



Fruit and Vegetables
for Sustainable
Healthy Diets

How can food environments support greater fruit and vegetable consumption in Tanzania?

A multi-stakeholder workshop to share findings and co-develop recommendations for interventions in Arusha Region

December 2024



World Vegetable Center



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Cover image: *Workshop participants in a small group discussion to develop and refine recommendations to address identified challenges, to support greater fruit and vegetable access in Arusha Region.*

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Background

As the first phase of the CGIAR Fruit and Vegetables for Sustainable Healthy Diets (FRESH) Initiative draws to an end, a multi-stakeholder “collaborative needs assessment” workshop was held in December 2024 to share findings from the lived experience research on food environments carried out in Arusha Region, and discuss recommendations for possible interventions to support greater fruit and vegetable consumption. Food environments are the settings in which people acquire and consume foods (Swinburn et al., 2013; Turner et al., 2018; Downs et al., 2020). This includes places where foods are purchased, grown, shared, distributed, or harvested from the wild (Bogard et al., 2021).

The workshop described in this report follows an initial collaborative needs assessment workshop conducted in March 2024, which brought together diverse food systems stakeholders to identify challenges and opportunities relating to the various dimensions of the food environment (Turner et al., 2018): fruit and vegetable availability, prices, product and vendor properties, marketing and regulations. An overview of ideas emerging from this first workshop are included in **Annex 1**. Both workshops have been co-hosted with the Arusha Sustainable Food Systems Platform, a multi-stakeholder group led by Rikolto and a key partner of the FRESH Initiative.

During the period between these two stakeholder events, a research protocol (also implemented in Sri Lanka and the Philippines through the FRESH Initiative) has been adapted and applied in two communities in Arusha Region, Tanzania. This comprised in-depth interviews with 30 fruit and/or vegetable vendors and 10 people directly involved in food acquisition for their household (“consumers”); followed by participatory photography (“photovoice”) with a sub-sample of 10 vendors and 10 consumers.

This research was implemented in contrasting areas: one peri-urban community, characterised by a high density of retail outlets and close proximity to a main road and fresh produce market; and one rural community, with widespread access to land for cultivating crops (for home consumption or commercial production), but fewer retail outlets and more difficult market access. Selection of research sites was guided by insights from a census and mapping of food retail outlets conducted in October 2023, in a total of 33 communities selected to participate in a wider evaluation of interventions in the FRESH Initiative.

Aims and overview of workshop

Aims of this second multi-stakeholder workshop were:

1. **To share findings from qualitative research** which characterised experiences and interactions in food environments in selected communities of Arusha Region, and identify the factors which influence fruit and vegetable sale, acquisition and consumption from consumer and vendor perspectives;
2. **To validate research findings** through interactions with and between research participants and a diverse group of local food systems stakeholders;
3. **To co-develop recommendations to address identified challenges**, to increase the contribution of fruits and vegetables to healthy diets and livelihoods, which might be pursued in a future phase of the FRESH Initiative or taken up through other channels;
4. **To share the process of conducting lived experience research**, including the use of the photovoice method to document and foster discussions about the everyday realities and priorities of fruit and vegetable vendors and consumers in Arusha Region;
5. **To consolidate relationships with regional food systems stakeholders**, through the Arusha Sustainable Food Systems Platform and additional government stakeholders, local market representatives and research organisations.

A total of 37 participants joined the workshop, including eight members of the Arusha Sustainable Food Systems Platform and eight research participants (fruit and vegetable vendors and consumers). **Annex 2** provides a list of workshop participants' organisations, roles and gender. The workshop was held in Swahili, with support provided to a few individuals for translation to Maa (language of the Maasai people, the primary linguistic group in the rural community participating in this study), or English, as needed.

The agenda is included in **Annex 3**. Following welcoming remarks and introductions, the workshop comprised three main components:

- **Presentation of the research process and findings**, using the interactive format of a "StoryMap", by research assistants directly involved in the study's implementation;
- **A panel discussion with research participants**, in which vendors and consumers shared some of the factors which limit and enable their sale, acquisition or consumption of fruits or vegetables, accompanied by images they captured during the photovoice activity;
- **Small group and plenary discussions** to reflect on research findings and develop recommendations for interventions to address priority challenges which limit fruit and vegetable access in Arusha Region.

