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NOURICITY PARTNERSHIPS FOR HEALTHY DIETS AND NUTRITION IN URBAN AFRICAN FOOD SYSTEMS – EVIDENCE AND STRATEGIES

Basic information of study design and surveys 2021-2022

Putting together the different elements for a healthy diet to have a strong body is easily compared to putting together a strong building: (1) energy-giving foods represent the bricks of a house, (2) bodybuilding foods are the sand, (3) body protection foods are the cement. All ingredients in the right proportions and you eventually need water to bring everything together for a strong body.

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by
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Executive summary

Poverty and malnutrition hotspots are moving from rural to urban communities, as Africa is urbanizing. The population in cities and countries are faced with the coexistence of overweight, obesity, micronutrient deficiency and undernourishment, the so-called 'triple' burden of malnutrition. The question on Who is affected and Why are they affected remains unclear. The project 'NOURICITY' sought to answer these questions by engaging in a chain of multi-stakeholder participatory events and fieldwork meant to deliver a blueprint for partnerships seeking to improve urban nutrition in Africa.

The project aimed to improve urban nutrition in Uganda by bridging knowledge gaps about its systemic and individual drivers and by developing partnerships for improved nutrition in urban areas. The research involved several components: (i) exploratory analysis of panel data on food consumption based on the latest Ugandan National Household Panel Surveys (NPS-LSMS), (ii) participatory mapping of urban food systems (UFS) and of nutrition-related policies in a study site in the Kampala region, (iii) designing and testing policy and other interventions to influence a behavioural change of the study populations, and (iv) the co-creation of successful partnerships with local stakeholders for improved urban nutrition in Kampala district. The named activities were to improve understanding of the drivers of urban nutrition in Uganda and provide a solid foundation for comprehensive, effective interventions and policies.

NOURICITY is a LEAP-Agri-funded project as part of a larger project implemented in three African countries, namely Ghana, South Africa and Uganda. The project duration and funding period were initially three years, from the 1st of September 2018 to the 31st of August 2021. Due to the global COVID-19 pandemic, the project was granted a no-cost extension until April 2022.

The activities involved seeking ethical clearance which was provided by Makerere University School of Health Science Research & Ethics Committee, College of Health Science in November 2019, nevertheless due to the COVID-19 pandemic this process had to be done 2 more times. Identification of key stakeholders to be engaged at various project implementation stakes. More than 25 key stakeholders were identified from sectors such as government ministries, national universities, international/national research institutes, development agencies and the private sector. The initial stakeholder engagement workshop was carried out in October 2019. Information on the current food environment and food security status was collected and information on food outlets was mapped. Food insecurity, limited knowledge of healthy nutrition, food safety and environmental concerns were identified as key issues in the study site.

In February 2020, the baseline focus group discussion was carried out involving a total of 85 households, which collected hands-on experience from parish representatives related to the food system in the parish. This was closely followed up with the second multi-stakeholder workshop. Within the second workshop, the findings from the first workshop were briefly presented, the food outlets maps were verified with the participants and the discussion highlighted key intervention suggestions, such as sensitization of healthier foods at the community level, urban gardening or sensitization of street food vendors to prepare healthier food.

Due to the current COVID-19 pandemic and the lockdown from March 2020 until October 2020, project activities were halted and resumed after the election period in January 2021. In March 2021, the baseline data collection was pursued, which followed the development and implementation of the project intervention. Nutrition education material in form of a flyer and healthy voice recordings and text messages were developed as two sets of interventions. The intervention was rolled out from October to November 2021 and was followed by the second round of data collection in November/December 2021 respectively. Preliminary results (comparison between baseline and end-line) show an increase in household dietary diversity and urban agriculture activity, suggesting a positive impact of the intervention. Further analysis is ongoing on whether the results are significant. To ensure ethical considerations in randomised control trials the final activity involved the distribution of flyers to the households falling within the control group.

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List of acronyms and abbreviations

AE	Adult equivalent
BOP	Base of the Pyramid Innovation Centre
CIAT	International Centre for Tropical Agriculture
CIP	International Potato Centre
d	day
DSIP	Agriculture Sector Development Strategy and Investment Plan
FGD	Focus group discussion
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture
IRB	Institutional Review Board
IVR	Interactive Voice Response
kcal	Kilocalorie
KCCA	Kampala Capital City Authority
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MakSHS-REC	Makerere University School of Health Science Research & Ethics Committee
MGLSD	Ministry of Gender and Social Development
mln	million
MOH	Ministry of Health
NAADS	National Agricultural Advisory Service
NARO	National Agricultural Research Organization
NCE	No-Cost Extension
NDP	National Development Plan
NPS-LSMS	National Household Panel Surveys
UFS	Urban food systems
WEcR	Wageningen Economic Research
WHO	World Health Organization

Acknowledgements

1. Introduction and background

Africa is urbanizing fast and its poverty and malnutrition hotspots are moving from rural to urban communities (Sahn and Stifel, 2003). Rising dietary aspirations of African urban populations often lead to increased consumption of unhealthy processed foods but hunger remains an issue (Tschirley et al., 2015; Ziraba et al., 2009). In African cities, overweight, obesity, micronutrient deficiency and undernourishment coexist (Popkin, 2003; WHO, 2018). The question is Who is affected? Why are they affected? How to reverse the course of malnutrition? Who needs to be involved? We seek to answer these questions by engaging in a chain of multi-stakeholder participatory events meant to deliver a blueprint for partnerships seeking improved urban nutrition in Africa (HLPE, 2017; Malabo Montpellier Panel, 2017).

According to a recent Action Aid study, millions of Ugandans are classified as either food-insecure, hungry or vulnerable. The Agriculture Sector Development Strategy and Investment Plan (DSIP) states that the number of people who are food-insecure increased from 12 million (mln) in 1992 to 17.7 mln in 2007 (MAAIF, 2010). It means that almost half of Uganda's population is food insecure (17.7 mln out of 41.5 mln in 2016). The nutrition security of many Ugandans remains worrying as well. While statistics show improvement in the average caloric intake per person per day (i.e. from 1,494 in 1992 to 1,971 in 2005), the figure is still considerably less than the 2,300 recommended by the World Health Organization (WHO) (FAO, 2001). Mean dietary energy consumption, which indicates the food available for human consumption, was reported at 2.226 kcal/person/day national wide (Kampala district 2,347 kcal/person/day) within the UNHS 2016/2017 report (Uganda Bureau of Statistics (UBOS) and ICF, 2018). Recently, a survey looking into slum-dwellers in four parishes in Kampala, located in Kawempe and Nakawa divisions reported energy consumption of 2,444 kcal/d/AE (Wanyama et al., 2019).

This project aimed to impact the nutrition of the urban poor in Uganda. The research objectives included:

a) Urban food sources, characteristics and rural-urban linkages as "systemic" drivers of food choices and nutrition,

b) People's access to nutrition-related knowledge (formal and informal, indigenous and Western), income, food tastes, habits and culture, as "individual" drivers of food choices, and

c) How systemic and individual drivers combined determine people's food consumption and nutritional status.

Our work relied on participatory research engaging stakeholders in food systems in a (peri-) urban study site in the region of Kampala district. Together with nutrition and public health practitioners and other actors of the local food system in Kampala, we devised and tested policy and other interventions to develop much-needed partnerships for improved urban nutrition in Uganda.

This was to be achieved by

i. An exploratory analysis of panel data on food consumption based on the latest Ugandan National Household Panel Surveys (NPS-LSMS),

ii.   Organizing three rounds of related multi-stakeholder workshops, focusing, respectively, on the mapping of the food system in a (peri-)urban study site in Kampala, the mapping of the policies and regulations operating in this area, and design - in a co-creating process with local stakeholders - the partnership concepts for improved nutrition;

iii.   Designing and testing policy and other interventions to influence a behavioural change of the selected study populations for the creation of successful partnerships for improved urban nutrition in Uganda,

iv.   Measuring the effects of these interventions by carrying out two household surveys, each of about 450 households, one before and one after the experiments (the baseline and the end-line, respectively). The surveys took place in the Kampala districts, Kawempe Division, and Kanyanya Parish.

2.   Main Research activities and Methods

This section states the involvement and support of the Alliance of Bioversity International and CIAT related to the project activities from 2019 to 2022 and its related outputs.

2.1 Ethical clearance

Each research study taking place in Uganda requires ethical approval from the Institutional Review Board (IRB). The ethical clearance process for the NOURICITY project was initiated in 2019 with the preparation of documents required by the IRB at Makerere University, College of Health Sciences to receive an Expedited Review, which approves ethical clearance applications for one year. Therefore, each year the ethical clearance needs to be renewed and reapproved.

The first clearance was granted on November 18th, 2019, until November 17th, 2020. The second was from November 6th, 2020, to November 5th, 2021 (REC Number: #SHSREC REF NO: 2019-048) while the third and last ethical clearance for continued review and the research approval license was successfully granted on the 11th of November (until the 10th of November 2022).

