 *canteiros*, and 26% more than 100 *canteiros*. In a rough estimate, this amounts to an average of 239 m<sup>2</sup> of land cultivated by the average individual farmer.

An article published by Smart (2016, p. 98) indicates expenses and gross benefit related to specific crops (see Figure 9). It comes to the conclusion that producers in Maputo can make an average of 1.7 MZN (approx. 2 cents) per m<sup>2</sup> harvested for cabbage and 1.3 MZN per m<sup>2</sup> harvested for lettuce, the two principal crops.



Assuming that lettuce and cabbage cover an approximately equal surface and assuming an average 1.5 MZN per m<sup>2</sup> harvested, the average farmer can extract 358 MZN (approx. €5) profit every 40-45 days, the duration of a production cycle.<sup>19</sup>

As described in Chapter 3.8.2, the Ministry of Health (MISAU) has defined a food basket to cover the food and nutrition needs of a five-person household that costs approximately 7 500 MZN (SETSAN, 2014). Any profit made from vegetable production is clearly not enough to cover this financial burden. 63% of farmers who replied to the 'income question' in the baseline survey would not earn enough to purchase the food basket – let alone pay for other household expenses (electricity, medical treatment, clothes, schooling, transport, etc.). Only the 'average' farmer would have just enough to pay for the food basket – and that is because 17% of respondents stated their income was between 15 000 – 60 000 MZN (approx. €220- 880).

<sup>19</sup> This figure seems remarkably low. Here, as in the UFISAMO baseline survey, caution is advised with regard to economic data gathered in surveys.

To conclude, urban agriculture does not allow the average producer to generate sufficient income to 'step up', to invest, to put money aside, or to cover more than basic needs, if at all. Nevertheless, urban agriculture is the only economic activity for 76% of urban farmers (Paganini et al., 2018).

Urban vegetable production in Maputo is a marginal economic activity conducted by vulnerable people within the urban community. 42% of producers are over the age of 65 and the majority of these are women, even if the ratio has leveled out from 80% female farmers recorded up to the new millennium to 55% female farmers according to membership lists of associations data provided in 2017. Most of them have no access to the National Social Security Scheme (INSS) and depend on their own labour or family support for income. The implications of this marginal economy on food and nutrition security through income is discussed in Chapter 3.8.

The total production costs, according to Smart (2016), are composed of expenses for seeds/seedlings (cabbage: 21%, lettuce: 45%), fertiliser (cabbage: 42%, lettuce: 17%), pesticides (cabbage: 9%, lettuce: 18%) and payments for daily workers (cabbage: 27%, lettuce: 20%) (ibid., p.99). Association-based seedling production, soil building and crop rotation to reduce the need for fertiliser and integrated pest management could reduce costs considerably. UrbanGAPs (Chapter 5.1.1) and recommendations (Chapter 6.3) take up these findings and provide further discussion.

## **3.6 Organisational structure of urban agriculture in Maputo**

*Luisa Chicamisse-Mutisse*

The current state of Maputo's urban agricultural sector is the result of food crises and state intervention following Independence. This chapter will first summarise the historical background to UA and follow with an overview of the general organisation of producers in the city. The focus lies on farmers' associations as the most important structure in UA.

### **3.6.1 History of urban agricultural development and the influences on its organisational structure**

Mozambique achieved Independence from the Portuguese colonial system in 1975, when the Mozambique Liberation Front (FRELIMO) took over the new government and designed a political and economic model. As a result of this process, the colonists and the invested capital left, a move that led to the crisis in several sectors of the economy. As a means of reversing this situation, the Third Frelimo Party Congress held in 1977 proclaimed FRELIMO a Marxist-Leninist party and saw the adoption of a centralised economic system. Agriculture was defined as the basis of development and a factor that would dynamise industry (Abrahamson & Nilsson, 1994). This new strategy sought

"The denial of colonial and neo-colonial models of development and the continuation of strategies developed during the armed struggle, but highlighting the need for a genuine socialist development based on institutions that (from the government's point of view)

did not promote the exploitation of man by man, namely cooperatives, state farms, state factories, and collective forms of commerce” (Adam, 2005, p. 118).

The creation of ‘green zones’ was launched in response to the food shortages and unemployment arising from the Portuguese and rural exodus (RPM, 1979). The objective of the green zones was to (i) absorb productive and surplus labour; (ii) guarantee urban supplies through farming and livestock production; (iii) promote fishing in rivers and lagoons; (iv) create recreational and landscape areas as a means of complementing measures to ensure an environmental balance; (v) create forest stands for wood extraction, construction material, honey and wax production (RPM, 1979).

The green zone production sector was organised into four separate units: cooperatives, associations, independent small-scale farmers and private business. Home gardeners (*quintaleiros*) were also introduced. At that time, the state intended to mobilise producers and unify them in cooperatives. When this failed, however, several producer categories coexisted.

To assist producers, the state provided technical support (organisation, extension services and access to inputs and markets) through the Office of Green Zones and *casas agrárias*. According to Sumbane (1988), by 1986, about 203 cooperatives with a total of 11 000 members on 580 hectares were engaged in UA; the private business sector with 390 producers occupied 1 787 ha; 60 000 individual small-scale farmers occupied approximately 0.75 ha per household, 0.5 in the dry areas and 0.25 in the wet zones. 64 associations were set up with 8 412 members. Excluding the land and the farmers organised in associations, this amounts to a total surface of over 47 000 ha (compared to 1 300 today) dedicated to urban agriculture and managed by over 70 000 farmers of all types.

The changes that took place after the adoption of the Structural Adjustment Programme (SAP) in 1987 led to a reduction in state support. As a result, a number of producers were unable to cope with the impact of the SAP and abandoned urban agriculture altogether. In the same year, the Administrative Reform was introduced. It reconfigured the space of the City of Maputo, separating it from the present City of Matola, where many of the urban agricultural activities were located. Around this time, talks to end the armed conflict began.

The signing of the General Peace Agreements in 1992 and the beginning of the post-war reconstruction period contributed to the acceleration of Maputo City’s urbanisation, which went hand in hand with pressure from the housing market, ultimately leading to land conflicts. In response to this negative impact on producers and the green zones in the city, the Municipality of Maputo (CMM) sensitised and mobilised independent producers and cooperatives, established associations and formalised their existence with the City Council of Maputo in order to enable them to receive support from different actors (e.g., State, NGOs, CMM).

### 3.6.2 Forms of producer organisation

*With contribution of Ivo Cumbana*

Urban agriculture producers in the City of Maputo do not have a unified organisational structure. Producers in farmer associations are organised in District Unions, which in turn congregate in the

Union of the city. The members of each association are distributed on three hierarchical levels, have different responsibilities and operate on the basis of a set of rules and defined norms (see organisational chart below).

The cooperatives used to join Zone Unions under the umbrella of the General Union of Cooperatives (UGC) but are now gradually dying out. Their internal structure was similar to that of the associations. The few surviving cooperatives, however, have a weak structure: some members have sold their spaces and now operate as independent producers.

Independent small-scale farmers are not formally organised but operate on the basis of family relations of cooperation, complementarity and reciprocity when it comes to household tasks, both in and outside the home.

Apart from the farming types mentioned above, many households practise horticulture in their front or backyards (home gardeners). Home gardening is organised in different ways with the help of relatives or hired labour. The objective is mainly self-consumption, although some produce is sold (for details on home gardening, see Flores, 2018).

Institutions that carry out agricultural activities, such as schools, churches, the Bank of Mozambique (*Banco de Moçambique*) and prisons, are organised according to their specific motivation and objectives. In the case of schools, UA takes place within the 'agriculture and livestock' classes, with the school management, teachers and students as the principal actors: from the 8<sup>th</sup> to 10<sup>th</sup> grade, students practice crop production, and learn about nutrition and animal rearing.

Irrespective of the internal organisation of the different producer categories, farmers receive support from the Municipality of Maputo (CMM), extension workers, NGOs, and Agricultural Extension Services (SEA) of the Directorate of Agriculture and Food and Nutrition Security of the City of Maputo (DASACM). These institutions provide support to associations and schools free of charge. In certain cases, they can request a technician and pay for travel expenses.

### **3.6.3 Farmer associations**

The City of Maputo has about 11 200 associated producers organised in 34 associations that operate in four municipal districts in the field of UA (see Table 8).

Municipal district	Number of associations	Number of producers	Occupied area in hectares (ha)
KaMavota	11	8 791	816
KaMubukwana	15	1 597	422
Katembe	5	162	53
KaNyaka	3	644	9
Total	34	11 194 <sup>21</sup>	1 300

Source: DASACM, 2018

Data available from Malauene (2002) and Chicamisse (2005), when compared with the data above, indicates an increase in the number of associations in the City of Maputo. The KaMubukwana, KaNyaka and Katembe districts increased from 10 associations and a total of ca. 1 800 producers to 22 associations and about 5 000 producers.

Despite a doubling of the numbers of associations and members almost tripling, many association presidents from the KaMavota and KaMubukwana districts reported membership losses in the last ten years. Death, withdrawal due to old age, illness, change of activity, migration, sale of space for housing construction and low production and productivity were some of the reasons (17\_AS\_MP). Combining the low rate of younger members joining the association (see Chapter 3.4) and the information above, it appears that urban agriculture is currently in a period of decline.

Most of the associations (54%) were created prior to the 1990s, with the Office of Green Zones and *casas agrárias* playing a major role (17\_AS\_MP).

### **Association size and gender composition**

The KaMavota and KaMubukwana associations have an average of 320 members. Association sizes, however, vary widely in the two districts, from 60 to 1 915 members in KaMavota and from 11 to 297 members in KaMubukwana. The association with the most members is 'Joaquim Chissano', with a total of 1 915 members, while the smallest is '8 de Março' with a membership of 11 (see Annex 4).

The associations in KaMubukwana district have fewer members (less than 300 members, 142 members on average). Older associations (formed in the late 1970s and early 1980s) with a smaller membership (11 to 297) are found in this municipal district, with women representing between 90 and 100% of its members. KaMavota district, on the other hand, has larger associations (60 to 1 915 members and an average of 601) that are more mixed in their gender distribution and occupy bigger parcels of land.

<sup>20</sup> No farmer associations were identified in the other municipal districts (Imamanculo, KaMpfumo and KaMachaquene). Some residences have small plots with agricultural production, as do occasional vacant lots and/or institutions (e.g., schools, churches, hospitals).

<sup>21</sup> Number rounded to 11 200 in report text.

Association members recognise the advantages of smaller over larger associations and highlight greater insertion; interaction (one respondent said: “we know people by name, and we know something about their family...there are associations where members do not know [each other]... those who are in the same block, yes...but the others do not”); knowledge of the organisation and leadership; ease of attendance control despite poor registration and non-existence of association archives; ease of communication and circulation of information; enhanced division of existing resources; personalised service of extensionists, who know the producers and their area of cultivation; facilitation of knowledge for both members and non-members who attend the association space to either sell or purchase products or provide services. On the disadvantage side they mentioned non- replacement of members of the management but instead an exchange of tasks; membership fees do not always cover Union expenses and fees (17\_B\_MP).

Associations with a large membership have the advantage of collecting more membership fees to cover operational expenses. In terms of disadvantages, access to agricultural extension services occurs at a lower ratio (less members attend sessions), as sessions by extensionists are almost always collective; there is a greater circulation of third parties and informal relations are established (workers and lessees of parcels) beyond the knowledge of management and other members.

In order to facilitate the functioning of these associations and minimise the negative impacts of a large membership, CMM and DASACM have sensitised the associations to resizing. The associates mentioned that they sought to minimise the negative effects of size by forming production blocks. The blocks divide the association into several parcels, each with a production head to manage operations and guarantee the flow of information to different levels.

There are two female-only and no male-only associations. Most associations are mixed, with a higher proportion of women as members. Older studies (Casimiro, 2004; Cruz e Silva, 2003; Malauene, 2002; Chicamisse, 2005) indicate an overall prevalence of females over males active in UA in the City of Maputo. The substantial presence of women is mainly due to difficult labour market insertion as a result of low schooling. In addition, women-headed households and/or women whose husbands work in the South African mines practice UA as an alternative source of income and access to food (Cruz e Silva, 2003).

Focus group participants reported that the overwhelming majority of female as opposed to male members in no way interferes with the functioning of the associations, since there is no gender-based division of labour in UA. They added that the presence of women attracts resources, given that the government and NGOs see them as vulnerable groups. They also contribute positively to member interaction (they create informal savings groups or ‘*xitique*’, support the making of meals at meetings and parties, and play a considerable role in consoling the bereaved or sick families).

Studies carried out in the green zones of Maputo show that the engagement of women in the associations brought about changes in gender relations; women now take increasingly part in the social and economic decisions of the family (Casimiro, 2004; Cruz e Silva, 2003; Malauene, 2002). This allows for improvements in living conditions and livelihoods, such as access to land, food, education, vocational training, and leadership positions.

The male presence in this activity has increased in recent years. Mosca (2005) states that this is related to factory closures and the adoption of the Structural Adjustment Programme. Changes in regional geopolitics also led to the reduction of workers in the South African mines, leaving the national labour market as an alternative. Women appreciate and react positively to male presence, but they believe it to be transitory. They claim that when other opportunities arise on the labour market, men withdraw temporarily or permanently. A study by Siteo (2010) also stated that women are convinced that the increase in male presence in urban agriculture is due to lack of employment.

### 3.6.4 Organisational structure of associations

Farmer associations in Maputo have a formal organisational structure and are published in the Government Gazette (85%). They have statutes (93%) and are enrolled in DASACM and CMM, the state and municipal institutions responsible for agriculture and urban land management, respectively.

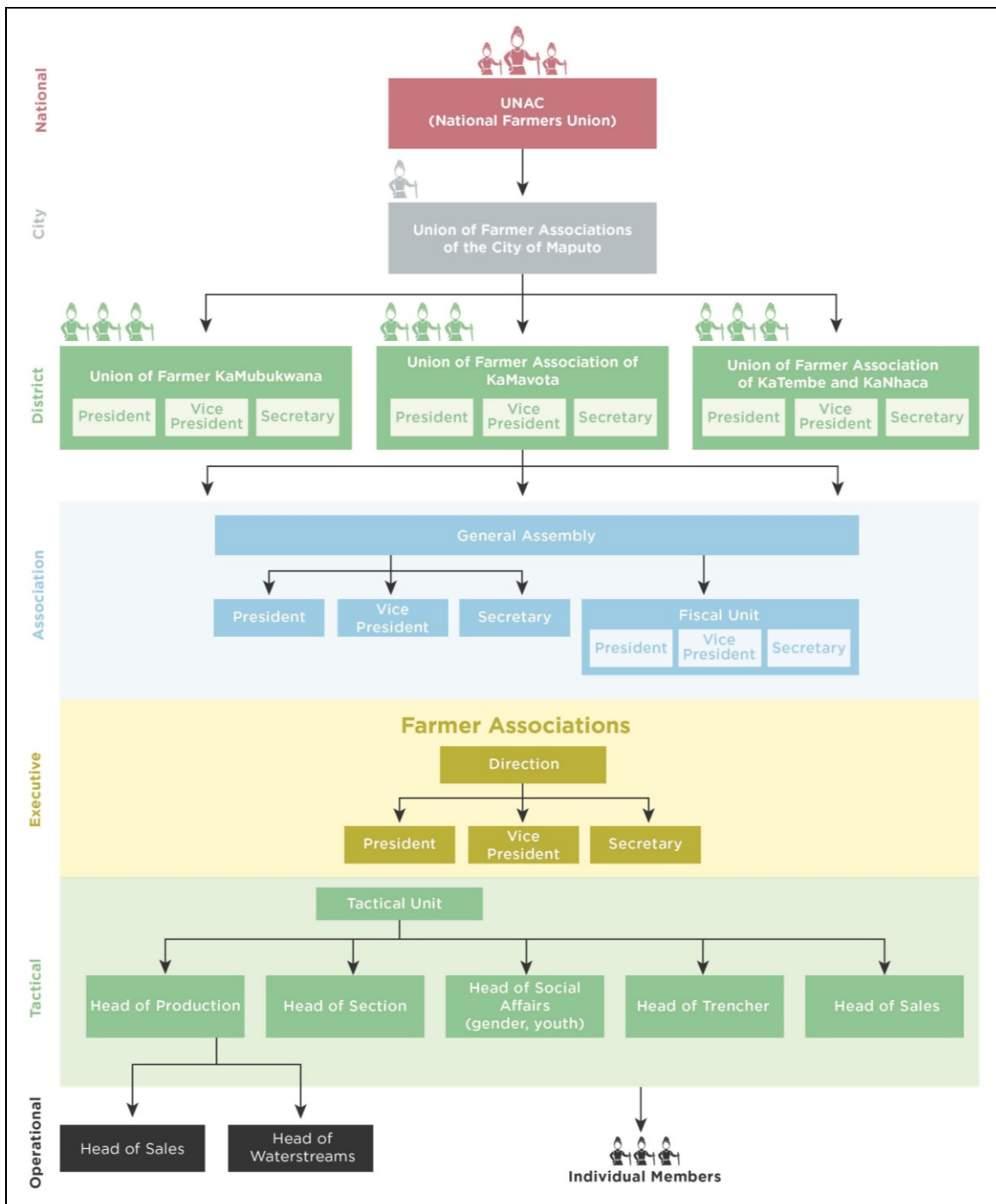
The organisational structure is composed of three distinct hierarchical levels, namely:

1. Union of the City of Maputo: constituted by a president, vice-president and a secretary;
2. Union of the municipal districts, constituted by a president, vice-president and a secretary;
3. Farmer associations organised in three hierarchical levels with individual tasks and responsibilities:
  - Board of Directors level: consists of the General Assembly and the Board of Directors (president, vice-president and secretary). Is accompanied by a supervisory board;
  - Tactical level: mediates between the management and members of the association. It consists mainly of heads of sectors, i.e., production, sub-units (small production units – *chefe de bloco*), social affairs, drainage, treasurer, and sales;
    - The head of production maintains the overview of products and quantities produced on the association land, he/she helps to disseminate production techniques and follows up on pesticide use and other issues such as theft, field hygiene etc. In brief, follow-ups serve to detect whether lessons learnt from the demonstration plots are applied by individual farmers;
    - The head of drainage is responsible for the overall irrigation and drainage system;
    - The *chefe de bloco* are sub-structures of the above-mentioned to support their tasks in large associations;
    - The head of sales (*chefe das vendas*) does not exist in all associations: he/she collects information on market prices in the city, sets a sales price to be respected by all association members, and checks that prices are actually paid by the intermediaries (*maguevas*).

These positions exist in most associations. Due to reservations on the part of association members, they often encounter difficulties when it comes to fulfilling their mission;

- Operational level: constituted by the members of the association. Their function is to produce, to participate in meetings and to ensure production support via demonstration fields.

The General Assembly is one of the association’s most important bodies. This is where the different forms of participation by members materialise. It elects the association's board of directors, approves their activities and proposes amendments to the statutes, regulations and activity plans.



**Figure 10: Organigramm**

Source: Chicamisse-Mutisse & Engel



Association functions can be performed by men and women as described in Table 9 below.

Function in the association	Male	Female	No appointment	Total
President of the assembly	34,6	50,0	15,4	100
President of the association	46,2	50,0	3,8	100
Vice-president	23,1	61,5	15,4	100
Secretary	53,8	42,3	3,8	100
Head of production	61,5	38,8	7,7	100
Head of drainage	69,2	19,2	11,5	100
Treasurer	7,7	84,6	7,7	100
Social affairs	34,6	53,8	11,5	100
Head of sub-units (small production units)	50,0	16,5	33,3	100
Guard	7,7	0	92,3	100%

Source: Chicamisse-Mutisse

Despite the non-gender-based division of tasks and activities, women tend to perform specific functions in the association directorate, namely, treasurer (84.6%) and social affairs (53.8%). The producers mentioned that women are preferred in this context because it is traditional that they perform these tasks within the family and in the community; they are trusted when it comes to managing funds. In turn, men primarily take on the task of head of production (61.5%), drainage (69.2%) and sub-units (50%), since these activities require physical strength and greater persuasion skills (qualities still believed to be more found with men than with women).

In associations with mixed gender distribution, management positions (President, Vice-President and Secretary) are occupied by both women and men. There are no homogeneous directorates. Respondents in focus groups stated that gender equity has gained currency in recent years. In the past, female-only management was not uncommon (18\_FG\_MP).

The formal structure described above coexists with an informal structure that arises from interpersonal relationships within the organisation and affects the daily life of the associations. This is possible because non-members work on association plots as permanent or seasonal workers and on individual plots. Informal traders of pesticides, food and seeds and women who sell meals in the fields are also a component of this informal structure.

Most labourers hired by association farmers are not members of an association but take part in farming activities and knowledge transfer at demonstration plots (CDR) on behalf of their employer. These farm labourers have no decision-making powers on the techniques applied and are sometimes not even aware of the type of pesticide or fertiliser they use.

The relationship between the actors in the two structures is based on trust. It is not regulated by the associations. The parties involved define the rules (e.g., membership fees, service delivery period, activity schedule, obligations to the requester). The relationship itself is dynamic and subject to short, medium and long-term change/modification.

The informal structure can create discomfort in the association, precisely because activities are not regulated. According to focus groups, some associations are in the process of keeping a record of the labour and the *machambas* leased in order to improve management of the lessees – and control them: some lessees are seen as people who cause confusion and possibly steal, e.g., the illegal sale of products in the absence of the owners (18\_FG\_MP).

### **Election, leadership and the decision-making process in associations**

The members of the board are elected by universal suffrage and are known to almost 90% of the association membership (n=369). That said, only 63% of the interviewed producers reported having participated in the electoral process (n=369), 46% of whom considered the process very good, 37% good and 5% adequate (n=263), (17\_B\_MP).

The mandate of the existing bodies in the associations varies from three to five years. Leaders who have been in charge for a long time are coerced into leaving their posts.

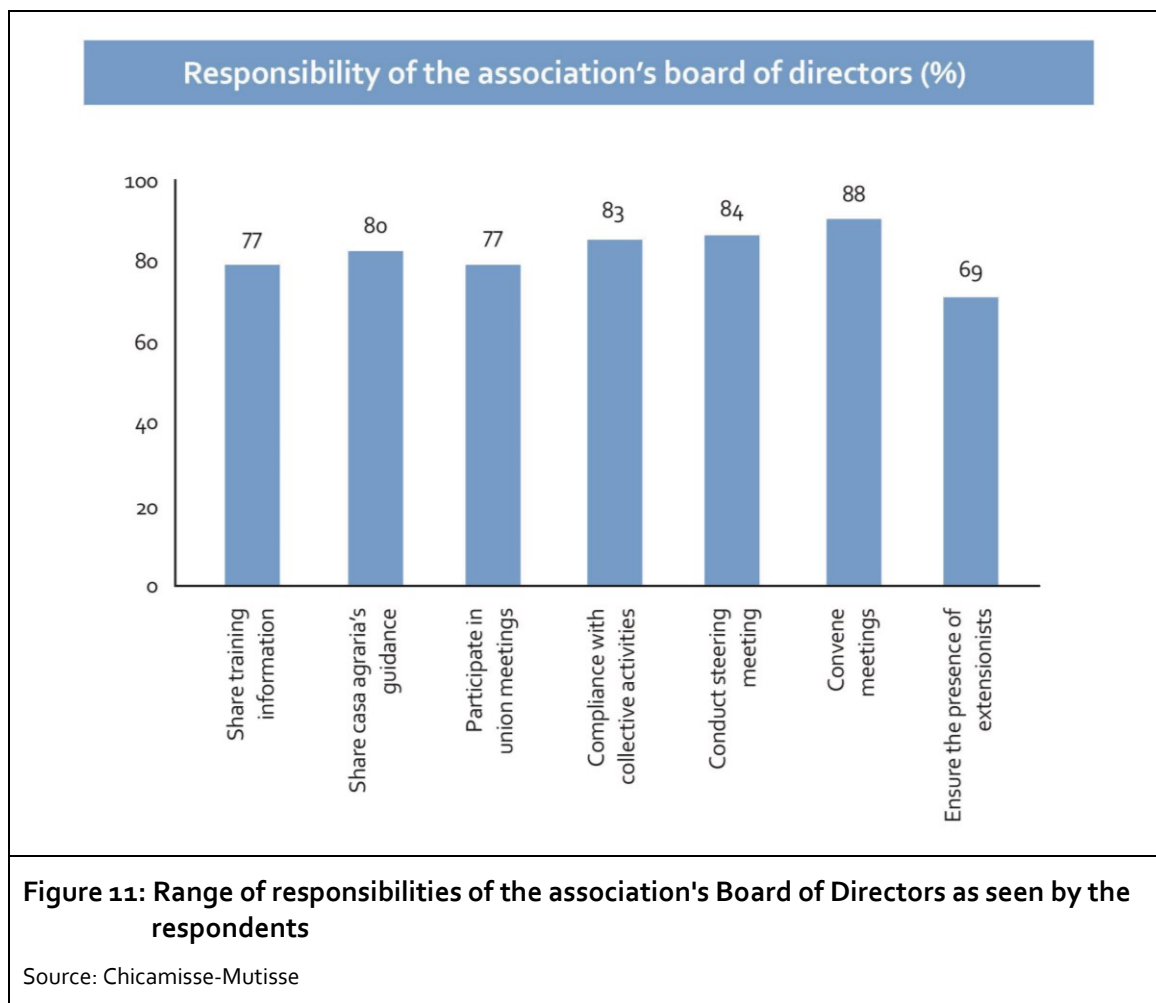
With regard to the competence of the association directors and various sector heads, the focus groups considered the following aspects: i) Leadership: previous experience in managerial positions and performance; presentation of ideas to bring the association forward; ii) Personality: good behaviour, dynamic, active and friendly to other members; irreproachable conduct in relation to the other members of the association and the association rules (payment of membership fees); iii) Engagement: active participation at meetings and engagement with third parties (stakeholders such as DASACM, CMM, NGOs); exemplary in collective activities.

In addition to these aspects, it was mentioned that gender equity should be a factor in the choice of leaders (18\_FG\_MP).

Decisions are made by majority in the General Assembly or at the weekly meetings of the association members. Supervision of compliance with decisions taken is a matter for the management, who may appoint the sector concerned to monitor the process.

### **Activities of board members**

In terms of responsibilities, the association management must ensure the day-to-day running of the association. All members are aware of the range of tasks to be carried out (see Figure 11).



In general, producers are satisfied with their association management and evaluate their work positively. They added that some concerns could be overcome by creating infrastructure, notably a building as headquarters. Such a building would be important for meetings, to archive information and to store products or purchased goods. In this context it was mentioned that meetings cannot take place when it rains. Furthermore, documentation of the association is passed from hand to hand and often poorly preserved.

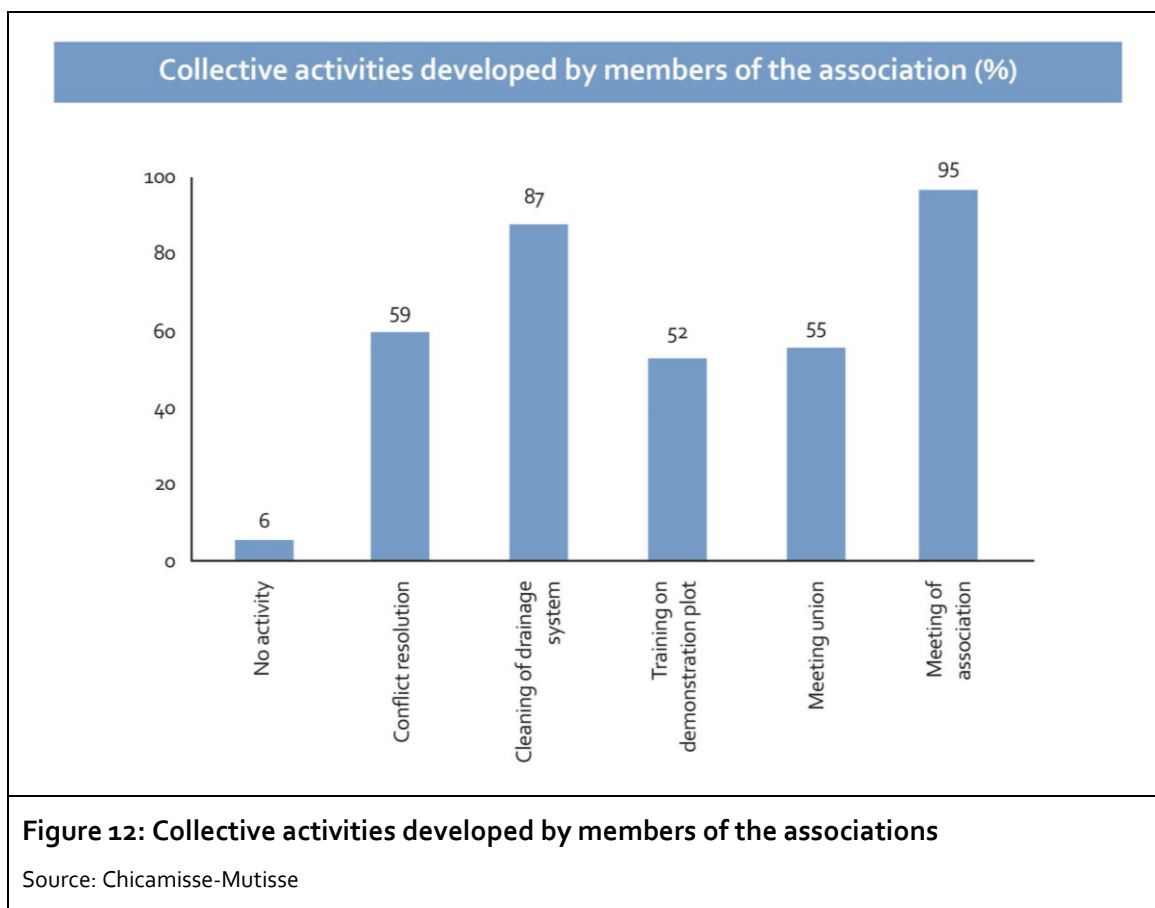
The producers added that the board has serious difficulty in enforcing regulations/statutes (25% of members). Some focus group participants stated, "we often complain about our rights and forget that we have duties in the association (...)". "Some only want the association when there are free benefits to be distributed to members...but when we require payment of membership fees, participation at meetings and contributions to management expenses, they are never available" (18\_FG\_MP). Lack of financial support to build infrastructure or cover daily expenses and the absence of a warehouse were likewise seen as management constraints.

Although the statutes are clear on penalties for non-compliance with established rules and standards, 52% of respondents said that most of the time verbal and written warnings were used instead (17\_B\_MP, n=329). Severe penalties (e.g., expulsion, 9%) are no longer meted out for fear of witchcraft or conflict among the members.

### 3.6.5 Functioning of associations

The associations operate according to the agricultural calendar, with the official opening of activities in March and annually closing from November to February. This period coincides with the appropriate planting period for most horticultural crops and is favoured by climatic conditions upon which cultivation heavily depends. During the off season, some producers take vacations; they work part-time, while others migrate to their *machamba* dedicated to drought-resistant cultures (*machambas de sequeiro*).

With regard to the type of activities practised in the associations apart from growing fruit and vegetables: in 11 of the 26 associations questioned, the members breed poultry and ducks (albeit at home rather than on association land), while members in 5 of the 26 associations have small fish farms. The type of activity performed depends on how much the producer invests in inputs and additional labour if required. Thus, producers make autonomous decisions on what to plant, when to plant, what techniques to use and how to market their products without interference from third parties. Added to individual productive activities are the collective activities that guarantee the functioning of the association as shown in Figure 12.

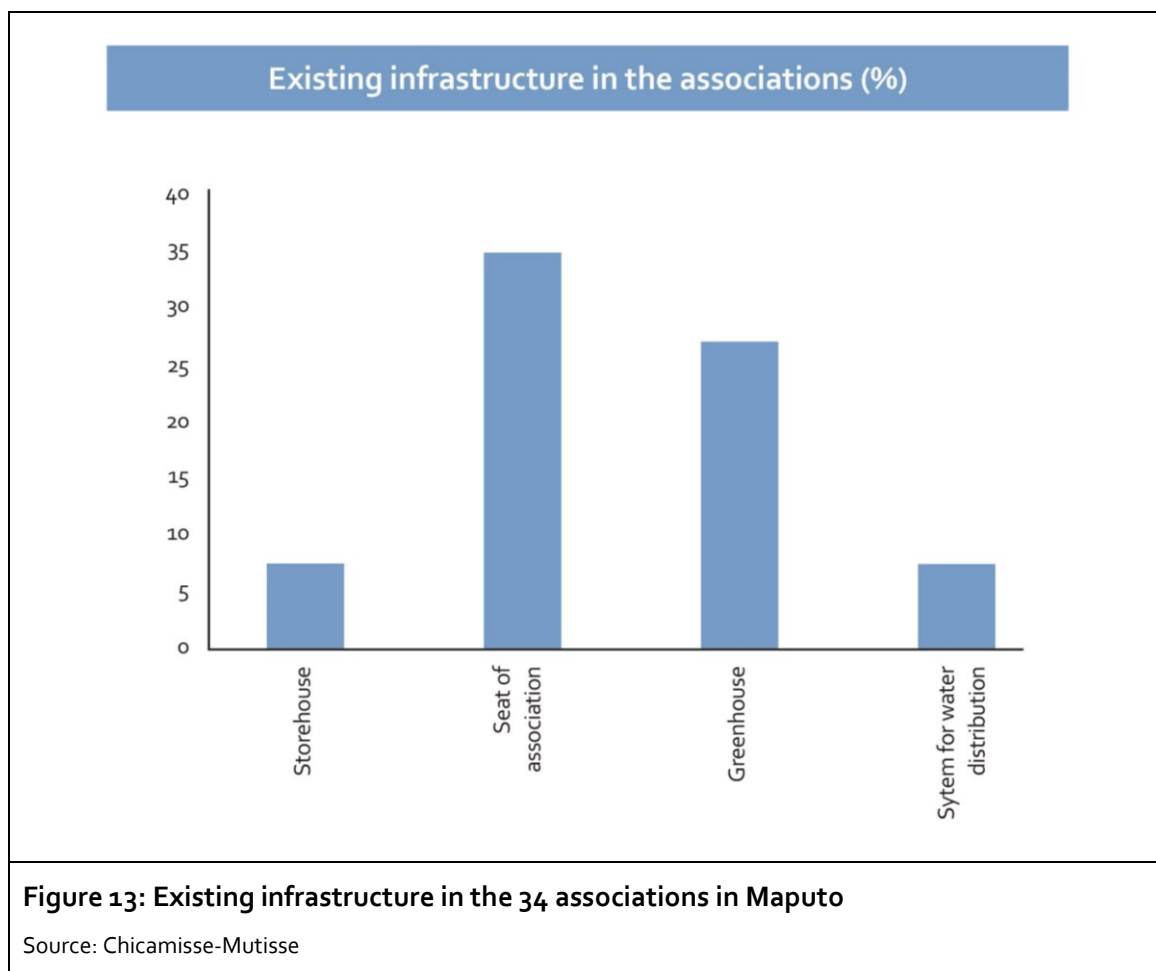


Association members participate in activities as a rule, evidencing both the high potential of associations for production and the commitment of their members. Only 27% reported having difficulty with participation in collective tasks (n=368). Lack of time for 78% of respondents (n=89), 8% lack of money (n=88) and 2% lack of appreciation for ideas (n=87) put forward by the members were among the reasons mentioned (17\_B\_MP).

### 3.6.6 Material resources and assets in associations

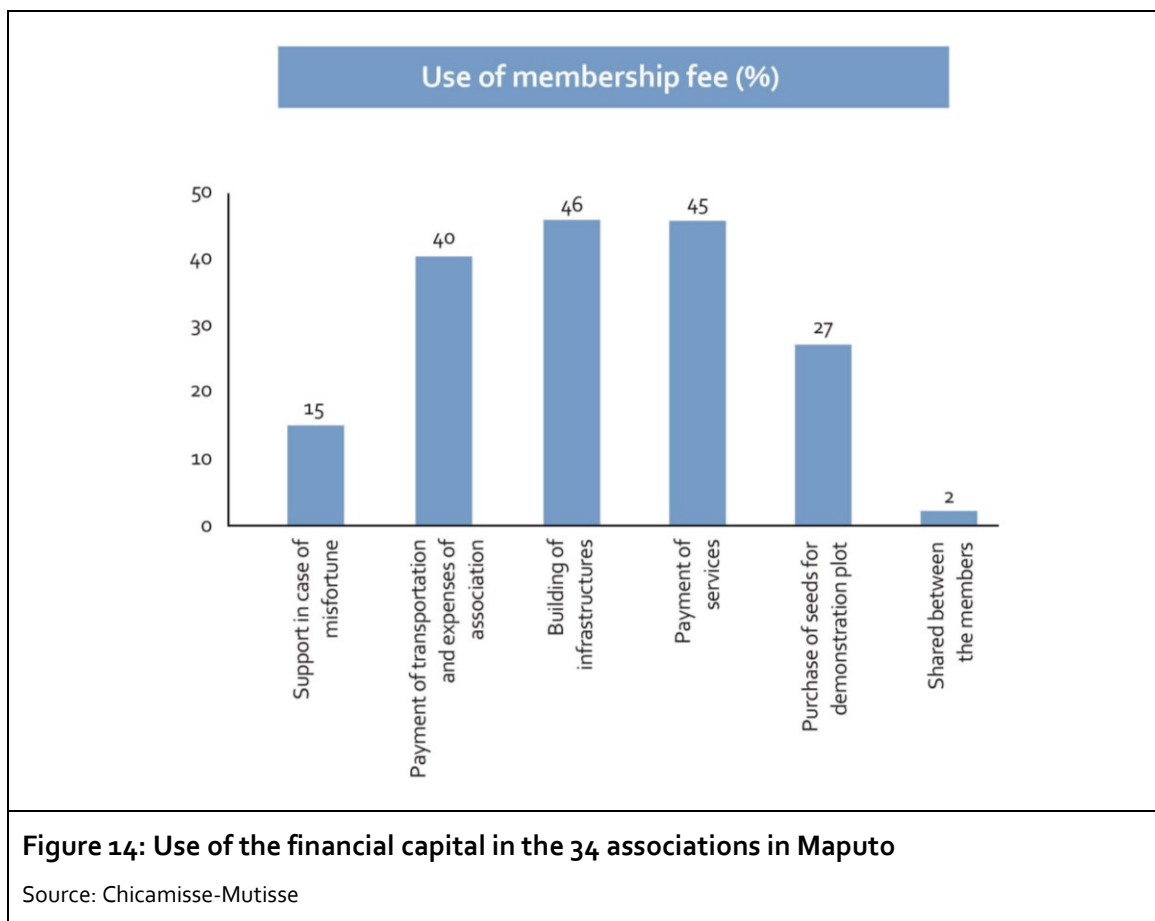
The resources of the institutions can be divided into infrastructure and financial funds.

The existing infrastructure comprises a headquarters building, a poultry house (poultry site), a greenhouse, a warehouse and a water distribution system, most of which was built with state and CMM support, or assistance from NGOs like ESSOR and ACDI/VOCA. Some associations financed part of it with membership fees.



Infrastructure distribution differs from one association to another in the same district and between districts, notably the headquarters and greenhouses. The Zimpeto Women's Centre is the association endowed with the largest infrastructure (1 headquarters, 1 house, 4 nurseries, 1 irrigation system, 1 well) and has no more than 14 members. Construction took place in the late 1970s and early 1980s, with funding from the Italian government and support from the Mozambican government. Some of the property is leased to third parties, thus generating additional income to finance association activities and payment of an annual incentive to members.

The financial capital of the associations consists essentially of monthly membership fees ranging from 30 to 100 MZN. The amount is channelled to different activities, as highlighted in Figure 14.



According to the members, the fees accumulated annually are insufficient to cover their needs so that numerous activities can no longer be carried out. This refers particularly to those related to investment in infrastructure and the cleaning of water drainage for irrigation. In May 2017, when data was collected, 53% had still not paid their membership fees for 2017.

It has been reported that in associations with fewer members, collecting membership fees is easy, fast and complete (all pay). Once the size increases, collecting fees becomes more difficult. The focus groups mentioned the following reasons for non-payment:

“Mainly due to the fact that most of the management of the associations do not perform monthly or annual accounts, not even the District Union does. The amount is deposited in the personal account of one of the members. There have been cases of diversion of funds from the association for personal expenses, without penalising the offenders” (18\_FG\_MP).

Bank credit would be an alternative to finance the infrastructure. Formal and informal banking institutions and agrarian funds provide lines of credit for agriculture. For several reasons, however, producers have no access to credit: the inherent risk in agriculture, particularly when it is poorly mechanised and fully dependent on climatic conditions; producers' lack of knowledge of existing opportunities. Most associations (70%) do not have a bank account (17\_AS\_MP). According to Mosca (2005), financial support for agricultural producers during the socialist period (1975 to 1984/1986) was borne by the state with funds from the *Banco Popular de Desenvolvimento* (BPD), which relied on *Banco de Moçambique* to make investments feasible, albeit the return has always

been problematic. The same author adds that since 1989, the agricultural sector budget has been cut back substantially, with devastating results for the cooperative and small-scale sector.

### 3.6.7 Perception of producers of farmers' associations on UA

In general, members (almost 90%) are happy to be part of the associations (n=366). Reasons for this level of satisfaction include: as a full- or part-time activity, it provides food for their families at low cost; it secures support and benefits from the government and partners; it provides opportunities in other sectors (e.g., selling food, selling inputs and pesticides, selling seedlings); it enables collective work and the sharing of experience; it ensures land protection; members can rely on assistance from the management and other members with personal and social problems or conflicts with third parties related to land access; it enables them to acquire knowledge and information from other members (17\_B\_MP).

About 48% of the associated producers report that there has not been any change in the association in the last five years (n=358). The problems (cleaning of the Mulahuze river, market access, payment of membership fees) that plagued management and associated producers in the 1980s and 1990s are still the same today, with no medium- or short-term solutions in sight. Producers would like to see more modernisation and mechanisation of UA in the future (17\_B\_MP).

To remedy this lack of modernisation, both interviews and focus group discussions suggested the following:

- Improvement of organisational set-up;
- Improvement of institutional memory and traceability/transparency;
- Improvement of attraction and benefits of urban agriculture;
- Improvement of supportive framework.

More detailed information on these suggestions can be found under recommendations in Chapter 6.

## 3.7 Food habits of urban farmers and households in Maputo

### *Ivo Cumbana*

Food preferences of producers and their households influence decisions on crops grown for self-consumption, while food and the eating habits of consumers/buyers of urban agricultural products determine their demand on the market. Urban agricultural research must therefore look at food and eating habits.

Food habits are defined as the way in which producers and households use the food they have, including how they acquire it, the frequency of food consumption, and the composition of the diet that determines the pattern of food consumption. Eating habits refer to the durable disposition acquired by frequent repetition of an act, use, or custom (Abreu et al., 2001). Eating habits

"depend, on one hand, on the possibilities of access to food: production and consumption depending on the position that individuals and groups occupy in the productive process. On the other hand, they depend on cultural contexts precisely because feeding is a socio-cultural phenomenon. That is, eating habits have symbolic and cognitive contents relative to the perception of the human organism and the relationship between sensations and the substances ingested" (Freitas et al., 2008, p. 25).

Looking at the main crops produced, producer food habits during working hours in the *machambas* and their respective households, this chapter answers the questions: What do urban farmers produce? and: What do producers and their households consume?

### 3.7.1 Farmers' production

Vegetable production in Maputo City's *machambas* is dominated by lettuce and cabbage in the districts where horticultural production is practised, with KaMavota and KaMubukwana districts as the largest producers. 99% of farmers in 90% of the production areas grow lettuce and cabbage year-round owing to their affordable production cost, short production cycle (30 to 45 days) and high market demand (17\_B\_MP, n=369). According to the interviewees, a small number of farmers have cultivated spinach, broccoli, cowpea, cauliflower, garlic, turnip and basil over the last ten years and met a considerable consumer demand.

Regarding the planting of fruit trees, 86% of farmers have banana trees, 36% mango trees and 51% papaya trees in their *machambas*, where they take advantage of existing water channels and ditches (17\_B\_MP, n=344).

In addition, 44% also grow lettuce, cabbage, onions and tomatoes in the backyards of their homes on small plots varying from 3m<sup>2</sup> to 12m<sup>2</sup>.

While most interviewed farmers produce for economic reasons, 75% also consume their own vegetables (17\_B\_MP, n=368). In this case, production is geared towards household food preferences, thereby contributing significantly to their food and nutrition security (see Chapters 3.7 and 3.8).

Animal husbandry is practised by only 28% of the total 369 respondents. This takes place in their own backyards or around their homes and not in the association *machambas* due to lack of infrastructure, high production costs and lack of security against theft. The animals raised are ducks (66%), chickens (51%), pigs (20%) and goats (3%). Duck is the most common animal bred due to low production costs, the use of leftovers as feed and the higher selling price compared to other poultry (17\_B\_MP, n=102).

Diversification in vegetable production is poor. The same crops are cultivated over and over again. On the other hand, urban agriculture means availability of and access to food, especially leafy vegetables, and to income. Although fruit production, primarily bananas and papayas, usually takes place in the fields, it is not the producers' main focus. Livestock production is carried out in backyards and less relevant as a contribution to food availability in Maputo's food system.



### 3.7.2 Food consumption of producers and their households

For most association farmers, their work in the field is a full-time occupation (see Chapter 3.4). The routine of an urban farmer in Maputo is a working day from Monday to Friday from 6 am to 5 pm with an average break of one to two hours. In addition, urban farmers usually work on Saturday mornings. This routine influences their food behaviour, determining what they consume in the *machambas* and in their homes.

#### Food consumption of producers in the *machambas*

In the *machambas*, most producers eat one meal (lunch) consisting of bread and *badgia* (fried bean cakes), *maguinha* (small fried rings made from wheat) or *maheu* (homemade drink from corn flour), all of which are acquired in the fields. They spend an average of 10 to 20 MZN on this meal. From the producer point of view, it is food purchased at an affordable price that gives strength and a sense of satiation, allowing them to endure long hours of work in the fields. On rare occasions, if food is left over from their evening meal, they take it with them the following day for consumption during their break.

Producers who work near their homes eat their meals at home (see below). From the producer perspective, an ideal lunchtime meal at the *machambas* should consist of *feijoada* (hotpot on a bean basis) accompanied by cornmeal to give them 'strength'. Even if 'hot meals' are on sale, producers will not buy them because of the expense (between 60 and 120 MZN, approx. 0,85 to 1,70 €). Hence financial circumstances and food access are key determinants in the choice of what to eat. It is important to consider accessibility and the purchasing power of producers, which often hinders a balanced diet of different food groups, i.e., basic foods (cereals and tubers), food builders (for growth), protective foods (fruits and vegetables), and energy foods (Sanches & Smith, 2014).

The consumption of fruit was mentioned only marginally, and in the producers' opinion does not 'fill the belly' or is not 'filling' enough for work in the field. Filling food is understood as the sort "the one that will make people strong, because it is through the perceived strength of food that endurance and aptitude for agricultural work will be obtained" (Canesqui, 2007 in Krone, 2011, p.33).

It was also observed that in the few cases where fruit consumption was mentioned, imported fruit such as apples, pears and grapes were favoured over home grown fruit such as *tindziwa*, *malambe*, guava and *mapfilua* (*Vangueria infausta*), although in terms of price these are more affordable and have a recognised nutritional value. According to the producers, local fruit sometimes wastes away due to periodic high produce availability and the absence of conservation facilities and techniques. In other words, the fruit surplus is not availed of to produce jams, pickles or juices, which would help to diversify their diet.

To conclude, producers consume little of what they produce during their working day. The basic food that producers eat in the fields always contains a cereal, either wheat or corn flour. The producers claim lack of time and facilities (e.g., shortage of drinking water, cooking facilities) as obstacles to preparing meals in the fields. According to the interviewees, the meal in the field is

secondary, not fundamental. The most important meals are those they eat in their own homes (see below).

### Consumption in households

All the vegetables grown on association land are also consumed by the households of the producers, with an emphasis on cabbage (99%), lettuce (100%) and pumpkin leaves (85%), (17\_B\_MP). A comparison between the production and consumption of vegetables, however, shows that the leaves of nhemba beans, sweet potatoes and cabbage, although consumed, are produced by a lesser number of farmers.

Vegetable leaves are prepared with peanuts and coconut milk and served with cereals (rice or corn flour). Given the shortage of time and the involvement of women in production or other professional activities, the leaves are sometimes simply prepared with oil. Families with economic power add fish (horse mackerel imported from Angola) to the leafy vegetables and some cereals (rice or corn flour).

Thus, in 69% of households, the main meal is composed of vegetables (cabbage and pumpkin leaves) and cereals (rice and corn flour), (17\_B\_MP, n=294). Only 13% of households have meals composed of cereals, fish, red meats and vegetables. In 12% of households, the main meal consists frequently of cereal and fish, and in 6% of household's cereals and chicken constitute the main meal (17\_B\_MP, n=297). The consumption of animal protein is generally low. Although the dietary pattern of producer households includes vegetables and cereals, it is low on fruit and animal protein, which contain the vitamins so crucial to growth, notably children's growth. According to UNICEF (2017), only 2% of children in Maputo City aged 6-23 months had a minimum acceptable diet and only 28% of children in the same age group consumed at least four food groups (basic foods, foods builders (for growth), protective foods, and energy foods). 54% of children aged 6-23 months had vitamin A intake, the source of which is mostly of vegetable rather than animal origin. Added to the lack of diversity, vegetables tend to be overcooked, leading to a very low vitamin content.

This data confirms the findings of the study by Raimundo et al. (2014), according to which dietary diversity in about half the households covered was low, presenting a deficit of micro and macro nutrients essential to a balanced diet.

On the subject of meat consumption, 62% of households consume chicken meat more frequently than any other meat. According to the interviewees, this high chicken consumption is due to the affordability of chicken meat. A broiler costs on average 215 MZN (ca. 3 €), while a duck costs 500 MZN (ca. 7 €). At informal markets, chicken meat is even more affordable as it is offered in small portions (sale in grams or chicken parts). In general, expensive red meat is consumed on festive occasions only, e.g., family ceremonies or as an exception at weekends.

The food preferences of individual household members diverge. Whereas adults and the elderly (45 and over) usually opt for traditional cuisine based on vegetables, legumes, and maize and cassava flour such as corn meal (cassava and cowpea) and *tihove* (corn flour similar to the South African 'samp' prepared with peanut butter), a majority of adolescents and young people in households prefers to eat meat, rice and fried foods, even coveting fast food and fast-food types

should their financial resources allow. For adolescents and young people 'fast food, chips, and meat are in fashion and make them grow'. These household perceptions show the tenuous boundary between categories seen as healthy or unhealthy, and the risks and consequences for consumers. On the other hand, young people's food preferences are indicative of a shift in consumption patterns.

In fact, there is evidence of an increase in licences for restaurants and pizzerias in Maputo City, all of which offer fast food. Their customers are teenagers but also staff from various institutions. According to the Department of Economic Activities in the Municipality of Maputo, licensing increased from seven in 2010 to 236 in 2017, mostly for restaurants, take-aways and bars.

A survey conducted by the Department of Markets and Fairs in the Municipality of Maputo indicates that the licensing of street vending of meals in vehicles and trolleys (two- or four-wheel trailers used to make and sell food) increased from 22 in 2012 to 453 in 2017. These operate for the most part in the KaMpfumu Municipal District. According to officials of that same department, pressure for new licensing remains high.

According to the data obtained, 50% of farmer households consume two meals and 45% consume three meals a day (17\_B\_MP, n=369). While the number of meals indicates access to food, it contains no information on diet composition or quantities consumed at each meal. 71% of households consider dinner the main meal, arguing that it gives them energy to work the next day (17\_B\_MP, n= 369). Lack of time as a result of professional activities and lack of financial resources to buy prepared food outside the home are influencing factors on the reduction in the number of meals eaten outside the home, especially on weekdays. The whole family is present at dinner, their evening meal. Here they take the opportunity to share the day's events and plan activities for the following day. It is on these occasions that members of the household talk about their day to day needs and concerns, thereby underlining the social importance of joint meals.

It can thus be concluded that food is available (some food groups) from production in the *machambas*. Vegetables cultivated in urban agriculture are an integral part of the household diet. Access to the different food groups by producers and their households is limited as a result of the poor diversity of production (which is geared to market demands), lack of good nutrition practices (see overcooking of vegetables) and the absence of facilities to store produce after harvesting. The combination of these factors impacts negatively on the household diet. This analysis fits into the FAO findings (2012): the poor food intake is related to lack of production diversity, tenuous physical and financial access to nutritious foods, inadequate nutrition knowledge, constraints that affect the treatment and feeding of children, and women's work overload.

### **Training and information**

About 83% of producers did not have access to training courses on the importance of nutrition in their diet so far (17\_B\_MP, n=102). The producers have heard, albeit sporadically, about ways of using fruit to produce jams and juices. Yet almost none of them apply this knowledge due to lack of time. Although the significance of nutrition has been recognised, their priority lies in food and nutritional security, which in turn refers to food availability and access through production and income generation. No one in the agricultural associations is in charge of health and nutrition, as is the case with other sectors such as production and sales. This further inhibits the discussion on

food consumption practices among producers. With the appointment of a focal person for Nutrition in the Directorate of Agriculture and Food and Nutrition Security of the City of Maputo (DA-SACM), however, a window of opportunity has opened and will allow for capitalising on and disseminating good nutrition practices, thereby contributing to a better use of products grown in the *machambas*, with the producers themselves as the protagonists.

### 3.8 Maputo: Urban agriculture, food and nutrition security and income

*Ivo Cumbana*

The present chapter gives an introduction to Maputo's food and nutrition security status and looks at the factors influencing food and nutrition security, such as household expenditure and food baskets. It also deals with the topics of malnutrition and health, and describes existing coping strategies.

#### 3.8.1 Food and nutrition security status

The report of the Technical Secretariat for Food and Nutrition Security (SETSAN, 2014) indicated that only half of the Mozambican population had an adequate diet composed of three meals per day and a variety of foods integrating the four food groups (basic foods, food builders, protective foods and energy foods). Not surprisingly, marginal households and low-income families – to which urban farmers belong – represented the groups with the lowest levels of dietary adequacy.

According to the same source, chronic food insecurity in the country lies at 24%. In Maputo, it is less than half of that, at 11%. There is, however, a differentiation in the prevalence of food and nutritional insecurity among groups of similar lifestyles (categorised by occupation, gender, age, income...). The highest percentage of moderate or severe food insecurity was shown to be in the group of households whose income source consists of temporary work, food assistance and begging, followed by the group involved in the production and marketing of agricultural and livestock products. Other vulnerable groups are children under five and women of child-bearing age. For these groups in particular, food and nutrition insecurity is still a public health concern.

Data on malnutrition indicates that 6% of women in Maputo City aged 15-49 years are underweight as a result of insufficient intake of macro and micro-nutrients, a condition that ultimately leads to chronic malnutrition. According to UNICEF (2017), 23% of children under five years of age suffer from acute or moderate acute malnutrition in Maputo City.

According to the Family Budget Survey 2014/15 (*Inquérito ao Orçamento Familiar - IOF*), the average caloric intake per capita in the City of Maputo is 755 (down from 1 016 in 2008), while the national average caloric intake per capita is 1 259 (INE, 2015, p.15). FAO (2010) estimates for Mozambique a minimum daily energy requirement (MDER) of 1 800 calories per person per day. The data from the 2014/2015 survey mentioned above is surprisingly low compared to other data quoted in this chapter. We can nevertheless conclude that the average caloric intake in Maputo is below the recommended amount – and if the family survey data is still correct – even below half of this amount (INE, 2015, p.16).

Food and nutrition security (FNS) is also characterised by nutritious food from different food groups: a growing aspect of malnutrition is the imbalanced composition of diets: 23% of women aged 15-49 in Mozambique and 42% in Maputo City were overweight due to excessive consumption of sugar and fats, leading to increased instances of obesity (SETSAN, 2014), another form of malnutrition. The growth in obesity rates is reflected by the prevalence of hypertension in the country in the last ten years, which rose from 33% to 40% in 2017, mainly due to poor eating habits (excessive consumption of salt, alcoholic drinks and fried foods); tobacco consumption and a sedentary lifestyle, notably in urban areas (Damasceno et al., 2017). Here, urban agriculture and its products can contribute to accessing a broader variety of micronutrient and vitamin-rich foods at affordable prices – for the producing families as well as for their customers.

### 3.8.2 Factors influencing food and nutrition security

Food and nutrition security is linked to the physical, social and economic access to food. The household income is therefore a crucial factor when it comes to assessing the FNS status of households: urban farmers in Maputo are more likely to be food insecure than urban dwellers with more reliable and better paid jobs. Urban agriculture is nonetheless the main source of income for over 11 000 farmers and their households (approximately 5% of the Maputo population), and an additional source of income or food for another 4% of the city's inhabitants.

Paganini summarises the role of urban agriculture in household income as follows: "Maputo's farmers' motivation to engage in urban agriculture are income (28%); hunger, necessity and poverty (16%); farming is their occupation (14%); they feel they have no other option (12%); family tradition (8%) (17\_B\_MP). (...) Urban agriculture is an activity to make a living within the vulnerable communities in the city. Of the interviewed farmers, 76% stated that urban agriculture is their only source of income. For 80% it has been their main source of income for the last five years. While most of the interviewed farmers produce for economic reasons, 94% also consume their own vegetables. 41% sell their products directly from their land to intermediators; others sell on local community markets and in their neighbourhoods (17\_B\_MP)" (Paganini et al., 2018).

Despite the importance of urban agriculture for household incomes and existing market channels, it cannot guarantee a return on investment due to unpredictable climate events, price instability, pests, theft, and the absence of conservation and processing systems. This dilemma pushes farmers into cultivating short-cycle low-cost crops under the assumption that possible losses will have a less damaging effect. Low productivity of vegetables such as tomatoes, cucumbers, peppers or Reno potatoes weakens their bargaining power with consumers such as boarding schools or local supermarkets, both of which prefer contracts with suppliers who can guarantee product diversity throughout the year.

Producer incomes fluctuate according to production and harvest periods. In the hot season, particularly between November and April, produce is scarce and crop prices are high, as the harvest is a long way off. In this period most urban farmers have little to sell and thus rarely benefit from higher prices. On the contrary, since their chief products are leafy vegetables that cannot be stored for longer periods of time, they have little or no income and high expenditures. In the cool season from May to October, on the other hand, production is relatively easy and produce abun-

dant. Producers have much to sell, although abundance leads to low prices. In this way, the climate and production cycles impact on producer incomes and expenditure.

The more diverse the crops and the greater the production area, the more harvests and sales can be spread over the year. Storage capacity and the processing/conserving of produce likewise help to reduce the need to sell the entire harvest immediately at unfavourable prices. Low produce diversity and limited options for storing and processing the principal crops (cabbage and lettuce) are therefore obstacles to raising income and/or production. Most farmers are obliged to sell their products at 'any price', without even a return on production costs.

For this reason, urban farmers and their households try to diversify the household income (see Chapter 3.4) with public service employment (11%), rural agriculture (9%), informal market sales (7%) and other low-skilled job opportunities (guard, housemaid) as an added source of income. Even in these households, however, income from urban agriculture constitutes 67% of the household income (17\_B\_MP, n=350, multiple response). In other words, they depend on UA yields for survival. The income obtained is limited by investment costs, the volume of production, the negotiating capacity and the ties established between the producer and the *magueva* (reseller), and finally by the oscillation of market prices.

### **Household expenditures and the food basket**

According to the household expenditure survey, food and non-alcoholic beverages account for approximately 36% of the country's household expenses. Expenditure on food products is more significant in rural (53%) than in urban areas (21%) (INE, 2015).

Regarding expenditure on food products in Maputo, households spend most on cereals and bakery products (47%), and on vegetables, potatoes and other tubers (20%). Seafood consumption, including fish, accounts for 11% of total expenditure, the same share as for meat and meat products (18\_FH\_MP). The consumption of milk, dairy products and eggs is quite low in budget terms, representing only 1% of total expenditure. The fact that prices for staples and vegetables per kg are considerably lower than those for animal products indicates that cereals and vegetables are the main source of food for most Maputo City households.

With their income from urban agriculture, more than 63% of producers fail to reach the monthly average income required (7 500 MZN or approx. 107 €) to purchase a basic food basket defined by the Ministry of Health (MISAU) as adequate for a five-member household (SETSAN, 2014). The monthly average income of a third of urban agricultural producers (31%) fails to reach even the minimum wage current in the agricultural sector (3 642 MZN, equivalent to about 52 €).

Urban agriculture represents the main source of income for households engaged in this activity. It is also an additional food source. The contribution of garden products to the household diet should, however, not be overestimated: only 17% of producer households said that most of the food they consume is self-produced, while the remaining 83% buy most of the food they consume in their households (18\_FH\_MP).

Urban production focuses on a few leafy vegetables. These are merely add-ons to the main food groups consumed. Urban agriculture has no comparative advantage when it comes to staple products like maize, rice or wheat. The urban setting does not offer the space or conditions for

grain production. Furthermore, these products are easily processed and transported in bulk over large distances without major quality losses. Hence, large-scale production in rural areas and/or other climate zones will remain people's staple diet in Maputo and other cities.

At the same time, urban horticulture and small-scale livestock breeding can and do complement and diversify household diets. Home gardens are a key source of household vegetables and a source of animal protein where chickens, ducks or fish are produced. *Machambas* and *quinteiros* do not guarantee access to food for producers and their families but are relevant additions to the composition of household diets. That said, neither the production nor the income is – broadly speaking – sufficient to ensure the FNS status of producer households.

### **Malnutrition and health**

Mozambique is one of eight countries worldwide with the highest prevalence of HIV in adults of productive age: 13% of men and 15% of women are infected. In Mozambique, women between 20 and 24 years of age are four times more likely to be infected with HIV than men in the same age group. HIV prevalence in urban areas is substantially higher than in the rural areas (urban: 20% of women and 12% of men; rural: 13% of women and 9% of men) (INE, 2017). The City of Maputo has a prevalence rate of 17% (22% of women and 11% of men). Prevalence in the 15-24 age group in Maputo is 7%. Here too, more women are infected than men (11% women, 2% men).

The high rate of food insecurity in Mozambique is one of the main drivers of high prevalence of HIV infection and its consequences (Banco Mundial, 2008).

People with a HIV infection require considerable strength to combat the disease, notably those undergoing antiviral treatment. Their nutritional status is affected as a result of less food consumption, poor nutrient absorption and metabolic alterations lead to the typical weight loss observed in HIV patients. Malnutrition prior to HIV infection aggravates the impact of the disease on the human organism, since the virus is then attacking an already weakened immune system.

The HIV incidence is higher in households with low formal education and low incomes (INE, 2017), burdening these families with enormous debts.

Families involved in agricultural production reduce their areas of cultivation and grow crops that are less labour-intensive (FAO, 2007). Association farmers with health problems, including HIV, find it difficult to carry out their farming activities due to exposure to the sun and the physically demanding tasks involved. They therefore tend to reduce their workload in the fields, which in turn leads to lower productivity, less income, and a smaller contribution to the nutrition needs of the affected households.

The food and nutrition insecurity of urban farmer households exposes them to the risks and adverse effects of HIV. 36% of farmers interviewed mentioned that their families had reduced the consumption of specific products due to limited resources. 15% of families spoke of food cut-backs for financial reasons. In the case of health problems, these families are even more exposed to nutrition hardships (18\_FH\_MP).

Farmer associations have carried out a number of activities to promote health in general and sensitise people to HIV/AIDS prevention in particular. Evidence of these interventions, e.g., the correct use of food to enhance the nutritional status of households, was not available. It is important therefore that a component dealing with the nutrition education of urban farmers (including HIV/AIDS) be integrated into existing health programmes. An increase in productivity and the diversification of agricultural production are further aspects vital to improving the nutrition diets of the households concerned.

### **Coping strategies**

The HFIAS (Household Food Insecurity Access Scale) indicator developed by the Food and Nutrition Security Technical Assistance project to measure the degree of Food Insecurity in the four weeks prior to a survey shows that 46% of households were unable to eat the kind of food they would like due to lack of resources. 36% of households said their food variety was limited for the same reason. 15% of households spoke of food restrictions for financial reasons. According to these responses, only a third (34%) of the surveyed households were in Food Security. Of the remaining households:

- 45% were in average food insecurity – households that were anxious about not having enough food to eat regularly (Coates et.al., 2007);
- 13% were in moderate food insecurity – households concerned about having food to eat, even 'sacrificing, often, the quality or type of food' and that considered their one-sided diet 'monotonous' (Coates et.al., 2007);
- 8% were in severe food insecurity-households that frequently had no food for meals. If and when they do, the amount is so small that household members suffer from severe deficiencies (Coates et.al., 2007) (18\_HFIAS\_MP).

Most households face some kind of restriction in terms of availability and/or access to food. Although these figures are worrying, they are better than the country's average.

According to the United Nations Food and Agriculture Organization (FAO, 2012) programme for Mozambique, starch-rich cereals, roots and tubers make up almost 80% of the energy consumed in the diet. As stated earlier (see Chapter 3.1), much of this produce is imported and liable to price volatility due to oil price fluctuations, stock market speculation with staple foods, and the economic dynamics of the producing countries. A study by de Brito et al. (2015) found that due to the rise in prices for basic food products and the depreciation of the Metical, families in some neighbourhoods of Maputo opt:

- To eliminate goods considered low priority or significantly reduce consumption frequency (chicken, eggs, other foods required for a balanced diet);
- To reduce the number of meals a day;
- To limit the composition of their meals when they have children under five years of age, basically consuming rice and cornmeal with no accompaniment (sauce or curry).



Urban agriculture cannot substitute rural production. It does generate income, however, allowing families to be a little more resilient to price increases and to add products to the household diet that reduces their dependency on food purchases.

Thus, although 70% of UA producers are optimistic about the future of UA in terms of food availability and income, evidence shows the vulnerability of households to food and nutritional insecurity (17\_B\_MP, n=56). This vulnerability is aggravated by the frequent need for other household members to carry out similarly precarious professional activities (e.g., informal trade, guards). Despite the goodwill of producers, they face tough obstacles in their production endeavour to ensure food and nutrition security. Mosca et al. (2013; in Ibraimo, 2017) show that if employment alternatives to urban agriculture and its attendant vulnerability were to arise, the actors involved in production would favour wage labour over their agricultural activities.

### **Conclusion**

The activities of urban farmers contribute substantially to household incomes (see Chapter 3.5) and the diversity of their household diet. Urban production thus serves economic and physical access (produce and income) and can contribute to 'social access' (diet composition, preparation techniques to preserve nutrients). The quality of the produce in terms of safety and diversity (uninhibited treatment with pesticides, monoculture – see Chapter 3.3) leaves room for improvement. So does the limited knowledge on good and nutritious food, on food preparation and food consumption. The organisational structures of producers and their supporting bodies (extension services and several NGOs) are in place to find solutions to these bottlenecks and facilitate a more positive impact on the nutritional status of both producers and their customers. A look at pathways and structures for the dissemination of knowledge and innovation and consequently the introduction of good practice in the various domains related to urban agriculture serves to identify the most suitable tools for communication.

## **3.9 Communication, information and dissemination channels for urban agriculture in Maputo**

*Anja Schelchen & Nicole Paganini*

Urban agriculture in Maputo has two economic functions: home consumption and income generation. In general, production is characterised by lack of diversity and the harmful use of chemical pesticides with impacts on human and environmental health.

Service and knowledge providers in Maputo are active in the field of urban agriculture, address urban production and the shift towards more sustainable agriculture and marketing options, and offer training to Maputo's organised farmers and backyard gardeners. This chapter describes Maputo's urban Agricultural Innovation System (AIS), its knowledge providers and their communication and knowledge exchange mechanisms. It also identifies the good practices of dissemination instruments, taking farmers' communication preferences into account.

Guiding questions are:

- Who are the actors, what are their roles?
- How do they disseminate information?
- How do farmers in Maputo communicate and learn?
- What good dissemination practices have been identified?

Results are based on two baseline surveys (association presidents and organised farmers), a qualitative survey on the UA Innovation System, a case study of the NGO ESSOR, as well as in-depth interviews and group discussions (see Chapter 1.3).

