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AN EXPLORATION OF ARUSHA'S FOODSCAPE

LISTENING TO THE EXPERIENCES OF MARKET VENDORS AND CONSUMERS

TABLE OF CONTENTS

CONTEXT

This explorative report is the result of a collaboration between two ongoing research projects in Arusha, Tanzania. It is a case study of Amber Steyaert's doctoral research on (urban) food governance and food democracy at Ghent University (Belgium), and it is part of a participatory research-by-design project on Arusha's urban food system conducted by Islands of Peace (Thomas Kuyper).

In this phase of the research - listening to the system - the main objectives are to listen to the experiences of actors within Arusha's food system and discover how their interactions lead to the system's behaviour. We will verify initial hypotheses produced during a previous multi-stakeholder workshop - framing the system - and look for key variables and relationships that influence the urban food system.

We do this by conducting multi-method field studies. We combine a survey with observations, visual documentation, focus groups and discussing the preliminary results with expert stakeholders. Based on the input from the first workshop, we identified local public markets as key hotspots for field studies and food system interventions at later stages. Also, during the framing the system workshop participants identified consumers, youth, and market vendors as key system actors to interview.
In this report, we look for the perspectives of these different actors on food system issues, how they experience them, how they change over time, and what variables are of key importance. In this stage, we aim to better understand the system and its interrelationships.

HYPOTHESES

Hypothesis 1	There is a growing awareness on food safety issues among consumers and market vendors in Arusha.
Hypothesis 2	Youth has little interest to be professionally involved in the food system (moreover because it is difficult to generate a liveable income, being a farmer has low social value, and access to land is a challenge).
Hypothesis 3	The current infrastructure at local public markets in Arusha is insufficient.
Hypothesis 4	Given the growing middle class and overall economic growth in Tanzania, there is a growing demand for safe, healthy, processed and quality food.
Hypothesis 5	Consumers in Arusha prefer to buy day-by-day fresh foods and see vegetables as inferior products. They prefer high starch and meat diets. Furthermore, there is a growing tendency to buy and eat processed food

The hypotheses are the result of discussions during a multi-stakeholder expert workshop called ‘framing the system’. This report aims to verify or get a deeper understanding of them.

LITERATURE: WHAT WE KNOW ABOUT FOOD VENDING AND - SAFETY IN ARUSHA

THE CONTEXT OF ARUSHA

The Arusha region lies in the North-East of Tanzania and has a population of 2.356.255. In 2020, the Arusha region had a regional GDP per capita of 3,358,805 (4,68% of the total GDP of Tanzania Mainland), which brings it to the 6th place of 25 regions on the Tanzanian Mainland (NBS, 2022).

Arusha City is the region’s capital and a large diplomatic hub in East Africa. Similarly to many other East-African cities, the city of Arusha is experiencing rapid growth due to rural-urban migration and population growth. In 2012, the population of Arusha City made up 25% of the entire population of the district. Since migration is often linked to employment opportunities, it is mostly younger people that are moving to the city. Consequently, Arusha has a large youth population.

EMPLOYMENT AND INFORMAL ECONOMY

60,1 % of the inhabitants of the Arusha region older than 15 are employed. 39,9 % is unemployed, of which 6,2% indicated they were actively looking for a job. The main reasons indicated for not looking for a job were being enrolled in an education program and caring for a sick or older family member (NBS, 2021).
While agriculture accounts for around 1/4th of the GDP of Tanzania, it employs 65% of the workforce (CIA, 2023). A report published by the ILO (2013) estimated that 76,2 per cent of non-agricultural employment in Tanzania is taking place in the informal economy (82,8% female, 70,9% male). Street vendors (in Tanzania referred to as Machingas) are an important share of this, there is no exact number, but estimations lie between 1.5 million and 3 million (Makakala, 2021).

However, this informality does not come without a challenge. Research into the daily life of informal vendors has revealed a huge vulnerability to shocks and stress due to the challenges they face on a daily basis (Dube, 2021; Lindell et al., 2019; Steiler & Nyirenda, 2021). Many vendors are dealing with high competition and unstable prices. Additionally, they are often the victim of evictions, relocations and penalties (Ahmed et al., 2021; Matamanda & Chinozvina, 2020; Ndawana, 2018). Bonnet et al. (2019) found that there is a significant overlap between working in the informal economy and being poor. Their study also suggested that women and people with a low level of education are more likely to end up in the informal economy.

Under the last president of Tanzania, John Magufuli, the Tanzanian government launched a plan to legalize street vending and provide vendors with specific ID cards, so they could be identified and contribute to the public system through taxes (Matandiko, 2021). However, Steiler and Nyirenda (2021) note that most of these strategies were implemented inconsistently, which made they didn’t correspond to the local reality of the vendor. In 2021, the current president, Samia Suluhu Hassan has ordered all Tanzanian regional commissioners to select areas where Machingas could be relocated to free up the spaces they are currently occupying. However, regions are struggling to translate these guidelines into practice (Lamtey, 2021; Steiler & Nyirenda, 2021).

In Arusha City this has led to new regulations where street vendors are now not allowed to sell their goods at certain markets, outside other shops and close to hospitals, health centres and schools. Instead, the regional commissioner has constructed new infrastructure (toilets, water, electricity, and roads) in other designated areas, so vendors could move here. In November 2021, food vendors have been relocated to a new market next to Kilombero Market (plot number 68). The regional commissioner has promised that “the machinga planning exercise in Arusha Region will be conducted calmly and will be participatory between government officials and Machinga officials themselves ("Haya ndio maeneo Machinga hawaruhusiwi kufanyabiashara," 2021)."

Formal markets	Informal markets
Presence of a formal market committee that is elected and/or appointed	Informal or no market committee
Written constitution and/or by-laws	Verbal or no agreements
The market is formally registered with and/or contracted to the responsible government. The market committee or responsible government makes investments in the market	Vendors are responsible for maintaining and improving the market without receiving support from the government or market committee or even while being opposed by them.
Vendors pay a regular fee to the market committee and/or municipal country and are in the possession of a trading certificate. Additionally, there is a formal register of vendors selling at the market	Vendors do not comply with the regulations of the (local) government and/or do not pay a market fee.
The market has regular opening and closing hours	The opening and closing hours of the market are unpredictable

TYPES OF MARKETS

Differences between formal and informal markets inspired by Davies et al. (2022)

LOCAL PUBLIC MARKETS

According to the latest numbers, Arusha City counts eleven formal markets, one informal market and one evening market (Abwe, 2020). Due to its position close to the border with Kenya, the markets (and especially the Kilombero market) serve as a regional distribution hub (Molina et al., 2020). Studies that specifically address the governance of local public markets in Arusha (a region in the north of Tanzania) are still limited. However, there is one report by Abwe (2020) that provides us with relevant insights. In an extensive rapport, including findings from six markets in Arusha city, Abwe describes characteristics regarding the quantity and quality of these markets.

While there are high spatial inequalities when it comes to the availability of markets, the main challenges relate to the quality of the markets. Some of the more urgent challenges Abwe mentions are a lack of appropriate market infrastructure, a poor pedestrian environment surrounding the markets and poor waste management causing hygiene issues.

Tanzania has clear policies in place locating the responsibility for the establishment and management of public markets with the local government. The local government is also responsible for health and safety within the markets. These responsibilities are translated into more specific guidelines for local public markets by (among others): The Urban Planning Act No 8 of 2007, The Public Health Act No.1 of 2009 and by-laws for the environmental protection of the city of Arusha. An important side note is that these policies only address the management of formal markets, leaving a vacuum when it comes to informal markets. Additionally, Abwe (2020) observes that even in the formal markets the enforcement of these policies is very weak. Molina et al. (2020) come to the same conclusions when it comes to food safety regulations, they find that, while there are regulations in place, due to fragmented political responsibilities and a concentration of the limited resources in the export and processed sector, enforcement is lacking behind.

While they are convinced of the necessity of government intervention, they also note that: “repressive reactions of authorities towards small-scale producers and vendors to enforce stricter regulations risk having adverse effects if they are not accompanied by measures that strengthen the capacity of such actors to comply” (Molina et al., 2020, p. 96).

Finally, while conditions can be improved for all vendors, both research and interventions taking place at the market should consider the gender dynamics at play. Molina et al. (2020) found that while women are generally involved in labour-intensive products such as pulses and fresh fruits and vegetables, men sell more grains and animal products. Although these products are less labour-intensive, they are often more profitable than the products the women sell.

CONSUMERS, FOOD SAFETY AWARENESS AND BEHAVIOUR

In the previous section we dealt with the (lack of) governance in local markets in Arusha and the consequences of this for food vendors. However, it is not only the vendors but also the consumers who bear the consequences of the conditions at the market.

A study by Molina et al. (2020) looks at public markets in Arusha, using a value chain perspective. They identify challenges related to unstable prices “due to limited consumer information, seasonality, and unpredictable supply”. Additionally, they find that a lack of enforcement of food safety regulations makes it difficult for consumers to assess the origin and safety of their purchases. This is also confirmed by Kapeleka et al. (2020). In this study researchers took samples from 9 major markets in Arusha among which Kilombero, Soko Kuu and Samunge and in the areas where food for these markets was produced. They found that 63,2% of market samples had biological contaminants on them (mostly, Pseudomonas Aeruginosa, Citrobacter, E. coli and Enterobacter). Similarly, 47,5% of all vegetable samples contained chemical contaminants (pesticide residues) of which 74,2% were above Codex MRL standards. These numbers indicate that the consumption of vegetables sold at these markets can cause health complications for consumers among which increased risk for foodborne diseases and gastrointestinal disorders.

Based on a translation of the Regional Codex Guidelines, DeWaal et al. (2022) identify five intervention categories when it comes to food safety: Policy and regulation, Infrastructure, Food handling, Vendor health and hygiene and Training and education. When it comes to policy and regulation the main points of interest in the African context are shared responsibility between government, vendors and consumers and making licensing and registration conditional on training in food hygiene.

The guidelines related to infrastructure include improving stall design, granting vendors their right to potable water, and regular cleaning of the vendor stalls. In this regard, FAO (2009) recommends only selling food on displays or in containers that are raised from the ground, meticulously cleaned and protect food from dust, insects and exhaust fumes. Food handling guidelines include carefully examining the products before purchase and avoiding contamination during transportation and storage. Vendor health and hygiene includes a list of practices such as wearing clean clothes, washing hands at specified times, avoiding sneezing and coughing and chewing gums in proximity to food. Finally, both vendor and consumer education are highlighted in the African context.