Due to the COVID-19 pandemic, the standard procedure to collect data had been regulated and changed by the government. Thus, before the first phase of data collection (baseline March/April 2021), the COVID-19 pandemic regulation adaptations, plus the data collection questionnaire needed to be amended and re-submitted for ethical clearance, more specifically data collection questionnaire. These documents were prepared in February and approved on 12th March 2021 (REC Ref No: 2019-048).

2.2 Study site

The study site for our research was Kanyanya parish in Kawempe Division in Kampala, Uganda, see **Figure** 1. The selection of Kanyanya for our research was described in Fongar et al. (2020c). Based on the field notes Kanyanya parish was characterised as follows.

-   Kanyanya parish is quite organized, well-structured homes and pit latrines, permanent homes, with visible urban farming
-   There is a litter problem, but it is still rather clean.

Three impressions form ladies who own a food stall in Kanyanya:

1. Food stall owner 1 (the lady sells a few vegetables and cooked meals)
   Her shop was located inside the parish and she buys her vegetables at Kalerwe Market; Prices at the market have not changed (in the last two years), but people cannot afford to buy from her anymore, cash is too low to buy food, therefore customers are few and her products dry out; She prepares cooked meals (cassava and beans) for 500 UGX.
2. Food stall owner 2 (a large variety of different vegetables, fruit and staples)
   Located just off the main road in the parish; Business is so-so; sells mostly to local, but also walk-in customers; Re-buys/restokes approx. 3 times a week her product, always when one product is finished; Settled in Kampala one year ago and opened her business
3. The shop owner (the young lady who sells cold drinks, vegetables, fruits, homemade juice, and snacks)
   Opened her shop 2 years ago, came to Kampala from the central region for employment; Good business, local and walk-in customers; Homemade juice/tea (tea leaves, pineapple, ginger, sugar – 500 ml 500-1,000UGX); Store looked very well organized and clean, very energetic women
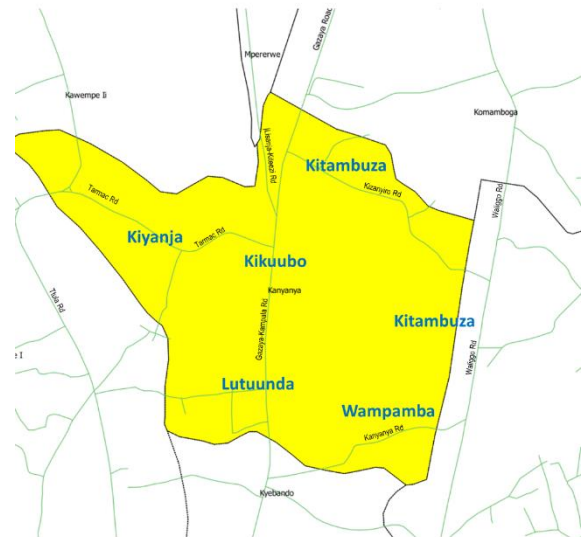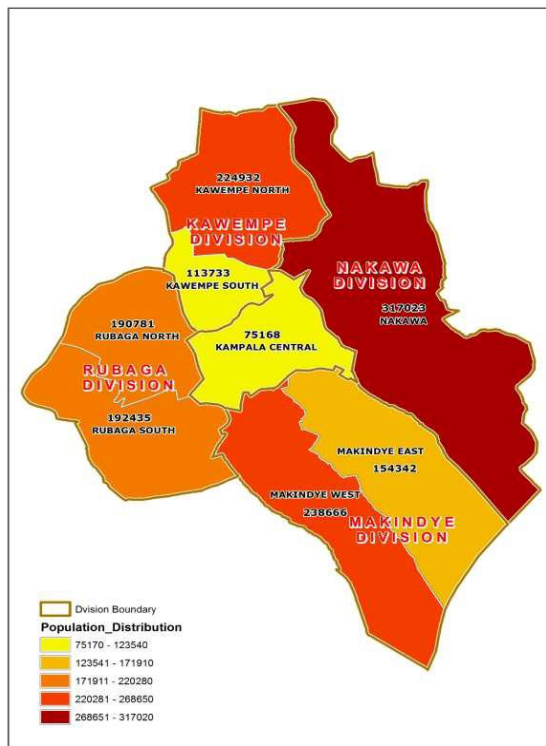

Figure 1 Kampala Capital City Authority Parliamentary Constituencies as of 1st July 2016 (Uganda Bureau of Statistics, 2016)

2.3 Identification of key stakeholders for the participatory workshops

The selection criteria for the key stakeholders to participate in the different NOURICITY workshops were to be conversant with the parish- and city-level, as well as a national food system and nutritional issues, should include regulatory and policy authorities, consumer organizations, and consumers themselves from the parish itself, but also on the national level. The first draft with potential names was developed by The Alliance team and shared with the WUR team. The list was verified based on team discussions and was finalised in September 2019. The stakeholder list included contacts (Name of Institute, potential role within the project, contact person and contact details for outreach) within six different sectors:

- **Governments representatives**: Kampala Capital City Authority (KCCA), Ministry of Health (MOH), Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), National Agricultural Research Organization (NARO), National Agricultural Advisory Service (NAADS), Ministry of Gender and Social Development (MGLSD)
- **Universities**: Makerere University, Kyambogo University, Wageningen University
- **Funder Organisation**: Dutch Embassy
- **Privat Sector**: Base of the Pyramid (BoP), Camp Green Uganda
- **Research Organisations**: Alliance of Bioversity International and CIAT, International Food Policy Research Institute (IFPRI), International Institute of Tropical Agriculture (IITA), International Center for Tropical Agriculture (CIAT), International Potato Center (CIP),
- **NGOs**: SUN – Initiative, World Vision, Deutsche Welthungerhilfe e.V., Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Farmgain Africa, Agricultural Marketing and Market Information, VEDCO Volunteer Efforts For Development Concerns, KilimoTrust Transforming Lives Through Agribusiness, Food Rights Alliance, Slow Food Uganda
- **Others**: SNV, USAID, Solidaridad, ISSD

3. Data collection

Within NOURICITY qualitative, as well as quantitative data were collected to assess the impact of the intervention and to get a better understanding of the living conditions.

3.1 Qualitative - Focus Group Discussion

Two qualitative data collection exercises, in form of focus group discussions (FGD), to gather information about dietary knowledge, food environment, food sources, food choices and key food systems-related information sources were carried out in Kanyanya parish, Kawempe division.

During the first FGD, 6 enumerators were recruited for this activity, they received a one-day training on data collection from the research team and were closely supervised and supported accordingly during data collection. This FGD was carried out in February 2020, over three consecutive days within three zones of Kanyanya parish. In total, 90 participants from the five zones were identified through collaboration between village leaders and the field assistant. They were then disaggregated into women (above the age of 30 years), men (above the age of 30 years) and youth (women and men below 30 years of age) were targeted (34 women, 24 men and 27 youth) from the five zones of the parish participated in the 3-day activity, see Table 1. Considering the

sub-groups of women, men and youths' data was collected from 9 FGDs (3 women, 3 men and 3 youth). The discussions were carried out in a place identified to be common and easily accessible, they were carried out in Luganda using developed protocols and guided by a facilitator and note-taker.

Table 1 Disaggregated numbers of participants of the nine FGD

	ZONE	WOMEN	MEN	YOUTH	TOTAL
1	Wampamba & Lutuunda	9	8	8	25
2	Kikuubo & Kiyanja	12	6	11	29
3	Kitambuza	13	10	8	31
Total		34	24	27	85

The second round of qualitative data collection was carried out after the end-line data collection in December 2021, with a subset of participants. In total, two officials from each of the five villages were targeted, including councillors, chairpersons, vice-chairpersons, residents and village health personnel, see Table 2. The second discussion round aimed to acquire a general overview of food access changes regarding the number of food outlets, changes in prices of foods, changes in transportation costs, and effects of the COVID-19 pandemic on food availability and consumption between March 2021 compared and December 2021. The procedures used were similar to those applied during the FGDs carried out at the beginning of the project.

Table 2 Disaggregated numbers of participants of the nine FGD

	ZONE	WOMEN	MEN	YOUTH	TOTAL
1	Kikuubo	1	1		2
2	Kitambuza		1		1
3	Kiyanja		1	1 (female)	2
4	Lutuunda		2	1 (male)	3
5	Wampamba	1	1		2
TOTAL					10

3.2 Quantitative data collection

Two sets of data collection took place in 2021. The baseline data collection was conducted in the first quarter of the year 2021, from the 16th of March until the 09th of April, while the end-line data collection took place from the 26th of November to the 18th of December 2021.