### 3.9.1 Maputo's urban Agricultural Innovation System (uAIS)

The innovation process includes the process of experiencing a problem as a whole and, trying to solve the problem by developing a new tool or technology and putting that tool or technology to routine use (Rogers, 2003). The AIS recognises that dissemination of agricultural innovation involves several factors and numerous service and knowledge providers. The AIS analyses stakeholders active in the innovation process, their roles, networks, applied dissemination instruments, and their communication. The media, NGOs, extension services and networks are key actors when it comes to disseminating innovation, the so-called innovation brokers who facilitate the process of dissemination (Gevorgyan et al., 2017; FAO, 2018). Each actor has a function within the system. Based on document analysis, field observation, interviews with key informants and own observations (17\_IS\_MP, 16\_IS\_MP), in-depth research (2018) and validation interviews (2018), Maputo's urban AIS (uAIS – see Chapter 1.3) embraces the following knowledge and service providers.

	<b>Function within the uAIS</b>	<b>Maputo characteristics</b>
Urban farmers	<ul style="list-style-type: none"> <li>▪ Adoption or rejection of innovation</li> <li>▪ Dissemination</li> <li>▪ Partial development of innovations</li> </ul>	<ul style="list-style-type: none"> <li>▪ A total of about 11 200 organised farmers with different levels of organisation and varying access to information, and 7 000 home gardeners</li> </ul>
Associations	<ul style="list-style-type: none"> <li>▪ Maintain plots for on-field demonstrations</li> <li>▪ Organise regular farmer meetings</li> <li>▪ Disseminate innovations</li> <li>▪ Contact/link for NGOs and training organisations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Hierarchical structure of associations (president to members), represented in União das Associações (see Chapter 3.6– Organisational structures)</li> <li>▪ Most associations have demonstration plots (Campo de Demonstração de Resultados)</li> </ul>
Public Extension Service	<ul style="list-style-type: none"> <li>▪ Innovation broker</li> <li>▪ Disseminate innovation and information</li> <li>▪ Training</li> <li>▪ Follow-up</li> <li>▪ Advice</li> <li>▪ Problem solving</li> </ul>	<ul style="list-style-type: none"> <li>▪ Under CMM, high in terms of ratio (1:250) and coverage, low in infrastructure compared to national average</li> <li>▪ Top down training and visit approach, at policy level under DAE and DNEA: responsibilities unclear</li> <li>▪ Weak link to research institutions, training content defined at national level (MASA)</li> </ul>

		<ul style="list-style-type: none"> <li>▪ Agricultural policies have a rural bias</li> </ul>
NGOs	<ul style="list-style-type: none"> <li>▪ Innovation broker</li> <li>▪ Disseminate innovation and information</li> <li>▪ Training, follow-up</li> <li>▪ Networking</li> </ul>	<ul style="list-style-type: none"> <li>▪ Few NGOs with focus on UA, more local than international NGOs, focus of the few NGOs concerned varies from agro-ecology (ABIODES) through backyard and food security (KULIMA and AfriCarte) to food sovereignty (Slow Food), no network</li> </ul>
Providers of agricultural training	<ul style="list-style-type: none"> <li>▪ Improve relevant stakeholder knowledge and disseminate information</li> </ul>	<ul style="list-style-type: none"> <li>▪ Technical Training Centres: urban agriculture and urban farmers (still) not focus</li> </ul>
Media	<ul style="list-style-type: none"> <li>▪ Disseminate innovation and information</li> <li>▪ Innovation broker via radio, television and newspapers, partly social media</li> </ul>	<ul style="list-style-type: none"> <li>▪ Television and community radio are the chief information providers, but broadcasting times are not in line with farmers' working reality.</li> <li>▪ Social media and ICT gaining currency</li> </ul>
Researchers	<ul style="list-style-type: none"> <li>▪ Knowledge provider</li> <li>▪ Innovation developer</li> <li>▪ Innovation broker</li> <li>▪ Networking</li> </ul>	<ul style="list-style-type: none"> <li>▪ Few networking activities related to UA and low feedback to farmers</li> </ul>
Networks	<ul style="list-style-type: none"> <li>▪ Connect actors</li> <li>▪ Disseminate innovation</li> <li>▪ Monitoring</li> </ul>	<ul style="list-style-type: none"> <li>▪ Some networks have UA as a topic, but no formal UA network in place, no lobbying structure for UA, meetings and activities irregular, no monitoring in place</li> </ul>
Source: Schelchen & Paganini		

Furthermore, input suppliers, intermediaries, private sector actors, financial institutions and consumers are all part of the innovation system. According to gfras (2018) and Gevorgyan et al. (2014, 2017), the crucial actors in the system are extension services (public and NGO), networks and the media. The extension service is technically linked to research and development (R&D), which in turn is embedded in a legal and political framework that provides working guidelines for extension officers.

### Maputos public extension service

Maputo's extension service is attached to DAE (*Departamento das Actividades Económicas*) and at national level to DNEA (*Direcção Nacional da Extensão Agrária*). DNEA itself belongs to MASA, the Ministry for Agriculture and Food Security and determines the pillars and content of the country's extension work at national level.

Maputo districts with urban agricultural producers organised in associations provide a public extension service. According to CMM, around 40 municipal extension officers assist the about 11 200 association farmers. The ratio of public extension agents to households at national scale is quite small in comparison to that of the city. Whereas in Mozambique as a whole one extension officer is responsible for 3 000 households, in Maputo the ratio is 1 to 250. The number of extension officers is said to increase further in 2019 (18\_MP\_I).

According to DELC (2018), 35% of all extension officers are female, a development that recent field observation (2018) has confirmed and contrasts with the low number of female extensionists seen in the fields prior to this.

As a rule, extension officers have either completed secondary school or graduated before participating in a three-year technical training course for extension workers and possibly taking an additional two-year training in leading positions. Most of the interviewees mentioned they had been trained at the Boane Training Centre in a nearby district in Maputo Province (16\_IS\_MP). In 2017, 35 public extension workers received a refresher course to align their knowledge (17\_IS\_MP).

During their on-field training, extensionists address various topics in line with the strategic agricultural development plan designed by the Ministry of Agriculture (*Plano Estratégico para o Desenvolvimento do Sector Agrário*, PEDSA). They range from irrigation, production and organic plant protection to organisational aspects, HIV prevention and the preparation of safe food (17\_IS\_MP, 16\_IS\_MP; Gaspar, 2013).

Urban farmers can access the extension service via *casas agrárias*, the extension service headquarters in each district. Farmer access to the *casas agrárias* is limited, however, since many lack means of transport. The extension service itself is equipped with information material and several motorbikes for extension officers, but not in sufficient quantity to cover demand in the two districts (17\_IS\_MP, 16\_IS\_MP).

### **Extension policies and public extension service**

Several policy papers address rural agriculture, poverty, food and nutrition security, but none focus specifically on urban agriculture or extension. Neither is there an explicit reference to the urban extension service in the Extension Master Plan 2007-2016 (MASA, 2007). The National Programme for Agrarian Extension Service (*Programa Nacional de Extensão Agrária* PRONEA) addresses the training needs of extension officers. It stressed

“the role of technology dissemination as a crucial element in the wider adoption of technologies that increases production and productivity. One of public extension’s major interventions in technology dissemination has been the establishment of on-farm result demonstrations or CDRs (*Campos de Demonstração de Resultados*) involving different food crops”, (IFPRI, 2013, p. 26).

The PRONEA support programme has been in place since 2016:

“The overall goal of the PRONEA Support Project is to reduce rural poverty through the introduction of demand-responsive extension services. This is to be achieved through: wide access to district-based technical support services; better organised producer groups influencing the supply of services; and the demand-based delivery of support services. The project supports the implementation of the Extension Master Plan (2007-2016) of the Ministry of Agriculture and Food Security (MASA)”, (IFAD, 2016, p.1).

The programmes refer to the rural areas only, a bias justified by the overwhelming significance of rural agriculture. Over 80% of the country’s population relies on this sector (IFAD, 2016) and urban agriculture has yet to be moved forward on the policy agenda.

Maputo's extension service is part of CMM (*Concelho Municipal da Cidade de Maputo*), more precisely of DAE, and takes the Social Development Plan as its working base, complemented by PEDSA, the Strategic plan for Agricultural Development. Observation and research (CMM, 2016) in Maputo City shows evidence of vagueness about the responsibilities of individual policy-makers. Neither is their great clarity on the type of extension policies to be used in the context of urban extension work. It is also evident that the national policy framework for extension work has failed to interact sufficiently and clearly with the city's responsible bodies.

### **Extension service offered by NGOs**

A number of NGOs offer training and counselling to organised farmers. A recent study (DELIC, 2018) mentions 48 NGO extension workers. NGOs, namely, ABIODES and ACDI/VOCA, complement the public extension service at associations. ABIODES carries out training and information visits that address the challenges of agro-ecological production and commercialisation. ACDI/VOCA mostly offers training in irrigation. Within the associations, NGOs dispose of well-equipped demonstration plots and training material. The case of the NGO ESSOR is described below (17\_IS\_MP, 16\_IS\_MP).

NGOs also provide an extension service for home gardeners. Still not seen as a target group by the public extension service, home gardeners are supported by the two NGOs KULIMA and Afri-Cardé (Paganini et al., 2018).

Individual farmers are more difficult to reach, as they are not systematically organised.

### **Research and Development (R&D)**

The *Instituto da Investigação Agrária de Moçambique* (IIAM) is part of the *Ministério da Agricultura e Segurança Alimentar* (MASA). IIAM is the leading research institution at national level. It addresses the country's agricultural challenges and designs the training manual and extension work content under DNEA. IIAM's Directorate of Training, Documentation, and Technology Transfer (DFDTT) also operates at national level, mostly in the northern provinces (16\_IS\_MP). For dissemination, IIAM uses demonstration plots, *vitrinas vivas* (live showcases), and organises *dias de campo* (field days). IIAM further organises markets for newly produced vegetables. Its Communication Directorate designs dissemination material such as leaflets and videos. IIAM itself hosts a library, to which Maputo's farmers have only limited access due to distance. In addition, the library was undergoing repair at the time of the survey (16\_IS\_MP).

Maputo's universities, *Universidade Eduardo Mondlane* (UEM) and *Universidade São Tomas*, each have an agricultural faculty that covers several topics associated with agricultural development. Systemised data and results on urban agriculture were not available, neither on- nor offline. One professor from UEM stated that students can intern at the associations and carry out field research for their final thesis on urban agriculture activities. The findings, however, are rarely conveyed to or evaluated with the farmers. Presidents of several associations claimed that they are used to giving information but receive no feedback on results or recommendations for improvement (16\_IS\_MP). This indicates that although solutions to different problems are explored, the results of innovations, for example, are rarely disseminated (16\_IS\_MP).

## Networks

The research results show that networks remain weak and are often informal. They are horizontal between the same interest groups such as urban farmers and vertical between various groups at different levels, e.g., the regular exchange between extension officers, farmer representatives and policy level. Existing networks were assessed on the basis of key informant interviews (17\_IS\_MP, 16\_IS\_MP). One formal network was identified. It addressed urban agriculture and the shift towards more agro-ecological production with a strong focus on the introduction of organic plant protection. When the work of the NGO that facilitated the network came to an end, the network was discontinued. This formal network consisted of an NGO, DEA and a *casa agrária*. Universities did not participate. UFISAMO research cooperation focuses on urban agriculture at the international level and seeks to strengthen university networks, as well as connecting UA actors in Maputo. A network of UA practitioners and researchers was established during the research phase of the SLE study and continues developing (see Chapter 5.2.3).

## Media

Maputo has a wide range of print and electronic media, with a notable increase in access to ICT in recent years. Twelve daily and weekly newspapers are published in Portuguese (UNESCO, 2011). Radio broadcasting is divided into public, private and community stations. Two state-owned radio stations provide information on various topics, community radios broadcast news with more local relevance and in local languages. Telecommunication infrastructure covers 97% of the national territory. The government stressed the significance of media and ICT in PARPA II (UNESCO, 2011).

There are three mobile phone operators, but mobile coverage remains low in Mozambique with 39%, compared to 78% in South Africa. Coverage in Maputo is higher than the national average (USAID, 2016). According to the 2007 population and household census, only 2% of households owned a computer with internet access and 4% had access to a computer. Mozambique has registered a significant increase in the use of the internet, rising country-wide from 22 500 users in 2003 to 4,5 million users in 2016, which corresponds to 17,5% of the population (indexmundi, 2018). These developments offer a wide range of dissemination instruments for the agricultural extension service.

ICT among urban farmers is not a common phenomenon in Maputo. Although most farmers have a mobile phone, only 20 % have a phone with internet access. At the same time, field observation in 2018 showed evidence of a shift towards greater use of smartphones. During a workshop hosted by UFISAMO, young farmers called for the design of a farming app. The impact of smartphones and apps on knowledge exchange should be assessed in the future. Several initiatives similar to ComOrganico use Facebook to address more clients, albeit urban farmers are rarely among them.

### 3.9.2 Dissemination instruments and communication patterns

The transfer of knowledge requires several different dissemination instruments. The most common instruments applied in Maputo's extension work are described below (3.9.2.2) and reflect

socio-demographic characteristics, farmer access to information and farmer communication preferences (3.9.2.1).

### 3.9.2.1 Education, communication and information access of Maputo's urban farmers

Farmers in the districts of KaMavota and KaMubukwana are primarily *Changana* speakers (64%), while 20% primarily communicate in *Rhonga*, the second local language in Southern Mozambique after *Changana*. None of the Maputo farmers indicated they had grown up with Portuguese as their mother tongue (17\_B\_MP, n=369).

Most Maputo urban farmers have a low standard of formal education, having attended merely a few years of primary school (47%), 15% finished secondary school and only 11% graduated from tertiary education (17\_MP\_B, n=369). Just 24% indicated they could read and write Portuguese well (17\_MP\_B, n=347). This does not correspond with the overall situation in Mozambique, where adult Portuguese literacy rates increased to 60% (UNESCO, 2017).

More than 80% of farmers are over 40 years of age (17\_B\_MP, n=357).

90% of Maputo farmers own a television set (n=368), 40% of whom received their agricultural information from television programmes (n=337). 44% have a radio at home (n=368), 27% (n=155) of whom received their agricultural information from radio programmes (17\_B\_MP).

Print media are not widespread among farmers, with only 7% (n=359) claiming access to print newspapers or magazines and no more than 10% to books about agriculture (17\_B\_MP, n=109).

81% (n=258) of female farmers and 92% (n=100) of male farmers have a phone, 19% have a computer at home (n=360), 43% of whom have access to the internet (17\_B\_MP). Although still only used on a small scale, social media contact is growing rapidly (i.e., WhatsApp).

Information in *Changana* and *Rhonga* is rarely available online. As user numbers are rapidly increasing, social media could serve as a new entry point for extension. Brazilian websites are an additional source of information due to language accessibility (16\_IS\_MP).

As a result of poor internet access, farmers tend to rely on phone calls and information from radio and television.

On the whole, 25% of farmers struggle to access information (17\_B\_MP, n=344). They see this deficit as the result of inaccessible information or failure to disseminate information (45%), weak organisation (12%), lack of time (9%) and educational barriers (8%), (17\_B\_MP, n=107, multiple response).

Farmers have nonetheless demonstrated openness to innovation in the last ten years, e.g., 31% indicated they had added new food to their diet (n=105), 51% changed their method of soil fertilisation (n=102), 22% changed their method of soil preparation (n=105), 43% tried new methods of pest and disease management (n=103). The ideas for this shift came from the extension service (45%, n=305), association presidents (26%, n=303), NGOs (11%, n=307), Field Schools (19%, n=304), other association members (23%, n=297) and the union of associations (11%, n=296) (17\_B\_MP).

### 3.9.2.2 Main dissemination instruments

#### Demonstration plots

Almost all associations have demonstration plots (16\_IS\_MP, 17\_IS\_MP), a so-called *campo de demonstração de resultados* (CDR). The plots in Maputo serve mainly to show farmers innovations in the farming system in line with the training and visit approach (T&V). As a dissemination tool, CDRs have a powerful impact (16\_IS\_MP). They are known as *escola machamba* and each association has very different conditions (16\_IS\_MP, 17\_IS\_MP). Associations with external (financial and technical) support from the extension service and NGOs have well-equipped plots at their disposal for training and trials (field observation). In total, every second farmer has received training in production systems (MP\_B\_17) (see Chapter 3.3).

#### Farmer Field Schools

Farmer Field Schools are found mostly in the rural areas but have not yet been established in Maputo. Since 2002, approximately 27 500 rural farmers in Mozambique have benefited from this FAO methodology. Farmers were trained at one of the 1 100 schools all over the country (FAO, 2019). A group of 25-30 farmers learn together with and from the extension officer for one cultivation cycle, e.g., the introduction of new crops or irrigation techniques. The learning cycle enables farmer to gain knowledge and put it into practice and enjoy verbal exchange with other farmers. According to officials, FFS will be established in Maputo in 2019 based on the FAO approach.

#### Training material

Interviews and field observation indicate that training material is still weak in terms of quantity and quality. Printed material is available at *casa agrárias* and NGO headquarters only. It is difficult for farmers to reach the few existing headquarters, mostly without storing facilities. Some NGOs disseminate printed material in the course of trainings. The survey conducted with association presidents showed that they were neither aware of the type of material disseminated nor to whom (MP\_A\_17, 17\_AS\_MP). The majority of farmers also indicated they had not made active use of the material they received (MP\_B\_17).

An assessment of existing information material in the form of books or leaflets, for example, shows that most printed information is in Portuguese. Key informants (2018) claimed, however, that material printed in Portuguese should remain, since local languages did not have the necessary terminology and the ability to read and write was generally low. Printed material in other languages would furthermore not fulfil the objective.

Public extension workers rely on one single training manual that operates on a national scale (see Extension service in this chapter) and is not adapted to the urban context. A training manual for the Maputo context was written by ESSOR and concentrates primarily on high pest pressure. It is widely used by farmers (see Chapter 3.9.2.3).



### Farmers meetings and farmer to farmer exchange

Presidents of associations conduct regular meetings to inform farmers of association issues such as organisational changes or new training opportunities (17\_AS\_MP). Most of the meetings are held in *Changana* or have Portuguese-speaking 'guest speakers' (NGOs and others).

Baseline data shows (MP\_B\_17, MP\_A\_17) that communication among urban farmers in associations mostly occurs face to face. 80% of farmers indicated a preference for gathering information from farmers close to their own plots in face to face communication. The principal source of information on new cultivation methods is first and foremost other association members, followed by extension officers. In-depth interviews with presidents confirmed that individual and spoken extension is one of most promising dissemination tools (17\_IS\_MP, 16\_IS\_MP).

### *Casa agrária*

Each district has its *casa agrária* as a provider of information, a meeting point and a link to the city's extension service (17\_IS\_MP). The *casa agrária* in KaMubukwana disposes of information material for farmers. It is neither systemised nor available in different languages. Although computers with internet access are available (16\_IS\_MP, 17\_IS\_MP), they are still not in working condition for urban farmers (17\_IS\_MP). For farmers in remote associations, the *casa agrária* is inaccessible (16\_IS\_MP), as most urban farmers lack access to (affordable) transportation and roads are often in bad condition, especially in the rainy season (16\_IS\_MP, 17\_IS\_MP). Some associations have their own house for reunions financed by external donors but not as an information point for farmers. Also, most farmers said they did not actively seek out information, which suggests the need for facilitation of the knowledge transfer process by extension workers or innovation brokers. Half of the farmers stated they had difficulty accessing information due to lack of time and money. Illiteracy was mentioned as affecting the use of media and ICT (17\_B\_MP).

### Media and ICT

As described above, the city offers a wide range of media channels to disseminate information: radio, television, print media and social media. See above for farmer communication patterns and preferences (Chapter 3.9.2.1).

### Further training opportunities and field days

93% of farmers indicated they were interested in further training (17\_B\_MP, n=148). That said, access for farmers without organisational and financial support from an NGO is not an easy task, since training opportunities such as those offered by the agricultural training centres are located outside of Maputo (in Maputo province). As yet, the universities in the city do not offer this type of training.

Farmer field days are offered sporadically in Maputo province and in training centres (Boane). These so-called *troca de experiências* are not the farmers' preferred information tool. An expensive event for NGOs, they take place at long intervals only. The experience exchange between urban and rural farmers in Naamache was beneficial in terms of observing new techniques, networking opportunities, raising questions in a group and the demonstration of new crop management techniques (18\_FG\_MP). The IIAM work with this instrument in rural Mozambique. It has

had a significant impact on knowledge transfer, allowing for the assumption that it could also be useful in the urban setting.

### Home gardeners

Associations also serve as a knowledge hub for home gardeners in their vicinity (16\_IS\_MP). In the case study areas of KaMavota and KaMubukwana, home gardeners actively seek out inputs and information at associations and from individual farmers. Inputs, pesticides and mineral fertilisers are sold close to the plots. Association farmers, however, do not have sufficient knowledge about the origin of these products or how to apply them. This lack of capacity to inform has a negative impact on cultivation in Maputo home gardens.

Around 7 000 dwellers have been trained to garden in their backyards or around their houses and up to 20% of households in Maputo are involved in some form of urban agriculture. The informal food economy in Maputo is 'viable and extensive' (Crush et al., 2014). Organisations like KULIMA and AfriCarte have been active in training urban dwellers in home gardening. Observation and interviews show that people farm around their houses for self-consumption, but also for commercialisation and as a leisure activity. Knowledge is mainly shared within the family and the community.

#### 3.9.2.3 ESSOR – A case study on the dissemination of agro-ecological techniques for plant production

Actors in UA operate for the most part on their own. The spread of information is not organised or disseminated via networks but initiated primarily in a top-down manner. The following case studies describe some examples from ESSOR, the French NGO that trained up to 1 000 farmers in agro-ecological techniques and assisted in their dissemination, emphasising the role of demonstration plots in Maputo farmer associations.

The NGO ESSOR focused on the dissemination of good practices related to the concept of agro-ecology, i.e., organic plant protection methods, compost, manure application and crop diversification (ESSOR, 2016). According to ESSOR's former extension officer, a third of all trained farmers adopted at least one of the trained innovations, mostly the use of organic plant protection products, known as biopesticides in the context of Maputo. Baseline data results (17\_B\_MP) confirm these findings, since farmers indicated they had introduced an innovation within the last ten years, notably 'production without chemicals'.

The NGO began dissemination with small pilot groups in a small number of associations with the permission and support of the presidents concerned, who also selected the participants. The pilot groups served as 'early adopters' (those to first make use of the innovation) and showed others how to reduce the use of pesticides and cultivate other crops (ESSOR, 2016). The extension officer also mentioned that success was the result of more than three years work, several follow-up trainings, and constant extension work via telephone. Farmers received the NGO manual for agro-ecological practice, which is still consulted. The ESSOR training manual was also distributed to the trained farmers.

The major reason why farmers reject the agro-ecological innovations is the effect on their income (16\_IS\_MP): shifting the conventional production method to a slower crop cycle means less income, since the agro-ecological farming method entails an increase in the seed to harvest period, i.e., of lettuce, from 30 to 45 days. Farmers who had altered their production techniques mentioned that the market access and prices guaranteed by the NGO was crucial to their decision to adopt the 'production without chemicals' method (16\_IS\_MP, 18\_MP\_FGD).

ESSOR supported the creation of ComOrganico, a buying entity, to commercialise these agro-ecological products. The design of the quality assurance tool PGS (Participatory Guarantee System) and market opportunities via an own brand stimulated the adoption process. Hence the NGO was not merely an information broker, but to a certain extent an intermediary in the selling of farm products with fixed prices that were stable (information system). The PGS system created trust among the farmers. This is a vital factor given that intermediaries (*maguevas*) play a powerful role in commercialisation (see Chapter 3.3).

ESSOR also promoted agro-ecology among consumers by establishing a box scheme, setting up fairs and introducing the PGS label to certify crops. The NGO connected actors along the value chain (production – commercialisation – consumers), enabling farmers to innovate and guarantee financial security.

The work conducted by ESSOR was handed over to the local organisation ABIODES, a partner of the UFISAMO research consortium. The workshop on urban agro-ecology hosted by UFISAMO and ABIODES in July 2018 resulted in a manual on urban agro-ecological production techniques. The manual simplifies the technical guideline document with the aim of helping farmers and facilitators to gain a deeper understanding of each production step (18\_MP\_urbanGAPs).

#### 3.9.2.4 Demonstration plots and knowledge transfer in Maputo

*Zita Seichter & Anita Tobies<sup>22</sup>*

The demonstration plot (*Campo de Demonstração de Resultados – CDR*) is described in the manual for extensionists as a place where valuable and approved techniques and their results are applied. It is a method of showing small-scale farmers the advantage of using certain practices on a collective field (Gaspar, 2013).

Practice has shown, however, that the CDR is interpreted and used differently by different associations and individuals in accordance with their specific needs. These range from testing, demonstrating and learning about innovations to joint production and income generation for the respective association and its members.

#### Objectives and functioning

Almost all associations cultivate at least one or two CDRs; these are generally located at a place central to the association or directly beside the association headquarters. 13 of 15 interviewed

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<sup>22</sup> Based on Seichter, Z. & Tobies, A. (2018)

association presidents stated using oral meetings and demonstration plots to disseminate information (17\_P\_MP). Information sharing, however, is not necessarily the primary objective:

- The '10 de Novembro' association calls its relatively large CDR a 'production field' (*campo de produção*) and focuses on quantity in order to support the income of farmers and the association; the learning objective is secondary;
- The 'Marcelina Chissano Zimpeto' association has a small CDR with several patches on which they experiment with crops such as onions or pumpkin leaves;
- The 'Eduardo Mondlane' association supported by the NGO ESSOR has a model demonstration plot (*campo modelo*) that demonstrates agro-ecological techniques and a wider variety of crops: model farmers receive a consultancy on their fields, while participants from nearby plots observe.

CDR sessions usually take place once or twice a week. The target group is the association membership, although external farmers are not strictly excluded. Participation is obligatory for association members and in some instances, fines are levied if the obligation is not met. In reality, however, this is not pursued consistently.

- The extensionist guides through the CDR session. NGO technical advisors occasionally assist or co-facilitate;
- Sessions normally begin with a practical unit in the field accompanied by explanations and continue off-field where everyone can discuss different aspects – not all of them related to the training in the field;
- The extensionist brings the seeds but participants must bring any other equipment required;
- *Changana* is the working language, although Portuguese is also spoken, in which case the participants organise the translation;
- As a rule, the produce cultivated on CDRs is sold; earnings go to the association. Leftover products are distributed among the participating farmers.

An evaluation system guarantees the functioning and quality of the CDR. It is based on monthly reports by extensionists and control visits by authorities from the *casas agrárias*, the Extension Directorate of the municipal council. Although the system is not adequately designed to improve the quality of the CDR day by day, it at least assesses its general functioning.

The research usually saw no apparent difference between CDRs and farmers' fields, neither in the layout, the design nor the techniques applied (e.g., cover crops). The plants looked no better or worse than those in ordinary fields. There was nothing to indicate the existence of the CDR or its function as a training space.

Training or information material was not used during the training sessions under review. Extension workers and farmers report that the material distributed by NGOs or the ministries concerned was occasionally used to help farmers identify pest and disease in their fields. During the interviews, only a few farmers mentioned the need for further training material.

## Contents and didactic

The knowledge transfer on CDRs works first and foremost via observation, comparison, practical work in the field and group discussions. Depending on their experience and know-how, farmers intervene and share their opinions. That said, although the extensionist is in the teaching position, there is no one-way communication.

CDR sessions focus on production methods for various crops, e.g., green leafy vegetables, beans or beetroot, peppers and tomatoes. Participants learn how to organise a field correctly, how to prepare the soil, how to plant and space accurately, how to use manure and how to use fertilisers and pesticides safely.

Depending on the extensionist, methods of vegetable production with a more agro-ecological bias are transmitted. Yet, these are limited to certain techniques due to low producer acceptance. Mulching, crop rotation, organic fertiliser production (compost, ash) and organic plant protection products (chilli, papaya leaves, soap) are some of the techniques that are given a more favourable reception.

CDRs pursue a different approach to that of Farmer Field Schools (FFS). FFS focus on farmer to farmer learning whereby the extension worker merely facilitates the exchange process, while CDRs see the extensionist as the teacher and chief provider of information. Depending on the experience and standing of the farmers, however, CDR sessions can greatly contribute to participatory and empowering farmer to farmer communication.

## Participation

The participation rate at demonstration plots varies considerably, oscillating between 5% and 100% of association members despite the risk of fines for non-participation (18\_CDR\_MP).

- The determining factor seems to be the size of the association, with higher participation rates in smaller associations of 10 to 20 members;
- The individual functioning of the CDR and its compliance with the needs of the farmers concerned likewise affects participation rates. Most producers seem eager to learn, others consider their participation a means of keeping abreast with recent association proceedings;
- A key motivation to attend CDRs is the distribution of the produce among the participant farmers, which is seen as a contribution to their income. One farmer reports: "I like it [the CDR] because it gives me a bit of food, right? So I like the school" (18\_CDR\_MP).

Urban producers are not a homogeneous group of people who share the same – positive – opinion on extension services. Some producers seem highly disillusioned by the public extension service and its extension officers: "We respect what they teach us, but they don't acknowledge our concerns, they listen but don't incorporate them in the field. There is this barrier [...]" (18\_CDR\_MP). This is the main reason why farmers are reluctant to participate in CDR training. Their knowledge comes from informal knowledge exchange, which is hugely important and widely practised among urban producers.

## Application

Just as farmer participation at CDRs fluctuates from one association to another, so does the application of the production techniques trained. Extension workers have gained the impression from field visits that most participants apply the methods discussed and tested. Given the lack of systematic monitoring of these new techniques, a robust statement on their application, on the drop-out rate (farmers who abandon new techniques after a trial phase) or on secondary uptake (non-participant farmers who learn from their peers) cannot be made. According to the interviews, many of the participants apply techniques such as mulching, soil fertilisation with manure and the appropriate and secure use of pesticides after their attendance.

The adoption of new techniques depends on a variety of factors:

- Economic advantage: The selling price is determined by the appearance of the bed as a whole and not by the size and appearance of each individual plant, an argument that defeats giving priority to a greater (crop specific) distance between seedlings or plants. Proper plant spacing allows for the healthy development of individual plants but is not in the economic interest of the producers;
- Proven applicability of innovation: The success of the experiments and the feasibility of what is learned for individual farmers is crucial, a factor primarily contingent on the extensionist's own knowledge. Numerous extension workers considered their knowledge insufficiently updated and recognised that the urban context and agro-ecological methods and marketing techniques were not the focus of attention;
- Trust: Trust in the public extension service and the extension officer has a huge influence on the acceptance and application of the training content. Moreover, it encourages the farmers when the association leadership takes part in a training session and lends an ear and a helping hand when it comes to farming problems;
- Age and experience of farmers: Contradictory answers were heard in terms of the receptiveness of different age groups. That senior producers are the least likely to incorporate newly introduced techniques since the methods they use have proved effective over decades in the field was a common statement from farmers and a number of extension officers. It is also the reason why young extension workers are sometimes not accepted: "She [the extension worker] teaches, yes. But she is still a child, a poor girl. And she's still studying" (18\_CDR\_MP). Some extension workers argued, on the other hand, that young producers were less likely to adapt to new technologies.

## Conclusion

A key advantage of CDR is the ability to reach a large group of people in a relatively short space of time in comparison to complementary on-field visits and the forthcoming Farmer Field Schools. The existing networks between the public extension service and NGOs involved in technical assistance and between extension workers and producers are another valuable asset. These actors meet regularly and despite their disparate backgrounds and objectives, they all have the desire to improve the work in the green zones and back the advancement of agro-ecological production with varying degrees of commitment.

It has also emerged that information not only flows in one direction. It circulates, with extension workers and farmers alike describing their work as a collaborative knowledge transfer: "When we're at the school, we're all studying. There's no professor, there's no student, all of us study. Well, we exchange knowledge, there is a good relationship" (18\_CDR\_MP). Moreover, the sharing and discussion of techniques is highly valued.

The shift towards more sustainable and healthier, partly even agro-ecological, production methods is a slow process for all age groups and across all associations. Deep-rooted habits have to be broken and the weak economic base of most producers makes them cautious about new methods. At the same time, producers value the exchange of knowledge and the learning experience offered at the CDR and by extension workers. Some of the newer producers obtained most of their agricultural knowledge from extension workers. The fact that participation at CDRs increases individual incomes is a further incentive.

CDRs are the most established form of communal training. Its success is highly individual because it relies heavily on the work of the extension officer involved, producer needs, the dynamic of the association concerned, the training group itself and the availability of resources. In order to roll out good agricultural practices, conditions pertaining to availability of the appropriate equipment (e.g., seeds) and regular updates of extensionist knowledge must be ensured.

### 3.9.3 Good practices, drivers and barriers for dissemination

*Anja Schelchen & Nicole Paganini*

In the course of two years of research on the urban Agriculture Innovation System (uAIS), the system itself, methods of dissemination and patterns of communication were assessed. A mixed method approach identified drivers and barriers for dissemination. The following table summarises the findings on drivers and barriers related to the dissemination of good practices in the context of agro-ecology.

<b>Interlinkages actors</b>	<b>Dissemination instrument</b>	<b>Drivers</b>	<b>Barriers</b>	<b>Farmer reach</b>
Public Extension	Demonstration plot (CDR), Training and Visit Approach	Individual and spoken extension	Access, coverage, training opportunities for extension workers, training material, absence of legal and policy framework for urban setting	Partly
NGO Extension	Demonstration plot (CDR), pilot groups, farmer to farmer approach, success stories	Individual and spoken extension	Access, coverage	Yes
	Printed material	Use of illustrations	Access	Partly due to literacy rate
	Phone calls	High mobile phone coverage, verbal advice	NGO capacities (personnel and time con-	Partly

			straints)	
	Social Media	Facebook (consumer), WhatsApp to link and network (farmer)	Access (technique and data), ability and openness to use	Partly
Media	Radio	Local language	Broadcast time, no systemised information	Partly due to local language
	Television	Local language	Broadcast time, no systemised information	Partly
	Internet, i.e., YouTube	New and fast information, curiosity	Access (technique, data), Capability	Partly
	Books, magazines, newspapers		Language, access and availability	Partly
Networks	Knowledge exchange meetings	NGO as facilitator	Need external kick-start	No
	Informal farmer meetings	Face to face in local languages		Yes
Source: Schelchen & Paganini				

Looking at the interlinkages of actors/innovation brokers it is evident that

- Spoken and personal advice;
- Personal contact;
- Continuous follow-up (training and visit approach);
- Combined with material and illustrations

are the main drivers for disseminating innovation.

Barriers to the uAIS emerge when vital linkages such as formal networks to facilitate the exchange process and the affiliation to universities are not in place. An urban strategy to connect R&D actors with farmers is still missing. Neither is there a policy to address extension worker needs. Decentralising agricultural extension from the national to the municipal level would be an all-important step towards critically exploring the drivers and barriers involved to the benefit of more sustainable production in the green zones of Maputo.







**Figure 15: Research farmer group in a workshop and over the fence marketing, Cape Town**

Source: Paganini 2019

## 4 Results Cape Town

Chapter 4 presents the research results in Cape Town as explored and analysed by one UFISAMO Ph.D. student from Germany, two Master students from Cape Town and a number of UFISAMO researchers and consultants from Cape Town.

The subchapters give an introduction to urban agriculture in the Cape Town food system (Chapter 4.1), the relevant policies and urban agricultural actors (primary and secondary) and their linkages and dynamics (Chapter 4.2). Chapter 4.3 deals with vegetable production and marketing in Cape Town, looking at production and climate conditions, horticultural production (commodities, production systems and methods, inputs used), distribution and marketing. It concludes with a summary of the challenges and opportunities for vegetable production and marketing in Cape Town. Urban Cape Town farmers are the focus of Chapter 4.4, which describes their main characteristics and gives the farmers' perspective on production and marketing challenges, followed by a brief economic analysis of vegetable production in Cape Town in Chapter 4.5. Subsequently, a case study of the organisational structures in urban agriculture (NGOs, farmers and networks) examines the organisational structures of urban farmers and urban agriculture in Mitchells Plain, a predominantly 'coloured' suburb of Cape Town (Chapter 4.6). The food habits of urban farmers and households in Cape Town are presented in Chapter 4.7, which gives a more detailed picture of farm and home garden production, food and consumer habits in less privileged areas of Cape Town and the factors influencing food choices. Chapter 4.8 gives an insight into both food and nutrition security and the income situation in Cape Town and looks at the topics of malnutrition and health, HIV/AIDS and food insecurity and urban agriculture. The last subchapter (4.9) addresses communication, information and dissemination channels for urban agriculture in Cape Town. It describes the communication patterns of urban farmers, the urban Agricultural Innovation System (uAIS), and information and dissemination instruments and channels, and summarises good practices and the drivers and barriers for dissemination.

### 4.1 Urban agriculture in Cape Town's food system

*Nicole Paganini*<sup>23</sup>

National, provincial and municipal policies, debates on land access and land reforms, extreme income inequalities, and pronounced social vulnerability derived from historical racist power structures all affect today's food system in Cape Town. From the late nineteenth century to the end of apartheid in 1994, 'Black' South Africans and the so-called 'coloured' population were deprived of political participation, higher education and access to resources and services. Treated by the 'white' apartheid regime as second-class citizens, they lost their access to land and were obliged to work in the mines or as farm labourers. Farming was traditionally a small-scale activity practised by the rural poor, while 'white' farmers engaged in scaled-up commercial production. The collapse of the apartheid era and the lifting of restrictions in the early 1990s saw the begin-

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<sup>23</sup> Parts of this chapter were already published in Paganini et al. (2018)

ning of food imports, leading to rapid change in the national food system (Greenberg, 2017). Historic structural disadvantages and the exclusion of 'Black and Coloured' South Africans is still felt today – both in the country as a whole and particularly in a segregated city like Cape Town. Today, South Africa and the City of Cape Town are challenged by a broken food system and the question of how to transform it. This also tackles the question of dignity and food justice, which is a strong underlying question in research on the South African agriculture system, e.g., Cape Town's urban agricultural environment.

Agricultural production contributes around 3% to the national GDP (CIA, 2018), mainly via large-scale commercial farms. Despite the collapse of apartheid and although the subject is repeatedly on the agenda, a fundamental land reform has yet to be introduced (Reuters, 2019). The 'dual agricultural economy' of (mainly 'white') commercial farmers integrated in global food systems, on the one hand, and (predominantly 'black') subsistence farmers with access to local markets only, on the other, is still in place.

The potential for job creation in the sector and the numerous linkages in the value chain led the government of South Africa to include agricultural production as a key sector in the New Growth Path. According to the CIA yearbook (2018), 4.6% of the labour force is engaged in agriculture, while around 8.5 million people are estimated to depend directly or indirectly on agriculture for employment and income (Brand South Africa, 2012). South Africa exports wine, citrus, maize, sugar and fruits, as well as beef, poultry, dairy products, wool and flowers (CIA, 2018) and is "self-sufficient in virtually all major agricultural products" (Brand South Africa, 2012). Nevertheless, the country imports staples such as rice from Thailand and Indonesia or grains from Russia, Germany, China and Canada (Haysom et al., 2017), as well as cane, beet sugar and meat (Government of South Africa, 2018). The department of the Western Cape, which encompasses the City of Cape Town, is a big grain, fruit, wine and potato producer but also important in livestock and fisheries.

The agro-processing industry of the country is diverse, and the counter-seasonality to Europe coupled with good infrastructure and competitive input costs make South Africa a major player on the world market and the leading player in the region. It is also the largest employer in the manufacturing sector (Government of South Africa, 2018). Cape Town hosts several hundred bigger and smaller enterprises, which process a wide variety of food.

### **Cape Town's food system today**

Cape Town's food system is embedded in the wider context of South Africa's food system and the history of the country. The post-apartheid system has not yet been transformed into a more integrative system and although racist laws have been abolished, segregation persists in everyday life. This notwithstanding, South Africa has undergone vast change since the amendments to the Co-operatives Act in the direction of a free market system and the opening of the country to foreign trade and investment, in turn leading to a more corporate power and privatised food system (Haysom et al., 2017). To compete globally, South Africa invested in mechanised agriculture and large-scale production.

Cape Town's food system is highly segregated – as is the city itself. Haysom et al. (2017) focuses on the role of governance within the food system and criticises that "the absence of a food gov-

ernance mandate in Cape Town (and in all other South African cities) means that no institution is tasked with the monitoring of the food system. The food system is largely in the hands of the private sector, which means that data is not uniformly recorded or readily available" (Haysom et al., 2017, p. 27). The food system in Cape Town is sophisticated and includes highly processed South African or imported food distributed through supermarkets, food that is rarely affordable for the urban poor. Its hip restaurants and 'foodie scene' carry the segregated food system to extremes: they pay attention to being 'instagrammable', which in turn increases their exclusiveness and underpins the existing privileges.

Supermarkets are the main source for Capetonians to purchase food, and despite the fact that supermarkets or malls are located in the Cape Flats, research by Battersby and Peyton (2014) shows evidence of a highly uneven distribution of supermarkets in Cape Town: wealthier neighbourhoods have eight times more supermarkets than poorer areas. For the urban poor, supermarkets offer lower quality foods and products, as do formal and informal markets and the *spaza* shops (small neighbourhood groceries). Observation has also revealed that food in the privileged inner-city supermarkets is of a higher quality than food in the traditionally so-called 'black' and 'coloured' areas in the outskirts of the city, where food is also more expensive. The question of food justice is therefore important in the context of the Capetonian food system. Who deserves which food? Why is healthier food mainly available in wealthier areas? Why do people in wealthier areas have the choice where to buy, whereas township dwellers due to transport barriers depend on few food sources?

Looking at Cape Town through the food system approach lens, the case study areas clearly show the extent to which the food system is interlinked with urban systems and urban infrastructure. Transport is a key challenge for urban farmers and a hindering factor when it comes to establishing their own more reliable markets. Secondary services such as packaging, washing, processing, storing or waste management are linked to the formal system, while urban agriculture operates for the most part in the informal sector (if not linked to middlemen). Urban food production is embedded in a conflicting system, where the need to develop new settlements is accompanied by increasing pressure to create affordable housing. Protests and squatting are day-to-day reality in Cape Town.

Urban agriculture, for many years promoted as a solution to food insecurity, plays a minor role in the food system. An exception is the Philippi Horticultural Area (PHA) with an area of 3 000 ha, 1100 ha of which are farmed to produce up to 50% of Cape Town's fresh produce. Around 80% of PHA produce goes directly to retail, while 12% is sold through the Cape Town Fresh Market and only 2% through informal traders (Battersby et al., 2014). At the same time, urban agriculture contributes to the food and nutrition diversity of producer households and of customers and has multiple other functions, notably in the densely populated townships with few communal or green spaces. According to the work of the Hungry City Partnership and AFSUN, numbers of households active in urban agriculture in Cape Town are very low, also in low-income areas. This previous research has further shown, that UA is "not a significant source of food" (Battersby, 2011, p. 22), with food insecurity in vulnerable neighbourhoods described as "severe and chronic" (Battersby, 2011, p. 28). Promoting urban agriculture among food insecure people cannot be regarded a stand-alone solution to address urban food insecurity (see Chapter 4.8).

UFISAMO research took the research conducted on community household into consideration and focussed particularly on the impact of urban agriculture on the farmers themselves.

Market access for urban farmers in Cape Town is challenging due to inconsistent produce quantities and quality. This is exacerbated by transportation and administrative challenges, as well as limited marketing knowledge. Local markets and the selling of fresh produce 'over the fence' are neglectable. As a result, urban vegetables are rarely consumed by local communities. Locally produced crops usually fail to coincide with local food habits: for the most part farm production planning and access to seeds and seedlings is masterminded by NGOs (see Chapter 4.2), who function as intermediaries and orient sales towards high-end markets in the inner city of Cape Town. Producers have no direct access to such markets and depend on NGOs and middlemen to access customers.

The Cape Town Fresh Market, established on South African legislation on fresh commission markets, privatised in 2004, is the principal distributor of fresh produce in the city, including deliveries to formal and informal traders, so-called '*bakkie* traders'. These informal food retailers (often migrants from Somalia and Zimbabwe) buy produce at the market and sell it in the Cape Flats neighbourhoods. As Battersby states, "the role of informal food retail as a component of food security is neglected within South African food security strategies and programmes" (Battersby et al., 2016, p. 15). The Cape Town Fresh Market is not a retail space for emerging farmers, since traders expect certain quality standards and that crops arrive washed and packed. Most farmers are challenged by simple post-harvest steps, as confirmed by NGO retailers.

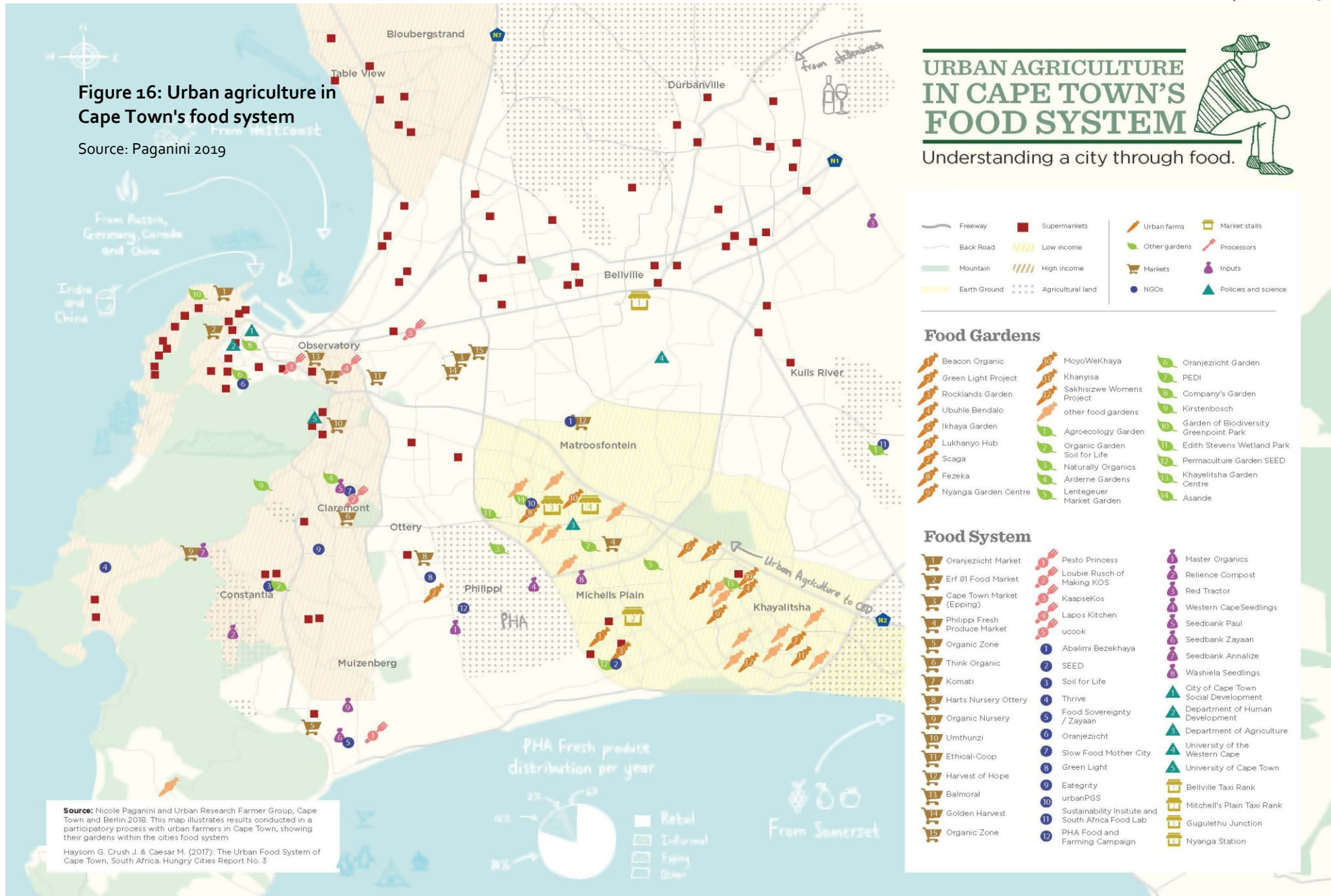
Haysom (2015) explained the concept of the Philippi Fresh Produce Market, a municipal response in the early 2000s that saw the establishment of a similar market for small-scale farmers that would also serve as an alternative for the poorer community. Plans included an emerging farmer sorting, packing and pre-packing co-op, a mobile trader co-op, and nursery and composting facilities. The top-down approach of the development project failed as the offer and infrastructure was not picked up by urban farmers. During the UFISAMO research, the idea of this central market was revived by the PEDI initiative, which took over the facilities and began compost and seedling production, organic farming and, in 2019, a retail test run with local farmers.

Food systems will always reveal power relations and identify gender inequalities, e.g., the majority of producers and processors are women, while traders are primarily men. Many small-scale farmers struggle to make a solid income from farming and numerous NGOs are now setting up new programs, and new – mostly 'white'-led – initiatives are mushrooming.



Figure 16: Urban agriculture in Cape Town's food system

Source: Paganini 2019



## 4.2 Urban agricultural actors and policies in Cape Town

*Nicole Paganini*

This chapter gives an overview of the actors involved in urban agriculture in Cape Town. The actor map in Chapter 4.2 illustrates their relations and interaction. It clusters the people or institutions concerned into primary and secondary actors. Primary actors are actively involved, while secondary actors play a background role, e.g., framing policies, accompanying research, collecting and providing data and information or teaching and consulting primary actors.

Actors have different interests, expectations and power relations; consequently, their contribution to urban agriculture differs. The power lines show how they impact on urban agriculture. The actor map likewise indicates the dynamics and changes involved.

More than a hundred actors were interviewed and asked about their role in Cape Town's urban agricultural sector. Analysis is based on actor perceptions and was systemised with experience from field observation during the UFISAMO research. The research period between 2016 and 2019 allowed for insights into the dynamics but also the fragility of Cape Town's urban agricultural scene. Personnel changes in NGOs or marketing units led to a lessening of stability, which mostly affected farmers and demonstrated their heavy dependency on external marketing channels and input suppliers. In addition, changes to municipal units culminated in reduced policy support for urban agriculture.

### 4.2.1 Primary actors

Each of the approx. 3 000 home gardeners cultivate vegetables on a few square metres, and around 80 small-scale food gardens (100m<sup>2</sup> to 1 ha) are managed by a small number of individual farmers who mainly sell via non-governmental organisations (NGO) acting as intermediaries to Cape Town's wealthy neighbourhoods. Interviews show that urban agricultural activities have received strong support from the City of Cape Town and several NGOs, with the latter promoting urban agriculture as the panacea to fight urban hunger (16\_CT\_I and 18\_CT\_I).

#### **Farmers**

Farmers are producers, consumers, sellers and mostly price-takers, networkers, input providers, facilitators, activists, knowledge providers, artists and influencers, and inevitably take centre stage in the world of urban agriculture. Cape Town producers are either home gardeners or food/market gardeners. A few thousand home gardeners have been trained by several NGOs and cultivate around their houses and in their backyards on private grounds, primarily for home consumption. Food gardeners are organised in small communities of farmers and the groups share bigger gardens, mainly on public land such as school grounds, hospitals or clinics, and cultivate about one hundred food gardens, depending on the season and on water restrictions (see Chapter 4.4). Between two and ten farmers work each of these food gardens with the aim of commercialising at least part of the harvest. Most of these gardens are affiliated to an NGO and linked to a marketing programme. One exception is the socio-agricultural project at Lentegeur hospital,



which produces organic vegetables on two hectares of land for direct sale and delivery to Cape Town's organic stores and works with patients from the psychiatric clinic (care farming).

Although this research concentrates on smallholder farming activities, it is vital to consider the impact of Cape Town's Philippi Horticultural Area (PHA), which has traditionally been the city's 'bread basket'. The Philippi farmland is located in the centre of the Cape Flats and surrounded by townships. Around 35 farmers, including those from 21 medium-sized commercial farms and five big commercial farms, produce leafy vegetables all year round in four to five harvest cycles on approx. 1 100 ha (Harrison, 2018). The five big commercial farms and 21 medium-sized farms are owned by 'white' male farmers over the age of 50. Together they own 95% of the PHA, with 63% of this land farmed by the five big commercial farms (Harrison, 2018). The area was reclaimed by early settlers in the late nineteenth century and transformed from poor sand to productive farmland. It sits on top of an aquifer that supplies the farmers with water; the Philippi Horticultural Area is one of the few regions in South Africa that suffered no harvest losses during the severe water shortage Cape Town faced in the summers of 2017 and 2018. Despite its relevance for the local food system and for the refilling of the city's underground water reservoir, PHA has been pinpointed by urban developers for housing and silica sand mining. With the PHA Food & Farming Campaign activists are striving to protect the aquifer and to secure the farmland in the area and make it accessible for small and medium-sized farmers.

## NGOs

NGOs are primary actors in Cape Town's urban agricultural landscape, as they are the main educators, sponsors, drivers, lobby advocates, and suppliers of inputs and marketing channels for urban farmers. The map lists the NGOs that have been actively involved in UFISAMO research. The three principal NGOs in Cape Town are Abalimi Bezekhaya, Soil for Life and SEED, all of which have long-term experience in the sector. Each has a different focus and expertise and is active in separate regional areas in the Cape Flats, the eastern suburbs of Cape Town.

- Abalimi Bezekhaya (isiXhosa: planters for the home) provides training for home gardeners (more than 8 000 have been trained in its 38 years of operation, more than 2 000 are currently active), primarily in the so-called 'black' townships of Khayelitsha, Nyanga and Philippi. With its Harvest of Hope programme Abalimi helps 35 food gardens with around 80 farmers to sell their produce via vegetable boxes to private households and restaurants, predominantly in the more privileged neighbourhoods of the city. Abalimi runs two garden centres in Nyanga and Khayelitsha, where farmers can source seeds, seedlings and compost, and receive support from the NGO field staff;
- Soil for Life is located in the wealthy area of Constantia and has an education centre with a demonstration garden. It provides training to home gardeners in the so-called 'coloured' township Mitchells Plain and gives support to community gardens in the townships of Macassar and Khayelitsha. Human health, soil building and recycling are further pillars on the NGO agenda;
- SEED (Schools Environmental Education & Development) is engaged in school garden development, largely in Mitchells Plain. Seed-saving and permaculture design principles are heavily emphasised. A demonstration garden is located at Rocklands Primary School in

Mitchells Plain. SEED has conducted several workshops with schoolchildren and reached more than 30 000 learners;

- Oranjeziicht City Farm (OZCF) hosts an outdoor classroom and demonstration plot in the heart of Cape Town's centre. The OZCF team works with organic principles and cooperates closely with schools. The farm serves as a training centre and showcases diversity. An allotment system includes neighbours. Produce is partly sold to neighbours and partly at the OZCF market at Greenpoint. The organisation has also hosted food dialogues to link different actors and lobbies for urban agriculture at municipality level. Design patterns for urban development in combination with agricultural activities have been developed;
- Neighbourhood Farm is an initiative founded by a South African celebrity chef and sets up urban farms in the suburbs of the Cape Peninsula. The project seeks to connect schools, neighbours and the community to locally grown food. Based on organic principles, the production system follows market garden patterns. It requires a large investment in tunnels, nurseries, quality seeds, irrigation systems and labour – the results are visible in these successfully run farms.

Although other NGOs were interviewed during this research period, their impact is mostly confined to the local and neighbourhood level, where they support, train and guide farmers. These NGOs are usually set up to support a single food garden (i.e., Ubuhle Bendalo in Khayelitsha Site B, Beacon Organic in Mitchells Plain or Green Light in Ottery). Others aim beyond the food garden to establish a neighbourhood or empowerment project (i.e., Lukhanyo Hub, Inity or Ihkaya Garden, all in Khayelitsha).

## Markets

The private sector plays a major role in the marketing of urban produce. Crops are rarely sold in the townships and urban farmers state that marketing is the key challenge (Paganini & Schelchen, 2018). Abalimi's business branch, Harvest of Hope, introduced a system whereby farmers sell their vegetables in boxes to clients or restaurants in the more privileged areas of the city. The close-down of the programme in early 2018 showed the dependency of farmers on NGO middlemen, since the farmers themselves had not set up any other – more local - markets and Abalimi had abandoned the old local markets and alternative selling channels. Early 2018 saw a similar box scheme introduced, called Umthunzi (isiXhosa: shade), focusing on distribution of vegetables to wealthier areas and the active involvement of farmers in business segments such as packing and delivery. The Ethical Co-op, an online shop for organic produce with a long history in Cape Town's alternative food system, provided an outlet for the sale of organic produce. The cooperative closed down their operations in 2018.

The year 2018 exemplified the dependency on middlemen/NGOs, and how economically dangerous it can be to rely on one outlet only: as mentioned earlier, most urban food farmers plant according to an NGO production plan. The NGO provides the sole marketing channel, as in the case of Harvest of Hope's box scheme. When HoH reduced and then (temporarily) shut down its operations in the beginning of 2018, the products were left to rot in the fields. Most of the horticultural production in that season was wasted (see Chapter 4.3).

Cape Town's main distribution market, Cape Town Fresh Market in Epping, serves as a fruit and vegetable source for *spaza* stores and street vendors in the Cape Flats. Urban smallholder farmers, on the other hand, are poorly equipped to sell their produce at this market, as they cannot reliably fulfil the quantity and quality requirements. Farmers in focus group discussions stated that their food purchases came mostly from *spaza* shops and street vendors, albeit they have land to grow their own vegetables. They mentioned lack of knowledge in administration, market pricing and marketing, non-ownership of their production sites and lack of alternative markets as the main reasons why urban agriculture has failed to establish local markets and free itself of the dependency on one NGO (17\_CT\_FGD).

As can be seen from the actor's map, there are other private marketing outlets, e.g., restaurants and food processors buy some of their herbs or other crops from township gardens. Described in Chapter 4.3, they play only a marginal role in terms of scale, but restaurants are of economic interest for farmers, as the prices paid are higher than through all other channels. The role of the private sector as a direct input provider is negligible – NGOs create the link between companies in the private sector (e.g., Red Tractor, a major compost producer or Landorff as main seedling provider) and urban farmers.

Cape Town's organic stores source most of their organic vegetables from commercial producers in the Philippi Horticultural Area (Naturally Organics) and the Western Cape region, notably because smallholder farmers cannot deliver quality and quantity consistently.

#### 4.2.2 Policies and secondary actors

##### Policies and decision-makers

Policy and decision-makers frame the legal context of urban agriculture. The relevant political units are either affiliated to the regional Department of the Western Cape or to the local City of Cape Town (municipality). The principal actor at regional level is the Department of Agriculture (DoA), which has so far supported more than 100 Cape Town food gardens with an extension service and basic subsidies such as compost, seedlings, shade nets and irrigation systems. At the municipal level, the City of Cape Town established a union entitled 'The Strategic Development Plan for the Promotion and Development of Urban Agriculture in the City of Cape Town', tasking it with advocacy building for urban farmers, knowledge management and technology transfer for the production and marketing of horticulture and urban livestock, and youth engagement (Haysom et al., 2017). More than 200 food gardens have been supported by the City of Cape Town (18\_CT\_I). Most of these gardens are simultaneously involved in NGO support programs.

In 2017, the Urban Agriculture Unit (CoCT) was integrated into the Department of Social Development. This move put a stop to the ongoing review of the Urban Agricultural Policy of 2007. The Food Gardens Policy (2011) drawn up by the Department of Social Development was introduced to encourage food gardens to address urban food insecurity and, according to Haysom et al. (2017), eclipsed the Urban Agricultural Policy. Interviews with the Department of Social Development show that the focus of support is expected to shift from food gardens to home gardeners in the near future. One reason was the water shortages in 2017 and 2018, when restrictions on the use of water affected numerous food gardens, which in turn had no possibility of registering

new boreholes; another reason was the constant dependency of farmers on outside support for materials, inputs and market access. These two political entities – the Urban Agriculture Unit and the Department of Social Development operate on different administrative and political levels, which harbours the risk of insufficient coordination and ultimately of working in a silo environment.

A change in the Department of the Premier at provincial level and a new city mayor in late 2018 refocused the work of the city. As one consequence, urban agriculture activities began to attract the attention of officials from various government departments (e.g., environment, urban planning, economic development).

### **Secondary actors**

- Other civil society organisations and movements

While NGOs dominate the sector, other civil society organisations and movements associated with agriculture, food security and organic cultivation also carry considerable weight. They act as change-makers and inspire farmers with campaigns, workshops, activities or training material. The Slow Food Movement and Slow Food Youth Movement have a long history in Cape Town, sensitising people to the value of traditional, regional and organic food. These networks are driven by individuals who are dedicated facilitators, moderators, researchers, writers and influencers in the promotion of local Cape heritage and indigenous food, as well as agro-processing, agro-ecology, diversity and seed heritage. Eategrity works towards traceability, quality assurance and consumer sensitising. The PGS (Participatory Guarantee System) – a bottom-up quality assurance tool to enable farmers and consumers to meet – is active in the Western Cape and was transferred to Cape Town urban PGS in early 2018. Strong personalities act as innovators and influencers, and their impact is crucial to the small environment of urban agriculture in Cape Town. Influencers inspire others, albeit inherent in this set-up is the risk that initiatives can peter out quickly when they are dependent on the charisma and motivation of one individual.

- Research

The topic of urban agriculture and food security in Cape Town has gained the considerable attention of national and international research. The African Food Security Urban Network (AFSUN) and the African Centre for Cities (ACC) at the University of Cape Town (UCT) have carried out in-depth research through the Hungry City Partnership and Consuming Urban Poverty.

Further UCT research has been conducted by the Department of Geography on the urban food system and urban planning aspects relevant to the wider urban food system. With its focus on food systems and food policies, the PLAAS Institute at the University of the Western Cape (UWC) has gained substantial international interest. Gender aspects associated with food have been researched by the Food Politics and Cultures Project at UWC. Climate change and impact studies take centre stage at the African Climate & Development Initiative at UCT. Food security has been widely researched by the Centre of Excellence in Food Security of the University of Western Cape. Stellenbosch University (SUN), close to Cape Town, offers research in the faculty of agrisciences. The SUN food security initiative provides practical research for master students on food systems, food security and small-scale organic agriculture. The Sustainability Institute offers

postgraduate studies and doctoral research, as well as short courses on sustainability. The South African Food Lab builds bridges between research and practitioners with a strong participatory research approach and the inclusion of actors in the field of food systems and agro-ecology.

UFISAMO research partners are the Department of Geography and the Department of Social Studies at UWC. Local students have already carried out initial research on urban agriculture.

#### **4.2.3 Linkages and dynamics between urban agricultural actors**

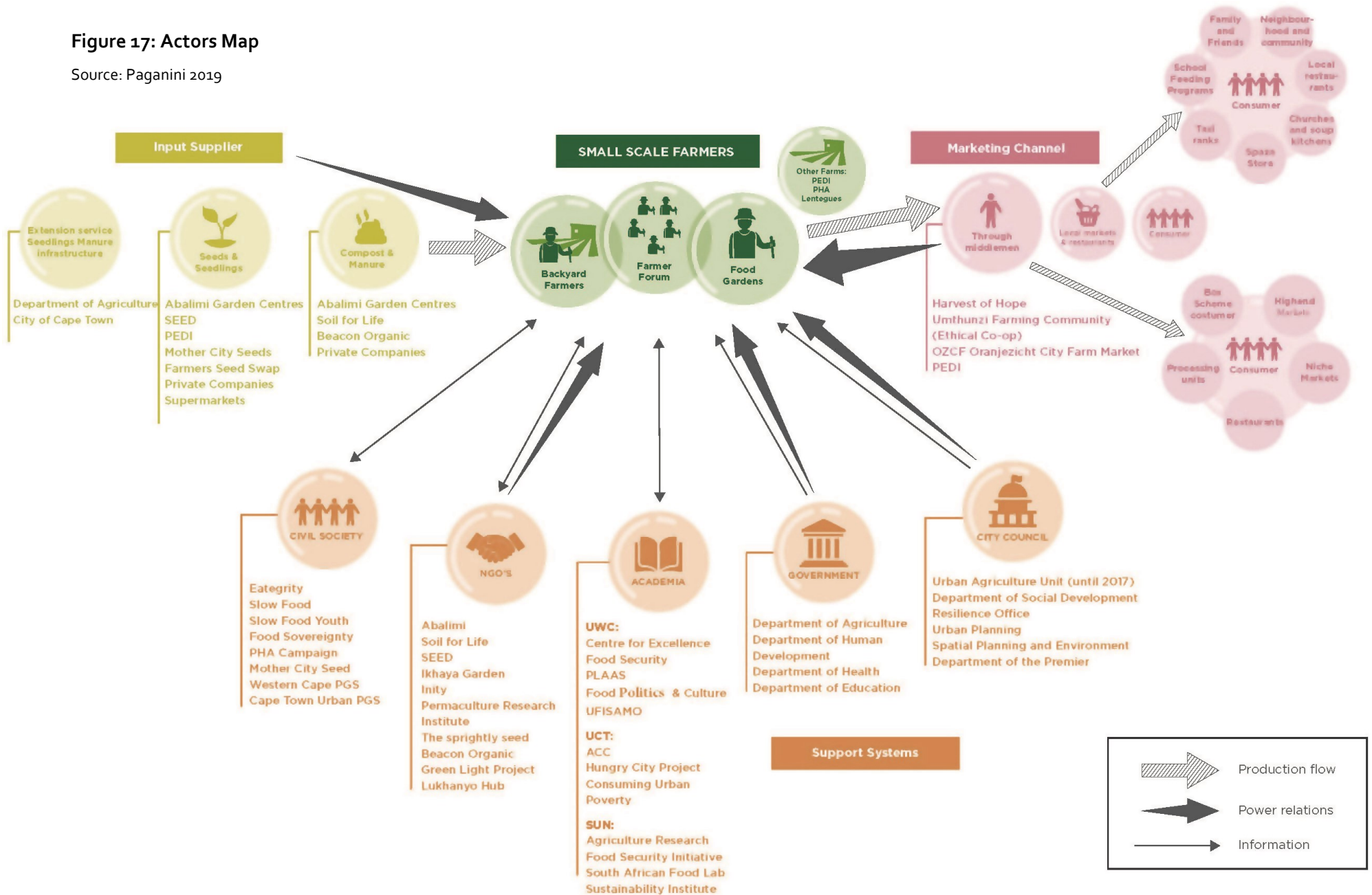
The map illustrates actor linkages and the 'silo structure' of urban agriculture in Cape Town: links between primary and secondary actors are few and far between. Interaction and relationships hinge on personal engagement. Almost no platform networks at the overall Cape Town level attempt to overcome township barriers and actor boundaries. UFISAMO provided this opportunity twice during a scenario workshop (2017) and a workshop on urban good agricultural practices (2018). Feedback in both workshops showed evidence of a general interest in enhancing collaboration and dialogue in the future. High transport costs and time constraints emerged as hindering factors to establishing and networks and keeping them alive. Also, farmers as the protagonists are generally less active when it comes to networking outside their NGO comfort zone and prefer to remain loyal to 'their' NGO or middlemen. Local (micro) networks exist between neighbouring farmers, primarily for mutual support and knowledge exchange. Although this exchange is far from vibrant, the individual dynamics involved have the potential to create a highly diverse actor network and attract other farmers. Township realities and gender dynamics are historical burdens; farmers are still dealing with the context of Cape Town's fragmented urban design and cautious about setting up working relationships and networks beyond their close neighbourhood or language group.

This tendency is exacerbated indirectly by NGOs and retailers as a result of their closed marketing system. Very few individual gardens make a living from their urban agricultural activities; that said, these gardens have been able to create independent marketing channels. The closing down of Harvest of Hope and Ethical Co-op (both in early 2018, see above) is evidence of the system's vulnerability. The decisive reason for the weak impact of urban agriculture towards food security and its inability to increase the income of the farmers concerned is the dependency on marketing channels established by third parties. Weak identification and loyalty during challenging times, show that most farmers don't feel an ownership for their market channel.

On the other hand, the dynamics of a vibrant, energetic and multi-cultural city like Cape Town and the increase of social media enables the mushrooming of NGOs and initiatives. This sparks off alternative platforms, opportunities, inspiration and new dynamics. The growing trend towards ethically sourced organic food that is sustainably and/or locally produced leads to linkages between actors of different ethnicities who would not have met without food as the common ground.