Besides food safety risks, consumers also face issues related to food insecurity and malnutrition. Between 2017 and 2019, 13 million Tanzanians were severely food insecure. Additionally, micronutrient insufficiencies are severe: anaemia affects 60% of children and 45% of women of childbearing age. Within this last group 32% suffer from being overweight, and 11.5% is obese (WFP, 2021). Another WFP report finds an explanation for these micronutrient insufficiencies in the diets in mainland Tanzania.

METHODS AND DATA COLLECTION

MARKET SURVEY

We developed a questionnaire based on a literature review, an explorative study and input generated during a workshop. The questionnaire was translated into Kiswahili. Then, we trained 10 Tanzanian enumerators on the content of the survey, the objectives of the study and how to use the tablets. The survey was conducted using Kobo Toolbox at four main markets in Arusha City. In total we interviewed 239 respondents (123 vendors and 116 consumers). We interviewed 45 vendors at Kilombero, 41 at Soko Kuu, 31 at Samunge and 11 at Plot #68 (the new market where street vendors have been translocated to next to Kilombero).

We mainly used (Likert) scales and combined these with open questions (with audio recordings) to gather more complex and/or sensitive information. We complemented the questionnaire with market observations by the researchers and visual documentation by a local photographer. We asked the photographer to document with a focus on market vendors and their produce, permanent and temporary food stalls, good and bad food safety practices, market infrastructure, waste management, sanitation facilities, traffic in and around the market and general infrastructure.

FOCUS GROUPS

We organised three focus groups with vendors from Soko Kuu, Samunge and Kilombero Market. In each focus group 5 to 6 vendors from a different market participated. The conversations were in Kiswahili and facilitated by a Rikolto staff member. Other attendees were a notetaker (taking notes in English) and the responsible researcher. Each session took more or less one hour and thirty minutes. Each participant received information about the study in Kiswahili after which they were asked for their consent to participate and to record the conversation.

During the focus group the participants were presented with various situations that could also concur in real-life.

- Situation 1: You need money to improve your stall or buy more/other products
- Situation 2: You can’t pay the taxes when they come to collect them.
- Situation 3: You pay a lot of taxes, but you see the market infrastructure doesn’t improve
- Situation 4: You have a conflict with another vendor
- Situation 5: The market manager addresses you because he thinks the way you sell your products is not safe
- Situation 6: You have a conflict with a middleman
- Situation 7: The market infrastructure is not functioning properly.

For each situation they were asked if this was something that already happened to them and if so, how they would react to this situation. Additionally, we asked them who they could/would ask for help if this did occur.

COMMENTS AND POTENTIAL BIASES

In this section we reflect on potential biases and limitations of the methodology in place. First, regarding the focus groups, we recruited participants for this study with the help of market managers. A possible consequence is that these vendors are the ones that have a good relationship with the authorities, which might not be the case for all vendors. Additionally, these were all vendors with a formally registered market stall. It is likely that their experience with the situations described above is different than these of the vendors operating in the informal economy.

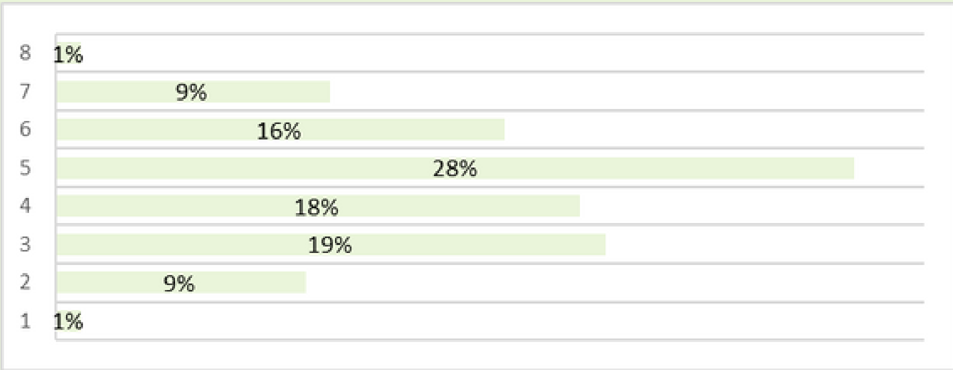
Second, in the consumer survey we did not differentiate between the markets Kilombero and Plot #68. Therefore, we can only make valid comparisons between Samunge, Soko Kuu and Kilombero, but we don’t have separate data from Plot #68. Furthermore, we only surveyed consumers at the markets, and not at other food outlets such as supermarkets or street stalls. Therefore, our results only apply to this group of consumers, and not to all consumers in Arusha-city.

Finally, we based our analysis and conclusions mainly on qualitative and scale questions. Therefore, the validity of statements about for example willingness to pay for safe food products can be questioned and should be interpreted as indications.

RESULTS CONSUMERS

SOCIO-ECONOMIC STATUS

FIGURE 1: WHERE DO YOU POSITION YOURSELF ON THE MAC ARTHUR SCALE?

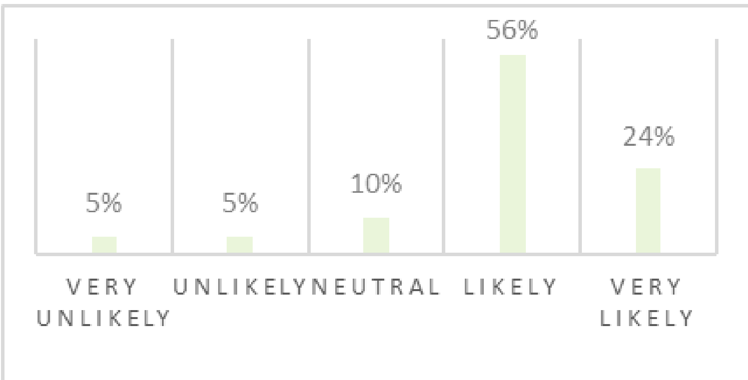


To get an insight into the consumers' socio-economic status, we used the Mac Arthur Scale of subjective social status. We presented them with a ladder with 10 rungs and explained that the ladder represents where people stand in society. At the top of the ladder, people are the best off, have the most money, the highest education and the best jobs. At the bottom, people are the worst off, have the least money, the lowest education, and the worst jobs.

Based on their subjective evaluation of their social status the data shows a normal distribution. With an average score of 4,5 and a median of 5 our sample overall ranks itself as 'halfway the social ladder'.

YOUTH AND FUTURE IN THE FOOD SYSTEM

FIGURE 2: DO YOU SEE A FUTURE WORKING FOR YOURSELF IN THE FOOD SYSTEM?

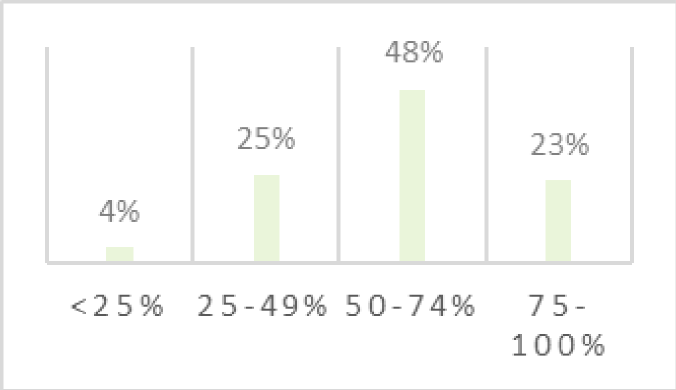


It is often assumed that youth doesn't have an interest in working in the food sector, but, remarkably, 80% of the youth consumers stated that they do see a future for themselves working in the food sector (56% likely and 24% very likely). Only 10% stated it was unlikely and very unlikely to get a job in the food sector. These results are consistent if we differentiate between different markets and control for gender – both female and male consumers see themselves more than likely working in jobs closely related to food.

As preferred jobs, the interviewed youth ranked **farmer** (31%) first, **distributor** (27%) second and **market vendor** (17%) third. This is remarkable since we hypothesized that becoming a farmer in the Arusha region in Tanzania is unattractive because of its low social status and low economic return.

SPENDING AND WILLINGNESS TO PAY FOR SAFE FOOD

FIGURE 3: HOW MUCH OF YOUR HOUSEHOLD BUDGET DO YOU SPEND ON FOOD?



Looking at their budget and spending patterns, 71% of all interviewed consumers spend more than half of their total budget on food. 23% of them spend even more than 75% of their budget on only food products. When we compare these results between the different markets, our results show that most consumers who spend more than 50 and 75% of their budget on food shop at Kilombero market.

FIGURE 4: ARE YOU WILLING TO PAY A HIGHER PRICE FOR SAFE FOOD?

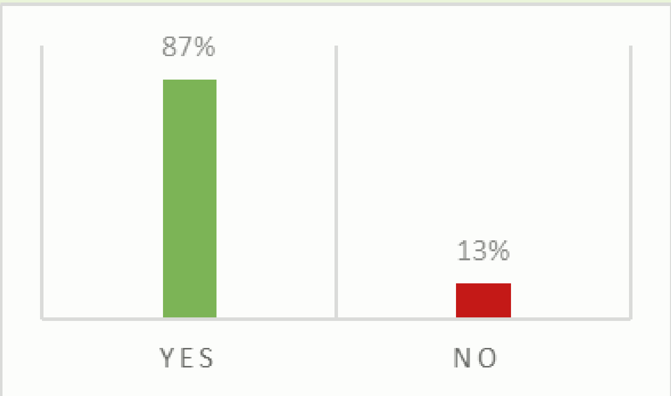
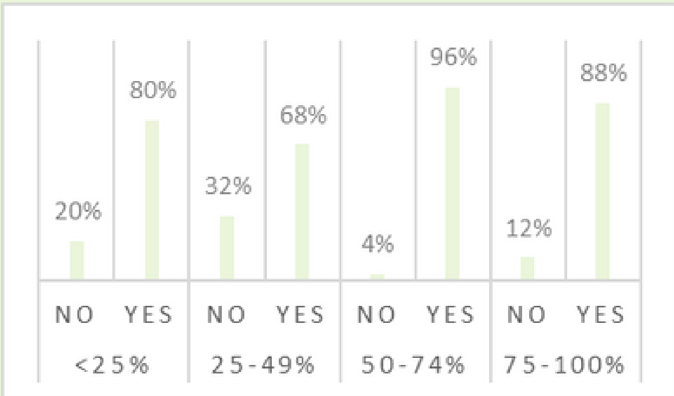


FIGURE 5: ARE YOU WILLING TO PAY A HIGHER PRICE FOR YOUR FOOD? (ACCORDING TO HOUSEHOLD BUDGET SPEND ON FOOD)



t's notable that the group that spends more than half of their total budget on food also seems to be more willing to pay a higher price for safe food products, according to their own statements. In total 87% stated that they are willing to pay a higher price for safe food products. The main reason indicated for this was to protect their own or their family's health. On the other hand, for almost half of the sample (47% of the respondents) their budget does not allow them to do so.