The sample size calculation was based on power calculations with the Household Dietary Diversity Score (HDDS) as the key indicator. The calculation used a two-sample t-test using an HDDS of 9.15 (SD 1.999) (11). The result indicates a sample size of 440, considering an attrition rate of three per cent, and the number 450 was selected. Thus, 450 households were targeted and distributed equally over the five villages/zones, e.g. 90 participating households each. The random sampling of the households was based on a random walk selection, which involved the field assistant of the Alliance of Bioversity International and each village/zone leader of Kanyanya Parish. During the walk, the name and the mobile phone number of the selected households were captured to be

able to inform the household of the interview day, place and time. The same set of households was targeted also during the end-line data collection.

Although, through a verification activity in October 2021, the field assistant of the Alliance of Bioversity International and CIAT contacted the 450 participants of baseline data collection, to update their availability, and mobile numbers and to verify if the households are still living in the targeted villages or if they have moved. In total, 45 participants had either shifted away from the target parish or had passed away. Hence, the new sample size was 405 for the end-line data collection, see **Figure 2**.
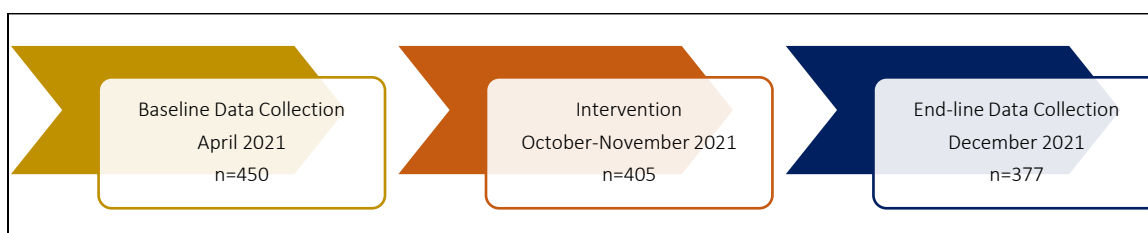
Figure 2 Timeline of the NOURICITY data collection and intervention

Table 3 shows how the participation of respondents was distrbuted over the five village of Kanyanya. Most respondents dropped out in Kiyanja.

Table 3 Number of household data collected during the end-line survey in December 2021

	Kikuubo	Kitambuza	Kiyanja	Lutuunda	Wampamba	Total
Baseline	90	91	89	89	91	450
Intervention	83	82	66	91	83	405
Endline	82	71	61	85	78	377

For both activities, six enumerators were engaged in the activity to conduct the interviews in the local language. The same enumerators as for the qualitative activity were approached and tried to re-contracted. At baseline, four of the six enumerators were available and two new members joined the team, while within the end-line only one member at to be replaced. The replacement in the end-line activity already was present within the first qualitative data collection. Before each data collection activity, the enumerators were trained in the tool in a 2-day training by the Alliance of Bioversity International and CIAT. During the training, the tool/questionnaire was pre-tested with six parish representatives. Tablets were used to capture the interview information. Each day the generated data was uploaded to a platform. Every enumerator had the target of interviewing 5 participants per day, which increased during the data collection period as the enumerators got more familiar with the tool and the questions. The timelines of both data collections are displayed in **Table 4**.

Due to the current COVID-19 pandemic situation and the related restrictions in Kampala, Uganda typical household interviews were not possible for both data collection activities. Therefore, in agreement with the COVID-19 MoH guidelines, the interviews took place at an aerated venue in

each zone, where social distancing could be observed. The aerated venues consisted of open restaurant locations, church buildings or community buildings. The locations were big enough to ensure privacy during the interviews. Impressions for both data collections can be found in **Figure 3** (baseline) and **Figure 4** (end-line). Face masks were provided to each participant and hand-sanitizers were placed at each entrance to the venue and participants were encouraged to sanitize as frequently as possible. During the interview, the participants received a transport reimbursement, refreshments sourced from local women and a bar of soap.

The raw data was provided by the Alliance of Bioversity International and CIAT to WUR shortly after both data collections. The data cleaning and analysis process was/is managed by WUR using the free software R.

Table 4 Baseline and End-line data collection timeline in 2021

Baseline					End-line						
Timeline		Activity	Questionnaires		Place	Day	Date	Activity	Questionnaires		Place
Tue	16.03	Enumerator Training			BI office	Thu	25.11	Enumerator Training			ABC Office
Wed	17.03	Enumerator Training				Fri	26.11	Enumerator Training			
Thu	18.03	Data Collection	30	90	Zone 1	Mon	29.11	Data Collection	75		Zone 1	St. Peters Primary School
Fri	19.03	Data Collection	30		Lutuunda	Tue	30.11	Data Collection			Lutuunda	
Sat	20.03	Data Collection	30			Wed	01.12	World Aids Day (PH)	59	134	Zone 2	
Mon	22.03	Data Collection	42	360	Zone 2	Thu	02.12	Data Collection			Wampamba	
Tue	23.03	Data Collection	48		Wampamba	Fri	03.12	Data Collection				
Wed	24.03	Data Collection	42		Zone 3	Mon	06.12	Data Collection	75	209	Zone 3	Brighton Gardens
Thu	25.03	Data Collection	48		Kikuubo	Tue	07.12	Data Collection			Kikuubo	
Fri	26.03	Data Collection	42		Zone 4	Wed	08.12	Data Collection/Buffer Day	65	274	Zone 4	New Life International Church
Sat	27.03	Data Collection	48		Kiyanja	Thu	09.12	Data Collection			Kitambuza	
Mon	29.03	Reporting		450		Fri	10.12	Data Collection	52	326	Zone 5	Anoonya Church
Tue	30.03	Data Collection	48		Zone 5	Sat	11.12	Data Collection			Kiyanja	
Wed	31.03	Data Collection	42		Kitambuza	Mon	13.12	Preparation Mo-up activity/Reporting				
						Tue	14.12					
Wed	7.04	Safety Day			Rap-up Reporting	Wed	15.12	Mop-up activity	63	389	All Zones	
Thu	8.04	Safety Day				Thu	16.12					
Fri	9.04	Reporting				Fri	17.12					
						Mon	21.12	Collection of tools				

Figure 3 Impressions of the baseline data collection activity in March 2021

Figure 4 Impressions of the end-line data activity in December 2021

3.3 Development of the Policy interventions

The project NOURCITY involved a policy intervention, rolled out between the two data collection rounds to assess the impact of the intervention. The discussion and development of the intervention started after the first FGD and the baseline data collection in mid-April/early May 2021 and was finalised in September 2021. Information on the FGD and baseline data collection was used to establish tailored information on healthy diets for the parish. The intervention included 2 packages containing a flyer, instant voice recordings and text messages.

The content of the flyer was arrived at through a careful review of the results of the baseline by the research team to identify knowledge gaps and a graphic designer supported the visualisation and formatting. This process was carried out between May-September 2021. The flyer holds recommendations on a healthy daily plate for Kanyanya and a variety of foods for healthy meals (Linderhof and Ekesa, 2021). The flyer uses a graphic to display the importance of 3 key food groups in the Kanyanya community. The finalised flyer is displayed in **Figure 5**.

The second package of the intervention included voice and text messages containing information on healthy diets and purposeful nutrition. Those messages build on the developed flyer to tell the information differently. In development and role out were carried out in collaboration with VIAMO a private sector company with extended experience in digitalisation. WUR and the Alliance of Bioversity International and CIAT provided the content of the respective nutrition-related information, which was further edited, translated into Luganda, and converted into a text message and audio recording by the VIAMO team. Both the finalised text messages and audio recordings were pre-tested with approximately ten colleagues from the Alliance of Bioversity International and CIAT and after adjustment and improvement of the messages and recordings following feedback received, the roll-out of the package to the target community took place between August-November 2021. In total, the participants received six messages and five calls. The two initial message calls included an introduction to the instant voice recording (IVR) approach and the text message procedure, the next four calls and messages were content-based. The calls and messages were on weekly basis to ensure instant feedback and communication on the activity. **Table 5** and **Table 6** include the content of the intervention in English. In the Appendix, the scripts of the messages in both English and the local language Luganda are presented, see **Tables A1** and **A2**.

(A) First page of flyer

(A) Second page of flyer

Figure 5 First and second page of the flyer (Linderhof and Ekesa, 2021)

Table 5 Content on the text message (SMS) intervention via the service provides VIAMO

Block Label	Script - ENGLISH
Pre SMS IVR	Hi, for the next 4 weeks you will receive calls from the Nouricity Project about healthy diets. If you miss it please beep 0200522715 and we shall call you back
Pre SMS text	Hi, for the next 4 weeks you will receive messages from the Nouricity Project about healthy diets for you and your family. Please follow the advice. Thank you
M1	Hello, did you know that a healthy plate in Kanyanya should contain a variety of energy-giving, bodybuilding & body-protecting foods, plus water? Try it today!
M2	Healthy life! Happy life! Did you know that each meal should contain energy-giving foods, with a variety of whole grains. Limit refined grains like white bread.
M3	Eat well, live long! Each meal should contain bodybuilding foods that are good for growth, like fish, chicken, beans, gnuts, eggs or dairy. Avoid processed meat
M4	Hello, each meal should contain body protection foods which are fruits and vegetables. Eat at least 5 portions of variety & colourful fruits & vegetables a day!