Figure 17: Actors Map

Source: Paganini 2019



## 4.3 Vegetable production and marketing in Cape Town

*Nicole Paganini*

This chapter describes production techniques, production systems, challenges and opportunities, and marketing channels in the context of small-scale urban farming in the densely populated and food-insecure townships of the Cape Flats. The results are based on field research on value chains (Dolch, 2017) and the author's research on production, a baseline survey, in-depth interviews and the insights of urban farmers who were accompanied for almost two years as part of the research. The findings were analysed to identify the opportunities and challenges of small-scale horticultural production in the urban context.

### 4.3.1 Production and climate conditions in Cape Town

Cape Town has a Mediterranean climate, with dry hot summers and unreliable winter rainfall. The city is located in the unique and diverse Cape biosphere, which is characterised by sandy nutrient-poor soils, fynbos vegetation and strong winds in the summer months. Droughts and water shortages are one of the major challenges for farmers in the area. Rainwater is kept in 14 catchment areas, of which the closest are the Table Mountain dams and the largest, the Theewaterskloof dam, approx. 100 km east of the city. Cape Town is influenced by the cold Atlantic currents running through False Bay, east of the Cape Peninsula. The dynamics and changing winds of this climate have a strong impact on the city's microclimate and consequently on the conditions for production.

The City of Cape Town faced severe drought in the summers of 2017 and 2018, caused by consecutive low winter rainfalls, mainly in the catchment areas of the city. Decreasing dam levels forced policy actors to react. They fixed a Day Zero, pointing to the day when dams would reach levels too low to supply the city with water. The authorities urged the population to save water, using both incentives and restrictions. International media reported on Cape Town as the first major city to run completely out of water. First public collection points were set up to supply each inhabitant with 25 litres of water in the event of Day Zero.

Field observation and in-depth interviews in the summer months of 2018 indicated that farmers had been struggling with water restrictions. Water for agricultural activities was reduced by 60% compared to the level consumed in 2015. The use of municipal tap water was restricted to 50 litres per person per day and the use of borehole water discouraged in order to save groundwater resources (CoCT, 2018).

Borehole water was the main alternative to the municipal water source, as other alternatives like catchment tanks (*jojjos*) were dry. This meant that farmers who had no access to borehole water were obliged to stop farming. Since borehole installation is costly and thus far more prevalent in the affluent parts of town, the water crisis was also a social crisis.

Water donations from commercial farmers in the Grabouw and Elgin region and the reduced water use in the city in early 2018 succeeded in pushing back Day Zero to the winter months of

2018 and calling it off thanks to good winter rainfalls: Continuous winter rains had filled the dams to 73% by November 2018, compared to 36% by November 2017 (CoCT, 2018). The city relaxed the water restrictions, i.e., water for personal use was increased to 70 litres and water for agricultural activities reduced by 50% instead of 60% compared to usage levels in 2015.

It was not the first and certainly not the last water shortage to affect Cape Town – the region has not escaped climate change and Cape Town itself has always been on the fringe of an arid zone. It is nevertheless too easy to blame climate change for the drought experiences of 2017 and 2018. Population growth, rising tourist numbers and an increasing demand for water in the agricultural, industrial and service sectors will challenge policy-makers' reliance on catchment water and force them to realise desalination plants or find other sustainable solutions.

### 4.3.2 Horticultural production in Cape Town

This section describes the production systems, production methods and cultivated commodities of urban farmers.

#### Commodities

Urban farmers in Cape Town produce a wide variety of crops, for the most part annual vegetables and fruits, as well as indigenous and traditional plants of the Cape. They are not producers of staples such as maize or grains. Neither do they grow fruit trees on a large scale (28% of food garden farmers (n=47), 32% (n=66) of home gardeners have a fruit tree) or cultivate perennial hedges. According to the farmers themselves, their top sellers are spinach, kale, carrots, onions and cabbage (17\_B\_CT). In 2019, the NGO Abalimi registered 76 cultivated crops to sell through their market channel Harvest of Hope.

#### **Variety of horticultural production:**

amaranth, asparagus, artichokes, baby marrow, basil, broad beans, beetroot, brinjals, broccoli, butternut, cabbage, carrots, cauliflower, celery, chives, coriander, cucumber, curry leaves, dune spinach, dune celery, fennel, garlic, ginger, garden beans, green beans, kale, kohlrabi, leeks, lentils, lettuce, mealies, melon, mint, morroch, nasturtiums, New Zealand spinach, okra, onions, parsley, peas, pepper, physalis, potatoes, pumpkin, radishes, rape, rhubarb, rocket, rosemary, spinach, spring onions, strawberries, squash, sunflowers, sweet potatoes, swiss chard, thyme, tomatoes, turnip, watercress






#### Production systems

The research focused on the production opportunities and challenges associated with food gardens, otherwise known as market gardens. Home gardeners were likewise visited to gain case experience and understand the impact of home gardens on households and their role in the wider food system. Urban farms, alternative systems (e.g., aquaponics) and community gardens were also interviewed.

The following Table 12 gives an overview of the production systems in Cape Town:



**Table 12: Overview of production systems in Cape Town**

Overview of production systems in Cape Town	
	<p><b>Home Gardens</b> Almost ten thousand backyard farmers were trained by NGOs, foremost by Abalimi Bezekhaya, Soil for Life, SEED and Thrive.</p> <p>Average size of production area around the house/shack between 2 and 20m<sup>2</sup>. Production focus is on self-consumption, partly sharing with neighbours.</p> <p>Contribution to diet diversity, social benefits and community building.</p> <p>Main challenges: lack of soil (mostly container gardening), lack of compost and seeds, water restrictions.</p>
	<p><b>Food Gardens (to produce for markets)</b> Approx. 80 Food Gardens established in Khayelitsha, Goodwood, Gugulethu, Nyanga, Mitchells Plain, Mfuleni and Philippi on public grounds, e.g., schools, hospitals, churches.</p> <p>2-10 farmers share land between 100m<sup>2</sup> and one hectare to produce a wide variety of crops. Most of the produce is sold through middlemen to Cape Town's wealthier areas.</p> <p>Contribution to household income and household food security.</p> <p>Main challenges: soil quality, water access, market access and local marketing.</p>
	<p><b>Urban Farms</b> Individual farms produce organically for commercial purposes, e.g., Oranjezicht Farm, Lentegeur Farm, PEDI.</p> <p>Most sale to organic stores or markets like OCZF market.</p> <p>Farms act as a knowledge hub and education centre for small-scale farmers and interested community.</p>
	<p><b>Community Gardens and Training Centre</b> Community Gardens are run by NGOs and located in Nyanga and Khayelitsha (Abalimi), Constantia and Mitchells Plain (Soil for Life), Mitchells Plain (SEED) and Hout Bay (Thrive).</p> <p>Gardens are used as agri-hubs to provide training courses, information, inputs and gardening technique demonstrations.</p>
	<p><b>Philippi Horticultural Area</b> Around 35 farmers, including 21 medium-sized commercial farmers and five big commercial farmers produce mainly leafy vegetables all year round in four to five harvest cycles on approx. 1 100 ha.</p> <p>The Philippi area produces up to 50% of Cape Town's fresh produce. Sells mainly to supermarkets and Cape Town Fresh Market and little informal selling.</p>
	<p><b>Alternative Techniques</b> Only few alternative techniques are tested, f.e. large-scale container gardening (Mitchells Plain, Beacon Organic), aquaponics (Scarborough, Permaculture Research Institute). Mushroom growing (SEED and individual food garden in Mitchells Plain) or wicking beds (Philippi, PEDI)</p>

Source: Paganini 2016 to 2019

## Inputs used

Relevant inputs along the vegetable value chain are land, seeds/seedlings, compost and manure, fertilisers, water, labour and knowledge. Farmers receive these inputs from the City of Cape Town and the Extension Service of the Department of Agriculture (DoA), NGOs and their respective garden centres and nurseries, local and regional commercial input producers, supermarkets or from their own production and the local sharing economy (see Chapter 4.2).

**Land** is crucial to urban agriculture and one of the major obstacles farmers face, given the constant growth of the population on the outskirts of the city. It is a very tense topic and was brought up by urban farmers in all multi-actor workshops conducted by UFISAMO. The distribution of land ownership is highly unequal in South Africa: “ ‘There are still no clear records of who owns land,’ says the Financial Times. But even Agri SA, an industry lobby group ‘more optimistic than most’ about the progress made since apartheid, estimates that 73.3 % of land is owned by ‘whites’, who make up just 8.4 % of the population....” (Financial Times in The Week, 2018).

To make matter worse, in the urban context land is hardly owned by farmers but leased or let too often on insecure conditions. This research witnessed housing protests associated with land-use disputes in densely populated urban areas, notably townships. Every Cape Town citizen has the right to lease fallow, unutilised municipal land for five to ten years, approval of which is a complicated process that can take months or years. Officially registered institutions and communities (schools, churches, hospitals) are usually granted permission within three months. Leasing land from private entities such as schools, clinics, churches, land owned by public institutions or private (farm)land is another option. The farmland in the case study areas is either municipal or private land, and to a large extent on school grounds. On average, the farmers lease the land for a period of five years, mostly free of charge for the land use. Farmers state that short-term lease contracts and land tenure insecurity hinders their investment in low-tech and soil-building material (17\_CT\_FGD).

Most farmers use vegetable **seeds and seedlings** provided by commercial sources and NGO-run garden centres, agri-hubs or government support programmes such as the Department of Agriculture (DoA) extension service. Additionally, commercial seeds are sold in supermarkets. The primary source for seedlings are other small-scale farmers, local nurseries or big retailers like Western Cape Seedlings and Landorff, large-scale producers in the Philippi area. PEDI is providing seedlings in small trays, adapted to small-scale farmer’s needs. Community and home gardeners purchase from all of these providers. Crucial criteria are price, availability and distance to providers but also quality: farmers state that commercially grown seedlings are a risk as the seedlings often arrive with diseases. Farmer request, that subsidies provided by government should follow certain criteria (organically grown, healthy). Two farmers in Mitchells Plain have started to produce seedlings to sell to fellow farmers.

**Seeds/Seedlings** are an expense factor for production. Recent years saw seed laws passed in South Africa, as in many other parts of the continent. These laws govern the Intellectual Property of registered seeds. One law in particular, the Plant Variety Protection law (PVP), governs the type of seeds available at a large-scale commercial market. As a result, the seed market is dominated by patented and commercial seeds, mostly hybrids and often genetically modified, coming from a few global seed companies.

Certified organic seeds are often more expensive and rarely accessible compared to seeds from commercial sources (mostly Starke Ayres). Farmer-saved seeds cannot enter commercial marketing and certified organic seeds fail to receive the kind of government or economic support enjoyed by patented seeds. It is imperative, however, that farmers can access seeds outside of this large-scale market, especially in terms of the revival of indigenous seeds and indigenous food.

Only a few alternative seed sources are available to small-scale farmers and it is a common strategy to save and share their own seeds with other farmers (over the fence, seed swaps, festivals). Seeds have a strong connection to culture and heritage, and events such as festivals and seed swaps are platforms for storytelling, knowledge sharing and awareness raising. When farmers harvest seeds on their own farms or in the farming community, when they share their seeds with other farmers it becomes a crucial political factor in the discussion of food sovereignty and the independence of small-scale farmers from industrialised agriculture and the monopoly of a few global seed companies (17\_CT\_I, 18\_CT\_I).

**Compost and manure** are key inputs when it comes to cultivating crops in the poor soils of the Cape Flats. Compost is supplied by commercial garden centres, nurseries, government support programmes, commercial producers (Red Tractor, Reliance Compost), the NGOs Abalimi (through Reliance Compost) and Soil for Life, or the Beacon Organic food garden in Mitchells Plain. Food garden farmers and home gardeners buy mainly from NGO garden centres, as the compost is subsidised by the NGO. Farmers need to consider that the application of raw manure can be a health risk: manure can host *E. coli* bacteria or pathogens, and furthermore contain antibiotics, especially when the source is conventional livestock farming. Of particular interest to urban gardeners and frequently used (directly applied to the soil) is kraal manure from cattle farms in Philippi or Durbanville.

Other inputs for **fertilisation** are mulching materials such as cardboard, straw, green waste, dry leaves or grass cuttings, all of which are collected by urban farmers in the surrounding neighbourhoods. Mulching material is very hard to collect. Paper and cardboard are traded informally and too valuable in terms of money to add them to the soil. Leaves are difficult to find, as the Cape Flats are nearly barren of trees, and strong winds blow the few dry leaves away.

The role of mineral fertiliser compared to compost and kraal manure is negligible (with the exception of commercial farmers in the PHA). Prices are rarely affordable for small-scale producers. However, pellets (Bio Ocean) are used to boost plant growth. Mineral fertiliser and other commercial inputs such as pesticides, chicken manure, chicken pellets, fish emulsion and gypsum can be bought at commercial agri-markets (Philippi). Tools, wheelbarrows, shade nets, irrigation systems and *jojo* tanks for rainwater collection are also sold via commercial agri-markets or subsidised by government support programmes, e.g., the DoA extension service. In 2018 the City of Cape Town supported *jojo* tanks (filled with water) through the program water4Cape Town. Most food garden farmers and home growers also produce homemade inputs (see production techniques below).

Irrigation is one of the key activities on the farms. **Water** for agricultural use in Cape Town comes from surface sources such as rivers, streams and reservoirs; groundwater from wells (open or capped); municipal water systems are provided by the City of Cape Town or other municipalities.

Cape Town's severe drought in 2017 and 2018 made water the most precious input and at the same time the greatest obstacle to farming. Water prices increased and water restrictions turned into a ban on municipal water for farming, leading to production losses or abandonment. The use of boreholes made farmers independent of the municipal water system but called for a high investment in drilling and technical equipment, as well as installation approval by the water department. No approvals were issued during the water restriction periods. Water quality in the Cape Flats can be considered a production hazard, since water sources are affected by salinity or run the risk of contamination by raw human and animal waste, as well as sewage water discharges. Home gardeners in particular use tap water or greywater for irrigation.

**Labour:** 74% of the backyard farmers work every day in their food gardens (n=69), 40% of the food garden farmers work every day in their food gardens (n=53), most (63%, n=70) of the backyard farmers spend one hour in their gardens, while 62% (n=53) of the food garden farmers work between four and eight hours per day. These gardens are primarily managed by a group of farmers, all of whom cultivate their plots individually. If farmers receive labour support, the helper in 23% of cases is the husband/wife and in 54% the children (17\_B\_CT, n=13). The Department of Social Affairs pays for short-term labour to cope with daily gardening activities, which is the case with one farmer (17\_CT\_I). Informal farmer networks are another pillar for farmers to rely on, especially for complex or heavy tasks such as installing irrigation systems or establishing compost heaps.

Traditionally, small-scale farmers in the rural context of the Eastern Cape had group activities to foster farming tasks in the community, the so-called *ilima*. With the urban research farmer group, *ilima* slightly came back, as common activities were included in the workshop program at the hosting garden. Having lost the spirit of *ilima* was explained with the migration to the urban area and a loss of close family and neighbour relationships.

### Production methods

The production methods applied are determined by environmental conditions, the cost and availability of inputs, the 'farmer's production philosophy' (e.g., sustainable/organic farming), the farmer's knowledge, and the trainings and advice the farmer has received.

The baseline survey indicated that 87% of the interviewed farmers stated to use techniques adhering to the principles of organic agriculture (17\_B\_CT, n=102). Of the farmers interviewed, 66% understand organic agriculture as 'growing naturally without pesticides', 13% name natural methods and techniques, 15% have forgotten the meaning of organic agriculture and 3% associate it with human health (n=96). This means that in reality 84% of farmers who claim to use organic techniques in their daily farming simply use homemade products, compost, manure or natural remedies instead of chemicals, whereas only 6% apply the specific soil preparation and water-saving 'trench bed' techniques, and 2% practise companion planting specifically as an organic technique (17\_B\_CT, n=83).

These results show that farmer perceptions of organic agriculture lag far behind its principles, holistic techniques, and strong emphasis on soil-building. Instead, perceptions are first and foremost based on the notion of agriculture that forbids the use of pesticides.

<b>Table 13: Overview of status quo of production cycle in Cape Town</b>
<b>Farm vision and site selection</b>
The size of the available land determines the layout and the scope of the farm. On average the farmers cultivate a few hundred squaremeters. Most farmers lease their farmland directly or through an NGO. None of the food garden farmers own the land they farm. Farmer discussion groups indicate that the land available is too small and too insecure in terms of lease duration. The average time for a lease is five years, usually farmers don't pay for the lease. Observation also shows that land is not always cultivated to the full due to lack of seeds/seedlings or compost/manure but also lack of time and lack of labour force. Conversations with farmers led to the assumption that very few of them had made long-term plans for the development of the land (e.g., farm vision). Land is a very scarce resource, and the use of the available land can be optimised.
<b>Production and crop planning</b>
Most farmers plant in accordance with seedlings distributed by NGOs. This leads to peaks and unwanted surplus produce because too many farmers have too many crops of the same variety at the same time. 90% of farmers interviewed in the baseline survey said they planted according to season. 83% worked to their own crop rotation plan of heavy feeders, light feeders and givers. 40% planted according to seed availability, while only 59% indicated they had their own production plan (17_B_CT, n=56, only market farmers of baseline). Most farmers do not focus on special crops. Few farmers have direct relations to a market and optimise the production planning according to the market needs.
<b>Seeds and seedlings – Nursery and transplanting</b>
Most farmers obtain their seeds from NGO garden centres. In addition, 73% said they produce their own seeds (n=109), while 58% also shared seeds (n=101). Observation shows that there are few seedling producers among the farmers themselves. NGOs or retailers buy cheap tranches to distribute to farmers in smaller quantities - usually without price decrease/subsidy. Farmers add liquid homemade organic fertiliser to the soil during the process of transplanting, e.g., earthworm tea, comfrey tea or nettle tea to boost plant growth. The commercially grown seedlings are a risk for pest and disease transfer, many seedlings arrive weak or infected at the farms.
<b>Land and soil preparation</b>
Farmers have been taught a wide range of soil preparation methods. The application of manure, compost and organic fertiliser is crucial to enriching the sandy soil in the Cape Flats with nutrients and building up organic matter. Inputs such as compost, raw manure or organic fertiliser (pellets) are expensive and rarely affordable for farmers. Implementation of trench beds is time intensive and requires huge amounts of organic residue. Only 74% of food garden farmers apply this technique (n=53), while 64% of home gardeners do so (n=72), (17_B_CT). Soil building is the most crucial aspect in farming in the Cape Flats and a general principle of IFOAMs organic agriculture. Due to lack of resources, however, soil building is not done as a priority by farmers.
<b>Soil management and soil fertility</b>
91% of the food garden farmers (n=53) say they apply production methods, e.g., intercropping or crop rotation. Crop rotation training usually distinguishes between vegetables with a large nutrient uptake (heavy feeders), medium uptake (middle feeders) and low uptake (low feeders). A limiting crop rotation factor is seed availability (17_B_CT). Most farmers mulch to protect soil from wind and sun dehydration. Farmers say they apply raw kraal manure (cattle), very few use horse or rabbit manure. Farmers do not use machinery: tillage, planting, weeding and harvesting is done by hand.
<b>Fertilisation</b>
For soil fertilisation 87% of the interviewed food garden farmers use liquid fertiliser with manure, and 21% use a mineral fertiliser (n=52). While 68% (n=71) of backyard farmers indicated to apply liquid fertiliser. The Soil for Life NGO has been focusing on soil-building techniques and composting, and contributes to the farmers' knowledge with numerous trainings, demonstration plots and on-site visits. Part of the urban farmer training deals with the production of own compost in order to be independent of external inputs. 82% of food garden farmers use their own compost heaps or vermiculture composts in their gardens, 50% buy commercial compost and 54% receive compost support. Compost is subsidised by NGOs and DoA (17_B_CT, n=195, multiple response). Liquid fertilisers are cheap and easy to produce and therefore most commonly used by farmers.

<b>Water management and irrigation</b>
<p>Most community gardens have irrigation systems and frequently access to boreholes. Sprinkler systems are favoured over drip irrigation in order to keep all of the top soil wet and prevent wind erosion. Ongoing drought has, however, forced farmers to use water-saving production techniques such as drip irrigation and mulching. Home gardeners mostly use tap water and watering cans.</p> <p>"In May 2017, 37% of Cape Town's urban farmers mentioned that water restriction decreased and hindered their production. From 2018, the use of tap water for agriculture is forbidden according Cape Town's water restriction plan which is a problem since 30% of food gardens and 70% of home gardens use tap water as main source" (Paganini &amp; Schelchen, 2018, p.3).</p>
<b>Pest and disease management, field hygiene and weed management</b>
<p>Despite the variety of pests and diseases observed in the gardens, farmers have little knowledge of pest and disease prevention or plant protection. Since NGOs do not promote pesticides, sustainable methods are used, albeit with varying success. The lack of success is not caused by the method per se, but by the lack of continuity of its application. That said, 21% of the interviewed farmers say they use pesticides.</p> <p>The most common pests are snails (handpicked), mice and rats (poison or dogs), aphids, moths/caterpillars mainly in cabbage, shoot and fruit borers (e.g., in brinjals) and weevils (homemade products and handpicking). Plant diseases are diverse and widespread, e.g., fungus diseases such as spinach rust or powdery mildew, bacterial rots (mainly in cabbage), viral diseases and nutrient deficiencies.</p> <p>Weeding is done by hand; herbicides are not available to small-scale urban farmers.</p> <p>Field hygiene is a major challenge, as farmers have peaks with unsold produce, most of which is left lying in the field. As not all farmers are working full time, additional labour force is needed to fully implement good agricultural practices.</p> <p>To combat pests and disease, farmers apply a variety of homemade products based for the most part on chillie, garlic, liquid soap and dish washer, paraffin, and dead and boiled snails. The use of liquid soap is nowadays scrutinised by the NGO trainers, as the application was not always successful in the past and the method is not accepted in organic agriculture. Neem, of which organic pest control products are made, is not available in the Cape Flats.</p>
<b>Harvesting and post-harvest handling</b>
<p>Harvesting is carried out manually and products are partly washed on-site. There are no storage facilities in the gardens, so farmers have 'picking days', where retailers buy the harvest from the field. 20% of farmers carry out simple processing steps (17_B_CT, n=102), e.g., drying chillies or preparing tomato sauce. Preservation techniques such as fermentation or boiling down are promoted by individuals but rarely used due to the different consumption habits of farmers. A pesto workshop hosted by UFISAMO demonstrated preservation techniques for leafy vegetables, which are now partly applied by farmers to add value to their produce.</p>
<p>Source: Paganini</p>

### 4.3.3 Distribution and marketing of vegetables in Cape Town

Looking at Cape Town's food system, food gardens and home growers produce less than 1% of the overall share (Battersby-Lennard & Haysom, 2012). At the same time, urban farmers produce a wide variety of vegetables (from artichokes to zucchini) but very little fruit, with the goal to sell to private households or restaurants in the wealthier parts of the city, using NGOs as intermediaries.

#### Markets, distributors and marketing channels

Marketing channels in Cape Town are diverse, ranging from informal street marketing to high-end food markets. Access to markets is contingent on socio-economic factors and income - and mostly dominated by NGO affiliation. Unlike many other African cities, Cape Town has no traditional fruit and vegetable markets where farmers and retailers sell to end consumers from mar-

ket stalls. Supermarkets are the principal food source, supplemented by the smaller *spaza* shops in the townships (see Chapter 4.1).

Box schemes are one of the major marketing channels for the sale of urban agricultural produce to wealthy customers in Cape Town. These box schemes are not organised by the farmers themselves: weekly boxes with vegetables can be ordered by customers on websites or WhatsApp groups run by intermediaries like Umthunzi, Harvest of Hope (ceased operating for a couple of months in early 2018), The Ethical Co-op (ceased operating in 2018), Green Road (ceased operating in 2017), and Oranjezicht Market.

Local markets are few and far between. Fruit and vegetables are sold in *spaza* shops and in 'fruit&veg' corner stores, both retail from Cape Town Fresh Market. A discussion paper published by Tawodzera within the Hungry City network in 2019 shows that informal traders in Cape Town source vegetables mostly from formal markets (42%), wholesale (26%), supermarkets (18%) and 12% directly from farms. The latter are most likely the commercial farms in the PHA area: as UFISAMO research shows, small-scale farmers do not sell directly to informal traders. Some individual exceptions have shown, however, that informal traders would be willing to buy from small-scale farmers. Market stalls around taxi ranks and junctions are located in Nyanga, Gugulethu, Mfuleni and Khayelitsha. Efforts to establish local markets in the Cape Flats, where urban gardeners could sell their products have so far failed but have been re-started in action research within UFISAMO project (see Chapter 5.3.1). The monthly Impilo Yabantu market in Khayelitsha set up in May 2016, for example, ceased operating after five market days (16\_CT\_MAW) but is re-established in 2019. PEDI is taking up the idea of the former Fresh Food market in Philippi for farmers as central retail hub (17\_CT\_I). Few farmers sell from their gardens, around their neighbourhoods or over the fence. Farmers explain this with the high cost involved and the powers of persuasion needed to convince potential customers to buy their produce.

The Cape Town Fresh Market in Epping is a commission market and the main distribution point for fruit and vegetables in the Cape Town Metropolitan Area. 60% of consumed vegetables pass through this market. 20% of suppliers are large-scale producers, delivering 80% of the products sold. 8 000 buyers and 5 000 producers who sell their products are registered. Wholesalers buy large quantities and supply supermarkets and the so-called *bakkie* traders. Individuals buy bulk and sell informally or in local *spaza* shops (16\_CT\_I).

The SPAR, Shoprite and Pick'n'Pay supermarkets have branches in the Cape Flats but only sell products from commercial farmers in the PHA, the Western Cape or other provinces in South Africa and neighbouring countries who comply with certain standards. The products are purchased via contract farming or licensed retailers. The SPAR distribution centre in Philippi is evidence of the amount of food in the system and the central role of Cape Town as food distributor for the whole country and partly for neighbouring countries. The distribution centre also carries out secondary activities such as cooling, freezing, storing, repacking, washing, transport and retailing, all of which take place in the vicinity of the centre, some of them informally (18\_CT\_PHDUFS\_UCT).

Lifestyle markets and so-called farmer markets sell vegetables and other types of food, drinks, craft and fashion to consumers in the wealthier neighbourhoods of Cape Town. Examples are Oranjezicht City Farm (OZCF) Market in Greenpoint, Neighbourgoods Market in Woodstock,

Thrive organic market in Hout Bay, Earth Fair Food Market in Kirstenhof and ERF81 Market in Tamboerskloof. As intermediaries these markets purchase goods from Harvest of Hope, urban farms (i.e., PEDI, Lentegeur) or Cape Town Fresh Market. A few organic shops and health shops (Wellness Warehouse) sell fresh and organic food with high nutritional value, as well as other products such as soaps and lotions. Organic stores, e.g., Think Organic in Kenilworth, Organic Zone in Lake Site and Rondebosch or Komati Food in Observatory sell certified organic vegetables (mainly EU organic and NOP) from the Western Cape or Naturally Organics farm in the PHA.

With a few exceptions, home gardeners are limited to self-supply, self-consumption and random 'selling over the fence' to neighbours or others in their community. There is also a certain amount of surplus exchange between neighbours. Apart from saving money by substitution, however, income generation is very low.

### **Adding value**

Although Cape Town is the location of several hundred food processing enterprises, only a few avail of urban crops. 'Pesto Princess' in Muizenberg, for example, produces a variety of pesto made of basil produced in small-scale urban gardens. 'Making Kos' processes a huge variety of locally grown, mainly indigenous and traditional herbs for pickles, jams, soups and bread, and also offers catering services. 'KaapseKos', a catering and processing enterprise, also works with urban produced vegetables. It supports agro-processing in workshops and exhibitions, promoting it as heritage. Examples are given of chefs who source urban produce for dinners and the making of sauces and pesto. Initial workshops were kick-started by UFISAMO in 2018 to encourage farmers to do their own agro-processing and will be continued by a local expert. Only 20% of the interviewed farmers in the baseline survey said they processed food, mostly for jams and sauces (17\_B\_CT, n=102).

Several restaurants located in the Central Business District, Sea Point, Woodstock and Observatory use urban produced vegetables in their kitchens for marketing purposes in order to attract certain guests or for personal reasons, e.g., a sustainable lifestyle. These restaurants target customers with above average income and are careful to emphasise the preparation of modern, healthy and organically produced food. A prominent example is the famous Mt. Nelson Hotel, which has for years been sourcing fresh vegetables through Harvest of Hope. The food processor 'ucook' also sources urban produce, marketing it as food grown locally. Ucook prepares full recipes and packs already cut, exactly weighted ingredients and sends it to final consumers – ready to cook.

#### **4.3.4 Challenges and opportunities in vegetable production and marketing in Cape Town**

In general, agricultural production in the city has the potential to create windows of opportunity, networks, and access to markets, inputs and knowledge. The proximity of actors allows for the generation of short value chains, greater access to niche markets and economic opportunities such as job creation, income and increased exchange. At the household level, urban agriculture contributes to diet diversity with additional nutrients. It is also instrumental in greening the urban



environment. Agrobiodiversity, for example, is higher in many cities than in the monocultural rural areas (see Chapter 2.1).

Compared to rural conditions, however, the urban context is far from risk free. It begins with site selection and the need for research on the land use prior to its conversion into agricultural land. The previous land use must be taken into account (e.g., was it a dumpsite, military land, a construction area?) and its proximity to possible contamination by hazardous industrial areas or roadways. Urban spaces harbour the risk of contamination by, for example, heavy metal residues, industrial pollution, human settlements and traffic. Health risks associated with urban agriculture are often the consequence of inadequate sanitation such as the use of polluted water, untreated greywater and wastewater leading to pathogenic organisms, which in turn affects crops.

The risks, challenges, benefits and opportunities of urban agriculture vary from city to city and should be explored with care.

The following table provides an overview of the benefits, risks, opportunities and challenges of urban agricultural production in Cape Town. The findings are the result of a baseline survey, in-depth focus group discussions and the multi-stakeholder urbanGAPs workshop conducted in Cape Town in March 2018. They were validated throughout the research by field observation and expert interviews.

<b>Table 14: Assessment of urban agriculture in Cape Town</b>	
<b>Benefits and opportunities of producing in the urban context</b>	
<b>Benefits</b>	<b>Opportunities</b>
<p><b>Food and nutrition security</b></p> <ul style="list-style-type: none"> <li>▪ Farmers add nutrients to staple diets, food garden farmers can partly contribute to household incomes and reduce food costs. The diversity of daily diets is improved</li> </ul>	<p><b>Food and nutrition security</b></p> <ul style="list-style-type: none"> <li>▪ Include more farmers in home garden programmes to increase nutrition security.</li> <li>▪ Empowering food garden farmers as independent producers could increase incomes</li> <li>▪ Increasing income due to direct selling could increase food security, as farmers would have more means for food purchase</li> </ul>
<p><b>Local economy, markets and marketing</b></p> <ul style="list-style-type: none"> <li>▪ Fresh produce is sold mostly to high-end markets, which are sensitised to organic produce from township gardens.</li> <li>▪ Short distance between consumers and producers (important for perishable products)</li> <li>▪ Niche products are grown to access niche markets, i.e. basil production for local pesto processor</li> <li>▪ Cape Town has prosperous, ethically aware customers interested in supporting urban agricultural farmers</li> </ul>	<p><b>Local economy, markets and marketing</b></p> <ul style="list-style-type: none"> <li>▪ Cape Town has vast potential to increase local marketing in the communities, since food deserts characterise the area.</li> <li>▪ Local economy increases, if value addition happens in the townships, e.g., food processing, transport, packing and consumption</li> <li>▪ Growth of niche markets, direct producer-consumer relations could boost urban farmer incomes</li> <li>▪ Potential to increase direct relations between chefs and food gardens</li> <li>▪ Linking urban agriculture to local school kitchens increases local economic activities</li> <li>▪ Creating co-ops to strengthen farmers bargaining power and increase margin of products</li> <li>▪ Establishing local markets would open new sales channels</li> </ul>

	<ul style="list-style-type: none"> <li>▪ Increase demand for niche products</li> <li>▪ Increase local support for ethical small-holder farmers</li> <li>▪ Increase the interest of chefs and restaurants in direct links to urban food gardens</li> </ul>
<p><b>Greening the city</b></p> <ul style="list-style-type: none"> <li>▪ Urban food gardens represent green zones in the depressed township areas. They attract animals and insects and add diversity to the urban context.</li> <li>▪ UA creates a healthy urban environment, reduces pollution and increases oxygen</li> </ul>	<p><b>Greening the city</b></p> <ul style="list-style-type: none"> <li>▪ Fruit trees, perennials or hedges could increase the quality of urban green in the Cape Flats and protect the fields from wind (and theft)</li> <li>▪ Fallow land in townships could be made available by the City of Cape Town to increase the number of food gardens</li> </ul>
<p><b>Production</b></p> <ul style="list-style-type: none"> <li>▪ Subsidised inputs for small-scale farmers, e.g., compost, fertiliser, shade nets, irrigation systems help farmers to cultivate</li> <li>▪ Social grants, which cover basic living costs allow most farmers to grow at all (see Chapters 4.4 and 4.5)</li> </ul>	<p><b>Production</b></p> <ul style="list-style-type: none"> <li>▪ Vacant land distributed to the many waiting 'farmers without land' could increase the urban vegetable yield</li> <li>▪ In most food gardens, the land is not fully cultivated due to a lack of inputs, labour force and time</li> <li>▪ Application of urbanGAPs could increase yield by reduction of losses through pests and diseases</li> </ul>
<p><b>Community building</b></p> <ul style="list-style-type: none"> <li>▪ Thousands of people have received training in urban agriculture</li> <li>▪ Urban agriculture on a micro level is a bonding activity for local communities, i.e. urban farms act as education centre, meeting point and potentially source of food</li> </ul>	<p><b>Community building</b></p> <ul style="list-style-type: none"> <li>▪ Local community markets could strengthen producer-consumer relations at local level and provide healthier food in urban food deserts</li> <li>▪ First development of a farmers co-op started in 2019 after UFISAMO research and has a promising potential to strengthen farmers network</li> </ul>
<p><b>Knowledge, Exchange and Networking</b></p> <ul style="list-style-type: none"> <li>▪ Dozens of NGOs are active in urban agriculture and provide farmers with training, knowledge, expertise, consultancies, and follow-up visits. Innovations are tested and good practices disseminated. UA strengthens community relationships and builds friendships</li> </ul>	<p><b>Knowledge, Exchange and Networking</b></p> <ul style="list-style-type: none"> <li>▪ Overcoming silo structures in NGOs and Departments could strengthen knowledge exchange and encourage extension service to undertake frequent and much needed follow-ups in the field</li> <li>▪ Potential to destigmatise farming and promote key aspects of UA as an aspirational pursuit</li> </ul>
<b>Risks &amp; challenges of producing in the urban context</b>	
<b>Risks</b>	<b>Challenges</b>
<p><b>Land access</b></p> <ul style="list-style-type: none"> <li>▪ Land rights are not secure; as a consequence, farmers avoid long-term investments in trees (shade), irrigation systems and soil building</li> <li>▪ Discussion on land is politically tense in South Africa and needs to be facilitated with consciousness for cultural and political issues</li> </ul>	<p><b>Land access</b></p> <ul style="list-style-type: none"> <li>▪ Secure land rights by lobbying at policy level; long-term contracts with schools and hospitals to encourage long-term investments in trees (shade), irrigation systems or soil building</li> <li>▪ Vacant land in the Cape Flats can be assigned as agricultural land</li> <li>▪ Land in the peri-urban areas which is assigned as agricultural land could be made available for emerging farmers, i.e. PHA, vacant farm land in Durbanville, Stellenbosch</li> </ul>
<p><b>Contamination</b></p> <ul style="list-style-type: none"> <li>▪ Punctual soil samples have shown that risk of contamination by heavy metals is low in the Cape Flats</li> </ul>	<p><b>Contamination</b></p> <ul style="list-style-type: none"> <li>▪ Apply alternative techniques such as raised beds in contaminated spaces, soil exchange to produce safely and avoid contamination caused by human latrines, livestock</li> </ul>

<p><b>Climate change and water use</b></p> <ul style="list-style-type: none"> <li>▪ Farmers with no borehole access struggle to maintain their gardens under Cape Town water restrictions. Use of greywater carries food safety risks</li> </ul>	<p><b>Climate change and water use</b></p> <ul style="list-style-type: none"> <li>▪ Train greywater use and implement other water smart techniques. Both call for investment</li> </ul>
<p><b>Pest and disease</b></p> <ul style="list-style-type: none"> <li>▪ Lack of knowledge on pest and disease management is an obstacle to consistent quality and quantity of produce</li> </ul>	<p><b>Pest and disease</b></p> <ul style="list-style-type: none"> <li>▪ Pursue field hygiene consistently to avoid further pest and disease pressure</li> </ul>
<p><b>Production challenges</b></p> <ul style="list-style-type: none"> <li>▪ Inputs are rarely affordable without subsidies from NGOs or government institutions</li> <li>▪ Limited financial profitability of market production</li> <li>▪ Organic seeds difficult to obtain</li> <li>▪ No record keeping or production evaluation process by urban farmers</li> <li>▪ Theft and vandalism</li> </ul>	<p><b>Production challenges</b></p> <ul style="list-style-type: none"> <li>▪ Onerous conditions for production, weak soil fertility</li> <li>▪ Implementation of local seedbanks, nurseries, adequate compost production</li> <li>▪ Production planning to increase profitability</li> <li>▪ Lack of tools, inputs, seeds, e.g., for crop rotation</li> <li>▪ Theft and vandalism</li> </ul>
<p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>▪ Farmers lack knowledge of pricing, administration, marketing</li> <li>▪ Transport costs are high, very few farmers have a driving licence</li> <li>▪ Urban farmers depend on NGOs and other middlemen, an enforced loyalty system hinders multi-market approaches</li> <li>▪ Urban farmers act in silos and catch simple opportunities to sell without seeking longer term relationships with consumers or retailers</li> <li>▪ Urban farmers compete with commercially grown cheaper crops and supermarkets</li> <li>▪ Crops are cultivated to supply high-end markets</li> </ul>	<p><b>Marketing</b></p> <ul style="list-style-type: none"> <li>▪ Produce reliable quantities and quality to address markets needs</li> <li>▪ Cover costs and generate income</li> <li>▪ Plan production in line with seasons and consumer needs</li> <li>▪ Strengthen collectives and associations of farmers to address unfair prices and lack of transparency by middlemen</li> <li>▪ Boost self-confidence of urban farmers to market their own produce</li> <li>▪ Improve access to markets, transport, finance, labour</li> </ul>
Source: Paganini	

#### 4.4 Being a farmer in Cape Town

*Nicole Paganini, with contributions from Zayaan Khan, Ria Schuurman & Noncedo Nomahe*

An authentic description of Cape Town farmers is only possible if farmers co-author with researchers and provide an insider perspective. During the author's research in Cape Town, research approach and preliminary results have been constantly checked and validated with the urban research farmer group. The results presented here are based on mixed-method research and have been commented on and framed by urban farmers during field phases in Cape Town and at the UFISAMO annual meeting in Berlin, where four farmers attended.

On the whole, urban farmers are located in the densely populated Cape Flats, the outbound area of Cape Town. Urban agricultural activities in Cape Town are carried out by two main groups: food gardeners, who grow fruit and vegetables to sell at markets, and home gardeners, who cultivate for self-consumption and to increase diet diversity and reduce food expenditures (see Table 12 in Chapter 4.3). The following table shows characteristics of the average home gardener and the average food garden farmer based on the baseline survey conducted in 2017.

Characteristics	Home gardener	Food garden farmer
Gender	Female	Female
Average age	53	57
Main crops	Cabbage or kale, spinach, onions	Spinach, cabbage or kale, carrots
Main water source	Tap water	Borehole water
Currently employed	No	No
Contribution to household income	No	Yes
Main income source	Grants	Grants
Meals per day	2	3
Income per week from UA	Nothing	501 - 1000 ZAR (30-60 €)
How much spent on food per week	100-300ZAR	100-300ZAR
How much spent on vegetables per week	Up to 100ZAR	Up to 100ZAR
Source: Paganini		

Urban farmers operating on a small scale in Cape Town survive in highly complex systems. There is talk of the Cape Flat dynamics, a reference to precarious and profoundly segregated urban patterns, on the one hand, and identification with the neighbourhoods, heritage adaptation, a cultural melting point and vibrant sub-culture, on the other (Paganini et al., 2018). Dependencies and power relations, politics and culture, misunderstandings and structural racism all frame the multi-actor environment of urban agriculture, to which farmers have belonged for decades. The missing success story of the urban Cape Town farmer was an underlying discussion in the last years of research.

#### **4.4.1 Who are Cape Town's farmers?**

To understand the socio-demographic and socio-economic characteristics of home gardeners and food garden farmers (n=54), 114 farmers (76 women, 38 men) from the Khayelitsha (76 farmers), Mitchells Plain (25), Gugulethu and Nyanga (12) townships were interviewed, and one farmer living in the more central neighbourhood of Observatory.

74% of the interviewees mentioned *isiXhosa* as their mother tongue, 13% *Afrikaans* and 3% *Shona*, *isiZulu* or *Sesotho*, while the rest (11%) grew up speaking English (n=112). More than 60% of the interviewees were over 50 years of age, with only 5% under 29 years of age (17\_B\_CT, n=109). Many urban farmers in the Cape Flats migrated to Cape Town from other provinces; the majority came from the Eastern Cape. Most of the interviewed farmers arrived between 1970 and 1994

(79%, n=58) during apartheid years. They live in Cape Town in their own stone houses (58%) or in shacks (16%) with poor access to electricity, light and water (17\_B\_CT, n=112).

The majority of interviewees are unemployed (83% women n=75, 70% men n=35). Only a small number of farmers practise urban agriculture as an income-generating strategy. Several NGOs have trained people to farm in their home gardens for self-consumption (17\_B\_CT).

Female farmer income comes in the form of grants (63% n=101, male 60% n=54), employment (34%, male 31%), family income and rent (34%, male 29%) and farming (15%, male 26%), an indication of the high dependency on social security payments and state transfers (social grants) (17\_B\_CT, multiple response).

#### **4.4.2 In-depth research on production and marketing challenges – the farmer perspective**

It emerged from the interviews that farmers find it difficult to measure or estimate their income. This was confirmed by the diaries written up by 15 farmers once a week for 12 months from November 2017-2018: that input costs frequently exceed earnings was one of the major findings. In the baseline survey, which included both home and food gardeners, 45% of farmers stated that they earned nothing from their farming activities and 26% earned less than 500 ZAR per week (less than 30 €). While a few well-run food gardens earned up to 4 000 ZAR per month (around 230 €), but due to seasonality not all year around (17\_B\_CT, n=105). The majority of farmers do not have access to enough land, inputs and seedlings, time and labour or to market channels to earn this amount. As production planning is a huge challenge, incomes differ from month to month (17\_CT\_FGD). Sometimes farmers fail to replant on time and ensure an ongoing harvest. On average, 61% of farmers spend less than 300 ZAR on food per week and 23% spend between 300 and 500 ZAR (17\_B\_CT, n=108).

From an economic perspective, the role of urban agriculture in the Cape Town food system is negligible (as research by Battersby, 2011, stated), since it does little to enhance the income of the farmers involved, in turn preventing them from investing more money in food. Farmer motivation to cultivate crops varies. According to the baseline survey, the reason female farmers practise urban agriculture is passion and hobby (38%), food security (28%), income generation (18%) or unemployment (18%), (n=105, multiple response), while the incentive for male farmers is food security (38%), unemployment (27%), passion and hobby (22%), income generation (16%) and family tradition (16%), (17\_B\_CT, n=53, multiple response).

Participatory in-depth research with a group of 20 farmers (urban research farmer group) took place in Cape Town from October 2017 until June 2019, with almost 20 focus group discussions, more than 100 field and home visits, farming diaries, photo diaries, participatory mapping, excursions and biographic interviews. The farmers were between 25 and 60 years of age, have different cultural backgrounds and live in different neighbourhoods and townships in the Cape Flats.

This undertaking allowed for farmer to farmer exchange across township barriers and exchange visits that led to trust and personal relations. The challenges of the food system were discussed through the lens of these farmers and clustered in a focus group discussion in 2018 (17\_CT\_FGD, 18\_CT\_FGD).

**Table 16: Challenges of the food system in Cape Town**

Production	Food Pathways	Marketing	Processing and Consumption
<ul style="list-style-type: none"> <li>▪ Theft and vandalism</li> <li>▪ Low soil fertility</li> <li>▪ Land access</li> <li>▪ UA competes with housing</li> <li>▪ Climate: strong winds and scorching sun in the summer</li> <li>▪ Water restrictions</li> <li>▪ Expensive inputs</li> <li>▪ Lack of knowledge on food production and crop planning</li> <li>▪ Lack of knowledge on pest and disease management</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lack of own transport</li> <li>▪ Competition with supermarkets &amp; cheap commercial agricultural produce</li> <li>▪ Stigmatisation of urban crops</li> <li>▪ No consistency of quantity and quality</li> <li>▪ Inability to fulfil formal market needs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lack of knowledge on administration, marketing and pricing</li> <li>▪ Little or no access to funding</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lack of knowledge on agro-processing</li> <li>▪ Little or no storage facilities</li> <li>▪ Lack of knowledge on how to increase income with value addition</li> </ul>
Source: Paganini et al.			

One focus group discussion addressed the participants' perception of their role as urban farmers in the city's food system. The farmers stated that their products are not usually sold in their communities but go directly to the city bowl via middlemen, although they themselves would prefer to grow food for their communities. They also analysed that knowledge of vegetable consumption is weak in the communities (products and consumer needs do not coincide) and that local consumers prefer supermarket vegetables to locally grown vegetables. They furthermore admitted to having little or no knowledge about marketing their produce. Neither did they have the time or the material to engage in packaging, selling or distribution activities.

These urban farmers collected data on their production, sales, challenges, local climate and lessons learnt for a period of one year. The key statement contained in their diaries refers to farm input costs, which on the whole were higher than their weekly income.

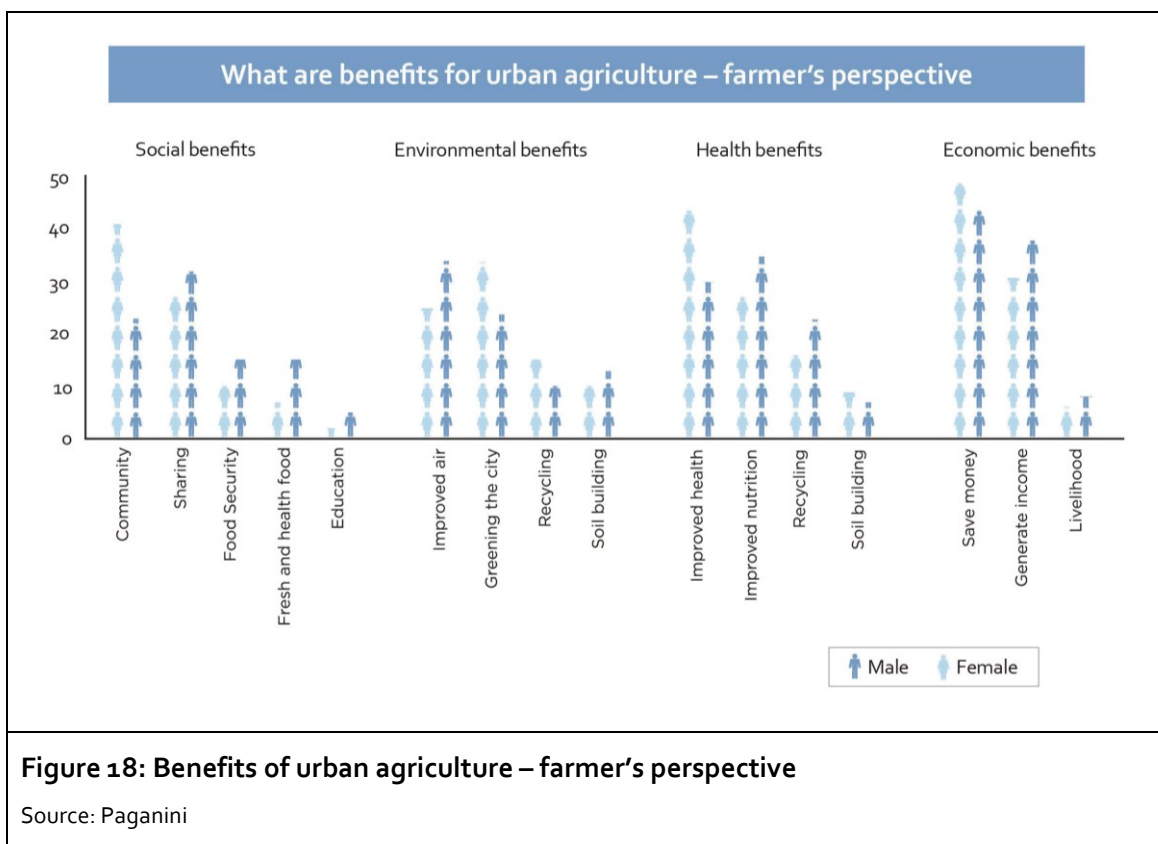
Income is strongly dependent on external marketing, as evidenced by the drop-in income when Ethical Co-op and Harvest of Hope closed down in early 2018. A couple of weeks later incomes began to rise again when Umthunzi was established. In retrospect, the farmers claimed it could have been worse, since the onset of drought – the so-called brinjal crisis – stopped many farmers from farming gardens, which would have left products rotting in the fields because the marketing outlets had ceased operations. Urban agriculture is only then economically viable when marketing is guaranteed.

The general argument that urban agriculture strengthens consumer-producer linkages due to short travelling distances is invalid in the case of Cape Town, where only a few farmers have a driving licence and the cost of transport makes it infeasible for one single farmer to deliver produce to the city centre or locations in the Cape Flats. Looking at the in-depth survey with market gardeners, for 71% of farmers (18\_MG\_CT, n=51), nothing has changed in their marketing activi-

ties in the last ten years and most of food gardeners sold their produce via Harvest of Hope in 2017. This dependency on middlemen in Cape Town is evidence of strong power relations, weak empowerment of small-scale farmers, and the challenges and inequities of living in a spatially and culturally segregated and fragmented city like Cape Town.

Farmers argued in focus group discussions that the potential of urban agriculture could increase if key challenges were overcome, namely, access to local and external markets with fair pricing and sovereignty in production planning to coincide with local consumer needs. Space is nevertheless a limiting factor. At the same time, exploiting the vast amount of fallow land around schools and churches could double or triple the current number of food gardens (17\_B\_CT).

The following graph illustrates that Cape Town’s reality fits into Tornaghi’s (2014) perspective on the multiple functions of urban agriculture (see Chapter 2.1).



**Figure 18: Benefits of urban agriculture – farmer’s perspective**

Source: Paganini

Being a farmer in Cape Town is a huge challenge if the expectation is to make a living. On the other hand, urban agriculture has the benefit of adding fresh crops to staple diets, promoting community building in depressed areas and enriching farmers’ lives in the process through empowerment and networking.

**FriDiary – Farmers’ notes on production and marketing challenges**

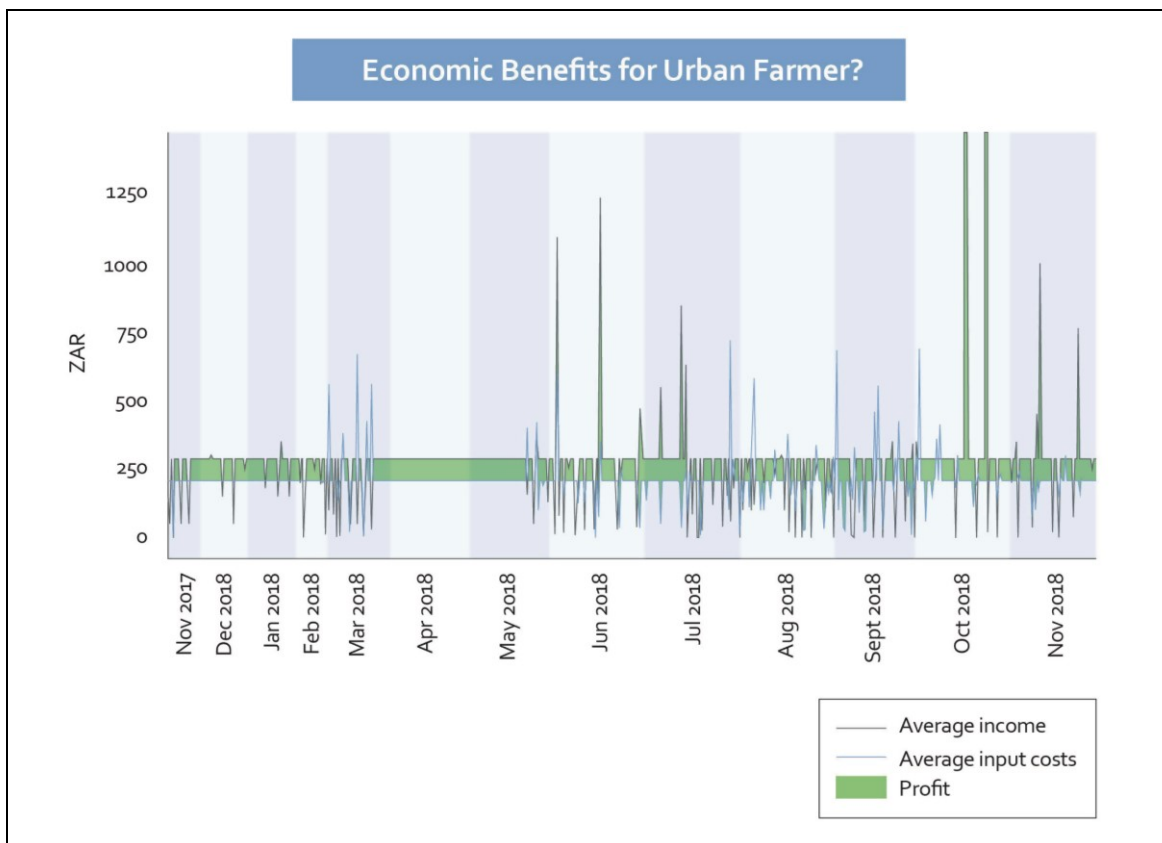
Between November 2017 and November 2018 twelve urban farmers in Cape Town made notes in farmer diaries, the so-called FriDiaries (Friday was nominated as the day for taking notes). These diaries helped the farmers to keep a record of their planting and pest management activities, their inputs and the money spent on seeds, seedlings or other inputs. They also served to keep

track of yields and the income generated. Tracing their own agricultural path also encouraged farmers to note down the challenges they faced during the week, as well as possible solutions and weather observations.

The graph below shows the annual challenge distribution. Production challenges were addressed with open questions and participant farmers replied with continuous texts or key points divided into categories. The hot and windy weeks in the summer months were seen as the biggest challenge. The question of sufficient inputs was mentioned frequently. The following quotation is evidence of the monthly challenge of calculating how much money to invest and difficulties to plan for a market, as costumers come irregularly to the food gardens and maybe won't come back, if the offer does not correspond to the wishes.

“You have something in your pocket, but seedling prices are too high. They were beyond my budget and I ended up spending a lot. The bad thing is that clients ‘pop in for null’ ” (Farmer describing challenges in April 2018 – ‘pop in for null’ means that potential clients show up, look around but purchase nothing).

The temporary withdrawal of the Harvest of Hope and their box scheme in February 2018 also appears in the graph. In March 2018 Umthunzi took over most of the production, which is why the challenge is only registered as the absence of a market.

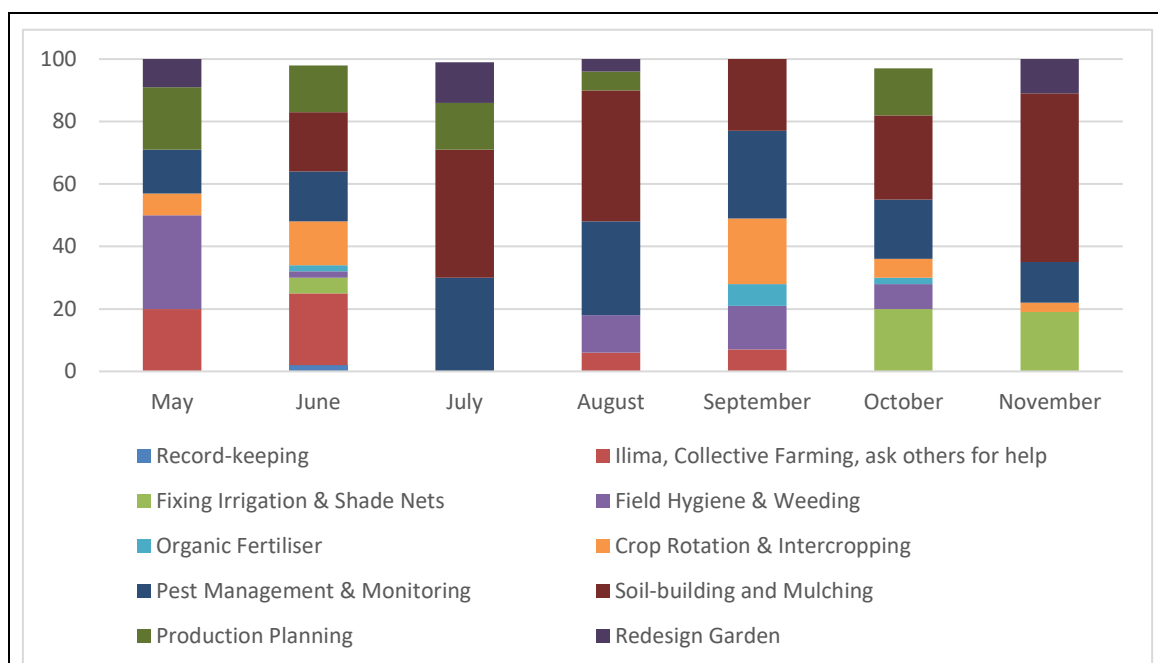


**Figure 19: Economic benefits for urban farmers**

Source: Paganini



UFISAMO held a workshop in March 2018 to develop production guidelines. Many of the diary-keepers took part and were heavily involved in their elaboration. In May, farmers began to write down in their diaries the urbanGAPs measures they had adopted in their gardens.



**Figure 20: urbanGAPs activities documented by the farmers**

Source: Paganini

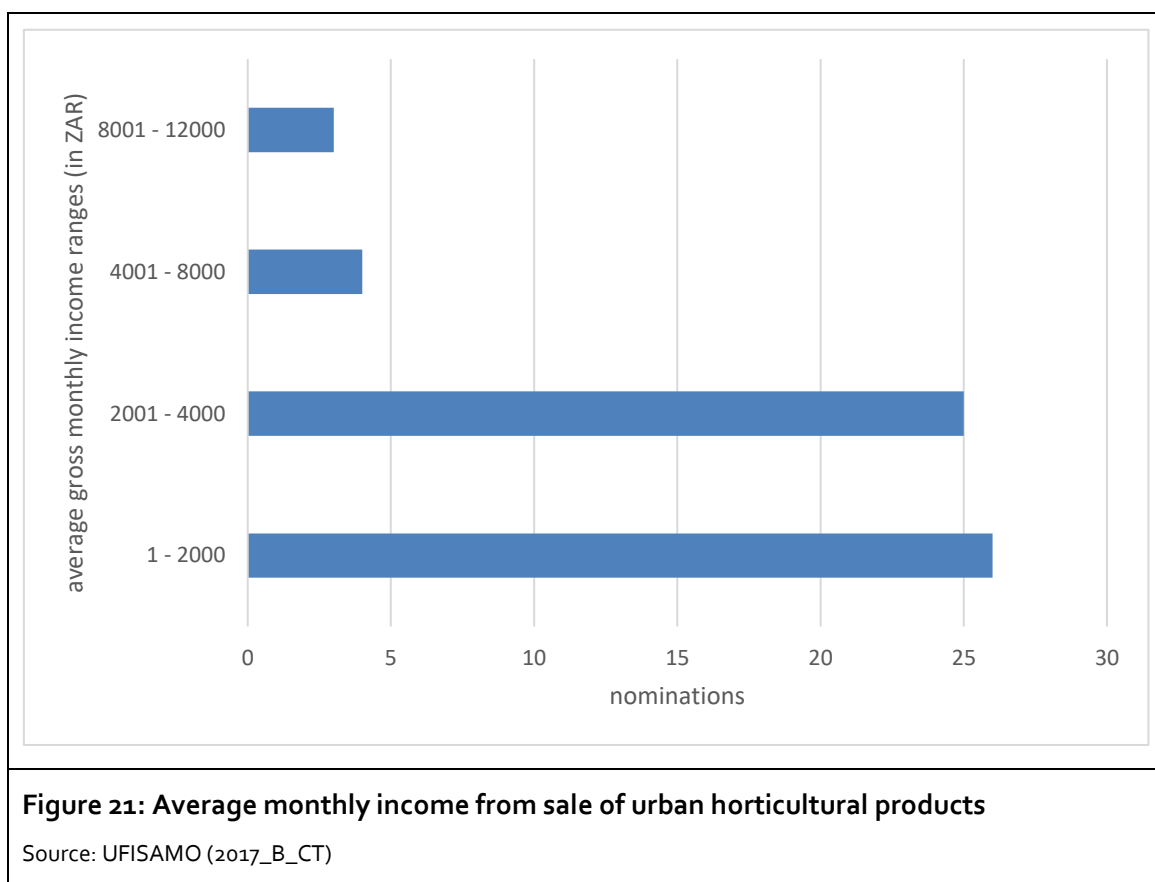
That farmers began to collaborate and carry out joint activities two months after the urbanGAPs workshop is an impressive result. The winter months were mainly used for soil construction (composting, mulching). Pest management was mostly limited to collecting snails. One crucial message imparted at the UFISAMO workshop was the importance of devoting time to field hygiene, which was in fact intensified in the first month after the workshop. The summer months were used to adapt infrastructure, i.e., to build up networks and repair irrigation systems. There is, however, still room for improvement when it comes to implementing field hygiene, production planning and organic fertiliser application.

## 4.5 Brief economic analysis of vegetable production in Cape Town

*Erik Engel*

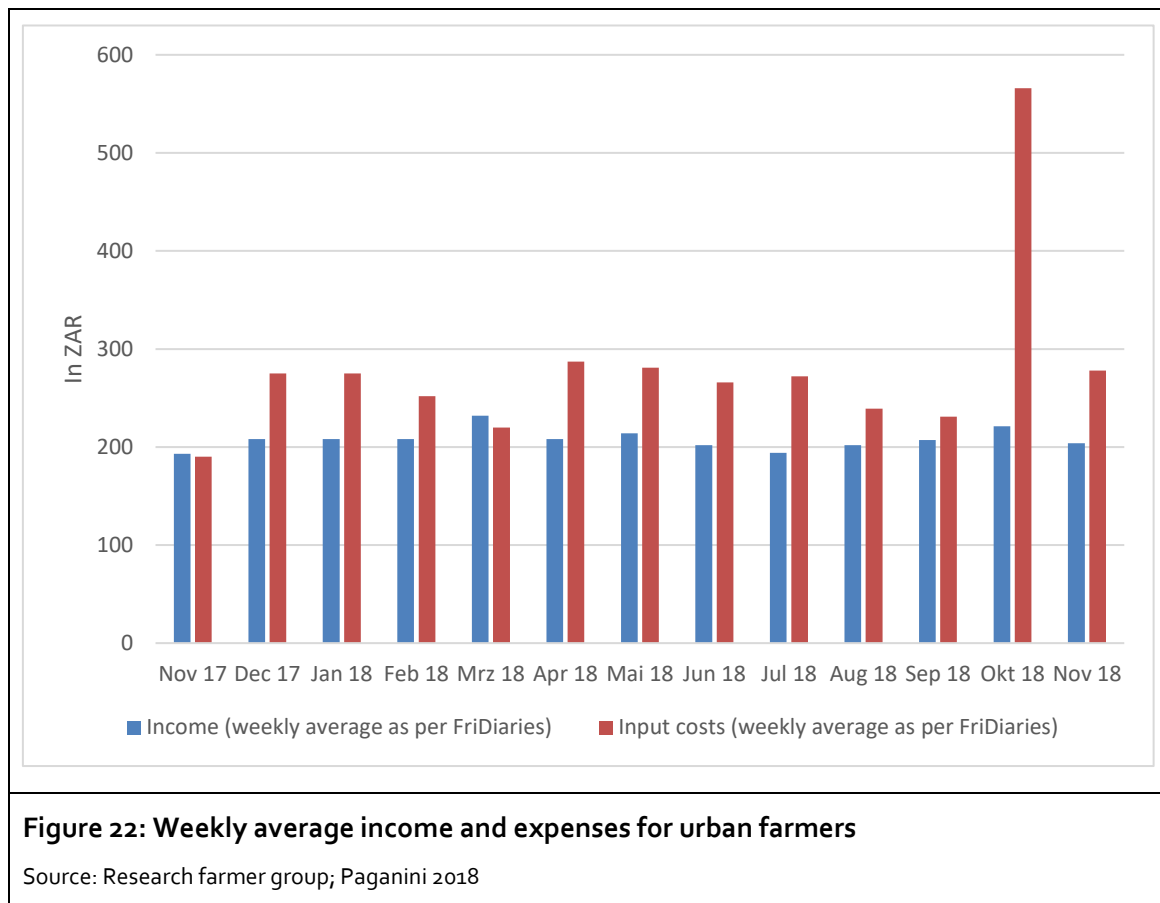
Of the 105 farmers interviewed during the baseline in 2017, 45% (47 respondents) stated that they had earned no money at all from their gardening activities. Looking at the statements of the remaining 58 farmers who did generate an income, 45% (or 25% of the total interviewees) earned on average less than 2 000 ZAR per month (approx. €115) gross income (i.e. prior to deducing investment costs), while another 43% (or 24% of the total interviewees) earned monthly between 2 001 and 4 000 ZAR (approx. €115 – 230) gross income from their garden products. The monetary poverty line for South Africa is defined at 3 500 ZAR (approx. €205) per month (CoCT, 2018).

Only 12% of farmers who earn money with their garden products (or 7% of the total interviewees) have an average gross income exceeding 4 000 ZAR, approx. €230, (see Figure 21, based on 58 farmers with an income from UA out of 105 interviewees)<sup>24</sup>.



The picture of economic benefit becomes even bleaker during in-depth discussions based on bookkeeping: when the members of the research farmer group compared their average weekly expenses and their income from urban agriculture over the course of one year, they found that (on average) their expenses exceeded their income (Figure 22) from crop production.

<sup>24</sup> These figures should be treated with caution – farmers did not consult books to follow up on their income and expenses, and may have given biased answers: at the end of the day, why should they disclose the economic details of our household to complete strangers?



**Figure 22: Weekly average income and expenses for urban farmers**

Source: Research farmer group; Paganini 2018

Surprising in this time-line – apart from the fact that farmers still cultivate despite it being a costly activity – is the fact that income remains constant all year round, regardless of Cape Town’s distinct seasons. Records were kept during the drought of 2017/2018, however, when urban horticultural production faced severe water shortages. The first rain brought a loosening of water restrictions after June 2018, but vegetable production needs time to recover. The extremely high expenses for October 2018 may be linked to the purchase of a water capture system or of material for soil building.<sup>25</sup> In addition, two marketing schemes that had operated in previous years (Harvest of Hope and Ethical Co-op) collapsed in 2017, leaving farmers with no sales outlets. It can therefore be questioned whether these results are representative. At the same time, they do provide a snapshot of a specific situation and hint at the fact that economic profitability is not the primary objective of urban farmers (see chapter 4.4.2).

The main production expense is seeds and seedlings, as well as compost to increase soil fertility. Compost from NGOs comes at subsidised prices (see Chapter 4.3.2). Water is one cost factor when city water is used, another is purchasing *jojo* tanks or other containers for water harvesting. Other expenses are linked to land leases, fencing materials and, when products are marketed, transportation. As elaborated in Chapters 4.3.2 and 4.4, farmers found it difficult to estimate their expenses. Due to no or only marginal net income gained from this economic activity and the fact that 82% (women) and 70% (men) of those interviewed are unemployed and de-

<sup>25</sup> One respondent stated having invested 8 000 ZAR (approx. €468) in a specific week in October, which clearly exceeds the average 250 ZAR (approx. €15) spent in other weeks.

pend on grants (see Table 15 in Chapter 4.4), it can be concluded that producing reliable quantities and good quality for sustained marketing calls for investments that are difficult to afford.<sup>26</sup>

Despite the meagre economic benefits: The baseline survey indicates that 91% of female food garden farmers and 86% of the men involved contribute to their income with urban agricultural activities. 40% of female home gardeners and 42% of male home gardeners contribute an average of more than 1 200 ZAR (approx. €70) per month. This is far below the monthly requirement for a four-person household, estimated by the PACSA NGO (2017) to be around 2 400 ZAR (approx. €140) per month, and well below the poverty line of 3 500 ZAR/month. Urban agriculture can only make a small contribution to the household income of the people involved in the activity, but cannot provide the entire income required (see Chapters 4.3 and 4.8).