Presentation and discussion of findings

Presenting the StoryMap

A key output from this study has been the creation of an ArcGIS “StoryMap”, which allows users to navigate the research process and findings through an interactive online platform – including images and video footage taken by community members within the study setting, text suitable for a non-specialist audience and geographic information systems (GIS) based maps. The StoryMap will be available in both English and Swahili. A draft version in Swahili was presented at this workshop, with the aim of seeking feedback which could be incorporated into the final product.



Image 1. Research findings are presented through the ArcGIS StoryMap platform.

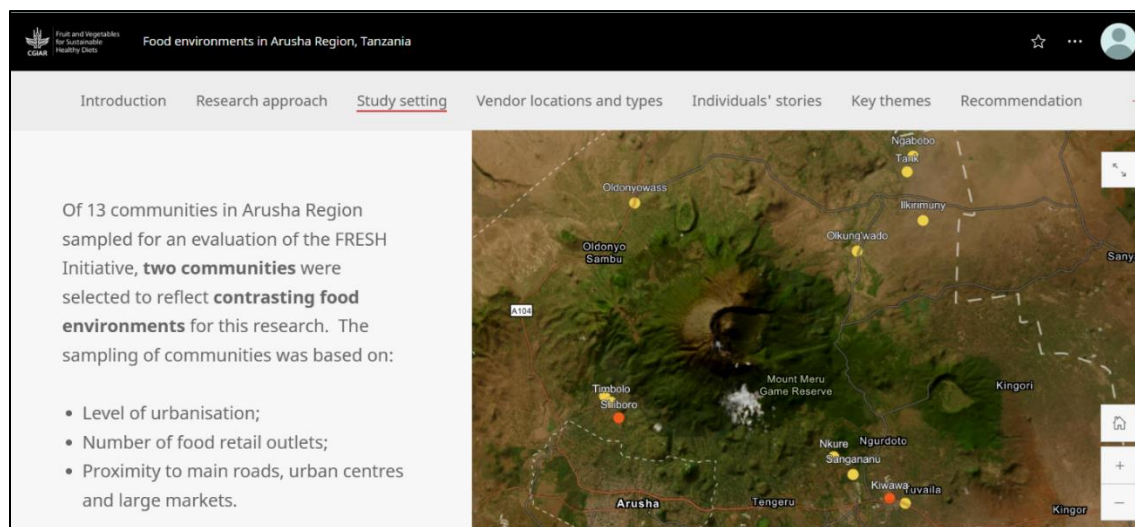


Image 2. Included maps use satellite images as a base map, and situate the two communities sampled for this research alongside others participating in the wider evaluation of FRESH activities in Arusha.

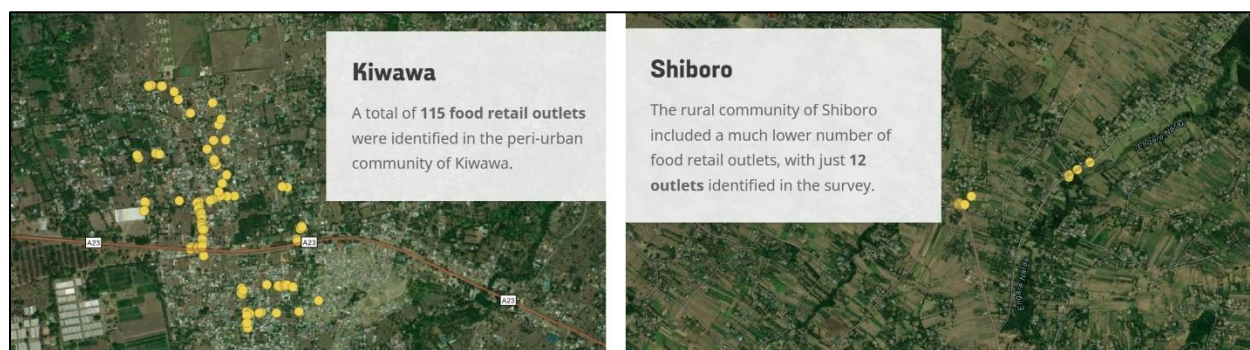


Image 3. Based on data from the FRESH evaluation’s census and mapping of all food retail outlets conducted in 2023, the Storymap illustrates a marked contrast in the density of retail outlets between the sampled peri-urban (Kiwawa, left) and rural (Shiboro, right) settings.