Table 6 Content of the instant voice recording (IVR) intervention via the service provider VIAMO

Block Label	Script - ENGLISH
M1	Hello, my name is birungi from the NOURICITY project and I will be calling you once a week for the next four weeks to share with you my journey with eating healthy. I hope the information I share with you will also help you decide how you shall feed yourself and your loved ones. Today I will be talking about what a healthy plate for each meal should have and I know we can get this food in Kanyanya. Can't we? (little laugh) I used to have so many illnesses, was always feeling tired and spending so much money in hospitals until one doctor advised me to change the way I eat and I have been healthier ever since. Do you want me to tell you how I arrange my meals these days? (Pause for dramatic effect) Alright, don't beg I will tell you. My plate at each meal contains a variety of energy giving foods, bodybuilding foods, body protection foods and water. For example, imagine the plate you normally use for your meals and divide it into 4 portions. I fill the first portion with energy giving food, such as any type of wholes grain, rice, cassava, yams, arrow roots, maize, millet, sorghum, matooke or sweet potatoes, my second portion is filled with bodybuilding foods, such as fish, chicken, peas, beans, gnuts, eggs and healthy dairy and the last 2 portions are filled with body protective foods, which are any type of healthy vegetables and fruits. I also make sure to drink at least 8 glasses of water a day. At the end of the day, we all want a better life for ourselves and our loved ones. This is why I advise you to also prepare your meals the way I do mine to reduce some diseases and you will also have a healthy body. I will call you again next week to advise you more specifically about energy giving foods. In the meantime make sure you check out your NOURICITY flyer. Have a great day! Goodbye!
M2	Hello, this is Birungi again from the NOURICITY project. Last week we talked about what a healthy plate for each meal should have. I hope you remember and have tried to follow my advice. Today I will be talking to you about energy-giving foods. Last time I advised you to split your plate into 4 portions: one portion of energy giving food, one

Block Label	Script - ENGLISH
	portion of bodybuilding foods, and 2 portions of body protective foods. Today we shall talk a little bit more about our portion that has energy giving food, which are any type of whole grains and cereals such as cassava, rice, maize, arrow roots, yams, wheat, sorghum, millet and others. These are important to include into your daily plates because they increase your energy levels and help you to be more productive. But remember that too much of anything can be bad so limit the consumption of refined grains, such as white rice or white bread. Also, avoid eating grains or cereals with moulds, which can make you sick. It is important to note that only 1 out of the four portions on your plate should have energy giving food. I will call you again next week so that I can tell you about the second portion on your plate which should have bodybuilding foods. In the meantime make sure you check out your NOURICITY flyer. Have a great day! Goodbye!
M3	Hello, this is Birungi again from the NOURICITY project. I know what you are thinking, "Oh my God why is she calling me again?" Well, I promised to call you for 4 weeks with advice about eating healthy and as the Baganda say, "It's only the one who cares about you who gives you advise". (pause) Yes, you heard it right, I care about your health and today I will be advising you about bodybuilding foods. We learnt in our first call that we should take a plate and divide it into 4 portions: one portion of energy giving food, one portion of bodybuilding foods, and 2 portions of body protective foods. Today let us go into more detail about bodybuilding foods also known as proteins, which can be obtained from both plant and animal sources, such as fish, chicken, peas, beans, nuts, eggs, and healthy dairy. Eating a variety of different proteins are important for growth, development and maintaining a healthy body. To maintain a healthy level of proteins in your body please Limit red meat and cheese and avoid cold cuts and processed meat. I will call you again next week so that I can tell you about the last two portions on your plate which should have body protective foods. In the meantime make sure you check out our NOURICITY flyer. Have a great day and remember to eat healthy! Goodbye!
M4	Hello, this is Birungi from the NOURICITY project. This is our last call and I will be advising you on healthy vegetables and fruits, body-protective foods. As we have seen from the very beginning it is better to take a plate and divide it into 4 portions: one portion of energy giving food, one portion of bodybuilding foods, and 2 portions of body protective foods. So, each meal of a healthy plate should always contain body protection foods, which are fruits and vegetables. The more, the better! Eat at least 5 handfuls of variety and colour of fruits and vegetables a day (fresh or cooked)! Try to vary between the different colours. Combine green, red, orange and purple vegetables and fruits whenever possible. Avoid overcooking vegetables to avoid loss of food value and ensure you wash your vegetables with safe drinking water before use. A healthy lifestyle helps you to reduce your risk of getting sick. Thank you for listening, for more information check out your NOURICITY flyer. Stay healthy and safe! Goodbye!

3.4 Randomization approach

The 405 participating households were randomly categorised into three groups: (1) a control group with participants not receiving the flyer or the IVR calls; (2) a group of participants receiving only the flyer; (3) a group receiving flyer and the IVR calls/text messages. Randomisation was done using excel and was based on the proportions of participating households per village. The distribution is displayed in **Table 7**.

Table 7 Number of participants per group according to village

Group	Kitambuza	Kikuubo	Kiyanja	Wampamba	Lutuunda	Total
1	27	28	22	28	30	135
2	28	28	22	28	31	137
3	27	27	22	27	30	133
Total	82	83	66	83	91	405

4. Results

Results are reported according to the four previously mentioned aims of the NOURICITY project.

4.1 An exploratory analysis of panel data on food consumption based on NPS-LSMS

This component was led and managed by WUR. First, preliminary results were presented by Dr. Vincent Linderhof of WUR during the Tropentag Conference 2020 under the title: 'How did Diets in Urban and Rural Uganda Develop over Time?' Human nutrition and diets (Linderhof et al., 2020c).

4.2 Multi-stakeholder workshops

This activity was also led by WUR in cooperation with BoP, while the Alliance of Bioversity International and CIAT was responsible for the development of the key stakeholder list (as described within the method section), as well as actively participating in the workshops.

In total, two multi-stakeholder workshops were held during the project. The first in October 2019 and the second in February 2020. The primary aim of the first workshop was to map the stakeholders of the food system in Kampala and the food flows within the selected parish of Kanyanya, as well as to get a better understanding of the food environment situation within the parish and Kampala. The workshop was held on two consecutive days consisting of two different groups per day. On the first day, parish representatives were invited, while the

Figure 6 Participants of day 1 of the first stakeholder workshop

second included national representatives at the governmental and research level. **Figure 6** displays

the participants on day one and **Table 8** displays a breakdown of the different participants per workshop.

Table 8 Number of participating institutions/organizations at both workshops

TYPE OF ORGANIZATION	ORGANIZATION	REPRESENTED POSITION	WORKSHOP	
			First	Second
GOVERNMENT	KCCA	Manager agriculture and agribusiness	5	6
	MAAIF	Ass commissioner food and nutrition security	1	
	MOH	Senior nutritionist	2	
	MAAIF		4	
	NAADS			1
	MGLSD		1	1
	Office of the prime minister (OPM)	Programme/Acisci	1	1
	Royal Netherlands Embassy	Senior policy officer	1	1
NGO	Deutsche Welthungerhilfe	Regional nutrition advisor	1	
	Kilimo Trust		1	
	SNV		1	
	Solidaridad			1
	GIZ		1	1
	Nutreal	Director		1
	Slow Food	Research Assistant	1	2
	Volunteers Effort For Development Concern (VEDCO)	Advocacy and communication officer	1	1
	World Vision	Program officer health	1	
PARISH	Local Health	Team member/sanitation	1	1
	Parish representatives	Chairperson of each zone or vice chair/Local security	1	
	Parish youth activist		1	
	Local business	food stall owner/been seller/business owner	1	
RESEARCH	IFPRI	Marketing and product development officer	1	
	ISSD	Vegetable manager		1
	ABC	Scientist		3
	NARO	Research Assistant	1	2
UNIVERSITY	KYU	Lecturer department of food technology	1	1
	Makerere	Professor/Ass lecturer	1	1
	WUR WCDI	Nutrition advisor	1	1
	KACITA	Membership services advisor		1
TOTAL PARTICIPANT			31	27

During the discussion, various challenges within the urban food systems were pointed out by the participants related to food safety risks, healthy food availability and affordability. Identifies main food safety issues, which were the overuse and misuse of pesticides at the farm level, the food handling processes by traders and retailers, as well as unhygienic ways of food preparation. Seasonality was the key concern in terms of availability, accompanied by the lack of appropriate storage facilities and knowledge. Important to note is that one participant highlighted that most families in Kanyanya are only able to afford one meal per day. It was also noted that food prices, as well as the cost of preparation (charcoal, wood), play a key role in the affordability and food security situation in the parish. The key outputs of the discussion were the establishment of an urban food outlet map of the parish. The exercise was a participatory one, accompanied by field mapping by the hired consultant, see **Figure 7** and **Figure 8** .

