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Kennis Basis Programme Feeding the Cities and Migration Settlements

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Contents

1 Introduction[1]

Cities are expanding rapidly. Population growth and urbanisation - the process by which more and more people leave the countryside to live in cities- are the main causes of this. Urbanisation has significant implications for both urban- and rural food systems.

On one hand, the influx of people in cities causes food demand in urban areas to increase, while food production in rural areas is pressured by this increasing urban food demand, particularly in low- and middle-income countries (LMIC). In socio-economic terms, many African countries have been experiencing urbanisation without growth in per capita income. This has led to a range of adverse outcomes, such as urban poverty and massive unemployment among a growing group of (mainly young) urban dwellers. Although not a homogenous group, migrants seem to be disproportionally represented in the low-income (sometimes illegal) settlements of city areas (IOM 2015). Consequently, access to sufficient, affordable, and nutritious food and healthcare is particularly difficult in fast growing cities in LMIC. Moreover, urbanisation is often associated with dietary changes towards more natural resource-intensive and energy-dense diets. In many LMIC, large proportions of the population are still unable to afford sufficient healthy foods, leading to undernutrition and micronutrient deficiencies. While others in the same cities face changes in their food environment that lead to increasing incidence of overweight and obesity (e.g. (GLOPAN 2016; IFPRI 2018). In LMIC, the prevalence of food insecurity within the urban populations is higher than among rural populations (Tefft et al. 2017). In urban areas, people rely almost entirely on purchased foods, which, coupled with insecure employment, leads to high levels of food insecurity. Urbanisation also results in environmental- and health related challenges. Many cities have inadequate waste management facilities, resulting in widespread prevalence of diseases due to vermin and other pests. Again, it is the poorest segments of the population, who are hit hardest by these circumstances. Not only because their living environment is often unhygienic and uncertain, but also because access to affordable healthcare is often limited.

On the other hand, the outflux of (mainly young) people from rural areas has significant implications for rural food systems. Urbanisation not only reduces the capacity of rural governments to provide services to their populations, but it also makes rural areas less attractive for young people. These factors contribute to the increasing inability of rural areas to feed urban areas (labour force, knowledge and possible other types of capital move with people). This leads to a downward spiral of outward-migration, reduced services, and reduced performance of rural food systems.

The links between rural-urban migration and food systems are little researched (Battersby and Watson 2019; IFPRI 2018; Serraj and Pingali 2018). The Kennis Basis (KB) programme: *'Feeding cities and migration settlements'* takes this complex and challenging context as the starting point of action-oriented research, with the ambition to contribute to resilient, sustainable and healthy urban food systems. To do so, the KB programme analyses and develops interdisciplinary approaches and solutions to improve the food systems of expanding cities in Africa and Asia, with particular attention to the role of migration in these areas.

The aim of this paper is to explore the usefulness of the food systems approach in city region contexts by analysing and comparing several case studies, in which the food systems approach is employed by the authors. The boundary of the 'urban food system' is inherently problematic, as cities are always related to their surrounding areas and other areas (e.g. in terms of food production and transport, rural-urban migration, etc). To overcome this, we combine the rural-urban food systems framework, as developed by van Berkum et al. (2020) and the city region food systems approach, as outlined by Blay-Palmer et al (Blay-Palmer et al. 2018). These frameworks bring together 'food systems thinking' and city regional governance, by paying attention to food and nutrition security, urban-rural linkages, and governance aspects of city regions.

[1] This introduction is loosely based on a draft analytical framework of the Feeding the Cities project (developed by Katrine Soma and Siemen van Berkum) and the draft for City Region Governance document (developed by Lotte Roosendaal and others)

2 Research questions and approach

2.1 Research questions

The main research question that this paper seeks to answer is as follows: *What can we learn from, and what are the benefits of applying the food systems approach in city region contexts in low- and middle-income countries?* This main question has multiple dimensions, which we can divide in the following sub-questions:

- *Which elements of the food systems are addressed more dominantly, which elements are less emphasised, and why, in the selected case studies?*
- *How do the case studies deal with the systems features of urban food systems (e.g., feedback loops, trade-offs, and synergies)?*
- *How do the case studies deal with stakeholder engagement and what are the advantages and disadvantages of the chosen strategies?*
- *What are the advantages and pitfalls of applying the food systems approach in city region contexts?*
- *What common elements emerge which make certain pathways in urban food systems successful or unsuccessful (and for who)?*

2.2 Approach

We purposely selected four case studies that explicitly deal with food systems in city region contexts:

- Innovations in the fish value chain in Kibera/Nairobi, Africa.
- Developing a sustainable food system in Dhaka city region, in Bangladesh, South Asia.
- Migration dynamics and food systems in Arua, a secondary city in Uganda, Africa.
- NOURICITY, a project about urban food consumers in Kanyanya, a parish in Kampala, Uganda, Africa.

The case-owners of the four case studies provided inputs for an initial narrative of the four case studies. Based on this initial step, we further refined the learning questions and organised a set of reflection meetings, in which the case-owners reflected on their own case and the other cases in relation to the following topics:

- *How different elements of the food system are addressed in the four cases (and why).*
- *How the cases deal with feedback loops, trade-offs, and synergies.*
- *Stakeholder involvement and engagement approaches.*
- *Successful and less successful transition pathways observed in the case studies.*

Three exchange sessions organised by the wider KennisBasis (KB) Programme Food Security and Valuing Water, which took place in June and July 2021, were also used as input for this document. During these exchange sessions, the different motifs under the KB programme exchanged experiences about: boundary setting in food systems, working with stakeholders in food systems, and working in an inter-disciplinary way in food systems. The Dhaka case, the Kibera case and the Arua case also served as case studies during these exchange sessions, which gave the case-owners the opportunity to relate their case and questions to what others are doing in other food system contexts.

When reflecting, we looked both at common elements and differences. The intention was to come to a synthesis of what we can learn from applying a food system lens in practice: *What does it add compared to other approaches; and what are disadvantages and challenges?*

3 Case descriptions

3.1 Dhaka Metropolitan Area (DMA) (Bangladesh)

Context
The Dhaka metropolitan area is rapidly expanding and population is projected to grow to 27.4 million people by 2030. Alongside being the third largest city in the world, it is also one of the most densely populated urban areas in the world, with 15,700 people per square km. Bangladesh is a lower-middle income country, where the demand for differentiated, healthy and safe food is increasing (World Bank, 2021).

Food and nutrition security remain an on-going concern in Bangladesh, especially in urban areas. At the moment of starting the project, no evidence existed of any coordinated strategy or set of policies to address the challenges associated with assuring urban residents of a reliable and sufficient supply of safe, healthy, and nutritious food.

Project scope, partners, timeframe
The project *'Support for modelling, planning and improving Dhaka's Food System'* envisions addressing the multi-facetted challenges that the current food system in Dhaka city region is faced with. The project aims to identify entry points for policies that build on rural-urban interdependencies and synergies towards fostering an enabling environment for smallholder farmers to participate more equitably in food chains, while simultaneously providing all residents within the DMA with greater access to safe healthy nutritious food.

The project is funded by the Embassy of the Kingdom of the Netherlands in Bangladesh.

The Food and Agriculture Organisation of the United Nations (FAO) and Wageningen University & Research (WUR) in the Netherlands formed a consortium to work on this project, within which FAO is the local representative and WUR the knowledge institute that supports FAO with advice. The project runs from May 2019 until mid-2023.

3.2 Kibera – Innovation in the fish value chain (Nairobi, Kenya, Africa)

Context
The Kibera food system is characterised by strong rural – urban linkages, in terms of migration, but also in terms of linkages between production (rural areas) and consumption (urban areas). Another aspect of Kibera's food system is the strong prevalence of informal networks (Soma et al., 2021). Due to Covid-19 and mobility restrictions, food security has become even more at risk than previously.

Project scope, partners, timeframe
The project addresses the deficit in (animal) proteins in Kibera's slums. In a multi-stakeholder workshop, a new sourcing option for fish was identified. In this project, the need and acceptance by multiple stakeholders, including acceptance by consumers, were analysed.

Wageningen Economic Research worked with external partners, foremost, with and through Egerton University in Kenya.

The case is part of the project: *"Feeding Cities and Migration Settlement",* which is financed by the Dutch Government's Ministry of Agriculture, Nature and Food Security. A series of research activities, including a household survey and action research related to the fish value chain were conducted by

Egerton University, in collaboration with the Nyeri Fish Farmers Society and Wageningen University & Research. The work started in December 2019, when WUR, the Egerton University team, and the slum community lead investigated Kibera in a literature review, conducted some preparatory household interviews, and prepared for a documentary. Research is still being conducted and will end when the Feeding Cities and Migration Settlement project ends in 2022.