Findings presented at the workshop drew largely on thematic analysis of captioned images and notes from the photovoice workshops and analysis of in-depth interview data. Selected findings from the census of food retail outlets were also presented to provide context on the study setting. Four key themes were discussed: (1) food safety and quality concerns and responses; (2) variation in availability and access, according to individual, household and community factors; (3) financial barriers and budgeting strategies used by consumers and vendors; and (4) linkages between vendor and product traits.

Individuals' stories

Manka's Story

Manka* is a 54 year-old woman, who lives in Kiwawa with her four children aged between 16 and 9 years old. For the past 12 years, she has suffered with a health condition that has caused her severe pain, distress and **mobility issues**. She has to use a crutch to walk, and has been unable to provide a stable income for her family. With no other adults in the household, they are reliant on help from others and ad-hoc jobs her eldest son does working as a mason's assistant which earns him up to 10,000 TZS per day. As the family has **no access to land** to farm, they rely on purchasing food for household needs. *"We can only buy food when we have money, as we don't have any land to farm. So, we rely heavily on purchasing food".*

Image 4. Case studies of selected research participants were presented at the workshop, to highlight specific circumstances and experiences of accessing fruits and vegetables.

Panel discussion with research participants

Building on findings shared through the StoryMap, four research participants – one consumer and one vendor from each of the two study sites – joined a panel discussion to share their direct insights on the factors which influence their sale, acquisition or consumption of fruits or vegetables. Each panel member had selected two of the images they had captured during the photovoice activity: one representing a challenge, and one a motivation or enabling factor. Selected images captured challenges related to poor transport and market infrastructure, impaired mobility, concerns about widespread pesticide use, and seasonal variation in production; as well as motivations related to home gardens, taste preferences and cultural norms for traditional leafy vegetables, and positive vendor-consumer relationships.



Image 5. Photovoice images and their captions were displayed for viewing throughout the workshop.

General feedback and reflections

- Workshop participants responded positively to the participatory research approach and qualitative methods applied, noting the rich insights gained by documenting experiences through images and extended interactions with community members.
- Several participants noted that some of the findings may be specific to the communities sampled for this study, and may not adequately represent the breadth of experiences in Arusha Region. One person advocated for extending this research to a wider range of rural and urban settings in Arusha, to reflect greater geographic and cultural diversity. This was felt to be important to make reliable conclusions and inform concrete recommendations.
- It was also indicated that the study communities, and Arusha Region more generally, experience favourable rainfall patterns for horticultural production. Conducting similar research elsewhere in Tanzania, where fruit and vegetable availability may be limited and seasonal variation in supply more marked, might be valuable.
- Several people complained about poor market infrastructure, including a lack of tables and the common practice of displaying goods on mats at ground-level. Local government authorities are said to continue to receive various taxes from market sellers, but not to invest in a suitable standard of infrastructure. A government officer from the trade department described the situation in two local markets:
 - In Usa River Market, the government has communicated to vendors the intention to relocate the market to an alternative location. Vendors are said not to be satisfied with the environment at this new location, and to have refused to move. The government does not plan to make any improvements in the existing Usa River Market site.
 - In Tengeru Market, the government has communicated a plan to vendors which would require improved storage and display areas to be constructed at their own expense, and then for vendors to enter into a contract with the government for their costs to be compensated. It was indicated that the government lacks financial resources to directly fund infrastructure improvements in the short-term.
- Further feedback from the group emphasised the importance of the government reaching a consensus with vendors on a suitable market location, and the responsibility to ensure poor market infrastructure does not contribute to the risk of contaminated produce and food-borne illness. The importance of good road infrastructure and water quality was also mentioned.
- Concerns about pesticide use were a common theme within the in-depth interviews and photovoice workshops. One workshop attendee noted that several pesticides have been banned and – if these are in use – questioned where farmers may be sourcing them from. The role of agricultural extension officers in providing guidance on safe pesticide use was highlighted.
- Participants recognised the role of sociocultural influences in food purchase decisions and intra-household food allocation, particularly in rural areas. This includes perceptions and beliefs about fruit and vegetable, and the division of responsibility at the household level.

Recommendations for actions

Workshop participants joined small groups to further discuss and elaborate on the challenges identified through this research, and to propose actions to enhance the contribution of fruits and vegetable to diets and livelihoods in Arusha Region. While this research has focused on food environments, it is recognised that addressing identified challenges may require actions in other areas of the food system – including at various stages of fruit and vegetable value chains. Recommendations are clustered under food environment dimensions below.