That said, urban farming allows people to develop social networks. According to Kroll (2016, p. 26), who bases his analysis on a number of AFSUN studies, "(...) for a small but significant proportion of the urban poor, social networks are an important food access strategy, highlighting the importance of social capital." This suggests that the contribution to income is not the main driver when it comes to involvement in urban agriculture. Motivations for conducting gardening activities mentioned by farmers confirm this conclusion: only 18% of respondents mentioned 'income generation' as their main motive (see Chapter 4.4.2).

Although the UA contribution to household income is not sufficient to cover household needs, let alone to ensure 'stepping up' in terms of a regular income that is secure and in the long run will enhance the living conditions of the farmers concerned, it can help to mitigate the effects of multiple poverty and deprivation, and is crucial in the absence of social programmes or job creation measures.

## 4.6 NGOs, farmers and networks: a case study of organisational structures of urban agriculture in Mitchells Plain, Cape Town

*Tinashe Paul Kanosvamhira*

This chapter looks at the organisational structures of urban farmers and urban agriculture in Mitchells Plain, a predominantly 'coloured' suburb of Cape Town. As a case study of this specific suburb, it also gives an insight into more general issues, such as the (self)-organisation of farmers, the role of supporting actors and the broader social context. In order to understand the interaction of these actors and dynamics, qualitative and quantitative techniques were employed. Data collection took place in two phases. The first phase saw primary data collection through self-administered questionnaires with 60 randomly selected urban farmers from Mitchells Plain. 30 of these urban farmers were selected from each of the two active NGOs identified in the study area – Soil for Life (SFL) and Schools Environmental Education & Development (SEED). The second phase of the study entailed the use of semi-structured interviews to solicit in-depth information from NGO representatives, selected farmers and the Provincial Department of Agricul-

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<sup>26</sup> An in-depth analysis of the economic implications of horticultural production in Cape Town will be part of a PhD paper by Paganini to be published in 2019/2020.

ture extension officer. In terms of sampling, NGOs working in the area served as an entry point to access urban farmers. The results are presented in the following.

#### 4.6.1 Role of state and non-state actors and linkages

Non-government Organisations (NGOs) are central actors when it comes to the training, organising, input supplying and product marketing of urban farmers. State actors support urban agriculture by setting up the legal framework and channelling their assistance programmes through NGOs (see Chapter 4.2).

Urban agriculture in Mitchells Plain is mainly practised around homes (home gardens) and in agri-hubs/community training centres run by NGOs (community gardens). Food gardens – land shared by a number of farmers who cultivate individual plots but share resources and marketing channels – are hardly represented (for this classification, see Table 12 in Chapter 4.3). NGOs have supported urban farmers in Cape Town with a number of resources, enabling them to engage in urban agricultural activities (Kanosvamhira, 2018). Interviews with urban farmers confirm that Soil for Life and SEED were crucial to the assistance and training of farmers in Mitchells Plain. Soil for Life (SFL), for example, currently supports 1 930 members with subsidised inputs, training and monitoring (Olivier & Heinecken, 2017). SFL supports home gardeners rather than food gardeners (Battersby & Marshak, 2013). According to an SFL project coordinator, this is due to numerous disputes the NGO experienced while working with groups of food garden farmers. Consequently, it prefers to support individual home gardeners. Similarly, SEED supports a hundred home gardeners in the Mitchells Plain area with gardening practices based on permaculture principles (Battersby et al., 2014).

Both SFL and SEED have been actively involved in Mitchells Plain and respondents acknowledged their assistance in the form of training and starter packs to launch their gardens. Both NGOs train soil building, water conservation and/or permaculture (see Chapter 4.2). This is crucial given that Cape Town's sandy soils require considerable attention prior to realising outputs (Battersby et al., 2014). Also, Cape Town is a generally dry region, so that permaculture and water conservation techniques have high relevance for urban farmers (see Chapter 4.3). Apart from these resources, NGOs were vital to providing a platform for urban farmers to meet, interact and strengthen the bonds between them.

NGOs conduct training workshops on sustainable urban agricultural practices in the respective community gardens/training centres. These workshops offer a platform where urban farmers can learn from one another and establish relations of trust. As a rule, these relations continue beyond the tenure of the workshop and represent a starting point for farmer networking on the topic of urban farming activities. They also have the potential to extend this communication to embrace other community issues. Hence NGOs have been instrumental in facilitating bonds between urban farmers from different areas of the community.

SEED has offices in Mitchells Plain, making them easily accessible to the community. SFL, on the other hand, is located some 25 kilometres away from the community, although their community presence improved when they worked to turn the Beacon Organic garden in Mitchells Plain into an agricultural hub. Additionally, NGOs utilise a number of tools to advertise their services to the

community. Asked about how respondents had come into contact with their NGO, 71.1% replied through the media, specifically a local newspaper, *The Plainsman*. Only 21.7% said they had been introduced to the NGO through friends, relatives or colleagues.

The Provincial Department of Agriculture (DoA) and the municipal government of the City of Cape Town are the state actors that regulate urban agricultural activities. As they go through NGOs to reach out to urban farmers, they are considered secondary actors (see Chapter 4.2).

The Provincial Department of Agriculture is instrumental in supporting urban agricultural activities in Cape Town (Battersby et al., 2014) through the Farmer Support and Development Programme (Halder et al., 2018). It called for enhanced coordination of activities by the leading players involved, thereby showing its recognition of the importance of partnerships between supporting actors. According to Swanepoel et al. (2017), the Provincial DoA provides home gardeners and community gardens with extension services and inputs. In fact, Battersby et al. (2014) report from 2008 that the Provincial DoA supported at least 114 community gardens in the metropolis.

In the case of Mitchells Plain, it was discovered that the Provincial DoA works mostly with the few food gardeners as opposed to home gardeners. In fact, none of the home gardeners had received any support from the Provincial DoA. The food gardeners, on the other hand, indicated that the Provincial DoA had been instrumental in supporting them with much needed resources such as perimeter fencing, borehole installations, storage containers and basic tools.

The study finds that the involvement of the municipality was insignificant among the surveyed respondents in Mitchells Plain, with respondents reporting compost bins as the only form of assistance forthcoming from the city. Further inquiry revealed that provision of these bins had no reference to urban agricultural activities. In other words, compost bins did not target urban gardeners as such but the community in general. The urban agriculture unit of the City of Cape Town is currently unstaffed (see Chapter 4.2).

#### **4.6.2 Linkages between primary and secondary actors**

Haysom & Battersby (2016) argue that the state of linkages between the government and non-governmental organisations across the country is weak. Specifically, they report that although NGOs within the urban agriculture sector have viable projects, local governments fail to work in unison with them. Closer cooperation, so they argue, would however be important, since NGOs maintain a more pronounced community presence.

A similar predicament was observed in the study area of Mitchells Plain. In fact, key informant interviews indicated that limited attempts were made to improve partnerships between the state and non-state actors. The senior extension officer at the Provincial DoA described the relationship between support organisations as 'very poor' and a 'random' occurrence. In his view, various reasons were responsible for the purely minimal cooperation efforts of primary and secondary actors. Nevertheless, there was some evidence of attempts to work together, since one NGO informant spoke of the possibility of conducting a training programme for the Provincial DoA in the future.

Another surprising finding was that interaction between the NGOs operating in the study area was also minimal. NGO interviewees admitted that NGOs working in the area are occasionally at loggerheads due to the competitive nature of funding. This could culminate in a fraught relationship, one that stifled any attempt at positive cooperation. As a result, the organisations failed to synergise and work together to improve the impact of their activities in the community. It also explains why most respondents have dual NGO membership. In other words, they could leave one NGO for the resources of another.

Citing examples from above, it is clear that both state (provincial) and non-state actors provide crucial support to urban farmers across the city. That said, interaction among these actors is limited, potentially reducing the meaningful impact of projects in the area.

#### 4.6.3 Obstacles to urban farmer networking

NGOs have been working on the creation of urban farmer networks in the community of Mitchells Plain. With limited success: the study revealed that farmers face a number of challenges when it comes to network engagement. Major inhibiting factors include time constraints, distances between farmers, lack of resources, and the divergent views of urban farmers.

Close to 40% of respondents indicated that time was a significant obstacle to networking with other farmers. In-depth interviews revealed that respondents had divergent priorities that frustrated siphoning off time to meet up with fellow urban farmers. In response, some urban farmers suggested using mobile technology platforms such as WhatsApp to help bridge the gap. This, too, presented problems since some group members failed to adhere to the group objective, forcing others to leave these online groups.

Distances between farmers and lack of resources for transportation are additional obstacles to maintaining networks. Mitchells Plain is a relatively large township and most urban farmers cultivate at home. Finding a common location to meet regularly and share information is not an easy task. Distance in the context of urban farmers translates to transportation costs for networking and workshop attendance. Hence the notion of establishing an urban farmer organisation seems doomed to failure under such circumstances. Closely linked to distance is the lack of resources: lack of finance means that travelling is out of the question, even within the city, and consequently conducting their own workshops.

The instability of food gardener groups also seems to be an impediment to increasing self-organisation among urban farmers. The formation of urban farmer groups should begin at grass-roots level and feed into higher level organisations. In other words, higher level organisations at the municipal level or beyond depend on the success of urban farmer groups on the ground. Food gardens in Cape Town, however, are marked by disintegration, conflict and unsustainability (Battersby & Marshak, 2013).

The dynamics of food gardens tend to affect their sustainability, which is why some NGOs (e.g., SFL) do not or no longer support them (*ibid.*). This jeopardises opportunities to form networks, as members are constantly leaving the garden or newly arriving. Such high attrition rates among food garden members translate directly to wasted effort and low production levels (Tembo & Louw, 2013).

Finally, the socio-economic diversity of urban farmers makes it difficult for them to organise (Schmidt et al., 2015). In Cape Town urban farmers are found across various localities and characterised by varying socio-economic status. The segregation policies of apartheid rule are still felt today and inhabitants of different townships, who often speak different mother tongues, still struggle to bridge the dividing lines (18\_O\_CT). Furthermore, urban farmers engage in urban agriculture to various degrees and for various reasons (CoCT, 2007). Uniting them under a shared vision is therefore nothing if not challenging. This circumstance is aggravated when it comes to acquiring and redistributing benefits from joint marketing activities. The emergent sense of competition and mistrust seems stronger than the mutual benefits of cooperation (18\_O\_CT). Seen from this perspective, persuasion skills are called for if networking among urban farmers is to become an effective tool in the field of urban agriculture.

#### **4.6.4 Conclusion: potentials & challenges**

NGOs have been instrumental in the shaping of urban agriculture activities in the township of Mitchells Plain, as in the rest of Cape Town, particularly through resource access and capacity building. The work of NGOs in capacitating urban farmers with the necessary skills to ensure their ability to cultivate under the unfavourable physical conditions of the Cape Flats has been crucial. The focus of NGO activities in Mitchells Plain are home gardeners.

NGOs are also in the process of refining the sustainability of urban agricultural activities in the community by training community members to head the organisation's projects and ensure that skills remain in the community when the project cycle ends. Training takes place in community gardens run by NGOs that serve as agricultural hubs. Besides general production and soil conservation techniques, urban farmers are taught compost making and water conservation techniques with the aim of reducing reliance on bought compost and instilling self-reliance.

NGOs have provided platforms to improve the social fabric of urban farmers and the community as a whole. As a result, loose informal networks have sprouted amongst urban farmers, allowing them temporarily to share knowledge and resources even in the absence of NGOs. In general, these networks have proved weak and are inhibited by time constraints, distance and lack of resources for transport. These obstacles are exacerbated by farmer disputes that partly derive from the segregation policies of the past but have systematically accrued cleavages between communities over time.

The Provincial DoA supports food gardens with crucial resources such as perimeter fencing, borehole installations and basic farming tools. Given that NGOs do not usually support community farms, the involvement of the DoA is vital.

The case of Mitchells Plain, however, indicates that the ubiquity of supporting actors in the urban agricultural sector does not necessarily translate into realisation of the desired effect. The findings show that interaction between the different actors is slight, partly due to competition for funding (among NGOs).

The case of Mitchells Plain likewise illustrates the scant dialogue between supporting actors. As a result, the latter conduct independent activities of minimal impact. In other words, there is a strong need for enhanced stakeholder dialogue to reinforce partnerships and tweak the impact



of urban agricultural initiatives. Such platforms would ensure that urban farmers, the government, civil society and the private sector hold discussions and generate solutions acceptable to each party involved.

Additionally, a forum of this kind would have the knock-on effect of improving the organisation of urban farmers at grassroots level, not least because of their interest in dialogue participation. As shown above, there is room for improvement with reference to the efficiency of informal urban farmer networks in Mitchells Plain: there is a heavy reliance on NGOs and an independent network is non-existent. Accordingly, urban farmers – specifically the vulnerable – have weak linkages to secondary actors and no access to the resources that would capacitate them to boost their household food security and their income (see Chapter 4.8).

## 4.7 Food habits of urban farmers and households in Cape Town

*Based mainly on Swanby, 2017 and contributions by Abongile Mfaku & Nicole Paganini*

Food habits are defined as the way in which producers and households use the food they have, including how they acquire it, the frequency of food consumption, and the diet composition that determines the food consumption pattern (Abreu et al., 2001).

Food habits and the food preferences of urban gardeners and their households influence the decision on crops grown for self-consumption, while the food habits of consumers/customers of urban agricultural products determine the demand for specific products on the market. Urban agricultural research must therefore explore food habits.

### Farm and home garden production

Urban farmers in Cape Town produce a wide variety of crops – primarily annual vegetables and fruits, as well as indigenous and traditional Cape crops. They do not produce staples such as maize or grains. Neither do they grow many fruit trees or perennial hedges. The farmers themselves see spinach, kale, carrots, onions and cabbage as their top sellers (17\_B\_CT), (see Chapters 4.3 and 4.4).

Urban agricultural activities in Cape Town are carried out by two distinct groups: food garden farmers, who cultivate fruit and vegetables to sell to markets, private households or restaurants in the wealthier parts of the city using NGOs as intermediaries and home gardeners, who cultivate to supplement their household diet, increase dietary diversity and reduce food expenditures (see Chapters 4.2 and 4.3).

With few exceptions, home gardeners are limited to self-supply, self-consumption and random 'selling over the fence' to neighbours and other members of their community. Neighbours also exchange surplus between themselves. Apart from saving money by substitution, income generation is very low (see Chapter 4.3).

According to Van Averbek (2007), who researched urban agriculture and FNS in the township of Atteridgeville, City of Tshwane (formerly Pretoria), home gardens provide 6.7% of the vegetable intake of 810 grams per day for an average-sized household. Urban farming and food security has

a positive correlation, although it was moderately low. The low contribution of urban agriculture to food security is also consistent with nutrition: Van Averbeke concludes that from a nutritional perspective, home gardening does not make a significant contribution to household food security.

Looking at Cape Town's overall food system, food gardens and home growers produce less than 1% of the overall share (Battersby-Lennard & Haysom, 2012), (see Chapter 4.1). Research results show that most of the vegetables produced in the Cape Flats reach customers with above-average income, either as private customers (e.g., via box schemes) or business clients such as restaurants.

### **Food and consumer habits in less favoured areas of Cape Town – low dietary diversity**

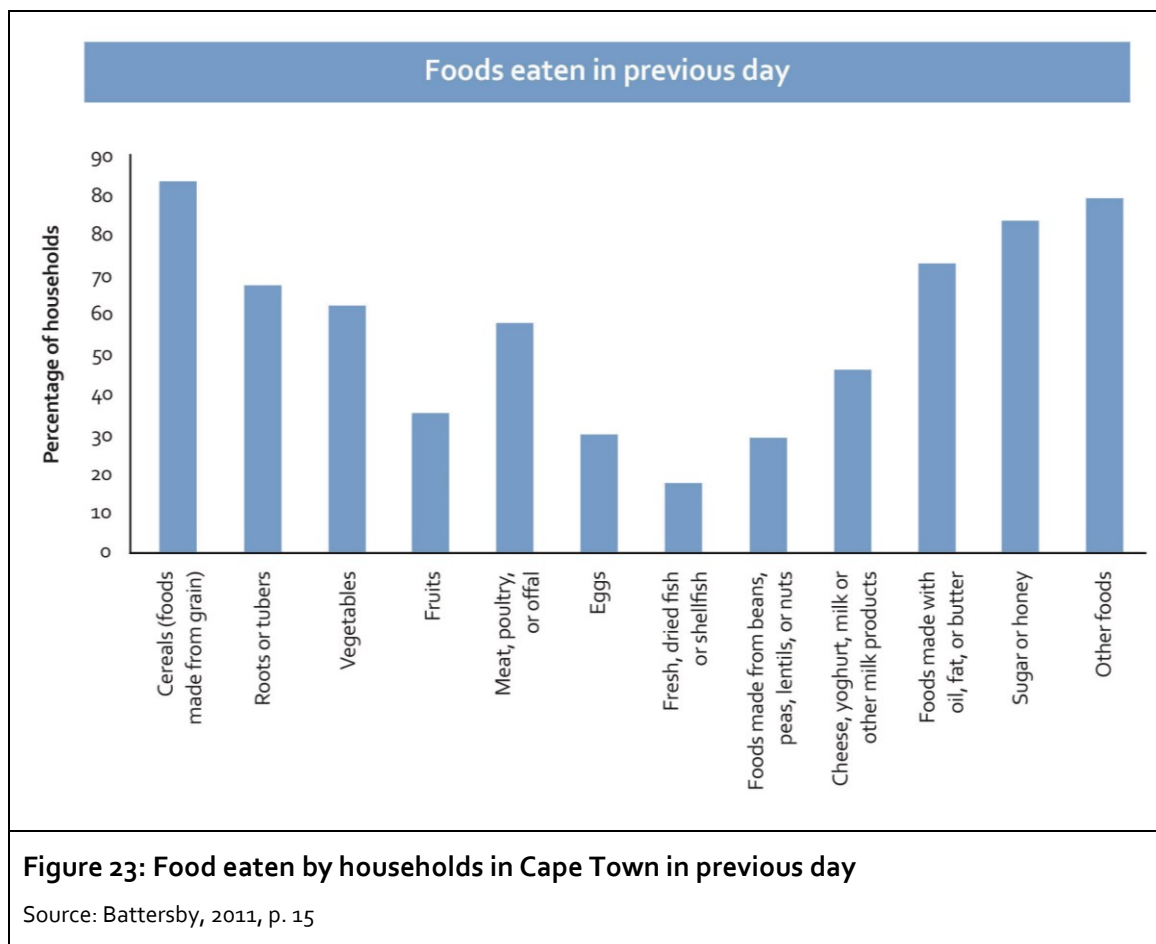
Most consumers in the townships buy in supermarkets or from formal and informal markets: urban farmers assume that knowledge in the communities on the importance of vegetable consumption is weak, and that there is a preference to purchase vegetables in large supermarkets rather than locally grown products, which often look smaller, are less shiny, and occasionally cost more. Furthermore, farmers admit to having little or no idea of how to market their produce. Neither have they the time or the material to engage in packing, selling or distribution activities. They also realise that their garden produce does not coincide with neighbourhood food preferences (18\_FG\_CT).

According to the BFAP Poor Person Index, which aggregated information on typical daily portions of the five most commonly consumed foods in South Africa, the following is a benchmark of the basic South African diet: maize porridge (532 g cooked), brown bread (150 g), sugar (22 g), tea (2.5 g, dry) and full cream milk (56 g).

This food is clearly not sufficiently nutritional and provides only 2500 KJ in a diet that is very low in protein and other nutrients. Although this is a fairly crude look at the South African diet, it does give some insight into the dangerously incomplete food plate (Swanby, 2017).

Dietary diversity in Cape Town's low-income areas is worryingly low. Food habits here reflect the characteristics of the nutrition transition associated with urbanisation, which leads to increased consumption of saturated fats, sugars, salt and processed foods (Drimie et al., 2013).

In Khayelitsha, household diets tend to be dominated by cereals and high sugar usage. Household dietary diversity was found to be low, with a minority of households eating nutritious foods such as eggs, fruit, beans, peas and lentils or fish (Crush & Tawodzera, 2016). Results from the AFSUN Cape Town case study in 2008, which surveyed in Ocean View, Philippi and Khayelitsha, showed that households were relying on a small number of non-nutritive foods. A HDDS survey in the Cape Flats that traced food groups consumed in the previous 24 hours found that 6 out of 12 possible food groups were part of the diet. Of the four most commonly consumed food groups, however, three were largely non-nutritive: oils/fats (72% of households), sugar/honey (83%) and tea/coffee (88%) (Battersby, 2011). While this caloric intake may be adequate, the diet itself is likely to be deficient in vitamins and other micronutrients (ibid.).



The results of the survey mentioned above showed that food preferences in Cape Town diverged from the 'typical South African meal' of *samp* and beans. In general, the percentage of households that consume non-animal protein (e.g., by eating beans, peas, lentils) was lower than expected. Similarly, and considering the Western Cape is an exporter of sea and freshwater aquaculture fish, the proportion of people in the townships who eat fish is low (12% in Philippi) and then mostly canned fish sold extensively in low-income areas (Battersby, 2011).

### Factors influencing food choices

Food habits are driven by a variety of socio-cultural, economic, and structural factors.

Price is the decisive driving force for food choices (SANHANES-1, 2013): according to research by Temple and Steyn (2011) conducted in food stores in urban and rural areas of the Western Cape, a healthy diet was 69% more expensive than unhealthy choices and that even when healthier choices were available (the bigger the stores, the greater the options), people opted for the less expensive and thus less healthy (Kroll, 2016). This is confirmed by research on dietary habits and obesity in Khayelitsha and Mitchells Plain concluded in 2017 (Dinbabo et al., 2017, p.139): "[...] the empirical study in Khayelitsha and Mitchells Plain clearly indicates that healthy food tends to be more expensive and as such, most people cannot afford it." And, according to the same source: "[...] although people have the knowledge in terms of what food items are more nutritional, they are often unable to exercise that choice." (ibid., p.102).

According to the SANHANES-1 survey finalised in 2013, the nutrient content of food influenced the decision of only 11% of 'informal urban female' inhabitants (SANHANES-1, 2013).

Poor knowledge of nutritional requirements contributes to the low average of dietary diversity in South Africa: "South African researchers have clearly shown that there is a lack of health knowledge despite the improved educational level in recent years. (...) The general nutrition knowledge results of the SANHANES-1 corroborate those previous studies, which support and extend the premise that the nutrition knowledge of the South African population is inadequate" (SANHANES-1, 2013, p. 188). This seems particularly true for knowledge on the benefits of different types of fruit and vegetables, and familiarity with them (Dinbabo et al., 2017). According to respondents of the obesity research quoted above, advertising on billboards, TV and radio seems to exert some influence on eating habits and food choices, especially on children (ibid., p.69). – and various studies (e.g., Aktas, 2006; Ofcom, 2004; Haroon et al., 2011, quoted in Dinbabo et al., 2017) reveal that advertising "generally tended to influence the purchase of cheap, processed unhealthy and highly sweetened foods" (ibid., p. 107).

Other reasons for the 'nutrition transition' – a transition from diets rich in cereal and fibre to diets richer in sugars, fat and animal sourced food – are thought to be related to urbanisation and the adoption of more 'Western style' diets (Popkin, 2002 in SANHANES-1, 2013). This may be due to the comparatively long preparation time for beans, lentils and other fibre-rich products, and the high energy – multiplied by high energy prices – needed to prepare them.

As mentioned earlier, formal shop products are often cheaper, already processed and rich in fat or sugar and calories. Here the high prevalence of informal vendors in the townships may act as a counterbalance: Kroll (2016) is of the opinion that informally available food is less intensively processed and therefore potentially healthier. On the other hand, *spaza* shops, most of which are unregistered and the most accessible shops in the researched townships, have a much smaller offer of products, especially when it comes to fresh fruit and vegetables (Dinbabo et al., 2017).

On another note, ethical considerations may influence food choices: some well-intentioned middle/upper class consumers intentionally buy products to support vulnerable groups or to get organically and locally produced vegetables. Thereby they are willing to pay a premium at markets, in restaurants and for box schemes (Paganini et al., 2018).

## 4.8 Urban agriculture, food and nutrition security and income in Cape Town

*Abongile Mfaku & Haidee Swanby*

South Africa faces a growing food insecurity crisis. Although the country is 'food secure' at national level, due to socio-economic inequality, 26% of the population regularly falls victim to hunger while another 36% is at risk of hunger (Oxfam, 2014). Food insecurity and malnutrition is becoming more and more an urban problem (Crush et al., 2012). The urban context with its high dependency on purchased food items, high food prices, low income and high unemployment puts a constraint on the accessibility and utilisation of food. Essentially, people are unable to buy

basic food items as a result of their limited purchasing power and ultimately make do with poor nutritional food or have not enough food to eat (Nicolson, 2015).

In 2012, the Western Cape had the lowest levels of food insecurity in the country, with 16% of household's food insecure. Despite that good overall score, SANHANES-1 (2013) found that the greatest number of people at risk of tipping into food insecurity live in urban informal areas. 36% of urban informal residents are rated to be at risk of hunger, followed closely by rural informal areas at 30%. 32% of urban informal residents experience hunger. The African Food Security Urban Network (AFSUN) study shows, however, that countless Cape Town residents are exposed to food insecurity, with higher levels in the lower-income areas. Khayelitsha, for example, was the most food insecure area surveyed, with 89% of the population at severe and moderate food insecurity levels – less than 10% of the population of Philippi and Khayelitsha was food secure (Battersby, 2011). This particular study showed the pervasiveness of the problem and the urgency of confronting what Crush & Frayne (2010) call the 'invisible crisis' of food insecurity among the urban poor: a crisis triggered not by lack of calories in diets, but lack of nutrients. The food security level furthermore varies according to season, presumably due to fluctuating casual labour opportunities and spending peaks: troughs appear in January (when construction employment is scarce and after New Year spending) and in June, when bad weather reduces job opportunities for manual labour (Battersby, 2011).

Poor households spend most of their income on food (33%) compared to 11% of non-poor households (StatsSA, 2012). Between 2006 and 2011, the proportion of food expenses increased by 52% (Kroll, 2016) due to rising world market prices for staples. Food is clearly the largest expenditure for poor households. Although these households spend a large proportion of their money on food, they remain vulnerable and food insecure.

According to SANHANES-1 (2013, p. 201), "the intake of fruit and vegetables by South Africans is around 200g per person per day (Nel & Steyn, 2002 in SANHANES-1, 2013), which is roughly half of the recommendation made by the WHO (...). Lack of fruit and vegetable may have adverse nutritional consequences with resulting micronutrient deficiencies (...). The low intake of fruit and vegetables can be attributed to many factors including poor household food security resulting from poverty. This may be due to both lack of access and the unavailability of fruit and vegetables in poorer communities such as informal settlements." Meat is consumed at comparatively high levels even by poor households, although it is a more expensive source of protein than legumes, nuts or eggs (Kroll, 2016). Poultry is the main animal protein purchased by poor households, showing the importance of poultry value chains for the foodways of the poor (Kroll, 2016).

"Food insecurity is not simply a problem of household poverty, but a matter of structural inequality that has spatial manifestations" (Battersby et al., 2014, p. 15). Poor dietary diversity and the resultant precarious food and nutrition security levels are attributed to various forms of deprivation: casual employment, disability or chronic illness, reliance on *spaza* shops for main shopping, informal dwellings, lack of running water in the house/yard and lack of safe toilets, no access to electricity... (ibid.). Lack of electricity means lack of possibilities to cool and store fresh food, thus increasing the dependency on processed, canned, and often oil and sugar rich produce to go with storable staples.

Access to food, one of the determinants of food security, is linked to monetary poverty: most households in the eastern suburbs of Cape Town (e.g., Khayelitsha, Mitchells Plain) have insufficient cash to purchase the food they want – or food that would contribute to a nutritious diet – and in the necessary quantities (see Chapter 4.7). On the other hand, greater wealth does not necessarily mean a healthier diet: the predominant value systems and lack of nutritional knowledge seem to favour the consumption of more meat and dairy produce and less legumes with increasing wealth (Kroll, 2016; Dinbabo et al., 2017).

Households employ various strategies to cope with economic factors that limit their access to food; chief amongst these is taking out loans to cover the monthly cost of food (Battersby et al., 2014). In some cases, informal traders offer interest free credit for food items. Households may also choose not to pay utility bills or move into informal housing. Dinbabo et al. (2017) reports a “difficult choice low-income families have to make between buying fruit and other basic necessities like electricity to sustain their daily lives” (2017, p. 106). Additional strategies include cutting back on the size and frequency of meals and eating ‘empty calorie’ foods that make individuals feel full but do not provide adequate nutrition for health and development.

School feeding programmes also play a major role in household food and nutrition for low-income families. Despite the generally positive attitude displayed by children about the experience of eating in a feeding scheme, interviewed parents state to be “concerned about how the food was prepared and what quality of ingredients was used {...}” (Dinbabo et al., 2017, p.132).

According to Kroll (2016, p. 26), who bases his analysis on various AFSUN studies, “(...) for a small but significant proportion of the urban poor, social networks are an important food access strategy, highlighting the importance of social capital.” Roughly a third of food insecure households go through social networks – eating with or borrowing from neighbours (ibid).

### **Malnutrition and health**

‘Hidden hunger’ is a key feature of urban food insecurity. South Africa displays the typical characteristics of an urbanising nation in the ‘final stage of nutrition transition’ (Shisana et al., 2013). This is evidenced by relatively moderate levels of underweight in children and men, high levels of obesity/overweight in women and a trend towards high intakes of energy-dense foods and beverages (Shisana et al., 2013).

Rates of obesity in South Africa are particularly high, with women showing the highest rates in the Southern African region at 40%. Meanwhile 12% of men are obese. Between 2005 and 2012, the rate of obese South African children rose from 5% to 8%, while the rate of overweight children shot up from 10% to 30%. SANHANES-1 revealed that the highest fat and sugar scores were found in the youngest age groups in formal urban areas in provinces that were largely urbanised, such as Gauteng. It has also been reported that resource-poor people tend to buy cheap, energy-dense foods that are high in fat sugar and/or starch as opposed to low-energy dense foods, which are higher in fibre and micronutrients, such as fruit and vegetables (Basiotis & Lino, 2002 in SANHANES-1, 2013).

The rate of obesity in girls in the Western Province is reported as the highest in the nation at 7%, while the prevalence of overweight and obesity in adults is estimated to be 10% higher than the

national mean. Older children and girls are more affected, and among teenagers, 28% of girls are overweight compared to only 5% of boys.

Overweight and obesity have been associated with the increasing incidence of non-communicable diseases (NCDs), which account for 40% of all deaths in South Africa. These diseases include non-infectious diseases such as cardiovascular disease, cancer, diabetes, osteoarthritis and chronic kidney disease. StatsSA reports that in 2015, diabetes was the leading underlying cause of death in South African women, while tuberculosis was the leading cause of death in men. (When men and women are taken together, tuberculosis remains the leading cause of death in South Africa, with diabetes ranking second.) StatsSA reports a steady decline in tuberculosis-related deaths and a steady incline in diabetes-related deaths over the past decade. In 2015, diabetes was the leading cause of death in the Western Cape, accounting for 7% of deaths, followed by HIV at 6% (StatsSA, 2017).

### **HIV/Aids**

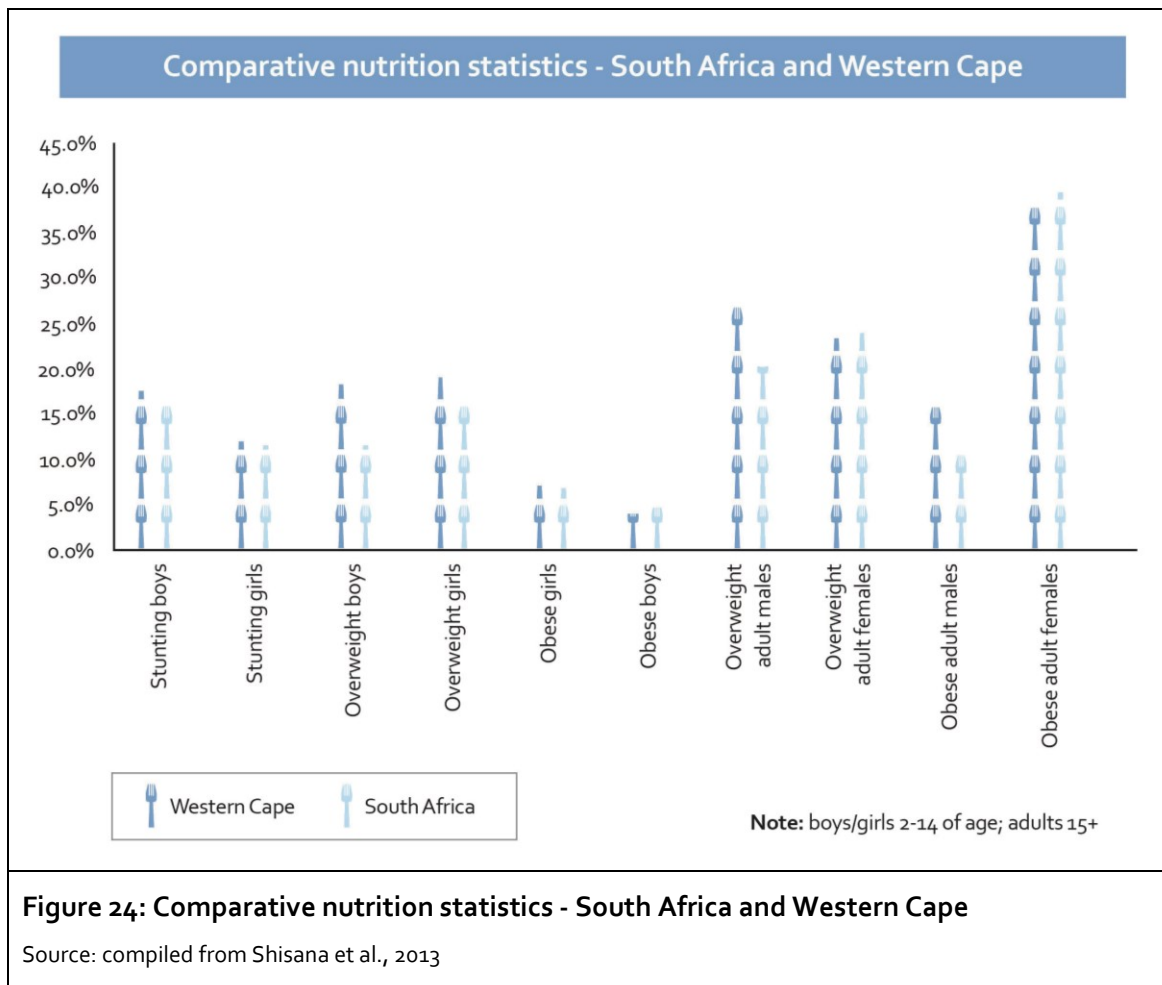
Access to adequate food and nutrition is especially vital in a country rated as having the largest HIV/Aids epidemic in the world, as well as the sixth largest tuberculosis epidemic. Good nutrition is essential to those with compromised immune systems and also important that treatments be taken with meals.

In 2016, an estimated 7.1 million South Africans were living with HIV (see Box below). HIV prevalence among young women in South Africa is almost four times that of men their age, with young women between the ages of 15 and 24 making up 37% of new infections in South Africa (SANAC, 2017). 2016 saw 270 000 new HIV infections and 110 000 South Africans die of AIDS-related illnesses.

The Western Cape has the lowest HIV prevalence in the country although there are significant variations at district and sub-district level. Khayelitsha, for example, has one of the highest burdens of both HIV and tuberculosis in South Africa. In 2011, it was reported that 20% of the City of Cape Town's HIV+ population lived in Khayelitsha. In 2013, the prevalence of HIV in Khayelitsha was estimated to be 34%. In Mitchells Plain it was estimated at 9% (SANAC, 2017).

#### **South Africa (2016)**

**7.1 million** people living with HIV  
**18.9%** adult HIV prevalence  
**270,000** new HIV infections  
**110,000** AIDS-related deaths  
**56%** adults on antiretroviral treatment  
**55%** children on antiretroviral treatment  
 (Source: UNAIDS Data 2017)



Research consistently shows that 'Black' South Africans have the highest HIV prevalence compared to other groups across South Africa. There is a clear correlation between the high prevalence of HIV in 'Black' African populations and the fact that the majority of 'Black' South Africans live in the informal areas of the country (57.6%). A significant proportion of 'Black' South Africans (4.8%) compared to all other groups live in rural informal areas and an additional 9.6% live in urban informal areas (Shisana et al., 2013). It is in urban informal areas that the highest prevalence of HIV is found.

In Cape Town, many households live in poor housing and depressed physical environments, including informal settlements. These areas are marked by severe social and economic conditions manifested in high levels of poverty, unemployment, illiteracy, alcoholism, low health status and deviant behaviour such as crime and delinquency. Substance abuse is a significant social determinant of HIV, especially among youth (CoCT, 2007).

### Food insecurity and urban agriculture

Sufficient income on a regular basis, better infrastructure, improved health status, nutritional knowledge, and social capital can help to mitigate food insecurity. On a general note, however, cities will have to look for alternative food sources other than food purchased in supermarkets and local shops if food insecurity and hunger is to be reduced (Frayne et al., 2009). Urban agriculture has been suggested as a strategy to reduce the state of food insecurity among the urban



poor. Yet, Battersby (2011) states that urban agriculture is not the panacea that will bring food security to the townships of Cape Town. And Kroll (2016, p. 26) concludes that “a vanishingly small percentage of poor urban people source food through urban agriculture (about 10%)”.

Food insecurity is a concern among the urban poor in Cape Town. Dietary diversity is low, due to insufficient and irregular household income, cultural preferences, limited nutritional knowledge and limited availability of nutritious and diverse food produce in the shops of vulnerable communities. Urban agriculture plays a vanishing role in the food security levels of the millions of people living in the townships of Cape Town. Despite the production and marketing challenges involved, however, it does contribute to the income of those who practise gardening for commercial purposes and is often their only income-generating activity apart from social grants (see Chapter 4.4). In addition, urban agriculture adds to the dietary diversity and nutritional knowledge of home and food gardeners, as producers learn about the produce they grow. Producers can access food without having to choose whether to spend their limited budget on staples, meat or vegetables. Urban farmers are, furthermore, likely to be organised in small, local and informal networks, i.e., they accumulate social capital – and as research shows, social capital is relevant to the mitigation of food insecurity, allowing people to tap into these networks in case of need.

The research findings mentioned above were concerned with food security on a general household level – some with a focus on the urban poor. UFISAMO research takes an in-depth look at the local producer and local consumer perspective. This research has shown that urban farmers have the potential to contribute to their livelihoods. The baseline survey indicates that 91% of female food garden farmers and 86% of the men involved contribute to their income with urban agricultural activities. 40% of female home gardeners and 42% of male home gardeners contribute an average of more than 1 200 ZAR per month. This is far below the monthly requirement for a four-person household, estimated by the PACSA NGO (2017) to be around 2 400 ZAR per month. In other words, urban agriculture can only make a contribution to the household income. Female food garden farmers primarily spend their income on the household (59%), personal expenses (11%), garden reinvestment (9%), family and child support (4%), while male farmers spend their income on the household (44%), personal expenses (28%), family and child support (16%) and reinvestments (3%). This suggests that food gardening is relevant to household incomes and thus to food security status, notwithstanding the production and marketing challenges involved (see Chapter 4.3).

Although the UA contribution to household income is not sufficient to ensure a ‘stepping-up’ in terms of a regular income that is secure and in the long run will enhance the living conditions of the farmers concerned, it helps to mitigate the effects of multiple poverty and deprivation, and is crucial in the absence of social programmes or job creation measures.

Home gardeners, on the other hand, cultivate predominantly for their own consumption. They grow products in accordance with seed and seedling availability and in line with their agricultural knowledge and food preferences. The urban farmers interviewed were alert to the nutritional value of legumes and certain vegetables and fruits. Producing their own vegetables means they do not have to choose between spending their limited budget on staples, on poultry or on vegetables (and usually dropping veggies as the least filling and least prestigious food). It also means

a more diverse household diet than that of the average poor household in Khayelitsha or Gugulethu.

The farmers spoke of experiencing food insecurity (hungry season) during the summer peak, when products are not yet ripe and expenses (for the festive season and for schooling) are highest. In the winter months, when the plots are barren, many of them reduced their food consumption. In that sense, they are no different from other representatives of 'the urban poor'.

Food garden farmers and to some extent home gardeners are often part of local informal networks – they meet at the community gardens of their supporting NGO and exchange seeds and information with their peers (see Chapter 4.6) – rendering urban agriculture a contributing factor to social capital. As seen above, social networks are used to mitigate food insecurity, and the stronger and broader the social networks, the more social capital is accumulated. There is additional evidence that urban agricultural activities accrued to several social benefits besides food security (Reuther & Dewar, 2005). Community gardens are a source of social capital that is accessed and used by members. As a result of their socialisation, participants build relationships and networks that strengthen communities and families (Van Averbeke, 2007). Research by Battersby and Marshak (2013) in the neighbourhoods of Vrygrond and Seawinds in Cape Town found that the support from NGOs such as Soil for life (which promotes home-based urban agriculture) did not translate into improved food security but that home and community gardens create a positive identity for groups and communities. Although urban agriculture may not be the most potent social capital wells, the networking aspect of the activity should not be underestimated when analysing the contribution of urban agriculture to food security.

Urban agriculture is just one of the livelihood diversification strategies that can potentially contribute to the food supply. Urban agriculture is a survival strategy adopted by a number of poor households. As a rule, it is micro-scale and not primarily motivated by profit, at least not when practised in and around the homes. By growing their own food, households broaden their livelihood options, increase food diversity, and enhance the nutritional value of their diet, all of which is central to health. The contribution of urban agriculture in the townships of Cape Town to the city's food system is negligible. For households active in urban agriculture, on the other hand, it adds to the household income, dietary diversity, health and networks. That said, neither food nor home gardening suffice to guarantee food and nutrition security for the urban agricultural households concerned. For this reason, the role of UA cannot always be considered 'relevant' – however, it is sometimes the only source of income (besides social grants) and the main source of vegetables. Analysis of the literature confirms these findings:

- Onyango (2010) illustrates this argument with a study on Orange farm, south of Johannesburg. The study shows that 89% of households involved in home and community gardening had no members who had been formerly employed and over a third of households produced 40% of their food in home gardens;
- Van Averbeke (2007) examines the contribution of urban agriculture to livelihoods and its impact on the food and nutrition security of households engaged in urban farming projects in the township of Atteridgeville on the outskirts of the City of Tshwane (formerly Pretoria). Households either had a home garden or a community garden or used open spaces to produce crops. Home gardens were popular and provided 7% of the vegetable intake of 810

grams per day for an average-sized household. Community gardening supplied farming households in Atteridgeville with 6.85kg of vegetables each month and 28% of the recommended household vegetable consumption. This was similar to home cultivation, except that community gardens sold 22% of their produce to generate income. Urban farming and food security had a positive correlation, although this was moderately low. From a nutritional perspective, home gardening did not make an important contribution to household food and nutrition security;

- Examining the Scaga garden projects in Khayelitsha, Cape Town, Reuther and Dewar (2005) defined the potential of urban agriculture for poverty alleviation as moderate.

Urban food gardens are used for economic and non-economic reasons. The critical focus of any urban agricultural intervention should nonetheless remain on food security and nutrition. Home and market gardens can provide greater access to healthy fresh nutritious food and increase household incomes, while simultaneously lowering the effects of pollution from transportation and waste products (Shisanya & Hendriks, 2011). However, organisational set-ups (e.g., dependency on NGOs for production planning and marketing) and production techniques need to be optimised, and urban producers empowered to generate a more substantial benefit from their activities.

## 4.9 Communication, information and dissemination channels for urban agriculture in Cape Town

*Nicole Paganini*

This chapter describes the patterns and ways of communication and learning associated with urban farmers in Cape Town. It further describes the knowledge and dissemination channels that embed the results into the urban Agricultural Innovation System frame (see Chapter 1.2) and outlines good practices of dissemination of information within the context of urban agriculture in Cape Town.

Cape Town's urban agricultural landscape is diverse and varies from garden to backyard plot, from project to project and from farmer to farmer. Mushrooming NGOs and civil society movements, high social media use and the strong role of influencers all contribute to shaping the knowledge system in which urban agriculture in Cape Town is embedded. For the most part, communication among urban agricultural actors in Cape Town runs horizontally between actors who operate at the same level, e.g., from farmer to farmer, from NGO to NGO, from researcher to researcher or between consumers and retailers. Further, UA actors also communicate vertically. Observation and interviews indicate that communication – horizontal and vertical – remains a huge challenge, despite actor awareness of its significance, notably for farmers. Many of these actors, especially those at policy level, work in silos.

The chapter raises the following questions:

- How do farmers in Cape Town communicate and learn?

- Who are the actors involved in communication and information dissemination?
- How do they disseminate information?
- What good practices of information dissemination have been identified?

Data is based on field observation in 2016, 2017, 2018 and 2019, a baseline survey conducted with 114 farmers in 2017 and in-depth interviews with 57 market farmers. A group of 20 farmers was accompanied from 2017 to 2019, and a process of farmer to farmer knowledge exchange initiated, assessed and observed. An in-depth workshop on communication, innovation and information with the 15 farmers concluded the research.

#### **4.9.1 Communication patterns of urban farmers in Cape Town**

A look at urban farmer communication patterns allows for initial insights into the communication system. The baseline survey shows that 74% of urban farmers are isiXhosa speakers, 13% mention Afrikaans as their mother tongue and 11% English (17\_B\_CT, n=112). The majority finished secondary school (50%), 31% completed primary school only (17\_B\_CT, n=112). Market farmers have a lower level of education, as the majority finished secondary school (44%). 35% completed primary school only (17\_B\_CT, n=54).

Farmers have access to television (95%, n=112) and 48% of these farmers watch programmes on agriculture, 12% watch sometimes programmes on agriculture (n=104). 64% (n=108) have a radio, from which 55% receive their information on agriculture, 10% sometimes (n=67). 49% of farmers (n=110) read newspapers and other print media, 80% look for information on farming (17\_B\_CT).

88% have a mobile phone, 60% of whom use them to access the internet. Only 33% have a computer at home, 38% of whom have internet access. This indicates a strong change in mobile data use and a shift from the classic media to smartphones and social media: 26% of respondents use Facebook, 11% Twitter, 6% Instagram and 6% have their own blog. 37% use WhatsApp to communicate (17\_B\_CT, n=112). The use of WhatsApp amongst urban farmers increased strongly over the last two years and the figure of 37% is invalid for 2019.

The use of social media brings many advantages and provides rapid communication. On the other hand, it also creates tensions and dynamics that take place in a virtual space (being part of a WhatsApp group) and are transferred to real life. Using social media as the main communication channel also excludes farmers who are partly offline (lack of data, stolen smartphone) from discussions and decisions. If market access is granted through social media communication, offline farmers are cut off from their channel to submit produce to their retailers.

Communication is one way of solving everyday problems: to solve production problems food gardeners rely on research and network (23%), improvise and innovate (17%) and ask NGOs or extension services for advice (11%) (17\_M\_CT, n=74, multiple response).

Cape Town's urban farmers rely partly on past experience, 25 of the 112 interviewed farmers stated they gained farming experience from their homes in the Eastern Cape (17\_B\_CT). South Africa's apartheid history excluded 'Black' South Africans from higher education, e.g., agricultur-

al studies. The farmers concerned gained their experience as farm workers or from small-scale subsistence farming. Traditional knowledge plays a major part in local culture. The farm systems used in Cape Town are based on a Western market-garden model. Local forms of planting, such as hill beds, are not applied in the context of urban agriculture.

#### 4.9.2 Cape Town's urban Agricultural Innovation System

The Agricultural Innovation System (AIS) recognises that dissemination of agricultural innovation is a process that calls for a range of service and knowledge providers and factors (see Chapter 4.2). The AIS analyses the actors involved in the innovation process itself, their roles, networks, applied dissemination instruments and communication. The urban context provides further linkages and bonding effects within the system, making it an urban Agricultural Innovation System (uAIS).

The uAIS in the City of Cape Town is heavily influenced by the segregation of the city, which can be traced back to the urban planning efforts of the apartheid system. Education and access to good education is still a challenge in vulnerable neighbourhoods due to lack of finance for private education institutes, universities and simply transport or teaching material. This segregated city planning also excludes countless dwellers from public education services such as libraries, universities and informal venues where people meet.

Language is another hindering factor and foils any attempt of one community fully understanding the information provided by another and vice versa. Although many South Africans speak and understand English and Afrikaans, hardly anyone in the so-called 'coloured' or 'white' communities speaks or understands isiXhosa, which would allow them to access local and traditional information. The city context (compared to the rural areas) of course provides more resources for interpretation and translation.

An overview of actors and their functions within the uAIS is provided in Table 17 below (adapted from the research conducted in Maputo, see Chapter 3.9).

	<b>Function within the uAIS</b>	<b>Cape Town characteristics</b>
Urban farmers	<ul style="list-style-type: none"> <li>▪ Adoption and rejection of innovation</li> <li>▪ Dissemination</li> <li>▪ Partial design of innovations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Approx. 5 000 gardeners cultivate their backyards/around their homes. Between 50 and 80 food gardens produce a variety of crops</li> </ul>
NGOs and Civil Society	<ul style="list-style-type: none"> <li>▪ Provide plots for on-field demonstrations</li> <li>▪ Organise regular farmer meetings</li> <li>▪ Supply learning material, information</li> <li>▪ Provide extension service</li> <li>▪ Disseminate innovations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Diversity of approaches, philosophies and principles, primarily related to sustainable food production and organic agricultural techniques.</li> <li>▪ NGO success frequently associated with specific individuals</li> </ul>
Public Extension Service	<ul style="list-style-type: none"> <li>▪ Service provider</li> <li>▪ Dissemination of material</li> <li>▪ Limitation as service provider</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provided by Social Development (City of Cape Town) and Department of Agriculture (Department of the Western Cape)</li> </ul>
Media	<ul style="list-style-type: none"> <li>▪ Dissemination of innovation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Farmers use social media to network and</li> </ul>

	<ul style="list-style-type: none"> <li>▪ Innovation broker, via internet, television and newspapers</li> <li>▪ Social media</li> </ul>	communicate
Researchers	<ul style="list-style-type: none"> <li>▪ Knowledge provider</li> <li>▪ Innovation developer</li> <li>▪ Innovation broker</li> <li>▪ Networking</li> </ul>	<ul style="list-style-type: none"> <li>▪ Strong networking activities</li> </ul>
Networks	<ul style="list-style-type: none"> <li>▪ Connect actors</li> <li>▪ Disseminate innovation</li> <li>▪ Design innovation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Numerous informal networks, farmer to farmer networks, horizontal and vertical information exchange</li> </ul>
Source: Paganini		

Identifying the actors allows for the next research step, namely, to identify and categorise innovations:

- Technical innovation (i.e., new crops and production changes, new water harvesting techniques, new production guidelines, e.g., the UFISAMO result: urbanGAPs, see Chapter 5.1.1);
- Social innovation (i.e., farmer to farmer exchanges to overcome township barriers (see Chapter 5.3.1), implementation of local economy models);
- Institutional innovation (i.e., the urban agricultural policy published by the City of Cape Town, formation of urban farmer association).

In the course of research for this chapter, innovations in Cape Town were identified and included those introduced by a third person or institution (innovation broker) as well as those initiated by local actors (bottom up). The diffusion rate further shows the extent to which individual innovations have been disseminated and is an indicator to assess the progress of innovations towards becoming good practices.

These can be single case good practices, e.g., when a farmer who keeps livestock (geese, ducks, chickens) sells eggs to the community or a farmer who grows basil sells it to a local processing enterprise. Other innovations lead to good practices if they are applied, such as water-saving irrigation methods (drip irrigation) or the cultivation of traditional and locally adapted crops.

The urban agricultural environment in Cape Town seems sufficiently vibrant for farmers to adopt innovations (mostly technical). New techniques were adopted by 54% of the interviewed farmers, 38% introduced new crops, 29% applied new methods of soil fertilisation, 18% altered their irrigation techniques and 34% introduced new pest management techniques (17\_B\_CT, n=104). Interview data shows that notably farmers working with food gardens for marketing have begun to adopt innovations referring to organic manure or compost (32%), trenching (30%), intercropping (19%), mulching (19%) and drip irrigation (11%), (17\_M\_CT, n=89, multiple response). The majority acquired these techniques either at Soil for Life (45%) or Abalimi (39%) (17\_M\_CT, n=67, multiple response).

The UFISAMO research focused on dissemination channels, their drivers and barriers, and the question of how information sharing could become good practice to reach urban farmers and promote exchange between them.

### 4.9.3 Urban agricultural information and dissemination channels in Cape Town

Farmers in Cape Town have several information and knowledge channels related to gardening and farming skills. The knowledge providers are described in the section below. 35% (n=60) of interviewed home gardeners claimed that obtaining information was challenging, while 26% (n=39) of food garden farmers struggled to gain adequate information. 79% (n=63) of home farmers and 90% (n=49) of food garden farmers actively seek information (17\_B\_CT). Four out of five farmers state that their information refers largely to vegetable production. Very few farmers asked for help with livestock keeping or product preparation (17\_B\_CT). The most useful subject farmers learned about was soil protection, mulching and manures (67%), administration and commercialisation (10%), food preparation, food security (8%) and an introduction to organic farming (8%) (17\_B\_CT, n=109, multiple response).

#### NGOs

NGOs are the principal source of information on urban agriculture, the main training providers and innovation brokers in Cape Town. This sector diversity lies in the original aim of many NGOs to devote their work to urban agriculture. Each follows a different approach associated with the respective organisation's ideals. The three largest NGOs are Abalimi Bezekhaya, Soil for Life and SEED (see Chapter 4.2). In interviews conducted in 2017, most farmers stated they had consulted for new techniques Abalimi staff (37%), attended workshops (29%) or referred to the Soil for Life team (5%) (17\_B\_CT, n=45, multiple response). Abalimi in particular provided information on commercialisation that was requested by 66% of farmers. Only 11% referred to their own networks, families and neighbourhoods for information (17\_B\_CT, n=37, multiple response).

**Abalimi Bezekhaya** has trained thousands of gardeners to produce food in their backyards or around their homes, for the most part in the townships of Khayelitsha, Nyanga and Philippi. Dwellers participate in a three-day basic garden course at the organisation's training centre. The courses are hosted by local trainers, the NGO field team. These trainers are gardeners with decades of farming experience. Close to 3 000 gardeners in Cape Town's townships have been trained. Training is pro-active, covers theory and practice, and with reference to language simplified to match trainee needs. In the course of three days training group participants create a trench bed using organic principles such as intercropping, crop rotation, composting or mulching. Information material is provided in the local language *isiXhosa* or in English. Furthermore, the NGO offers special workshops and guidance for farmers who start or join a community garden to cultivate public land with other farmers and sell the produce, e.g., the box scheme. A youth training concept was initiated to accompany young farmers for half a year and train them in different fields of expertise, e.g., seedling production and nursery management. A senior trainer supervises the training staff. The chief purpose of training is to address the dramatic food insecurity in the townships.

The **Soil for Life** NGO focuses on home gardeners in Mitchells Plain. In a three-month cycle, gardeners receive a weekly input, are encouraged to develop their home gardens, and are monitored by the trainer team. Gardeners are accompanied by the organisation's trainer and given a weekly input. The latter have studied agriculture, horticulture or permaculture and have practical experience. The strength of the Soil for Life approach is its ability to establish linkages among the course members and initiate farmer to farmer exchanges. The NGO team evaluates the home gardens at the end of the three-month session and the most creative, inspiring and productive garden is honoured. Depending on the neighbourhood, training material and course are in the local languages Afrikaans or isiXhosa, or in English. Farmers who set up food gardens are monitored by the NGO extension team. In addition, Soil for Life offers workshops at their demonstration and learning garden in Constantia, where the organisation has for over twenty years provided a learning platform for techniques associated with vegetable and fruit production. Their garden adheres to permaculture design principles and includes a venue for workshops. In two days, Capetonians can acquire the basics of vegetable production, composting and soil management or drought farming techniques. The key message here is the Soil for Life principle that soil-building (trenching, mulching, composting) is the backbone of food production.

**SEED** provides training courses and workshops on seed saving and permaculture at their venue in Mitchells Plain. It focuses on addressing community health needs, healthy food and a green environment, and is primarily active in Mitchells Plain. SEED trainers also teach in schools and encourage pupils and teachers to establish school gardens. The training material is highly explanatory and used all over Cape Town, including in other organisations.

Other NGOs also provide training and workshops, e.g., Guerilla House, where farmers and interested dwellers are taught a wide range of topics related to gardening, food production and permaculture. The Philippi Horticultural Campaign links farmers from different townships at workshops and has established a learning platform that concentrates on soil-building. The Hout Bay-based organisation Thrive acts as a knowledge provider and offers workshops on urban agriculture, recycling and waste management to students at their school gardens. Ubuhle Bendalo, a community garden based in Khayelitsha, offers home gardeners training close to their gardens in Site B. Green Light in Ottery provides agricultural workshops for neighbours who benefit from the garden and young adults. It cooperates closely with the local library and the soccer team to address the needs of this target group.

Beacon Organic in Mitchells Plain offers courses on, e.g., compost making or setting up a vegetable garden. They also integrate learners with disabilities into the learning environment of the farm. Soil for Life uses Beacon Organic as an agri-hub in Mitchells Plain, it serves as a base for the surrounding home gardeners and supplies them with seeds, seedlings and compost. Trainings and workshops on behalf of Soil for Life are also carried out at the garden. The Permaculture Research Institute in Scarborough focuses on aquaponic projects and permaculture design courses.

Common to all training is the location in the field or the gardens, at NGO demonstrations plots or home base. The training itself is of a practical nature and demonstrates the principles and techniques in the field with examples. This method allows for direct trainer to farmer and farmer to farmer communication. Many of the farmers avail of beginner courses to establish informal net-



works. The baseline study shows that farmer motivation goes beyond food security, extending to an interest in social benefits such as networking, learning and community building.

Other knowledge providers are national or regional organisations and institutions such as the Food Sovereignty Campaign, Slow Food or the Sustainability Institute. Numerous farmers are well connected, either through their NGO or individual efforts, and take advantage of these learning opportunities.

Topics frequently embrace content other than production, tackling such issues as Food Justice, Food Choices, Food Sovereignty and Rights to Seeds.

The results of in-depth research on market farmers is evidence of the strong role played by NGOs when it comes to knowledge: 55% of market farmers said they had asked NGOs for help, community and family 11%, workshops and trainings 4%, while only 7% relied on the extension service (17\_M\_CT, n=69, multiple response).

### **Social media and media**

The role of the media, especially at local level, has grown considerably. Several newspapers in Cape Town report on local urban agricultural activities to showcase success stories. Farmers access information and knowledge provided by NGOs, other farmers or experts. They also garner information through social media, albeit this is more inspirational in nature than in-depth knowledge. Smartphones and messenger services such as WhatsApp are commonly used to contact other farmers, buyers and customers or common interest groups. Instagram, where individual farms showcase harvest pictures or garden visits, has gained currency, mainly at NGO and retail level. The hashtag #growyourown is highly popular, followed by #localfood (Instagram, January 2019).

WhatsApp groups are typically initiated after workshops and provide a platform to stay connected and follow up. Farmers usually belong to three or more larger groups, where up to 50 farmers are organised. At the same time, they are involved in local groups that link them to their fellow farmers in the neighbourhood.

Social Media is an extremely fast medium to reach the relevant public. Messages are written quickly, sent off or forwarded without weighing up words or checking sources, and notably regardless of the consequences. The virtual character of social media adds to this disregard for consequences. Once aired, posts and messages cannot be taken back and could lead to the rapid spread of (sometimes harmful) rumours. Tensions created in the virtual world trickle down to reality and affect farmers' discussions and work.

### **Farmer to farmer exchange**

Most food garden farmers work in groups and cultivate the same plot. Although the gardens are divided into individual plots, this common ground facilitates communication and farmer to farmer exchange. The plots are mostly shared by senior and junior farmers.

Farmer to farmer exchange can be thwarted by interpersonal disputes between farmers or the hierarchies and barriers inherent in South African cultures associated with gender, religion, eth-

nicity and status. Suspicion and jealousy were also mentioned as an obstacle to be overcome, one primarily related to crop marketing and retailer preferences to buy from certain farmers and not from others, leaving the latter economically empty-handed.

This notwithstanding, the benefits pointed out by farmers in a focus group discussion underlined that mutual learning in the exchange with other farmers led to new information. A group of farmers was accompanied for almost twelve months (urban research farmer group). One of their initial tasks was to describe to other farmers crops that work well and to explain why other crops were challenging. The information was shared with other farmers, as were useful farming practices, such as spacing, fertilisation of soil and plants, and companion planting.

The same group discussed ongoing marketing challenges or helped out with information on funding and prices. A small support circle was set up, with one farmer in charge of seedling production, another responsible for compost production and yet another tasked with co-ordinating packaging. Farmers stated they saw the value of learning from other farmers. The success stories, learning experience and good practices tested and implemented by their fellow farmers had convinced them.

Farmer to farmer exchange was also successful during field visits within the PGS movement. Farmers appreciate visits to other gardens or plots to observe, to learn and to ask. The workshops conducted with the UFISAMO research farmer group allowed for field visits to their farms. Visits to farms outside of this group were also included. Farmers were asked to take notes and identify good practices they had never seen before or were eager to try out in their own gardens. This habitually led to farmers trying out new crops or redesigning the farm according to models based on perma-cultural principles, intercropping or companion planting. Convincing arguments for testing innovations were mostly related to beauty, a desire to experiment with new food, the opportunity to intensify market activities or the solution to a burning production challenge.

An inspiring farmer exchange was conducted between a small group of vegetables farmers and the fishery cooperative Weskus Mandjie. This visit allowed small-scale producers and fisher ladies to identify their commonalities and highlighted their challenges in the face of (misguided) NGO policies and middlemen.

### **Department of Agriculture/Extension service**

The Department of Agriculture acts as an input provider and supports farmers with tools, seeds and seedlings, compost and shade nets, and the installation of irrigation systems. Due to the absence of an extension service, the DoA is barely in the position to monitor farming activities. Only a handful of extension technicians work in the Cape Town area. All of them have a good relationship to the farmers and if required provide financial support.

Government extension work includes working with organic agricultural principles. Most farmers who cultivate on a small-scale use per-se mostly farming techniques related to organic agriculture. Knowledge gathering on farm inputs, their source and their safety constitutes a challenge for small-scale farmers. The inputs are for the most part conventional.

The Department of Agriculture does not provide demonstration plots or farmer field schools.

## Research

Urban agriculture has been in the research focus of Cape Town's university and institutes for many years, with questions on food security (Battersby, Haysom, Harper), food systems (Drimie, PLAAS), social benefits (Olivier) and agricultural science (University of Stellenbosch). Most farmers are unaware of the results, although many of them were interviewed by researchers and students, and appreciate the interest in urban agriculture. The experience of farmers speaking to researchers and students carries the risk of interfering with the thoroughness of research, since farmers are tired of being interviewed, suspicious of new people and say what their NGO wants to hear. A number of topics associated with food security are sensitive and farmers are ashamed to talk about them. Building trust is therefore a time-intensive task. Furthermore, they expect researchers to step into the role of mediator between farmers and policy.

Innovation in matters of production and consumption mostly occurs in action-oriented research or practical research courses, e.g., those of the Sustainability Institute, which carries out research and gives short courses on sustainability, agro-ecology and food systems.

In general, researchers in South Africa are modest and for farmers approachable. Farmers are confident they will benefit from research and keen to take part in dialogue.

## Conferences and workshops

Other information channels are conferences and workshops, where Cape Town provides a platform for many activities, e.g., the Festival Food and Culture in District Six museum in November 2017, Seed Campaigns by the Food Sovereignty movement in 2018 or the Agro-ecology Festival in 2019. Dialogue with consumers (e.g., through the Umthunzi network and Abalimi introduced main HoH clients to farmers) and contact with experts are additional platforms for knowledge exchange. Some farms are advised by consultancy or senior farmers who actively support farmers in their production activities.

## Participatory Guarantee System (PGS)

PGS visits are a powerful tool for the dissemination of knowledge and information. The Participatory Guarantee System (PGS) links consumers and producers through farm visits. In this bottom-up system a group of farmers designs a production guideline (the urbanGAPs could be the guideline for Cape Town; farmers in the Western Cape have the PGS in place) to ensure production is carried out according to organic and agro-ecological principles. Monitoring visits are based on checklists filled out by the farmers in advance (self-assessment) and monitored by the people present during the visit. As a rule, the visiting group consists of fellow farmers, NGO staff, interested consumers and retailers. In the course of completing the checklist, farmers give each other advice or act as auditee and ask for help. Observation of five PGS visits over the last two years has shown that communication in the team is horizontal and farmers display a readiness to learn and share knowledge. The structured checklist enables the group to follow a clear guideline without missing any topics that arise in conversation. In comparison to a third-party audit, PGS visits have the advantage of being a learning process with a non-hierarchical structure.

Two methods of learning were identified during the PGS visits. First of all, other farmers learn from the auditees by observing their plots and listening to the questions raised. Secondly, the

audited farmers are in an active learning position by having to explain their own production systems and receive comments, advice and tips from fellow farmers and other visitors. The completed checklists are further support for the farmer.

Field monitoring and record keeping are useful tools that allow farmers to reflect and interpret their experience. Farmers gather and summarise knowledge based on their own experience. Within the scope of the UFISAMO research they kept farm diaries for the period of one year (see Chapter 4.4.2). All of these farmers declared their appreciation of this reflection even though it meant extra work. Since no diaries were made available after the official ending of the UFISAMO data collection, it can be assumed that none of the farmers continued to make notes. The UFISAMO urbanGAPs document provides an empty copy of a farm diary, which can be printed and disseminated amongst farmers.

### **Demonstration plots**

NGOs are the main drivers and knowledge providers of urban agricultural training and demonstration activities in Cape Town. They teach a set of agricultural principles from organic agriculture to permaculture, from seed-saving to soil-building (see above).

Urban agricultural expertise abounds in Cape Town. Observation has shown, however, that farmers tend to focus on one NGO and fail to take advantage of the wide range of workshops and training opportunities available.

Apart from the activities of civil society actors, the City of Cape Town's urban agricultural policy foresaw the establishment of Urban Agricultural Centres to support farmers with service and assistance, training, demonstration and extension services, sell and rent materials, tools, equipment, and seeds and plants, and to provide project management where required (CoCT, 2007, p.14). These centres were never realised. In reality, replacement of the urban agricultural policy by the food garden policy saw a cut back in city support for the data monitoring of urban farms, training and assistance for farmers, financial assistance, and support for infrastructure and seeds (CoCT, 2013, p.7).