3.3 Arua food system (secondary city with migration settlements, Uganda, Africa)

Context
The primary livelihood strategy for the majority of Ugandans is subsistence agriculture, which is associated with high levels of poverty. Productivity levels are relatively low, and diets remain highly seasonal. Only one-third of crop production is marketed and less than 7% is exported (CIAT, 2017). Nevertheless, Uganda is self-sufficient in terms of staple foods and plays a major role in regional food supply and trade.

The area of focus in this case study is the secondary city of Arua, in the North Western part of the country. Arua is strategically located, near the border of the Democratic Republic of the Congo (DRC) (15 km) and South Sudan (75 Km), making the city a key trade-hub for the region. Uganda hosts the largest number of refugees and internal displaced persons in Africa, and this district, in particular, hosts a sizable refugee population due to its proximity to the border. This refugee population creates both advantages and challenges for local development. Arua still suffers from poor service provision (the city was only connected to electricity in 2018, and much of the population still does not have access to electricity) and has historically been cut-off from the rest of Uganda, as a result of a long-term instability caused by the Lord's Resistance Army, which has resulted in underdevelopment of the area.

Arua has recently been designated as a regional city by the Government of Uganda, based on its potential role in facilitating regional trade with neighbouring countries. The West Nile Regional Investment Plan highlights five areas, which they see as key strategic drivers of agricultural transformation in the region. These include climate change and its effects on production, the availability of cheap labour, which could be better utilised through improving skills and training, abundant fertile land that could be more efficiently farmed with increased mechanisation, primed domestic and regional markets, and support for the establishment of industrial agricultural processing (Government of Uganda, 2018).

Project scope, partners, timeframe
The Nutrition and Income Generation (NIGI) project seeks to provide innovative, sustainable, and scalable solutions to improve the nutrition and food security for people in and around the refugee settlements in the West Nile Region. The project started in November of 2018 and ended in June 2021. The project is funded by a special envelope of funding from the Dutch Government's Ministry of Foreign Affairs to support finding durable and sustainable solutions for refugees in key refugee-hosting counties. The project was implemented by WUR (and a WUR office in Uganda) and the pre-commercial foundation of the private company, East West Seeds, East West Seeds Knowledge Transfer.

3.4 Kanyanya/Kampala (Uganda)

Context – see 3.3

Project scope, partners, timeframe
The NOURICITY project aims to investigate the structure and dynamics of urban food systems in Africa (including rural-urban food value chains), to reveal the co-existence of different facets of malnutrition and their drivers. These insights will be used to develop partnerships for coherent, nutrition-sensitive policies in the respective countries. One of the cases is Kampala (Kanyanya parish). In particular, NOURICITY investigates the interventions to stimulate urban consumers in low-income

neighbourhoods to opt for healthier and safer diets. Other cases studies from the NOURICITY projects are being conducted in Accra (Ghana) and Cape Town (South Africa).

The project started in 2018 and is still running. Due to the Covid-19 pandemic, the three-year project is likely to be extended by one year and will end in 2022. For the Kampala case study, the main funder is the Dutch Government's Ministry of Agriculture, Nature and Food Quality and CGIAR. Its main implementers are Wageningen Economic Research, the Alliance of Bioversity International and CIAT (the International Center for Tropical Agriculture) and BoP (Base of Pyramid) Innovation Centre.

So far, the project has included the following research:

- Two-day workshop on the challenges in the food system in Kanyanya (October 2019), (Linderhof et al. 2020), including;
  - One day with local stakeholders (village leaders, citizens, retailers, farmers etc.).
  - One day with high-level stakeholders (Kampala Capital City Authority (KCCA), ministries, NGOs etc.).
- Food outlet mapping to identify the locations of the type of food outlets in Kanyanya, resulting in a Google Earth map (December 2019) (Linderhof et al. 2020).
- Workshop on interventions for improving the choices for healthier and safer diets in Kanyanya (February 2020).
- Focus group discussions with local stakeholders (men, women, and young people) in preparation of the baseline survey (February 2020) see Fongar et al. (2020).
- Baseline survey conducted in March-April 2021.

In addition, the NOURICITY project collaborated with two other Long Term EU-African Research Partnership-Agriculture (LEAP-AGRI) projects:

- NUTRIFOODS on climate-resilient crops for bakery products in Uganda, and
- Food4Cities on the transformation of food systems in Africa (Kampala) with food flow exercises.

3.5 Summary

In the table below, a summary overview is presented of the key features of the four case studies that formed part of the cross-case learning.

	DMA (Bangladesh)	Kibera (Kenya)	Arua (Uganda)	Kampala (Uganda)
FS focus	Entire food system	Improving nutrition through new fish supply opportunity	Migration dynamics / nutrition	Consumer dynamics / nutrition
Geographic scope	Dhaka City Region	Nyeri (rural areas north of Nairobi) and Kibera (slum in Nairobi)	Arua (secondary city)	Kampala
Funding	Large (> 10 million Euro)	Small (< 0.1 million Euro)	Medium	Small (<1 million Euro)
Funding source	Embassy of the Kingdom of the Netherlands in Dhaka	Dutch Government's Ministry of Agriculture	Dutch Government's Ministry of Foreign Affairs	Dutch Government's Ministry of Agriculture
Project lead	FAO	WUR	WUR	WUR
WUR departments involved	Wageningen Centre for Development Innovation, Wageningen Food and Biobased Research, Wageningen Economic Research and Wageningen Environmental Research	Wageningen Economic Research, Wageningen Food and Biobased Research	Wageningen Centre for Development Innovation, Wageningen Plant Research	Wageningen Economic Research
Other partners	Dhaka City Council	Egerton University, Community lead in Kibera and Chair of the Fish Farmer Cooperative in Nyeri	East West Seeds, Wageningen University Uganda	The Alliance of Bioversity International, CIAT, BoP Innovation Centre
Timeframe	2019-2023	2019-2022	2018-2021	2019 - 2022

4 Description of findings

4.1 Which elements of the food systems are addressed more dominantly, which are less emphasised, and why in the selected case studies?

4.1.1 Dhaka

The overall project goal of the Dhaka Metropolitan Area (DMA) project is to contribute to a safe, sustainable, and resilient food system for Dhaka, which is underlined in its vision in the Theory of Change, which states that '*In 2041, Greater Dhaka will be a city where everyone can consume safe, affordable, and nutritious food and lead a healthy life*'.

The Theory of Change identifies five pillars:
- Safe food for all.
- Strengthen inclusive urban food system governance.
- Sustainable and resilient value chains.
- Reducing food waste; and
- Food nutrition security for resource-poor urban population.

The DMA project is explicitly using the framework as developed by (van Berkum et al. 2018) as its guiding frame for analysis and intervention. The programme is active in most elements of the food system.

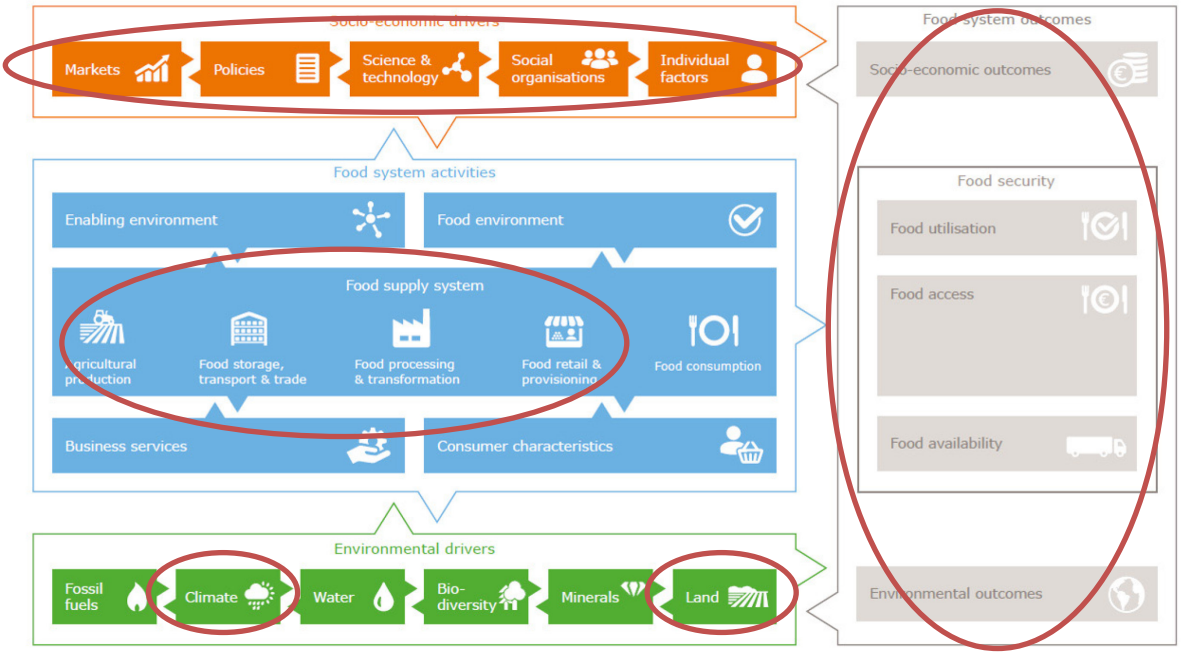

Figure 1 *Focus of Dhaka project*

In the table below, the major food systems challenges are described, as perceived by WUR project team.