Note: these results are based on a limited mix of qualitative questions and opinions. There were no experiments involved so we cannot provide information on consumers' willingness to pay in real-life situations, we can only give indications based on their own statements.

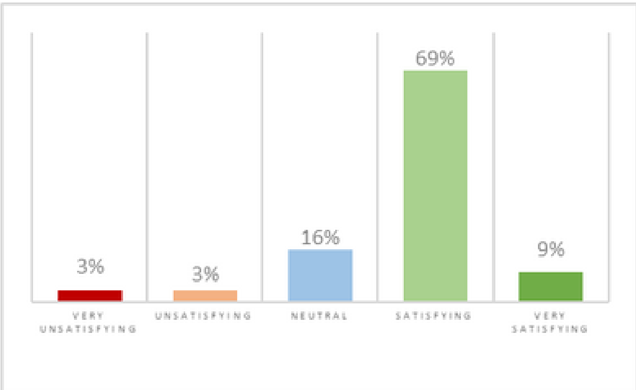
FOOD SOURCES

When we look at where consumers source their food, our results show that the preferred source for 84% is buying at the local public markets, followed by street stalls, buying directly from farmers and producing themselves. Buying at supermarkets is usually ranked last, but this result might be a misrepresentation since we only interviewed consumers at the local public markets. On the other hand, we know that local public markets are the primary source of food for most Tanzanian consumers

MARKET EXPERIENCE CHANGE

Overall, consumers in the survey seem to be satisfied with buying food at the markets and the current market conditions. The market experience satisfaction is consistent over the different markets we surveyed. However, the enumerators often reported cases of different opinions of consumers when the interview was over. They noticed reluctance to give critical answers during the official interview, but after the interview consumers' opinions often changed.

FIGURE 7: HOW DO YOU EXPERIENCE BUYING FOOD AT THE MARKET?



Furthermore, when we differentiate between different markets a pattern arises: half of the respondents at Soko Kuu were very unsatisfied with the market experience, while all respondents at Samunge were satisfied. This is remarkable since Soko-Kuu is often seen as 'the more expensive market' by citizens of Arusha, and Samunge as 'the market for the less affluent'.

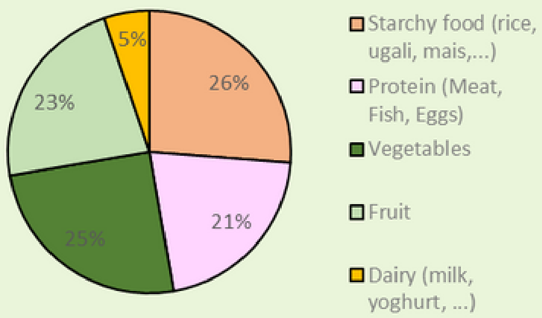
Especially at Kilombero and Soko Kuu, respondents reported that their experience had changed, mostly in terms of the price of products. The market experience of consumers at Samunge has remained the same.

FOOD BUYING HABITS AND PREFERENCES

On average, consumers buy food 3,6 times a week, with a mean of 3. This result mildly supports the hypothesis that citizens of Arusha prefer to buy almost daily, fresh produce. It could also mean that their budget only allows them to buy food for 2 days at a time.
We assumed, following input from the previous workshop and desk research, that most Tanzanian consumers choose meat as their preferred food choice, and that there is a high and growing preference for processed foods. However, when we asked them to rank their food preferences and give us a top-3, the results tell us a different story.

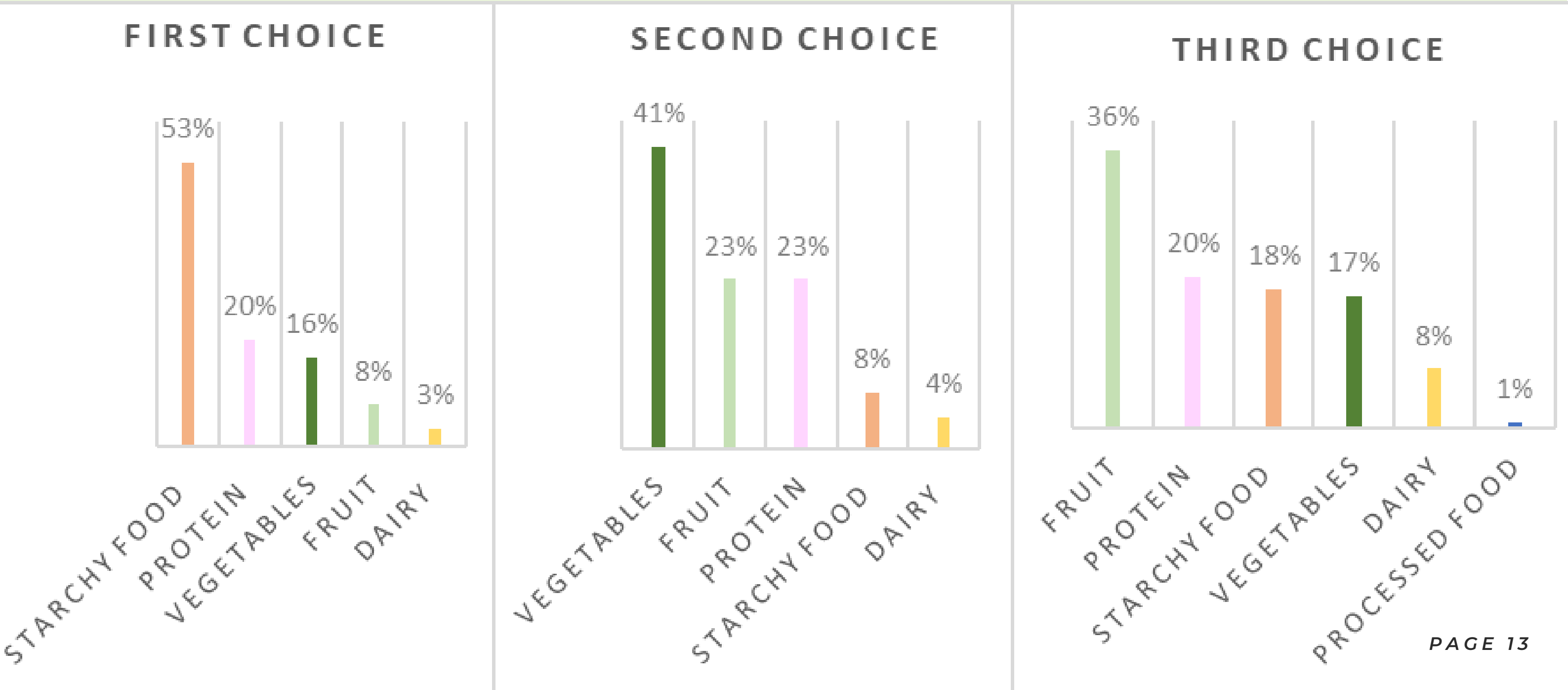
The most occurring first choice is starch food such as rice and maize, the second choice is most commonly vegetables and the third is fruit. When we sum up all votes, we get the following scores:

FIGURE 8: WHAT IS YOUR PREFERRED FOOD TO EAT?



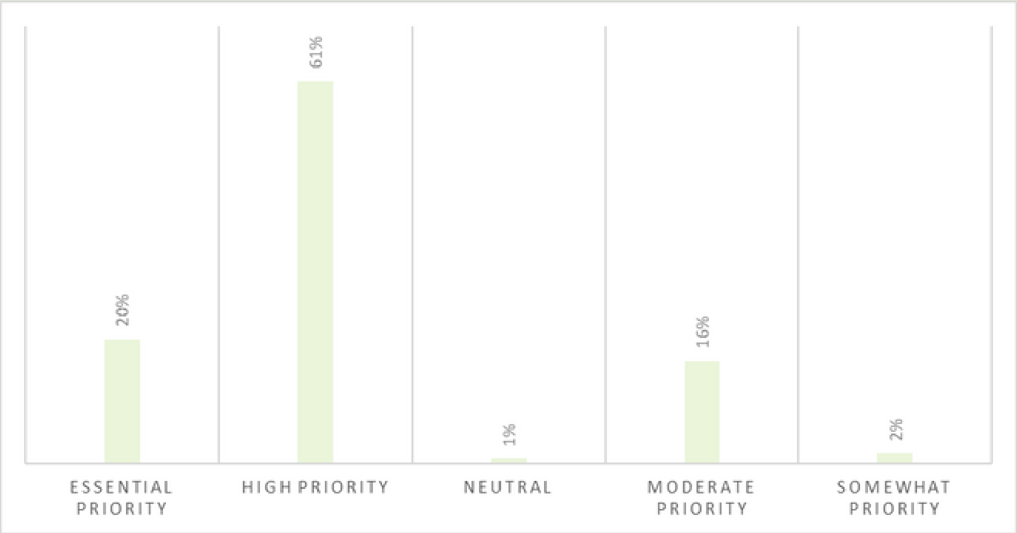
Surprisingly, in the totals, fruit and vegetables are almost equally highly ranked as proteins and starchy food. Protein, including meat, only scores 21%. Processed foods such as chapati, mandazi or biscuits don't make the top-5. At the same time, we know that the Tanzanian population doesn't eat enough vegetables, far less than the recommended amount to qualify as a healthy diet (FAOSTAT, 2021), and that the sector and consumption of processed food in Tanzania are rapidly growing (Sauer et al., 2019).

FIGURE 9: WHAT IS YOUR PREFERRED FOOD TO EAT? FIRST, SECOND AND THIRD CHOICE.