Figure 7 Urban food outlet map displaying the distribution of supermarkets and local markets within the boundaries of Kanyanya parish, Kampala (created by Vincent Linderhof).
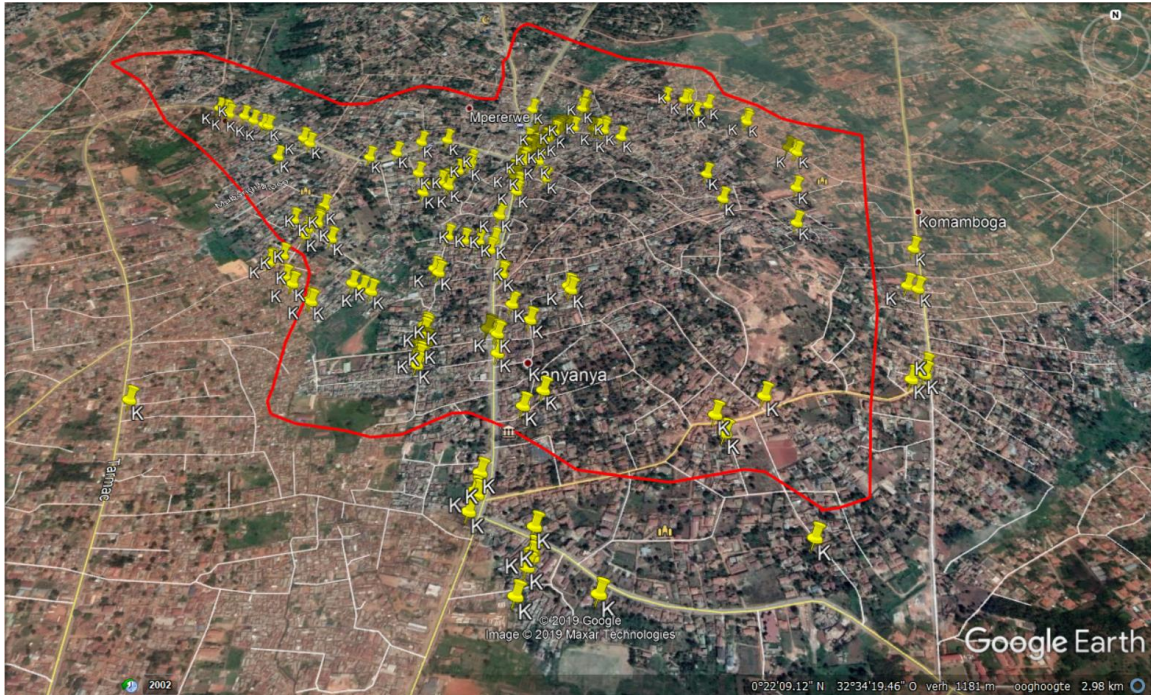
Figure 8 Urban food outlet map displaying the distribution of kiosks within the boundaries of Kanyanya parish, Kampala (created by Vincent Linderhof).

The second workshop, held in February 2020 had the key objective to inform the stakeholders about the progress of the project and discuss possible interventions in a participatory manner. The workshop was a one-day activity, including parish-level representatives as well as a national representative from Kampala. Results and the map created within the first workshop were shared and discussed. Also, the developed pamphlet 'The Kanyanya food challenge: the first results of mapping the food system' established in cooperation with WEcR, was shared with the participants. The pamphlet included summary findings of the first multi-stakeholder workshop in October 2019 (Linderhof et al., 2020a). The main objective of this second discussion is to discuss and get suggestions on possible interventions to be carried out by the Project. The discussions were carried out and the interventions arrived at were:

- Sensitization of parish inhabitants and key health workers through approaches such as cooking demonstrations and, nutrition education sessions.
- Seizing urban agriculture opportunities i.e. vertical gardens-sack gardening, water conservation, backyard gardening
- Sensitization of street food vendors to promote healthier foods

4.3 Policy Intervention

The first intervention package included nutrition communication and awareness creation using flyers, see **Figure 5**. A flyer with information on healthy diets was prepared by the Alliance of

Bioversity International and CIAT and WUR and validated by Dr. Beatrice Ekesa. The final flyer was distributed to the project treatment groups (groups 2 and 3) in October 2021. The Alliance of Bioversity International and CIAT field assistant in collaboration with village leaders carried out in-person distribution of the flyers. **Figure 9** displays some impressions of the distribution activity. A total of 265 flyers were distributed to 265 households.

Figure 9 Impressions of the flyer distribution by the Alliance of Bioversity International and CIAT field assistant

The second intervention package included awareness creation and sensitization through the digital platform telephone. This was led by VIAMO and included telephone calls and short messages to the beneficiaries. This was initiated shortly after the distribution of the flyer had been finalised (4 weeks). The first message was sent on the 1st of November 2021 and continued over the following four weeks. The participants received one call and text message per week. The report on this activity was shared with the main project partner WUR. The campaign targeted 132 household members (participants). Preliminary results show that on average 106 participants picked the call (80%), while 98 completed the call. Almost 80% of the participants listened to the calls in the local language and most pick-ups were found in the village of Lutuunda. Only one third completed the satisfaction survey. Almost all indicated that the messages were easy to follow and over 75% shared the messages with others, while 50% indicated that the messages received were too many, yet 90% enjoyed the messages and would like to receive them in future

To note and to ensure ethical guidelines are adhered to, all participating households of group one (the control group), also received the flyer in January/February 2022, after the implementation of the intervention and the completion of data collection. **Figure 10** shows the study design and intervention highlighting the treatments according to the study groups and that accorded to the control group.
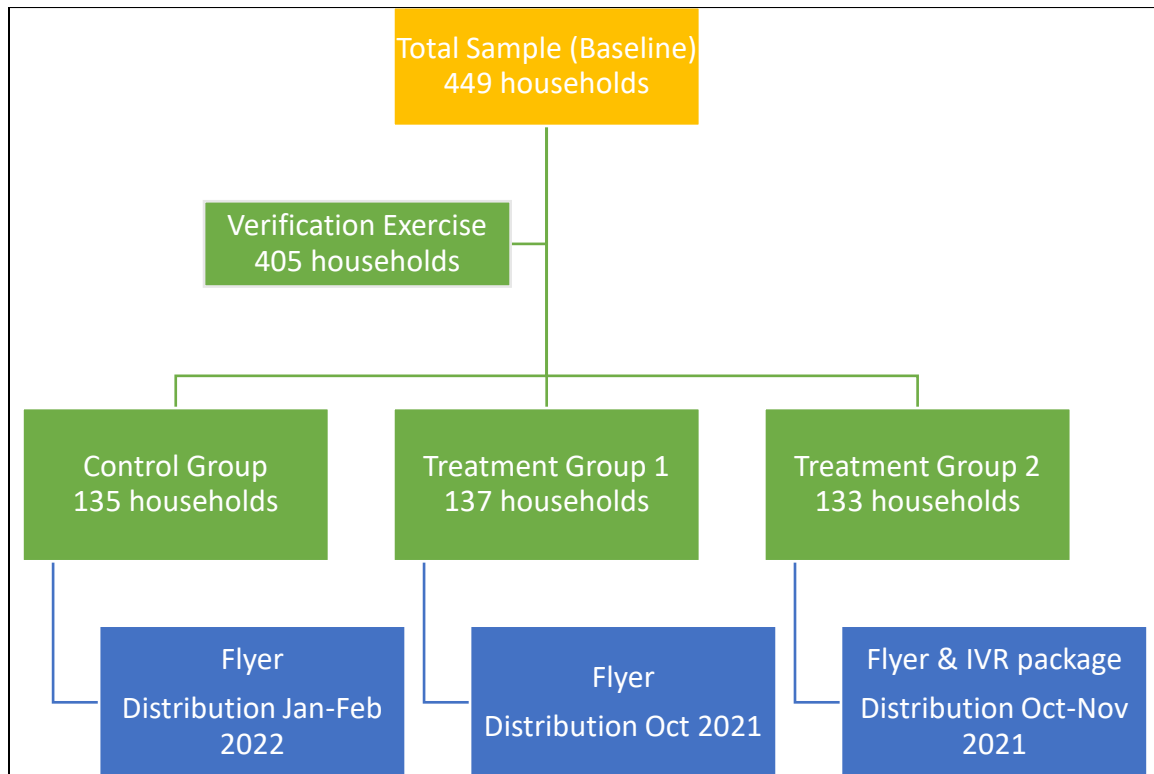
Figure 10 NOURICITY Study design

4.4 Measuring the effects of policy interventions

4.4.1 Qualitative data collection

Following the first FGD sessions, some of the highlights were as follows:

- Agreeing on operational definitions such as healthy food and food safety by the participants was a challenge as the opinions were quite diverse. The following statements were mentioned to indicate healthy foods within the community: balanced diets, bodybuilding food, and foods with nutrients like vitamins.

- Key food safety concerns were storage and preparation of food, but also the preservation of food was mentioned.

- The main identified challenges within the food system in the parish of Kanyanya include elements of the food supply chain, such as post-harvest losses and poor infrastructure and transport of food towards the community/parish.

