



RSM2SNF

Research Supporting African MSMEs
To Provide Safe and Nutritious Food

Stakeholder Perceptions of the Fish and Vegetable Value Chains in Nigeria

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About Research Supporting African MSMEs to Provide Safe and Nutrition Food (RSM2SNF)

The Research Supporting African MSMEs to Provide Safe and Nutritious Food (RSM2SNF) is funded by the Bill and Melinda Gates Foundation. RSM2SNF dives deep into the wholesale, logistics, processing, and retail segments of the value chains of several products, such as fish, tomato, and green leafy vegetables. The goal is to understand the midstream of these food value chains with a focus on Micro, Small and Medium Enterprises (MSMEs), and to inform policies and interventions to support MSMEs in providing safe and nutritious foods at affordable prices. This five-year project (2022–2026) is led by Michigan State University (MSU) working with partners in Nigeria and Tanzania.

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Executive Summary

Agrifood value chains (AVCs) in Nigeria have expanded rapidly in recent decades. This process has been driven, in part, by enormous aggregate investment on the part of the many micro, small, and medium enterprises (MSMEs) that operate all along the AVCs (Reardon et al. 2019). These include producers, input suppliers, transporters, aggregators, processors, wholesalers, and vendors, among others. While these MSMEs together form the backbone of Nigeria's food system, they face significant challenges that impede their operations, growth, and productivity.

The "Research supporting African MSMEs to provide safe and nutritious food" (RSM2SNF) project aims to better understand the structure, conduct, and performance of three particularly nutritious and locally relevant foods, namely fish, tomato, and green leafy vegetables (GLVs). In May–July 2022, the RSM2SNF project administered a survey to capture stakeholder perceptions of the most pressing challenges faced by MSMEs in the fish and vegetables value chains in Nigeria. The survey also captured a broad assessment of the food system in Nigeria and touched on gender roles in the fish and vegetables value chains and awareness and perceptions of related legislation, among other topics. Agrifood stakeholders from both the north and south of Nigeria were recruited using both purposive and snowballing methods. The survey was administered to 200 stakeholders, including representatives from civil society organizations, government, farmers, the private sector (post-production), and academia. Survey results are analyzed for the full sample and are disaggregated by region of the country, gender of the respondent, and stakeholder group.

Eight key points stand out. First, respondents judged the availability and affordability of vegetables to be greater than the availability and affordability of fish. The affordability of fish was viewed as lower in the poorer north, where 55% of respondents considered fish affordability to be "poor" or "very poor", than the relatively more affluent south, where this value was 40%. This highlights a need for region-specific efforts to increase access to nutritious foods.

Second, there seems to be a clear preference for efforts to bring down food prices rather than improve food safety. Respondents prioritized government efforts aimed at affordability and de-emphasized efforts aimed at monitoring of food system actors and the provision of hygiene-related infrastructure. This likely reflects the stress felt by consumers who are worried that they cannot even access affordable nutritious foods, with food safety seemingly deemed a lower-order concern. It also implies that greater sensitization may be needed around the importance of food safety and hygiene, which are pressing concerns in Nigeria.

Third, for both fish and vegetables, the high cost of inputs for production was regarded as the greatest challenge for affordability, and a lack of food safety knowledge was seen as the greatest challenge for safety. While this alignment across the two products may point to some synergies in programs or investments (e.g., the need for training or improved infrastructure), any intervention such as research/training would still need to be product-specific.

Fourth, there is a dominant focus on high costs of inputs and a lesser focus on post-production challenges (e.g., post-production food losses). While this may indicate that the most important drivers of affordability are at the production stage, it may also reflect path dependency in thinking about the food system, since government programming in Nigeria has historically given more attention to producers than to other nodes of the value chain. Additional research is needed to understand whether this strong perception is an accurate view of the drivers of food affordability in Nigeria.

Fifth, women and men play distinct roles in the value chains for fish and vegetables. Men were viewed as more engaged in the provision of inputs for production (for both fish and vegetables) and in the production of fish, while women were viewed as more engaged in the processing, trading, and retailing of both fish and vegetables. Female respondents were somewhat more likely to view women as more engaged than men in retailing of fish and vegetables and the production of vegetables. Overall, these highly gendered patterns indicate that any intervention to improve these value chains—from the provision of inputs for production all the way to consumption—requires gender specific considerations and would necessarily have gendered impacts.

Sixth, we find important differences across the perspectives of representatives of the federal government and other stakeholders. For example, while federal government representatives were least likely to view the high cost of inputs as a challenge to the affordability of fish, this was the major challenge noted by all other stakeholder groups. Similarly, while federal government representatives viewed the availability or high cost of electricity as a meaningful challenge, all other stakeholder groups were neutral about that challenge (state government and academia) or considered this among the least serious concerns (farmers, industry, and civil society/donors). While state government representatives were most likely to fault weaknesses in the legislation and guidelines for street vending as a key challenge (for food safety for fish), federal level respondents considered a lack of guidelines to be the least serious concern. This gap between the federal government and others may point to a disconnect between those who make policy and those who play a more direct role in the implementation of those policies.