Type of challenge	Challenge
Economic	In Dhaka, an estimated 30-40% of the people live in marginal, partly illegal settlements under conditions of extreme poverty. The causes of urban poverty are due to the limited employment opportunities, degraded environment, poor housing and sanitation. Dhaka experiences a great influx of migrants into the city, and therewith, unplanned expansion of the city. From this perspective, urban planning of public interest and food access is difficult, and typically follows after the expansion of the city. Inequality prevails in Bangladesh. Inequalities can be seen through the lens of sex, religion, non-native (such as Rohingya), age. This challenge is not addressed to a great extend in the briefing notes, but is as part of the gender strategy by Wageningen Centre for Development Innovation – also to create awareness Dhaka has a large informal, unregulated food market. This concerns the city corporations in terms of food safety and the interest of the formal food system. On the other hand, the informal food system is essential for the urban poor with regards to food access.
Environmental	Due to climate change, Bangladesh is facing increasingly threats of floods, droughts, landslides and less food production opportunites domestically. Rural-urban migration may speed up as a reult of this. Dhaka's waste disposal problems are huge. Consequently, health concerns, water pollution and sanitation problems, as well as waste collection and sewage problems are significant. A natural consequence of such rapid urban growth is that peri-urban and rural land is being developed for residential and industrial purposes. Estimates from the Bangladesh Bureau of Statistics demonstrate that more than 810 square km of arable land are being lost to urban settlements, roads, and industrialisation every year.
Social	In Dhaka, an estimated 30-40% of the people live in marginal, partly-illegal settlements, under conditions of extreme poverty. The causes of urban poverty are due to the limited employment opportunities, degraded environment, poor housing and sanitation. Ensuring access to quality health services and proper sanitation in urban areas, particularly for the poor is an important factor in improving health and nutrition outcomes in urban areas in Bangladesh. Food security is on the rise in Bangladesh, but despite improvements in food availability and access, levels of both chronic and acute under-nutrition remain above acceptable levels (WFP 2016). New concerns around food security and nutrition are emerging with the increasing pace of urbanisation. These include: (i) poor food safety; (ii) increasing obesity, especially among women; and (iii) the increasing difficulty of combining work outside the home with care-giving, which is essential for the nutritional well-being of children. Studies indicate that food is not on the political agenda of cities, such as Dhaka.

The dominant challenge depends upon which lens or frame is taken. The project lead (FAO) is in close contact with the four City Corporations of Dhaka, as they are perceived as important actors in devising and implementing policy directions in relation to the Dhaka city region food system. According to the City Corporations, the main challenges include food- and nutrition security for the urban poor, food safety, market formalisation (modern slaughterhouses, street food vendors, wet markets) and food-waste management. However, as food and nutrition security are not the mandate of City Corporations, their priority is shifted to acute and visible problems, such as **waste management** – which is the responsibility of a city corporation. In the analysis of the project, the case-owners have not observed a structured way of classifying, weighting and prioritising project activities. It is apparent that the Dhaka city corporations prioritise visible problems (e.g. waste management) and technical solutions, over invisible problems (e.g. governance).

The case-based learning exchange with the other three case studies resulted in an observation that certain aspects of the food system may be overlooked or underrepresented in this case. These are:

- The fact that food systems extend beyond the city of Dhaka.
- Overarching national issues and priorities (e.g. Flooding, climate change not mentioned).
- Informal actor and sectors (e.g. informal leaders, informal citizen organisations, informal actors active in waste management and informal trade).
- Indigenous solutions and/or social innovations.

4.1.2 Kibera fish food system

The Kibera case study focused on one particular value chain within the food system: The fish value chain (Soma et al. 2021). However, the 386 household interviews also provide information about livelihood more broadly, as well as consumption of other food, water availability, energy use, security, trust, food insecurity, etc. (Ayuya et al. 2021). As such, the case study touches upon several elements of the food system, as depicted in the figure below.

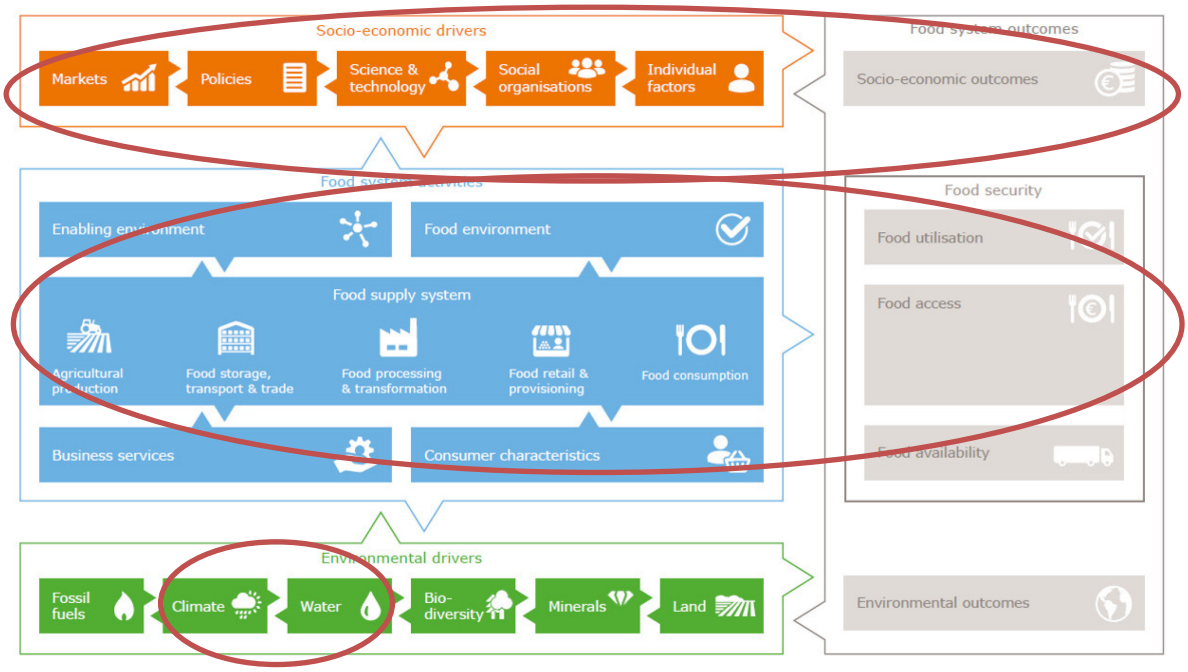

Figure 2 *Focus of Kibera project*

So-called 'network leaders', or informal sector community leaders, play an important role in this case study, as well as focus on socio-economic aspects of the food system. This is unique in comparison to the other three case studies.

3In the table below, the main challenges of the Kibera food system are described, as perceived by the case-owner.

Type of challenge	Challenge
Economic	- *High levels of poverty.* - *People migrate extensively into the city in search for work.* - *Unstable labour conditions, creating problems for particularly women fish traders.* - *Inequality.*
Environmental	- Here, they face problems of water shortage, water pollution, and sanitation problems, as well as waste management and sewage problems.
Social	- About 700.000 people live in Kibera, of which a large proportion are poor households with too little food, and high demand for nutritious protein food as fish. These households include HIV affected families with children. - Security is low for the Kibera vendors when they have to get the fish from elsewhere in Nairobi. - Setting up a new value-chain is the same as setting up a new institional context. This is done in cooperation with a trusted network who actually have defined needs and solutions in frequent dialogues with WUR.