- Challenges within the food environment of the community include issues around food safety and the availability and affordability of preferred and healthy food items. Additionally, the missing knowledge and awareness of healthy food and waste management influenced consumer behavior and the external drivers of the food system. The area suffered from flooding and poor waste and sanitation practices.

- Further, the results of the FGD can be found in the Technical Report of the FGD, which was finalized and published in December 2020 (Fongar et al., 2020c), see Figure 11.

Figure 11 Impression of the focus group discussion exercise in Feb 2020

The second FGD was carried out shortly after the end-line data collection (December 2021) with the objective to get a better understanding of the impact of the COVID-19 pandemic on the parish especially with regard to food systems produced the below highlights:

- The number of food outlets had reduced and most of the small restaurants had to close in response to the COVID-19 pandemic and related closure of economic activities in the country.
- Transportation costs had increased substantially, as the capacity to carry people were regulated, making it difficult for inhabitants to reach the market. It was mentioned that several community members had come up with alternative food sources and even skipped meals completely.

4.4.2 Quantitative data collection

Following an analysis of both the baseline and end-line results, preliminary results suggest an overall increase in dietary diversity at the household level. The household dietary diversity score (HDDS) increased from 8.5 to 9.2 consumed food groups. The distribution of different food groups consumed is displayed in **Figure 12**. Most consumed food groups in both periods (all above 95%) were cereals (FG1), vegetables (FG3), legumes, nuts and seeds (FG8), sweets (FG11) and condiments (FG12). Eggs (FG6) were only consumed by 17% of the household in the baseline, while this doubled in the end-line. In total, households consumed on average 16 different food items over one week, while the end-line number increased by 2 to 18 food items per household per week.
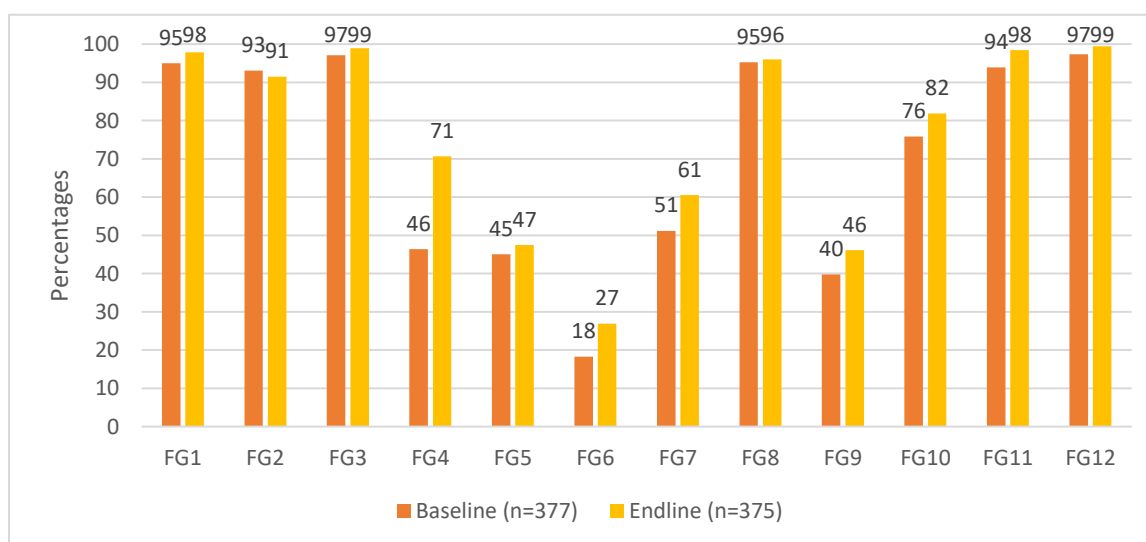
Figure 12 Distribution of food group consumption based on the HDDS 12 food groups comparing baseline and end-line data

Looking at the individual level, the minimum dietary diversity score for women (MDD-W) was calculated for both periods. Hardly any variation was seen between baseline and end-line data collections. At baseline, 40% of women reached minimum dietary diversity. Similarly, in the end-line around 41% of women reached minimum dietary diversity. On average in both periods 4.3 different food groups were consumed.

Any type of agricultural activity was performed by almost 30% of households at the baseline period in March/April 2021, which increase to December 2021 at the end-line collection to 38%. The

increase is mainly associated with an increase in holding any type of livestock. On average, households have grown 1.5 different crops in March/April 2021 and 2 different crops in December 2021.

Currently, the calculation of households and housing characteristics is ongoing, as well as other indicators are forthcoming. Although, the preliminary results suggest a positive impact of the NOURICITY intervention. We found an increase in dietary diversity at the household level and an increase in urban farming activities. Further analysis will determine the different impacts according to the treatment groups and the significance of the impact

5. Research outputs

Several outcomes of the NOURICITY project were published online and presented on several different occasions. This section provides an overview of the outcomes so far on the workshops and data collection, trends in urban diets, the impact assessment of the experiment on awareness raising of healthy food and heathly diets, urban farming and the food resources/food environment.

Workshops and data collection

- Results of the first multi-stakeholder workshop in October 2019 were summarised in a pamphlet with the title 'The Kanyanya food challenge: the first results of mapping the food system' (January 2020) and shared within the second stakeholder meeting in February 2020 (Linderhof et al., 2020a).
- Workshop report of the second multi-stakeholder workshop in February 2020 on Possible interventions in the food system of Kanyanya, Kampala (Linderhof et al., 2020b);
- For the first key FGD, a technical report was prepared by the Alliance of Bioversity International and CIAT in cooperation with WUR (Fongar et al., 2020c).
- Presentation by Andrea Fongar at the Alliance of Bioversity International and CIAT science seminar series under the heading of 'Urban Food System of Kampala, Uganda: A Participatory Approach To Map Systemic Drivers For Healthier Diets' on December 9th, 2020, link to the webinar recordings: Recordings.
- This document with the information on the surveying.

Trends in urban diets in Uganda
- Paper presented at Presentation at the Tropentag 2020 conference (online): How did Diets in Urban and Rural Uganda Develop over Time' (Linderhof et al., 2020c)

Impact assessment of the experiment on awareness raising of healthy food and heathly diets

- Paper 'Urban Food Systems of Kampala, Uganda: a Participatory Approach to Map Systemic Drivers for Healthier Diets' presented at the Tropentag 2020 conference (online), (Fongar et al., 2020a).

- Paper titled "Impact of healthy food and diets information on household food security. A randomized control trial in Kampala, Uganda". Revised manuscript under review of the journal *Frontiers in Sustainable Food Systems*

Food resources/food environment

- Paper presented at Tropentag 2022 titled Where do Inhabitants of the Parish Kanyanya in Kampala shop? (Fongar et al., 2020b)
- Paper to be presented at the 22nd IUNS-International Congress of Nutrition, December 6-11, 2022, in Tkyo, Japan Where do Inhabitants of the Parish Kanyanya in Kampala shop? IUNS 2022,

6. Conclusions and Recommendations

Urbanisation is accompanied by a shift of poverty and malnutrition hotspots from rural to urban areas (Sahn and Stifel, 2003). In most African cities overweight, obesity, micronutrient deficiency and undernourishment coexist (Popkin, 2003; WHO, 2018). The project NOURICITY running from August 2019 to April 2022, aimed to improve urban nutrition in Uganda by engaging in a chain of multi-stakeholder participatory events and fieldwork meant to deliver a blueprint for partnerships seeking to improve urban nutrition in Africa.

Through multi-stakeholder workshops with parish and national representatives' food outlets were mapped and the current food security and environment situation of the parish was assessed. Key issues, unhealthy consumption, problems with food availability and access, food safety, as well as environmental problems and lack of nutritional knowledge were identified. During the workshop, possible suggestions for interventions were developed together with parish and national representatives.

The information gathered during the stakeholder meetings was verified using focus groups discussion and quantitative data from random sample households within the parish. First, the results underline the issues raised during the stakeholder workshop. Based on this information an intervention was designed and tested. The intervention involved information on healthy diets, including recommendations on how to enhance the variety of one plate. The information was provided to sample households in two different ways, via a flyer and voice recordings.

Preliminary results suggest a positive impact of the intervention, while analysis needs to confirm which type of information is more promising. As the stakeholder workshops were very well received, we suggest holding another workshop to share the results and key findings of the NOURICITY project and tighten stakeholder relations as well as develop lasting cooperation and scale up the developed interventions.

References

FAO, 2001. Human energy requirements, Report of a Joint FAO/WHO/UNU Expert Consultation. Food and Agriculture Organization of the United Nations, Rome, Italy.

Fongar, A., Dijkxhoorn, Y., Ekesa, B., Linderhof, V., 2020a. Urban Food System of Kampala, Uganda: a Participatory Approach to Map Systemic Drivers for Healthier Diets. Presented at the Tropentag 2020 "Food and nutrition security and its resilience to global crises."