Seventh, we find other differences in priorities among different stakeholder groups. While infrastructure-based efforts to reduce food loss/waste, such as cold storage facilities, were highly prioritized by the full sample, representatives of industry were less likely than most or all other groups to prioritize such a program. They rather prioritized infrastructure improvements to reduce transportation costs, particularly for vegetables. This divergence in perspectives highlights a need to gather accurate and complete information on the drivers of food costs for the different value chains to best determine where public dollars should be allocated.

Eighth, different stakeholder groups varied in their experiences of inclusion. Farmers and representatives of industry (and respondents from the north) were least likely to feel that their voices were heard by government. While they tended to perceive that a dialogue was indeed occurring, they viewed themselves as marginalized in this conversation. This likely has bearing both for the suitability/effectiveness of policies and for the level of buy-in on the part of stakeholders.

These insights will inform the activities of the RSM2SNF project, which aims to build knowledge and capacity around how MSMEs in the Nigerian food system can be supported to provide affordable, safe, and nutritious foods. The agrifood system in Nigeria is growing rapidly and is in the process of a “quiet revolution” by MSMEs. As a large majority of respondents provided permission to be re-contacted, a second stakeholder perceptions survey will be conducted in several years to update this analysis.

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List of Acronyms

AVC	Agrifood value chain
GLV	Green leafy vegetable
MSME	Micro, small, and medium enterprises
RSM2SNF	Research supporting African MSMEs to provide safe and nutritious food

1. Introduction

Agrifood value chains (AVCs) in Nigeria have expanded rapidly in recent decades. This process has been driven, in part, by enormous aggregate investment on the part of the many micro, small, and medium enterprises (MSMEs) that operate all along the AVCs (Reardon et al. 2019). These include producers, input suppliers, transporters, aggregators, processors, wholesalers, and vendors, among others. While these MSMEs together form the backbone of Nigeria's food system, they face significant challenges that impede their operations, growth, and productivity.

These challenges span the micro level, such as limited technical capacity of MSME owners/managers and limited access to finance (Liverpool-Tasie et al. 2020); the meso level, such as poor organization and management of markets or clusters, congestion, security challenges, and limited access to water, cold storage, and other amenities (Reardon et al. 2021); and the macro level, such as poor road and rail infrastructure or limited supply of electricity that significantly increase the costs of operation, as well as policies that make it difficult for MSMEs to be established or formalized (e.g., multiple taxation, bureaucratic and unclear processes). Macro challenges also include the weak regulatory framework used to oversee and monitor the operations of many of Africa's food systems (Liverpool-Tasie et al. 2020; Liverpool-Tasie et al. 2021). Together, these micro, meso, and macro factors can significantly shape the incentives of MSMEs and affect their ability to provide affordable, safe, and nutritious foods to consumers.

The "Research supporting African MSMEs to provide safe and nutritious food" (RSM2SNF) project, which launched in May 2022 in Nigeria,¹ aims to better understand the structure, conduct, and performance of AVCs and the associated implications for food and nutrition security. Particular attention is given to the midstream and downstream of AVCs, comprising their wholesale, logistics, processing, and retail segments.

The RSM2SNF project focuses on the value chains of three particularly nutritious and locally relevant foods, namely fish, tomato, and green leafy vegetables (GLVs). These value chains have grown rapidly in many African countries in response to changing consumption patterns associated with urbanization and rising incomes. This is because, as incomes increase, the share of the food budget dedicated to non-staples rises disproportionately (Bennett 1941). Fish is among the most important animal-sourced foods in Africa and is crucial in combatting malnutrition, particularly among low-income consumers (Chan et al. 2019; Desiere et al. 2018; Headey et al. 2018; Liverpool-Tasie et al. 2021). According to the Nigeria General Household Survey 2018/19, 81% of Nigerian households (and 73% of poor households) consume fish. Households allocate an average of 5.2% of their total food budget to fish, and an average of 52% of the value of animal products consumed is in the form of fish. Studies also indicate a rise in the shares of fruits and vegetables in national consumption of sub-Saharan African countries (Smale et al. 2021). Nearly all households (99.3%) in Nigeria consume some vegetables, with an average of 6.7% of the total food budget allocated to vegetables. Tomatoes and green leafy vegetables (GLVs) are consumed in 88% and 48% of households, respectively.

¹ The RSM2SNF project will expand to Tanzania in 2023.

Tomatoes and GLVs comprise, on average, 8.3% and 29.9% of the value of vegetable products consumed in Nigerian households.