According to the case-owner, the choice is not what to do, but what to do first: " *To avoid that what we do first will have negative implications on what to do next, a food system approach is very helpful. With the overview we are reminded about what we actually need to do next."*

The most urgent issue in Kibera- according to this project - is access to stable employment that provides stable income. When challenges around this are addressed first, food security will follow as an urgent challenge to be solved, by understanding how the context will transitioning into a situation with more stable incomes. The main goal of the Feeding Cities and Migration Settlement project – zero hunger – is, thus, highly relevant, because this is integrated with employment and health. With steady income, people can make a living, take care of their health, and otherwise not. Also, social challenges are perceived as highly critical, as it is not safe, and particularly not for women, in Kibera. Women must walk far to go to the toilet, and while walking and queuing, harassments can occur on a daily basis. The project has one component that is zoomed in on the fish value chain, in particular the introduction of a new channel for fish marketing to increase the availability of affordable fish in Kibera (Soma et al. 2021; Obwanga et al. 2020).

The case-based learning exchange resulted in the observation that certain elements receive less attention in this case study. These are environmental aspects, a longer/wider food system perspective (i.e. how the particular value chain intervention impacts the longer-term changes and wider food system and *vice versa*); and finally the linkage with governance and the national policy arena.

4.1.3 Arua

The NIGI case study in Arua, Uganda, has a focus on specific aspects of the food systems approach, namely food production, specifically vegetables and fruits and food consumption/nutrition and supporting the enabling environment for improved production by supporting the seed sector and with agronomic skilling (see Figure 3 below).

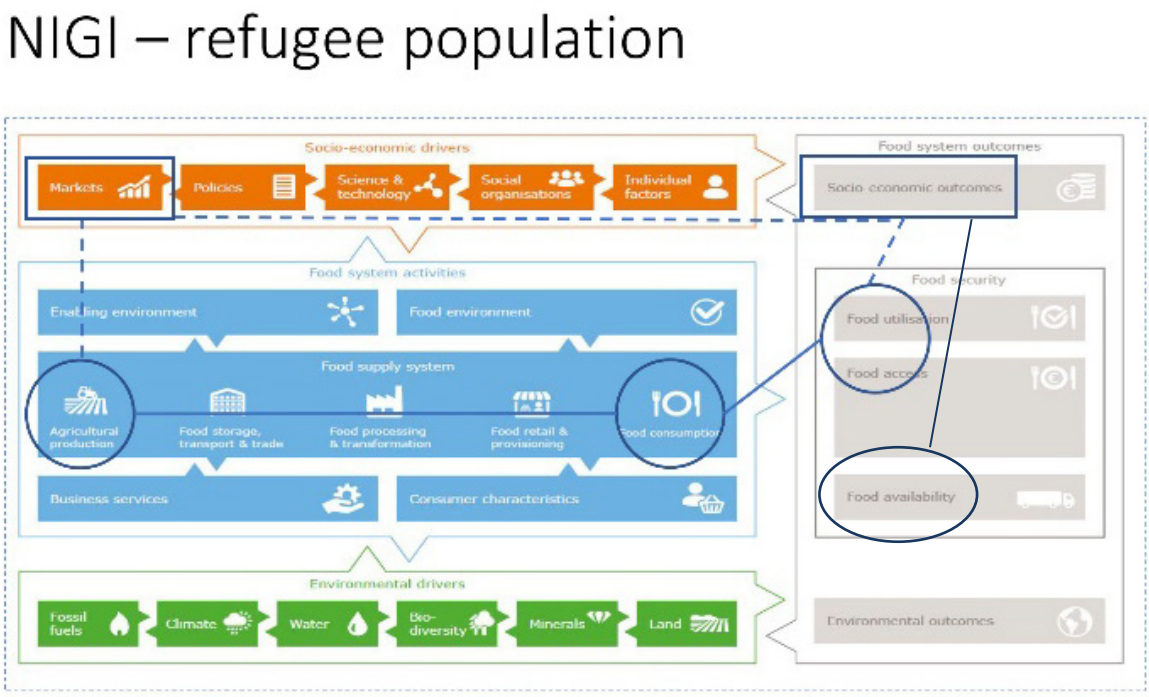

Figure 3 *Focus of Nigi/Arua case*

The project also worked on issues of business services, including the support for increase access to quality seed, for example, supporting the establishment of kiosk for purchasing seeds in the refugee settlement.

The main sustainability (or Sustainable Development Goal - SDG) or food system challenge(s) that the projects aim to address are outlined in the table below.

Type of challenge	Challenge
Economic	**Job creation** – the population of West Nile, as in the rest of Uganda, is very young and growing quickly. There is a significant shortage of jobs, as well as necessary skills to preform jobs. The project seeks to provide expanded income generation activities for the local community by providing necessary skills to become commercial vegetable farmers, providing farmers with new or more diversified income sources. **Refugee integration to local economy-** Uganda has one of the most welcoming refugee responses in the world (World Bank 2019). Newly arrived refugees are provided with a small piece of land and are allowed to freely travel around the country. However, the overall challenge of lack of jobs also affects refugees and there are limited opportunities for refugees to find formal employment (most jobs available to them are working for non-governmental organisations (NGOs) or the United Nations (UN) within the settlement). Challenges in accessing formal education (many refugees do not have the necessary paperwork), as well as in accessing finance, makes it especially hard for refugees to obtain the necessary qualifications to find jobs or set up on their own. While refugees are provided with cash or food for the first few years in Uganda, after five years they are expected to have found work or become self-sufficient in agriculture. The NIGI project provides skills to support refugees to increase their incomes through vegetable production. **Supporting the overall enabling environment for a thriving agricultural sector.** Farmers lack access to high quality inputs, including seed. Development of improved agronomic practices should lead to an improved enabling environment for agriculture production, as farmers will start demand for improved inputs, and with knowledge about how to use these inputs correctly, they should be able to increase their profits, thereby, supporting overall development of the sector.
Environmental	**Preserving soil fertility** – much of the land provided to refugees in West Nile region is of poor quality (very rocky, not very fertile). However, In the first few years of the project, vegetable farming has been more successful than expected because the land is 'virgin' land and not previously used for vegetable production. In order to ensure longer term productivity, soil fertility must be carefully managed. WUR Plant Research is carrying out a number of soil fertility studies in both the settlement and host communities to understand which nutrients are present in the soil, which nutrients are being depleted by the project, and what needs to be added back into the soil to ensure long term soil fertility. **Use of agronomic techniques to minimise water loss** - Access to water is a critical challenge, especially in the settlement area. In the study site associated with the project, at which we trial new seeds and practices, we focus on simple irrigation techniques and mulching methods to reduce water loss. **Reduced need and use of pesticides in vegetable production –** The vegetable gardens promoted in the settlement aim to use only organic methods to prevent pests and diseases, and the integrated pest management is practiced by the commercial vegetable farmers, using organic methods, as far as possible, and pesticides only as a last resort. Proper training in pesticide application should also help reduce harmful environmental effects.
Social	**High levels of undernutrition -** Rates of undernutrition among young children in the West Nile region are among the highest in Uganda; 34 percent of children aged six to 59 months were stunted, and 56 percent were anaemic in the most recent nutrition survey carried out by the Government of Uganda, UNHCR, UNICEF, WFP, 2018). In Arua, the global acute malnutrition rate for children aged between six to 59 months (a measure of recent levels of food security) was 10.3 percent, above the World Health Organisation cut-off for a public health emergency; while other settlement areas in West Nile region also have high rates of acute malnutrition compared to settlement areas in other parts of the country. The project provides nutrition education, combined with knowledge on how to produce vegetables to support improved dietary diversity and nutrient intake, as well as increasing access to vegetables. **Peaceful co-existence and development between refugee and host communities.** The project seeks to support strengthened ties between the host community and surrounding refugees in terms of collaboration for land (to farm), skills exchange and trading. This is part of the Government of Uganda's strategy, and recent work by the FAO and United Nation's High Commissioner for Refugees (UNHCR) has found that projects can help in building and improving collaborations to enable integration and a peaceful co-existence.

The dominant challenge by the majority of the actors involved in the case is **creating sustainable livelihoods for newly arrived refugees** and supporting the development of agriculture in the region more broadly. Newly arrived refugees must find a way to support themselves. The additional population in the region provides some opportunities for the local population (new markets, etc.), but also challenges regarding strain on agricultural systems and other services.