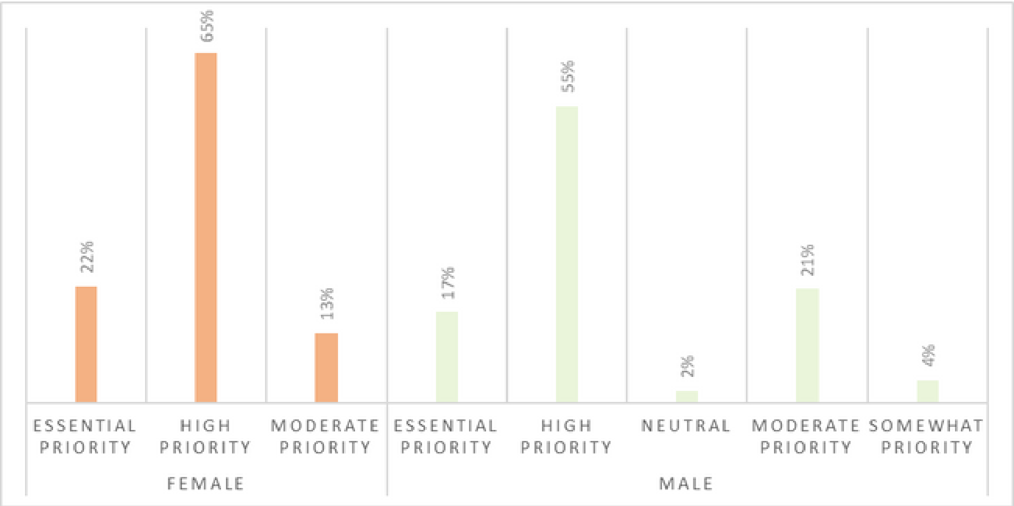
FOOD SAFETY AND - AWARENESS

FIGURE 10: IS FOOD SAFETY A PRIORITY TO YOU WHEN YOU BUY YOUR FOOD?



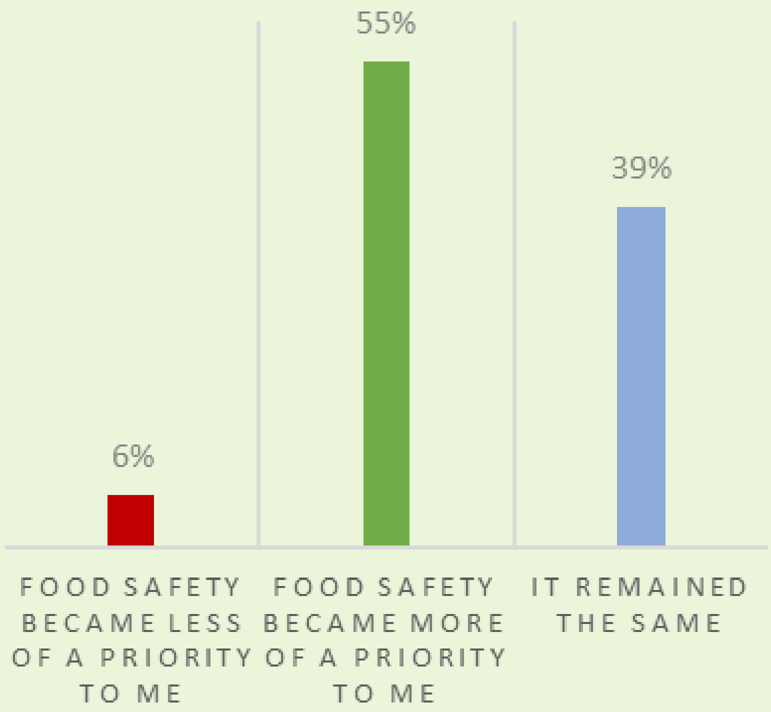
Consumers report high awareness of food safety issues when they are buying their food. For 61% of them, food safety is a high priority. For 20% even an essential priority.

FIGURE 11: IS FOOD SAFETY A PRIORITY WHEN YOU BUY YOUR FOOD? (ACCORDING TO GENDER)



Our results show that food safety prioritization varies slightly between gender. More specifically, female respondents prioritize food safety higher.

FIGURE 12: DID YOUR PERCEPTION OF FOOD SAFETY CHANGE OVER TIME?



55% of consumers state that over time, food safety became more of a priority to them. However, when we look more closely at the data and compare between age groups, we find that mainly for youth consumers food safety became more of a priority, while for older age groups the attitude towards food safety more frequently remained the same. When we look at the different markets, we see that for consumers at Kilombero it became more of a priority, while at Samunge it remained more often the same.

Surprisingly, 77% of all consumers assume that food bought at the markets is safe (69% safe and 8 % very safe). Only 22% reported the food is not safe, and 1% that it is not safe at all. This is remarkable, especially since several studies are showing the high food unsafety of food in the Arusha region (in terms of biological and chemical contamination) due to poor food handling, insufficient market infrastructure and incorrect – and overuse of pesticides.

Furthermore, this topic is increasingly discussed in popular media and is a key focus of different research institutes and NGOs active in the region.

These results are rather consistent over the different markets: everywhere consumers think most frequently that the food bought there is safe.

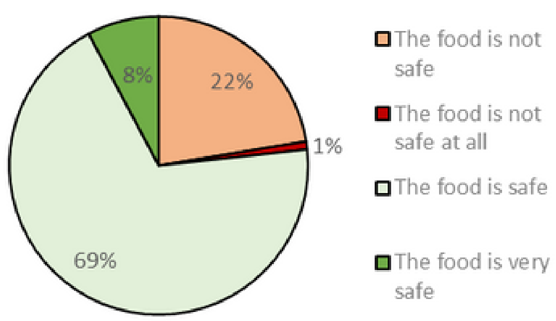


FIGURE 13: WHAT IS YOUR PERCEPTION OF THE FOOD AT THIS MARKET?

But, at Samunge market 32% of consumers are opinionated that the food is not safe, while at Soko Kuu it is only half this score, 16 per cent.

When we compare food safety priorities with consumers' opinions about the topic something interesting occurs. Most respondents who state that food safety is a high priority to them, believe that the food bought at the local public markets is safe or very safe. Clearly, there is an information gap to overcome and work to be done in terms of consumer sensitisation. Furthermore, regardless of consumers' high priority of food safety when buying food, our results show that it is not their main determinant when buying food.

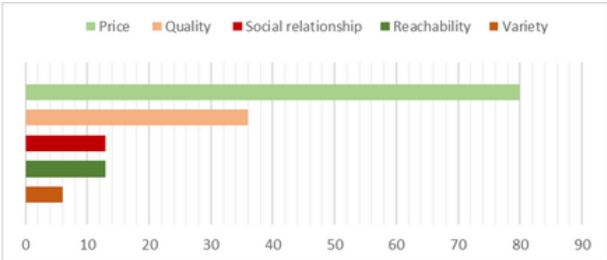


FIGURE 14: HOW DO YOU DECIDE WHERE YOU BUY YOUR FOOD?

The main determinants to inform consumers' decisions are first – by far - price, then followed by quality. We will elaborate more on the relationship and assessment of quality and safety in the following sections.

FIGURE 15: IS FOOD SAFETY A PRIORITY WHEN YOU BUY YOUR FOOD? (ACCORDING TO GENDER)

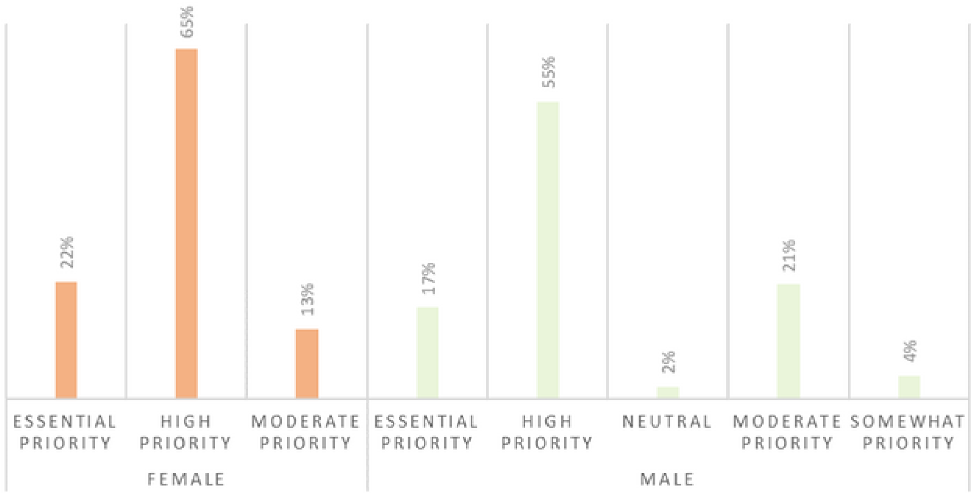


FIGURE 16: WHAT IS YOUR PERCEPTION OF THE FOOD AT THIS MARKET? (ACCORDING TO MARKET)

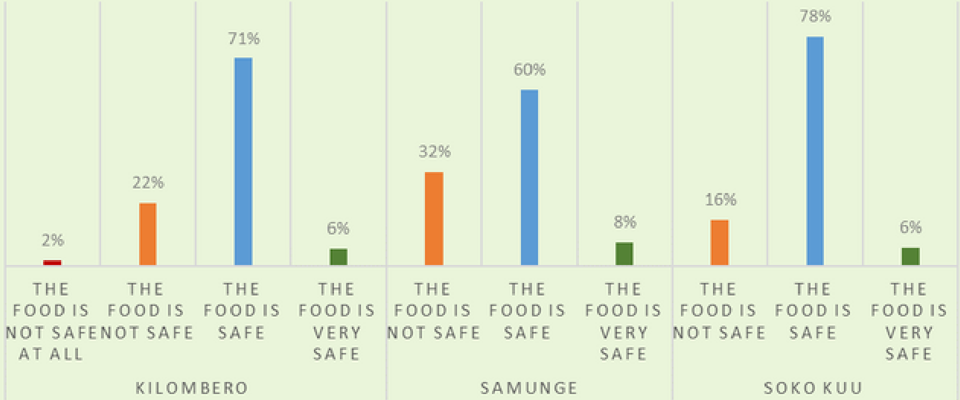


FIGURE 17: DID YOUR ATTITUDE TOWARD FOOD SAFETY CHANGE OVER TIME? (ACCORDING TO GENDER)

QUALITATIVE ANALYSIS CONSUMERS

In this section, we further elaborate on some of the results explained above, based on the open questions, audio recordings and visual documentation of the markets.
Food safety awareness is present and is growing, mainly for youth consumers, but at the same time many misconceptions exist about the concept. For example, we observed food safety and observable food quality are often interchanged.

‘Safe food is of good quality and is kept in a clean environment.’

Consumers have a growing knowledge about food safety, mainly through education and information campaigns. They refer to health and nutrition education, radio campaigns and information through other institutions such as hospitals after being sick. But, to assess the safety of food, they only look at cleanliness, freshness, shelf life, origin, cleanliness of the environment, damage, and the presence of insects.