External dimensions

Food availability

- Encourage more households to grow their own fruits and vegetables, through home gardens.
- Provide support for agroecological farming practices and vertical agriculture, as these practices can help those with small spaces to grow vegetables for household use.
- Encourage the use of traditional vegetable varieties and local manure for fertilisation, to improve the health of soils and preserve local biodiversity.
- Support production of a greater diversity of fruits and vegetables.
- Provide agricultural education to young people in schools, to encourage agricultural livelihoods and cultivation for home consumption through gardens and small plots of land.

Prices

- Allow markets to function through the forces of supply and demand, and avoid interventions by the government to regulate fruit and vegetable prices*.

(*This was a suggestion by one participant from a non-governmental organisation, and contrasts with a recommendation from the first collaborative needs assessment workshop in March 2024; see Annex 1).

Product properties

- Mobilise agricultural extension officers to promote the use of natural pesticides and integrated pest management practices, and train farmers in the prudent use of chemical pesticides (e.g. adhering to withholding periods prior to sale).
- Establish monitoring systems for detection and traceability of chemical residues in fresh produce, involving extension officers and market chairpersons.

Marketing and regulation

- Encourage investment in small businesses along the value chain to help them to grow. As businesses thrive and generate higher income, they will contribute taxes and strengthen the national economy.
- Avoid relying on small businesses and sole-traders to fund market infrastructure improvements. This places a huge burden on those in the informal sector, whose income and access to capital is often low.
- Attract investors to contribute to improving market infrastructure and value chain technologies. Sound business plans can encourage investment and ensure funds are utilised effectively.
- Regulate the quality and proper use of pesticides, through the Tanzania Plant Health and Pesticides Authority (TPHPA).

- Provide low-interest loans to farmers and small-scale entrepreneurs to support uptake of innovations which improve productivity and quality of fruit and vegetables.
- Design and implement effective marketing campaigns to drive demand for fruits and vegetables.

Personal dimensions

Desirability

- Build awareness about the importance of fruit and vegetable consumption for all ages. This includes improving understanding of the micronutrient-rich nature of fruits and vegetables, and the health implications of insufficient micronutrient intake.
- Provide clear guidance on quantities of fruits and vegetables to be consumed, across the life course, based on the national food-based dietary guidelines. This should be part of wider messaging about the importance of eating a varied diet.
- Promote traditional diets (with a range of traditional vegetables) and physical activity, and mitigate transitions to 'modern diets' which include high intake of processed foods and low intake of fruits and vegetables, alongside a more sedentary lifestyle.
- Provide training in different methods of vegetable preparation, for taste, convenience and nutrient retention and to encourage consumption of unfamiliar items.
- Build awareness about food safety, including safe food handling at home and identification of food safety risks in market settings.



Image 7. Participants in the second Collaborative Needs Assessment workshop in Arusha.

Conclusion

Food environment activities in the current phase of the FRESH Initiative (2022-2024) in Tanzania have comprised mixed methods research and a multi-phased process of engagement with food systems stakeholders. Both the process and findings of this component of lived experience research, which explored consumer and vendor perspectives on the factors that enable or constrain vegetable access, were well received by this stakeholder group. There was interest in the contrast evident in the relative numbers of food retail outlets between the two study communities, as shown in the StoryMap using GIS maps and the baseline census data.

Food safety concerns and risks emerge strongly as a factor influencing fresh produce acquisition, particularly for vegetables. A voting exercise amongst workshop attendees identified that strategies to improve food safety, including training farmers in alternatives to chemical pesticide use, testing for contaminated produce in market settings, and guiding consumers on safe food handling practices, are of high priority.

Linked to food safety and quality, the need for **infrastructure improvements in market settings** was also emphasised by this group (and supported by research findings). While participants spoke of a government strategy which relies on vendors to fund improved stalls and storage facilities in market settings, it was considered to be infeasible and unfair for small operators to bear this cost. Calls were made for external investment to be secured for market infrastructure improvements. Opportunities to improve the design of other vendor types, including the neighbourhood street stalls (*magenge*) which are a key access point for fresh produce for many households, were not discussed.

Among personal dimensions of the food environment, discussions at this workshop centred entirely on **improving desirability of fruits and vegetables**. Each of the small groups discussed the importance of building consumer awareness about the nutritional importance of fruits and vegetables. Some highlighted the need for specific guidance on portion sizes, while others indicated a role of training on how to prepare vegetables in nutritious, convenient and appealing ways.