Four NGOs and one commercially organised farm run demonstration sites in their community gardens to showcase their teaching principles. The following table gives an overview of these gardens:

**Table 18: Demonstration Gardens in Cape Town**

Demonstration Gardens in Cape Town	
	<p><b>Nyanga and Khayelitsha Garden Centre</b> The Abalimi Bezekhaya NGO runs two garden centres in Nyanga (Nyanga Day Hospital) and Khayelitsha (Village 1 North) in an effort to sell seedlings, provide information and cultivate vegetables. One farmer manages the garden centres and is in charge of daily farming activities. The Abalimi field staff hosts beginner courses in the gardens, where locals are taught basic gardening skills in three-day workshops. During these courses, the trainers show participants how to make trench beds and how to mulch. The Abalimi field staff is available in these garden centres for follow-up information and advice.</p>
	<p><b>Rocklands Permaculture</b> At Rocklands Primary School in Mitchells Plain, the SEED NGO runs an environmental sustainability centre and an outdoor classroom to teach permaculture principles, seed-saving techniques and encourage the community to practise personal resilience. The demonstration includes techniques such as agro-forestry, mulching, mushroom cultivation, water harvesting and how to attract pollinators. The garden is managed by volunteers and NGO staff. All techniques are explained on signboards.</p>
	<p><b>Soil for Life Constantia</b> The Soil for Life NGO runs a demonstration garden in the wealthier neighbourhood of Constantia. This garden shows soil-building techniques, agro-forestry and permaculture principles, recycling ideas and container gardening. A permaculture designer, who is supported by the NGO staff, manages the garden. Soil for Life hosts weekend workshops in the garden, which are mostly attended by people from the more affluent neighbourhoods of Cape Town. The affiliated home gardeners from the Cape Flats are invited to special garden events.</p>
	<p><b>Thrive School Garden</b> The Thrive NGO based in the suburb of Hout Bay runs a school garden at Hout Bay Secondary in the local township of Hangberg. The NGO uses the garden to highlight simple container garden options to the children but also the diversity of crops and flowers, as well as water-saving techniques. The garden has playful elements and is managed by local teachers with the support of the NGO staff.</p>
	<p><b>PEDI Academy</b> The farm is located in the Philippi Horticultural Area and runs an urban agricultural academy with the aim of demonstrating production techniques based on Good Agricultural Practices to farm on scale. The farm also tests different irrigation techniques and different soil types, and experiments with intercropping and companion planting. The trials take place in cooperation with local students and local farmers.</p>

Source: Paganini 2016-2019

#### 4.9.4 Good practices, drivers and barriers for dissemination

Generally, urban agriculture in Cape Town is diverse and a vibrant surrounding with the right atmosphere for innovation. The key drivers that disseminate innovations are success stories, market benefits and topics that deal with sustainability and the environment. Seed sharing, for example is a major driver of dissemination when it comes to information related to seed justice, food sovereignty, traditional seeds and heritage, but also cultivation practices and crop specific requirements. The dependency on low quality seeds that are usually treated with chemicals

opens the discourse on stepping out of the circle of global big players in agriculture. Storytelling is a simple method of shaping relations between farmers and food. Asking farmers to tell a story about their favourite seed is a door-opener for further conversations. Many organisations (SEED, Slow Food Mother City, Food Sovereignty and individuals) exploit the story of seeds to disseminate information. Barriers are mostly of an economic nature, e.g., lack of transport, lack of finance to access resources, lack of finance for higher education. Social barriers are historical burdens, still visible today in the work with different ethnic groups. Hierarchies and power relation prevent farmers from joining movements or farmer groups outside their own community.

### **Good practices for dissemination**

Questioned about what they considered a useful learning tool, food garden farmers mentioned field visits (47%), exchange with other farmers (37%) and the extension service (30%), practical training 9%. Only 7% mentioned books and also only 7% workshops (17\_M\_CT, n=84, multiple response). The first three of these good practices were identified by farmers in surveys and in-depth research. The following good practices were identified with field observation and expert interviews.

**Field visits:** An inspirational tool to learn from others, to observe, to compare methods of farming and to see good practices in the field. Field visits show that techniques or principles can work and are more convincing than expert lectures or training.

**Farmer to farmer exchange:** Speaking the same language and understanding each other's challenges allows farmers to open up and share experiences, problems and solutions. Farmer to farmer exchange is a basis for possible cooperation, which is vital for economic success at the small-scale level of farming.

**Demonstration areas:** Demonstration areas are opportunities for NGOs to showcase their principles and techniques, to experiment with different practices and to include farmers in this process. Good practices can be disseminated with demonstration plots, which in turn can also be used as a venue for workshops or field visits.

**Follow-up with supervision:** Very little supervision is provided in Cape Town and farmers request the help of experts for specific issues. Pest and disease identification and monitoring, soil fertility and production planning are the principal areas of interest. Government and NGO extension services must be strengthened to cover farmers' needs.

**Lead farmers:** They take on responsibility and link urban farmers to other actors. They also act as innovation brokers. Their reliability is essential if success stories are to be believed. They also function as community influencers and agents of change in the case of innovations.

**WhatsApp groups:** Messenger channels are a simple technical tool that allows farmers to communicate via text message, voice mail or photograph. Group chats combine knowledge and facilitate farmer to farmer exchanges. Barriers such as lack of transport are partly overcome via virtual meetings.







**Figure 25: Farmer workshops in Maputo and Cape Town**

Source: Paganini 2019



## 5 Implementation of research results

Action research and the practical orientation of the research design played a crucial role throughout the UFISAMO project – from its inception to its recommendations. Consequently, implementation of the research results was of great importance.

Chapter 5 gives a short overview of the first activities in the UFISAMO project, or rather those initiated in the research process. The Maputo examples (see Chapter 5.2) refer to the promotion of agro-ecological products via a media and social media campaign launched by the partner NGO ABIODES, the introduction of an archive to the agricultural associations, and the creation of an urban agricultural network.

In Cape Town, the chapter deals with farmer to farmer knowledge exchange, focusing on the urban research farmer group, the UFISAMO demo plot at Beacon Organic, and activities related to agro-processing (see Chapter 5.3).

The development and introduction of guidelines on urbanGAPs (with initial monitoring results for Cape Town) and the inauguration of an Urban Agriculture and Food Security module at the partner universities are described for both cities (see Chapter 5.1).

### 5.1 Examples from both cities

#### 5.1.1 Development and introduction of guidelines on urbanGAPs

*Anja Kühn, Zayaan Khan & Nicole Paganini*

The findings of the UFISAMO project suggest that the most appropriate way to address the production and marketing challenges identified in the research was to develop Good Agricultural Practices adapted to the urban context (urbanGAPs). The guidelines for urbanGAPs (Kühn & Paganini, 2018) seek to standardise a set of practices and techniques for urban agriculture that are based on organic and agro-ecological principles and techniques, and take account of the challenges, risks and hazards (e.g., prior land use and soil contamination) of farming in a city environment. UrbanGAPs help small-scale farmers to improve the quantity and quality of their yields, which would in turn lead to better market access, but also encourage home gardeners to grow healthier produce for their own consumption.

Figure 26: Hazard tree for Cape Town

Source: Paganini & Kühn, 2018

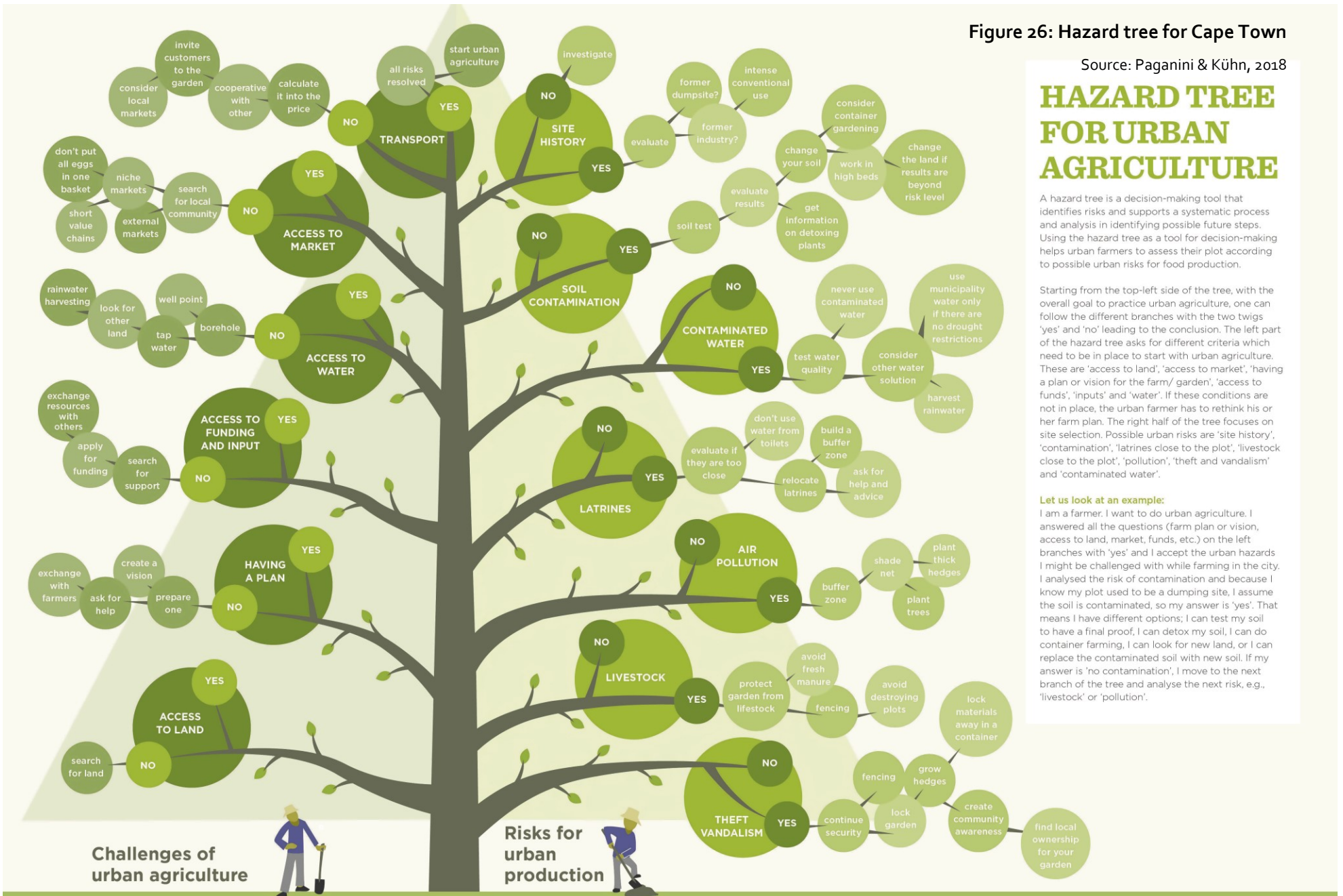
# HAZARD TREE FOR URBAN AGRICULTURE

A hazard tree is a decision-making tool that identifies risks and supports a systematic process and analysis in identifying possible future steps. Using the hazard tree as a tool for decision-making helps urban farmers to assess their plot according to possible urban risks for food production.

Starting from the top-left side of the tree, with the overall goal to practice urban agriculture, one can follow the different branches with the two twigs 'yes' and 'no' leading to the conclusion. The left part of the hazard tree asks for different criteria which need to be in place to start with urban agriculture. These are 'access to land', 'access to market', 'having a plan or vision for the farm/ garden', 'access to funds', 'inputs' and 'water'. If these conditions are not in place, the urban farmer has to rethink his or her farm plan. The right half of the tree focuses on site selection. Possible urban risks are 'site history', 'contamination', 'latrines close to the plot', 'livestock close to the plot', 'pollution', 'theft and vandalism' and 'contaminated water'.

**Let us look at an example:**

I am a farmer. I want to do urban agriculture. I answered all the questions (farm plan or vision, access to land, market, funds, etc.) on the left branches with 'yes' and I accept the urban hazards I might be challenged with while farming in the city. I analysed the risk of contamination and because I know my plot used to be a dumping site, I assume the soil is contaminated, so my answer is 'yes'. That means I have different options; I can test my soil to have a final proof, I can detox my soil, I can do container farming, I can look for new land, or I can replace the contaminated soil with new soil. If my answer is 'no contamination', I move to the next branch of the tree and analyse the next risk, e.g., 'livestock' or 'pollution'.



UrbanGAPs follow the vegetable production cycle comprised of the following stages: (1) Farm Vision and Site Selection, (2) Production and Crop Planning, (3) Seeds and Seedlings – Nursery and Transplanting, (4) Land and Soil Preparation, (5) Soil Management and Soil Fertility, (6) Fertilisation, (7) Water Management and Irrigation, (8) Pest and Disease Management, Field Hygiene and Weed Management, (9) Harvesting and Post-Harvest Handling.

After thorough research on the production techniques and systems in place, and on the extension material and experiences of NGOs and extension services in Cape Town and Maputo, a participatory process associated with urbanGAPs was launched with urban farmers in both cities.

In Cape Town, a research farmer group was initiated, a demonstration plot established, and a multi-stakeholder workshop carried out with urban farmers, NGO representatives, researchers, retailers, experts from the department of agriculture and certifying agencies (March 2018) to discuss potentials and challenges of urban horticultural production and marketing, and to exchange ideas on Good Agricultural Practices in the city. Guidelines on urbanGAPs were drawn up and a manual designed. At a later stage these were tested, monitored and evaluated in the field by the research farmer group (see below for initial evaluation results).

The multi-stakeholder workshop on urbanGAPs in Maputo (July 2018) was attended by representatives of farmer associations, NGOs, the municipality, the Ministry of Agriculture and researchers. An urbanGAPs manual was subsequently designed in cooperation with ABIODES with the aim of setting up a demonstration of good practices that would feed into the final draft of the Maputo urbanGAPs.

Networking with the actors involved to institutionalise and implement the guidelines on urbanGAPs is ongoing in both cities. The principal implementation bodies are SOLIDARIDAD Mozambique, the CMM in Maputo and the research farmer group around PEDI in Cape Town.

### **First implementation experience with urbanGAPs in Cape Town**

In the course of monitoring and evaluating the practical implementation of urbanGAPs by the research farmers in Cape Town (Khan, 2018)<sup>27</sup>, good agricultural practices/techniques and those that were challenging or missing were identified, as were the benefits/impacts and lessons learnt, all of which will serve to finalise the guideline document.

**Good practices** – The farmers identified the following as the most positive results:

- Production planning has made a marked difference, notably as a platform of sovereignty in cases where production plans had previously been created **for** farmers and not **by** farmers;
- Using mapping as a farm planning tool has greatly enhanced both production and knowledge. It encouraged farmers to make changes to correspond with planting schedules;
- Crop selection and crop rotation is carried out on a regular basis and in some cases enables access to community markets, where planting is geared to the needs of the community;

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<sup>27</sup> The complete results can be found in the UFISAMO report 'Monitoring & Evaluation of urbanGAPs – implementation by farmers in Cape Town.' (Khan, 2018)

- A better understanding of market complexities and awareness of neighbourhood demands was vital to securing new markets and improving access to local markets such as community schools and churches: 'Not just planting but knowing what you plant and for whom';
- Record-keeping has been paramount and had a major impact on production, allowing not only for an overview of inputs and outputs, but also its use as a decision-making tool. It helps to plan production and take account of past experience. By recording their activities with diary entries, farmers have gained considerable insights into their own practices. Initially tedious and difficult for some, the FriDiaries have created a culture of recording. Farmers claimed they had more control over the gardens and felt capable of taking their farms to 'the next level';
- The importance of soil and land preparation has been acknowledged: 'If you do soil preparation right, you will have fertile soil.' There is a common desire to combat sandy soil conditions. Although this will take years, farmers are making valiant attempts with different techniques to strengthen soil fertility in line with their cultivation needs. Farmers have noticed a dramatic change since employing methods such as green manure, trench beds or garden waste management to make compost. Albeit this may be challenging initially, the farmers have understood that the current discomfort of altering the farming system will make farming easier and more rewarding in the future.
- Regular composting and manuring, intercropping and the use of trench beds have led to improved soil fertility and soil management: 'To be a successful farmer, you have to start with the soil. Focusing on soil is the key'; and 'Better soil fertility leads to better productivity';
- Enhanced production and productivity due to implementation of practices such as wind breaks or improved (water-saving) irrigation techniques have increased the quality and quantity of the produce;
- Techniques such as weeding, field hygiene, and pest and disease management have raised the overall quality of farm management and garden waste management;
- Communication and networking among farmers have made headway and boosted community involvement (neighbours, local markets): 'People are beginning to notice how good the garden looks and to show interest – even children and youths.'

**Challenges** - The participant farmers also mentioned some challenging techniques and issues related to the implementation of urbanGAPs:

- Although the advantages are obvious, practices tend to be time-consuming and labour-intensive. Maintaining field hygiene, processing diseased planting material, regular weeding and trench beds were some of the examples cited;
- Producing their own compost or manure is advantageous (no dependence on external sources) but also labour-intensive. Notably the processing/management of kraal manure constitutes a logistic challenge: although cheap, compost storage works only after fermentation and processing, which in turn demands space, time and know-how;

- Finding the right mulch material and technique may be challenging as there are requirements to consider. The mulch must be disease and weed free. Some materials contain too much acid (such as pine needles) and may attract ants and termites. Strong winds require heavy mulch to prevent material from blowing away so that the use of something heavier than sawdust needs to be considered;
- Farmers need support when it comes to understanding soil pH, sodium and salt levels, and general soil health. Water and soil testing are essential but costly in the urban environment. In addition, interpreting test results, i.e., finding the appropriate response, is not an easy task. Urban soil contamination is a major issue and for farmers, organisations and customers who were unaware of it, perhaps the most threatening. Learning how to mitigate the impact is a crucial element here. Farmers who had their soil tested are seriously concerned about the results, as they have no idea what it could mean in terms of health;
- Identification and management of pest and disease is challenging and calls for access to information and know-how;
- Access to seeds, seed-saving, and the relevant knowledge remain a key challenge. Seeds are not readily available, organic seeds are either unavailable or too expensive; many seeds are not suited to the Cape Flats. Farmers frequently produce their own seeds, albeit not without difficulty, or buy seedlings from specialised nurseries. Seed-saving is a recent specialisation and must be planned from the beginning. It calls for space and resource allocation, which currently overtaxes the farmers. It also requires knowledge of seeds and seed production, as well as time for transition;
- Since English is not the farmers' first language, communication in the context of urbanGAPs is difficult.

Farmers requested (more) information in the guidelines on, for example, soil amendments, tunnel production, animal production for manure, the use of seaweed for fertility, and the mulch, nutrient and pH needs of crops, pest and disease identification and control, the differentiation of nutrition deficiencies, logistics, and agro-processing/value addition. Most farmers admitted to struggling with post-harvest storage and would appreciate some form of cold storage and more knowledge on post-harvest techniques.

In conclusion, farming in the Cape Flats is a highly challenging occupation; from a production perspective soils are sandy with a high acid and low nutrient content, and minimal water retention. Despite these conditions, farmers are optimistic and agree that urbanGAPs have seen a radical improvement in the marketability of their produce and increased yields in the process.

Unforeseen positives refer to networking and horizontal learning, which ultimately leads to exchanges and seed sharing, as well as successes and failures. Building friendships and solidarity through farming has also reinforced the importance of farmers and farming.

### **Conclusions and the way forward**

As a successful innovation, urbanGAPs have the potential to transform urban agricultural production and mitigate urban hazards. They will likewise improve product quality and increase quanti-

ty. With proper production planning, farmers should be able to continuously produce, sell, consume and distribute locally. Lack of knowledge on production techniques is still a strong hindering factor when it comes to pest and disease identification, prevention and management, and crop-specific GAPs.

Cape Town's production and market challenges are demanding nonetheless, and urban agriculture should not be seen as the panacea for urban hunger. A greater presence of food gardens is vital in areas where food insecurity is high, access to food a challenge, and good food barely affordable. Therefore, urban farmers must take up the challenge of improving local markets and developing a production plan to meet community needs. This requires the sustained support of the Department of Agriculture, the City of Cape Town and NGOs involved in the training of farmers in administration, finance, pricing and marketing. It also calls for a deeper understanding of local consumer behaviour and of lessons learnt from former local markets, and not least for the destigmatisation and empowerment of urban farmers as a step towards becoming relevant players in local urban food systems.

In Cape Town, the testing and monitoring of the urbanGAPs implementation by the research farmer group should therefore be continued and where possible extended to other farmers. Further discussion and exchange with and between farmers and in-depth analysis of the FriDiaries would underpin this process. In a further step, criticism and missing topics and practices identified by the farmers should be included in the guidelines before the document is finalised. The guidelines should eventually be handed over to the farmers and partners, and urbanGAP training organised. PEDI, the Philippi Economic Development Initiative, is currently testing the urbanGAPs with some of the research farmers and expressed interest to continue working with the guidelines and manual.

According to in-depth interviews, Maputo's farmers see organic urban agriculture as the future of farming. The assumption is that urban agriculture that is environmentally friendly and in line with good agricultural practice and agro-ecology adapted to the urban context (urbanGAPs) has the potential to reduce the health and ecological risks associated with conventional urban agricultural practices; it can provide the city with more Agrobiodiversity and facilitate market access, including a future niche market for organically grown local food.

The next step for Maputo was to draw a draft version of the Maputo urbanGAP guidelines, which has been done by UFISAMO coordination and the CMM in April 2019. UFISAMO will share the draft version of the urbanGAPs with the municipal partners and the international NGO SOLIDARIDAD. Both actors will individually adapt the guidelines for their needs.

Crucial to sustaining the activities and initiatives now in place in both cities is continued engagement with potential partners who could take over and push ahead with the development, consolidation and dissemination of urbanGAPs when the UFISAMO project comes to an end.

### 5.1.2 About the Urban Agriculture and Food Security Module

*Samuel Quive & Abdulrazak Karriem*

#### Context

The practice of urban and peri-urban agriculture has gained growing acceptance in the cities and towns of the global north and south. Many cities and towns in developing countries are faced with high unemployment rates, growing urban poverty, and climatic changes that have undermined the livelihoods of the poor. In response to these challenges, urban agriculture has been held up as an important avenue through which to address food insecurity, green the city, create employment, increase incomes, and make cities more environmentally sustainable.

Much of the literature highlights and extols the benefits of urban agriculture as noted above, but there are also a number of critiques that challenge these benefits. The UFISAMO project launched a process to increase the knowledge on and debate about urban agriculture in Mozambique and South Africa as a means of perpetuating the link between research and practice initiated by the project.

A survey of universities in Mozambique assessed whether these have chairs or modules on urban agriculture or at least on food security in cities. None of the five Higher Education Institutions (HEIs) were identified as having degree courses in agronomy, or disciplines or modules related to urban agriculture. This is due to the fact that agricultural policies in Mozambique (and elsewhere) refer exclusively to the rural areas, leaving urban agriculture a no-policy activity.

A module on urban agriculture was subsequently developed in cooperation with the University of the Western Cape and the *Universidade Eduardo Mondlane*. It taps into existing experience in teaching and discusses the problematic of urban agriculture and food and nutrition security in cities. The objectives of this module are to:

1. Investigate the practical experience of urban agriculture (UA) in different cities;
2. Appraise how and to what extent UA promotes food and nutrition security;
3. Explore the multi-dimensional outcomes (e.g., the health, social, income and livelihood diversification benefits) of UA;
4. Evaluate what climate change adaptation strategies urban gardeners employ and how they contribute to promoting climate resilient urban agricultural practices;
5. Critically appraise how UA has been incorporated into public policy and practice in cities in other parts of the world and draw lessons for Cape Town and Maputo.

#### The module

In the module, the universities will evaluate the divergent perspectives on UA mentioned above and explore the many obstacles undermining urban agricultural projects across the world. Lack of access to land and water, poor and contaminated soils, and lack of farm knowledge (e.g., soil management, composting, using waste as inputs) are among the major difficulties facing the

urban poor. Case study material from cities and towns in both developing and developed countries will be looked at to reach a better understanding of the benefits and challenges of urban agriculture.

While we acknowledge that the practices and objectives of urban agriculture differ between and within the cities and towns of these countries, we will draw on and critically assess successful (and unsuccessful) examples of urban agriculture in these different contexts to help inform practice in specific socio-political and ecological settings.

### **Institutionalisation and implementation**

Institutionalising a new module in university curricula is a complicated task. In Cape Town, elements of the module will be integrated into existing courses on urban development. In Maputo, on the other hand, the module will be included in its entirety in two existing master programmes within the UEM postgraduate curricular framework: it will be offered to students pursuing a master's degree in Rural Sociology and Development Management (MSG) as a compulsory core subject and remain optional for students taking a master's degree in Development Sociology.

Teaching takes place in the form of a seminar, whereby the teacher moderates the process of teaching and learning. Fundamental to this approach is active student participation. The module will work through examples from La Havana in Cuba, Belo Horizonte in Brazil, Toronto in Canada, Cape Town in South Africa and the City of Maputo in Mozambique, showcasing the different approaches and responses to challenges in their various contexts. Apart from teacher input, students will be encouraged to work in groups on specific subjects and subsequently present their results and share experiences in group discussions. As well as textbooks, reports and journals, field visits will be vital to encouraging an exchange with practitioners, i.e., farmers and supporting actors such as extension workers and NGOs. The method mix is complemented by viewing documentaries on the contribution of urban agriculture to food security and nutrition in various cities and towns around the world.

The module serves to promote the debate on urban agriculture in a country with an accelerated urbanisation rate, taking into account the phenomenon of climate change and the need to develop specific policies for the practice of healthy and environmentally sustainable urban agriculture. Since the module is offered in the Faculty of Arts and Social Sciences, the focus will be on socio-economic phenomena rather than on agricultural practices. The module contains the following topics:

- General overview and introduction to UA;
- The multiple dimensions of urban agriculture;
- Income generation and access to markets;
- Promoting climate resilient urban agriculture;
- Policy, governance and implementation;
- Urban agriculture and food and nutrition security.



In the first year, the module will be available as a twenty-hour course. An extension to forty hours is likely, as the subjects covered and the methods applied require time. Where possible, experts on the topics concerned will be invited to lecture and guide discussions. The module was launched in June 2019.

## 5.2 Examples from Maputo

### 5.2.1 Promoting agro-ecological products with a media and social media campaign

*Alberto Luis & Alzira Mahalambe*

#### **A brief insight into a project implemented by ABIODES from October 2018 to April 2019**

##### **Context**

Between 2013 and 2016, the NGO ESSOR implemented a project promoting agro-ecological principles in the green zones of Maputo in partnership with the Maputo Municipal Council (CMM) and Directorate of Agriculture and Food Security (DASACM) (see Chapter 3). The objective was to introduce more sustainable production methods. Nearly 1 000 producers were sensitised, approximately 100 of whom proved to be committed and continued in that line of production.

In order to provide the products with market access at a fair price, several commercialisation channels were experimented with, namely, itinerant sales, sales at fixed points, participation in agricultural fairs, and the creation of a retail company called ComOrganico. Despite all efforts, marketing agro-ecological products is an ongoing challenge and discourages producers from adopting this method of production in the process.

The NGO ABIODES, which continued to propagate sustainable production techniques, saw the need to respond to market challenges. In partnership with We Effect, CMM and DASACM, it initiated a campaign to publicise the advantages of agro-ecological products to Mozambican society, with the aim of creating awareness about the benefits to ecosystems, the environment and public health. One specific objective is to increase the number of consumers and supporters of the agro-ecological value chain.

The initiative to increase the visibility of healthy urban vegetables and improve market access for producers is in line with the findings of the UFISAMO research – that there is a dire need to introduce more sustainable agricultural practices in the green zones of Maputo if health risks for both consumers and producers are to be avoided and pesticides reduced or banned. Good Agricultural Practices for the urban context (urbanGAPs) developed by the UFISAMO team in a participatory process with local actors is a broader approach than the organic/agro-ecological approach. UrbanGAPs do, however, strongly promote integrated procedures and processes similar to those used in organic/agro-ecological production. The benefits of these newly introduced production principles need to be communicated to potential consumers in order to establish the market that producers need to generate income. Only with a market will agro-ecological production principles thrive.

As a partner in the UFISAMO project, ABIODES intends to share the approach of the agro-ecology campaign with a broader public, highlighting the results achieved and the challenges faced.

### **Overall objective**

To increase awareness of agro-ecology and highlight the contribution each citizen can make towards preserving ecosystems, public health and the environment through consumption, commitment and identification with the agro-ecology movement.

### **Specific objectives**

- Disseminate the existing agro-ecological production steps building on the intervention of different actors (ABIODES, CMM, DASACM, UEM – UFISAMO, KOSMOZ), including the Participative Guarantee System (PGS) and the label for organic products;
- Increase the number of consumers of agro-ecological products by raising awareness of the general public on the importance of consuming healthy products;
- Contribute to the adoption of healthier eating habits through the consumption of healthy, safe food of known provenance.

### **Main activities**

- Produce and transmit information on agro-ecological products to citizens through short advertising videos broadcast during television prime time and on social networks, and the creation of a YouTube channel;
- Explore the use of labels in Maputo;
- Promote television and radio debates on the importance of agro-ecological products;
- Strengthen the participation of producers adhering to agro-ecological principles at agricultural fairs, and support the visibility of agro-ecological products.

### **Results achieved**

Despite the short implementation period, some significant results have been achieved:

- Increased visibility of the agro-ecology production chain practiced in the green zones of Maputo. The campaign enabled the initiation of partnerships with two organisations, Radio Mozambique and APROC (*Agremiação para o Progresso Comunitário*). The latter contacted ABIODES immediately after participation in a radio programme expressing its interest in developing a partnership with ABIODES to promote Conservation Agriculture in Morrumbene, Inhambane province;
- 60 new producers (43 women and 17 men) from the three associations showed an interest in integrating agro-ecological principles and abandoning conventional agriculture;

- The number of consumers of agro-ecological products has increased. In addition to orders that both ABIODES and ComOrgânico have been receiving from companies, at least one restaurant has committed to buying agro-ecological vegetables. Seven new customers have begun to buy the vegetables and ComOrgânico is currently negotiating with a school;
- The population of Maputo can learn through radio, television, Facebook and blogs on agro-ecology, its principles and benefits to health and ecosystem preservation.

### **Sustainability**

The dissemination initiative allowed for expansion of the existing network between ABIODES and the various actors whose role is fundamental to the growing visibility of agro-ecological actions. Such is the case of Radio Mozambique (RM), a public communication channel. RM will continue to be involved in activities to promote the agro-ecological production chain developed for the green zones. With the help of RM, ABIODES also plans to connect with other radios.

The information produced in flyers, roll-ups, banners, posters, and videos will be used by ABIODES, partners and producers at agricultural fairs. The material is also available on YouTube channels, WhatsApp, blogs, and Facebook, so that the viewing of and debates on the topic of agro-ecological products remains ongoing.

The increase in consumers of agro-ecological products goes a long way to motivating producers to continue cultivating according to agro-ecological principles and build up their family income. It also convinces other producers to alter their methods. This leads to a growth in agro-ecologically cultivated areas and ultimately to a reduction in the risk of contaminating soil, water, the environment and public health.

### **Lessons learned**

Implementation of the initiative for the dissemination of agro-ecological products through the media led to the following conclusions:

- Actions to change the behaviour of the public must be continuous and accompanied by persistence and plenty of repetition;
- The involvement of different actors and the use of different means of communication is necessary in order to ensure greater coverage, which in turn contributes to increasing the impact of the action;
- The greatest impact of this agro-ecological products dissemination campaign was not necessarily immediate, although there were some immediate results;
- Radio and television need time to decide whether and how to include such a campaign in their programmes. Perseverance and good relationships to media actors are vital to facilitating this process;
- The period from December to February was not appropriate for the development of activities with agro-ecological producers of the Maputo green zones, given that at this time of the year, a significant number of these producers devote themselves to the production of

cereals, roots and tubers in fields outside the city. On the other hand, the floods at this time of year in most of the agricultural fields in the Maputo green zones make it necessary for producers to wait for this period to pass before resuming agricultural activity.

## 5.2.2 Document archive and institutional memory of Maputo's agricultural associations

*Luisa Chicamisse-Mutisse*

The data collection phase at the agricultural associations in 2017 and thereafter revealed an obvious lack of archive material and the need to develop a functional archive system adapted to the profile, needs and management capacity of the association Directorate and the affiliated members. A practical archive system would be of considerable advantage to the daily management routine of the associations. Against this backdrop a private archive system was created for the agricultural livestock associations. The archive, which is accessible on request and authorised by the association management, essentially contains printed documents issued by the association as well as by other entities working on UA, as shown in Table 19.

<b>Table 19: Background to the agro-livestock association</b>		
<b>Ambit</b>	<b>Subjects</b>	<b>Contents</b>
Legal Framework	Legislation*	<ul style="list-style-type: none"> <li>▪ Land law; law of associativism and cooperatives Constitution</li> </ul>
Genesis of the Association	History of the association	<ul style="list-style-type: none"> <li>▪ Context of emergence (motivation), choice of association name; name of founding members, significant changes that marked association</li> <li>▪ Activities versus changes that occurred; list of presidents and term of office; gender characteristics of association</li> </ul>
	Membership data	<ul style="list-style-type: none"> <li>▪ Identification data; recognition and formalisation; access to land; existing infrastructure; access to resources; partners</li> </ul>
Human Resources	Personal data	<ul style="list-style-type: none"> <li>▪ Identification data; socio-demographic and economic data; integration into the association; access to land; contacts</li> </ul>
	Household record	<ul style="list-style-type: none"> <li>▪ Name and degree of kinship; contact details</li> </ul>
Organisation and operation	Organisational structure	<ul style="list-style-type: none"> <li>▪ Organisation chart; governing bodies and functions; list of names of current members and term of office</li> <li>▪ Statutes</li> <li>▪ Official publication bulletin of the association</li> </ul>
	Documentation and information	<ul style="list-style-type: none"> <li>▪ Minutes and summaries of General Meetings, weekly meeting</li> <li>▪ Reports from sectors or association bodies, including supervisory board; production; social affairs; treasury; block; trenches</li> <li>▪ Production plan: What is produced; main techniques; productivity recording; market selling price; sales strategy</li> </ul>
	Patrimony	<ul style="list-style-type: none"> <li>▪ List of movable and immovable assets</li> <li>▪ Loan application forms or use of association assets or resources</li> </ul>

Partners	NGO*	<ul style="list-style-type: none"> <li>▪ Area of action, duration of project support; type of support provided; number of beneficiaries</li> </ul>
	CMM*	<ul style="list-style-type: none"> <li>▪ Area of action, duration of project support; type of support provided; number of beneficiaries</li> <li>▪ Strategic plan</li> </ul>
	DASACM*	<ul style="list-style-type: none"> <li>▪ Area of action, duration of project support; type of support provided; number of beneficiaries</li> <li>▪ Strategic plans</li> </ul>
Research	IES*	<ul style="list-style-type: none"> <li>▪ List of theses, dissertations and degree monographs</li> <li>▪ Drill down reports</li> </ul>
	IIAM*	<ul style="list-style-type: none"> <li>▪ Surveys, manuals, etc.</li> </ul>
Miscellaneous issues	Conferences, trainings, lectures, fairs, visits etc.	<ul style="list-style-type: none"> <li>▪ Public and private institutions</li> </ul>
Source: Chicamisse-Mutisse		

Legend: \* documents that can be stored in an electronic archive

Ensuring consistency of information and facilitating the preparation and management of information called for the design of models/forms/fiches and drafts to be used for association activities and will guarantee the existence of documents for the archive. Each ambit, file or archive folder is preceded by a guide/index containing a summary of the archived information.

The secretary of the association Directorate is responsible for document management and supervises current documentation of the associations. The Directorate must guarantee the security of the documents in its possession and restrict access to documents considered confidential.

Once the archive has been established, it will be the duty of the management and the protectors of the document collection to make it functional and accessible so that it can be exploited for quick and useful consultation. Taking into account its multiple facets, institutional memory should be seen as a collection of attributes, stories, moments and trajectories pertaining to the members of the association. It consists of the actions of individuals as association members, of their context, their external relations and the paths they have chosen, all of which will be visualised today and in the future, contextualising the past and the present.

### 5.2.3 A network for urban agriculture in Maputo

*Candida Bila & Erik Engel*

After a series of multi-stakeholder meetings initiated in the course of the UFISAMO project since August 2017, a constitutional meeting to formalise an Urban Agriculture Network was called for in April 2019.

#### Context

Urban agriculture in Maputo is strongly organised (see Chapters 3.2, 3.6 and stakeholder map):

- Most farmers are organised in associations which in turn are linked through unions of associations at district and city level. The city union is part of the national peasants/farmers union UNAC, which itself is part of an international peasants/farmers network defending land access rights for small-scale farmers, seed and food sovereignty, amongst other objectives;
- The Ministry of Agriculture maintains a network of extension workers in the districts of Maputo where urban agriculture is practiced. These extension workers are based in *casas agrárias*, resource centres supported also by departments of the municipality of Maputo;
- NGOs support specific activities in urban agriculture, usually through broader programs which do not necessarily focus on urban agriculture alone. Usually their agendas encompass sustainable resource management, food sovereignty or improving nutrition. Many NGOs and other civil society actors have congregated in the ROSA (*Rede de Organizações para a Soberania Alimentar*) network, a national network to promote and lobby for food sovereignty.

Exchange between all these actors exists, but it is not systematic, nor is it formalised. Actors from the municipal level as well as representatives of civil society expressed the necessity to form a network on urban agriculture in order to promote specific production methods and to lobby for a stronger consideration of UA in urban development (Halder et al., 2018) - despite all the structures and linkages mentioned above. "Today, organisation hardly manage to survive on their own. It becomes ever more important to share information, capacities, knowledge, and by this to maximise the gains and merits of each member organisation" (translated from the draft ToR for the Coordination Committee of the Urban Agriculture Network for Maputo, 24.05.2019).

### Activities

The initial meeting of a variety of stakeholders, encompassing public sector representatives, farmers, NGOs and researchers, took place during the research conducted by SLE in August/September 2017 (Halder et al., 2018). Two more meetings took place amongst interested parties between February 2018 and February 2019 in response to invitations issued by the UFIS-AMO partners at UEM.

In April 2019, NGOs (ABIODES, Kulima), UNAC, the ROSA network and UEM researchers convened to formalise the UA network. Other parties had been invited but could not participate, e.g., representatives of the municipality and farmer representatives of the district and sub-district level were missing.

- The participants agreed to formalise the network on Maputo City level by means of a memorandum of understanding (MoU) defining the vision and mission of the network as well as the specific objectives;
- In addition, the MoU is to contain some rules and regulations to sketch the functioning and decision-making mechanisms of the network;
- Reaching out to adjacent municipalities (e.g., Matola) or other cities with UA networks (e.g., Beira) was defined as options for the future, after a consolidation phase;

- Next steps and a time plan were agreed upon;
- A necessary next step was seen in mobilising more stakeholders to be part of the “*Rede da Agricultura Urbana da Cidade de Maputo*”, the Urban Agriculture Network of the City of Maputo.

This ‘formalisation light’ model (MoU) was preferred to a ‘fully’ formalised network with statutes and a registration with the Ministry of Justice. It was argued that such a full registration could happen at a later stage – but that the network had to prove meaningful and dynamic before undertaking these more complex steps. The argument to focus on Maputo rather than creating a ‘national network’ went down a similar line: stepwise growth if that proves necessary/of benefit for achieving the objectives, rather than creating a big structure with potential logistical and organisational challenges.

### **Vision, mission and objectives**

During the workshop, participants agreed on the following objective framework for their cooperation:

The objectives of the network are to

- a) Promote effective coordination between actors (producers, NGOs, consumers, private sector, public sector);
- b) Promote horizontal and vertical communication between all the actors.

That shall contribute towards the networks vision:

- Increased production and productivity of urban and peri-urban agriculture;
- Food and nutrition security;
- Food sovereignty;
- Sustainable urban and peri-urban agriculture;
- Promotion of social welfare.

The network sees as its mission to

- Disseminate information in sustainable agriculture (sustainable production methods, climate change);
- Facilitate market access for sustainably grown urban products;
- Promote research and workshops; and
- Foster exchange with other actors in society.

## Implementation

In order to facilitate communication between the different actors, the participants decided to appoint a coordination committee for a duration of two years with a successive rotation. The committee would be composed of representatives of the public and private sector as well as of civil society and academia. Draft ToRs were developed and circulated for approval in April 2019.

A general assembly will provide the general directions for the actions of the network in form of an action plan. This action plan agreed is to guide the activities of the coordination committee. The latter will set the dates and invite to meetings according to needs, but at least twice a year. External monitoring and evaluation as well as governing bodies shall be in place to ensure a correct functioning of the network. As means of communication within but also beyond the network, the choice was for easily accessible media from social media to theatre and radio clips in an easy language excluding nobody.

## Sustainability

As mentioned above, the meeting decided – for the time being - against a more formal network, even though a registration with the Ministry of Justice would allow to access funds and submit project proposals. Initially, the network will thus not be able to generate money to cover potential expenses. All activities within the network are unpaid, and a mechanism to cover transportation and meeting costs has to be found.

The network will thrive if the actors involved in it see the advantages of linking up with others – and if the members or at least some of them develop the dynamics to keep it going. Also, expectations towards the network should not be exaggerated. Given the high interest institutions involved in urban agriculture expressed towards forming a network, it is likely that it will take off and evolve. The extent to which urban agriculture is practiced in other cities, nearby Maputo and further away in the country, provides a solid foundation for a growing network for mutual learning, support and lobbying.

## 5.3 Examples from Cape Town

### 5.3.1 Farmer to farmer knowledge exchange – the urban research farmer group

*Zayaan Khan, Sonia Mountford & Urban research farmer group Cape Town*

*Our deepest gratitude goes to the members of the research farmer group in Cape Town, who collaborated closely with UFISAMO researchers over a period of two years, sharing their knowledge and experience. It seems incredible that you spent two whole years shaping this research, supporting it and sharing your knowledge and your heart to enable us to reach conclusive results. That we learned to overcome boundaries together, to grow together and to tell our own story is a result that cannot be valued highly enough.*



*Enkosie, Dankie, Thank you: Babalwa, Benji, Carolin, Chris, Clifford, Ezra, Hazel, Iming, Jeremy, Khutala, Liziwe, Magda, Nomonde Senior, Natasha, Nomonde Junior, Noncedo, Ria, Sibongile, Sophumla, Vatiswa, Vuyani, Washiela, Zikhona*

Focus group discussions allow researchers to delve deeper into specific issues and systems. A set of focus group workshops in Cape Town enabled UFISAMO to look at and gain valuable insights into urban agriculture and urban food systems, most importantly from the farmers' perspective.

The urban research farmer group was established in October 2017 in the course of a first workshop on the production challenges of urban farmers in Cape Town.

After the first session, the focus group decided to continue with group discussions and farm visits in order to comprehend more fully the food system in which they are embedded. The farmer perspective of the opportunities and challenges involved is reflected in the findings of the research project (see Chapter 4.4). The focus group of farmers joined the UFISAMO project as co-researchers, sharing their knowledge by means of participatory workshops, farm diaries and detailed biographic interviews. Based on Chambers' participatory workshop design, the research group worked with an approach entitled "self-organising systems on the edge of chaos", a label given to the unplanned learning process within a workshop (Chambers, 2002, p. 105).

Workshops were conducted in English, the second language of all participants and the main facilitator. Storytelling, mapping, participatory knowledge generation, plenum and dialogues were some of the participatory tools applied. Farmers were encouraged and have now developed the ability to observe, monitor, reflect and subsequently share their thoughts and ideas with the group. The workshops, which were declared 'PowerPoint free zones', used cards, pictures and visual clusters, and took place in rotation at the various food gardens. This allowed farmers to take a close look at other realities, farming practices and neighbourhoods.

Along with on-site visits, group discussions and workshops, the group also went on two learning excursions. One was a visit to an Italian chef in the city centre who gave the farmers a lesson on making pesto and tomato sauce. The second excursion took them to Babylonstoren, an inspiring vegetable garden in the Winelands close to Cape Town, to identify good growing practices.

The following topics were covered: production and marketing challenges; water restrictions and climate change; seeds and seed saving; the impact of urban agriculture on the city's food system; food waste and food processing; a joint effort with other actors to work out good agricultural practices for the urban context; marketing opportunities; food mapping; the role of the farmer in cities; knowledge and information systems; production monitoring, including production planning and record keeping; urban food policy and local market access.

A key element of the process was building trust and confidence between farmers and facilitators. Abundant interaction, more than a hundred farm visits, communal garden work, get-togethers and shared meals over an extended period of time helped to create a safe environment in which farmers could express themselves openly.

"Some of our ideas are perhaps far-fetched and the ability to understand us and our dreams as producers has been reassuring. Perhaps it is patience and this ability to be freely trusting that has opened us up and not feeling being misled by some. Farmers, es-

pecially small-scale farmers, are often misled and manipulated in the highly complex, political context of agriculture in SA. This happened for decades with us during apartheid and continued after apartheid" (farmer's comment).

Small-scale urban farmers in Cape Town survive in highly complex systems and the commitment shown by the farmers to this research group exceeded expectations.

The group increased from seven to 20 farmers in June 2019. Some Cape Flats farmers knew one another from their local communities but not well enough to know that they were both vegetable growers. The group is diverse and has varying affiliations to local NGOs – from home gardener to food garden farmer, from political gardening activist to seed saver. The members are between 25 and 60 years of age, live in different neighbourhoods, were socialised in different townships, have different levels of education, and different socio-demographic and ethnic backgrounds.

Most of the farmers concerned had never before seen other food gardens. Lack of transport and no knowledge about other farmers are limiting factors to farmers' exposure to growing methods in other communities. In addition, there is a persistent historical mindset of staying in one's own community and of not being welcome in other townships.

Farmers admitted that these visits had been inspiring and a powerful tool to increase their knowledge of farming.

"The urban research farmer (URF) group (...) here is the first opportunity for farmers to remain connected after the research has been conducted and the sessions have ended. The group united the farmers as a collective. One can very easily become isolated in the Cape Flats. This was the first time that farmers from different neighbourhoods, cultures and colours united. It was the most incredible journey learning about my food, my community and our stigma as urban farmers" (farmer's reflection).

Besides on-site meetings, the farmers actively collected information in their farm diaries on production challenges, sales, self-consumption, food waste and lessons learned. A WhatsApp group was created and is used by the farmers with great enthusiasm for exchanges on production challenges (chiefly pest- and disease-related) and surplus harvest, and for advice on inputs, solutions, price disputes with their retailer or seeds and seedlings. Continuous feedback on results, data analysis and findings within UFISAMO were crucial to keeping farmers in the loop, encouraging their reflection on these findings and making them an integral part of the broader research picture as co-creators.

"Amazingly, we as farmers are growing with each day and finally being rewarded for the work and time we invest in our gardens. Together we learnt about the complexities of the food system embedded within each farmer's work." (farmer's reflection).

The concept of joining a group intermittently over a period of almost two years has broadened researchers' scope of knowledge. More important is the knowledge exchange between the farmers and their knowledge creation. Peer learning is a very powerful tool, with farmers evoking it as their main motivation to continue to invest time in the group. Overcoming social barriers is equally important to the farmers. Friendships developed and continued beyond the workshops,

bilateral cooperation has been initiated, i.e., seedling exchange, business cooperation, mutual assistance during planting activities.

“We joined as farmers and we stay as friends” (farmer’s reflection).

Urban farmers in Cape Town’s food system have been pushed into strong dependencies. One such dependency is that of NGO subsidies for inputs such as seedlings, tools or compost. They also depend on middlemen market channels and NGOs as knowledge providers (see Chapters 4.3 and 4.9). This funded NGO support system has largely disempowered farmers. In juxtaposition, the focus group recognised the power of independence from NGOs when they acknowledged that the united voice of farmers and a participatory method of mutual support rather than reliance on the top-down approach of NGOs was vital. Being in a group where the farmer’s voice counts was crucial to understanding they were not alone. Discussion of these facts allowed for self-realisation and the discovery of self-empowerment in the face of common challenges.

This example shows the significance of the farmer to farmer learning approach and how valuable knowledge can be created in a mutual learning process. Following conclusion of the main action research phases, the group continued to meet. In May 2019, it began to set up a farmer cooperative, a hitherto unique model in the Capetonian context. Discussing and reflecting on their own role and dependencies for almost two years was a strong tool of change. Connecting with a collective of fisher ladies up Westcoast (Vredeburg, Paternoster) was the start of the initiative to unite and understand the underlying power relations.

Can a process like this be replicated and serve as a facilitation model in other areas and contexts? In retrospect, it seems astonishing that it worked out despite the complex segregation dynamics of post-apartheid Cape Flats and the power relations that prevail in the urban agricultural environment of Cape Town. Overcoming these separations to realise that in the bigger picture the challenges are similar, having the feeling of being in a safe and trusted environment, and benefiting from new knowledge can be seen as the qualitative achievements of this urban research farmer focus group.

### **5.3.2 UFISAMO demonstration plot at Beacon Organic, Mitchells Plain**

*Nicole Paganini*

The Beacon Organic urban farm located at Wespoort Drive in Mitchells Plain on the grounds of Beacon Primary School for Learners with Special Needs was chosen by UFISAMO to establish an indigenous and perennial vegetable garden— the initiative came from the former EthicalCoop manager and the farmer at Beacon Organic. UFISAMO took the opportunity of collaborating with a farmer in a not overly researched setting. In addition, the plot was chosen to test good practices for production and to compare techniques identified in the urbanGAPs process.

The garden was established in 2013 to grow vegetables for the local community and introduce children to agriculture and food production. Step by step, fallow land was reclaimed for vegetable production and clustered into four production sites. A more playful area was set up to showcase various techniques, e.g., cultivation in empty bottles, hill beds and eco-circles, and a zone created for compost production. The garden also includes container farming and seedling pro-

duction. The farm was chosen by Soil for Life in 2016 as an Agrihub in Mitchells Plain, a location for home garden training and the NGO's health and well-being training. Soil for Life supported the main farmer with a lease for a *bakkie* (pick-up), extension and initial funding. The manager runs the garden with three workers and the frequent support of volunteers.

A first meeting was held in February 2017 to define the aims of a demonstration plot within the UFISAMO research project:

- The indigenous and perennial garden will be a learning hub for organic urban agriculture;
- Techniques for small-scale vegetable production as subsistence farming will be demonstrated and function as a learning hub for home gardeners;
- Market/Food garden techniques will be tested to enhance production quantity and quality (reduce pest and disease) based on Western Cape PGS standards and to improve production planning;
- Production techniques will be examined for more water smartness;
- Traditional Cape heritage and indigenous vegetables will be showcased.

The garden was designed by a group of farmers from different farms and community members in a three-day participatory planning workshop. The design process was based on perma-cultural techniques, taking into consideration local micro-climate, soil quality, wind directions and the urban surroundings of the garden. It was the manager's wish to establish an indigenous garden to introduce local varieties to the farm and make strategic use of empty space.

The first step took place in October 2017 and included the installation of an irrigation system. Building organic matter was given high priority. Fruit and nut trees, hedges and berries were also planted. Windbreakers in the form of dune spinach pyramids were set up to protect the plot from erosion and the heavy summer winds. The garden struggled with wind erosion, so most of the energy was put into windbreakers. The demonstration of good practices for vegetable production was stopped when water shortages in the summers of 2017/2018 forced Cape Town farmers to curtail their urban agricultural activities. The water source for the demonstration plot (newly installed *jojo* tanks) was empty at the time. Despite the hot summer months, the fruit trees and most of the hedges survived.

The plot was revitalised with the first winter rains in May 2018 and sunflowers, mustard and indigenous crops such as dune spinach, dune celery, dune asparagus were planted and propagated. Water-saving production techniques such as sunken-beds were tested, and the area used as a learning hub for compost production. It also served as a workshop venue for students and the urban research farmer group. Following a multi-actor workshop hosted by UFISAMO to design Good Agricultural Practices for the urban context (urbanGAPs) and the publication of a draft guideline and a manual in June 2018, the farmers experimented with these techniques on the demonstration plot.

A close look at the process of design and implementation shows that participatory planning is crucial, as it takes into account a range of opinions and knowledge. Breaking with conventional

garden patterns enables farmers to show creativity and add beauty to their farms. The planning process has shown how important basic farming skills are to making a plot productive by including techniques such as companion planting, intercropping and the planting of fruit trees.

The process also highlighted the challenges involved in establishing gardens. Two major challenges in the UFISAMO process were identified in retrospect. Firstly, the workshop facilitator underestimated the climate forecast for the summers of 2017/2018, which put an unwelcome stop to the process and later saw the adoption of the previous demonstration garden plan (removal of vegetable section and focus on indigenous perennials, fruit trees and windbreakers). Secondly, the manager altered the base design of trees and hedges, replanting them after a couple of months with the result that the trees have been struggling ever since to adapt to the new design. The garden produced a range of indigenous crops. These are sold to generate income and cover garden costs. The first fruit was harvested for self-consumption. In winter 2018, the plants settled down and crops such as gooseberries, blueberries and the indigenous perennials were ready for propagation. The dune spinach was climbing and the windbreakers could have fulfilled their purpose in the upcoming summer of 2019. In the meanwhile, however, the farmer in charge was taught about agro-forestry in vegetable production. Trees were transplanted a second time, causing most fruit trees to die. Windbreakers were removed, which led to the loss of garden protection. Berries were not irrigated, resulting in the death of most of the plants.

Apart from the investment of time and money, farmers underestimated the enormous economic value of fruit trees and the long-term perspective of satisfying a niche market with berries and indigenous crops. This experience illustrates that planning and installing a garden calls for a long-term perspective and consistency of implementation. The farmers and UFISAMO had a feedback session during which the manager pointed out that the monitoring of the plot and further support by UFISAMO had been insufficient.

The Beacon Organic garden fulfils its role as a community hub, a space in which home gardeners and students can observe and learn. The garden is not ideal as a demonstration area due to frequent changes to production principles. This example shows that production depends entirely on the individual farmer's decision and her or his vision for the farm. It is also a reminder that farmers – particularly the less experienced ones - frequently alter production techniques and farm visions according to short-term benefits, and rarely pursue a long-term plan. The farmer at Beacon Organic is mainly engaged as a community leader, appears in the local media with success stories and supports the introduction of new farms in the neighbourhood. The main garden acts as a community hub but not a demonstration plot for urbanGAPs or indigenous crops.

### **5.3.3 Agro-processing: preservation and value addition**

*Zayaan Khan*

This article provides the frame for a series of workshops on agro-processing within the context of UFISAMO and in cooperation with the research farmer group. It highlights why processing is necessary and of value, and the types of processing already in existence. It serves as an appetizer – once interested, farmers would need practical training to learn how to process food and to recognise the issues to be considered. Some of the techniques described below have been adopted

for home use or commercialisation: pesto-making has taken off with some farmers, while others supply basil to a company that produces pesto on a large scale. So far, pickle production is limited to home use. A number of workshops carried out in Cape Town in 2018 and 2019 gave an insight into the broad art of processing and saw the display and tasting of various pickles, jams and fermented vegetables, and the making and preserving of pesto and other sauces.

Agro-processing is a vital component of post-harvest work for farmers and gardeners. Farmers frequently seek the help of a support team or the community. This could be family relatives, young people in the community, women or simply people who are otherwise unemployed due, for example, to a disability or single parenting.

Agro-processing is also known as value adding, a common phenomenon in other fields where a certain process adds value to a product, e.g., in the domain of goods and services. In the field of food production value adding is also referred to as food transformation or food processing.

Harvested produce is processed for many reasons:

- Processing adds value to the produce with merely one processing step (such as slicing and salting a tomato in a restaurant salad). The financial value is added to the original selling price. Processing adds financial value to what would otherwise have been product waste;
- Agro-processing preserves the harvest throughout the seasons. In other words, tomato paste is available in the middle of winter or peppers in early spring. This allows us to continue cooking the recipes we love by creating a pantry of off-season goods;
- Preserving the harvest is the way forward to food security;
- Devoting a space to value adding creates business opportunities and job opportunities within the communities. Agro-processing is a welcome window of opportunity for those who cannot find work easily, e.g., single parents, the elderly, people with disabilities. It is a means of enhancing the community through food and enables the community to work more closely with the farmers and appreciate farming;
- Agro-processing intensifies the flavour of the produce and increases its potential;
- Agro-processing produces ideal gifts instead of spending money on them;
- Agro-processing allows the producer's story to be told, especially when packaged, labelled and distributed. The general public can access the products directly and engage with food and the food system.

Since farming is a full-time job, farmers should be encouraged to make agro-processing the work of many. More heads than one create recipes, think problems through and come up with solutions, while more hands contribute to processing activities. Processing is time consuming and many hands make light work, especially in the absence of cold storage to preserve the produce.

The above reasons for agro-processing can be divided into the two categories business and home use, whereby each category calls for different processes and applications. Farm-to-home pro-

cessing helps to reduce household costs. Farmers spend less money on food, the methods of preserving are easy to learn and apply to fresh produce.

Understanding the process itself requires knowledge of the different harvest grades and their uses:

**1<sup>st</sup> Grade:** These are the fresh harvest products sold to market. They are 'market-ready' and considered raw products. A raw product is the primary commodity, the first item produced in the value chain. These vegetables, fruits and herbs are mostly marketed to home users through box schemes or directly to the communities, schools, churches, neighbours.

It should be noted that most urban farmers have a surplus of 1<sup>st</sup> Grade produce.

**2<sup>nd</sup> Grade:** This is fresh produce not seen as market ready. According to a dominant market narrative, however, it refers to large-scale agriculture, whose products must fit both mechanised systems as well as the ultimate packaging for supermarket shelf displays. The UFISAMO workshop worked with this narrative when it spoke of the intention of farmers to broaden their current markets, i.e., to introduce box schemes to the local community. 2<sup>nd</sup> Grade vegetables have been dubbed 'ugly veg' in a campaign to highlight surplus vegetables that are highly nutritious and of the same quality as 1<sup>st</sup> Grade produce, but simply misshapen. 'Ugly veg' can be divided into four categories:

- **Class A:** This produce may be amorphous in shape, but the integrity of the vegetable remains and is identical in quality to 1<sup>st</sup> Grade produce. Neither do these products have bruises, scars or disease. Further usage options in terms of kinds of food processing were discussed in the theoretical section of the workshop;
- **Class B:** This covers produce that has been damaged during growth, harvest or post-harvest. Products may have splits, insect marks, slight bruising or a similar level of degradation, all of which makes them ideal when it comes to chopping the produce fine or cooking it down;
- **Class C:** Here the taste of the produce is somewhat compromised mostly due to bacterial growth, which leads to greater damage. Processing this produce category involves spending more time cutting and cleaning than in other grades. The focus here is on making non-food items such as paper or dye;
- **Class D:** The produce in this category is unusable. If used as compost it should be buried down into the pile and not simply placed on top as this would spread disease.

### Types of food processing

Processing food is an ancient practice that has been performed since time immemorial. Using fire to cook, fermenting produce and burying food to preserve it is all part of our collective heritage. Industrialisation, global wars and forced removals have led to the loss of many traditional methods of preservation or agro-processing, so that they have to be relearned. The following are some of the methods:

**Fresh Produce:** For soft preservation methods, products without a lot of preservatives and fresh ingredients such as ginger, salt, lemon, chilli and cooking are used.

**Pickling:** is a broad term for the use of oil, vinegar or spices (chilli, mustard, garlic, ginger) to preserve food. This can be atchar or pickled onions in vinegar.

**Maceration/Infusion:** is layering herbs, fruit or veg in vinegar. Vinegar infusions are easy to make and can be sold at a good price.

**Fermentation:** means using salt or sugar to lacto-ferment. Although there are several ways of fermenting, the workshop discussed salt fermentation only.

**Drying:** Sun dried but shielded from dust and wind is an excellent way of preserving fruit and vegetables.

**Dehydration:** Dehydrating encourages drying food to lose water, such as in the making of powders or crisps.

Numerous other products should be explored.

### **Labelling**

Labelling for home use is important because it reminds us what is in the jar. If the jar has been kept for some time, it is possible to forget the contents and the date of manufacture. Labelling is likewise good for presents and makes the receiver aware of the content. It is also vital for transparency when the products are sold, since the producer rarely has the opportunity to meet the consumer, e.g., in a supermarket context.

The following information should be on the label:

- Ingredients used to create the product;
- Allergies such as peanut or tree nut allergy. This is crucial because even if nuts are used in the production area or kitchen, they can affect the consumer and have fatal consequences;
- The date of manufacture;
- If possible, the best before date should appear. The 'best before' date indicates when the product is considered to be at its best, i.e., 'this product is at its best before 30 July 2019';
- The shelf life should be added if known. It indicates the shelf expectancy of the product, which may still be consumed, for example, within the next two weeks. Supermarkets are now utilising this more often as it allows them to still charge a fraction of the cost and not discard the product as waste;
- Company name;
- Product name;
- Weight or volume, either 'when packed' or prior to packing. Where the weight appears without the words 'when packed', it is assumed that the weight refers to the amount prior to packaging;



- The story of the farm or producer can also be told on the label. This helps to relate to the buyer, a consumer we do not usually meet directly. The story should be a brief narrative that tells how the farm produces (agro-ecologically/organically and so on) and what this means.

To reiterate, this is done as the person buying the product is not able to engage with us directly when the product is being sold, the product needs to sell itself and the purchaser needs to have some kind of recourse should there be a need to follow something up. In South Africa people may contact the Department of Health or Consumer Complaints Commission if there are concerns about the product. It is a good idea to put contact information on the product, so consumers are able to contact the producers directly.



## 6 Challenges, good practices, recommendations

*Erik Engel, Karin Fiege & Anja Kühn*

The results presented in the previous chapters clearly show the differences between Maputo and Cape Town in terms of history, climate, and the overall economy. Urban agricultural conditions and practices likewise differ in each of the two cities, e.g., the role of UA in the food system, production methods, marketing opportunities, consumption habits, organisation, communication and information channels or stakeholders, support and (political) framework conditions.

A comparison of the two case study cities is therefore limited. Nevertheless, the UFISAMO research identified a series of similarities and differences between Maputo and Cape Town, suggesting that a number of good practices in each context might well be mutually transferable.

Actors from both locations highlighted the idea of learning from one another, despite their divergent framework conditions: actors from each city were impressed by the other's good practices, e.g., the fairly widespread agro-ecological practices in the Cape Flats impressed the Mozambicans, while the local demand for urban vegetables and the degree of farmers' organisation in Maputo inspired the Capetonian farmers.

This chapter presents characteristics of Maputo and Cape Town's urban agriculture – the food system (6.1<sup>28</sup>), organisational structures/networking (6.2), production and marketing (6.3), food and consumption habits and food security status (6.4), and dissemination and information channels (6.5). Conclusions were drawn for these research areas and recommendations made, based either on existing good practices or on challenges identified during the research. The recommendations are presented per city, as they respond to specific good practices and challenges. As far as possible recommendations have been addressed to specific actor groups (e.g., farmers, associations, NGOs, department of agriculture).

Delivering recommendations is a dynamic process based on the research results presented in this report (up to February 2019, see Chapters 2 to 4). This also includes the initial implementation experience (see Chapter 5) and new information obtained in discussions and validation workshops with UA actors in Cape Town and Maputo between March and July 2019.

The UFISAMO partners are aware that the availability of funds or the possibility of raising funds is critical and could be a limiting factor when it comes to the successful implementation of the recommendations made.

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<sup>28</sup> The sub-chapter 6.1. presents an overview of Maputo and Cape Town's food systems without further information or recommendations, since the topic will be addressed in detail in a Ph.D. thesis to be published after completion of the UFISAMO project

## 6.1 Overview on food systems and urban agriculture in Maputo and Cape Town

Table 20: Characteristics of food systems and urban agriculture in Maputo and Cape Town	
Urbanisation	
<ul style="list-style-type: none"> <li>▪ Urbanisation impacts heavily on the food systems in each city</li> <li>▪ Across the African continent, 57% of the population will live in cities by 2050 (UN HABITAT, 2014)</li> <li>▪ Rural migration for employment purposes increases the urban population</li> <li>▪ Municipalities are challenged to supply the new urban population with infrastructure, access to safe water, hygiene, food, and jobs but also to make transport affordable and available</li> <li>▪ Growth of informal economies and trade, i.e., <i>magueva</i> system in Maputo or non-registered loan work in Cape Town</li> <li>▪ Achieving food and nutrition security is not only a rural challenge, access to adequate healthy and affordable food in terms of quantity and quality is a growing issue for cities</li> </ul>	
Maputo	Cape Town
<ul style="list-style-type: none"> <li>▪ Projected urban population growth by 2030 from 1.1 million to approx. 1.5 million (UN, 2018)</li> <li>▪ Mozambique’s urbanisation rate is expected to reach 51% by 2050 (UN HABITAT, 2014)</li> <li>▪ Future challenge to production areas: increase in housing will lead to a decrease in traditional production areas in Maputo</li> <li>▪ ‘Outdated city development plans’ - city planning formalised in ‘Maputo metropolitan Area Master Plan’ and ‘Partial Urbanization Plan’ (for priority areas. → challenged by lack of financial, technical and human resources), (UN HABITAT, 2014)</li> <li>▪ “Informal peripheral neighbourhoods where majority of Maputo city lives” (UN HABITAT, 2014) characterised by disorderly occupation, lack of basic infrastructure and adequate housing – investment by city council in basic physical (water, sanitation, electricity, roads) and social infrastructure (UN HABITAT, 2014)</li> <li>▪ Migration from countryside of approx. 3.5%/year (compared to 2%/year on national scale) adds to population density in sub-urban neighbourhoods beyond capacities of infrastructural growth (UN HABITAT, 2014)</li> <li>▪ Institutions in the municipality of Maputo (CMM) lack financial, technical and human resources (UN HABITAT, 2014)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Projected increase in urban population by 2030 from 4.1 million to 5.4 million</li> <li>▪ South Africa, where 60% of the population already lives in urban areas, is expected to reach an urbanisation rate of 80% by 2050 (UN HABITAT, 2014)</li> <li>▪ Open areas for production on public ground are rarely accessible to urban producers</li> <li>▪ Post-Apartheid South Africa is one of the most unequal countries in the world, with townships hosting vulnerable population with high unemployment rates. Inequality in Cape Town measured in GINI coefficient on the increase since 2010 (in 2014: 0.62 from 0.57 in 2010) (CoCT, 2017)</li> <li>▪ Population growth, for example, of Mitchells Plain + Khayelitsha Planning district (2001-2011) 27.5% (CoCT, 2013), (the informal increase may be far higher given the trend to provide informal shacks on plots of formal dwellings)</li> <li>▪ City planning for ‘sustainable urban development’ formulated in ‘New Urban Agenda’ (Naidoo, 2017)</li> <li>▪ Highly segregated cities with high population figures in specific neighbourhoods/districts</li> <li>▪ Development agenda framed by ‘Integrated Development Plan 2017-2022’ (reviewed annually); long-term Metropolitan Spatial Development Plan + annual Built Environment Performance Plan → they “reflect their city’s concern with overcoming apartheid legacy of spatial and socio-economic inequalities through basic service delivery and transit-oriented</li> </ul>

<ul style="list-style-type: none"> <li>▪ Housing policy (reorganisation of peripheral neighbourhoods) sees the municipality encouraging private public partnerships to complement efforts undertaken by central government (UN HABITAT, 2014)</li> </ul>	<p>development” (Mistra Urban Futures, 2018, p.5)</p> <ul style="list-style-type: none"> <li>▪ City planning challenged by rapid population growth, notably in mushrooming informal settlements: infrastructure, the officially repeated goal of “housing for low-income residents” still not attained</li> <li>▪ Challenges exacerbated by resource constraints and climate change/drought: how to reconcile conflicting development objectives?</li> <li>▪ City of Cape Town has only limited or no mandate on social development education, health and safety/security (provincial/national mandates)</li> </ul>
<b>Public institutions for urban agriculture</b>	
<ul style="list-style-type: none"> <li>▪ Global level: ‘Zero Hunger’ (SDG2) and ‘Sustainable Cities’ (SDG11) are global commitments within the scope of the Sustainable Development Goals. SDG2 does not tackle the urban perspective, SDG11 does not refer to food (Battersby, 2017)</li> <li>▪ Communication on policy level between municipality and regional and national Department of Agriculture is weak</li> <li>▪ Different political institutions tackle different areas related to urban agriculture (agriculture, health, social development, spatial planning, education) but work in silos</li> <li>▪ Food Planning plays only a minor role in urban planning</li> </ul>	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>▪ Municipality (CMM) has an active entity in charge of urban agriculture. The municipal directory for economic activities (<i>Direcção municipal de actividades economicas</i>) organises extension, mapping and registration of farmers and provides advocacy</li> <li>▪ Ministry of Agriculture and other stakeholders currently developing framework for production standards to ensure food safety – to be fully implemented (including information campaigns for producers) by 2020</li> <li>▪ Ministry of Agriculture focus on quantity to support national food security structure, which includes the use of mineral fertiliser and pesticides</li> <li>▪ A reinforcement to stabilise UA has been observed in 2019 due to a change in the leading team of the municipality</li> </ul>	<ul style="list-style-type: none"> <li>▪ Urban Agriculture Entity was developing a policy for urban agriculture (2007) aimed at promoting and subsidising urban farmers</li> <li>▪ Revision of the policy in 2017 was stopped and the entities responsible were transferred to Social Development</li> <li>▪ The food garden policy (2013) replaced the urban agricultural policy</li> <li>▪ The City of Cape Town looked from different departments on UA and has engaged with a forum of farmers in July 2019 to re-write the UA policy</li> <li>▪ Absence of food governance has been criticised by other researchers (Haysom et al., 2017)</li> <li>▪ National departments are responsible for food legislation: Departments of Agriculture, of Health, and of Trade and Industry</li> <li>▪ DoA regulates safety and quality of agriculture and animal products in accordance with the Agricultural Product Standards Act, 1990</li> <li>▪ Food Legislation Advisory Group (academics, scientists, consumers, industrial representatives) advise government</li> <li>▪ Enforcement of food safety acts delegated to provincial and local health authorities</li> <li>▪ Supermarkets have their own standards or follow localGAPs</li> <li>▪ Informally sold products are not controlled but most go through Epping market value chain</li> </ul>

<b>Food Infrastructure and Urban Food System</b>	
<ul style="list-style-type: none"> <li>▪ Both cities have ports and access to the sea</li> <li>▪ Global imports of food play a major role for each city's food system</li> <li>▪ Both cities face the challenge of changing consumer/food habits from traditional staples to processed, pre-packaged and supermarket distributed food (nutrition transition)– that process is more advanced in Cape Town</li> </ul>	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>▪ Hardly any processing within the city</li> <li>▪ Largely depends on imports, mainly from South Africa</li> <li>▪ Only 23% of purchase in supermarkets (Crush et al., 2016)</li> <li>▪ Informal sellers are main food source in daily life of consumers</li> <li>▪ Upcoming challenge: shift in consumer/food habits from traditional staples to processed, pre-packaged and supermarket distributed food</li> <li>▪ Hub for food imports for the country</li> <li>▪ Infrastructure: port, airport, national highway to the North of the country, highways from South Africa and Kingdom of Eswatini</li> </ul>	<ul style="list-style-type: none"> <li>▪ Very few urban farmers are linked to the many hundreds of food-processing enterprises</li> <li>▪ Highly segregated city, affects access to and affordability of food</li> <li>▪ Strong private sector, mostly 'white-owned'</li> <li>▪ Heritage of local and indigenous knowledge in the Cape is crucial to consider</li> <li>▪ Food deserts in vulnerable neighborhoods/townships</li> <li>▪ High supermarketisation, especially in the wealthier areas of the city, which boast eight times more supermarkets than the townships (Battersby, 2011)</li> <li>▪ The Cape Town Fresh Market, established by South African law on fresh commission markets, is the city's main distributor of fresh produce to formal and informal traders, so-called 'bakkie traders'</li> <li>▪ Many big supermarkets have retail systems in Cape Town</li> <li>▪ South Africa is a large food exporter, supplying neighbouring countries with fresh produce, grains, meat and processed food and the global north with citrus, rooibos and wine</li> <li>▪ The opening of the market after Apartheid flooded the country with global products. Many small-scale producers and processors failed to survive the transition period from an excluded country to a world-market player. One example is the dairy industry. Many dwellers had cows in Mitchells Plain and some produced butter or cheese</li> <li>▪ Infrastructure: port, airport, national highways</li> </ul>
<b>Relevance of urban agricultural production in urban food system</b>	
<ul style="list-style-type: none"> <li>▪ Impact of UA by vulnerable households on the urban food system is negligible or limited to specific crops (Maputo). It has almost no outreach in Cape Town; in Maputo it produces specific crops (lettuce, cabbage, pumpkin leaves) thus responding to the demand for fresh leafy vegetables but the contribution to the overall food system (staples, other fruit and vegetable, animal protein, processed foods, etc) is minor. This was established by other research (Battersby, 2011; Raimundo et al., 2014) and confirmed during the UFISAMO research</li> </ul>	

Maputo	Cape Town
<p>The green zones produce relevant quantities of green leafy vegetables (lettuce, cabbage) for the local market. Other vegetables, staples and animal products are chiefly imported from South Africa</p> <ul style="list-style-type: none"> <li>▪ Over 11 000 associated farmers cultivate more than 1 300 ha (João, 2018), which represents 4.3 % of Maputo’s total urban area</li> <li>▪ In the last five years, agriculture has been the main source of income for 80% of urban farmers in associations. The income does not exceed 7 500 MZN per month</li> <li>▪ Up to 7 000 people were trained to cultivate in their backyards/around their homes</li> <li>▪ 20% of households are involved in urban agriculture (Raimundo et al, 2014)</li> <li>▪ 40 000 people benefit economically from UA (Sitoe, 2010)</li> <li>▪ Farmers produce what they eat</li> <li>▪ Four out of five urban farmers contribute to their household income with UA, but half of the households still depend on other sources of income</li> </ul>	<p>Small-scale urban farmers in vulnerable areas of the city produce negligible quantities for niche markets only. The Philippi Horticultural Area (PHA – not in the focus of this research) produces significant amounts of fresh produce for the Cape Town market</p> <ul style="list-style-type: none"> <li>▪ 50-80 small-scale food gardens in the Cape Flats</li> <li>▪ 5 000 home gardeners trained in the Cape Flats</li> <li>▪ Philippi Horticulture Area with 1 100 ha urban farmland produces up to 50% of Cape Town fresh produce (Haysom et al., 2017) on 0.4% of the city’s urban area</li> <li>▪ Highly supported UA by NGOs and City of Cape Town, who regard urban agriculture as solution to urban hunger</li> <li>▪ Previous research: UA at backyard level has almost no impact on food security within the townships (Battersby, 2011)</li> <li>▪ Social grants are main source of income for urban farmers</li> <li>▪ Four out of five food garden farmers contribute to their household income. Only 10% of farmers rely on UA as their main source of income</li> <li>▪ Three out of five food garden farmers assume that their gardens could be profitable if there was a market</li> <li>▪ Food waste in township gardens is up to 70%</li> <li>▪ Average income of an urban farmer with UA is R500 per month</li> </ul>
Source: Paganini & Engel	

## 6.2 Organisational structures and networks in Maputo and Cape Town

*UFISAMO Team*

Cape Town and Maputo host a wide range of urban agricultural forms: individual home gardens, farmer associations, cooperatives, school gardens, and community gardens. Despite a similarity in their diversity, the differences prevail. This is due for the most part to the historical developments in each city that continue to shape the structure and significance of UA.