‘The food here is in a safe environment. It’s clean and not damaged. The hygiene has been considered and the produce looks good.’

Most consumers believe that the food sold at the markets is safe, for example, because they don’t get sick or because other people buy at the markets as well. The few consumers who assume the food is unsafe, point out that they cannot know the origin of the produce, and refer to poor market infrastructure and the misuse of chemicals. Currently, there is no way to know or assess the actual biological or chemical contamination of fresh food products, even though they are aware of the health risks.

‘‘Most food is grown, stored and preserved with pesticides and can make us sick.’
‘We don’t know how it is produced. We just find it at the market here. And that’s why I assume it is not safe.'

When we ask consumers why they were willing to pay a higher price for safe food, almost all answers relate to their personal health and the health of their families, and some referred to nutritional quality.

‘Food safety has become more important for the sake of protecting my health and because of my education. I care about the health of my family, and I don’t like to get sick.’

All respondents who weren’t willing to pay a higher price for safe food referred to their economic situation, lack of income and high prices as the main reason. These answers show the persistent perception of safe food being more expensive.

‘If I had more financial resources, I would buy better quality. It’s better for you but I don’t have a choice. Because the prices are too high, the lower class cannot afford it.’

Furthermore, regardless of health-risk knowledge, consumers sometimes deliberately choose to buy food that is presented on the floor instead of on a market stall, following the assumption that the price will be cheaper. So, besides knowledge or means of assessment, price is the main obstacle to buying safe food, especially since it is consumers’ most important determinant to decide which food to buy before food quality.

SYNTHESIS CONSUMERS

In conclusion, the results of the survey on consumers at the local public markets in Arusha, Tanzania, provide insights into their socio-economic status, employment prospects, spending patterns, food sourcing habits, market experiences, food preferences, and food safety concerns. The majority of the sample is made up of youth, with an average subjective social status ranking. Despite common assumptions, the youth showed a strong interest in working in the food sector, with farming being the preferred occupation.

Consumers spend a large portion of their budget on food, with a self-reported willingness to pay more for safe food products although budget constraints limit their ability to do so. Most consumers source their food from local public markets and are generally satisfied with their market experience. However, there were differing opinions on market experiences based on the location. The top food preferences were starch foods, followed by vegetables and fruits, with proteins and processed foods not ranking highly. Additionally, the population does not consume enough vegetables for a healthy diet.

"Food safety awareness is increasing among market consumers in Arusha, particularly among the youth."

Based on the qualitative data we can conclude that food safety awareness is increasing among market consumers in Arusha, particularly among the youth. However, there are still misconceptions about food safety, with many consumers interchanging it with food quality. Consumers primarily assess food safety based on food quality factors, which can indicate biological contamination, but rarely consider chemical contamination. Despite having knowledge of health risks, many consumers choose to buy food based on price, often resulting in them not choosing to buy from clean market stalls. Personal health and family health are the main reasons consumers were willing to pay a higher price for safe food, while their economic situation was the main reason for not being willing to do so. Overall, price is a significant obstacle for consumers when buying safe food.

RESULTS VENDORS

YOUTH VENDORS

In total, 123 vendors participated in the survey. Just over half of the respondents were younger than 34 years old. When looking at the most remarkable differences between youth – and older vendors, three findings stand out.

Firstly, where most of the youth vendors are male, vendors over 45 were mostly female. Secondly, while younger vendors are more often selling fish and processed food, more older vendors sell staple crops and meat. Finally, 36% of youth vendors would not like to stay in their current working conditions, while in the older group it is only 24%. However, when looking at how these vendors experience selling food at the market dissatisfaction is largest among the vendors over 45, where 43% have a negative experience (13% very unsatisfying, 30% unsatisfying).

Similarly with the consumer group, 75% of youth respondents would see themselves continuing to work in the food sector in the future. As preferred jobs, the interviewed youth ranked market vendor (28,4%) first, retailer (27,7%) second and farmer (25,2%) third.

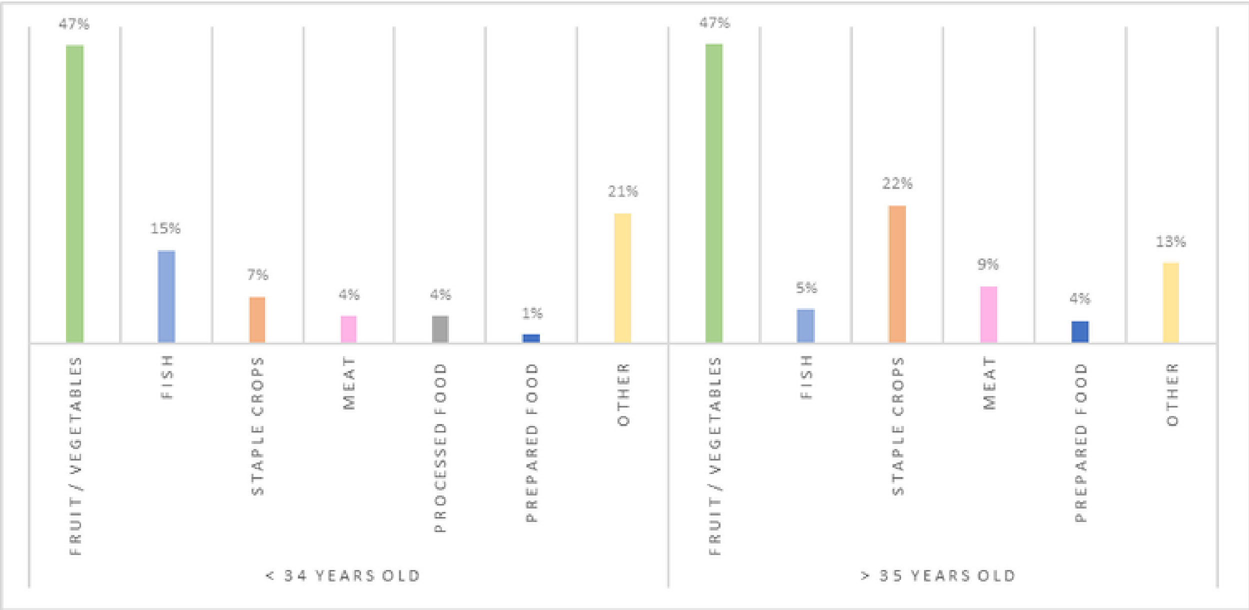


FIGURE 18: WHAT TYPE OF FOOD DO YOU SELL? (ACCORDING TO AGE)

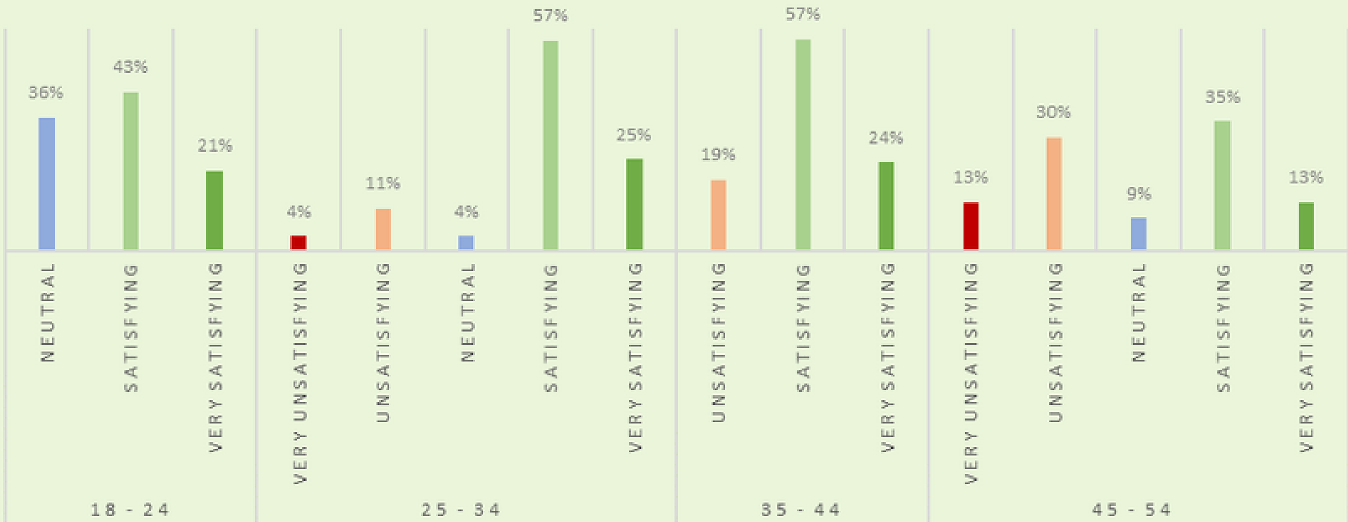


FIGURE 19: HOW DO YOU EXPERIENCE SELLING FOOD AT THE MARKET? (ACCORDING TO AGE)

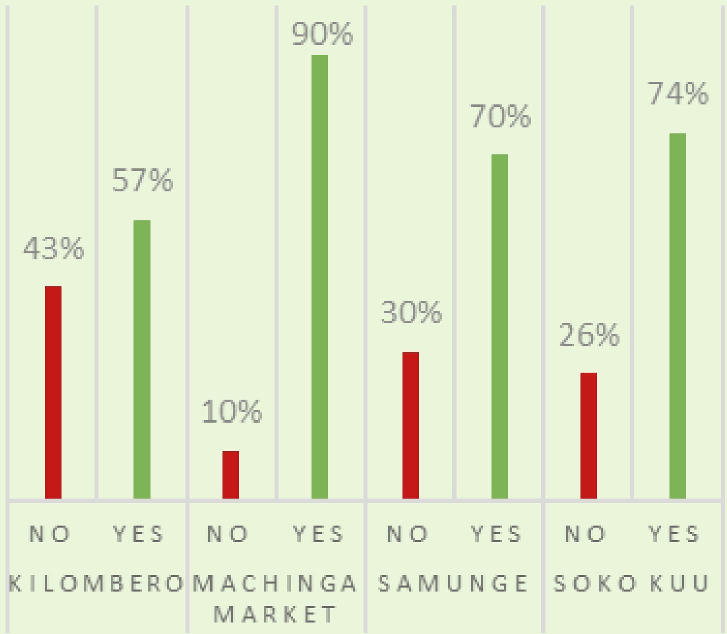


FIGURE 20: DO YOU PREFER TO STAY IN YOUR CURRENT WORKING CONDITIONS? (ACCORDING TO MARKET)

The number of formally registered stalls is considerably higher at the Plot #68 than at the other markets since all these stalls were registered and appointed to a vendor before the relocation. However, formal registration also seems to be linked to the age of the respondents. The younger, the more likely that their stall is registered. Surprisingly, the number of unregistered stalls is highest at Kilombero (43%)

VARIATIONS BETWEEN MARKETS

As stated in the methodology data collection for this questionnaire happened at four markets: Kilombero market, Soko Kuu, Plot #68 and Samunge market. This allowed us to make some comparisons between markets.