As the FRESH Initiative moves into its next phase, evidence-informed recommendations from the two multi-stakeholder workshops conducted in 2024 provide options for potential actions which might be co-developed, tested and evaluated. Some proposed actions align with existing or potential work in other areas of the “end-to-end approach” (e.g. nutrition education, integrated pest management, or cultivation of traditional vegetables). Others – related to the safe handling of produce, hygienic display of produce in improved market (or street) stalls, or promotional strategies at community or market levels – might be pursued as food environment interventions.

A continued plan for engagement with this multi-stakeholder group will be valuable in a future phase of the FRESH Initiative. We envisage that this group, including members of the Arusha Sustainable Food Systems platform, government actors, researchers and community representatives, would provide a suitable forum for the co-design of interventions to be tested in food environments of Arusha Region.



Image 8a and b. Small group discussions brought together research participants and government, research and NGO stakeholders, to propose recommendations for actions to address identified challenges within food environments of Arusha Region.

Annex 1 – Overview of recommendations from first workshop

Food availability

- Provide training to farmers and value chain actors to increase production, extend the production season, and minimise post-harvest losses.
- Encourage commercial production of a wider range of fruits and vegetables by local farmers, and develop markets for items currently unfamiliar or uncommon in Arusha Region.
- Pursue options for processing fruits and vegetables to increase availability across the year.
- Support households to cultivate small plots of vegetables (e.g. leafy green vegetables) in inner areas of the city, for home consumption or local sale.
- Test the feasibility and economic viability of alternative or innovative post-harvest handling methods and value addition activities.
- Involve diverse stakeholders to increase vegetable supply, including local and central government, seed companies, NGOs and member-based organisations.

Food prices

- Advocate for government to regulate fruit and vegetable prices, as is currently done for cereals.
- Make price information available to consumers, using platforms like SMS or radio, to guide fruit and vegetable purchase decisions – including relative affordability of different items.
- Provide financial support or incentives to farmers to increase production, to boost availability and reduce prices, potentially for specific underutilised or nutrient-dense items.
- Encourage and support home production of vegetables to make vegetables more affordable.
- Develop and test innovations to improve the transport, storage and display of produce to ensure quality while maintaining affordability, with a focus on motivations and priorities of mid-stream value chain actors and vendors in the informal sector.
- Design social welfare programs to address price barriers limiting fruit and vegetable access by vulnerable people, including through vouchers or public procurement programs.

Product properties

- Engage with multiple levels of government to improve existing training resources on food safety, such as those of the Tanzania Plant Health and Pesticides Authority (TPHPA).
- Establish ‘safe selling centres’ within Arusha, following similar procurement models to Mesula (a social enterprise selling organic and agroecologically produce fruit and vegetables).
- Strengthen capacity of farmers to adopt organic or agroecological production practices.
- Pursue research on improved fruit and vegetable varieties: not only on crop performance, but also nutrient profiles and alignment with local taste preferences and cooking practices.

Vendor properties

- Strengthen capacity amongst vendors for improved handling and storage of fresh produce, to maintain freshness and ensure food safety in markets and retail settings.
- Evaluate and scale the voluntary certification scheme implemented by Rikolto (i.e. a food safety training program and a pledge by vendors to meet minimum food safety standards).
- ‘Bridge the distance gap’ between producers, vendors and consumers: develop short supply chains for quality produce, and greater numbers of vegetable outlets in settings.
- Involve vendors and market authorities in advocacy and lobbying efforts to ensure fruits and vegetables are not overlooked in policy and investment decision-making.

Marketing and regulations

- Improve market infrastructure, especially in rural areas, including improved water, sanitation and hygiene, protection from adverse weather conditions, and tables or shelves which display produce to attract consumer interest, and maintain food safety and quality.
- Analyse policies which govern the marketing of fruits and vegetables, and their implementation.
- Engage with diverse food systems stakeholders to better understand roles, needs and constraints related to market policies.
- Develop a coordinated marketing strategy, with activities along fruit and vegetable value chains, to stimulate demand for a diverse range of safe, quality vegetables.
- Organise a large-scale promotional event like a ‘fruit and vegetable festival’ to build interest around this food group (as currently exists for *nyama choma* (grilled or barbequed meat)).
- Explore the feasibility and suitability of existing and new policy actions to improve food safety, and how their effectiveness might be monitored (e.g. sampling produce for pesticide residues and microbiological testing).
- Conduct research on consumer behaviour, including drivers of food choice, and market trends.