Fongar, A., Dijkxhoorn, Y., Ekesa, B., Linderhof, V., 2020b. Where do inhabitants of the parish Kanyanya in Kampala shop? Presented at the Tropentag 2020 "Food and nutrition security and its resilience to global crises."

Fongar, A., Ekesa, B., Dijkxhoorn, Y., Linderhof, V., 2020c. NOURICITY - Technical report on qualitative data collection (Focus Group Discussions) (Report).

HLPE, 2017. Nutrition and food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome.

Linderhof, V., Dijkxhoorn, Y., Fongar, A., Onyango, J., Ekesa, B., 2020a. The Kanyanya food challenge: the first results of mapping the food system (No. WEcR 2020-124).

Linderhof, V., Ekesa, B., 2021. Healthy Diets Kanyanya.

Linderhof, V., Fongar, A., Nalweyiso, M., Onyango, J., Dijkxhoorn, Y., 2020b. Possible interventions in the food system of Kanyanya (Kampala): workshop report. Wageningen Economic Research, Wageningen, The Netherlands.

Linderhof, V., Motovska, N.M., Janssen, V.C.J., Ekesa, B., Fongar, A., 2020c. How did diets in urban and rural Uganda develop over time? Presented at the Tropentag 2020 "Food and nutrition security and its resilience to global crises."

MAAIF, 2010. Agriculture Sector Development Strategy and Investment Plan: 2010/11 – 2014/15. Ministry of Agriculture, Animal Industry and Fisheries, Kampala, Uganda.

Malabo Montpellier Panel, 2017. Malabo Montpellier Panel (2017). Nourished: How Africa Can Build a Future Free from Hunger and Malnutrition. Dakar. August 2017. Malabo Montpellier Panel, Dakar, Senegal.

Popkin, B.M., 2003. The Nutrition Transition in the Developing World. Dev. Policy Rev. 21, 581–597. https://doi.org/10.1111/j.1467-8659.2003.00225.x

Sahn, D.E., Stifel, D.C., 2003. Urban–Rural Inequality in Living Standards in Africa. J. Afr. Econ. 12, 564–597. https://doi.org/10.1093/jae/12.4.564

Tschirley, D., Reardon, T., Dolislager, M., Snyder, J., 2015. The Rise of a Middle Class in East and Southern Africa: Implications for Food System Transformation. J. Int. Dev. 27, 628–646. https://doi.org/10.1002/jid.3107

Uganda Bureau of Statistics, 2016. The National Population and Housing Census 2014 – Main Report. UBOS, Kampala, Uganda.

Uganda Bureau of Statistics (UBOS), ICF, 2018. Uganda Demographic and Health Survey 2016. UBOS and ICF, Kampala, Uganda and Rockville, Maryland, USA.

Wanyama, R., Gödecke, T., Qaim, M., 2019. Food Security and Dietary Quality in African Slums. Sustainability 11, 5999. https://doi.org/10.3390/su11215999

WHO, 2018. Obesity and overweight [WWW Document]. URL https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight (accessed 12.2.19).

Ziraba, A.K., Fotso, J.C., Ochako, R., 2009. Overweight and obesity in urban Africa: A problem of the rich or the poor? BMC Public Health 9, 465. https://doi.org/10.1186/1471-2458-9-465

Appendix

Table A1 Content on the text message (SMS) intervention via the service provides VIAMO

Block Label	Script - ENGLISH	Script - LUGANDA
Pre SMS IVR	Hi, for the next 4 weeks you will receive calls from the Nouricity Project about healthy diets. If you miss it please beep 0200522715 and we shall call you back	Nkulamusizza, wiiki 4 eziddako ojja kukubirrwanga essimu okuva mu ba NOURICITY Project ku bikwata ndya ennungi. Bwevuga n'otogiraba, beepinga ku 0200 522 715 tujja kuddamu tukukubire.
Pre SMS text	Hi, for the next 4 weeks you will receive messages from the Nouricity Project about healthy diets for you and your family. Please follow the advice. Thank you	Nkulamusizza, wiiki 4 eziddako ojja kufuna obubaka obuwandiike ku ssimu okuva mu NOURICITY Project obukwata ku ndya ennungi gyoli n'abenju yo. Goberera amagezi gano. Weebale
M1	Hello, did you know that a healthy plate in Kanyanya should contain a variety of energy-giving, bodybuilding & body-protecting foods, plus water? Try it today!	Nkulamusizza, okimanyi nti essowaani y'emmere ereeta obulamu e Kanyanya erina okubaako emmeere ereeta obulamu, ezimba omubiri, kkuuma omubiri n'amazzi? Kigezeeko leero
M2	Healthy life! Happy life! Did you know that each meal should contain energy-giving foods, with a variety of whole grains. Limit refined grains like white bread.	Obulamu obulungi, obw'essanyu! Okimanyi nti buli kijjulo kirina okubaako emmere ereeta amaanyi, ngeriko ebika by'emmere ey'ensigo. Kendeeza ku nsigo ezirongooseddwa ng'omugaati omweru (White Bread).
M3	Eat well, live long! Each meal should contain bodybuilding foods that are good for growth, like fish, chicken, beans, gnuts, eggs or dairy. Avoid processed meat	Lyaa bulungi, wangaala. Buli kijjulo kirina okubaako emmere ezimba omubiri, eyamba okukula obulungi nga ebyennyanja, ebijanjaalo, ebinyeebwa, amagi oba amata n'omuzigo. Weewale ennyama ensunsule.
M4	Hello, each meal should contain body protection foods which are fruits and vegetables. Eat at least 5 portions of variety & colourful fruits & vegetables a day!	Nkulamusizza, buli kijjulo kirina okubaako emmere ekuuma omubiri nga mulimu ebibala n'enva endiirwa. Lya waakiri ebitundu 5 ebya langi 5 ezenjawulo ebyebibala n'enva endiirwa olunaku!

Table A2. Content of the instant voice recording (IVR) intervention via the service provider VIAMO

Block Label	Script - ENGLISH	LUGANDA
M1	Hello, my name is birungi from the NOURICITY project and I will be calling you once a week for the next four weeks to share with you my journey with eating healthy. I hope the information I share with you will also help you decide how you shall feed yourself and your loved ones. Today I will be talking about what a healthy plate for each meal should have and I know we can get this food in Kanyanya. Can't we? (little laugh) I used to have so many illnesses, was always feeling tired and spending so much money in hospitals until one doctor advised me to change the way I eat and I have been healthier ever since. Do you want me to tell you how I arrange my meals these days? (Pause for dramatic effect) Alright, don't beg I will tell you. My plate at each meal contains a variety of energy giving foods, bodybuilding foods, body protection foods and water. For example, imagine the plate you normally use for your meals and divide it into 4 portions. I fill the first portion with energy giving food, such as any type of wholes grain, rice, cassava, yams, arrow roots, maize, millet, sorghum, matooke or sweet potatoes, my second portion is filled with bodybuilding foods, such as fish, chicken, peas, beans, gnuts, eggs and healthy dairy and the last 2 portions are filled with body protective foods, which are any type of healthy vegetables and fruits. I also make sure to drink at least 8 glasses of water a day. At the end of the day, we all want a better life for ourselves and our loved ones. This is why I advise you to also prepare your meals the way I do mine to reduce some diseases and you will also have a healthy body. I will call you again next week to advise you more specifically about energy giving foods. In the meantime make sure you check out your NOURICITY flyer. Have a great day! Goodbye!	Nkulamusizza, erinnya lyange nze Birungi okuva mu NOURICITY - Project era nja kukubiranga essimu omulundi gumu mu wiiki nnya ezijja okugabana naawe olugendo lwange olw'endya ey'obulamu. Nsuubira nti bye naagabana naawe era bijja kukuyamba okusalawo ku ngeri gyoneeriisangamu n'abaagalwa bo. Leero ka njogere ku ssowaani ey'obulamu ku buli kijjulo ebirina okubaako era mmanyi nti tusobola okufuna emmere eno e Kanyanya. Tusobola? (akaseko akatono) Nalwalalwanga nnyo endwadde, nga mpulira obukoowu ate nga nkozesa ssente nnyingi mu malwaliro okutuusa Omusawo omu bwe yampabula okukyuusa engeri gye ndaymu era okuva olwo ndi mulamu katebule. Oyagala nkubuulire engeri gye ntegekamu ebijjulo byange ennaku zino? (Pause for dramatic effect) Essowaani yange buli kijjulo ebaako emmere ewa omubiri amaanyi, emmere ekuuma omubiri n'amazzi. Ekyokulabirako, fumiitiriza ku ssowaani gyokozesa bulijjo ku bijjulo byo ogigabanyeemu ebitundu 4. Nzijjuza ekitundu ekisooka n'emmere ewa omubiri amaanyi, omuli ebika nga eŋŋano, omuceere, muwogo, amayuni, kasooli, obulo, omuwemba, amatooke oba lumonde, ekitundu kyange ekyokubiri ne nkijjuza mmere ezimba omubiri nga enkoko, kawo, ebijanjalo, ebinyeebwa, amagi n'amata n'omuzigo ebirungi, ate ebitundu ebibiri (2) ebisembayo ne mbijjuzaako emmere ekuuma omubiri nga muno mwe muli ebika byonna ebyenva endiirwa n'ebibala eby'obulamu. Nfaayo okunywa lwakiri giraasi 8 ez'amazzi olunaku. Naye mu byonna fenna twetaaga obulamu obulungi n'obwabaagalwa baffe. Ye nsonga lwaki nkuwa amagezi naawe otegekenga ebijjulo byo nga bwe nkola, okukendeeza ku ndwadde ezimu era ojja kuba n'omubiri omulamu. Nja kukubirako wiiki ejja nnyongere okukuwabula naddala ku mmere