The first finding, which is linked to the section above is that youth vendors are more prevalent at Plot #68 (70%) and Soko Kuu (59%), whereas at the two other markets numbers are more or less balanced.

A second finding is a large variation between markets when it comes to preferences to stay in their current working conditions (as can be seen in figure 4).

Where on Kilombero market and Samunge market around 70% of vendors want to stay in their current working conditions, and in Soko Kuu even 79%, these numbers drop tremendously when looking at the vendors in Plot #68. Here only 10% of vendors would prefer to stay in their current working conditions. The main reason indicated for this is that the decline in food prices makes selling more difficult.

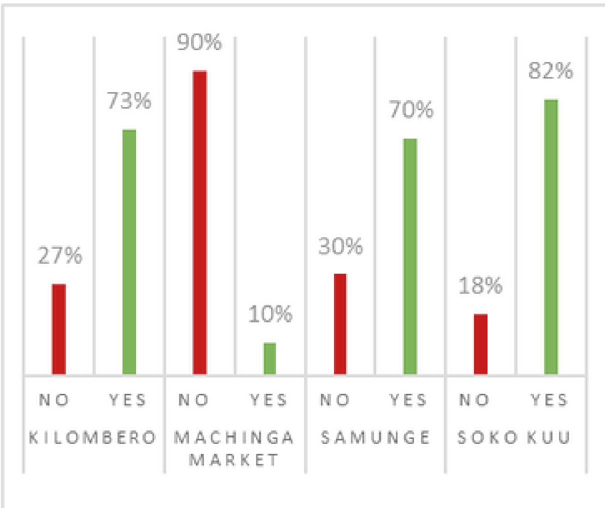


FIGURE 21: IS YOUR STALL FORMALLY REGISTERED? (ACCORDING TO MARKET)

Most of the vendors who are now selling at Plot #68 were relocated from stalls beside the roads or after hawking. For many of these vendors this was not a voluntary choice, which could explain why they don't prefer these working conditions.

GENDER

Of the 123 vendors that participated, 43% was female and 57% was male. Differences between the sexes are most clear when it comes to the quality of the relationships with market managers and brokers (which are mostly male). Figures 6 and 7 show women indicated more often that they had a bad or very bad relationship, while men are generally more neutral about these relationships.

In the focus groups women indicated that conflicts with brokers are mainly rooted within the Mali Kauli system, where vendors receive their products from the brokers, but only pay after the product is sold. This is a system based on trust, however, when the products are damaged the consumers would pay a lower price. Since the products are often sold in big bags, vendors can only assess the quality of the products after buying them.

'Because of the situation now people want their product to be bought cash, directly, and that means the relationship has changed'

Conflicts appear when vendors want to pass the cost to the broker. Survey participants who indicated the relationship with the brokers had changed for the worse, explained that this was mainly due to the rise in food prices. This also made it less likely that the brokers allowed vendors to pay later. In case of conflicts participants indicated contacting market managers.

“They don’t bring us problems, when they come they expect to receive the taxes, and if we pay all is good. If we bring problems, then they will take further steps”

While the relations with the market managers are usually good, some participants also indicated issues like managers removing stalls of vendors who do not pay their taxes. In general vendors indicated that as long as they paid their taxes on time, the relationship with the market managers was good.

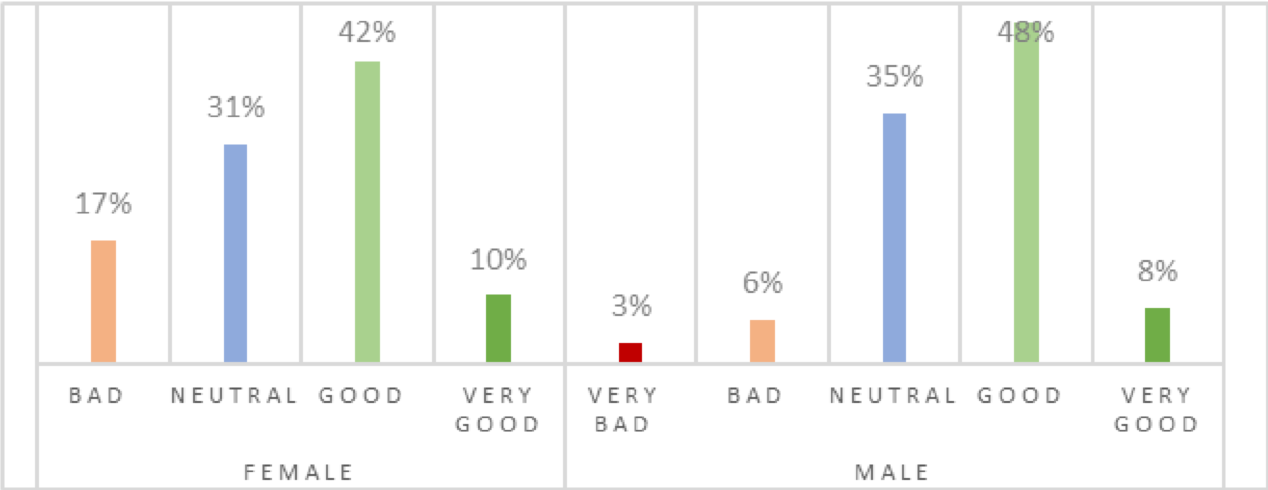


FIGURE 23: HOW IS YOUR RELATIONSHIP WITH THE MARKET BROKERS? (ACCORDING TO GENDER)

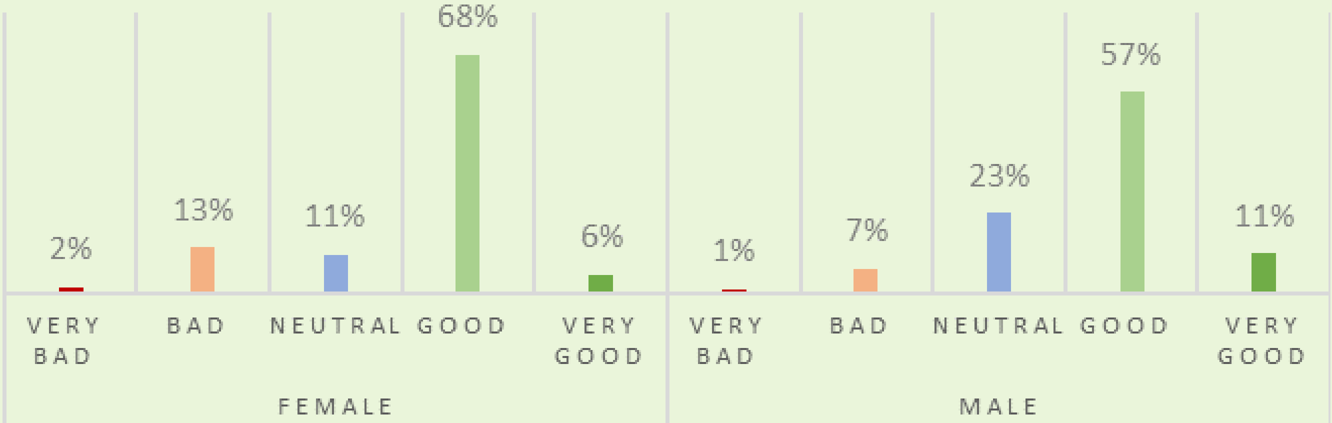


FIGURE 24: HOW IS YOUR RELATIONSHIP WITH THE MARKET MANAGERS? (ACCORDING TO GENDER)

QUALITATIVE ANALYSIS VENDORS

PERCEPTIONS OF MARKET INFRASTRUCTURE

The market vendors we spoke to indicated that the markets lack the infrastructure to sell safe food. The problems most frequently mentioned are the lack of drainage systems, lack of access to clean water and vending stalls that are in bad condition.

Market vendors also perceived a lack of return when it comes to the taxes they pay to the local government. Although the monthly market tax they pay has been increased last year from 6000 TZS to 15.000 TZS, they see little to no improvement when it comes to the roads and sidewalks around the markets and the general market infrastructure. This feeling is reinforced by the fact that they also have to pay for most services offered at the market. For example, vendors pay guards to secure the market (1500 TZS/ month), for every time they use the toilet (200 TZS / service), to receive clean water (100 TZS / bucket) and for garbage collection (3000 TZS / month)

.This leaves them wondering what the 15.000 TZS they pay on monthly is used for. One vendor also mentioned that if you fail to pay your tax three months in a row, they take away your table.

Vendors prefer improvements to the current market over the construction of a new market since they like their current location and have established contacts with consumers. At Soko-Kuu, vendors indicated that their priorities for improvement would be the reconstruction of drainage systems and the placement of new security gates.

DRAINAGE SYSTEM AT KILOMBERO

PERCEPTIONS OF FOOD SAFETY

The results of the survey show that food safety practices vary greatly between vendors. When asking vendors how they make sure that their products are safe we found that their definitions of food safety overlap with food quality definitions. For instance, vendors look at the colour, shape and smell of products to assess the safety of their product. This indicates a limited knowledge about food safety, but also makes sense since vendors only have limited insight into the previous steps of the production chain and no access to testing facilities. As one of the vendors replied to the question of how he assesses the safety of his products:

'This is a hard question because we are just sellers. We look for cleanliness, and nice packaging, but in the case of pesticides we don't have that knowledge'

In this sense vendors also indicate the importance of a trustful relationship with the brokers since they are the ones providing them with more information about the product, such as the origin and the method of production. It is not clear from our research how accurate the knowledge from the brokers is.

'I don't know much about pesticides, I just believe the person who sells to me, who confirmed that it is safe for consumption'

In the focus groups, market vendors indicated that they made efforts to prevent further contamination of the market, mainly because consumers are always asking about food safety. However, they also noticed that many consumers preferred food that was sold from the ground since this was perceived as cheaper. This creates a dilemma about making improvements to their stall since a stall that is looking 'too nice' might give the impression to the consumers that the food is expensive.