### 6.2.1 Organisational structure and networks of urban agriculture in Maputo and Cape Town

Maputo suffered a severe food crisis following the exodus of Portuguese farmers after the Declaration of Independence in 1975. The outbreak of civil war in 1977 and the isolation of the country by western states intensified the crisis. In an attempt to overcome it, the Mozambican socialist government fostered agricultural production by small-scale producers, cooperatives and associations in the so-called green zones of Maputo. Thus, began a vibrant urban agriculture that has maintained its importance to the present day. Vast numbers of smallholder farmers organised in associations engage in horticulture for the local market. Income generated from this practice is the main source of revenue for over 80% of the households involved. Production is largely commercialised and plays a key role in the provision of specific horticultural products (cabbage, lettuce). The state guarantees and formalises land access and provides extension services for association members. These associations are democratic in structure and members come together regularly for meetings and activities. The association is still the most important organisational UA structure in Maputo today and consists of individual farmers who decide on their own production and marketing. Several shortcomings prevent the associations from being more efficient as promotional vehicles for healthy production, joint marketing, innovation, and knowledge transfer.

Understanding the evolution of UA in Cape Town calls for a close look at the history of apartheid, a system that divided the city into vast areas where the 'Black' South Africans and 'coloured' people lived in precarious economic and social conditions, and a wealthy, attractive area reserved for 'whites' only. NGOs were the first to initiate UA during apartheid. They are still active and support unemployed and vulnerable residents by strongly encouraging organic horticultural production and organising produce marketing. Working towards social cohesion is a key NGO objective and offers a perspective in an extremely complex urban environment. NGOs promote both individual home gardeners and community gardens, and decide on the production process and marketing procedures. Despite these efforts, the contribution of UA to income generation and the food supply of poor households is marginal. Decades of NGO support have established dependencies in a treacherous comfort zone for the farmers, who in turn depend on these structures for inputs, marketing and the acquisition of new knowledge. When it comes to freeing themselves of these dependencies, farmers encounter numerous obstacles, be they material, social or entrepreneurial.



Women are the chief urban agricultural protagonists in both cities. In times of economic crisis and job loss in the formal sector, however, more and more men are now entering the field. Most of the farmers are elderly but captivating the interest of youth for this field is not an easy task.

Although Cape Town has a UA policy, it has never been fully implemented. Maputo has no UA policy. Nevertheless, the state has intervened in the sector in a number of ways, providing associations with access to land and their members with extension services.

Actor networks at different levels can be crucial to disseminating good practices and integrating UA into urban development policies. Both cities dispose of a wide range of networks, each with its specific characteristics.

Whereas networks in Maputo are more formalised, those in Cape Town tend to be informal. Generally speaking, Maputo networks do not focus solely on UA but include topics such as agro-ecology, resource governance, and food and nutrition security or sovereignty. Hence, UA lobbying has so far taken place in conjunction with lobbying for other issues.

Several Cape Town networks focus on UA. Actor integration, however, seems to be quite difficult. This is partly due to the strong dominance of NGOs in the sector and their simultaneous search for funds and resulting competition for limited resources. Another aspect is the absence of state actors on all platforms and networks, thereby frustrating the effective search for solutions in the UA sector.

More research institutions focus on various aspects of urban agriculture in Cape Town than in Maputo. Research in Cape Town is also more directly linked to the UA sector – student researchers often apply for internships or research permits with different NGOs to get a picture of the field reality.

<b>Table 21: Characteristics of organisational structures and networks in Maputo and Cape Town</b>	
<b>History</b>	
In both cities historical developments have had a decisive influence on UA. The conditions under which urban agriculture developed still characterise the sector and its actors today.	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>▪ In colonial times urban agriculture was practised on land in the <i>zonas verdes</i>, the green zones of Maputo.</li> <li>▪ Mozambique's Independence led to an exodus of the Portuguese and a breakdown of agricultural production close to Maputo.</li> <li>▪ The civil war following Independence and the economic crisis as a result of the country's political isolation crippled the food supply of urban populations. The entire food system collapsed.</li> <li>▪ The government fostered food production by Mozambican farmers in the green zones and established a system of input provision, extension services and distribution. The right to food and food sovereignty became key political values.</li> <li>▪ A variety of urban agricultural forms evolved, including cooperatives and individual farmer production.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The apartheid system segregated Cape Town into economically and socially prosperous 'white' areas and townships where the 'Black' South Africans lived in precarious economic circumstances and were socially and politically isolated. Cape Town's apartheid spatial planning ensured up to 1994 that no urban agriculture was practised in the public spaces of 'white' areas. 'Black' South Africans could engage in UA on land available in the peri-urban zone.</li> <li>▪ After the fall of apartheid in 1994, its spatial planning collapsed, and the city grew as a result of massive rural-urban migration.</li> <li>▪ Post-apartheid governments had conflicting visions of urban development and no clear strategy on how to deal with urban agriculture. The state tolerated urban agricultural activities in the sector but did not foster them.</li> <li>▪ Urban agriculture was primarily championed by civil society, local organisations &amp; NGOs.</li> </ul>
<b>Current structure of urban agriculture</b>	
In both cities there are diverse UA forms and actors, as well as formal and informal structures. Each city has its own dominant form of UA.	
<b>Maputo</b>	<b>Cape Town</b>
<p>Formal and informal structures, formal structures dominate.</p> <ul style="list-style-type: none"> <li>▪ Home gardens</li> <li>▪ Associations</li> <li>▪ Cooperatives</li> <li>▪ Institutions with UA, e.g., schools, churches</li> <li>▪ Individual farmers</li> <li>▪ Over 11 200 members (CMM; João, 2018) are organised in associations; the latter is the dominant form of UA. Associations receive land titles from the state</li> </ul>	<p>Formal and informal structures, informal structures dominate.</p> <ul style="list-style-type: none"> <li>▪ Home gardens</li> <li>▪ Food gardens</li> <li>▪ Individual farmers</li> <li>▪ Community gardens/Training centers</li> <li>▪ Urban farms</li> <li>▪ Commercial farms (PHA)</li> <li>▪ Institutions with UA, e.g., schools, churches</li> <li>▪ The dominant forms are food and individual gardens. Access to land is a challenge, with many urban farmers leasing land, e.g., from schools, churches</li> </ul>

<b>Socio-economic characteristics of UA: gender and age</b>	
<ul style="list-style-type: none"> <li>▪ In both cities UA is primarily an activity carried out by women and the elderly. Men enter the sector only in times of economic crisis. Most urban farmers are over 45 years of age.</li> <li>▪ Incentives to increase youth involvement exist, so far with only limited success: it is not considered financially rewarding. Neither is it 'hip' or 'urban'</li> </ul>	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>▪ The process of economic liberalisation and the upheavals provoked by the structural adjustment programme saw more men entering the sector.</li> <li>▪ The elderly dominate the membership structure of the associations, which are faced with a growing difficulty to recruit young people.</li> <li>▪ Special public programmes promote youth integration into the sector. The establishment of PITTA and youth associations are key initiatives to promote youth involvement.</li> </ul>	<ul style="list-style-type: none"> <li>▪ UA is either conducted by resource-poor inhabitants of townships in the Cape Flats on communal or rented land as a marginal economic activity – or by affluent 'white' farmers with large holdings in the Philippi Horticultural Area</li> <li>▪ The provincial government encourages youth leadership in UA projects. NGOs also support UA youth projects.</li> </ul>
<b>Access to land</b>	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>▪ Access to land for urban agriculture is comparatively easy in Maputo due to the overall land rights: Land is owned by the state and associations can access land for UA. Legally formalising the land title (DUAT), however, is a lengthy process.</li> </ul>	<ul style="list-style-type: none"> <li>▪ There is mixed ownership of land (private and state land)</li> <li>▪ Land is largely privatised, creating access challenges</li> <li>▪ Public land can be requested from the local municipality/councillor. Obtaining the land-use right is a lengthy process and the land title itself is not secure.</li> </ul>
<b>State policy and public services</b>	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>▪ There is no urban agriculture policy, but the state promotes UA with certain measures: the public extension service provides technical support for association members, public services support associations in acquiring land titles etc.</li> <li>▪ Different institutions intervene in the sector at different levels.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The City of Cape Town passed an urban land policy in 2007, which was revised in 2019. Implementation was weak, however, and the city's UA unit was closed down.</li> </ul>
<b>Involvement of state actors in UA and UA networks</b>	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>▪ Strong involvement of state actors in UA</li> </ul>	<ul style="list-style-type: none"> <li>▪ No involvement of state actors in UA networks</li> </ul>
<b>Support by (local) NGOs and networks</b>	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>▪ Poor involvement of NGOs in UA</li> <li>▪ Limited networking between NGOs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Broad involvement of NGOs in UA</li> <li>▪ Poor dialogue between NGOs as a result of rivalry (competition for financial resources)</li> </ul>

<ul style="list-style-type: none"> <li>AGIR: objective is to reduce the competition between NGOs in search of funds and to act as an intermediary between funding agencies and NGOs/civil society organisations</li> </ul>	<ul style="list-style-type: none"> <li>Limited representation of farmers in NGO structures (e.g., board membership)</li> </ul>
<b>Types of networks at different levels</b>	
<ul style="list-style-type: none"> <li>Both cities have a wide range of networks intervening or acting in the UA sphere. These networks act on different levels, from the local to the international.</li> </ul>	
<b>Maputo</b>	<b>Cape Town</b>
<p>The city has numerous formal networks. Most of them are not focused on UA as such but related in the wider sense, e.g., food and nutrition security, food sovereignty, ecology.</p> <p>Networks at the local (municipal) level of Maputo:</p> <ul style="list-style-type: none"> <li>Farmers associations and their representative structures</li> <li>Union of agricultural associations: Maputo association networks depend on the farmers union where they are part.</li> <li>Formal national level (Mozambique):</li> <li>CONSAN – National Council of Food and Nutrition Security</li> <li>ROSA (Food Sovereignty)</li> <li>Hopen (gender-related issues)</li> <li>Joint (environment, advocacy)</li> <li>FOSCAM (environment, advocacy)</li> <li>AGIR (platform, natural resources and agriculture, intermediary between civil society and financing organisations)</li> <li>UNAC (national farmers union) (→ linked internationally to La Via Campesina)</li> <li>Regional level (Southern Africa):</li> <li>CONSADC International (connected to a variety of other networks)</li> <li>AFSUN, ACC –Academic Research Network</li> </ul> <p>Informal networks: The informal network of researchers, farmers union, NGOs and the Municipality of Maputo in the context of agro-ecology works despite its informal character</p>	<p>The city has a great many informal networks. These focus on different aspects of UA, e.g., production and marketing.</p> <p>Networks at local and national level are in fact NGO networks or facilitated by NGOs.</p> <p>Networks at local level:</p> <ul style="list-style-type: none"> <li>Harvest of Hope – WhatsApp Chat</li> <li>Abalimi field staff</li> <li>Umsenge farmer groups (produce for farmer platform)</li> <li>Farmer platform (includes farmers, markets and buyers)</li> <li>Philippi Hub (platform)</li> <li>Vegetable quality (WhatsApp group)</li> <li>Urban research farmers (WhatsApp group)</li> </ul> <p>Regional level (other provinces in South Africa):</p> <ul style="list-style-type: none"> <li>Philippi Horticultural Area Campaign</li> </ul> <p>International level:</p> <ul style="list-style-type: none"> <li>AFSUN, ACC – Academic Research Network</li> </ul>
<b>Researchers in UA networks</b>	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>Few researchers involved in UA networks</li> </ul>	<ul style="list-style-type: none"> <li>Several research institutions focus on different aspects of urban agriculture</li> <li>Research is more directly linked to the UA sector (e.g., students in different NGOs)</li> </ul>
<p>Source: UFISAMO</p>	

## 6.2.2 Challenges, good practices and recommendations for organisational structures in urban agriculture in Maputo

*Luisa Chicamisse-Mutisse, Ivo Cumbana, Erik Engel, Karin Fiege & Anja Kühn*

The summarised challenges, good practices and recommendations for organisational structures in UA in Maputo refer to associations, home gardeners and networks.

### 6.2.2.1 Associations

In response to the challenges and good practices related to the organisational structure of UA in Maputo (see Chapter 3.6), interviews and focus group discussions suggest recommendations in the following fields:

- a) Size and composition of associations;
- b) Legal framework and internal regulations of associations;
- c) Roles, functions and responsibilities of leaders and members of associations;
- d) Autonomy of producers versus association as a corporate entity;
- e) Production and marketing;
- f) Infrastructure;
- g) Thefts;
- h) Supportive framework and institutional links.

#### a) Size and composition of associations

Although the Maputo associations are an example of a successful organisational set-up for urban agriculture, numerous aspects of their viability could be improved.

#### Challenge: Size of associations not functional

Many of the associations have a large membership, the biggest with more than 1 000 members. This complicates communication and management, particularly against the background of little or no infrastructure, means of communication etc.

#### Good practice: Resizing big associations

In order to facilitate the functioning of the associations and minimize the disadvantages of a large membership, CMM and DASACM have sensitised associations to resizing. Associates spoke of their attempt to minimise the adverse effects of size by introducing production blocks that divide the association into several parcels. The head of each block is responsible for its operation and the flow of information to the different levels.

## Recommendations

### Associations, CMM

- Resize associations to facilitate integration of members. It makes associations more dynamic and promotes active membership that will comply with established norms and regulations;
- *In order to raise support and ownership for the resizing process:* Initiate a participatory discussion on resizing, taking into account the numerous challenges that this entails, and carefully weigh up advantages and disadvantages, as well as possible complications. Some members have land in different association zones, larger associations have the advantage of being able to pay the membership fee for the union, a number of associations have acquired projects and received infrastructure, land use is not always transparent etc.

### Challenge: Aging of association members

Many of the associations have a high proportion of relatively old members. This impacts on their work force, their innovation potential, their internal social dynamic, and in general on their future existence. The future of urban agriculture in Maputo greatly depends on the ability of associations to attract younger people as members.

Although some young association farmers own *machambas*, young people mainly work as paid labourers (non-members). For them – as for other young people – land access is not easy. The association is granted the land title (DUAT) but it is the members who labour the land, notably the founders of the association, who in turn inherit user rights or divide up the land within the family. They decide on land distribution, usually through inheritance. De facto, all young farmers who are association members, belong to the founding families of the association.

### Good practice: Strengthen youth in the associations

Young emerging farmers should be given particular attention since they embody the future of the associations. Everything they learn now will most likely characterise the next decades of urban agriculture. The setting up of youth groups in KaMavota and KaMubukwana shows that the actors involved are aware of the issue and are not only intent on enhancing their technological knowledge but also on giving more weight to the position of young farmers within the organisational structures.

## Recommendations

### Associations

- Make UA more productive and competitive, both to avoid migration to other sectors and to attract more practitioners, especially young people: training, organic production and certification, new cultures and technologies;

- Mobilise young people to engage in production in order to reverse/balance the existing pyramid that consists mostly of active adults/seniors;
- Invest in public relations, communicate the 'unique selling point' of Maputo's green zones (social media);
- Attract younger farmers with the diverse advantages for associated members: discounts for buying inputs for agricultural production or breeding animals, privileged access to subsidised credit from various public funds, e.g., Agricultural Development Fund (*Fundo de Desenvolvimento agrário*) and others, benefit of importing inputs;
- Make agriculture more appealing by including farmers in the INSS system (social security);
- Support the government's Integrated Programme for Technology Transfer (PITTA) to include more youth (young farmers and extension officers);
- Identify unused land and discuss within the associations ways of transferring plots to new members;
- Create communication platforms for young farmers to report on their positive experiences;
- Identify young association farmers and encourage them to disseminate their experience
- Strengthen support programmes for young producers in terms of equipment, input, etc. (special credits for start-ups, training in business start/investment planning can be conducted by UEM (specialists in FAO Rural Invest Courses);
- Involve young people in small agro-business projects in the urban area (compost-making, seedlings, nursery, biopesticides, transport);
- Admission of new, preferably young, members to associations with a small membership in order to ensure full occupation of plots;
- Ensure participation of youth in governing structures of associations;
- Create mechanisms to manage generation conflicts, e.g., bring old and young producers together to resolve current disputes.

#### Challenge: Non-membership of agricultural workers

An important part of the daily work in association fields is performed by hired labourers. Most of these workers are not associates but take part in the work on the CDR and in knowledge transfer on behalf of their employer. At the same time, they have no decision-making powers regarding the application of certain techniques and are sometimes uninformed about the pesticides or fertilisers they apply, which makes working with them difficult.

#### **Recommendations**

##### Associations

- Integrate farm labourers into training courses;
- Discuss ways of integrating farm labourers as association members with special status;
- Define rules and instruments to clarify the relationship between wage labourers and farmers;

- Identify plots where (interested) farm labourers can become farmers;
- Create a database on the wage labour group and their working conditions.

## b) Legal framework and internal regulations of associations

### Challenge: Legal situation

Not all associations have a certificate of registration recognised by the Ministry of Justice and Ministry of the Interior.

### **Recommendations**

#### Associations

- Promote the legalisation of associations (recognition by justice entities)
  - Identify and present successful examples of legalised associations;
  - Exchange experience with legalised associations;
  - Disseminate the requirements for legalisation;
  - Disseminate among the members the advantages/benefits of legalisation (e.g., access to bank credit, agro-business).

### Challenge: Access to land

In some cases, land 'ownership' (user rights) by association members creates problems: land is not used, land is transferred to others, young people find it difficult to acquire land.

### **Recommendations**

#### Associations

- Return land to the association in cases of partial or total non-use;
- Devise an internal strategy to regulate the use/rent and transfer of land;
- Promote land access for young people;
- Discourage the speculation with association land (members selling land for construction).

### Challenge: Absence of regulations

Associations have a standard statute, but details differ according to the individual situation of the given association. The statute was elaborated with the support of CMM. Generally, members have no access to the document details as they were not involved in the process of elaboration and approval. There are no written management regulations for the different sectors and association activities apart from this statute. Some associations made efforts to define regulations for their internal functioning, e.g., Terms of Reference for sectors (production, drainage, blocks,



social affairs and others), land transfer, and the sale of inputs and pesticides. One of the most advanced associations in this context is '10 de Novembro'.

### Recommendations

#### Associations

- Involve members in the drafting of rules of procedure in the light of existing statutes;
- Develop standard regulations for discussion at union and association level;
- Convene a general meeting to define aspects to be considered in the rules of procedure;
- Discuss the regulations and create guidelines for each association (regulations should take into account the challenges and concerns experienced in the day to day life of the associations);
- Discuss standardised regulations for pesticide application, owner-wage labour relationship;
- Make decisions by consensus to satisfy members involved.

#### Challenge: Accountability and transparency

The obligation of accountability and transparency in the work of organs (union and associations) is not observed by social organs.

### Recommendations

#### Associations

- Subject the social organs of the union and the associations to the obligation of accountability and transparency in exercising their functions
  - Preparation and fulfilment of work plan by sector;
  - Accountability of all sectors at the general meeting;
  - Display a statement to management and members showing proof of expenses incurred and contributions from members or other support received;
  - Strengthen the autonomy and supervisory role of the Fiscal Council vis-à-vis the board: the president of the association is not head of the Fiscal Council;
  - Provide regular accounts (presentation of bank balance);
  - Heads of corporate bodies, notably the treasurer, must be qualified for the position held (ability to register and manage association accounts);
  - Report illegal and non-compliant members (who have failed to pay their dues);
  - Install transparency in the management of association assets;
  - Inform members of assets received;
  - Define rules of use and loans where applicable;
  - Apply penalties in cases of destruction or misuse of goods.

### Challenge: Internal communication in associations

There are signs of internal communication deficits. Late entry of invitations (short notice) frustrates internal communication, there are no funds for communication, and some producers withhold information.

### Good practice: Farmers meetings and farmer to farmer exchange

The occurrence of regular meetings and trainings at association demonstration plots fosters information and knowledge exchange, as well as frequent, mostly face to face, communication between farmers. The principal source of information for new cultivation methods are other association members and extension officers. Presidents confirm in in-depth interviews that individual and spoken extension is one of the most promising dissemination tools.

### **Recommendations**

#### Associations

- Improve the communication system within the association
  - Hold planning meetings (by sector: block, social affairs etc.);
  - Forward conclusions of sectoral meetings to the management meeting and then send them to the general assembly for discussion and approval;
  - Identify personal contact and dissemination of information;
  - Create a contact list (database);
  - Define a budget for communication and specify the receivers,
  - Designate part of the amount collected from the fees for communication expenses.

### Challenge: Documentation system

The documentation system is weak. The institutional memory of the association must therefore depend on a limited number of members.

### **Recommendations**

#### Associations

- Create a physical database and systematic membership register containing personal information (name, age, gender, year of affiliation in the association, etc.), the plot occupied and the type of involvement in production, i.e., household producer or contracted worker), and any other relevant information;
- Create an archive of all documents pertaining to the association;
- Archive the minutes of meetings and activity reports. These are not usually available and, if so, are in the possession of the president or the secretary to the exclusion of others;
- Prepare an organisation chart of the associations with a clear description of the hierarchical levels and responsibilities involved.

### c) Roles and functions in the association

#### Challenge: Unclear roles and responsibilities of leaders and members

Leader roles are often vague; leaders tend to act as chiefs rather than representatives of the members. Members are not always committed; the sense of belonging to an association is lacking. Founding members rarely follow the rules, e.g., they are frequently absent from collective activities. How these issues should be handled was assessed differently in the discussion, with some voting for heavier penalties (or consistent application of the rules), while others preferred the idea of more incentives (e.g., *xitique* groups and mutual aid), exchange of experience.

#### Recommendations

##### Associations

- Support transparent leadership
  - Make management transparent in all its aspects, including management of funds;
  - Greater readiness of the leadership (at both association and union level) to present monthly and annual expense accounts;
  - Open bank accounts to deposit membership fees and donations made to the association;
  - Agree on rules and procedures at general meetings;
  - Clarify, separate and decentralise the competencies of each association sector (avoid intrusion);
  - Make meetings participatory (participatory/inclusive leadership);
  - Clarify the desired association leadership; leader profiles;
  - Clarity on the eligibility criteria.
- Improve member commitment
  - Implement rigorous administrative measures against members who fail to comply with the statutes;
  - Disseminate the benefits of associative movements (with concrete examples);
  - Raise awareness among producers on pro-active search for information;
  - Increase supervision of activities at all levels (union-association-block);
  - Introduce presence list to activities;
  - Introduce severe penalties and process regulations to ensure compliance with standards;
  - Create incentives to involve members (e.g., *xitique*, saving groups);
  - Discuss in the associations how to work on self-esteem and foster a more committed mindset in the members, and to increase the sense of belonging to an association (explain the benefits of associations and common marketing as a link between producers).
- Improve knowledge on the regulations governing the operation of associations
  - Hold lectures in associations;
  - Introduce reading of relevant documents;
  - Discuss the orientation script of the different sectors prepared by the union.

#### CMM and NGOs

- Provide training to heads of association sectors (head of production, sales, drainage, social affairs) so that these are enabled to better fulfil their functions
  - Heads of production need to be innovation brokers of improved production techniques (e.g., urbanGAPs, agro-ecological methods) and proper pesticide application;
  - Heads of sales should be equipped with or elaborate a functioning price information system and a monitoring system to ensure that farmers and intermediaries abide by the agreed prices for specific products. Since vegetables in the canteiros may be of different quality, price categories for quality A, B and C could be introduced;
  - Heads of drainage need to be innovation brokers of enhanced water management and community mobilisation to ensure joint labour on common interest infrastructure (irrigation and drainage system);
  - Heads of social affairs need to be strengthened on youth mobilisation, conflict resolution and good nutrition practices.

#### **d) Producer autonomy versus the association as corporate entity**

##### Challenge: Producer autonomy versus common objectives and rules of associations

One of the key reasons for the involvement of farmers in associations is land access. As cooperative structures, however, associations have objectives that potentially conflict with individual interests. The two approaches may not always be compatible (collective work, production standards etc.).

#### **Recommendations**

##### Associations

- Discuss existing or potential conflicts at association workshops but also in the union and try to define the space in which associations and farmers act. Leading question: What associative movement do we want?;
- Create ethics and disciplinary councils in the associations;
- Internal regulations should provide for aspects related to the boundaries between producer autonomy and the association;
- Existing corporate bodies should enforce statutes and regulations.

#### **e) Production and Marketing**

##### Challenge: Production and marketing issues

The economic success of farmers is thwarted by numerous production and marketing difficulties, e.g., the non-use of space belonging to the associations or the non-identification of new market niches.

## Recommendations

### Associations

- Use all lands belonging to the association, including land unoccupied as a result of soil salinity or inactivity of the owners. These spaces are a breeding ground for pests, insects (e.g., mosquitoes) and snakes in the fields and could instead be used to experiment with other cultivation practices (containers, horizontal planting) and/or allocated to other members; buy fertile soils from other fields to improve unproductive land (as done by the association '*Sombra de enxadas*');
- Associations should improve marketing and market access to give advantages to local products;
- Strengthen liaison between associations and traders/markets;
- Raise farmer awareness of producer identification cards/member cards and highlight the multiple advantages (e.g., seed price discount);
- Access to banks;
- Associations could produce for orphanages and other social institutions through concessions from both parties (follow the example of Brazil);
- Involve other actors in the horticultural value chain (to facilitate bilateral agreements between the parties, e.g., access to credit).

### Academia

- Fill research gaps linked to marketing opportunities, e.g.:
  - Feasibility study on the transformation of the association to a co-op system aimed at supplying the new central market (Zimpeto 2.0);
  - Options for linking UA to social institutions (see above);
  - Options for improved exploitation of niche markets and promotion of sustainable UA production.

## f) Infrastructure

### Challenge: Infrastructure

Association infrastructure is deficient and/or not functional, e.g., irrigation systems or the absence of buildings for meetings etc.

### Recommendations

#### Associations, CMM

- Modernise irrigation systems, which would in turn help to economise on water, and take into account the reduction in rainfalls;
- Create greenhouses for protection against pests and cultivation out of time;
- Establish buildings for a variety of aims, such as meetings of association members, archives etc.;

- *Capoeiras* for the creation of broilers, for example, would help to diversify farmer incomes and produce chicken manure to fertilise the fields.

### g) Theft

#### Challenge: Theft

Countless associations have a problem with theft. The area is not protected, and non-members can enter the green zones unrestricted.

#### **Recommendations**

##### Associations, public services (e.g., security)

- Develop a strategy with other public sectors to guarantee public security;
- Introduce seal for associations;
- Reduce the circulation of third parties (neighbourhoods can be accessed currently through association terrain);

### h) Supportive framework and institutional links

#### Challenge: Institutional support could be reinforced

Although urban agriculture is not yet a development focus there is a formal framework and government structures support the functioning of associations. Support from other entities is fragile, given the poor engagement of NGOs, and bilateral and international organisations. Furthermore, links to academic research and institutions are weak.

#### Good practices: Supportive government framework

Various levels of government play a leading role in the development of UA in Maputo: this ensures access to land for agricultural production in the associations (DUAT), technical support via extension workers and *casas agrárias*, and follow-ups on UA processes by the responsible department of the municipal council (CMM). Further support, however, is recommended.

#### **Recommendations**

##### Government, CMM

##### Supportive government framework

- Draft an urban agriculture policy that integrates the social protection of the producer, with emphasis on the elderly;
- Greater sustainability of UA programmes and projects by securing access to public funds/donor funds;
- Communicate possible access to credit for producers with subsidised interest rates.

Good practice: Research and training links between the associations, the urban agriculture sector and the Eduardo Mondlane University

Establishing research and training links with the associations, the urban agriculture sector and the Eduardo Mondlane University was a major step in the context of the UFISAMO project. These should be intensified by identifying common research and training interests.

**Recommendations**

UEM, associations

Supportive UEM framework

- Associations and researchers from different faculties should identify research topics for action and decision-oriented research. This should be harmonised with the municipality/*casa agrária* and DASACM to avoid duplication;
- Researchers should identify research funds;
- Students absolve association internships in the different sectors and contribute to problem-solving: e.g., management, finance, monitoring systems, training, agro-ecological practices, marketing, conservation;
- Training/Extension: UEM should identify areas for short training courses in marketing, management, finance management, documentation systems, agro-ecological production, marketing and conservation.

Challenge: Absence of supportive framework from bilateral and international public organisations and NGOs

Urban agriculture is a key element when it comes to meeting the many challenges in Maputo (e.g., income, support for vulnerable urban populations, greening the city, climate change adaptation, social cohesion). That said, however, support from international public donors and international NGOs is poor.

**Recommendation**

CMM, NGOs, international donors, associations

Supportive framework of bilateral and international public organisations and NGOs

- CMM and associations should engage in defining programmes in cooperation with international donors such as FAO or NGOs that would enable the associations to respond to these challenges.

### 6.2.2.2 Home gardeners

Home gardens are an additional source of fresh fruit and vegetables and contribute to the nutritional diversity of the households concerned. In Maputo, many home gardeners (about 40%) also commercialise their surplus products.

#### Challenge: Lack of public support for home gardeners

Organisations working on urban agriculture, including government units and academia, have almost no knowledge of home garden distribution in Maputo or who the backyard gardeners are, what they sell and to whom. Home gardeners are currently not a public extension service priority and are less exposed to formal knowledge transfer. In order to increase the relevance of their activities, specific support activities should be put in place.

#### **Recommendations**

##### Government, Public extension service

- Nurseries: Encourage families to create a plant nursery whereby members of the family share the work of taking care of the plants. When the plants are ready, they can be replanted in their own home gardens;
- Nutrition knowledge: Improve knowledge on how to produce but also on how much and when to eat the food produced, particularly where children are concerned;
- Finance knowledge: Capacitate farmers in basic financing to understand how to administer money and invest some of it in seeds and other inputs. This can be extended to include a small business model based on home production;
- Social involvement: It is vital that the dynamics of producing and selling food under critical circumstances be analysed in the context of future projects. This would allow for more information on the household situation and, secondly, boost home gardening activities, which tend to remain invisible to or be disregarded by urban development actors.

#### Challenge: Lack of organisation among home gardeners

Exchange of information among home producers is rare. Even if they belong to an association, there seems to be little or no communication about home gardening activities or operations. Willingness to take the lead and create a formal platform is low.

#### **Recommendations**

##### CMM, DASACM

- More information on the characteristics of home gardeners is necessary;
- Fairs should be initiated to facilitate the exchange of information among home gardeners;
- Create support mechanisms for home gardeners in the agricultural extension service;
- Spread information on the advantages of home gardening for the food sovereignty of urban families.



### 6.2.3 Challenges, good practices and recommendations concerning networks/networking in Maputo

*Luisa Chicamisse-Mutisse, Ivo Cumbana, Erik Engel, Karin Fiege & Anja Kühn*

#### Challenge: Formal networks

The research results show that networks are still weak and frequently informal. They are horizontal in the same interest group, such as urban farmers, and vertical between the different groups at different levels, e.g., regular exchange between extension officers, farmer representatives and the policy level.

At the same time, there are informal network initiatives in the urban agricultural sector, e.g., the informal network between agro-ecological producers, ABIODES, ComOrganico and a number of individual consumers. Another initiative was set up within the frame of the UFISAMO project: an informal platform for public and private institutions and individuals working in the urban agricultural context (see Chapter 5.2.3). The platform aims to support the interaction and flow of information between all UA stakeholders in Maputo and will work on the basis of a memorandum of understanding.

#### **Recommendations**

Association, CMM, DAE, UEM, NGOs

- Strengthen formal networks
  - More formalisation of networks between research and the UA context, notably in agro-ecology;
  - Increase functionality of intersectoral networks, improve information flow in all directions (e.g., to farmers, to research institutions, in monitoring);
  - Identify sustainable ways of financing networks.

#### Challenge: Regional and international research bodies

Need to connect to regional and international research bodies, such as the African Food Security Urban Network (AFSUN), which has conducted in-depth research on UA in South Africa.

#### **Recommendation**

UEM

- Strengthen contact to regional and international research bodies.

#### Good practice: NGO coordination/platform

The presence of regulatory bodies such as AGIR, which creates an enabling environment for civil society operations, enhances the coordination of civil society activities in the City of Maputo and acts as an intermediary between funding agencies and NGOs/civil society organisations.

### **6.2.4 Challenges, good practices and recommendations for organisational structures in urban agriculture in Cape Town**

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Data collection and discussions helped to identify challenges and existing good practices pertaining to the organisational structure of urban agriculture in Cape Town. This chapter provides recommendations based on the analysis carried out by the researchers involved and discussions at the annual meeting of the UFISAMO team in December 2018. The recommendations were further consolidated and elaborated during workshops and discussions in Cape Town in March 2019. The following topics were discussed:

- The role of NGOs and the dilemma of dependencies;
- Farmer networks and farmer self-organisation;
- Multi-stakeholder and policy dialogues and farmer representation;
- Public support for UA;
- Linking research networks and urban farmers.

#### **a) The role of NGOs and the dilemma of dependencies**

#### Good practice and challenge: NGO as capacity builder and innovator; NGOs do, however, create dependencies

NGOs were instrumental in shaping urban agriculture activities in the township in the Cape Flats, as in the rest of Cape Town, particularly through resource access and capacity building. They were also crucial to capacitating urban farmers with the necessary skills to ensure their ability to cultivate under the unfavourable physical condition of the Cape Flats.

NGOs also attempt to improve the sustainability of urban agricultural activities in the community by training community members to head the organisation's projects. This ensures that skills remain in the community even when a project has finished. Training takes place in community gardens run by NGOs, which serve as agricultural hubs.

NGO interventions, however, have also created dependencies: on inputs, innovative knowledge, marketing (when the organisation promotes food gardens). Since NGOs function with project logic and external funding, they have to reach out to a specific number of people, show specific outcomes in a specific timeframe – and in a sense hold on to 'their' beneficiaries to justify further

funding. They have an incentive to bind farmers to their institutions and do so by offering certain benefits, e.g., marketing channels and income, additional training, seedling. As a form of recognition, they tend to adapt 'their' philosophy to coincide with (often international) donor agency priorities.

These structures discourage self-organisation and pro-active action, e.g., the search for markets, adapted information, like-minded people. Dependency can be comfortable and beneficial – as long as the support structure functions. The long-term functioning of NGOs along the given lines, however, cannot be guaranteed, bearing in mind the volatility of donor interest and the financial constraints of NGOs. If farming systems depend on the particular actions of external structures that could one day cease to function, urban farmers are in deep trouble.

## Recommendations

### NGOs

- Empower local community members and field staff and include 'people of colour' into the management board;
- Maintain capacity development role: Provide NGO trainers with regular additional trainings to broaden their knowledge (e.g., business planning, processing, composting, nutrition) and keep up to date with innovation in technical and methodological terms;
- Involve farmer representatives in the NGO decision-making structure (e.g., board) to ensure that the farmers' voices are heard.

### NGO, donors

- Create a common fund to which organisations can apply for project funding. The fund should receive contributions from various institutions/countries; a board should approve/reject proposals. Decisions should not be based primarily on short-term 'development trends' (e.g., climate adaptation, gender empowerment) but correspond to a set of criteria that allows for medium- and long-term planning and financing;
- Promote empowerment of urban farmers by encouraging self-organised links to secondary actors (e.g., restaurants, merchants) and networking (e.g., with policy level, other farmers);
- Provide training in entrepreneurial skills and organisational development to encourage self-organisation and independent economic action by farmers/farmer groups .

*Note: Since self-organisation cannot be promoted or kick-started externally, supporting actors can only provide expertise in good practices (e.g., organisational development, business partnerships) and then withdraw.*

### Farmers

- Get organised. Seek the support of those who have successfully joined up with other people; (*note: the following list is incomplete and merely serves to trigger ideas. External actors can only support self-organisation if people have expressed a willingness to self-organise*).

- Use the platform of the farmer forum to approach policy makers, NGO boards or input providers with a common voice;
- Use the experiences of other cities, e.g., Johannesburg or Maputo. Keep the different contexts and framework conditions in mind;
- Search for common objectives (e.g., marketing, knowledge exchange, social benefits, pooling of resources);
- Start locally (know/trust your fellow partners, be transparent), this requires keeping up the discussion on trust and cooperation;
- Avoid starting too big: be realistic in your plans rather than frustrated by the difficulties inherent to too ambitious ideas;
- Keep financial needs small (e.g., transport costs for meetings), use cheap alternatives where possible (e.g., WhatsApp groups for information exchange);  
Generating money locally to finance networking can be challenging. Some farmers, however, have greater resources, such as money or a car. They could be persuaded to spearhead networking and help those who have less at their disposal (solidarity principle);
- In the medium and long term, networks will need to discuss how to cover internal services and share expenses;
- Ideally, networks generate benefits that balance or justify the expense, i.e., financial benefits (marketing) or social benefits (friendships, social capital); at the end of the day, actors need to experience their group/network advantages, since keeping groups/networks alive requires time, effort and resourcefulness.

## **b) Farmer networks and farmer self-organisation**

Good practice: Farmer to farmer exchange/networking

Good practice and challenge: NGOs promote peer exchange but lack the efficiency and durability of informal urban farmer networks

With their trainings, resource centres and meetings/workshops, NGOs offer platforms to improve information exchange, while simultaneously enhancing the social fabric of the urban farmer landscape. As a result, loose, informal urban farmer networks have sprouted up, temporarily enabling them to share knowledge and resources despite the absence of NGOs.

Most food garden farmers work in groups and cultivate a shared space. Although the gardens are divided into individual plots, this common ground permits farmer to farmer communication and exchange and is potentially a basis for cooperation. Hindering factors for farmer to farmer exchange are mistrust, jealousy and interpersonal conflict, as well as the hierarchies and inflexible barriers in the South African social context related to gender, religion, origin, ethnicity or status. At the same time, the benefits observed and pointed out by farmers show that mutual learning generates fresh information, not least in the course of exchanges with other farmers.

Based on a study conducted in Mitchells Plain, farmer networks have proved weak and are inhibited by time constraints, distances within the communities, and lack of transport resources.

These obstacles are occasionally aggravated by farmer disputes, some of which derive from segregation policies that systematically accrued cleavages between the communities. The result is a heavy reliance on NGOs. Hence there is room for improvement to the efficiency of informal urban farmer networks:

There is a strong potential for the emergence of urban farmer organisations, with existing food/community gardens providing a solid basis for the formation of producer groups, which would then feed into the higher-level associations.

## Recommendations

### Farmers

- Farmer self-organisation at municipal/ward level (see above) could trigger the creation of a more formal network from community level upwards to a 'farmers union' that would represent the various farming communities. This would help to position urban farmers as a stronger lobby group at the political level and in multi-stakeholder dialogues. It would also help to access resources and funds (e.g., public funds, credits, NGO support);
- An organisation of this kind must be open to all types of urban farmers, including home gardeners. Home gardeners (with limited networks) will be able to access these networks and boost their ability to access resources from other farmers or NGOs. More importantly, they can then share their challenges and experience with other farmers from other parts of the city;
- Transparency and the flow of information from one level to another must be ensured; this is the responsibility of the delegates/representatives at each level and adherents must demand it;
- Farmer self-organisation must come from within: financial benefits to the group is usually a driving force;
- Farmer self-organisation needs strong personalities to push the process through and mechanisms to function independently of the 'founding fathers and mothers';
- A farmer self-organisation/union needs support to professionalise its internal functioning and ensure that it is run according to principles laid down by the members.

### NGOs, DoA, supporting actors

- Support the setting up and professionalisation of the farmer organisation in terms of legal procedures, internal regulations, democratic representation and governance, accountability, etc.

## c) Multi-stakeholder and policy dialogues and farmers representation

Challenge: Limited interaction of supporting actors

Good practice and challenge: Absence of multi-stakeholder dialogues as discussion platform

Challenge: Farmer representation and empowerment

The ubiquity of supporting actors (NGOs and provincial DoA) within the urban agricultural sector in Cape Town does not necessarily translate into achievement of the desired gains, since interaction and dialogue between the actors involved is limited.

Poor dialogue between the various NGOs as a result of competition for funding, individual agendas and time constraints has led to actors conducting activities independently and thus missing out on larger impacts, as research results in Mitchells Plain show (see Chapter 4.6).

Multi-stakeholder dialogues involving policy-makers, supporting institutions, civil society representatives (e.g., NGOs) and academia take place sporadically. They serve as a discussion platform to exchange views, resolve problems and agree on the way forward but are often perceived as inconclusive with few positive results on the ground. A new urban agricultural policy is currently (July 2019) in its infant stages. To this end, UFISAMO and the urban research farmer group organised a policy dialogue, a meeting that served as a platform for UFISAMO to present results, a briefing paper and the recommendations of this report. Farmers shared their needs and wishes and introduced the spokespersons of the Cape Town urban farmer forum set to continue the dialogue. City representatives have confirmed that a new urban agricultural policy will be written.

Furthermore, farmer concerns are usually represented by intermediaries (e.g., NGOs working with farmers) rather than by the farmers themselves. Due to this strong dependency on NGOs, urban farmers have weak linkages to secondary actors and are unable to access additional resources. Representation on dialogue platforms would open doors to other actors and underpin farmer networks. Dialogue forums on UA would have the knock-on effect of improving the organisation of urban farmers from the grassroots level, since they have a considerable interest in representation there.

In theory, these platforms ensure that urban farmers, the government, civil society and the private sector can hold discussions and generate solutions acceptable to each party involved. Multi-stakeholder dialogues are much appreciated when they take place. Here, too, there is room for improvement. Regular stakeholder dialogue and cooperation is vital to ensuring that supporting actors are in a position to reinforce partnerships and to enhancing the impact of urban agricultural initiatives. As the main actors in UA, farmers need strong representation.

## Recommendations

### Policy-makers, supporting actors

- Multi-stakeholder dialogues should have a clear objective and be designed to result in concrete action, since they would otherwise be seen as a 'waste of time'. The level of participation (provincial, municipal, etc.) should correspond to the set objectives;
- Multi-stakeholder dialogues should be conducted regularly and give the urban agricultural stakeholders concerned a platform to discuss issues that affect them;
- Farmers should be represented (see above for farmer representatives);
- According to the farmers (in March 2019), land access, land tenure security, water and water-wise agriculture should be high on the agenda;
- Participants should agree on the agenda for the coming meetings.

Farmers

- Farmer representation at these forums is paramount in order to ensure their active involvement in discussions that affect their livelihoods. Furthermore, it enables them to communicate their challenges and offer plausible solutions (see above for farmer self-organisation);
- Farmers should speak through a committee, which should be elected regularly. An interim committee will set up structures for an election process.

**d) Public support**Good practice: Support from DoA and the Cape Town municipalitiesChallenge: Insufficient and inconsistent support and unclear responsibilities

The provincial DoA supports food gardens with resources such as perimeter fencing, borehole installations and basic farm tools. The involvement of the DoA is particularly crucial given that many NGOs do not support food garden farms. Municipal support is also available – albeit CoCT responsibility ends once the premises are on private land: gardens on school or hospital premises only receive support from DoA.

Some farmers appreciate this limited support (no support = no dependencies), while others argue that emerging farmers in urban areas should receive the same amount of support as emerging and commercial farmers in the countryside. If support is provided, so the consensus, it should be 'holistic', i.e., it should not be confined to the provision of inputs – farmers need a market, they need skills and they need cold storage, to name but a few essentials. Government should be committed, not just on paper or during election campaigns, and local councillors should be more informed about what goes on in their community and made accountable for their (in)action.

**Recommendations**Supporting actors, NGOs

- Support/train farmers in how to access political decision-makers and political programmes;
- Provide farmers with good quality and, if accessible, organic inputs (farmers claim they often receive infested seedlings, glyphosate or GMO seeds);
- Access to infrastructure (fencing, irrigation, shade house) should be simplified;
- Follow-up visits by the extension service should be regular (farmers have also requested that the DoA send more qualified and knowledgeable extension workers).

Farmers

- Use local representatives to make your voice heard at higher administrative levels;
- Select people from your group who are capable of lobbying, approaching (local) politicians and demanding that promises be kept.

### e) Linking research networks and urban farmers

Good practice: Existing links between urban agriculture and universities

Challenge: Cooperation with/feedback from research networks

Challenge: Comparative research between cities

Research has a say in policy-making (e.g., multi-stakeholder dialogues, consultancy committees) and the potential to act as intermediary between politics and farmers. Significant linkages to academic research bodies exist in Cape Town (e.g., African Centre for Cities at UCT and Centre for Excellence at UWC). High quality research on urban agriculture has taken place over the years. Many NGOs take on researchers as interns, all of whom carry out their study projects and benefit from field experience.

Farmers complain that researchers tend to remain in their academic realm, with little feedback reaching the 'researched'. Research topics correspond to academic curricula needs rather than farmer information needs. This has led to research fatigue among farmers and the supporting agencies.

Other cities in South Africa also have experience in urban agriculture. More comparative analysis and networking between farmers from different locations could promote mutual learning.

### Recommendations

#### Researchers

- Communicate the purpose of the research at the outset and adapt it (where possible) to the needs/ideas of the 'researched'. Research should provide knowledge and arguments (for the 'researched') to make informed decisions;
- Universities and students should align their research topics with the farmers and/or farmer representations (see above). Topics could range from agriculture, organisation, health and nutrition, and economic and legal themes, and be covered by internships, study projects, and/or theses;
- Feedback to farmers and discussions on research results are a 'must';
- Researchers should compile information of interest to farmers (useful products, e.g., manuals);
- Comparative study on Johannesburg/urban research farmer group and/or other UA associations/cooperatives in Cape Town to understand the hindering factors for Western Cape farmers compared to more entrepreneurial Gauteng farmer networks;
- Support farmers' perspective based on research evidence in policy dialogues (example: a policy brief is being published by UFISAMO based on participatory research in an attempt to reflect the position and concerns of farmers; farmers as the main protagonists of the research participated in a presentation of the research results to policy-makers);
- Research should provide access points to further knowledge for those interested, e.g., names, webpages, phone numbers, so as to avoid a one-way flow of information.



Challenge: Research tends to focus on the same research areas

Researchers have, over the years, done great and comprehensive work on urban agriculture in Cape Town. There is however a tendency to work along established entry points and to focus on 'extreme' neighbourhoods (including UFISAMO research). In consequence, blank spots/under-researched areas remain, while the others experience research fatigue.

**Recommendation**Researchers

- Specify on unseen areas in the city like suburbs, middle-class, 'coloured' community, rural-urban linkages, livestock farming communities – most research conducted (including UFISAMO research) was done in Langa and Khayelitsha.

Challenge: The researcher perspective is privileged

Much of the research on UA is masterminded/designed and conducted by privileged segments of the population – including the research conducted by UFISAMO. Researchers are usually people with privileged access to higher education. In addition, research on UA is mostly conducted by 'white' people who are more or less familiar with the South African context and more or less sensitised to questions of race, gender, power relations and structural racism (here, too, UFISAMO is no exception). Gathering relevant information calls for building trust and shifting perspectives.

**Recommendation**Researchers

- Consider 'whiteness', culture, policies – small-scale urban farmers need a safe space, which is difficult to grant and takes time to develop. Honesty and transparency are crucial, as is the timely sharing and discussing of results.

## 6.3 Production and marketing in Maputo and Cape Town

*UFISAMO Team*

This chapter summarises the characteristics of urban horticultural/agricultural production in both cities and for different actor groups, and presents recommendations. In Cape Town farmers should be encouraged and enabled to become more independent of NGO support. For this purpose, it is crucial that food garden farmers gain access to diverse markets. In Maputo, a long-term approach to reshaping urban agricultural production seems advisable: existing production practices lead to extreme pest pressure, while the corresponding use of pesticides is unsustainable and poses a threat to consumer health.

### 6.3.1 Vegetable production and marketing in Maputo and Cape Town

Although climate conditions in Maputo and Cape Town differ due to their location, the impact of climate change and extreme weather events on production is rapidly increasing, with heavy rain-falls and floods, on the one hand (Maputo), and extreme droughts, on the other (both cities).

The risks and benefits of vegetable and fruit production in the urban context are similar in both cities. Urban agriculture must consider the risk of contamination from industrial or human settlements, for example, as well as theft and vandalism.

Both cities use a variety of production systems ranging from home/backyard production, small-scale farming systems to commercial farms. The level of farmer organisation differs greatly: most farmers in Maputo are organised in associations but work individually, while farmers in Cape Town work individually or create informal groups in food gardens. One huge difference lies in the variety of crops grown. Whereas Cape Town produces a wide range of vegetables and fruits, Maputo is characterised by low crop diversity, with the principal focus on crops such as cabbage and lettuce for a quick turnover.

The availability of and the access to inputs for vegetable production are key factors in both cities. Input costs are rising steadily and push up production costs, so that many inputs are barely affordable for farmers with no external support. Secured and sufficient farmland for production is a major issue against the backdrop of pressure from growing urbanisation and the transformation of agricultural land to housing developments. Access to affordable quality seeds is another huge challenge for farmers; seed expenditures are their largest input cost.

Looking at production methods and challenges in Maputo and Cape Town reveals a number of similarities: there is little or no record-keeping or production planning in line with market demands, self-production of seedlings is widespread (leading to quality problems), the high pest and disease pressure in the fields leads to crop losses, and knowledge of pest and disease identification, prevention and protection is poor. The main differences in terms of production methods is the tendency in Cape Town to revert to more agro-ecological production and soil-building techniques, while in Maputo conventional production for rapid turnovers is predominant, as is the intense and often unsafe use of pesticides.

In both cities, market access for small-scale farmers is frustrated by inconsistent and unreliable produce quantities and quality, and the non-observance of market demands. Access to local markets is easier in Maputo, whereas the Cape Flats have very few local markets. Other similarities farmers in Maputo and Cape Town share are the high dependency on intermediaries and lack of knowledge and experience in pricing, marketing and administration.

Agro-processing is rare in both cities but has potential. Promising instances of success could serve as examples of good practice.

<b>Table 22: Characteristics of vegetable production, marketing and processing in Cape Town and Maputo</b>	
<b>Climate and production conditions</b>	
Farmers face similar challenges: <ul style="list-style-type: none"> <li>▪ Climate change has an adverse effect on production conditions, e.g., heavy rainfall, drought and water shortages, strong winds and scorching sun all impact on production</li> <li>▪ Soil fertility is poor</li> <li>▪ Urban (health) risks, e.g., contamination, must be taken into account</li> <li>▪ Human risks such as theft and vandalism are a common problem</li> </ul>	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>▪ Subtropical climate with summer rainfalls and dry winter months</li> <li>▪ Heavy rainfalls between January and March lead to periodic flooding, while the city's water dependency on the Pequenos Limpopo Dam causes water shortages in summer</li> </ul>	<ul style="list-style-type: none"> <li>▪ Mediterranean climate with hot dry summers and unreliable winter rainfalls</li> <li>▪ Located in the unique Cape biosphere, characterised by sandy, nutrient-poor soils, fynbos vegetation</li> <li>▪ Difficult production conditions, e.g., heavy winds, strong sun, water shortages/droughts</li> </ul>
<b>Commodities</b>	
Little production of staples	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>▪ Farmers eat what they produce</li> <li>▪ Low crop diversity: focus on cash crops cabbage, lettuce and pumpkin leaves with short production cycle and fast turnover</li> <li>▪ Humid conditions challenge scaled production for fruit and vegetables such as tomatoes, peppers or aubergines</li> <li>▪ Livestock (mainly broiler) produced by SME specialists and marketed locally (<i>frango nacional</i>)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Market farmers do not normally eat what they produce (NGO lead production for markets outside the townships)</li> <li>▪ Wide variety of crops, mostly annual fruit and vegetables, and indigenous and traditional Cape crops</li> <li>▪ Top sellers are spinach, kale, carrots, onions and cabbage</li> <li>▪ Livestock rearing not allowed but tolerated; chicken, rabbits, goats and cattle kept in townships and range on unoccupied land and along roads; partly feeding in areas with high rubbish concentration. Active livestock farming communities in Mfuleni, Blue Downs</li> </ul>

Production systems and organisational structure	
Diverse production systems	
Maputo	Cape Town
<ul style="list-style-type: none"> <li>▪ Home producers, public space producers, organised and non-organised small-scale producers, commercial producers, farming companies, one cooperative</li> <li>▪ Most farmers are organised in registered associations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Home gardens, food gardens, urban farms, training centres, community gardens, commercial farms</li> <li>▪ Mostly individual farmers, not organised</li> </ul>
Production inputs	
<ul style="list-style-type: none"> <li>▪ Due to limited financial resources and lack of storage facilities, small-scale farmers usually buy when in need rather than in advance</li> <li>▪ Constantly increasing input costs push up production costs and make buying of suitable and sufficient inputs difficult</li> <li>▪ Inputs are almost unaffordable without NGO or government institution subsidies</li> <li>▪ Existing farmland is under pressure due to growing urbanisation and the transformation of agricultural land to housing, to salinisation, and to unclear urban food planning futures or lack of a food system policy</li> <li>▪ Seeds (particularly certified seeds) are the largest input expense for farmers</li> <li>▪ Access to quality seeds is difficult, notably organic and pollinating seeds</li> <li>▪ Water quality is a human safety concern (river as a water source, pollution from close industrial areas and human settlements)</li> </ul>	
Maputo	Cape Town
<ul style="list-style-type: none"> <li>▪ 1 300 ha production area is available, historically established to feed the city</li> <li>▪ Land titles are not granted to individuals but to the associations as legal entities</li> <li>▪ Seeds are usually imported from South Africa, China or India; these are chemically treated GMOs and patented by big international companies</li> <li>▪ Mineral fertilisers and pesticides are also imported and distributed via stores and mobile agents. Stores offer a wide variety of pesticides (also banned products). Mix of pesticides is common</li> <li>▪ Water availability is limited during drought, while fields in the lower areas cannot be cultivated due to extremely high water tables or floods during the rainy season</li> <li>▪ Work is done by farmers and family relatives, but most small-scale producers pay one or two seasonal/casual workers for support</li> </ul>	<ul style="list-style-type: none"> <li>▪ Available farmland in the Cape Flats is scarce. Land access and security is difficult and hinders investments, mainly in private land</li> <li>▪ Farmers invest more in inputs (compost, seeds, mulching material) than they earn from produce sales</li> <li>▪ The seed market is dominated by patented and certified seeds, mostly hybrids and often genetically modified, sold by a few global seed companies</li> <li>▪ Cape Town's severe droughts in 2017 and 2018 made water the most precious input and at the same time the greatest hindering factor for farming. Water prices increased, and water restrictions turned into a ban on municipal water use for farming, leading to losses or the abandoning of production</li> <li>▪ Often own work force only or family labour, external labour is rarely used</li> </ul>
Production methods	
<ul style="list-style-type: none"> <li>▪ No production planning according to season or consumer needs</li> </ul>	

<ul style="list-style-type: none"> <li>▪ Record-keeping and evaluation of production process rarely performed</li> <li>▪ Crop rotation and intercropping uncommon in the fields</li> <li>▪ Own seedling production is a rare occurrence</li> <li>▪ High pest and disease pressure in the fields but scant knowledge of pest and disease identification, prevention and protection</li> <li>▪ High crop losses in the field due to poor field hygiene and inappropriate cultivation and handling methods</li> <li>▪ Farmers do not use machinery; most farm work is done by hand with tools</li> <li>▪ Harvesting is performed manually; products are mostly sold without on-site washing. Little or no storage facilities available in production areas</li> </ul>	
Maputo	Cape Town
<p>Conventional production</p> <ul style="list-style-type: none"> <li>▪ Most farmers plant the same crops for a quick turnover and sell complete beds</li> <li>▪ Soil building and soil fertility measures are rarely carried out</li> <li>▪ Crop rotation is practised unsystematically</li> <li>▪ Chicken dung, compost and mineral fertilisers are used</li> <li>▪ Pesticides are commonly used, as are herbicides for weeding. Unsafe handling of pesticides is widespread</li> <li>▪ Farmers use pesticides and mineral fertilisers to boost the crop growth. Agro-ecological methods (without mineral fertiliser) require a longer crop cycle</li> <li>▪ Watering is labour intensive and done manually with watering cans. Water is applied directly onto the plants all day, even in hot periods</li> </ul> <p>Agro-ecological production</p> <ul style="list-style-type: none"> <li>▪ Agro-ecological production techniques are only applied by NGO trained farmers. The focus is on the application of plant protection liquids such as chilli mix, garlic, soap or papaya leaves</li> </ul>	<ul style="list-style-type: none"> <li>▪ The majority of farmers plant according to the availability of seedlings distributed by NGOs (in the past this has led to peaks and unwanted produce)</li> <li>▪ Many farmers use techniques based on organic agricultural principles</li> <li>▪ Soil fertilising measures (compost/manure, trench beds and mulching) are widespread due to poor soil conditions</li> <li>▪ Mineral fertilisers or pesticides are rarely used, if at all</li> <li>▪ Water-saving irrigation techniques are crucial in the case of drought</li> </ul>
Marketing	
<ul style="list-style-type: none"> <li>▪ Difficult market access due to lack of consistent and reliable produce quantities and quality in response to market demand</li> <li>▪ Strong dependency on middlemen (NGOS and/or businesses)</li> <li>▪ Difficulty to access local organic product markets, as prices are higher than conventional food prices</li> <li>▪ Lack of knowledge and experience in pricing, marketing and administration</li> <li>▪ Competition with commercially grown, cheaper crops and supermarkets</li> <li>▪ Goods are usually exposed to sun, sand, dust and traffic emissions all day long</li> <li>▪ Lack of own transport facilities</li> </ul>	

Maputo	Cape Town
<ul style="list-style-type: none"> <li>▪ A variety of formal and informal markets exist in Maputo, but most farmers sell directly from their fields through intermediaries</li> <li>▪ Farmers sell all over the city and in their home communities at weekly local markets</li> <li>▪ Street markets are open all day throughout the city</li> <li>▪ Different selling method: Lettuce is sold by bed (<i>canteiro</i>) rather than individually</li> <li>▪ Prices vary considerably from season to season (the same crops are grown all year round with a break during the hottest weeks of the year)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Stigmatisation of urban crops – almost no marketing ‘over the fence’ within the own community</li> <li>▪ Diverse marketing channels from (small) informal street marketing to high-end food markets</li> <li>▪ No traditional fruit and vegetable markets with stalls for farmers or retailers in the production area</li> <li>▪ Few existing local markets</li> <li>▪ Spatial layout and historical separation of the city makes it difficult to transport produce to markets</li> <li>▪ High transport costs, few farmers have a driving licence</li> <li>▪ Wealthier, ethically aware clients interested in supporting urban agriculture farmers</li> <li>▪ Different selling method: vegetables are sold individually or by weight</li> <li>▪ More price stability (crops are adjusted to the season – summer and winter crops – to reach good prices)</li> </ul>
<b>Processing</b>	
<ul style="list-style-type: none"> <li>▪ Lack of knowledge on agro-processing</li> <li>▪ Little or no access to funding and lack of knowledge about how value addition could increase income</li> <li>▪ Vegetable processing by farmers is rare but has potential and needs further promotion</li> </ul>	
Maputo	Cape Town
<ul style="list-style-type: none"> <li>▪ Vegetable processing is not common, since cabbage and lettuce, as the main crops, are not usually processed</li> <li>▪ Very few farmers dry chillies for home consumption</li> <li>▪ Juices, chutneys, jams and salads are promoted at special markets to attract potential clients.</li> <li>▪ Farmers are encouraged to make vegetable cakes to improve nutrition of children and adults</li> </ul>	<ul style="list-style-type: none"> <li>▪ Only 20% of farmers undertake simple processing steps, e.g., drying chillis or preparing tomato sauce, pesto or chutney</li> <li>▪ Preservation techniques (fermentation) are promoted by individuals but rarely used by farmers due to other consumption habits, e.g., sauerkraut</li> <li>▪ Several hundred food-processing enterprises exist, but very few use urban crops</li> <li>▪ Urban crops are used by a few restaurants</li> </ul>
Source: Paganini	

### 6.3.2 Challenges, good practices and recommendations for vegetable production in Maputo

*Nicole Paganini, Alberto Luis, Alzira Mahalambe, Estevão João, Matias Siueia, Erik Engel, Karin Fiege & Anja Kühn*

Data collection, workshops, field visits and discussions helped to identify the challenges and existing good practices associated with the production and marketing of horticultural products in Maputo. This chapter provides recommendations based on the analysis of the researchers in close cooperation with ABIODES and representatives of the Municipality of Maputo, and on discussions at the annual meeting of the UFISAMO team in December 2018. The recommendations were further consolidated and elaborated during workshops and discussions in Maputo in April and May 2019.

A key element of the recommendations are considerations on how to meet the challenges related to low crop diversity (peak incomes and low periods, pesticide use, soil exploitation) and move towards more integrated, holistic production systems. Support in establishing markets for new or healthier products that valorise these added efforts is necessary. Suggested production changes are usually accompanied by the need to adapt organisational structures as well as the focus and methods of knowledge dissemination.

The following topics were discussed:

- Production – for home and association farmers;
- Production – for public extension services, NGOs;
- Production – for policy-makers and the municipality of Maputo;
- Production – for academia;
- Marketing and processing – for producers;
- Marketing and processing – for extension services and NGOs;
- Marketing – for the municipality of Maputo.

#### a) Production for home and association farmers

Challenge: High use of pesticides. Application often uncontrolled and irrespective of basic safety rules

Production systems in Maputo – aimed at rapid production of cabbage and lettuce – favour the proliferation of pests and disease. Pest pressure is high, with farmers applying pesticides to address the challenge, especially in association *machambas*. Although rules and regulations for the application of pesticides exist (banned products, inappropriate spraying periods, protective gear, a penalty system for breaching the rules), control is weak and enforcing mechanisms are even



weaker. Despite the inherent danger – consumers of green zone products died after eating contaminated cabbage in 2018 – the misuse is ongoing.

### Recommendations

- If pesticides continue to be applied (which is likely in the short to medium term), farmers need to:
  - Consider Maximum Residue Levels (MRL), take notes on the type of product and when applied in order to avoid application too close to harvesting;
  - Use authorised products only and never buy from informal traders. This requires a strict control system by government actors at the border (Komatipoort), at the selling points (*lojas, casa do agricultor*) and of the agro-dealers who approach farmers directly in the fields;
  - Follow the dosage instructions carefully on the packaging, as underdosage may result in pest resistance and enhance the problem;
  - Use a specific product for a specific pest. There is no 'one product fits all' pests and diseases. Applying the wrong product may result in pest resistance and enhance the problem;
  - Seek advice from fellow farmers, the production manager, the extensionist or other knowledgeable people, if uncertain which pest/disease is affecting the crops. Be aware that retailers for specific products and even extension workers may be more interested in selling their product than saving your crops;
  - Always wear protection gear and a mask;
  - Dispose of packaging material (bottles, cans) correctly and store the sprayer safely to prevent children or others from coming into contact with poisonous substances;
  - Associations could (via MASA) be supported with spraying teams that are both trained and equipped, and are familiar with the products and their application;
  - Farmers should harvest 6 days after applying chemicals at the earliest in order to reduce health risks;
  - Spraying should not be carried out if rain is forecast so as to avoid soil contamination
  - The urbanGAPs guideline draft should continue to be developed by the actors involved. CMM could take the lead.
- In the long run, a switch to more integrated pest management (IPM) is recommended. It will take political will and support to facilitate the transition and likewise the institutional capacities of the associations and the willingness of farmers to comply with these new techniques. Customer awareness and preferences will add to the incentive to shift to more holistic and less harmful methods.