The cross-case learning exchange resulted in the observation that this case study, as compared to the other case studies (in particular Dhaka and Kibera) is more analytical than action-oriented, or more towards understanding the food system rather than intervening in it. The nutrition and consumer perspective comes out more strongly, with a whole pillar of the project focused on nutrition awareness and education, as compared to Dhaka and Kibera. It was also observed that the project seems to prioritise the involvement of public and more formal actors, at the expense of indigenous or more informal actors. However, more recently, the project is collecting some data on traders and who purchased the vegetables from those producing vegetables commercially. Environmental aspects receive less attention than socio-economic and nutritional aspects.

4.1.4 NOURICITY/Kampala

The NOURICITY case study has a strong focus on the consumption side of the food system, as becomes clear from the figure below.

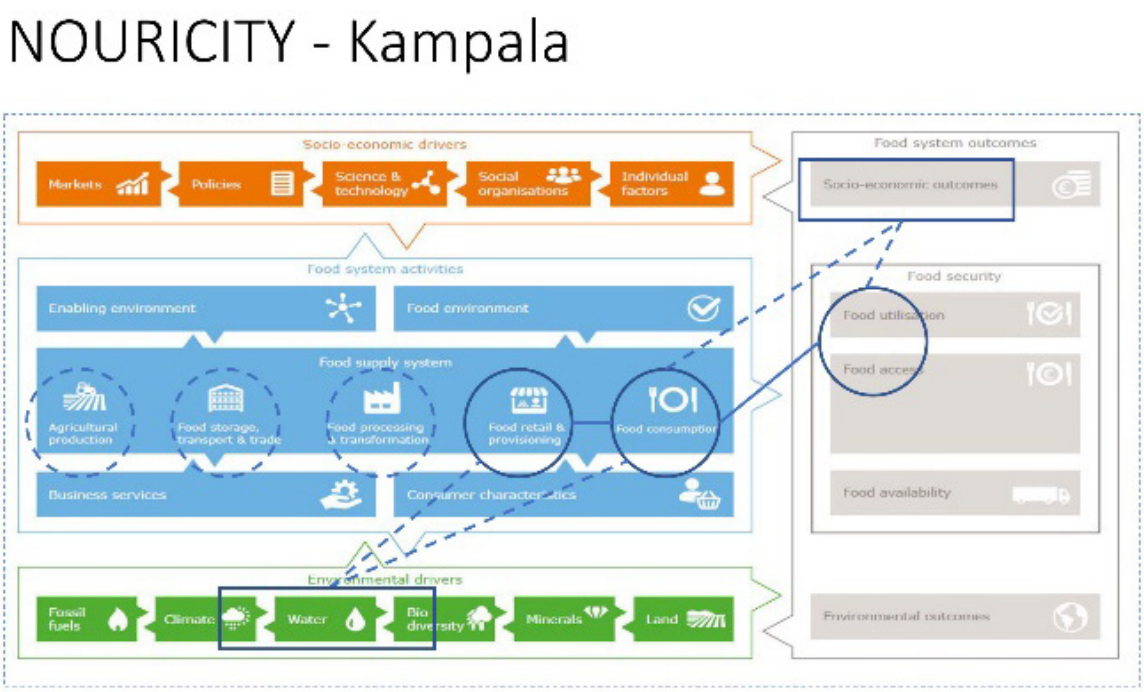

Figure 4 *Focus of the NOURICITY/Kampala project*

The main sustainability (or SDGs) or food system challenge(s) according to the NOURICITY project are outlined in the table below.

Type of challenge	Challenge	
Food security	Availability of healthy food	-Transportation too long without cooling (fresh products). -Limited food processing. -Limited cooling storage capacity. -High seasonality. -Traditional cooking methods affect nutritional values.
	Affordability: Price of food	-High prices and low incomes (see economic aspects).
	Food safety	-Presence of pesticide residues in food. -Unsafe processing of food by street vendors.
Economic	High food prices. High unemployment rates, especially amongst young people.	
Environmental	Lack of safe water for cooking/preparation. Energy availability (charcoal).	
Social	Education, sensitisation and training. Criminal areas in the neighbourhood due to high unemployment etc..	

The dominant challenge by the majority of the actors involved in the case is food safety, affordability, and availability of nutritious food. The basic idea is to start interventions to improve the consumption of healthy and safe food at local level. Interventions are meant to be structural, and social acceptance is crucial, which is why involvement of local people and partners is employed.

On the one hand, interventions and their opportunities of success were discussed in a project workshop (February 2020). One outcome of the workshops was that the lack of awareness of healthy and safe diets among the citizens of Kanyanya was a substantial problem, which hinders the success of interventions. On the other hand, the partnership agreements should maintain the success of the intervention for a longer period of time, and hopefully be a good example for other neighbourhoods in Kampala or other cities in Africa.

The cross-case exchange resulted in a number of observations. Firstly, the NOURICITY case is rather research-oriented (as compared to some of the other cases). Through experiments, the situation can be understood better, which can help future interventions in food systems. Secondly, the link to local- and higher-level stakeholders is an integral part of the project. Thirdly, due to the local level of study area, the link between this project and the national policy arena is less obvious, as well as the link between the boundaries of Kampala and the hinterland, where the majority of the food for the urban population is produced. Note that the city-level policy-makers, as well as the national policy-makers of several ministries were represented at the workshop conducted. Fourthly, actors who operate in the informal food economy were also part of the stakeholder consultation which is often not the case. Lastly, as was the case with the Kibera case, the links with the longer term and wider food system do not seem to receive much attention in this case study, although the long-term impact is part of the research structure with the partnership agreements.

4.1.5 Analysis

The table below gives an overview of the main food system challenges, the dominant perspectives, and aspects that receive less attention in the four case studies.

Case	Main food system challenges identified	Main challenge selected to work on	Reasoning	Dominant perspectives	Perspectives that receive less attention
Kibera	- Access to stable employment and income. - Hunger. - All kinds of water challenges. - Poverty.	Food Security → Innovations to improve production and supply of Fish. Social issues (gender, women's safety).	The choice is not what to do, but what to do first. The network leads are core stakeholders, and a bottom-up research perspective is applied to ensure ownership by local communities.	- Nutrition. - Social issues/socio-economic aspects. - Value chain development.	- Longer term perspective. - Links with governance and national policy arena. - Environmental aspects.
DMA	- Illegal settlements, extreme poverty. - Migration. - Inequality. - Climate change. - Waste problems. - Chronic mal- and undernutrition, but also food safety, obesity.	Safe food for all. Inclusive urban food system governance. Sustainable and resilient value chains. Reducing food-waste. Food Nutrition Security for resource-poor urban population.	Council is major stakeholder, for them waste problems are important.	- Nutrition and job creation. - Modern, technical solutions. - Visible problems (waste) prioritised.	- The fact that food systems extend beyond the city. - Larger national issues are underrepresented (e.g. flooding, climate change). - Informal actors and sectors. - Less visible problems and solution directions (e.g. governance).
Arua	- Low productivity, low efficiency in value chains. - Job creation. - Refugee integration to local economy. - Natural resource management. - Malnutrition.	NIGI prioritises nutritious food production and dietary diversity (settlement), as well as commercial vegetable production (host) and supporting access to, and demand for, improve inputs, including seeds.	Challenges are prioritised based upon discussions with stakeholders and guided by national policy priorities including the Ugandan Refugee Response Plan, and West Nile Agricultural Development Plan, as well as the funding priorities of the Dutch Government.	- Nutrition perspective. - Smallholder/local solutions farming is dominant. - Focus on practical and ready to implement low-tech solutions.	- Indigenous solutions. - Informal actors. - Environmental aspects. - In the national policies, the economic/modernisation frame is dominant (this conflicts with the dominant frame of the case study).
NOURICITY	- High food prices. - Unemployment. - Lack of safe water for cooking/preparation. - Energy availability (charcoal). - Criminality due to high unemployment.	Awareness of consumers on healthy diets, food safety, affordability, and availability of nutritious food	The key for people to change their behaviour towards healthier diets is to understand what healthy diets are. Currently, this knowledge and awareness is lacking in the urban areas, like Kanyana in Kampala.	- Understanding the food system rather than changing it. - Nutrition. - Consumer side.	- Link with national level is not clear, but national policy makers are aware of the project. - Link between Kampala and wider hinterland (boundaries of the system), which is partly covered by the collaboration with the Food4Cities project. - Informal sector is included, as we conducted workshops and focus group discussions for citizens. - Long-term perspective is part of the project structure.

All four case studies took the food system as an overarching framework. The advantage of this approach, according to the case-owners, is that it enabled them to zoom out and create an overview of different and interrelated challenges and trends in the food systems. Furthermore, it helped the researchers to acknowledge how different challenges relate to each other, realising that there is not one single solution to solve the magnitude of problems. For instance, in all four case studies the relation between food security and employment and between food safety/health related issues and increasing demographic pressure on cities were apparent.