Compliance with the food safety regulations is also checked by environmental officers. In case they find any violations, vendors can face a fine up to 50.000 TZS.

MARKET VENDOR ASSOCIATIONS

The survey showed that there is only a very small number of vendors that is part of an association. The vendors that are association members are mostly older vendors. While in Arusha you have TCCIA (Tanzania Chamber of Commerce, Industry and Agriculture) defending the interests of larger traders and businesses and TAHA (Tanzania Horticulture Association) defending the interests of the horticulture sector, associations who defend the interests and rights of the vendors are still missing. Some participants indicated there were some attempts in the past to start an association bottom-up, however they were difficult to manage as it was hard to find unity between members.

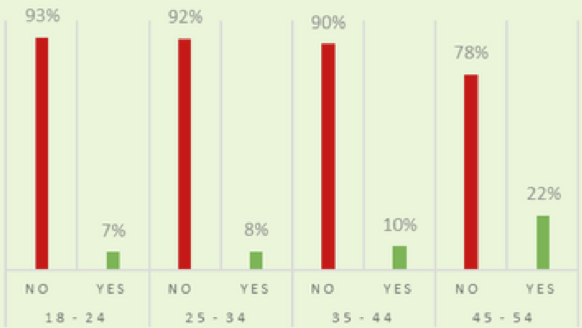


FIGURE 25: ARE YOU PART OF A MARKET VENDOR ASSOCIATION? (ACCORDING TO AGE)

Vendor associations that do exist are mostly focused on financial transactions. Since interest rates and demanded collaterals at banks are generally too expensive for vendors, they are involved in other systems to be able to make investments.

Two systems were frequently mentioned among the participants. The Village Community Banks (VICOBA) are a type of registered community microfinance groups with a clear group constitution. Members pay a weekly contribution in return for the possibility to take credit from the VICOBA when necessary. They pay a small interest rate however, at the end of the year members get back their share and the interest they paid. The second system, KIBATI, works in the same way but is more informal. The members agree on the conditions among themselves and there is no formal registration. This also makes it riskier since there is not much they can do if other members do not keep to the rules.

SYNTHESIS VENDORS

The results of the survey on vendors at the local public markets provide insights into product characteristics, employment prospects, job satisfaction, formality, relationships with other market actors, organization structures and perceptions of market infrastructure and food safety. Additionally, we were able to differentiate between age, gender and markets, providing us with more understanding of the dynamics at play in these categories.

When it comes to age, the most important finding is that older vendors generally experience lower job satisfaction. Additionally, 75% of youth respondents still see a future working in the food sector. On the subject of gender we found that women have it more difficult as they are more likely to have a bad relationship with market managers and brokers and less likely to have a formally registered stall. With regard to differences between markets, the most telling result is the strong desire for a change of working conditions in Plot #68. This is also the market with the most youth vendors and the most registered stalls. All these results are probably linked to the relocation of the street vendors to this market last year. Previous conversations with vendors in these markets showed that they would prefer to have vending sites along the main roads as this was more profitable to them.

"a lack of market infrastructure such as access to clean water, drainage systems, and vending stalls, leads to unsafe vending conditions.."

The focus groups provided us with some additional insights. Participants indicated a lack of market infrastructure such as clean water, drainage systems, and vending stalls, which leads to unsafe vending conditions. Vendors are also aware of this link between bad infrastructure and safe food and indicated they are already doing their bit. Finally, different types of vendor groups exist of which VICOBA was the most popular. However, these groups only provide financial support. Vendors would like associations that help them with advocacy.

These results provide valuable information for those looking to understand and improve the food system in Arusha.

DISCUSSION

The present study assessed the perceptions of food vendors and consumers in relation to food safety and the governance of public markets. To do so, we formulated five hypotheses together with a dedicated group of local food system actors. The study results confirm two of these hypotheses and disprove two others. For one hypothesis the results could not show a conclusive result (see table x).

VERIFICATION OF HYPOTHESES

Hypothesis 1	There is a growing awareness on food safety issues among consumers and market vendors in Arusha.
Hypothesis 2	Youth has little interest to be professionally involved in the food system (moreover because it is difficult to generate a liveable income, being a farmer has low social value, and access to land is a challenge).
Hypothesis 3	The current infrastructure at local public markets in Arusha is insufficient.
Hypothesis 4	Given the growing middle class and overall economic growth in Tanzania, there is a growing demand for safe, healthy, processed and quality food.
Hypothesis 5	Consumers in Arusha prefer to buy day-by-day fresh foods and see vegetables as inferior products. They prefer high starch and meat diets. Furthermore, there is a growing tendency to buy and eat processed food

** Note on hypothesis 2: In this study the increase in food safety awareness is self-reported. This could cause a bias of people assessing their behaviour change as more positive than it actually is.*

*** Note on hypotheses 4 and 5 based on desk study; in Tanzania there is both a fast-growing middle class and a fast-growing economic sector of processed foods. Meat consumption is high and growing, and overall, the Tanzanian population does not eat enough vegetables to qualify for a healthy diet. But, not represented in our sample?*

Hypothesis 1: There is a growing awareness of food safety issues among consumers and market vendors in Arusha. ✔

Our results show that both consumers and market vendors are aware of food safety issues, especially concerning the potential health risks of unsafe food*. A recent study in Nigeria showed that consumers mitigate food safety risks by looking for cleanliness in stalls, vendors, and surroundings and by establishing a relationship of trust with certain vendors (Nordhagen et al., 2022a). Our results confirm these findings. Additionally, both vendors and consumers try to mitigate food safety by inspecting the products for visual damage (insects, holes and colour), smelling it and touching it. It is important to note that the food safety risks established in the study by TPRI cannot be avoided by doing this sensory check.

However, there seems to be a persistent gap between knowledge and action. Growing awareness does not result in changing behaviour. This was also observed in studies in Ethiopia (Parikh et al., 2022) and Nigeria (Nordhagen et al., 2022b). This is mainly due to the price of products. A stall that looks "too clean" can create the perception that the products are more expensive. Furthermore, 77% of the consumers assume that the food bought at the markets is safe while only 22% reported that they think the food is unsafe.

Hypothesis 2: Youth has little interest to be professionally involved in the food system. Especially becoming a farmer is not attractive to them. ✖

The interviewed youth, here defined as younger than 34 years old, do seem to be interested in working in the food system (75% of the vendors and 80% of the consumers). As a preferred job, all respondents state becoming a farmer as an option in their top 3. Other preferred jobs are market vendor, retailer, and distributor. Despite high urbanization rates with the corresponding rural-urban migration, young market vendors and consumers do value food sector jobs and aspire to be professionally involved in them. This is remarkable since we hypothesized that becoming a farmer in the Arusha region in Tanzania is unattractive because of its low social status and low economic return. On the other hand, we don't know what drives their interest in farming life. This could be a question for further research.

Hypothesis 3: The current infrastructure at local public markets in Arusha is insufficient. ✔

Overall, we can confirm the observation of Abwe (2020) that the existing market infrastructure is insufficient. However, different questions on this topic show somehow ambiguous results. In the survey, consumers stated they are satisfied with the market experience, and vendors stated that they would prefer to stay in their current working conditions. But analysis of the open questions, focus groups and market observations show a different result: there is a clear lack of infrastructure to sell safe food, a lack of functioning drainage systems, limited access to clean water an2d vending stalls that are in bad condition. Regardless of a rise in taxes for market vendors, they do not perceive any return on these payments and must pay extra for services such as access to water, toilet use, security, and waste collection. Would be interesting to weigh this against the perception of the vendors who were moved to the new market. New infrastructure is not always perceived as better by vendors and/or used optimally.

Hypothesis 4: Given the growing middle class and overall economic growth in Tanzania, there is a growing demand for safe, healthy, processed and quality food.

Previous research in India, Nepal and Turkey has shown that higher levels of education and household income do positively influence food safety awareness (Kilic & Eryilmaz, 2015; Sharma & Sangha, 2015; Thapa et al., 2020). A very recent study in Tanzania has also shown a link between growth in household expenditures and improved diet quality (McCullough et al., 2022). Similar results were found in other countries (Ali et al., 2006; Nie et al., 2021; Yu & Abler, 2009). However, since we did not measure demand, we cannot provide a conclusive answer to hypothesis 4 in the local context of Arusha.

We did discover consumers' preference for quality food (by looking at different tactile characteristics) and their willingness to pay for safe food products, but currently there is no way to identify safe and healthy food at the markets. Since 55% of consumers stated that food safety has become more of a priority to them over time, we could assume there is a growing demand. However, 77% of all consumers assume the food at the markets is safe, and price (over quality) is the main determining factor when buying food. One explanation for this is that a change in awareness does not necessarily lead to a change in behaviour (Mullan et al., 2016; Sheeran, 2002)

Hypothesis 5: Consumers in Arusha prefer to buy day-by-day fresh foods and see vegetables as inferior products. They prefer high starch and meat diets. Furthermore, there is a growing tendency to buy and eat processed food.

On average, consumers at local public markets buy food 3 or 4 times a week. This mildly supports hypothesis 5, but the assumptions that fruits and vegetables are inferior products in comparison to starch and meat products are not supported. Overall, fruit and vegetables are stated more frequently as preferred food than meat and other protein-rich food.

Previous research on a larger scale has shown that maize very much dominated the Tanzanian diet. This study also showed that the consumption of other products is very much dependent on their price. As such, lower food prices generally lead to improved diet quality (McCullough et al., 2022). However, the study also warns that lowering the prices of wheat and meat would lead to consumers substituting other components of their diet with these products leading to more micro-nutrient deficiencies (such as Vitamin A). [CF1]Could this be because they get protein-rich food from different outlets?

RELATIONSHIPS AND CONTRADICTIONS WITHIN THE SYSTEM

MARKET STALL QUALITY, PRICE PERCEPTION OF CONSUMERS AND CONTAMINATION

Customers' main determinant to buy food is price. When fresh produce is presented nicely in a clean stall, they assume the price is higher. Therefore, they sometimes opt for food that is lying on the ground, often sold by informal/unregistered vendors, with a higher risk of contamination.

TAXES, LACK OF RETURN ON PAYMENT, AND UNEQUAL COMPETITION

Informal vendors can sell their produce for a lower price than formally registered market vendors, since they don't have taxes as a fixed cost. This unequal competition, in combination with poor market infrastructure, as can be seen in a perceived lack of return on the payment of taxes, creates a negative dynamic in the market environment. Vendors don't want to stay in their current working conditions and get little incentive to pay taxes or to be formally registered.