### Challenge: Extremely limited crop diversity

Cabbage and lettuce are the dominant crops in the green zones of Maputo. The short production cycle and the stable demand for these crops are a strong incentive to continue growing them instead of practising systematic crop rotation and introducing new crops. The negative impacts of this type of production system are many: a) soil quality reduction due to the absence of soil-

feeding techniques and periods, not to mention cost-intensive fertiliser; b) proliferation of pests and diseases, such as specific bugs, fungi and bacteria, all of which find ample food and places to dwell; c) concentration of risks, i.e., similar plants are likely to be affected by similarly adverse conditions, and lack of diversity leads to reduced resilience; d) production peaks and meagre seasons force farmers to sell at low prices when the offer is highest, leading to fluctuating income. In addition, the positive effects on nutrition diversity are lost, since few pulses, fruit or other fruit groups are produced in relevant amounts.

### Recommendations

- Introduce new crops for the purpose of a) extending the growing season; b) drought resilience; c) soil-building, i.e., legumes; d) food and nutrition security, i.e., indigenous leafy vegetables, which are good sellers (including sweet potatoes); e) diversifying the market and most importantly; f) reducing cabbage as the chief worry for pest and disease management;
- Full-time farmers could introduce fruit crops, which should be produced in tunnels (aubergine, tomatoes, peppers, cucumbers) and makes sense in winter when South African imports are relatively small and expensive;
- Small-scale farmers cannot compete with products imported from South Africa (e.g., onions, potatoes, carrots and tomatoes). Production is only realistic if a niche market such as ComOrganico exists or if it is intended for self-consumption.

### Challenge: Insufficient intercropping and companion planting

Production is currently organised in plant beds – *canteiros* – with one crop only. These are purchased as an entire *canteiro* by intermediaries (*maguevas*). Intercropping can be beneficial to companion plants ('good companions') and repel pests. It also allows for maximum use of available space.

### Recommendation

- Intercrop with leeks, spring onions, basil, *tschambalakate* as pest barriers and for sale, taking full advantage of the available space.

### Challenge: Partly harmful irrigation methods

Maputo is regularly hit by floods and dry spells. Agricultural production needs to adapt to these weather extremes. Existing watering techniques are not water-saving and are applied in ways that are harmful to plants or favourable to plant diseases. Irrigation is almost always performed by hand, often at midday, and usually from above (overhead watering), thereby watering the entire plant.

## Recommendations

- Avoid overhead watering of plants, notably lettuce, since this can lead to fungal infection
- If affordable, change to drip irrigation systems;
- Stop watering plants at midday;
- Introduce mulching, particularly in the dry summer months, to reduce water usage.

### Good practice and challenge: Lack of soil-building

Urban agriculture in Maputo has the advantage of having mulch and compost material at the ready. In addition to natural materials such as reed and sugar cane or leaves and grass cuttings, high vegetable consumption also results in kitchen waste. This notwithstanding, composting is virtually never applied as a method of recycling organic waste and feeding soils. Manure from conventional agriculture rather than homemade compost is currently being worked into the soil.

### Recommendation

- Associations should include compost heaps in their organisational structure. Coordinating this task and the work itself could create more jobs. Compost could be sold directly to association farmers (see below). It would also reduce the risk of *E. coli* and food insecurity.

### Good practice and challenge: Small business opportunities in service provision

Today, farmers rely on fertiliser, manure and chemical pesticides. A shift towards more sustainable methods and consequently healthier and safer products could be a window of opportunity for the emergence of small agro-businesses. Some already exist in the green zones. Young people in particular might find it interesting to specialise in certain products and offer specialist services. Specialised side businesses are opportunities to diversify income.

## Recommendations

- Full-time farmers could specialise in seedling production, seed harvesting (as in KaTembe);
- Some farmers could specialise in compost production on some of their *canteiros* and sell it to interested fellow farmers;
- Some farmers could specialise in producing organic plant protection products, locally known as biopesticides. By growing tobacco, neem or piri-piri they could access the ingredients for organic plant protection products.

### **b) Production – for public extension services, NGOs**

Challenge: Poor crop diversity; high pesticide use, lack of knowledge on alternatives

Good practice: Promotion of more diverse production, reducing the need for pesticides

Good practice and challenge: Promotion of organic plant protection products (biopesticides)

The production of lettuce and cabbage in the green zones stems from the high demand for and short production cycle of both products. This uniform production facilitates the proliferation of pests and disease, and prevents soil-building based on natural cycles. In the long run, this production system will face challenges, since more and more pesticides and fertilisers will be required to maintain production levels.

Public extension workers and NGOs are promoting more holistic forms of agriculture, including a greater diversity of crops, companion planting, and the application of biopesticides to reduce chemical residues in food crops. But the adoption of these practices is challenging and biopesticides alone cannot resolve the high pest and disease pressure.

The continuing demand for conventionally grown cabbage and lettuce and the guaranteed financial benefits of these products – for the time being – further reduces the incentive to apply holistic and integrated plant production methods and pest management techniques.

#### **Recommendations**

- Broaden extension team topics to cover crop rotation, including legumes, companion planting, soil building and composting;
- Promote urbanGAPs, including adapted water-saving irrigation techniques, mulching;
- Continue fostering the use of biopesticides, introduce a broader, more integrated approach that sees crop rotation, utilisation of repellent plants and the attraction of beneficial insects. The latter will have difficulty surviving if conventional pesticides continue to be applied to the same degree;
- Facilitate (in cooperation with public programmes) the availability of inputs by promoting the emergence of small specialised agro-businesses for seed production, composting, organic plant protection products. Extension workers or specialists in MASA should help to control the quality of these inputs;
- Assist in efforts to market diverse and more organic food products (see below);
- Support these efforts with a campaign for healthier and more diverse diets.

### **c) Production – for policy-makers and Maputo municipality**

Challenge: Transition to more sustainable agro-ecological production

In the context of mal- and undernutrition, actors involved in Mozambican agriculture aim to increase the production quantity: When politicians announced the '*Fome Zero*' campaign, urban farmers in Maputo set about using chemical fertilisers and pesticides to produce in greater quantities. Hence their correct use is part of the teaching content of the national extension service.

These chemicals, however, have adverse effects on the health of both farmers and consumers, threaten biodiversity, soils and the water quality, and render land less productive in the long run. Consequently, the public extension service training content is not the most sustainable response to hunger in Maputo.

For this reason, the extent to which agro-ecological production in the context of Maputo's urban agriculture could maintain or even increase productivity should be further explored, or whether quantitative and qualitative issues are mutually exclusive.

If agro-ecological production is indeed an appropriate method, it would call for a more widespread application of good agricultural practices. To accomplish this, however, general conditions such as the availability of the appropriate equipment (e.g., seeds) and regular updates of the extensionists' knowledge must be guaranteed.

In addition, many small-scale farmers fear financial cutbacks due to the risks involved in the shift to more sustainable production methods. There should therefore be a focus on the topic of commercialisation. In particular, the interrelation between *maguevas* and producers and the scope of action for negotiation could be discussed during CDR.

### Recommendations

- Promote agro-ecological urban agriculture to reduce health and ecological risks, e.g., by following the urbanGAPs guidelines and manual;
- Provide more agro-biodiversity within the city;
- Update extensionist knowledge regularly (see recommendations on knowledge and information dissemination);
- Facilitate the availability of the required inputs for more organic production, e.g., by promoting the emergence of small specialised agro-businesses for seed production, composting, biopesticides. Extension workers or specialists in MASA should help to control the quality of these input;
- For the promotion of SMEs, secure microcredits for farmers, who can then invest in small infrastructure along the production chain need to be accessible. Infrastructure encompasses e.g., nurseries, compost systems, transport and packing or processing. Microcredits are provided by IFAD, Grameen Bank or GAPI;
- Facilitate market access (also to potential niche markets for organically grown local food – see below).

### Challenge: Despite all efforts: continuing high and uncontrolled use of pesticides

A long-term reduction in pesticides requires a political step and state control based on continuous training and extension service follow-ups.

## Recommendations

- Intensify staff training significantly and knowledge about the effect of pesticides and mineral fertilisers on humans and nature if incorrectly applied or the products are harmful;
- Strict control of and sanctions for extension workers who sell and promote pesticides;
- Impart information on dependencies and financial disadvantages of pesticide use;
- Establish a system of strict pesticide control and monitor observance of the list of banned pesticides;
- Develop and implement a ten-year plan to gradually reduce the use of pesticides, while pushing soil build-up and natural plant strengthening. This can only be achieved in its entirety;
- In the meantime, the extension service should support the safer use of pesticides with trained spraying teams when required. This would limit MRL exceedances, uncontrolled products and mixtures, and improper use;
- The existing system of penalties and controls in the associations could encourage transition to the safer use and long-term reduction of pesticides. It must, however, be strengthened as it has not proved efficient in the past;
- Apply clear restrictions and border controls on pesticides entering the country illegally.

### Challenge: Access to inputs, especially seeds

Accessing seeds is a challenge to farmers and a constant cost factor. Establishing a farmer-based seed system could be a way out.

## Recommendations

- Support the establishment of a farmer-based seed system by providing training, follow-up, control of seed quality, and the import of certified, organic and – most importantly – pollinating seeds.
- Support the establishment of nurseries, e.g., with young farmers as service providers for their peers.

### Challenge: Securing areas for urban agriculture

The ongoing urbanisation process puts the Maputo green zones under pressure. Salinisation in some parts of the coastline likewise reduces space for profitable agricultural activities.

Some fallow land, e.g., Campo de Golfe, is currently used as a production site by the highly food-insecure neighbourhood of *polana caniço*. These inner-city dwellers cannot afford to travel to the peri-urban *zonas verdes* and have no other access to plots, primarily because large areas of the Costa do Sol, once a production area, have now been converted into malls, housing, hotels, embassies and casinos.

## Recommendations

- The long-term urban plan for Maputo must guarantee that the *zonas verdes* in their current dimensions (1 300 ha) are protected as agricultural land. This means relocation to other fallow lands (e.g., the areas behind the railway line in KaMubukwana could be farmed) if certain areas are stressed by industry, salinisation or economic investment;
- Fallow land used for household urban agriculture and cultivated by home growers such as in the Campo do Golfe should be protected at all costs.

### d) Production – for academia

#### Challenge: Natural pest management and holistic agricultural production

As described above, crop diversification is necessary if pest pressure is to be reduced and soil-building enhanced. Research by the UEM agricultural faculty, possibly in cooperation with IIAM, could support identification of the most adaptive plants with multiple benefits.

#### Recommendation

- Research on new varieties, crop rotation and the replacement of cabbage production as a pest magnet. The focus should be on traditional leafy vegetables (*tseke*, *matapa* varieties), legumes (peas and beans beyond cowpeas and green beans) and the introduction of drought-resistant crops.

### e) Marketing and processing – for producers

#### Challenge: Weak storage capacity

Poor storage capacity for production purposes and the weak adoption of other forms of food conservation/drying in households are obstacles to increased income and/or production. Consequently, dependency on income from this activity for the survival of the family sometimes causes farmers to sell their products at 'any price', without even gaining a return on the production costs.

#### Recommendations

- Improved storage techniques and facilities and the promotion of food conservation leads to higher incomes and less food waste;
- Product processing adds value, adds nutritional value and conserves products. Processed products should meet consumer tastes.

### Challenge: Means/independency of transport

About 57% of producers use public transport. Only 13% have a car, 3% a motorbike and 3% a bicycle (17\_B\_MP). Lack of individual transport is seen by producers as one of the main barriers to market access. In their view, a car would enable them to transport their produce to the various markets and consumers in the City and Province of Maputo. This in turn would lessen their dependency on *maguevas* (resellers), avoid direct competition with South African products and place the product wherever there is a deficit, ultimately giving the producer financial advantages.

### **Recommendation**

- Associations or the district union of associations must work out whether purchasing a car is a worthwhile option to boost marketing benefits. Although it might free farmer associations of intermediaries to a certain extent, it would pose other challenges to producers (organising joint/group marketing).

### Challenge: Niche markets/crop diversity

The producers stated that 98% of production in the *machambas* is destined for sale and income generation (17\_B\_MP). This, however, is not a guarantee for a return on investments. Dependence on climate events, price instability, pests, theft and lack of conservation and processing systems are some of the reasons. Consequently, the choice falls on short-cycle and low-cost crops, since the damage is less in the case of loss.

The low production of vegetables such as tomatoes, cucumbers, peppers and Reno potatoes diminishes the negotiating capacity with some consumers, e.g., schools with local centres or supermarkets that opt for contracts with suppliers who can guarantee the availability of diversified products throughout the year.

### **Recommendations**

- Increase crop diversity to access other markets and gain a better bargaining position;
- Carry out market research to find out what can be produced at favourable prices;
- Explore niche markets for specific products (e.g., organic produce);
- Put forward the benefits of local and healthy produce. Labelling is an option.

## **f) Marketing and processing – for extension services and NGOs**

### Challenge: Product marketing

Product marketing beyond the conventional lettuce and cabbage production is a challenge for urban farmers. Transition to more diverse, integrated production (with the attendant benefits to soils, pest and disease control and human health) will only take place if producers can make a profit with their products – and profits should be at least as high and reliable as those gained with current practices.



## Recommendations

- Support or initiate marketing campaigns for locally produced foods that respond to a set standard (e.g., PGS certified) in cooperation with producing farmers;
- Support the existing participatory guarantee system and labelling to create added value for PGS certified farmers (improved access to niche markets). Support farmers in setting and controlling standards.

### Challenge: Accessing niche markets

The niche market is currently covered by ComOrganico. In April 2019, ComOrganico considered relocating ComOrganico's vegetables source to Namaacha (a city at the border to the Kingdom of Eswatini/ ex-Swaziland). Here, numerous farmers produce a variety of crops, with most of them applying organic principles. A new business entity would eventually be required to promote the marketing of agro-ecological vegetables.

## Recommendations

- NGOs (e.g., ABIODES) or social entrepreneurs should organise a box scheme similar to that established by ComOrganico and learn from the challenges it confronted, i.e., funding, seasonality and covering an all-year-round demand;
- Intensify marketing of (urban, healthy) products to restaurants as reliable weekly customers.

### **g) Marketing – for the municipality of Maputo**

#### Challenge: Accessing markets

The CMM Department of Markets & Fairs deals with sales. A direct connection to the unit dealing with urban agriculture was made recently. The subsequent cooperation, which is primarily an exchange of information and experience, and joint development of future papers, could help to promote urban agriculture and its future development. Cooperation between the two units is highly satisfactory and has considerable potential.

## Recommendations

- Control informal street markets and relocate to informal/formal CMM markets (planned by the municipality for 2019);
- Establish more fairs in central areas and communities but not on Sundays (see *Mercado da Terra*, which collides with church day);
- At the market sites: support market stands with urban vegetables that comply with set production standards (e.g., PGS, urbanGAPs, organic);

- Review the functioning of Zimpeto central market and establish it as a retail market for producers (associations) and buyers, radically reduce informality, and avoid price increases, which mostly hurt people affected by food insecurity;
- Communicate daily prices in the morning from Zimpeto 2.0 with a message service to all farmers/heads of sales in the associations in order to prevent price speculation by *mag-uevas*;
- Help associations or district unions of associations to establish a transport system for small-scale farmers for food transport, to reduce costs and to increase job opportunities.

### 6.3.3 Challenges, good practices and recommendations for vegetable production in Cape Town

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Data collection, workshops, field visits and discussions helped to identify challenges and existing good practices with regard to the production and marketing of horticultural products in Cape Town. This chapter provides recommendations based on the analysis of the researchers in close cooperation with the research farmer group and on discussions at the annual meeting of the UFISAMO team in December 2018. The recommendations were further consolidated and elaborated during workshops and discussions in Cape Town in February and March 2019. The following topics were discussed:

- Production – for home and food garden farmers;
- Production – for NGOs and supporting actors;
- Production – for policy-makers;
- Marketing – for food garden farmers;
- Marketing – for third parties (intermediaries, supporting agencies, businesses with social objectives);
- Marketing – the role of public institutions.

#### a) Production – for home and food garden farmers

Good practice and challenge: Good agricultural production methods are applied in part (diversity, intercropping, companion planting, soil feeding, biopesticides).

UrbanGAPs – good agricultural practices that take into consideration the challenges, risks and hazards of a city environment – suggest a sequence of good practices from site selection to post-harvest handling. The objective is to increase yields and produce quality in the long term by adopting a holistic approach and integrated methods.

Good agricultural practices already widely applied in Cape Town include crop diversity, intercropping, companion planting, soil feeding and the use of organic plant protection products. Other recommended practices have not yet been (fully) implemented (e.g., composting, production planning). Crucial in the Cape Town context is the reduction of water consumption through plant selection, soil-building and other practices.

Full application of urbanGAPs can, however, be challenging to farmers as it is labour intensive and not part of their routine practices.

### Recommendations

Apply urbanGAPs, notably:

- Water harvesting
  - Water in Cape Town is a scarce resource. In order to bridge dry periods, a water-saving system must be established in the garden to carry allotment gardeners through these dry phases. This can be in the form of *jojo* tanks, groundwater wells or water-saving irrigation methods: drip rather than sprinkle;
- Water restrictions must be respected. Recurring dry phases reinforce the argument that PHA could provide small farmers with land that has a natural aquifer;
- Soil-building and composting
  - Urban agriculture in Cape Town is sold to consumers as organic. Although selected principles of organic farming are applied, a holistic and authentic organic agriculture is not given. A central element of organic farming is constant soil construction and composting. Local NGOs have a great deal of expertise in this area, but implementation is not always consistent, and many farmers are challenged with acquiring sufficient material for composting and mulching. Green manure and legumes should be included in crop rotation.
- Make use of available space
  - The space available in many gardens is not used to the full. If farmers implemented their production plans, applied intercropping and used the entire area available, their harvests could double. This requires more work and sharing the space with other farmers or hiring labour.
- Do production planning
  - Production planning should be carried out according to the individual farmer's priorities (marketing or home consumption) and adapted to seasons. It is vital to adjust production planning to the crop rotation plan, which involves a three- to four-year cycle that includes crop rotation and soil-building measures.
- Integrated pest and disease management begins with good field hygiene
  - Healthy soil and a diversity of crops reduces the risk of high crop loss through pest or disease;
  - Field hygiene (removal of infected plants and damaged plant parts) reduces the risk of pest and disease proliferation;
  - Regular monitoring of the garden and hand-picking of visible pests lessens their damaging effect. Farmers should be aware of the reproductive cycle of certain spe-

cies – finding eggs or removing larvae helps to minimize the damage caused by fully grown insects and interrupt their proliferation.

Challenge: Horticultural production does not match local food preferences, leading to food waste

Food waste is a challenge, since production is mainly aligned to seedling/seed distribution and to production plans elaborated by market actors as distinct from production planning by the producers themselves according to their own food needs and market ambitions (if any). In the context of the high food insecurity rate in the Cape Flats, production should be aligned to local consumption habits and existing markets.

**Recommendations**

- Reduce food waste by planning production according to your priorities (self-consumption, local markets, markets via intermediaries). Produce what farm families and neighbours like to eat, what farmers are sure to sell, and/or what can easily be conserved or processed;
- In the case of market production: market-oriented production planning, ideally producers have agreements with customers/retailers prior to the harvest. Diverse market outlets increase selling opportunities;
- Pro-active sales when products ripen;
- Preservation of produce for conservation and value addition (processing, e.g., vegetable stock, pickles, sauces).

**b) Production for NGOs and supporting actors**

Good practice and challenge: Long-lasting NGO support and subsidies

NGOs have successfully worked as knowledge brokers and introduced more valuable production practices. They have adapted techniques to Cape Town's environmental conditions (e.g., soil-building for water conservation and increase of nutrients) and supported thousands of farmers over the years. There is, however, limited interaction among the various NGOs, so that synergies between interventions are not fully exploited.

Driven by project logic and funding needs, NGOs have contributed to establishing dependencies between themselves and the farmers concerned (see also: organisational structures). Farmer subsidies – for inputs, the physical basis for horticultural production – have not only failed to achieve the 'stepping up' of farmers but also instilled in them the expectancy of follow-up subsidies.

**Recommendations**

- Continue and expand the role of knowledge broker. Widen capacity development topics,

e.g., include agro-processing, running an enterprise, production planning, marketing, plant protection (pest and disease monitoring, identification, prevention and control). Promotion of urbanGAPs: support urban farmers in production enhancement in terms of quality and quantity towards a healthier, more water-wise and environmentally friendly urban agriculture. Support the implementation of a holistic farming system according to good practices;

- Seek viable alternatives to subsidies in cooperation with financial institutions and policy-makers. Inputs are the basis of horticultural production and NGOs can facilitate access. Micro-credits are proven instruments to foster a business mentality and entrepreneurial activity. Credit takers, however, bear huge risks due to high interest rates (to cover risks and running costs of small-scale credits) coupled with limited entrepreneurial experience and the inherent unpredictability of agricultural production. On the other hand, given the social benefits of UA and the importance of social security for those involved, some subsidies are justified.

#### Good practice: Support for food gardens

Food gardens are used as agri-hubs to provide training courses, information and inputs, and to demonstrate gardening techniques.

#### **Recommendations**

- Adapt well-functioning food gardens to low-tech small-scale farms and implement techniques such as wicking beds and tunnel production to increase productivity. In times of drought, well-run and productive low-tech food gardens are more sustainable than an array of micro-farms, where water access becomes a daily challenge for producers;
- Well-functioning food gardens could become agri-hubs (e.g., Ubhule Bendalo, Beacon Organic, SCAGA, Green Light, Fezeka or Asande). They could produce seedlings and act as demonstration gardens but also as meeting points, community centres and space for social interaction, knowledge exchange and transversal learning.

#### Good practice and challenge: Support for home gardens

Home gardens for self-consumption provide additional and nutritious food products, as well as green space, exercise and personal satisfaction. Home gardens are supported by some, but not all NGOs. A healthier diet for home gardeners is a key benefit of Cape Town's urban agriculture.

#### **Recommendations**

- Promote home gardens as a contribution to a healthier diet. Home gardeners need initial support for tools, soils and compost, as well as seeds and seedlings. Many home gardeners start small with recycling and creative ideas, highlighting the benefits of a more diverse and nutritious diet;

- Offer more courses on nutrition for home gardeners.

Challenge: Horticultural production does not match local food preferences and leads to food waste

Food waste is a challenge as production is mainly aligned to seedling/seed distribution and production plans elaborated by market actors/NGOs. In the context of high food insecurity rates in the Cape Flats, production should be aligned to consumption habits and existing markets.

**Recommendation**

- Reduce food waste by supporting producer plans for production in line with their own priorities (home consumption, diverse market outlets).

**c) Production for policy-makers**

Challenge: Access to land

Access to land is a problem for farmers: procedures to apply for land are lengthy and non-transparent. Who to approach is also unclear. Land is leased for short periods only, thereby lessening the incentive to invest in long-term infrastructure and soil-building.

**Recommendations**

- Simplify land access by having uniform and transparent application mechanisms, a list of fallow land in the respective districts and a contact person for land use (councillor);
- Help farmers to access land and acquire a long-term lease so as to make investment in infrastructure and trees/hedges or intensive soil-building attractive.

**d) Marketing – for food garden farmers**

Challenge: Weak marketing skills and lack of diverse marketing channels

Marketing is mentioned as the key challenge for urban food garden farmers. They currently rely on one marketing channel, usually managed by third parties (and often set up by NGOs), while other markets are located in the inner city, an additional hurdle since access is both difficult and expensive. Farmers thus depend on intermediaries to access markets and are in a weak bargaining position in terms of prices.

According to the farmers, very little produce is sold in their communities. Most of it goes straight to the city bowl via middlemen. Farmers would prefer to grow food for their own communities but assume that knowledge on the benefits of vegetable consumption is poor (consumer needs do not coincide with the produce) and local consumers prefer vegetables from big supermarkets rather than locally grown vegetables from local shops. Investigation of local restaurants and po-

tential clients for urban vegetables suggests, however, that if the products were better known locally, they could in fact meet the existing local demand.

### Recommendations

- Diversify marketing channels, do not rely exclusively on one channel;
- In order to follow a multi-market approach: evaluate and prioritise market channels. Look at marketing channels that fit your product system and evaluate which one is best;
- Take notes on prices, input cost relation and increase selling prices if input costs are higher. Add your own labour to the calculation;
- Promote the products for what they are: healthy, local and beneficial additions to a nutritious diet and support for the local economy;
- If necessary, seek support from research institutions or NGOs to develop promotional material.

### Challenge and good practice: Direct selling/marketing

Direct marketing is labour intensive but perhaps the most satisfactory method of marketing.

### Recommendations

- For direct marketing, concentrate on customer wishes;
- Establish a customer base: deliver quality products in reliable quantity and on time;
- Have local stands on regular days so that interested customers know when and where to come;
- If one garden is too small to satisfy customer demand over a longer period: match up with other farmers you know well and trust (see below: group marketing).

### Challenge and good practice: Selling through retailers

There are several ways of selling through middlemen. This is an easy option for farmer and rapidly earned money. Nevertheless, it is important to deliver good quality and meet middleman standards. At the same time, farmers have rights. They can demand price transparency and compare it with other retailers.

### Recommendations

- Diversify market outlets – do not rely on one intermediary/middleman only;
- Deliver reliable quality;
- Demand price transparency, in particular from NGOs and social businesses, as they claim to work on behalf of the farmers and benefits should cover operational costs only;
- If farmers establish a good relationship with a retailer/middleman, it is crucial to remain

loyal to them as long as dealings are conducted fairly. Short-term benefits from selling to others (you do not know them yet, nor can you vouch for their reliability) may jeopardise your established relationship and prove harmful in the long term.

#### Challenge: Group marketing

Research has shown that farmers prefer to sell as a group rather than be dependent on third parties. This calls for a large investment in cooperation, organisation but also in mutual trust.

Ideally, co-op structures are a good choice as is the establishment of agri-hubs to enhance support structures, knowledge centres and networking opportunities. Collective marketing involves trusting partners in terms of the quality and quantity they produce, and the reliability of delivery. It also means that group members are obliged to trust each other when it comes to sharing costs and benefits.

#### **Recommendations**

- If the garden is too small to satisfy customer demand over a longer period, farmers can match up with other farmers they know well and trust for marketing cooperation;
- If possible, cut down on effort and cost of group formation by starting small with people close to each other;
- Establish mechanisms to share responsibilities and benefits in a transparent and fair manner (see also: organisational structures);
- Look at success stories of small-scale farmer groups visited during the research, e.g., Weskus Mandjie, a fisher ladies collective on the West Coast or Izindaba Zokudla, an urban agricultural collective in Johannesburg.

#### **e) Marketing – for third parties (intermediaries, supporting agencies, businesses with social objectives)**

#### Challenge: Establishing marketing channels for small-scale farmers

Practices of selling farm produce – e.g., box schemes – have distanced and alienated farmers from markets and the consumers of their produce. It has proved challenging for intermediaries to establish, maintain and expand (upper-class) markets in the city bowl. Centrally organised packing and distribution systems are difficult to maintain in view of fluctuating product quantities and quality. Nevertheless, these box schemes and niche markets are opportunities for food gardeners to sell vegetables and generate income.

#### **Recommendations**

- Follow up on the idea generated in the Stellenbosch studies to establish a digital food system App that shows what kind of food is available and where. This could reduce food



waste and digitally link food producers and consumers;

- A box scheme aligned to local food habits could facilitate selling (e.g., the imfino box for 'Black' African neighbourhoods and the groen blare box for Afrikaans neighbourhoods);
- Communicate prices and costs involved. Farmers may feel exploited if packaging, transport, delivery and system organisation costs are not made transparent;
- Be transparent in your objectives. Businesses are run for profit, which is acceptable if the other partners involved also profit from them;
- Ensure the quality and quantities of the produce you receive. Explain your reasoning, engage in contractual relationships, but encourage independent local marketing of your partner farmers. Establish a broad base of producers to meet client demands, so that more farmers will benefit from the 'upper-class market', while at the same time be encouraged to market some of their produce locally;
- If product promotion includes 'stories': ask farmers to tell their own stories rather than have you narrate their story for them. Cape Town's NGOs environment is heavily geared to social media and although these same farmers are on different social media channels each week, their stories are told in the words of NGOs. Having farmers tell their stories and share their perspective empowers them;
- Support farmers with local marketing by helping to prepare promotional material (e.g., nutrition and recipe leaflets for less known vegetables, radio spots on community radios, advertisements in community newspapers).

#### f) Marketing – the role of public institutions

Challenge: Linking food garden farmers and public feeding programmes (schools, hospitals, churches, jails)

Productive gardens in schools are not usually integrated in the school feeding programme (which is centrally organised for the Western Cape). Thus, a golden opportunity to create direct value chains, raise awareness at an early age and support small-scale farmers directly is missed. Public canteens do not source their vegetables from local small-scale producers. At the same time, to constantly provide the quality and quantity such large food programmes demand would be a considerable challenge for small-scale producers.

#### Recommendations

- Link UA to public institutions such as school feeding systems, clinics or churches/food kitchens. This calls for decentralisation of the existing food procurement system in these institutions or direct trade of urban grown crops through an agri-hub (see consumer habits and FNS);
- Create and support a system of procurement for national or regional institutions such as hospitals, jails and public institutions to promote the local economy, food sovereignty and independence from global food players. Link food gardens and small-scale farmers with these other stakeholders. Learn from other metropolises (e.g., Belo Horizonte/Brazil) where similar schemes have had a positive impact.

Challenge: Lack of market infrastructure

Research shows that the Cape Flats should be seen as ‘food deserts’. The most common local food providers are a small number of supermarkets and *spaza* shops with a limited product range and mostly vegetables from a Cape Town market. There are almost no local markets.

**Recommendations**

- Establish and support local markets in communities and neighbourhoods. This requires infrastructure (hall, banks, cleaning facilities), security and dweller access. Strategic areas identified by farmers are Mitchells Plain town centre, the upgraded Nyanga and Khayelitsha train stations, the Strandfontein hospital area, and the Philippi fresh produce market;
- These markets could become agri-hubs and sell inputs;
- Establish a conscious consumer programme in the production areas to push consumption of locally grown vegetables and support local farmers. This could be broadcast on radio, TV and social media.

## 6.4 Food habits and food and nutrition security in Maputo and Cape Town

*UFISAMO Team*

This chapter gives an introduction to common food and consumption habits in Maputo and Cape Town and the food and nutrition security status in each city. Recommendations were made on the basis of good practices and the challenges involved.

### 6.4.1 Food habits and food and nutrition security in Maputo and Cape Town

Food insecurity is an urban problem: while in both cities the incidence of food insecurity is lower than the overall country average, the population in the research areas – vulnerable townships in the Cape Flats of Cape Town and the population adjacent to the green zones of Maputo – show higher food insecurity figures than the overall city average and indeed, as in the case of Khayelitsha, than the country average.

Urban farmers in the vulnerable districts of both cities – not unlike their non-farming neighbours – are categorised overall as moderately food insecure. Limited accessibility (poverty) and availability (lack of shops with healthy and affordable products, i.e., food deserts) contribute to the fact that households cannot always eat the food they prefer in the quantities and quality they desire. In both cities, seasonal peaks and low seasons mean hungry seasons for the producers in periods when they cannot generate income from their gardens and are forced to purchase food elsewhere at high prices. These hungry seasons are equally correlated to the availability of temporary job opportunities, e.g., in construction. As Cape Town farmers rely to a greater degree on other sources of income than Maputo farmers, the correlation is stronger there.

Hidden hunger caused by diets composed mainly of carbohydrates and an insufficient intake of protein, minerals, vitamins and micronutrients is a phenomenon reported from Cape Town. The national health survey suggest that poor nutritional knowledge is a contributing factor, apart from socio-cultural aspects and the financial constraints on purchasing both filling and nutritious foods. Key informants on public health issues, however, question this statement: they see financial and physical access as the predominant causes of hidden hunger. The nutritional transition to sugar and fat rich foods combined with less physical exercise contributes to the high occurrence of obesity in Cape Town and its mounting occurrence in Maputo.

In terms of diet diversity (according to this research, supplemented by secondary literature), the vulnerable urban population in Maputo seems slightly better off than their Capetonian peers, meaning that on average they consume more nutritious food such as fish, fruit and groundnuts to complement a diet based on staples and vegetables.

Dietary preferences of the population in both cities follow a generational divide: the young (in general) prefer bought oily food and sweetened drinks, while the elderly tend to cherish cereals as staples accompanied by vegetables and sauce – and on special occasions by meat. Seasonal fruit is readily available in Maputo, as most urban plots have one or more fruit trees, while in

Cape Town, fruit usually has to be purchased – according to schoolchildren, a rare but welcome treat when the family has the financial resources.

The cultural and social significance of dinner as the principal meal of the day differs between cities and communities: in Maputo it is an occasion for the family to come together and talk after a day spent on all kinds of activities, whereas in Cape Town, different population groups have different traditions, e.g., some families prefer to eat their dinner separately.

A specific characteristic of Cape Town is the preference for supermarkets (where available) compared to the strong reliance on corner shops or open-air markets in Maputo. This was voiced despite evidence that the product range in supermarkets is considerably lower in townships than in the more affluent areas of Cape Town. This leads to so-called food deserts, areas with difficult access to food products in general and to healthy and fresh food products in particular.

Generally speaking, urban agriculture has more impact on the food and nutrition security status of urban farmers in Maputo than in Cape Town. Urban agricultural products in Maputo are successfully commercialised, they penetrate the local markets and are likewise consumed by the producers themselves. The products contribute significantly to the income of urban farmers and consequently to their purchasing power, as well as to the producer household consumption and dietary diversity. In Cape Town, in contrast, urban horticultural products are first and foremost produced for markets in the wealthier areas of the city, and thus leave the townships where they were produced. That said, the profit margin for farmers is minimal, so that the income barely allows them to cater for their basic dietary needs. These unequal benefits are partly linked to the decision-making powers: Maputo farmers make their own production decisions, have access to local markets through intermediaries (*maguevas*) and enjoy the high demand for their products. In Cape Town, on the other hand, production in food gardens is primarily mediated by NGOs, who dictate production and establish the market link. Accordingly, producers depend for their income on the contracts with and demand from these NGOs.

Another major difference is the existence of a broad school feeding programme in the townships of Cape Town, whereas there is none in the City of Maputo (there are some school feeding programmes in the countryside run by the World Food Programme (WFP)). The primary aim of these programmes, however, is to provide an additional incentive for children to attend school rather than to ensure food and nutrition security among the adolescent. The school feeding programme in Cape Town has been criticised for not purchasing locally but instead boosting processed food of little nutritious benefit.

The following chapters present good practices and challenges that touch on the spheres of linking cultivation and consumption, cooking, promotional activities for urban produce, and interventions to alter nutritional knowledge and counter the nutritional transition. The objective of these efforts is to enhance the production and consumption of healthier produce for a more diverse diet. The good practices identified, and recommendations made also refer to interinstitutional communication and synergies, nutrition education and practical aspects such as production planning for a healthier diet.

<b>Table 23: Characteristics of food habits and food and nutrition security in Maputo and Cape Town</b>	
<b>Food and consumption habits</b>	
<ul style="list-style-type: none"> <li>▪ Two to three meals a day (if two, then lunch and dinner) – dinner is the main meal</li> <li>▪ Different food preferences per age group</li> </ul>	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>▪ Consumers like to buy at local markets (e.g., local urban vegetables): affordable prices but limited quality control</li> <li>▪ Lunch is usually taken between 11-12 a.m.</li> <li>▪ Consumption habits of different age groups are similar but changing: adolescents push for fast food</li> <li>▪ Dinner has a social function; the whole family comes together and talks about their day and their plans</li> </ul>	<ul style="list-style-type: none"> <li>▪ Consumers like to buy in supermarkets (if available), (presumably) better price, better reputation/social standing but often low quality</li> <li>▪ Lunch is usually taken between 1-2 p.m.</li> <li>▪ Diet of the young tends to be different (see above)</li> <li>▪ Dinner is frequently eaten separately rather than with the entire family</li> </ul>
<b>Diet composition</b>	
<ul style="list-style-type: none"> <li>▪ Cereals and vegetables constitute the basis of the food consumed</li> <li>▪ Low consumption of animal protein by urban farmers, mainly for economic reasons</li> <li>▪ Youth consume more fast food and soft drinks</li> <li>▪ Tendency to cook vegetables excessively with loss of nutritional value</li> </ul>	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>▪ Lettuce and tea for breakfast; bread/<i>fat cooks</i> and fizzy drinks for lunch, dinner with staples, vegetables and sauce is the main meal</li> <li>▪ Some fish (imports from Angola, Namibia) and broiler More fruit (trees in gardens), peanut and coconut consumed</li> <li>▪ Less fast food available than in Cape Town, apart from the typical fast food sold in small restaurants and <i>lanchonetes</i> (lunch stall) abundant in the vicinity of schools. <i>Comida de rua</i> (street food) is often sold by informal sellers from the back of cars and consists of more traditional local foods (<i>xima</i>, <i>feijao</i>, rice, crabs and chicken)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Consumption habits of ethnic groups and townships vary: In Khayelitsha, maize porridge for breakfast; bread/<i>fat cooks</i> and tea for lunch; dinner is the main meal with staples and sauce</li> <li>▪ Animal protein intake depends on township/cultural background of consumers</li> <li>▪ 'Typical South African' meal of <i>samp</i> and beans less prevalent in Cape Flats than expected</li> <li>▪ Low fish consumption, although the province exports fish</li> <li>▪ Fast food widely available; fats and sugar have led to high incidence of obesity in adolescents</li> </ul>

Factors for food choice	
<ul style="list-style-type: none"> <li>▪ Individual, social, cultural preferences and norms</li> <li>▪ 'Nutrition transition' to more pre-processed foods and diets rich in sugars, fats and animal protein ongoing – but more advanced in Cape Town than in Maputo. Connected to urbanisation and 'western' lifestyles</li> <li>▪ Nutrition knowledge generally low (controversial statement: contested by some public health experts)</li> <li>▪ Economic choices</li> </ul>	
Maputo	Cape Town
<ul style="list-style-type: none"> <li>▪ Younger generation more open to nutritional transition and embracing an 'urban life-style'</li> <li>▪ Food from street vendors and/or fresh food markets cheaper than in supermarkets</li> </ul>	<ul style="list-style-type: none"> <li>▪ Nutritional transition advanced. Food choices and where to purchase them are also a status symbol</li> <li>▪ Food from supermarkets often cheaper</li> <li>▪ Pre-processed food is cheaper to prepare than, e.g., beans and pulses → lower cooking costs (energy)</li> </ul>
Impact of UA on consumer habits	
<ul style="list-style-type: none"> <li>▪ Home gardeners in both cities produce for home consumption</li> <li>▪ Contribution of home production to vegetable consumption, albeit moderately low</li> </ul>	
Maputo	Cape Town
<ul style="list-style-type: none"> <li>▪ UA production in green zones for the local market and tailored to consumer habits</li> <li>▪ UA home production mainly for home consumption. Choice of crops often in combination with the <i>machambas</i> in the green zones (availability of seeds)</li> <li>▪ Home gardeners for home consumption seem to apply less pesticides than those at the <i>machambas</i> and are (partly) sensitised to pesticide risks</li> </ul>	<ul style="list-style-type: none"> <li>▪ UA production in township food gardens is for niche markets in the city bowl. Disregard for local food preferences</li> <li>▪ UA home production mainly for home consumption. Choice of plants according to availability of seeds, personal experience and preferences, and general framework conditions (e.g., water availability)</li> <li>▪ Urban farmers seem more sensitised to nutritional importance of vegetables and value of clean/organic food</li> </ul>
Food and nutrition security status	
<ul style="list-style-type: none"> <li>▪ The majority of the vulnerable urban population is moderately food and nutrition insecure (farmers are part of this vulnerable population)</li> <li>▪ The majority of urban farmers purchase the bulk of food consumed at home</li> <li>▪ Obesity is a growing problem in both cities</li> <li>▪ Hidden hunger (lack of micronutrients) is an issue (diet composed of staples and sauce, no diversified and balanced diet)</li> <li>▪ Access to healthy and nutritious food constitutes a problem, partly caused by food deserts, lack of financial means and (allegedly) poor nutrition knowledge.</li> </ul>	

Maputo	Cape Town
<ul style="list-style-type: none"> <li>▪ Income from UA is the primary contribution to the household income for a significant number of association farmers (80%)</li> <li>▪ Income generated from UA sales allows farmers to purchase other food items (staples) or cover other basic needs</li> <li>▪ Lower obesity levels than in the Cape Flats but increasing</li> </ul>	<ul style="list-style-type: none"> <li>▪ Limited profitability of UA</li> <li>▪ Income supplemented by social grants</li> <li>▪ Although farmers are often trained to produce for an external market, their market access and financial benefit from production is marginal</li> <li>▪ Hidden hunger (lack of micronutrients)</li> <li>▪ Food deserts (limited access to nutritious and quality food at affordable prices in townships)</li> <li>▪ High obesity levels, especially among women</li> </ul>
<b>Contribution of urban agriculture to food and nutrition security</b>	
<ul style="list-style-type: none"> <li>▪ Home gardening mainly for home consumption: diversifies and enriches the diet and provides basic minerals, vitamins and other nutrients</li> <li>▪ Generally low diversity in consumption despite promotion of more diverse cultivation by supporting agents. Consumption confined to a few vegetables only (mainly leafy green vegetables)</li> <li>▪ Food gardeners produce vegetables they do not consume themselves</li> <li>▪ Staple food is not produced in urban gardens</li> </ul>	
Maputo	Cape Town
<ul style="list-style-type: none"> <li>▪ Urban production impacts on the urban food system (relevant quantities of specific products enter the market)</li> <li>▪ Approximately 80% of association farmers cultivate in backyards for home consumption</li> <li>▪ Few NGOs promote production diversity</li> <li>▪ Many associated and some home gardeners have plots outside the city where they grow maize and other staples</li> <li>▪ Farmers decide individually what they grow (marketable products)</li> <li>▪ Easy access to local market; vegetables are widely valued by consumers</li> <li>▪ Animal rearing on market scale for sale and home consumption (broiler)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Little impact on food system: farmers struggle to penetrate the market</li> <li>▪ Many NGOs promote production diversity. Production diverse but limited self-consumption</li> <li>▪ Food gardeners in townships produce for an affluent 'white' market, e.g., asparagus or aubergines which they themselves are not used to eating</li> <li>▪ Farmers in Philippi Horticultural Area within the city limits produce limited amounts of staples. These are mostly large-scale conventional farmers who produce 50% of Cape Town's fresh produce</li> <li>▪ In the townships, production decisions are strongly influenced by NGOs</li> <li>▪ Difficult access to local markets; consumers prefer supermarket products (status)</li> <li>▪ Animal rearing officially prohibited, but takes place informally, only estimates available</li> </ul>

Food and nutrition security policies	
<ul style="list-style-type: none"> <li>▪ Follow-up on the FNS situation and has developed strategies to reduce malnutrition</li> </ul>	
Maputo	Cape Town
<ul style="list-style-type: none"> <li>▪ National food security strategy in place</li> <li>▪ SETSAN: established as a focal point in all matters concerning FNS</li> <li>▪ No school feeding-programme in Maputo</li> <li>▪ Programme for nutritional rehabilitation, <i>Programa de Reabilitacao Nutricional (PRNI)</i> for children and adolescents (0 – 14 years; over 15 years)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Range of food security policies exist at different administrative levels</li> <li>▪ School feeding programme is implemented in the townships, primarily to increase school attendance. No link to urban agriculture (sourcing from school and market gardens), no specific nutrition objective</li> </ul>
Source: Cumbana, Mfaku & Engel	



## 6.4.2 Challenges, good practices, and recommendations on linking urban agriculture and nutrition habits in Maputo

*Ivo Cumbana, Luisa Mutisse, Erik Engel, Karin Fiege & Anja Kühn*

The following recommendations were drawn up and discussed by the UFISAMO team at the annual meeting in December 2018. Based on data analysis and secondary literature, they were consolidated and further elaborated in Maputo during a workshop with farmers, association representatives and representatives of institutions responsible for food and nutrition security in Mozambique. They are discussed in the following four clusters:

- Interinstitutional cooperation;
- Nutrition education;
- Consumer behavioural change and awareness creation;
- Addressing the consumer and local markets.

### a) Interinstitutional cooperation

Good practice: Interinstitutional platforms

Challenge: Cooperation on FNS

In 2010, the government of Mozambique established the Technical Secretariat for Food and Nutrition Security (SETSAN), an entity that acts as a focal point in all matters of FNS. Through this national institution under the Ministry of Agriculture and Food Security (MASA), the government guarantees and coordinates the promotion of food and nutrition security (FNS). SETSAN is in charge of implementing the Strategy and Action Plan for Food Security and Nutrition and of inter-ministerial and institutional coordination. The Secretariat is furthermore responsible for the evaluation and monitoring of programmes and actions in the area of food and nutritional security and the Human Right to Adequate Food, taking into account the specific role of the institutions, entities and communities involved (SETSAN, 2017). The existence of FNS monitoring institutions is crucial to addressing challenges associated with mal- and undernutrition.

Despite interinstitutional cooperation and exchange on the topic of FNS under the leadership of SETSAN, however, cooperation, information exchange and the exploitation of synergies seems less fruitful on the ground. A platform on good nutrition habits operates under the authority of the Ministry of Health (MISAU), but exchange with SETSAN is neither systematic nor fully exploited.

## Recommendations

### Ministry of Health, Ministry of Education, SETSAN, ROSA, UAACM

- Institutionalise cooperation between sector institutions on health, education and agriculture to exploit synergies and harmonise core messages (e.g., joint meetings to share information on nutrition; creation of a memorandum of understanding);
- Reinforce cooperation with the existing platform on good nutrition habits under the authority of MISAU, Department of Nutrition;
- Search for additional partners of renown, e.g., UNICEF;
- Involve civil society organisations in the cooperation.

### **b) Nutrition education**

#### Good practice: Capacity building for health workers

Efforts have gone into capacity development of the national health system in Mozambique to capacitate local health workers in counselling on healthy eating and nutrition. Besides other interventions (fortified foods, sentinel sites that monitor the status of malnutrition) are being rolled out. However, “nutritional indicators show slow progress (...), pointing at the need to strengthen on-going multisectoral strategies, or the need to assess their impact” (Ministry of Health, 2013, p.32).

#### Good practice: Development of educational material on healthy nutrition

Nutrition education is vital to the promotion of healthy diets if the transition to sugar and oil rich processed produce is to be countered. The Ministry of Health in Mozambique, supported by other ministries, the Technical Secretariat for Food and Nutrition security (SETSAN), and international organisations like USAID or Save the Children have designed educational material for healthy nutrition, highlighting several basic messages.

#### Good practice: Integration of UA and nutrition programmes in schools

Generating synergies between different ministries (e.g., health and education) to integrate health and nutrition programmes in schools is a stated objective in Mozambique. Good nutrition is seen as a vehicle for positive public health effects, as it reduces the occurrence of non-communicable diseases and generally improves the capacity of the body to withstand illness. Consequently, UA is addressed in ‘agriculture and livestock’ classes from 8<sup>th</sup> to 10<sup>th</sup> grade. Students practice crop production and learn about nutrition and animal rearing. Although the research cannot judge the impact of these classes, the fact that they exist is promising.

#### Challenge: Training on nutrition

About 80% of producers did not have access to training on the importance of nutrition in their diet. The producers heard only sporadically about using fruit to produce jam and juice and almost none of them apply their knowledge. No one in the organisational structure of the associations is

responsible for health and nutrition (as is the case in other sectors such as production and sales). This further limits the discussion on food consumption practices among producers.

## Recommendations

### **Training and information material**

MISAU, MITADER, MASA, National Directorate of Agricultural Extension, extensionists in associations

- Aggregate the nutritional component in extension service training in schools and health posts;
- Provide (public and NGO) extension workers with basic knowledge on good nutrition practices, healthy diet guidelines and information material on healthy diets;
- Provide easy-to-manage textbooks/food guides in schools and other relevant institutions;
- Produce nutrition posters and make them available to associations, schools and hospitals, and train users in their benefits;
- Train grassroots actors as replicators/multipliers of food poster content.

### **Link nutritional education and production**

Casas agrárias/extensionists, associations, ABIODES, UNIÃO, SETSAN, Agricultural Institute

- Systematically include nutrition considerations in production planning;
- Promote diversification of food crop production; associate diversified production with better knowledge of the nutritional value of crops;
- Link nutritional education to agricultural training: appoint someone to be responsible for nutrition issues in the association and act as a link between the extensionist and the newly established focal point for food and nutrition security matters in DASACM;
- Promote the cultivation of adapted crops in home gardens with high nutritional value for domestic consumption (e.g., pulses and beans, which also possess soil-building properties);
- Promote cultivation of crops adapted to small spaces for home and container gardens. Herbs are small but have a range of health benefits (e.g., parsley, coriander, watercress, lettuce, scallions, beetroot, tomatoes);
- Disseminate the nutritional value of each crop and explain the conditions required for production;
- Highlight the multiple benefits of the different plants both for the garden and for human health (e.g., intercropping, companion plants, wind breaks);
- Hold lectures in the neighbourhoods on the importance of vegetable gardens (case studies, good practices, testimonies);
- Create demonstration plots in the neighbourhoods, public and private institutions.

DASACM, associations

- Use the window of opportunity that opened with the appointment of a focal person for nutrition in DASACM: Capitalise on and disseminate good nutrition practices and thereby contribute to better use of products from the *machambas* and influence production choices.

**c) Consumer behavioural change and awareness creation**

Good practice/challenge: Existing food habits

The fact that many urban farmers have a vegetable rich diet is good practice as such. It needs to be supplemented, however, by other food groups (animal protein, vitamins) and more attention should be given to the healthy preparation of vegetables in order to maintain their nutritional value.

Good practice: Cooking demonstrations

Joint cooking events at associations in Maputo are important social events. They provide opportunities for nutrition specialists and other multipliers to intervene. Supporting bodies organise cooking demonstrations to promote the nutritionally valuable preparation of food.

**Recommendations**

**Consumer behavioural change**

Activists in associations, health committees in liaison with DASACM, CCM, Municipal Directorate, MASA, UNIAO

- Get involved in nutrition education and focus on dietary diversity, food handling and food preparation;
- Expand the promotion of healthy cooking:
  - Utilise existing social events in cooperation with influencers to have a wider outreach;
  - Organise culinary demonstrations at farm events, in health facilities and communities;
  - Take advantage of association meetings where meals are prepared to promote good food preparation practices and to disseminate good gastronomic practices among producers (e.g., grill rather than fry; use beetroot);
- Involve civil society organisations and the media to address consumer behavioural change
  - Use television programmes to spread good eating habits and good practices;
  - Demonstrate good food preparation practices;
  - Disseminate information on the nutritional value of each food element.

**Awareness creation and sensitisation**

OCS, MASA, DASACM, MINEDH, Education, MITADER, District Peasant Union, Civil society, SETSAN, CBOs, health committees, health activists, cooperation partners

- Consider existing eating habits and discuss them (taking taste and health aspects into account);
- Sensitise people to other products, indicate alternatives that are affordable and rich in macro- and micronutrients, foster a combination of foods to ensure a nutrient-rich diet;
- Identify multipliers of nutritional content in associations (e.g., health activists or a group of mothers) for knowledge transfer on the importance of dietary diversity and food hygiene;
- Use diverse dissemination channels to spread information (community radio stations, educational spots, radio soap operas involving public figures).

Good practice/challenge: Consumption of healthy, diverse and nutritious food

Agro-ecological practices have the potential to contribute to a healthier diet. Home production, which is mainly for self-consumption, applies less pesticides and mineral fertiliser, and consequently delivers healthier products. There is an understanding among some farmers about the health advantages of agro-ecological production.

The small-scale production of livestock can contribute significantly to making animal protein accessible to vulnerable families. At the same time, there is the question of hygiene and the fact that animal rearing carries health risks for neighbouring communities. It should also be remarked that animal welfare in confined urban settings is by no means guaranteed.

**Recommendations**

Municipality, Ministry of Agriculture, ABIODES

- Expand the promotion of agro-ecological practices to produce healthier food;
- Support home gardening for household consumption and further diversification of home garden production;
- Support small-scale animal production and handling in suitable areas in line with animal welfare guidelines and minimal hygiene standards.

**d) Addressing the consumer and local markets**

Challenge: Greater involvement and sensitisation of all actors in the value chain, especially urban consumers

Raising the awareness of local consumers for local products could bring about a shift in the sector with mutual benefits for consumers and producers, e.g., consumption of domestically produced

chicken in Maputo (positive results with increased consumption and sales to supermarkets of reference and at the informal market).

### Recommendations

Local government: DASACM, Directorate of Health; Civil Society (e.g. ABIODES)

- Further promote locally produced vegetables and harmonise production with local demand;
- Create sites/markets for local products;
- Promote safe and short transport of food from the production site to the recipient;
- Promote appropriate packaging (boxes, etc.);
- Promote organically produced vegetables, highlighting their health benefits;
- Support certification of local products/ local brands and/or expand existing (participatory) guarantee systems;
- Highlight the advantages of local food production for urban consumers (domestic vs. imported chicken);
- Disseminate locally produced products at all levels;
- Create awareness about the importance of fresh vegetables for a healthy diet;
- Make UA products appealing to teenagers and young people (dissemination through lectures to all age groups/seminars, radio and television debates);
- Improve linkages and cooperation between the stakeholders involved in the VC: include INAE (National Inspection of Economic Activities);
- Review relevant policies to facilitate processes.

CMM, DPASAN, SETSAN, UEM, Casas agrárias, District and City Union

- Stimulate the processing of seasonal fruits to add value to food and avoid waste in times of overproduction;
- Intensify/maximise liaison with food technologists to train and ensure technology transfer in order to reach the farmers;
- Increase technology transfer fairs along the value chain (different presentations of the final product).

### 6.4.3 Challenges, good practices, and recommendations on food habits and food nutrition security in Cape Town

*Abdulrazak Karriem, Abongile Mfaku, Erik Engel, Karin Fiege & Anja Kühn*

The following recommendations were developed and discussed by the UFISAMO team during an annual meeting in December 2018. They are based on analysis provided by UFISAMO researchers and the secondary literature. They were discussed in Cape Town with key informants on public health from UCT and the UWC school feeding programmes, as well as with practitioners in urban agriculture from SFL. Recommendations are presented for:

- Nutrition education;
- Addressing the consumer and local markets;
- Linking UA production and nutrition;
- Governance;
- School feeding programme.

#### a) Nutrition education

Good practice: Nutrition education and interinstitutional cooperation on FNS

Challenge: Limited impact of nutrition education

Nutrition education is crucial if the transition to processed sugar and oil rich produce is to be countered and healthy diets promoted. The Department of Health in South Africa and institutions such as the Food Advisory Consumer Service (FACS) supported by WHO have designed educational material for healthy nutrition, highlighting several basic messages. There are attempts to generate synergies between the different ministries (e.g., health and education) in order to integrate health and nutrition programmes into schools.

Critics have remarked that the 'nutrition education approach' is often paternalistic and does not solve the problem, since it fails to address the underlying factors (lack of access). In their opinion, improved access must be at the forefront of efforts for better nutrition, e.g., tax exemptions for nutritious produce (and not solely for staples, oil and sugar).

#### Recommendations

##### Government organisations

- Institutionalise cooperation between sector institutions on health, education and agriculture to exploit the synergies and harmonise core messages;
- Link education to other measures, e.g., subsidies or tax exemptions for fruit and vegetables for specific target groups (e.g., diabetes patients);
- Use the full potential of school gardens for production and nutrition education.

##### Government organisations, NGOs

- Link nutritional education to agricultural training (given that knowledge alone does not solve the problem in the absence of shops or cash);
- Provide (public and NGO) extension workers with basic knowledge of good nutrition practices, guidelines for healthy diets and information on healthy diets (Department of Social Development, NGO management, cooperation with UCT).

##### NGOs

- Link production training to nutrition training;

- Associate diversified production with better knowledge of the nutritional value of crops
  - Consider existing eating habits and discuss them, taking taste and health aspects into account;
  - In trainings: promote home garden cultivation of adapted and diversified crops with high nutritional value (e.g., pulses and beans) and highlight their multiple benefits to both humans and soils in terms of feeding;
  - Highlight the multiple benefits of different plants for the garden and for human health (e.g., crops for intercropping, as companion plants, as wind breaks and additional nutrient providers);
  - Promote peer learning among farmers (instead of educational interventions by NGOs).

#### NGOs, farmers

- Apply messages from nutrition training: systematically include nutrition considerations in production planning (include plants with specific characteristics, e.g., rich in vitamins or protein);
- Use nutritional value of produce for local marketing (highlight health effects, provide easy recipes for consumers).

#### Good practice/Challenge: Existing positive consumption habits

#### Good practice/Challenge: (Rare) cooking demonstrations

The fact that many urban farmers have a vegetable rich(er) diet is good practice as such. It needs to be supplemented, however, by other food groups (animal protein, vitamins) and more attention should be given to the healthy preparation of vegetables in order to maintain their nutritional value.

Supporting organisations conduct cooking demonstrations to promote the preparation of nutritionally more valuable food (albeit rarely). According to local information, people are not used to improvising recipes and require concrete advice when it comes to trying out new dishes.

#### **Recommendations**

#### NGOs, local communities

- Get involved in nutrition education focusing on dietary diversity, food handling and food preparation (as already practised by Soil for Life);
- Expand the promotion of healthy cooking and utilise existing social events in cooperation with influencers for a wider outreach (community gardens with infrastructure, invite local chefs, use existing contacts);
- Expand cooking demonstrations (grill rather than fry) and provide detailed recipes.

#### Government organisations



- Involve civil society organisations in the approach to consumer behavioural change (social department & DoA) (e.g., advertising);
- Involve media in promotion of healthier consumption.

### b) Addressing the consumer and local markets

Challenge: Greater involvement and sensitisation of all actors in the value chain, notably the urban consumer

Good practice: Promotion of local produce

Challenge: Limited market access - no direct access to local markets, dependency on intermediaries for up-town markets

Raising the awareness of local consumers for local products could bring about a shift in the sector with mutual benefits for both consumers and producers. Some restaurants and 'lifestyle' markets in Cape Town are already marketing their products, emphasising the social and environmental benefits of 'buying locally'. This opens up niche markets and provides potential sources of income for township producers. The latter are currently linked to these markets via (NGO) intermediaries on which they depend.

Independent market production (as in Maputo) empowers producers and holds them responsible for their own decisions. The risk is great, however, if secure marketing channels are not in place.

Local marketing increases the food and nutrition security of local consumers (availability of and access to food products) and producers (purchasing power) alike.

### Recommendations

Farmers, DoA, NGOs, business support

- Promote township vegetables locally (group marketing, active market research, branding/labelling);
- Produce vegetables that are locally in demand in the communities.

Farmers, DoA, NGOs, business support

- Improve accessibility of local fresh and diverse products by marketing locally;
- Create awareness of the importance of fresh vegetables for a healthy diet based on staples, vegetables and fruit, and supplemented by animal protein. Highlight the benefit of pulses and other sources of non-animal protein, all of which are cheaper and safer than (badly stored) animal products (nutrition education, advertising, leaflets for marketing);
- Promote organically produced vegetables and highlight increased health benefit;
- Support urban farmers in their efforts to access local markets and sell their produce (market research, promotion of 'local foods').

### c) Linking UA production and nutrition

#### Good practice: Production of healthy, diverse and nutritious food

Agro-ecological practices are well known and have the potential to contribute to a healthier diet. Farmers often have an understanding of the health advantages of agro-ecological production and of diversifying diets.

NGOs in Cape Town, generally speaking, promote several approaches to agro-ecological production (bio-pesticides, soil-building, compost and manure as fertilisers, seed banks).

UA policy support and a number of NGOs in Cape Town are now gradually going back to promoting home rather than food gardening, as expectations of enhanced incomes for urban producers did not materialise.

The small-scale production of livestock can contribute to the accessibility of animal protein for vulnerable families. Although officially prohibited in Cape Town, livestock breeding is widely practised, as witnessed driving through the townships of the Cape Flats.

#### **Recommendations**

##### DoA, NGOs

- Expand the promotion of agro-ecological practices to produce healthier food;
- Support home gardening for household consumption and further diversification of home garden production;

##### R&D

- More research on small-scale animal production and handling in suitable areas, according to animal welfare guidelines and in line with minimal hygiene standards.

### d) Governance

#### Good practice: Existence of FNS monitoring institutions

#### Challenge: Limitation of urban agriculture (policies)

The existence of FNS monitoring by the responsible institutions in the Ministry of Health is crucial to appropriately addressing the challenges of mal- and undernutrition. In its IEC material, the MoH promotes the creation of food gardens to supplement nutrition diversity. That said, there is no systematic link between health/nutrition and urban agricultural actors.

Existing policies and practices are inadequate when it comes to addressing nutrition/public health issues in the communities. Although UA policies can contribute to an FNS programme to a minor degree, they cannot be a substitute for social welfare. The benefits of UA are too weak to satisfy the needs of the families involved. At the same time, UA is advantageous in many ways: it greens the city, brings people together, and provides financial and nutritional benefits. UA can

only be a complementary activity, however, and cannot bear the brunt of achieving food and nutrition security.

### Recommendations

#### Public institutions (MoH, DoA, CoCT)

- Link nutrition and urban agricultural actors;
- Support NGOs active in UA in providing supplementary training on nutritional benefits of UA for their extension workers (training of trainers);
- Use NGO training sessions to dispatch municipal health promoters/nutrition specialists to contribute and participate in training sessions on home garden production.

### e) School feeding programme

Good practice/Challenge: Existing school feeding programme with many obstacles and limited impacts on nutrition diversity

A centrally organised school feeding programme for the Western Cape is in place and currently implemented by Peninsula School Feeding (PSF). It supplies 30 000 pupils in 160 schools. The primary aim of these school feeding programmes, however, is to provide an additional incentive for children to attend school. The PSF has been criticised for serving processed food of little nutritional benefit instead of purchasing locally. It should be noted that the system includes a product checking facility, thereby preventing a direct link between school/community gardens and the school feeding programme.

Although the PSF has attempted to source products from small-scale farmers, most of the requirements pose a challenge for these farmers, e.g., guaranteed quantity and quality, demand for specific products, transport, or packed and barcoded produce.

Challenge: Weak link between school gardens and school feeding programme

School gardens are vital to nutrition education and could be a source of food for the PSF. Lack of funding and vague roles and objectives, however, are obstacles to their maximum use.

As PSF has collected products centrally before, e.g., for quality control, the direct link between school gardens and the school kitchens is not used.

### Recommendations

#### Government organisations

- Promote sourcing of products for school feeding (partly) from local production to fully exploit synergies between environmental education, school garden production, income generation and food and nutrition security;
- Increase sourcing of locally produced food from small-scale farmers:

- The PSF should adapt diets/menus to availability of produce in food gardens;
- Supplier farmers should adjust their planning and production accordingly.
- Find and learn from good examples in other countries, e.g., Brazil/Belo Horizonte (decentralised to municipal level, away from major distributors towards sourcing from small-scale farmers);
- Clarify role, objectives and funding of school gardens to encourage their use as a PSF source and their potential for nutrition education;
- Use school gardens to teach basic skills in food production and nutrition (food literacy), include them in school curricula, consider the food justice aspect (rehumanisation).

## 6.5 Dissemination of knowledge and information<sup>29</sup> in Maputo and Cape Town

*UFISAMO Team*

The urban Agricultural Innovation System (uAIS) in Maputo and Cape Town is comprised of urban actors, urban farmers, NGOs, the public extension service, policy level, media and information providers, training institutions, and universities. These differ considerably in number, type of extension tools, framework conditions and policy environment.

### 6.5.1 Characteristics of knowledge and information dissemination in Maputo and Cape Town

The principal actors in the urban Agricultural Innovation System in both cities are farmers and their organisational forms: home gardens, farmer associations, cooperatives, school gardens, community gardeners and food gardens (see Chapters 6.1 and 6.2). In Maputo, the degree of farmer organisation is high; most farmers are organised in associations, whose umbrella organisation is the General Union of Cooperatives (*União Geral das Cooperativas - UNIAO*). Only one NGO addresses organised farmers, while two NGOs have been working with home gardeners. In Cape Town, in contrast, the number of formal farmer organisations or associations is low. Most farmer groups are directly linked to one of the many NGOs active in the field of urban agriculture. The high segregation backdrop to urban planning in Cape Town makes it difficult for farmers to exchange with other communities and neighbourhoods. This exchange barrier fosters farmer dependence on NGOs, not least due to their financial input. There are little or no informal farmer networks in place, neither is there an umbrella network like the General Union to coordinate exchange activities (see also Chapter 6.2).

Maputo has a high public extension worker coverage: a ratio of 1:250 compared to 1:3000 in the rural areas. *Casas agrárias* exist in districts with urban agricultural production. The extension service is the chief information broker, supporting farmers in an advisory capacity. In Cape Town, the public extension service is limited to input provision for farmers on request.

Cape Town's urban agricultural policy is outdated, and Maputo has no policy in place to address urban agriculture, not to mention agro-biodiversity.

Both cities use diverse communication and dissemination tools, albeit to a different degree. In Maputo, the associations hold formal meetings at least once a month. Meetings are also organised by the extension service, sometimes in cooperation with NGOs. In Cape Town communication via (social) media and the internet is crucial, while NGOs provide training and workshops on a regular basis. On average, farmers attend a workshop once a month, some every week.

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<sup>29</sup> This chapter focuses on the dissemination of knowledge and information. The topic of innovation is part of a Ph.D. dissertation to be published after completion of the UFISAMO project.

In Maputo and Cape Town, demonstration plots are used as a dissemination tool. Most associations in Maputo have demonstration plots where trainings are carried out by extension officers. Despite this predominantly top-down knowledge transfer (reflecting the association's organisational structure), knowledge and information at demonstration plots circulate rather than flow in one direction only. NGOs in Cape Town use their garden centres to showcase production techniques and carry out trainings. The Ministry of Agriculture in Maputo defines the pillars of the extension service at national level.

Learning and farmer to farmer exchange are both crucial to knowledge dissemination and highly valued. Informal networks in Cape Town contribute in particular to continuous knowledge exchange and allow actors to disseminate bottom-up innovation. Farmer to farmer exchange also takes place within the framework of NGO trainings, although exchange in this case is often confined to the NGO group and does not cater for cross group exchange or interaction between townships. Farmers in Maputo use the association or union meetings for exchange. ABIODES encourages farmer exchanges to peri-urban or rural farmer communities.

Training material exists in both cities but is less effective as a dissemination tool than on-farm training, personal advice and most importantly, continuous follow-up by the extension service. Face to face communication is highly appreciated. The training material usage rate in Maputo is low and illiteracy levels among farmers are high. In Cape Town, NGO-based training material related to the NGO programme is used by Soil for Life and Abalimi. Others use overarching/international material, e.g., agri-planners and posters on permaculture principles or common pests and diseases.

The role of media and ICT for knowledge and information dissemination is on the increase in both cities but bears the risk of leaving the most vulnerable behind. In Maputo, access to smartphones remains low. In Cape Town, on the other hand, almost every farmer uses a smartphone. That said, a great number of farmers can, if at all, barely afford regular data volumes. Generally, ICT is more widespread in Cape Town than in Maputo and also favoured by NGOs in their extension work.

Most urban farmers in Maputo prefer to communicate in *Changana*, their local language, and are more partial to radio than television. The use of ICT and social media is expanding but still outside the economic radius of most farmers. In Cape Town, language differs from one neighbourhood to another, so that farmers communicate in Afrikaans, *isiXhosa* or English. Although English is not their mother tongue, farmers understand and communicate in English. Here, too, radio is the preferred medium.