An observation across the four case studies is, however, that despite the food systems approach that was taken, the primary entry point of the assignment, the composition of the team and involved expertise determines the focus of the analysis and foreseen interventions. In advance, the environmental (and spatial) expertise was less represented, or subservient, in the four case studies. A wider scope and environmental conditions and challenges, such as the effects of climate change or natural resource management was not always in sight; or the potential positive or negative environmental feedback loops with the food system activities. Nonetheless, parallel to the KB projects, additional research took place in which the spatial and environmental perspectives were highlighted (de Rooij et al., 2020(a), and progressive insights in the projects themselves came more at the forefront (de Rooij et al., 2020b) and Verweij et al (2020).

One of the challenges that all four case studies identified in working with the food system approach is the step from 'zooming-out' to making the decision to 'zoom-in' (and determining the actual focus of interventions). In Dhaka and Arua, the project stakeholders aim to address a number of challenges simultaneously. In the Arua case study, solutions are tailored for various stakeholder groups. Refugees are supported to produce small amounts of diverse foods for their own consumption, whereas host community farmers are supported to grow vegetables for profit, and a seed component seeks to support development of a stronger seed system with improved access to quality inputs. While formal policy interventions are critical in guiding the intervention, the intervention itself focuses on less engagement with, or attempts to influence for policy processes, although there was some effort to work with key actors including UNHCR and World Food Programme (WFP), who help set the policies that guide many of the decisions about projects, which are implemented in the settlement areas. In Dhaka, interventions at policy-level are combined with technical innovations that have a visible effect on the ground. The visual impact is needed to raise awareness on the possibilities within food systems, but also from the perspective of political interest.

The NOURICITY and Kibera cases are similar in the sense that they are much smaller in scope and more focused in their actions. In NOURICITY, the choice was made to focus on the consumer side of the food system, as there was a lack of awareness on health and safe diets, in Kanyanya parish in Kampala, where a household survey was conducted twice to detect change in food security before and after innovations. Also, in Kibera, a consumer survey on fish consumption and livelihood in Kibera was conducted in August 2020 and repeated in August 2021 to detect any changes (Ayuya et al. 2021). In Kibera, the case-owners emphasised that the urgent situation with lack of available food influenced the decision to focus on the introduction of a new fish marketing channel that would increase the availability of affordable fish, by adding a new value-chain from Nyeri to the existing one, with fish being delivered from Lake Victoria (Soma et al. 2021). The choice for fish in Kibera (as compared to other commodities) was influenced by priorities set by local stakeholders, national policies (blue economy) and partner (FAO) priorities.

4.2 What type of transition(s) are the case studies explicitly or implicitly working towards?

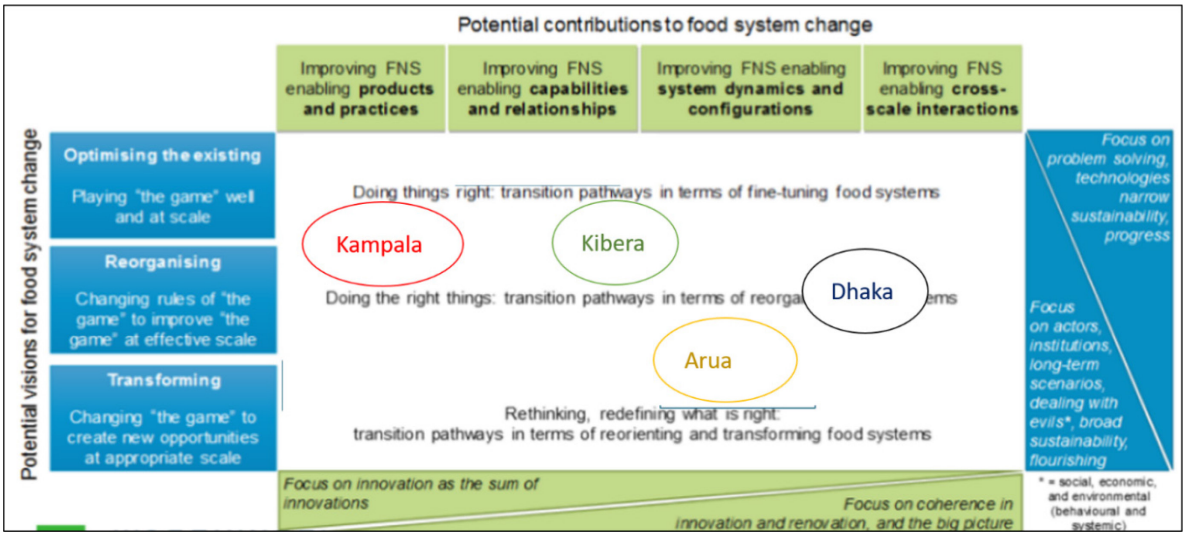

Figure 5 *Positioning the four cases in relation to the type and depth of transition*

The Dhaka project is the largest (in terms of money involved) and most ambitious in terms of scope and timing. 'On paper', this project has a clear vision of how to work on interrelated challenges towards a transformation of the food system. This vision was created through the organisation of a Theory of Change session, conducted with FAO and WUR representatives. In preparation of this meeting, FAO conducted stakeholder meetings to obtain inputs. Inputs were prioritised based on (a) their potential to address the challenges in the Dhaka food system, (b) financial feasibility and (c) the expected stakeholder engagement. The outcome of the session was four strategic objectives:

1. Improving access to food and nutrition security for the urban poor,
2. Strengthening the food market system and reducing food-waste,
3. Improving governance, planning, and management in the city, and
4. Building awareness about food safety and strengthening community participation.

However, the Dhaka project struggles with the challenge of translating the food systems approach into tangible and complementary interventions that together enable a transformation of the entire food system within 30 years. One of the constrains in the project is the pre-defined focus on the urban food system and having the city corporations as main stakeholder, limiting the options in a food system, which is predominantly dependent upon food produced outside of the city boundaries.

One could argue that the Kibera project started from a very different angle, mainly from bottom-up involvement of informal network leaders, focused on what was considered most urgent, according to them. The Kibera case can be seen as a first beginning of a larger transformation of 'the game'. A particular feature of this project is that it is not based on NGOs and aid premises, or on government support. Instead, this case study targets community leads, i.e. network leaders, who have the trust of the community, a large network, know the local context, and have the intention to support the community on the long run. The assumption in this project is that working with local leaders who are eager to alleviate hunger and poverty will produce more significant impacts.

It seems that NOURICITY and Kibera work towards creating a new equilibrium by optimising existing 'ways of doing'. This is achieved through introducing new marketing channels and cold storage techniques (Kibera), or experimenting with new ways to make the citizens aware of healthy and safe food (NOURICITY). Where NOURICITY works on practices and capacities, the Kibera project is also creating new connections and relations by establishing a new value chain.

The NIGI project in Arua, on the other hand, aims to introduce systemic changes that will not only improve the relations between native Ugandans and a growing refugee community, but also provide policy options for similar contexts that struggle with similar issues of refugee communities that are likely to stay in the new area, with an explicit aim of developing an effective way to support increased dietary diversity in other protracted refugee contexts that could be taken up by other actors, for example, UN organisations. This is achieved through a combination of technical interventions (home-gardening, seed production, soil fertility management) and socio-organisational interventions, such as setting up a stakeholder platform to improve connections between actors in the area in relation to local economic development.

An interesting difference that was observed during the cross-case exchange is a contrast between the type of solutions that are being proposed in the four case studies. Whereas Dhaka has a strong focus on technological and more visible solutions (e.g. storage and waste management technologies), the Kibera and Nigi project combine technical interventions (cold storage, seed varieties, etc) with organisational interventions, such as improving the coordination and collaboration between actors in the fish value chain, or setting up a stakeholder platform to improve cross-sector linkages. Capacity development of actors was also a key focus of the NIGI project, seeking to build capacities, not just in technical agriculture, but also in, for example, how to run a local seed business more effectively or make commercial decisions about farming.

4.3 How do the case studies approach stakeholder engagement and what are the advantages and disadvantages of the chosen strategies?