FOOD SAFETY AWARENESS, PURCHASING POWER AND WILLINGNESS TO PAY

Food safety seems to be a major concern for most consumers, also for the lower income groups. Even though they state to be willing to pay a higher price for food, their budget does not allow them to do so. Unfortunately, this is also a matter of perception: safe food is not always more expensive.

FOOD QUALITY, - SAFETY AND – ASSESSMENT

Even though the general awareness seems to be growing, both vendors and consumers have no means to assess the true safety and quality of fresh food products. They base themselves on the means available, freshness, colour, smell and relationships of trust with respective market vendors or market brokers. These means are unreliable. For example, pesticide residue is often washed off in contaminated water - given the markets' poor infrastructure, waste management and drainage systems. Within the current system, there are barely any means to reliably guarantee and assess food safety. This implies that these vendors cannot be held completely accountable for guaranteeing food safety. In this sense, the government has an important role to play in offering safety guarantees.

KEY RECOMMENDATIONS

CREATE A SHARED UNDERSTANDING OF FOOD SAFETY

There is a need for a shared interpretation and operationalisation of food safety between research institutions, government, civil society actors and food system actors. Since both consumers and market vendors have a growing awareness of food safety but lack any means to assess it, alternatives need to be developed where actors can assess or guarantee the safety of the products that they sell or buy. For example, a Participatory Guarantee System (PGS) where actors within the system (from production to consumption) collaborate and control each other and where relationships of trust are formalized. This system can be an alternative for technical food safety testing and/or organic certification of products. An important note here is that all actors participating in these systems must see personal benefits for changing their behaviour

Currently, two such mechanisms are being piloted in Arusha. Firstly, a PGS network linking farmers from to Arusha Region to safe food outlets in the city by the NGO Islands of Peace. a Participatory Food Safety System (PFFS) that aims to build networks of safe food across the food system, both linked to the Arusha Sustainable Food Systems Platform (ASFSP). However, they still require a shared understanding of food safety and governance mechanisms that allow them to include food system actors such as vendors and consumers.

In the current system vendors have already received a series of awareness training regarding food safety, mainly from non-profit organisations. However, this training can cause frustrations among vendors as it can make them feel instrumentalized when they are not paired with actions that answer their needs. For example, when there is no follow-up or further support after a single training. Additionally, this training only focuses on food safety, while vendors also have needs related to marketing and infrastructure.

Studies linking PGS and food safety are still limited. However, PGS can improve the practices and knowledge of both consumers and producers. Additionally, PGS can positively affect access to local, affordable and organic food for consumers (Smith & Barrow, 2018). Where consumers are actively involved PGS has a positive effect on restoring their trust when it comes to food safety on the condition that these systems provide them with access to high-quality information (Ge et al., 2022).

EXTEND CONSUMER SENSITIZATION CAMPAIGNS

On top of existing campaigns and education, there is a need to extend sensitization about food safety, especially with a focus on the differences in safety with food quality and cleanliness. Food that looks appealing can be unsafe and both vendors and consumers have little awareness of this. Furthermore, we want to suggest using different and more channels for these campaigns since it mainly seems to reach the youth population. For example, communicate about food safety practices at the markets themselves.

A second suggestion is to have campaigns specifically targeting women. Studies in Turkey and Ghana have shown that women are generally more sensitive towards food safety issues than men (Kilic & Eryilmaz, 2015; Omari et al., 2018). At the moment, several consumer sensitization campaigns are being developed by different civil society actors in the city. They aim to communicate key messages about food safety and reach a broad audience through different channels (e.g. advertisement through public transport, art paintings and banners at the local public markets, aprons for vendors, radio, cartoons, playing jingles at the markets, et cetera).

"We need campaigns targeting women as they are generally more sensitive towards food safety issues than men"

However, to be effective, at least two prerequisites should be met: safe food needs to be available and affordable, and communication should be informed by how to overcome the action-cognition gap. Knowledge and awareness of food safety don't automatically translate into action, in this case buying and consuming safe food. Therefore, we need a better understanding of the relationship between knowledge, awareness, attitudes and practices.

Actors: NGOs, market managers, government

IMPROVE MARKET INFRASTRUCTURE AND WORKING CONDITIONS TOGETHER WITH THE VENDORS

Several studies have shown the impact of poor market infrastructure on the effectiveness of food safety systems (Aworh, 2021; Liguori et al., 2022; Umali-Deininger & Sur, 2007). Davies et al. (2022) also state that: “top-down barriers, such as an absence of government investment in essential market infrastructure and services […] can undermine market performance and ultimately lead to market failure”. For this reason, market (infrastructure) improvements are urgently needed and need to be co-designed in a participative manner with the vendors. This will increase feelings of shared ownership and responsibility and will avoid investing in so-called white elephants – investments whose costs are not in line with their usefulness or value.

"Giving vendors a voice in further market planning and development is of essence"

Giving vendors a voice in further market planning and development is of essence, especially given their current market dissatisfaction (mainly at Plot 68) and the lack of return of their tax payments. This importance is also emphasized by a study in Ghana. This study has shown that failure to involve the vendors in market reconstruction leads to problems related to the quantity, distance, and size of trading space. As a result, traders had no or not enough space, which affected their livelihoods (Asante, 2020).

The vendors in Arusha prioritize the reconstruction of drainage systems and the instalment of security gates, and prefer strongly not to be delocalized. Finally, a new bylaw could be created that obliges market vendors to sell only from elevated stalls.

Actors: market managers, government, market vendors

SET UP DESIGNATED MARKET SPACES FOR SAFE FOOD

Existing markets can designate certain spaces solely for safe food products. These spaces can simultaneously sensitize consumers, stimulate vendors to increase safety and promote sustainable food production techniques (since the market outlets are already there, which is often a concern for producers).

However, when developing such spaces, vendors should be included and heard. Furthermore, it will be important to not reinforce the existing (higher) price perception of safe food. Developing designated market spaces therefore must be linked to consumer sensitization strategies that also focus on price and perception.

Actors: government, market managers

ORGANIZE TRAINING ON SUSTAINABLE FOOD SYSTEMS AND ENTREPRENEURSHIP FOR YOUTH

Given Arusha's big and fast-growing youth population and their interest in working in the food sector, there is a big potential for positive food system transformation. Therefore, they must have a good understanding of what a sustainable food system is and can have access to knowledge and training about setting up their businesses.

"Arusha's youth population must have a good understanding of what a sustainable food system is"

Small and medium-sized enterprises (SMEs) are an important part of the food system and have the potential to change it, but until today often get overlooked. For example, initiatives that valorise, re- and upcycle organic waste collected at the markets, or logistical players that organize safe transport from producer to vendor can both significantly impact the urban food system's sustainability and create economic opportunities for youth.

Actors: NGOs, government, youth

ESTABLISH AND SUPPORT MARKET VENDOR ASSOCIATIONS

To generate a shared understanding of food safety with market vendors, further sensitize them about food safety challenges, and co-design market infrastructure improvements, there is a need to set up new governance structures. The establishment and further support for market vendor associations can be a pathway to include vendors in decision-making processes and give them a voice, for example in the Arusha Sustainable Food Systems Platform, or by linking them to government officials.

"The establishment and further support for market vendor associations can be a pathway to include vendors in decision-making processes"

RECOMMENDATIONS FOR FURTHER RESEARCH

Firstly, there is a need for more knowledge on market brokers and if they are capable of making correct food safety assessments based on their knowledge about the origin of the product and means of transportation. What knowledge and means do they have? And how is it used in practice?

Second, we need a better understanding of the risk awareness of consumers when it comes to food safety. In the survey they generally indicate they are aware, their knowledge is growing, that food safety became more of a priority to them, but at the same time they assessed that food bought at the markets is safe or very safe. What is this assessment based on and how can it be improved? Regarding this last, it would also be interesting to know where different categories of consumers get their information from and what effect the existing initiatives have on their awareness level. Additionally, we need a better understanding of how this knowledge and awareness translates into changed attitudes and practices: the actual buying and prioritizing of safe food.

Thirdly, it would be interesting to know what would motivate different actors (producers, transporters, vendors, consumers) to participate in a PGS or participatory food safety guarantee system, and what are the barriers they experience related to this system While it is important to have more information for all actors, we would suggest prioritizing research on consumers. Their participation in ongoing food safety discussions is generally very low, while they are the main actor affected by this issue.

Finally, given the persistent idea that safe food products are more expensive, a price comparison study between safe and unsafe food products can bring us more clarity, in addition or in comparison to existing and ongoing research about willingness to pay for safe food products (ongoing project by IITA).

NEXT STEPS

In November 2022, we shared and discussed the initial version of these results with the Arusha Sustainable Food System Platform, the mayor and the district commissioner. Building on this discussion, we propose the following steps.

First of all, we will share and discuss these results again with relevant food system actors in Arusha such as the Arusha Sustainable Food Systems Platform, Iles de Paix, Rikolto, IITA, Trias, TPRI, City Government departments, et cetera.

Secondly, we will compare our results with a similar study recently conducted in Arusha by World Vegetable Centre and Wageningen University and Research (FRESH project), inform each other's research, and look for synergies and further steps where we can collaborate on. In addition, from March until May 2023 a master student will conduct research on food safety challenges in Arusha supervised by the two authors of this report. This research will further zoom in on the relationship between food safety knowledge, awareness and the link to attitude and behaviour.

To facilitate the development of PGS (Participatory Guarantee System) and PFSS (Participatory Food Safety System) we will develop a good food map. This map is the next step in the context of the research-by-design project that maps and assesses Arusha's food system. It will combine a geographical map where consumers can find safe/healthy/sustainably produced food and where producers can find potential markets, with a dynamic digital database of producers and safe food outlets in the city (such as kiosks, market stalls, restaurants, et cetera). This map can facilitate the development of short food supply chains and can act as a marketing channel for safe food ambassadors. It will provide information about Arusha's food system and show good practices and its actors. It aims to sensitize consumers, help producers to access markets and incentivizes vendors to sell safe food while facilitating the development of short and transparent food supply chains.

Thirdly, the results of this report will be visualized in a systemic map, which will show all variables, their relationships, synergies, and trade-offs. This way, we will generate a deeper understanding of the system. The visualization will be used in a multi-stakeholder workshop, which will help to identify leverage points and co-design the desired future of Arusha's urban food system.

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