<b>Table 24: Characteristics of knowledge and information dissemination in Maputo and Cape Town</b>	
<b>Urban Agriculture Information System (uAIS) Interlinking actors</b>	
<ul style="list-style-type: none"> <li>▪ Different urban agricultural forms: individual home gardens, farmers organised in associations, cooperatives, school gardens, and community gardens (see Chapter 6.2 and 6.3)</li> <li>▪ Urban conditions: proximity to service and knowledge providers, easy access to media and social media, interlinkages with academia, proximity to other farmers allows for exchange</li> </ul>	
<b>Maputo</b>	<b>Cape Town</b>
<ul style="list-style-type: none"> <li>▪ High degree of formal farmer organisation, most farmers organised in associations, associations form umbrella organisation - <i>União das associações</i>. Formal networks at association level and between associations (UNIAO)</li> <li>▪ Access to service providers, especially the public extension service, is a given (ratio 1:250, in rural areas 1:3000). <i>Casas agrárias</i> exist in districts with urban agricultural production</li> <li>▪ The public extension service is the main information broker. Advisory training and the creation of national extension guidelines are the principal objectives. The extension approach is vertical learning: Training and Visit with follow up</li> <li>▪ Very few NGOs are active in the field of UA with training and advice</li> <li>▪ Trainings (by public extension service and NGOs) are irregular and unsystematic, and not always adapted to farmer needs</li> <li>▪ Despite the absence of a specific UA policy, there is a support structure at city level (CMM, DAE, extension officers employed at city level, <i>casas agrárias</i>)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Low level of formal farmer organisation. Farmers are primarily linked to NGOs. Although several informal farmer networks are in place, there is no umbrella network to coordinate exchange activities</li> <li>▪ High segregation in Cape Town hinders farmer exchange with other communities and neighbourhoods and leads to farmer dependence on NGOs, notably on their financial input</li> <li>▪ NGOs are the chief innovation brokers: NGOs address a wide range of training topics in different neighbourhoods and with different target groups</li> <li>▪ The public extension service provides inputs on request. These are difficult for farmers to access due to high segregation, poor knowledge of their existence and the procedure involved (bureaucratic)</li> <li>▪ Knowledge exchange between NGOs is low, existent NGOs are poorly linked</li> <li>▪ Horizontal and vertical learning: farmer to farmer approach, but no regular follow up</li> <li>▪ The Urban Agriculture Unit was integrated into the Department of Social Development. This put an end to the ongoing review of the Urban Agricultural Policy of 2007</li> </ul>
<b>Dissemination and communication tools</b>	
<ul style="list-style-type: none"> <li>▪ A streamlined agricultural/horticultural training programme is non-existent – organisations and institutions train 'their' topics and messages</li> <li>▪ Demonstration plots can be an important dissemination tool</li> <li>▪ Farmer to farmer exchange exists, is highly appreciated and can be reinforced. Field days rarely take place due to lack of resources</li> <li>▪ Media, social media and ICT have gained currency and their use is increasing, although there is a risk of leaving behind farmers who have neither access to smartphones nor sufficient data volume</li> <li>▪ Face to face communication is appreciated most</li> <li>▪ Local languages are preferred for communication</li> </ul>	

Maputo	Cape Town
<ul style="list-style-type: none"> <li>▪ Formalised meetings take place in associations, organised by the leadership. Extension services or NGOs also organise trainings and meetings</li> <li>▪ Each association has a demonstration plot that is used to varying degrees. Plots belong to associations and are used by the extension service and several NGOs for field trainings. Farmer Field Schools are planned for 2019</li> <li>▪ Farmer to farmer exchange takes place mostly within the associations (regular meetings) and between the associations</li> <li>▪ Field days are a sporadic activity but due to lack of resources not a preferred dissemination tool</li> <li>▪ Information and training material can be found in the <i>casas agrárias</i> but is rarely availed of by farmers. Material distributed in the associations tends to remain with the leaders and is therefore not easily accessible to ordinary members</li> <li>▪ Two main local languages are spoken (<i>Changana</i> and <i>Rhonga</i>), but there is a preference for <i>Changana</i>. Literacy and schooling rates are low</li> <li>▪ Regular radio and television programmes exist, but broadcast times do not correspond with the farmers' reality. Radio is preferred to television. Community radios broadcast in local languages. Social media gaining in importance</li> <li>▪ Information and training material exist, although farmer usage rate is low</li> </ul>	<ul style="list-style-type: none"> <li>▪ Farmer meetings and trainings organised by NGOs or external donors take place sporadically</li> <li>▪ Demonstration plots exist in NGO garden centres (agri-hubs), where they act as a showcase combined with training</li> <li>▪ Farmer to farmer exchange in food gardens (here a successful undertaking and highly valued tool). Also takes place within the framework of NGO trainings (more temporary)</li> <li>▪ Field visits are donor-driven, but highly appreciated by farmers, notably when township barriers are overcome</li> <li>▪ Information and training material is mainly NGO-based and related to NGO programmes</li> <li>▪ Three main languages are spoken (<i>isiXhosa</i>, Afrikaans, English). Higher literacy rates among farmers, the majority of whom have finished secondary school</li> <li>▪ Radio and television are not used regularly as dissemination tools. Use of smartphones for WhatsApp groups and other social media very common and main information channel</li> </ul>
Source: Paganini & Schelchen	



## 6.5.2 Challenges, good practices and recommendations for innovation and dissemination in Maputo

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In response to the challenges and good practices related to dissemination and innovation identified in Maputo during the UFISAMO research and based on the analysis of the researchers, recommendations were made on the following fields:

- Extension services and their dissemination channels;
- Training of extensionists and farmers;
- Linkage R&D, extension service and associations.

### a) Extension services and their dissemination channels

#### Good practice: Public and NGO extension services

The existing government support and long-lasting presence of the public extension service for urban agricultural farmers can be seen as good practice. The public service is complemented by NGO extension work.

#### Challenge: Regular advice under resource scarce conditions

Although the farmer to extensionist ratio is still considered too low, it is higher in Maputo than in the rural areas of Mozambique. The main obstacle to continuous and far-reaching farmer consultation is the scarcity of resources: lack of the necessary material, transport, funds and extension service employees challenges extension officers in the course of their routine.

#### Challenge: Association sub-structures not fully exploited for knowledge transfer

Associations appoint specialists to supervise and harmonise production and sales. Heads of production, e.g., must make sure that pesticides are used in accordance with MASA recommendations and the law. Their potential for knowledge dissemination remains underutilised, since the reality on the ground tells a different story.

#### Challenge and good practice: Involving youth

The importance of youth development has already been highlighted. UA needs to become more attractive, more profitable and offer youth more opportunities, if young people are to be integrated into the UA sector. Currently, the majority of association farmers are over 45 years of age, making it difficult for young people to find their niche within the associations. ABIODES is about to set up a programme that will focus exclusively on young people. Small start-ups that go beyond simple production could make urban agriculture more attractive, an approach that calls for a strengthening of entrepreneurial thinking (Chicamisse et al., 2019).

## Recommendations

### MASA/DoA, NGOs, associations, UNIAO, R&D

- Improve outreach and sourcing of existing extension service;
- Ensure continuity and include regular follow-up visits after trainings in the associations;
- Given the scarcity of resources, look for other solutions when advising farmers:
  - Promote farmer to farmer exchange and mutual learning within and between the associations. Visit other farms so that farmers can learn from each other. Visit other associations in Maputo, visit the Marracuene farmers to experience other methods of production (more organic, more collective) and become familiar with their marketing channels to Maputo Fresh;
  - Provide specific training for appointed specialists in associations (e.g., head of production) so that they can fulfil their tasks and act as information brokers;
  - Expand consulting services in the associations (appoint people in charge) and make use of model farmers and demonstration plots (see below);
  - Explore and use the potential of upcoming farmer field schools in Maputo (see below);
  - Research and use media as an affordable means of effectively disseminating information (see below).
- Explore international good practice examples and experiences, and transfer them to the Maputo context;
- Establish a youth programme (ABIODES) that includes entrepreneurial skills (e.g., by transferring Rural Invest to the urban context).

### Good practice and challenge: Knowledge circulation at demonstration plots (CDRs) and Farmer Field Schools

CDRs are generally considered by local actors to be the most effective method of disseminating knowledge in Maputo's green zones. They allow for a two-way information flow, i.e., from extension service to producers and vice versa. Knowledge circulates and many extension workers and farmers describe their work as a collaborative knowledge transfer. This sharing and discussion of techniques is greatly appreciated. The CDR management is not challenge free, however, and implementation of extension activities on the ground not always successful, e.g., due to disinterest among farmers or non-utilisation of demonstration plots (see Chapter 3.9).

It can be assumed that the extension service will undergo change with the implementation of the Farmer Field Schools (EMCs) in 2019. Despite the observed efficiency of CDRs, it is collectively hoped that the EMCs will lead to better results in terms of knowledge transfer, since farmers will be encouraged to find feasible solutions to their own problems. In this sense, these participatory EMCs could help to ease the process by transmitting knowledge in a more trustful environment – a farmer to farmer learning situation. Also, the number of extension officers has increased in recent years.

## Recommendations

### Associations

- Use CDRs to train farmers. Specific knowledge (e.g., on organic production) for interested 'pilot groups' can be transferred to here;
- Enhance farmer to farmer learning at CDRs and later at Farmer Field Schools;
- At selected demonstration plots shift the emphasis to agro-ecological production adapted to the urban context.

### UNIAO

- Announce a competition for the best association CDR and award prizes.

### Farmers

- Farmers should make use of CDRs and their potential and associations should design CDRs in such a way that farmers participate, i.e., a reward rather than a punitive system.

### Good practice: Model farmers and extensionists

Exemplary producers and extension workers are role models and trigger a snowball effect in terms of information distribution. NGOs like ABIODES make use of this and the *agricultor de contacto*, a model farmer chosen by the local extensionist, is a mechanism applied by the public extension service to underpin these achievements.

## Recommendations

### DoA, NGOs, associations

- Focus on enabling adaptive extension workers and producers (especially if restricted by limited resources);
- Involve farmers in the selection of model farmers;
- Identify early adopters/ influencers/ senior farmers who can play a significant role in knowledge and innovation dissemination.

### Challenge: Use of (social) media

Using media channels is a comparatively affordable method of disseminating information with a broad outreach but its potential has not yet been fully exploited. It could be used by ministries and extension services (public and NGOs) to compensate for the lack of information flow. It should not be forgotten, however, that many small-scale farmers have little or no access to smartphones, radio or TV.

## Recommendations

### Ministries, DoA, NGOs

- Disseminate information via radio and television, and where possible for farmers via SMS/WhatsApp or phone calls;
- Use the appropriate dissemination channels for the corresponding information, e.g., market prices or warnings (such as 'attention, Glyphosate is toxic') via SMS, photo WhatsApp groups for pests and diseases, information on climate or pesticides via radio;
- Encourage the use of social media and messenger services;
- Support the use of or design easy-to-handle Apps, e.g., for market prices or pest and disease identification.

### **b) Training of extensionists and farmers**

#### Challenge: Provision of regular and up-to-date training for extensionists

A major challenge with regard to training relates to updating the agricultural knowledge of extension workers. Providing advanced training for extensionists is essential and could also help to counteract the poor extensionist-farmer ratio: Studies have revealed "that training and education of extension workers [...], rather than extension worker/farmer ratios, has a greater impact on the efficiency and effectiveness of agricultural extension" (Mafunzwaini et al., 2003, p. 3).

#### Challenge: Training content

Producers have voiced their criticism of the topics discussed during trainings, which they see as not always relevant to farmer and not aligned to their various interests and priorities. Farmers who apply a range of organic techniques, for example, object to the topic of chemical products and their application at the CDR training. This poses a challenge to extension workers since they are obliged to offer solutions to a variety of farmer problems.

#### Challenge: Insufficient training material

Training material for association members is limited and often inadequate. The content has not been adapted to the urban context. Although training material is kept at the *casas agrárias*, it is not distributed to the farmers.

#### Challenge: Limited language skills

Limited language skills (in Portuguese) hinders access to information and inhibits active participation and knowledge sharing during trainings. Documentation on the internal workings of the association is likewise in Portuguese, thus excluding many of the association members from this information.

## Recommendations

### DoA/MASA, NGOs

- Ensure regular extensionist training (e.g., by IIAM, MASA, NGOs);
- Ensure exchange between extensionists;
- Update knowledge/training content regularly and with topics corresponding to farmer needs (mainly on agro-ecological or organic production methods, soil-building, composting, intercropping, crop rotation and ICT);
- Provide target group-specific consulting on certain topics (only for interested farmers) across all associations (use UNIAO to identify these needs);
- Implement extensionist specialisation on specific topics;
- CMM: continue to develop urbanGAPs, use draft version of urbanGAPs and training manual for farmers;
- Adapt training material to the urban context with a view to sustainable agricultural production;
- Improve access to information
  - Design information material with and for farmers;
  - Provide print material with illustrations and less written text;
  - Install a well-structured library at *casas agrárias* or, if funds allow, at associations, display posters etc.

### c) Linkage R&D, extension service and associations

#### Challenge: Weak linkage between R&D and extension service and associations

Although connections between the extension service and research institutions such as IIAM and UEM exist, the bond could be stronger in order to profit from research findings, e.g., on urban agro-ecological production methods, seed production and pest control and prevention. For the most part, extension workers complained that research results are rarely shared with them.

## Recommendations

### R&D, DoA, associations

- Improve linkage and information exchange between R&D and extension service to close the gap between R&D and practice;
- R&D: Consider farmer needs for research, design research lines jointly with farmers and introduce institutionalised mechanisms for farmer feedback.

#### Good practice: Research students

Four faculties at the University Eduardo Mondlane (UEM) conduct research on agricultural production and its relevance to the urban context: the Agronomy, Veterinary Medicine, Geography and Arts and Social Science faculties. Agricultural research at the faculty for Agronomy is divided

into three departments: plant protection and sanitation, extension, soil and production. Notably the soil department has conducted surveys in the green zones of Maputo. Students are sent twice a year to the various districts to train producers in agricultural practices. The Veterinary faculty is likewise involved in research and training. The faculty of Arts and Social Science is represented by the department of sociology, which carries out research on urban food systems, food security and urban agriculture. The department of sociology hosts the master course on rural sociology and development management (MSG), which is a UFISAMO partner.

### Recommendations

#### University faculties

- Discuss research lines with associations and adapt them to farmer needs;
- Institutionalise feedback to farmers, make faculty management responsible for this and its form of expression (e.g., presentations, training material).

### Good practice and challenge: agricultural and other research

Research is conducted by a number of actors (e.g., UEM, IIAM, international organisations, research networks). Results are not always easily accessible and exchange between institutions is wanting. The value of farmer knowledge is underestimated. Both IIAM and UEM have experimental plots to generate knowledge and, in the case of UEM, to provide students with first-hand experience in agriculture. At UEM, the area designated as an experimental plot is currently unused. In general, knowledge transfer between farmers and researchers is poor: a more dynamic knowledge exchange could occur if farmers were invited to summer schools or agronomy students encouraged to engage in agriculture.

### Recommendations

#### University faculties, IIAM, international research

- Integrate existing research results, especially from the IIAM, and local innovation experience into the project process. It makes sense to integrate the IIAM into future third-party funded projects in order to avoid duplication, build on experience and include the interface between research and politics;
- Establish a demonstration plot for trial innovation and accompany the work with a graduation thesis. Cooperate with IIAM and establish a transfer system to the extension service;
- Research gaps: a feasibility study on the transformation of associations to a co-op system, with the aim of providing a new central market (Zimpeto 2.0);
- UEM Agronomy faculty should have a full professorship for urban agriculture that focuses on small-scale production methods. This position should transfer research results from UEM colleagues, i.e., a long-term pest and disease project or soil-building research into practices for urban farmers. An exchange with universities in other cities could reduce duplication and improve research coordination;

- Research results and discussions with farmers have shown that the educational background is low, although some farmers have been to university. A great number of farmers generate a higher income than expected. A campaign with agronomy students could make farming attractive and help young graduates to find a perspective in farming, either as urban farmers in Maputo or in the surrounding areas of Boane, Marracuene and Namaacha. Graduation in farming could lead to innovation in the field;
- Transfer of the rural invest programme to an urban invest programme. The curriculum would include the challenges to entrepreneurial thinking;
- UEM should provide summer schools for farmers and students, following the example of the Sustainability Institute/Food Lab in South Africa, to link practice and theory.

### 6.5.3 Challenges, good practices and recommendations for innovation and dissemination in Cape Town

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Based on data collected during the UFISAMO research, the challenges and good practices identified in association with the dissemination of knowledge and information in Cape Town and the subsequent recommendations refer to:

- Training and follow up by NGOs and the extension service (DoA);
- Farmer to farmer exchange and learning;
- Policy environment.

The recommendations are intended to show how farmer empowerment can be enhanced. The research identified farmer dependency on NGOs as one of the obstacles to urban agriculture developing its full impact. NGOs have proven crucial to providing knowledge and information. They should maintain this role, but at the same time support farmers in peer knowledge exchange. Changes to knowledge dissemination rely partly on changes to organisational structures and should accompany the suggested changes to production (see Chapters 6.2 and 6.3).

#### a) Training and follow up by NGOs and DoA

##### Good practice: Advice to and training of home and food gardeners by NGOs

NGOs like Abalimi Bezekhaya or Soil for Life focus on the training of home gardeners, mainly in the townships, and have enabled thousands of gardeners to produce vegetables in their own backyards. Abalimi offers a three-day basic garden course at their garden centres. These courses are hosted by local trainers, are pro-active, include theory and practice, and are adapted to the trainees in terms of language. There are also special training and workshop offers for youth (up until 2016) and farmers who are setting up or joining a food garden on public land with other farmers in order to produce and sell at a market.

Soil for Life trains home gardeners in a three-month cycle. Gardeners take part in weekly workshops and are encouraged to establish their own home gardens. These are monitored by the trainer team. The training content ranges from seed harvesting, composting and soil-building to recycling and re-using material. Trainers are accompanied by the organisation's trainer of trainers and receive a weekly input. One objective is to establish linkages between course members and initiate farmer to farmer exchange. Courses are conducted in Afrikaans, *isiXhosa* or English and the training material is likewise written in these languages. Farmers who set up food gardens are monitored by the NGO extension team.

### Recommendations

#### NGOs

- Customise training content to farmer needs (e.g., production planning, marketing skills), use good practices and experience from well-established NGOs with a view to farmer independence and empowerment;
- Establish agri-hubs and offer one-year training courses adapted to agricultural education curricula (instead of offering a multitude of workshops);
- Use farmer-appropriate training methods: hands-on, practice-oriented, topic trainings (instead of PowerPoint presentations), carry out trainings in farmers' gardens/farm visits, carry out regular follow-ups, use farmers as facilitators;
- Simplify access to information: posters in gardens, NGO information networking.

#### Challenge: Lack of follow-up visits after trainings

Irregular follow-up visits by supporting institutions (usually NGOs, rarely DoA) diminish the training impact as farmers miss out on the opportunity to discuss their experiences and lessons learned. Farmers should be able to request expert help on specific issues.

### Recommendations

#### NGOs, DoA

- NGO and DoA support should include farm monitoring and an ongoing impact assessment to accompany farmers in their process of learning and improvement;
- Extension services, whether government or NGO, need to be strengthened to cover farmer needs (with a focus on enhancing farmer independence and empowerment);
- Embed post-training follow-ups as an integral part of the trainings (ensure financial backing and/or look for funding);
- As a follow-up alternative, use regular peer visits by farmers who have participated in trainings. Promoting farmer exchange/bringing farmers together has been evaluated by the research farmer group as one of the major impacts of the participatory UFISMAO research.



Good practice and challenge: Demonstration areas/garden centers

Demonstration areas/garden centres are opportunities for NGOs to showcase their principles and techniques, to experiment with different practices and to include farmers in the process of experimentation. The focus, however, is on showcasing practices; there is no immediate opportunity for hands-on farmer training.

**Recommendations**NGOs

- In addition to showcasing good agricultural practices at the garden centres, use demonstration plots as a venue for workshops or trainings;
- Promote joint work on farmer plots and the exchange of ideas observed while visiting each other's plots (enhance farmer to farmer exchange and field visits);
- Strengthen a participatory learning approach at demonstration plots, starting with the joint creation of plots.

Good practice: Senior farmers as innovation brokers

Some farms are guided by consultancy or senior farmers who actively support farmers in their production activities. Senior farmers who take responsibility and link urban farmers to other actors are relevant innovation brokers. Their reliability is important to proof success stories and to use community change makers to adaptation of innovation.

Challenge: Involving youth

Integrating youth into urban agriculture is crucial. UA needs to become more attractive, more profitable and more open to youth if young people are to set their sights on this field. Currently, most farmers are over the age of fifty, making it difficult for the young to gain entry into the field of horticulture. Small start-ups that go beyond mere production could make urban agriculture a more attractive option. This calls for a strengthening of entrepreneurial thinking (see recommendations for Maputo).

**Recommendations**NGOs, government

- Stronger support for senior farmer links with other relevant UA actors to enhance their visibility and outreach (financing to be ensured);
- Finance/support trainings and organic agriculture traineeship for senior farmers. Use training opportunities at Elsenberg, Sustainability Institute, Spier, PEDI;
- Pro-active search for ways to involve youth in urban agricultural activities. Design small business opportunities (e.g., in compost-making and marketing: see also recommendations for Maputo).

## b) Farmer to farmer exchange and learning

### Good practice: Farmer to farmer exchange

Speaking the same language and understanding each other's challenges allows farmers to open up and share experiences, challenges and solutions. Farmer to farmer exchanges are the prerequisite for further cooperation.

### Good practice: Field visits

Field visits are an inspirational tool to learn from others, to observe, to compare individual methods of farming and to see good practice in the field. They produce the evidence that techniques or principles can work and carry more weight than a lecture or training by an expert.

### **Recommendations**

#### Farmers

- Enhance farmer to farmer exchange and field visits as a learning tool and as a means of promoting farmer interests (e.g., Gauteng, where farmers succeeded in establishing direct marketing networks);
- Support farmer-based initiatives and farmer groups for knowledge exchange. This provides an opportunity to ask fellow farmers questions, to visit and experience other farms/gardens, and to provide hands-on training;
- Avail of offers in the Western Cape (SEND ME), traineeships, links to academia, and training opportunities at PEDI.

### Good practice and challenge: Use WhatsApp groups to share information

Messenger channels are an easy ICT tool that allows farmers to communicate via text message, voice mail or photo. Group chats combine to generate considerable knowledge and facilitate farmer to farmer exchange with technology. Barriers such as lack of transport can be partly overcome, as virtual meetings are possible. WhatsApp messages/groups can, however, lead to tension, misunderstandings and conflict. In addition, farmers who are offline (lack of data, stolen smartphone) are excluded from discussions, decisions and business arrangements.

### **Recommendations**

#### Farmers, NGOs

- Use messenger channels carefully and be mindful of misunderstandings, rumours and conflict;
- Groups need group facilitators or administrators with a defined set of rules (to establish a group, define group members, clarify group objective, purpose, problem solution).

Good practice/challenge: PGS visits

PGS is a valuable tool for knowledge and information dissemination. The Participatory Guarantee System (PGS) links consumers and producers via farm visits. This is a bottom-up system whereby a group of farmers define a production guideline (e.g., Western Cape PGS) that guarantees production in line with organic and agro-ecological principles. Monitoring visits are based on checklists. These are filled out by farmers in advance (self-assessment) and monitored by the those present during the visit. The visiting group consists mostly of fellow farmers, NGO staff, interested consumers and retailers. During the process of ticking off the checklist, farmers give each other advice or – as auditees – ask for help.

Practical implementation of the system has shown, however, that it only makes sense if a market exists and that its success depends on the engagement of whoever is in charge (since the system is volatile). Another challenge is financing the transport of farmers to exchange visits.

**Recommendations**NGOs, farmers

- Communicate PGS as a successful system, as observed in the Western Cape and (introduced in 2018) Cape Town;
- Link PGS to a local label (branding) to increase recognition value;
- At the same time, create niche markets and consumer awareness campaigns.

Good practice: Conferences and dialogues

Other information channels are conferences and workshops, where Cape Town's sustainability environment provides a platform for a range of activities, e.g., the Festival Food and Culture in District Six museum in November 2017, Seed Campaigns by the Food Sovereignty movement in 2018 or the Agro-Ecology Festival in 2019. Dialogue with consumers (e.g., through the Harvest of Hope and Umthunzi network) or contact with experts are further platforms for knowledge exchange.

Researchers from academia who have a profound knowledge of the UA landscape and its impacts should be included in dialogue forums. In general, a regular exchange between the different knowledge providers should be encouraged and supported.

**Recommendation**Farmers, NGOs

- Ensure that farmers receive information on upcoming events and facilitate active farmer participation (share information, invite others, common transport).



## 7 Conclusions

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Urban agriculture is frequently promoted for its potential contribution to food and nutrition security and has gradually become part of policy maker visions of a 'sustainable city' and of climate change adaptation. Researchers and activists alike praise the multiple benefits of urban agriculture, which include social benefits as well as the economic and ecological advantages mentioned above.

Urban agriculture is an ancient practice that has over time gained currency in periods of crisis, when supply routes to cities are severed and rural production is interrupted. In the Global North it expresses a certain lifestyle, while in general in the Global South, food production for home consumption or marketing carries more weight than the lifestyle aspect.

Urban and peri-urban production sites have a comparative advantage when it comes to delivering fresh, nutritious and high value horticultural products and vegetables, all of which are sensitive to transport and heat, notably in regions where supply chains and cooling facilities are inaccessible to producers.

Urban agriculture is also under pressure: the globalised food economy is in the process of transforming consumer habits and supply patterns. Worldwide urbanisation trends lead to accrued competition for land, while soil and water sources in cities are exposed to higher contamination risks from industry and human settlement, and, last but not least, policy support is no more than partial and usually inconsistent.

Urban agriculture comes in many shapes and sizes. This research focused on small-scale urban agriculture with vulnerable communities as the main actors. Medium- and large-scale commercial producers such as those in the Philippi Horticultural Area (PHA) of Cape Town and innovative but high-input intensive agricultural systems similar to those found in the cities of the Global North (e.g., Japan, Netherlands) were excluded from the research.

The main objective of the UFISAMO project was to find out whether urban agriculture in Cape Town and Maputo genuinely contributes to the urban food system, to food and nutrition security and to income generation for the producers concerned. In a second step, the implementation of 'good practices' in the different lines of research was geared to making recommendations that would enhance the positive impacts of the practices observed. The challenges identified in the course of the research formed the basis of the recommendations to overcome them.

Following a broad view of the context in both cities, this concluding chapter answers the main research questions systematically and presents a brief outlook on the future of urban agriculture in Cape Town and Maputo.

### **Two cities, two settings**

The results presented in the previous chapters clearly show the differences between Maputo and Cape Town in terms of history, climate and the overall economy. Urban agricultural conditions

and practices likewise differ in each of the two cities. Both host a wide range of urban agricultural forms: individual home gardens, farmer associations, cooperatives, school gardens and community gardens. Despite a similarity in the diversity of these forms, the differences prevail. This is due for the most part to the historical developments in each city that continue to shape the structure and significance of UA.

Maputo suffered a severe food crisis after the Declaration of Independence in 1975. The outbreak of civil war in 1977 and the isolation of the country by western states intensified the crisis. In an attempt to overcome this crisis, the Mozambican socialist government fostered agricultural production by smallholders, cooperatives and associations in the 'green zones' of Maputo. UA in Maputo is formally organised in farmer associations, association unions and a national union of farmers, all of which ensure the representation of producer views and concerns at the various policy and decision-making levels. The state plays a key role through the municipal council and the Department of Agriculture in providing agricultural extension services and overall guidance on production and markets. Political support, organisational design from grassroots to national level, 1 300 ha of land and a market for products grown in the green zones have all helped to shape a vibrant urban agricultural landscape that has maintained its importance to the present day.

Understanding the evolution of UA in Cape Town calls for a close look at the history of apartheid, a system that divided the city into vast areas where the so-called 'black' and 'coloured' population lived in precarious economic and social conditions, and a wealthy, attractive area reserved for 'whites' only. NGOs were the first to initiate urban agriculture during apartheid. They are still active and support unemployed and vulnerable residents by strongly encouraging organic horticultural production and organising produce marketing. NGOs promote both individual home gardeners and community gardens, and decide on the production process and marketing procedures. Cape Town designed a policy outlining the promotion of UA, with the overall aim of tackling food insecurity, unemployment and social tensions in the more deprived townships of the city. Although never fully implemented, this policy has been repeatedly reviewed. Consequently, UA in Cape Town is highly diverse, ranging from small-scale home gardens on the sandy soils of Khayelitsha to lifestyle gardens in the city centre and the commercially exploited PHA, but it has failed to meet the expectations of policy makers, i.e. to contribute to food security and employment. Urban agriculture among the vulnerable urban population of Cape Town is mostly fragmented, small-scale, and far from lucrative.

### **Does urban agriculture play a role in the urban food systems of Maputo and Cape Town?**

Generally speaking, the contribution is low in Maputo and even negligible in Cape Town. Small-scale urban agriculture produces a narrow range of products in limited quantities (green leafy vegetables in both cities, with the addition of horticultural fruits in Cape Town). There are clearly designated peak seasons and there are lean seasons when very few products reach the market. The overwhelming amount and assortment of food in both cities is sourced from rural production (staples, fruit, meat, milk) or imports (Maputo and Mozambique source large amounts of food from South Africa). The comparative advantage of the rural areas in terms of available land, soils and water, flanked by targeted policy support for industrialised rural agriculture, leads to scale

effects that easily outcompete urban production. Penetrating the urban food system is a major challenge for urban producers.

In Maputo, producers organised in associations supply lettuce and cabbage to the local market. For the most part their products are purchased directly from the field by intermediaries who re-tail them to shops and markets. The number of small-scale producers in Maputo (and the amount of land cultivated) by far exceeds the number of producers in Cape Town. Lettuce and cabbage are the only green zone products to reach the markets and make up only a small part of family diets. Processing options for these products are limited. Despite their undisputed health benefits, *Sauerkraut* and *Kimchi* (fermented cabbage), for example, do not yet belong to the major eating habits of the local population. Most fresh food products available at local wholesale and retail markets or at supermarkets and corner stalls are imported from South Africa. The heavy focus on the conventional production of lettuce and cabbage leads to greater use of pesticides and consequently greater health risks.

In Cape Town, small-scale horticultural township products fail to penetrate local markets, regardless of the type or size of the shops and stalls. On the whole, the food system in Cape Town is still highly segregated, with the affluent city centre and richer neighbourhoods well-endowed with shops that stock a broader variety of better quality products more often than not at cheaper prices than those of supermarkets in the townships. The major source of food products in the townships are small *spaza* shops that sell all kinds of items for daily use but have only a small choice of fruit and vegetables. Supermarkets are not interested in buying from urban small-scale farmers, since the quantities produced by individual food gardens or individual producers are inconsistent and too small to be viable. In addition, quality standards are not always met. Horticultural township products only serve niche markets, which are driven by the social choices of more affluent clients (individuals and restaurants). The processing of township products is marginal. Nonetheless, there is a visible trend towards healthier and more environmentally friendly production in Cape Town. Small-scale farmers avoid using pesticides and crop diversity is comparatively high.

The case of the PHA is a different matter: medium- and large-scale – mostly 'white' – male farmers cultivate 1 100 ha of land on an industrial scale. Their products reach the urban food system through the Fresh Fruit Market. It is estimated that up to 40% of fresh vegetables at this market originate from the PHA.

### **Does urban agriculture generate income for urban producers?**

Urban agriculture is not the panacea that will solve the issues of unemployment and low income. Neither can the promotion of UA be a substitute for a social security system.

When producers manage to reach the markets, however, they do generate income that adds to their household cash and overall financial resources. Again, the financial benefits in Maputo are very different to those in Cape Town, which is primarily due to the size of and access to the markets, but also to production conditions, such as soil quality, water availability, input costs, climate and the resultant production cycles.

Maputo farmers produce in 30-45-day cycles almost all year round. Productivity decreases during the periodic heavy rainfalls from January to March and in the dry hot summers when water is

scarce. Intermediaries come to the fields to purchase entire beds of cabbage or lettuce. As a result, up to 80% of the over 10 000 association farmers generate most of their income from urban agriculture. Apart from the producers and their families (taken together, approximately 40 000 people), other actors such as the *maguevas* (intermediaries), specialised service providers (e.g., members of the watering association), and employee farmers also derive an income from green zone production. All told, this amounts approximately to a further 40 000 people according to the literature. In conclusion, between 4 and 8% of the population of Maputo depends on agriculture in the green zones for their income. These earnings, however, are far too low to allow farmers to step up, since they barely cover basic needs such as the 'food basket', housing, electricity, clothes, health, education and leisure. This is the reason why young people find the agricultural sector unattractive, choosing it only as a last resort. Numerous farmers and their family relatives are obliged to look for secondary occupations or additional income opportunities in low-qualified jobs.

Cape Town farmers generate almost no income from their horticultural activities. Consistent book-keeping even suggests that input costs and the labour investment involved exceed the income from sales, although there are exceptions where some manage to add to their other sources of income (mostly pensions). But the overall income effects are negligible: poor soils, no local markets, and competition from conventional vegetables grown on large scale in rural areas are the main obstacles. This sobering assessment is true even of more successful farmers who are well connected to the box-schemes that organise sales to niche markets in the affluent parts of town. Working poor soils with unreliable market access to sell produce is not an attractive prospect for most younger people in the townships: the majority of farmers in Cape Town, as in Maputo, are over 45 years of age. For the farmers, financial benefits are only one of many possible gains from urban agriculture, and they perform their work with sincerity, attention and pride. Indirect income benefits arise when farmers manage to produce for home consumption and can thus spend cash on items other than food.

### **Does urban agriculture contribute to the food and nutrition security of producers?**

Yes, but...

The income generated by urban farmers in Maputo allows them to purchase food and cater for other needs. The income generated by 70% of the farmers, however, does not cover the costs of the monthly food basket (7 500 MZN) as recommended by the Ministry of Health. In addition, urban farmers usually cultivate small plots at home for self-consumption. They produce a wider variety of vegetables on these plots, increasing the dietary diversity of family meals, which in turn helps to remedy monotonous and deficient nutrition. The positive impact on food and nutrition security remains primarily with the producers, since their products for sale are low in nutritional value, i.e., in terms of calories as well as vitamins and micro-nutrients.

In Cape Town, the main effect of UA is dietary diversity for the urban farmers themselves and their families. It is the vegetables produced and consumed by the home gardeners and their families (and neighbours) rather than the income generated (very little) that allow for a more balanced diet and less dependence on meals rich in sugar, oil and starch.



Food and nutrition insecurity has multiple causes. Many consider access to shops and produce availability at affordable prices to be the decisive factors. As discussed earlier, urban agriculture in both cities does not provide sufficient income to cater for a fully balanced, healthy and nutritious diet. Addressing food and nutrition insecurity in the cities of Maputo and Cape Town is a topic for poverty reduction programmes. Focusing solely on the promotion of urban agriculture is not enough.

(Lack of) nutritional knowledge is another aspect put forward to explain poor food and nutrition habits. The green zones in Maputo and the community and home gardens in Cape Town serve as a green oasis in an otherwise austere part of town. As showcases for vegetable production, they provide hands-on experiences for children and other inhabitants and can thus play an important role in nutrition education. Many community gardens are located in schools and some teachers use the premises to raise children's awareness and thus contribute to nutrition education. Nutrition education approaches are not systematic, however, and too few to counter the nutrition transition. The result is a high occurrence of obesity in Cape Town and subsequently of non-transferable diseases.

### **What other positive impacts result from urban agriculture?**

Farmers in Maputo plant predominantly for income, especially in association *machambas*. When they set up gardens around their homes, home consumption, leisure and aesthetic motives become equally important. There is an awareness of the beneficial health effects of freshly grown, untreated vegetables and of the positive impact of the green zones – islands of acoustic peace – on air circulation and climate. In addition, most farmers are organised in associations. Although this form of social organisation may not be fully exploited due to numerous dysfunctions, it nevertheless provides a framework for information sharing, mutual support and public representation.

Producers in Cape Town highlight the social benefits of farming and exchanging. Unlike Maputo, social interaction is by no means institutionalised here, and the politics of apartheid did its work of durably disrupting the social tissue and social cohesion of the city. Exchange between different language groups, between people categorised under apartheid as 'black' and 'coloured' is difficult and subject to cultural and political reservations. Racial prejudice and structural racism are still widespread, often unknowingly. This situation impedes an unhindered information flow and unbiased interaction. Meetings and interaction in the course of trainings and workshops have helped to overcome some of the apprehension. Being an active part of a training group is a start when it comes to bonding, building friendships and, in the long run, strengthening the social tissue of the community in the interests of mutual support. The ecological and health benefits of farming should also be highlighted: the many faces of the townships in Cape Town range from informal shacks to neatly planned neighbourhoods. All of them, however, lack parks, green spaces and areas for relaxation, where traffic is mute, and wind and sun are kept at bay. Community and market gardens are small havens of green in an otherwise densely built-up environment. The PHA area is vital to replenishing the groundwater around Cape Town, as it is located on the main aquifer and thus a major factor when it comes to sustainable climate change adaptation.

### **What are the main challenges and opportunities of urban agriculture?**

Markets and market access pose challenges to producers in both cities (albeit on a different scale) and tend to boost unsustainable methods of crop production in Maputo. Enhanced production techniques along good agricultural practices for the urban context (urbanGAPs) are needed if more reliable quantities are to be produced in line with existing markets and consumer habits, and if produce quality is to meet specific standards. In addition, the different organisational set-up in each city leads to a different set of challenges in terms of participation and self-organisation.

#### Maputo: production systems and markets

In Maputo, the main challenge to cultivating healthy urban products is the excessive and unsystematic use of pesticides coupled with an underdeveloped market for healthier products.

None of the interventions by the municipality, by extension workers or by NGOs has resulted in a measurable reduction of pesticide application in the field. Banned pesticides, for example, are often smuggled across the border and sold in unmarked bottles. To 'obtain a broader impact', pesticides are frequently mixed and tend to be used as a broadband weapon against unspecified growth problems rather than to combat specific pests or diseases. Pesticides are applied in response to the immense pressure caused by pests and diseases, both of which find favourable conditions in the local climate, the de facto monoculture of cabbage and lettuce, and inappropriate cultivation methods. Basic measures for non-chemical pest management are ignored. These include field hygiene, crop rotation, soil building, careful watering, companion planting or the planting of repellents. More specific measures such as hand-picking, interrupting the reproductive cycle by destroying eggs and larvae are underutilised. Beneficial insects fall victim to broadband pesticides and are unable to thrive. Biopesticides, on the other hand, are not efficient enough to curtail the impact of pests and diseases.

Producers have little incentive to change their production methods and adhere to organic or agro-ecological practices: there is a demand for conventional products despite sporadic poisoning from urban cabbage due to improper pesticide application (notably non-observance of the pre-harvest Interval). Cases like this cause periodic discomfort and lead to a drop in prices as less people are eager to buy – but the turmoil soon settles and consumers go back to purchasing conventional, heavily treated leafy vegetables. Although certain pesticides are banned, control mechanisms are weak. Extension workers, who should be promoting good cultivation practices and environmentally friendly techniques including the correct application of licensed pesticides, are occasionally pesticide dealers themselves and consequently have special interests. Heads of production in the associations should encourage good agricultural practices but often lack the authority or capacity to do so. Markets for organic pesticide-free products remain niche markets.

Campaigns advocating healthy products have been launched by ABIODES, a UFISAMO partner, and the municipality of Maputo. These must be sustained if consumer behaviour is to change. The higher price for organic products (due to higher production costs and longer production cycles) should be made transparent to consumers and the latter must be willing and have the wherewithal to pay for them. Consumers will ask for proof that the products are indeed healthier.

A Participatory Guarantee System (PGS – peer-reviews of production steps) has been introduced but so far failed to function on a large scale.

Transforming the production system of the green zones to introduce the basics of agro-ecological or environmentally friendly crop cultivation calls for a long-term strategy, since it requires a sequence of interrelated steps, including the introduction of other crops, the identification of markets for these crops, and knowledge transfer to the producers. And it will take convincing: the existing system seems to function; a newly introduced system is full of uncertainties. Only a market for healthy products can sustainably transform local production systems.

#### Maputo: associations and networks

Another set of challenges pertains to the functioning of farmer associations. These have great potential to disseminate knowledge, organise production and standardise certain procedures, organise market access and the purchasing of inputs, and organise processing. More often than not, however, they lag far behind their potential and are mainly used to access land use rights (DUAT) and organise basic tasks such as cleaning irrigation canals. The association movement needs to be revitalised if it is to develop its full potential and should encourage young people to become members. Associations and their leadership should be more transparent, and members need to see the advantages inherent in good self-organisation.

Networks across actor categories are almost non-existent. This leads to the absence of synergies between interventions and actors working towards similar objectives. The UFISAMO project supported the creation of a network between NGOs, associations and research representatives in the course of their research work. It will thrive if the actors concerned see added value in their meetings and plans, given that maintaining a network requires time, energy and financial resources.

#### Cape Town: Market access and production

Market access for urban products in Cape Town is currently limited: affluent customers reached by vegetable 'box schemes' and organised by NGOs or social businesses constitute the major outlet. Producers have rarely explored local township markets. Access to input is mostly mediated by NGOs. They provide seeds and seedlings that sell in their marketing schemes. Many of the products (e.g., brinjal, asparagus) are consumed by affluent box-scheme customers, while the majority of the population in the townships has no idea how to prepare them, since the said products are not part of their traditional food and thus not in local demand. Hence, urban producers have become dependent on NGOs: Provided they are still in operation, the latter supply inputs and regulate market access.

Research has shown that even well-established NGOs are not problem free. When the major market outlet of a big Capetonian NGO was forced to close down temporarily in 2018, farmer dependency on NGOs was a disincentive to actively look for other markets. Worse still, since input provision was tuned to distant markets that could not be accessed by individual farmers, most of the annual production ended as food waste.

Market diversification is vital if farmers are to become empowered entrepreneurs, either individually or as groups. Marketing, business planning and cost-benefit analysis has so far not been

part of the training content offered by NGOs. The latter focused primarily on improving individual production steps. A resilient urban farmer system, however, demands steps towards empowerment – ideally driven by the farmers themselves.

Market access will always depend on good production practices (e.g., urbanGAPs). If institutional customers, regardless of their location, are to source their products from urban farmers they will want consistent quality and plannable quantities. The application of urbanGAPs – here the focus should be on improving field hygiene – and more thorough production planning are advised.

Another critical factor in Cape Town is water: the 2017-2018 drought shows how fragile agriculture-based livelihoods are in the throes of climate change and an environment like Cape Town, where mismanagement of water resources, water waste and unequal access to water are the rule rather than the exception. Water-saving production techniques (e.g., mulching, windbreaks, drip irrigation) and drought resistant varieties should be at the centre of farmer training in order to show alternatives to currently applied techniques, all of which are futile in times of drought.

#### Cape Town: weak organisational structures

As mentioned earlier, NGO interventions have created dependencies: on inputs, innovative knowledge, marketing (when the organisation promotes food gardens). Rather than promoting them, these supportive structures discourage self-organisation and pro-active efforts, e.g., the search for markets, adapted information, like-minded people. Dependency can be comfortable and beneficial as long as the support structure functions. The long-term functioning of NGOs along the given lines cannot be guaranteed, however, bearing in mind the volatility of donor interest and the financial constraints of NGOs. If farming systems depend on the particular actions of external structures that could one day cease to function, urban farmers are in deep trouble.

In general, farmer networks have proved weak and are inhibited by time constraints, distances within the communities, and lack of transport resources. These obstacles are occasionally aggravated by farmer disputes, some of which derive from segregation policies that systematically accrued cleavages between the communities. The result is a heavy reliance on NGOs and the absence of an independent farmer network. Hence there is room for improvement to the efficiency of informal urban farmer networks. The reasons for joining forces are manifold: joint marketing; joint input purchases; knowledge exchange; specialisation (e.g., compost-making, biopesticide production, seedling production); lobbying.

There is strong potential for the emergence of urban farmer organisations, with existing food/community gardens providing a solid basis for the formation of producer groups, which would then feed into higher level associations. Farmers have begun to self-organise and network with other groups. These are promising steps on the way to more self-confident urban farmers creating networks and finding solutions to issues and challenges in ways they themselves deem appropriate.

#### **How does knowledge transfer work?**

Supporting actors in both cities have created structures that are crucial to disseminating knowledge, innovation and information. In Maputo, this knowledge transfer is mainly organised by state actors, i.e., public extension workers. In Cape Town, on the other hand, NGOs are the

chief information brokers. Both sets of actors work (to varying degrees) with in-field demonstrations (*campo de demonstração de resultados/CDR*; agri-hubs and garden centres). Both face the challenge that trainees use their training material only part of the time and both provide information to a vast number of people with different educational backgrounds, interests, problems and prior knowledge of agriculture. Trainers and extension workers often lack specific knowledge on aspects identified as important: production planning and business planning; administrative skills and book-keeping; marketing; support for self-organisation; processing; good nutrition; urban agriculture. They also lack systematic refresher courses to remain up-to-date on new developments in the agricultural sector: climate change adaptation and water saving; seed production.

Digital media usage is increasing, already well-established in Cape Town and strongly on the rise in Maputo. While social media groups allow for easy and cost-efficient networking and information sharing, they also bear the risk of excluding other actors and of spreading unconfirmed statements and rumours.

Farmer to farmer learning has proven the most appropriate method of information sharing. Horizontal knowledge exchange is appreciated, and farmers are trustworthy sources of knowledge as they operate in conditions similar to their peers. In addition, farmer potential for innovation should not be underestimated: farmers are under pressure, but they are capable of adapting to changing circumstances. They are also able to tailor innovations promoted by external actors to fit their own specific needs.

Nevertheless, inputs from third parties may be of importance for the promotion of further innovation. Close cooperation with universities and a reciprocal information flow are indispensable if farmers, too, are to benefit from research projects. In other words, research should be aligned to farmer needs and open to farmer requests for information, and researchers should present and discuss their results with the farmers concerned.

### **What constitutes appropriate policy support?**

Policy support for urban agriculture cannot replace social security programmes or policies geared to food security/food sovereignty and poverty alleviation. This research, along with many other scientific publications, concludes that urban agriculture has the potential to impact on income and food security but that large-scale positive impacts call for specific conditions. Policy support should focus on land tenure rights, on promoting products and production techniques that enhance public and environmental health as well as sustainability, and on providing interested farmers with the appropriate knowledge.

Farmers need secure land tenure if they are to invest in soil building, tree planting and sustainable practices. Real estate speculation in expanding cities is a lucrative business and highly tempting. That said, support for and the granting of land use rights should be sustained and become a policy maker priority: even in Cape Town, where financial benefits are marginal, UA plays a significant role for the urban gardeners along its multiple functions and deserves a secure space.

An urban agricultural policy does not per se translate into policy support. Nor does it necessarily strengthen the position of urban farmers: in Maputo there is no explicit UA policy, but state sup-

port for this activity is far more relevant than in Cape Town. Policies can generate an environment that fosters certain types of urban agriculture (e.g., sustainable, diverse, healthy, climate smart, organic) and help to create markets and sensitise customers to the benefits of urban products. Very few promotional campaigns have been implemented so far. They could be scaled up to transmit nutritional messages, promote more organic agricultural practices and encourage switching to more sustainable production techniques. The potential public health effect of greater nutrition would justify the expense of these campaigns.

Whether agricultural extension should be a public service – as it is in Maputo – or a private service – as Cape Town NGOs have offered and which could be a fee-based extension service – is debatable. If policy makers have visions of a 'sustainable city', then urban farmers should be part of those visions.

## 8 References

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## 9 Annexes

### Annex 1: Glossary

<b>Bakkie</b>	Pick-up car or truck in South African English
<b>Biopesticide</b>	Organic plant protection product
<b>Bloco</b>	Small production units in Maputo's associations
<b>Campo de demonstração de resultados (CDR)</b>	Almost all associations in Maputo have demonstration plots, which serve mainly to show farmers innovations in the farming system in line with the training and visit approach (T&V). As a dissemination tool, CDRs have a powerful impact.
<b>Canteiro</b>	Single beds in association fields in Maputo
<b>Casa agrária</b>	Casas agrárias are coordinated by the Directorate of DASACM and the DAE in Maputo. They are the local institutions responsible for policy implementation, as well as for animal and crop production and are located close to production sites. Each district has its own Casa Agrária.
<b>Dumba nengue</b>	Informal traders who mostly sell on the ground, often directly around the formal markets: In Southern Mozambique, the expressions <i>dumba nengue</i> (trust your feet) and <i>kutsutsuma</i> (run if you can) are used to refer to activities in the informal economy. This terminology clearly reflects the tension that exists between informal traders and law enforcement agents. Compared with other cities in the region, however, Maputo has traditionally adopted a more tolerant approach to the informal economy. Policy interventions aim to discourage informality through registration and formalization rather than by eradication and punishment. Two main strategies have been pursued by the municipal government. First, formal urban markets have been established and existing informal markets have been upgraded and vendors now pay rent for stands. When Xikhelene market was upgraded, all trading on the streets around the old market was eliminated. Second, a simplified tax system was introduced in 2008 that requires traders to pay business tax either as a lump sum or as percentage of turnover. This initiative has been hampered by low uptake and strong resistance from the informal traders (Raimundo & Chikanda, 2016).

<b>Escola na Machamba do Campônes (EMC), Farmer Field School (FFS)</b>	A Farmer Field School brings together a group of farmers, livestock herders or fisherfolk, to learn on how to shift towards more sustainable production practices, by better understanding complex agro-ecosystems and by enhancing ecosystem services. A FFS group meets regularly during a production cycle, setting up experimentation and engaging in hands-on learning to improve skills and knowledge that will help adapt practices to their specific context. The FFS empowers individuals and groups to move towards more sustainable practices and improve livelihoods (FAO, 2019). Farmer Field Schools are found mostly in the rural areas but will only be established in Maputo in 2019 - based on the FAO approach.
<b>Ilima</b>	The migration to the urban area and a loss of close family and neighbour relationships in the Eastern Cape
<b>Lanchonete</b>	Small food stall for lunch in Maputo
<b>Lojas</b>	Agricultural store in Maputo
<b>Machamba</b>	Parcel of land used for agricultural production in Mozambique
<b>Magueva</b>	Informal intermediaries/re-sellers, habitually women, playing a powerful role in commercialisation in Maputo. Magueva is a word from Changana, used in southern Mozambique that characterises informal sellers who buy products in large quantities, mainly in the early hours of the day and sell them in smaller quantities with an increase in price.
<b>Patrilineal system</b>	In the patrilineal system (male descent) men ensure the preservation of lineage, preserving their unity and maintaining the social order, which gives them power and authority. In these societies, the public space is predominantly masculine, with women being more connected to the domestic sphere, to family life, more often than not they assume tasks related to the reproduction of the domestic unit (Loforte, 2000).
<b>Polana caniço</b>	Maputo: The 'reed' city ( <i>polana caniço</i> ) is marked by informal settlements established without an urbanisation plan. The area is dense with horizontal buildings and highly congested. Spaces for service provision are few and far between, as are electricity and safe water sources. Reed buildings are gradually being substituted by structures of more permanent material.
<b>Polana cemento</b>	Maputo: The 'cement' city ( <i>polana cemento</i> ) was originally built for the colonial elite, complete with residential buildings, infrastructure and economic functions. Colonial buildings in the art deco style and



tropical modernist architecture mixes with contemporary representative buildings often built by Chinese enterprises (Jenkins, 2015). Access to the cement city was restricted for 'non-whites' up to Independence in 1975 – they worked during the day in the inner-city neighbourhoods but were not allowed to settle there.

**Population registration act**

**(Terms 'white', 'black', 'coloured')**

After decades of apartheid's racial reasoning, the idea that South African society comprises four distinct races - 'whites', 'Coloureds', 'Indians' and 'Africans' - has become a habit of thought and experience, a facet of popular 'common sense' still widely in evidence. So, it remains the norm for the narratives we hear in public media or in conversation to designate unnamed social actors in terms of their race - as though this reduces their anonymity and renders their actions more intelligible. Nor is this simply an apartheid residue; there are ethical and political arguments - as in the Employment Equity Act, for example - for the renewed salience of racial identification in the project of 'transformation'. If apartheid's racial categories were previously the locus of racial privilege and discrimination, these very same racial designations are now the site of redress - for, how else can the damage be undone, and equitable treatment established?

Apartheid was underpinned by a hankering for order - an orderly society and an orderly state to tame the perceived dissolution and turbulence engendered during the 1940s. Apartheid's principal imaginary was of a society in which every 'race' knew and observed its proper place - economically, politically and socially. Race was to be the critical and overriding faultline: the fundamental organising principle for the allocation of all resources and opportunities, the basis of all spatial demarcation, planning and development, the boundary for all social interaction, as well as the primary category in terms of which this social and moral order was described and defended.

In terms of the Population Registration Act, passed in 1950, every citizen would be subject to one authorised act of racial classification, the result of which would be preserved in the form of an official identity document. All individual classifications were to be assembled in a centralised, national population register – a comprehensive database in which the racial identity of all citizens could be cross-checked against a battery of information about their access to work, social services, accommodation, taxation, marital status etc to ensure that all of these facets of everyday life were appropriately racially bounded and monitored. (Posel, 2018, p. 55)

What then of the fate of race? And how is the issue of racial classification implicated in it? Since 1994, with the formal demise of apartheid, the idea of race, racial identities and racial reasoning have become newly politicized as important sites of interrogation and con-

testation. The urgency of 'transformation' has accorded a new significance and politics to the idea and practice of racial differentiation. If ideas of race and racial difference are indeed as deeply embedded in the social fabric as this paper suggests, then it will require deliberate and strategic interventions from the state to refashion social relations and dismantle prevailing economic hierarchies. 'Race' has understandably been the site of that intervention. (ibid., p. 67)

**The Population Registration Act** of 1950 required that each inhabitant of South Africa be classified and registered in accordance with his or her "racial characteristics" as part of the system of apartheid (Wikipedia, 2019a). These "racial characteristics" were partly based on "scientific racism" - deeply imprinted in the Afrikaner nationalist circles - which postulated that "race" was a biological category and was determined on the basis of "blood" (Posel, 2018). Apartheid ideologues - with years of bureaucratic experience and knowing that biological race was nothing but a construct - opted for a "deliberately more flexible, elastic approach to the definition of racial categories [...] - one that gave official standing to long-established social readings of racial difference, which tied these judgements closely to hierarchies of social class. Race, said the Minister of the Interior, moving the Population Registration Bill, was a matter of social standing, and the authority to make that assessment rested with public opinion" (ibid., p.56).

Social rights, political rights, educational opportunities, and economic status were largely determined by the group to which an individual belonged (or to which the individual had been categorised). There were three basic racial classifications under the law: Black, White and Coloured (mixed). Indians (that is, South Asians from the former British India, and their descendants) were later added as a separate classification as they were seen as having "no historical right to the country".

An Office for Race Classification was set up to overview the classification process. Classification into groups was carried out using criteria such as outer appearance, general acceptance and social standing. Reclassification was not uncommon, and a board was established to conduct that process.

Under the act, as amended, Coloureds and Indians were formally classified into various subgroups, including Cape Coloured, Malay, Griqua, Chinese, Indian, Other Asian and Other Coloured.

The South African Parliament repealed the act on June 17, 1991. However, the racial categories defined in the act remain ingrained in South African culture and they still form the basis of some official policies and statistics aimed at redressing past economic imbalances

(Black Economic Empowerment and Employment Equity).

**Spaza shops**

Spaza shops are informal trading posts or convenience stores in townships or remote areas in Cape Town, often run from a person's home as a means of supplementing income.

**Townships**

In South Africa, the terms township and location usually refer to the often underdeveloped racially segregated urban areas that, from the late 19th century until the end of apartheid, were reserved for non-whites, namely Indians, Africans and Coloureds. Townships were usually built on the periphery of towns and cities (Wikipedia, 2019b).

**Zonas verdes**

After the independence of Mozambique in 1975, government decisions had led to a disincentive for rural farmers to produce food for the urban costumers (...). Thus, the Mozambican government encouraged urban agriculture in order to increase the food provision for cities like Maputo and Beira by providing tools and seed and by promoting the formation of officially Green Zones (green belt) for agricultural production. In the late 1980s and the early 1990s the Green Zones were marked by on-going conflicts between farmers and those who wanted to build factories and residencies in the area (Sheldon 2003 in: Barghusen et al., 2016).

**Xitique**

Xitique is a financial habit in Mozambique, an informal saving and credit arrangement based on mutual trust. Two or more people contribute a fixed sum which is lended in turn to one member of the group (Comundos, 2019).

## **Annex 2: UFISAMO - Leading questions<sup>30</sup>**

The leading questions for the research and work packages are presented below:

### **Overall leading question**

How can weaknesses and risks of urban agriculture be reduced, and potentials be developed for strengthening the impacts on food and nutrition security and income generation?

### **Specific leading questions for working packages**

#### **Work package 1**

- How are the food value chains structured in Maputo and Cape Town and what are the main limitations for the development of urban agriculture?
- Is there a potential for value-adding options through improving and diversifying urban agriculture systems?
- What is the general political and institutional framework for food and nutrition security?
- In what way does urban agriculture influence food and nutrition security?
- In what way does urban agriculture influence consumer behaviour and consumer habits and vice versa?
- Which measures can influence consumer behaviour and consumer habits (also of the producers themselves) for reaching a better/healthier nutrition situation?

#### **Work package 2**

- What are the main challenges of urban agriculture to human health and food security and what are the benefits?
- How can the challenges inherent to urban agriculture be reduced and how can a sustainable urban agriculture be promoted?
- How can the risks of urban livestock be reduced and how can a sustainable urban livestock production be promoted?
- What is the legal and institutional framework for promoting good agricultural practices?

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<sup>30</sup> UFISAMO (2017): Urban Agriculture for Food security and Income generation in South Africa and Mozambique, Inception report

**Work package 3**

- What are the main actors in research and dissemination of innovations in the field of urban agriculture in Southern Africa?
- How can UFISAMO contribute to these networks or should UFISAMO establish own local structures for networking?
- How can the scientific understanding of urban farming be strengthened within the academic sector?

**Work package 4**

- What are the characteristics of different types of organisations in urban agriculture?
- What are the main organisational challenges for producers/producer groups and what is the need for promotion?
- Which institutional framework exists for local capacity building and knowledge exchange in the field of urban agriculture?
- Which information systems and channels exist in urban areas and how can they be used for dissemination of innovation?
- Can the promotion of stakeholder dialogs and the realisation of scenario workshops promote the understanding of the importance of urban agriculture and how could they be institutionalised?
- What types of training and information material is necessary for different target groups and how can it be tested and distributed?
- What types of good practice examples identified in the WP 1 to 4 should be selected for further promotion and dissemination and how can dissemination take place?

### Annex 3: UFISAMO - Hypothesis and assumptions<sup>31</sup>

Topic	Hypothesis/Assumptions
Value chains	<ul style="list-style-type: none"> <li>▪ Due to the proximity of markets, local producers can easily access markets/ customers for their vegetables</li> <li>▪ However, international competition is strongest in urban centres, as imported products arrive there</li> <li>▪ Markets for urban products are twofold: either small but affluent markets for local products with a social touch and a certain quality (organic, community etc. - CT); or big local markets looking for cheap price rather than quality (Maputo)</li> </ul>
Risks and benefits crops	<ul style="list-style-type: none"> <li>▪ Utilisation of waste water for crop cultivation and cultivation on contaminated grounds makes healthy production and adherence to standards difficult</li> <li>▪ Organic standards cannot be met even if organic inputs are used as far as possible (conventional seeds, conventional manure, contaminated soils and waters)</li> <li>▪ Financial benefits from crop sales are marginal in a market environment without subventions</li> </ul>
Research and education network	<ul style="list-style-type: none"> <li>▪ Higher education in Mozambique does not have specific research and education programs on UA</li> <li>▪ There is no specific collaborative network in UA (in Southern Africa)</li> <li>▪ There is no Excellence Centre in UA</li> </ul>
Organisations	<ul style="list-style-type: none"> <li>▪ Associations and organisations are utilised to very specific ends only (e.g. obtaining DUAT/land tenure document); their potentials are not fully exploited</li> <li>▪ The urban context and more loose social fabrics makes the creation of associations and the self-organisation of interest groups difficult</li> </ul>
Food and consumption habits	<ul style="list-style-type: none"> <li>▪ Food habits – particularly among the youth, are strongly influenced by urban lifestyles and stand in stark contrast to more rural habits (fast food; potentially: preference for imported foods)</li> <li>▪ Food habits have a strong influence on the nutritional situation and, therefore, on the food security and health of the urban population – they contribute to obesity and/or malnutrition of consumers</li> <li>▪ Educational (school) level, purchasing power, health and nutrition awareness, as well as sociocultural aspects influence eating habits and behaviour of urban consumers</li> </ul>
Information & dissemination systems; transfer of research results	<ul style="list-style-type: none"> <li>▪ The urban context provides a large variety of options for dissemination of information as ITC are relatively more widespread and internet literacy is higher (than in rural areas), and as target groups are not spread over a vast territory</li> <li>▪ Many interventions have produced educational material and performed trainings. Success rate (i.e. maintained urban plot over a few years, multiplication of messages) is low as risks are high, profit margins minimal and other options for profit more attractive</li> </ul>

<sup>31</sup> UFISAMO (2017): Urban Agriculture for Food security and Income generation in South Africa and Mozambique, Inception report

## Annex 4: Number of association members in Maputo

### Number of members of associations from the Kamavota Municipal District (17\_AS\_MP)

Nº	Name of association	Founded in	Members		
			Total	Male	Female
1	Albazine	1977	320	262	58
2	Costa do Sol	1990s	238	8	180
3	Djaulane	1984	192	72	120
4	Eduardo Mondlane	1982	850	n/d	n/d
5	Armando Emílio Guebuza	1987	250	130	120
6	Graça Machel	1983	380	180	200
7	Joaquim Chissano	1994	1915	1012	903
8	Lirandzo	no data	1114	n/d	n/d
9	Massacre de Mbuzini	1986	60	43	17
10	Samora Machel	1983	913	300	613
11	Tomas Sankara	1986	385	80	305
	<b>Total</b>		<b>6617</b>	<b>2087</b>	<b>2516</b>

Caption: n/d=no data

### Number of members of associations from Kambukwana Municipal District (17\_AS\_MP)

Nº	Name of association	Founded in	Members		
			Total	Male	Female
1	25 de Setembro	n.d.	200	175	25
2	Alívio a Pobreza	1990s	120	78	120
3	Augusto Chirruete	1987	240	n/d	n/d
4	Sombra das Enxadas	2003	297	197	100
5	Dia da Família	2016	57	7	50
6	10 de Novembro	2012	130	30	100
7	Força do povo	1975	170	70	100
8	Luísa Dias Diogo	2006	250	100	150
9	Maguiguana 1	1980s	30	3	27
10	Marcelina Chissano	1986	200	75	125
11	Janete Mondlane	1990s	58	3	55
12	Centro das Mulheres	1975	14	0	14
13	8 de Março	1980	11	0	11
14	Josina Machel	no data	135	n/d	n/d
15	Marcelina Chisano	no data	237	n/d	n/d
	<b>Total</b>		<b>2.139</b>	<b>738</b>	<b>877</b>

Caption: n/d = no data

## Annex 5: List of UFISAMO products

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- Flores, Fernández E. (2018). Backyard horticulture in Maputo. Research Report. UFISAMO-Project
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- Quive, S. (2018): Outline for an academic module on urban agriculture in Maputo.
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### Conference participation and contributions (papers, posters, presentations)

- Paganini, N. (2019). Understanding a City through food: An analysis of sustainable urban food systems in Cape Town and Maputo. At the institute for social development, University of the Western Cape
- Paganini, N. (2019). Urban Agricultures potential contribution towards a more sustainable urban food system in the vulnerable neighbourhoods of Cape Town and Maputo. At Sustainability Science - Global Leadership Initiative (GPSS-GLI), University of Tokyo
- CGB International Conference on “Contemporary Issues in Food and Food Security” in Maputo, Mozambique, 4-5 July 2019: Presentations: ‘It is not about spinach: The role of local markets for urban farmers within the food system of disadvantage neighbourhoods in Cape Town and Maputo’ (Paganini & Khan). ‘Urban agriculture uptake in Southern African Cities: Bottom-up approach perspectives from the Cape Flats’ (Kanosvamhira). ‘Crisis and urban landscapes of informal food enclaves: The experience of the city of Gweru in Zimbabwe’ (Tevera). ‘Mahala: Challenges and Opportunities of Marketing Agricultural Production in Maputo City’ (Mutisse, Cumbana & Quive).
- Society of South African Geographers' Student Conference. 8-10 July 2019. Presentation ‘Urban agriculture in Mitchells Plain, Cape Town: Examining the linkages between urban farmers and supporting actors’ (Kanosvamhira).
- Conference ‘Agro-ecology for the 21st century’ in Cape Town, January 2019. Fishbowl on: A reflection of the 2-year Urban Agro-ecology research for food security and income generation within Cape Town and Maputo, supporting farmers as researchers, creating Guidelines for Good Agricultural Practices and with encouraging outcomes such as building solidarity between farmers. (Luis, Khan, Mahalambe & Paganini)
- III International Conference on Agriculture and Food in an Urbanized Society (AgUrb), September 2018 in Rio Grande del Sul (Porto Alegre): Chicamisse Mutisse - conference paper: Policies and public action that stimulate food production and income generation in Maputo city’s agriculture and livestock associations – the mismatch between promise and practices. Porto Alegre
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- ISDRS Messina, June 2018: Presentations on: urbanGAP innovation (Paganini, Kühn, Schelchen, Engel & Fiege) and Impact of urban agriculture (Paganini, Schelchen & Karriem)
- African Centre for City Conference, Cape Town, February 2018, Presentation Urban Agriculture in Southern Africa’s cities: urbanGAPs for a Sustainable Urban Food System. The case of Cape Town and Maputo. (Paganini & Schelchen)

- 8th Annual Conference AESOP Sustainable Food Planning group, 2018. Conference proceedings published: Paganini & Schelchen (2018). Food Planning for Organic urban Agriculture in Southern Africa's Cities. Sustainable Urban Food Systems with urbanGAPs for Horticulture Production In: TORNAGHI Chiara (editor) (2018), Re-imagining sustainable food planning, building resourcefulness: food movements, insurgent planning and heterodox economics. Proceedings of the 8th Annual Conference AESOP Sustainable Food Planning group. Coventry: Coventry University. pp. 176-179
- AESOP Conference in Coventry, November 2017: Presentations on: Sustainable urban food planning (Paganini & Schelchen) and Participatory Guarantee Systems as planning tool for organic urban agriculture and as knowledge hub (Paganini & Schelchen); Posters on: Innovation Knowledge Exchange and Impact of Urban Agriculture
- International Urban Farming Conference/ Grüne Liga Berlin e.V., September 2017 in Berlin: Facilitation of session to Edible Cities and Presentation: Urban Agriculture for Income Generation and Food Security in South Africa and Mozambique. (Paganini & Schelchen)
- Tropentag Bonn, September 2017, Presentation: UFISAMO Reflection after 1 year (Engel), Posters: Innovation Knowledge Exchange (Schelchen) and Impact of Urban Agriculture (Paganini & Schelchen)
- ISDRS conference, Bogotá, June 2017: Presentations: Innovation and knowledge exchange systems for sustainability: The case of urban agriculture in Maputo, Mozambique (Paganini & Schelchen) and Planning edible cities Food Planning in Southern Africa's cities: urbanGAPs for crop production from small scale agro-ecological backyards to organic market gardens (Paganini & Schelchen)
- UCT Colloquium Identity and Consumption in African Cities in Cape Town, March 2017: Presentation UFISAMO Approach (Karriem, Paganini & Schelchen)
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### **UFISAMO Project documents**

- Chicamisse Mutisse, L. (2017): PW 4.2: Estrutura organizacional da agricultura urbana. Materialband
- Cumbana, I. (2017): WP1 – Hábitos alimentares e comportamento de consumidores urbanos. Relatório preliminar. Materialband
- Paganini, N. (2017): Preliminary Results: WP 2.1 Benefits and Risks Horticulture Production & PhD Thesis Sustainable Food Planning. Materialband
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- UFISAMO (2017): Urban Agriculture for Food security and Income generation in South Africa and Mozambique, Inception report
- UFISAMO Project 2017: Zwischenbericht zum Projekt UFISAMO.
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#### **UFISAMO-Newsletters**

- UFISAMO Newsletters: 1 QY19, 3 QY18, 1 QY18, 4 QY17, 3 QY17, 2 QY17, 1 QY17, 4 QY16