The Arua and Dhaka case studies have chosen a strategy to mainly involve public stakeholders. In Arua the nature of the project implies the engagement with many stakeholders: in settlement areas you must work with the Office of the Prime Minister (OPM), UNHCR, and all other actors working in settlement (mainly NGOs). In the host community, the main partners are the local government and local agricultural research centres. In Dhaka, the FAO is leading the stakeholder engagement. Stakeholder mapping was conducted to identify the parties to be involved, informed or who could be left out of the loop at this stage. In each sub-project, stakeholders are consulted, engaged, or asked for input. The most important implementing partner of the Dhaka project is the city corporation, a public stakeholder.

Kibera shows a rather different picture. The existing value-chains stemming from Lake Victoria and Lake Naivasha connect with tribes and families living in Kibera, and, therefore, hold important traditions and cultures attached to the fish trade. The new fish value-chain originating from a different area, Nyeri, connects with another tribe, actually the same tribe as the landlords in Kibera. The Kibera Community lead and Chair of the Fish Farmer Cooperative in Nyeri are key stakeholders of this project. They have solved a lot of issues together to make the intervention a success. Public stakeholders are less involved to date. The focus is on local informal leaders is a deliberate one. They are not only trusted by the community, but they have friendly relations within the public system, often to the very top of the ministries, and internationally with UN, FAO, International Fund for Agricultural Development (IFAD) and the private sector, including local and international businesses. With these people, often operating independently, it is possible to define long term goals for sustainability and act to them accordingly while they communicate upwards and locally.

In NOURICITY (Kampala), stakeholder engagement is focused on citizens, local city government and local entrepreneurs, as well as national policy makers and NGOs. Despite differences in opinions and perceptions, all stakeholders were heard on topics, such as the challenges of the food system in Kanyanya and potential interventions to improve the choices for healthier diets.

Although the Arua project (NIGI) partners directly with a private sector actor, both Dhaka and Arua indicated that they struggle with the structural engagement and involvement of private sector actors (both formal and informal ones), as well as the informal actors, such as local leaders or informal

community-based organisations (CBOs), who may have the trust of the local communities that are targeted or affected by the foreseen interventions of those projects. This partly due to the nature of the projects.

A challenge that is shared between all four cases is the right way to engage with politicians, as they are quite powerful. Having them on board and as ally is considered a condition for success. However, in some contexts, being seen as *apolitical* is also considered important, as it implies more neutrality. Having too much involvement with politicians could also present challenges in working with other actors, such as NGOs for instance. In all cases, interests and needs between politicians and other stakeholders are not necessarily aligned. This tension plays at the local (NOURICITY, Arua, Kibera) as well as at the national level (Dhaka).

5 Key insights

5.1 What are the advantages and pitfalls of applying the food systems approach in city region contexts?

The merits of the food systems approach are its holistic and systemic nature. A food systems approach forces projects and people to look beyond their own isolated field of knowledge or perspective. The Kibera case, for instance, acknowledges that – even though the project picks one single value chain – this value chain is linked to wider and longer-term changes, which need to be taken into consideration as well. The Dhaka case explicitly and wholeheartedly embraces a food systems lens, implying that researchers and stakeholders from different scientific disciplines and angles are involved in determining the future directions of food production and consumption in the city region of Dhaka.

The cross-case learning identified a number of challenges, while implementation of a food systems approach in city regions in practice. They can be summarised as: (1) the boundaries of a city region food system (both spatially and thematically) and (2) how to deal with interdisciplinarity and decision-making in a food system programme.

Boundaries of the food system
Drivers of food systems do not stop in the outskirts of the city, as cities are not self-sufficient, every country is also dependant on food import. Countries are inherently linked to international markets. We'll have to broader our view to higher spatial levels to identify all relevant levels and stakeholders involved.

The spatial component to food systems (urban / national / international) brings different dynamics. The Dhaka project is focused on an urban area, which is highly dependent on the rural production from the hinterland, as well as inputs from other geographic areas. The question is how to understand the boundaries of the food system in such a project. For example, urban farming could fall in the responsibility of the city corporations, but sustainable intensification of production in rural areas not, while the latter would probably increase FNS to a greater extend. The same issue is clear in the NOURICITY case.

In the Dhaka project, initially a clear choice was made to work with actors within the city boundaries, with city corporations as the main target group. This had consequences on priorities that were set. Along the way, the project members and sponsor realised that a more integrated scope would have been useful. After the mid-term evaluation, the stakeholder involvement was revisited, to include more relevant parties to cover for a better food system approach. This was considered to be important, to cover topics such as dynamics in rural areas and national food (security) policy.

Besides the geographic scope, another challenge in this respect is the thematic scope of a food system, or the primary outcome that is focused on. The food systems approach is an interdisciplinary framework, determined by many factors. The outcomes can be evaluated in terms of the social-, economic- and environmental dimensions. Issues, such as job creation, land tenure, or political stability, are of major importance for the future directions of the food systems, while a single project or programme is not able to tackle all such issues, even if a food systems approach is taken. Moreover, such issues are sometimes also politicised (e.g. land tenure or political stability), making it even more challenging for a research institute to work on.

During the exchange session organised by the KB exchange programme on Food Security and Valuing Water, of which Feeding the Cities is one of the projects, it was suggested that there is consensus that a system change is needed, in all three dimensions: social, environmental, and economic. In the exchange it was argued that: *"Research that claims to apply a food system approach should analyse*

all three areas, and analyse synergies, trade-offs and feedback loops. If these dimensions are not included in the research, then it is not designed as a Food Systems project.". In line with the above, another reflection during this exchange session reflected on *"the need to consider larger biophysical and social systems when assessing scaling potential of new technologies or strategies, as not all interventions at a smaller scale are sustainable at a larger scale.".* This requires a continuous process of negotiating boundaries that should be part and parcel of food systems research projects.

In relation to the above, it could be questioned to what extent the case studies are to be considered full food systems projects. For instance, the Dhaka project focuses on the Dhaka Metropolitan Area and seeks to influence planning and policy making within those boundaries. Nevertheless, the food system goes beyond the city limits, and spans many rural areas outside Dhaka in all of Bangladesh, where most of the food is grown. This calls for a broader perspective and links to national and regional planning, which connects directly to wider environmental and societal challenges. While the Dhaka project initially limited itself to the metropolitan food system set within strict boundaries, the Kibera case study initially had a strong focus on a specific value chain at a community and household level. The surveys carried out also address some environmental aspect and could serve as a starting point for broadening the environmental perspective and linkages. Although the NOURICITY project does pay much attention on climate change impacts, it addresses local environmental aspects that link to food safety issues, such as water pollution and the use of charcoal for cooking. In the NIGI case, the researchers also recognised that the project did not adequately cover all aspects of the food system, so an additional project was started, which sought to carry out a more comprehensive food systems analysis taking a broader perspective. None of the case studies pay specific attention to possible trade-offs between elements (i.e. environmental, social, economic) of the food systems that they operate in.

Dealing with diverse perspectives and decision-making in a food system approach
Compared to single issue projects, a food systems approach adds several layers of complexity. It could be questioned whether such complexity is always effective when decisions need to be taken in light of diverging interests.

In Dhaka for instance, it could be questioned to what extent the selected sub-projects contribute to the overall food system objectives? In this particular case, the city corporations perceived food waste and waste management as an urgent issue to be addressed, as waste is a visible problem. Consequently, a choice was made to invest in food waste and digesters to utilise food waste from wet markets for bio-digesting solutions. By investing in bio-digesters, measures to *prevent* food waste in the first place will become less attractive.

Similar challenges were mentioned by the Arua case, in which decisions around what to focus on in the programme were sometimes perceived as politicised and also based on the interests of the implementing partners. In the NIGI project, the government of Uganda prioritise self-sufficiency of refugees, largely in agriculture, and this drives the focus of many projects targeting refugees in the region. The focus on own production for consumption is also driven by other food systems factors. For example, a recent study carried out by the German Society for International Cooperation (GIZ) found that while there is the perception that the challenge in West Nile is that the labour market does not have the necessary skills for finding employment, the study found that actually there are simply not enough larger farms and commercial agricultural opportunities to generate substantial employment opportunities. Thus, the challenge was not that the labour force does not have enough skills, but that there are simply not enough jobs to meet the demand, therefore, it is hard to focus on economic outcomes of the food system in a more systemic way. Developing commercial agriculture is constrained by many drivers, including land ownership rights (communal property ownership discourages individuals from investment) and difficulties in accessing finance for investment. Unless these challenges are also addressed, it may limit what types of interventions can practically be carried out in the context of the West Nile Food System.