			ewa omubiri amaanyi. Mu kiseera kino fuba otunule ku lupapula oluliko ebikwata ku NOOURICITY. Nkwagaliza olunaku olulungi; weeraba!
M2	Hello, this is Birungi again from the NOURICITY project. Last week we talked about what a healthy plate for each meal should have. I hope you remember and have tried to follow my advice. Today I will be talking to you about energy-giving foods. Last time I advised you to split your plate into 4 portions: one portion of energy giving food, one portion of bodybuilding foods, and 2 portions of body protective foods. Today we shall talk a little bit more about our portion that has energy giving food, which are any type of whole grains and cereals such as cassava, rice, maize, arrow roots, yams, wheat, sorghum, millet and others. These are important to include into your daily plates because they increase your energy levels and help you to be more productive. But remember that too much of anything can be bad so limit the consumption of refined grains, such as white rice or white bread. Also, avoid eating grains or cereals with moulds, which can make you sick. It is important to note that only 1 out of the four portions on your plate should have energy giving food. I will call you again next week so that I can tell you about the second portion on your plate which should have bodybuilding foods. In the meantime make sure you check out your NOURICITY flyer. Have a great day! Goodbye!		Nkulamusizza nate, nze Bikrungi okuva mu NOURICITY Project. Wiiki ewedde twayogera ku ssowaani ey'emmere ey'obulamu gyolina okulya buli kijjulo. Nsuubira nti ojjukira era ogezezaako okugoberera amagezi gange. Leero ka nkubuulire ku mmeere ereeta amaanyi. Ku mulundi ogwayita nakuwa amagezi essowaani yo ogyawulemu ebitundu 4; ekitundu ekimu nga kya mmere ereeta amaanti, ekirala kya mmere ezimba omubiri ate n'ebitundu ebirala 2 ebyemmere ekuuma omubiri. Leero katwogere katono ku kitundu ekirina emmere ereeta amaanyi nga muno mulimu ebika byonna ebyemmere ey'ensigo n'ebirala nga muwogo, omuceere, kasooli, emmere eyomuttaka, amayuuni, omuweemba, obulo nebirala. Bino bikulu nnyo okussa ku ssowaani yo buli lunaku kubanga byongera amaanyi mu mubiri ate bikusobozesa okwongera ku maanyi mu byokola. Naye jjukira nti buli kintu bwe kisukka kifuuka kibi n'olwekyo fuga engeri gyolyamu emmere eyo eyebika ebirongoseddwa ng'omuceere (White Rice) n'emigaati emyeru (White Bread) era wewale okulyanga emmere emu eyensigo eriko empumbu eyinza okukulwaza. Kino kikulu nti ekitundu kimu ku biri ku ssowaaniyo kirina okubaako emmere ereeta amaanyi. Nja kukubira wiiki ejja mkubuulire ku kitundu ekyokubiri ekirina okubaamu emmere ezimba omubiri. Mu kiseera kino, kebera ku lupapula lwa NOURICITY. Nkwagaliza olunaku olulungi.. Weeraba!
M3	Hello, this is Birungi again from the NOURICITY project. I know what you are thinking, "Oh my God why is she calling me again?" Well, I promised to call you for 4 weeks with advice about eating healthy and as the Baganda say, "It's only the one who cares about you who gives you advise". (pause) Yes, you heard it right, I care about your health and today I will be advising you about bodybuilding foods. We learnt in our first call that we should take a plate and divide it into 4		Nkulamusizza, era nze Birungi okuva mu NOURICITY Project. Manyi kyolowooza kati, nga webuuza nti "Katonda Wange ate ono lwaki azeemu okunkubira essimu?" Ye nnasuubiza okukubira essimu okumala wiiki 4 nga nkuwa amagezi ku ndya eyobulamu era ng'Abaganda bwebagamba nti "akufaako era yakuwa amagezi. (Gakuweebwa munno). (Pause) Ye, owulidde kituufu nfaayo nnyo ku bulamu bwo era leero nkuwa amagezi ku mmere ezimba omubiri. Mu ssimu gyenasooka okukubira twayiga nti essowaani y'emmere gyawulemu ebitundu 4, ekirala kya mmere ereeta amaanyi, ekirala kya

	portions: one portion of energy giving food, one portion of bodybuilding foods, and 2 portions of body protective foods. Today let us go into more detail about bodybuilding foods also known as proteins, which can be obtained from both plant and animal sources, such as fish, chicken, peas, beans, nuts, eggs, and healthy dairy. Eating a variety of different proteins are important for growth, development and maintaining a healthy body. To maintain a healthy level of proteins in your body please Limit red meat and cheese and avoid cold cuts and processed meat. I will call you again next week so that I can tell you about the last two portions on your plate which should have body protective foods. In the meantime make sure you check out our NOURICITY flyer. Have a great day and remember to eat healthy! Goodbye!	mmere ezimba omubiri n'ebitundu bibiri eby'emmere ekuuma omubiri. Leero tugenda mu buziba bw'emmere ezimba omubiri, era eyitibwa Protein era nga tugifuna okuva mu bimera n'ensolo nga ebyennyanja, enkoko, kawo, ebijanjaalo, amagi n'amata n'omuzigo. Okulya ebyokulya ebyo ebyebika eby'enjawulo kikulu nnyo mu kukula n'okuzimba omubiri omulamu. Okukuuma Protein obulungi mu mubiri gwo, kendeeza ku nnyama erimu omusaayi (Red Meat) n'omuzigo omulongoose (Cheese) era wewale nennyama ennongoosereza (Processed meat). Nja kuddamu nkukubire wiike ejja ndyoke nkubuulire ku bitundu ebibiri ebirala ebyawulwa mu ssowaani yo okuli emmere ekuuma omubiri. Mu kiseera kino faayo okusoma ku lupapula lwa NOURICITY. Nkwagaliza olunaku olulungi ate jjukira okulya emmere ey'obulamu weraba!
M4	Hello, this is Birungi from the NOURICITY project. This is our last call and I will be advising you on healthy vegetables and fruits, body-protective foods. As we have seen from the very beginning it is better to take a plate and divide it into 4 portions: one portion of energy giving food, one portion of bodybuilding foods, and 2 portions of body protective foods. So, each meal of a healthy plate should always contain body protection foods, which are fruits and vegetables. The more, the better! Eat at least 5 handfuls of variety and colour of fruits and vegetables a day (fresh or cooked)! Try to vary between the different colours. Combine green, red, orange and purple vegetables and fruits whenever possible. Avoid overcooking vegetables to avoid loss of food value and ensure you wash your vegetables with safe drinking water before use. A healthy lifestyle helps you to reduce your risk of getting sick. Thank you for listening, for more information check out your NOURICITY flyer. Stay healthy and safe! Goodbye!	Nkulamusizza, nate nze Birungi okuva mu NOURICITY Project. eno ye ssimu yaffe esembayo, era ngenda kukuwabula ku nva endiirwa n'ebibala ebyendya ennungi nga ye mmere ekuuma omubiri. Nga bwe tulabye okuva ku ntandikwa kirungi okuddira essowaani nogyawulamu emirundi 4; ekitundu ekimu kya mmere ereeta amaanyi, ekitundu ekirala kya mmere ezimba omubiri n'ebitundu 2 eby'emmere ekuuma omubiri. N'olwekyo buli ssowaani eyemmere ennungi bulijjo erina okubaako emmere ekkuuma omubiri, nga bino bino bye bibala n'enva endiirwa. Gye bikoma okukozesebwa ennyo n'obulungi gye bukoma! Lya embatu 5 ezebibala ebyenjawulo n'enva endiirwa olunaku nga bifumbe oba bibisi!! Gezaako okukuŋŋaanya langi z'ebibala ez'enjawulo; kiragala, ebimyuufu, kacungwa ne kokobe buli lwe kisoboka okubifuna. Wewale okufumba ennyo enva endiirwa kuba kibimalamu ekiriisa ate faayo enva endiirwa okuzoozaako n'amazzi amayonjo nga tonnazikozesa! Enneeysa ennungi mu byendya ekuyamba okukendeeza ku bizibu by'okulwala. Weebale okuwuliriza, okumanya ebisingawo somako ku lupapula lwa NOURICITY. Wekuume nga oli mulamu. Weeraba!