Annex 2 – Workshop participants

Affiliation	Role	Gender
Arusha City Council*	1. Industry, Trade and Investment Manager	Female
Arusha District Council	2. District Agriculture, Irrigation and Trade Officer	Male
	3. District Community Development Officer	Male
	4. District Nutrition Officer	Female
ECHO*	5. Technical Advisor	Male
Iles de Paix*	6. Country Director	Female
Kiwawa Community	7. Research participant (consumer)	Female
	8. Research participant (consumer)	Female
	9. Research participant (vendor)	Female
	10. Research participant (vendor)	Male
	11. Village Executive Officer	Male
Meru District Council	12. District Agriculture, Irrigation and Trade Officer	Male
	13. District Community Development Officer	Male
	14. District Nutrition Officer	Female
	15. District Trade Officer	Male
MVIWA-Arusha*	16. Field Officer	Male
Nelson Mandela African Institute of Science and Technology	17. Researcher	Male
Ngaramtoni Market	18. Market Chairperson	Female
Research, Community, and Organizational Development (RECODA)*	19. Project Officer – Nutrition	Female
Rikolto*	20. Program Coordinator	Female
Shiboro Community	21. Research facilitator	Male
	22. Research participant (consumer)	Female
	23. Research participant (consumer)	Female
	24. Research participant (vendor)	Female
	25. Research participant (vendor)	Female
	26. Village Executive Officer	Male
Tanzania Agricultural Research Institute – Tengeru	27. Researcher	Female
Tanzania Foundation for the New Generation Organization (TAFONEGO)*	28. Director General	Female
Tengeru Market	29. Market Chairperson	Female
World Vegetable Center	30. Scientist – Healthy Diets	Female
	31. Research Assistant	Female
	32. Research Assistant	Female
	33. Intern	Female
	34. Intern	Male
World Vision Tanzania	35. Operations Director	Female
	36. Program Quality and Strategy Director	Male
YEP Tanzania*	37. Program Assistant	Female

*Members of Arusha Sustainable Food Systems Platform

Annex 3 – Workshop agenda

Time	Activity	
9 – 10 am	ASFS Platform Session (<i>Platform members only</i>) • Updates and evaluation of 2024 activities • Recent and planned activities by members • Learning and exchange activities • Meeting calendar for 2025	Hilda Okoth (Rikolto) ASFS Platform Members
10 – 10.10 am	Workshop welcome and outline of agenda (<i>All workshop participants</i>)	Hilda Okoth
10.10 – 10.20 am	Introductions and warm up exercise	All
10.20 – 11.20 am	FRESH food environment research • Introduction to Fruit and Vegetables for Sustainable Healthy Diets (FRESH) Initiative • Brief review of ‘food environment’ research and key definitions • Summary of research process and findings: • Lived experience research with vendors and consumers • Survey of markets and retail outlets • Walk through of draft “StoryMap” (interactive online platform) • Sharing of initial policy recommendations • Brief Q&A on research process and findings	Julia de Bruyn Lydia Mukasa Sheila Msangi (WorldVeg)
11.20 – 11.45 am	TEA BREAK*	
11.45 am – 12.15 pm	Participant perspectives on lived experience of food environments • Panel discussion with consumers and vendors from two study areas • Sharing experiences of the research process and subject area: <i>What influences the sale or consumption of fruits and vegetables?</i> <i>What did you capture and learn about your food environment, from your participation in this research (including photovoice workshops)?</i>	Julia de Bruyn Lydia Mukasa Sheila Msangi Research participants x4
12.15 – 1.15 pm	Small group activity on food environment challenges and actions • Facilitated discussions in thematic groups: Challenges <i>Which of the main challenges identified through the research resonated with you, and which do you see as most critical?</i> <i>Are there any challenges you think haven’t been captured?</i> Actions or policies <i>Which of actions or policies do you think should be prioritised?</i> <i>Which stakeholders can or should be involved in future actions?</i> <i>For which interventions do you (or others in your organisation or department) have relevant experience?</i> <i>Would you be interested in collaborating to trial different food environment interventions? How?</i> • Voting activity to indicate priority actions	One facilitator and note taker per group
1.15 - 1.45 pm	Plenary discussion • Feedback from facilitators of key points discussed in each group • Contributions from other group members and wider discussion	Hilda Okoth
1.45 – 2 pm	Wrap up and closing remarks	Julia de Bruyn
2 – 2.30 pm	LUNCH*	

* PhotoVoice images on display for viewing during registration and break times, and throughout workshop