In the Kibera case, the case-owner mentioned that the chosen bottom-up approach generated opportunities to create local success. Local leaders, who were targeted as key stakeholders, knew which bottlenecks to target first and what opportunities could contribute the most given the urgencies

at the specific time and local context. Applying a food system approach in the research enabled the project to develop governance structures that empowered the local change makers to ensure scalability. The project started by listening to the needs of different local stakeholders to develop a scalable aquatic nutritious fish food system together. By using the food system approach, fish produced in the rural area of Nyeri was connected to Kibera, the largest slum in Nairobi. A food system approach gives an overview of different roles and activities in food system networks. Change makers do not work in isolation, but within networks of different actors, in order to obtain impact.

Insights into the role of the informal sector in this survey may contribute to valuable insights into how future collaboration between project donors and receivers can result in large impacts on small scale entrepreneurs, local communities, and vulnerable groups in the societies

Besides decision-making at stakeholder level, another challenge in this regard is how to effectively manage and implement an interdisciplinary project that aims to address the entire food system of a city region. In the Dhaka case study, four different Wageningen Research institutes with diverse expertise are involved. From the outset, the project was designed with a 'work package' approach, implying that each institute (and respective expertise) worked on single issues, making the project multidisciplinary instead of interdisciplinary. For example, several value chain analyses were conducted resulting in recommendations for improvement. These recommendations were however biased towards economic feasibility and technical availability of food, and less so on socio-economic aspects of distribution and affordability (particularly for the urban poor) can afford this food. This is not to say that the institutes do not collaborate. The design of the project does, however, allow for limited space to integrate perspectives throughout the project cycle and this, therefore, depends upon the willingness and capabilities of individual project members.

In the case of the NOURICITY project, the starting point is the diets of citizens in the low-income parish of Kanyanya, Kampala, Uganda. The food system approach is key for analysis using the diets as entry point of intervention. The project was designed to incorporate local stakeholders in the type of intervention to promote healthier diets in the area. The assumption is that this will result in a higher acceptance of the intervention proposed and analysed. In addition, food flow maps were prepared to identify the outlet in the area, which could be linked to other initiatives that link the food acquisition to the origin of the food. Moreover, there seem to be incentives to continue the intervention even after the NOURICITY project will finish, and the approach could be transferred to neighbouring and other parishes within Kampala using the information of other studies, such as Hemerijckx et al. (2020), which include Kanyanya in their research as well.

Systems work: Trade-offs and feedback loops

Besides the two issues of boundaries and decision-making, the analysis also brought to the forefront that a pertinent aspect of the food systems approach, namely trade-offs and feedback loops, are not explicitly featured in the four case studies. This is a missed opportunity, that leaves room for improvement for the future.

6 Discussion and recommendations

From the cross-case analysis there are a few conditions emerging for successful food systems approaches in city region contexts.

Analytical

- First of all, a food system approach provides opportunities to apply a holistic angle to problems that urban poor are faced with. A food system approach gives an overview of different roles and activities in food system networks, which is helpful when designing novel governance arrangements.
- From the cases and broader practice it is observed that 'food system project' and 'food system approach' are used interchangeably. However, we would like to stress that projects executed within a food system, are not automatically a 'food system approach'. The approach refers to the "*more holistic perspective on food and nutrition security, by broadening the focus of researchers and policy makers from the activities in the food system to the food security, social and environmental outcomes and the socio-economic and environmental drivers of these food system activities.*" (Dengerink and Brouwer, 2020). For instance, this internal reflection exercise brought to the forefront that even though all four case studies explicitly use a food systems approach, none of the projects explicitly addressed an analysis of (potential) trade-offs and feedback loops, which is a pertinent aspect of the food systems approach. The majority of the case studies also lacks a specific analysis on the environmental aspects and how they relate to other elements of the food system. This explicit attention for trade-offs and feedback loops could render projects more complex and would require a continuous process of negotiating boundaries.
- In Arua the project is able to increase dietary diversity and access to nutritious foods for refugees but has not had an impact on overall food security. In part, this was due to the small amounts of land available to refugees. A similar conclusion could be drawn from the Dhaka case, where the project mostly focuses on activities within the city boundaries, while food is largely being produced in rural areas. This draws the attention to the fact that interventions in parts of the food system may be less effective unless these more structural challenges are also addressed.
- A food systems approach is useful for 'zooming in and out' and seeing the 'bigger picture'. Currently, the approach is still rather conceptual, and there is a lack of guidance on how to zoom in (e.g. when translating the food system approach into practical work streams). This makes the success of food systems approaches depend very much on the donor and project team. In some of the studied cases, generic ambitions at food system level were split up in a number of separate questions where the food systems approach seemed no longer to be leading (e.g. in Dhaka and Kibera). To avoid this in the future, it would be helpful to have a set of guiding procedures, methods, and tools to operationalise food systems work into practice for different budget ranges.
- The case in Kibera has shown that using a food system approach makes it possible to connect a previously unconnected rural area with an urban slum.

Practical

- While ownership of the process by local stakeholders is key for success and durability, it is important to weigh up different views and prevent capture of influential players and their (personal) agendas. This could be done by working with a diverse set of stakeholders (who have different mandates and constituencies). This diversity is lacking in Arua, where the challenge is to involve the private sector, in particular the informal sector, which may be crucial for the financial durability of the project.
- It is important not to take the food systems approach too literally, as it is impossible to address all issues at the same time. Adaptive and flexible management are important, in particular in light of timeframes and budgets available.
- A condition for success may be seeking the right balance between solving local problems and ensuring the right linkage to the higher-level policy arena for further institutionalisation. Where Dhaka is quite successful in creating national buy-in from influential (public) actors and linking to the national policy arena, the project seems to be less strong in getting ownership among

stakeholders beyond the city corporation (e.g. private sector and informal sector). The opposite may be true for the Kibera case.

- By using the food system approach, fish produced in the rural area of Nyeri was connected to Kibera, the largest slum in Nairobi. Listening to the needs of different local stakeholders was key to develop aquatic nutritious fish food system together. Change makers do not work in isolation, but within networks of different actors. Scaling received less attention in this project, so far.
- Even though transitions take a long time, it is still important to kick-off in the right way. For food system transformation, it is crucial to design for integration from the start. The Dhaka case teaches us that the design of the team, which disciplinary expertise to include/exclude, decision-making processes about focus and scope of interventions and funding streams are crucial factors that determine the room to integrate. If integration is only supposed to happen after the main scope and focus have already been decided upon, it is often too late.
- The case studies show that interdisciplinary approaches are key to solve the complex problems that the projects are faced with. However, it is also realised that working in interdisciplinary and transdisciplinary ways is time consuming. It is, therefore, important not to underestimate the time investment it takes to create a shared language and shared understanding of the main problems (and how they relate), before jumping into work packages and dividing the work.
- In Dhaka, the challenge of trying to work with the city on the food system, without strong linkages to the surrounding region is a challenge. More efforts should be made to think about how to effectively operationalise city region food systems approaches as urban food systems challenges cannot be tackled by the urban area alone. Opportunities for future work may lie in cities that are recently established, such as in the case of Arua. Arua has only recently been designated as a city and has strong linkages with the surrounding rural areas, which provide an interesting opportunity for considering how the urban and rural food systems might be better able to link as the administrative and policy directions are not yet carved in stone.

Concluding, we present a few arenas that – based on our analysis - require research and policy attention:

- When looking at the policy frameworks in which actions take place there is a large difference on how 'food' finds it way. There is no direct policy perspective; the economic perspective is detached from the agriculture perspective; and the urban perspective is still detached from the rural perspective. The question this raises is*: Is there a need for a programmatic approach centred around food (i.e. the food systems approach), or should the food system approach find its way in the different sectoral policies?*
- Understanding the role of the informal sector is critically important to contribute to transitions towards enhanced food security.
- Currently, the food systems approach is still rather conceptual, and there is a lack of guidance on how to 'zoom in' (e.g. when translating the food system approach into practical work streams). It would be helpful to have a set of guiding procedures, methods, and tools to operationalise food systems work into practice.
- One potential pathway to further explore is whether it is possible to generate a checklist/ set of questions/topics that need to be addressed for having a proper food systems analysis (before 'zooming in').
  - One of the elements of such checklist would be to ensure that people using a food system approach analyse and 'zoom in and out' between multiple scales. This does not mean that every scale should be dealt with in every project, but the given context or potential effect or implications at other scale levels should be taken into account.
  - Another element could be to give more guidance on how to (explicitly) address setting boundaries, trade-offs, and feedback loops in operationalising a food systems approach.
  - A third element is to assess to what extent all three main domains of food systems: economic, environmental, and social dimensions receive attention in the analysis, design and/or intervention of food systems work.

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