As demand for non-staple foods expands, it is important to understand the configuration of their food supply chains; the incentives for MSMEs to supply affordable, safe, and nutritious food; and the implications for the food and nutrition security of consumers. In addition, literature documents that perceptions are often a precondition for behavioral change (Deressa et al., 2011; Kilders et al. 2021; Khanal et al., 2018; Maddison, 2007; Odeyemi et al. 2019). Thus, understanding the perceptions of value chain actors will shed light on likely strategies that could prompt behavioral changes to increase the availability of affordable, safe, and nutritious foods.

To better understand stakeholder perceptions of the food system in Nigeria and the challenges faced by MSMEs, a survey was administered in mid-2022 to a broad range of agrifood system stakeholders (e.g., representatives from civil society organizations, government, food producers, the private sector (post-production), and academia). The intent was to understand the most important issues affecting the fish and vegetables value chains, with a focus on challenges to affordability and food safety and the efforts that should be prioritized to address these challenges. The survey also captured a broad assessment of the Nigerian food system, awareness and perceptions of related legislation and government-led activities, and understandings of gender roles in the fish and vegetables values chains. The survey allowed for a disaggregated analysis of perceptions across respondent genders, stakeholder groups, and regions of the country.

A second survey (of similar length and content) administered to the same respondents is planned towards the end of the RSM2SNF project, which will conclude in 2026. The panel survey can be used to understand changes in stakeholder perceptions of the food system over time, and also to understand whether stakeholder awareness of, and concern for, food safety and nutrition varies with their level of engagement with the RSM2SNF project.

2. Data and Methods

A survey of stakeholder perceptions was administered to agrifood stakeholders in Nigeria in May–July 2022. The survey was piloted in April 2022 and revised to ensure that questions were understood by respondents, to gauge the ease of the online survey experience, and to confirm that the time required to complete the survey was not prohibitive and would not dissuade participation. The survey questionnaire, which is available in the Annex of this report, captured basic information on the respondents and the organizations they represent; general perceptions of the food system with a focus on the fish and vegetable value chains; and awareness and perceptions of related legislation and government-led activities. Emphasis was placed on challenges related to affordability and food safety in the fish and vegetable value chains and potential avenues to address these challenges.

A best-worst scaling approach to eliciting preferences was used at several points in the survey, allowing for priorities to be captured in both an ordinal and cardinal manner. For these questions, respondents were asked to consider a list of options and select their most

preferred options (or the items they consider to be most important), and also their least preferred options (or the items they consider to be least important). These responses are analyzed by assigning a value of +1 to options selected as most important/most preferred, -1 to options selected as least important/least preferred, and 0 to options that were not selected. In section 3 of this report, these values are sometimes summed over the sample to discern how the group collectively ranks the various options, and these values are sometimes averaged within a given subsample to compare the ordering and intensity of preferences across different respondent categories. Results for various subsamples are presented wherever views of a given topic seem to vary in an interesting way across categories.

The survey was mostly administered online, although a small number (34) of respondents completed a paper version of the survey, and a small number (27) completed the survey verbally over the phone. This was to accommodate respondents who were not literate or comfortable using digital technology. Surveys that were initiated but not completed are not considered in this report.

Three approaches were followed to identify respondents. First, all stakeholders who attended the launch of the “Research supporting African MSMEs to provide safe and nutritious food” (RSM2SNF) project, which took place on May 19, 2022 in Ibadan, Nigeria, were invited to participate in the survey. These included representatives of research/academia, industry, production, government, civil society, and development partners. While some respondents completed the survey during the launch event, most participated online over subsequent weeks. Attendees received two reminders by email or phone to complete the survey. Seventy two percent (72%) of the attendees participated in the survey.

Second, a database of agrifood stakeholders in Nigeria was compiled based on online research and the networks developed by RSM2SNF researchers in past projects on food systems transformation. Invitations to participate in the survey were extended to the stakeholders in this database. Third, invitations were extended widely among the professional and personal networks of those affiliated with the RSM2SNF project, especially the members of the project's National Advisory Committee. An effort was made to ensure geographic representation from both the north and south of Nigeria, as well as representation across different food products (e.g., fish, tomatoes, and GLVs) and a wide set of stakeholder groups (e.g., government representatives from both state and federal levels; representation of aquaculture as well as capture fisheries). It is important to acknowledge that the sample of agrifood stakeholders constructed through these methods of outreach is not necessarily representative of the universe of agrifood stakeholders in Nigeria.

The final sample included 200 respondents, with 45.5% from Southern Nigeria and 54.5% from Northern Nigeria (Table 1).² According to the National Bureau of Statistics, 54.0% of Nigeria's estimated population are in the north, while 46% are in the south (NPC and NBS 2016). Thus, the broad geographic distribution of our sample loosely matches the national population. About one third (34.5%) of respondents were representatives of research/academia, 23% were farmers, 22.5% were representatives of industry/the private sector, 11% were representatives of government, and 6% were representatives of civil society or development partners.³

Table 1. Stakeholder groups represented in the sample (number of respondents)

	North	South	Total
Civil society organization	3	1	4
Donor/Development partner	7	1	8
Farmer	27	19	46
Government (Federal level)	9	3	12
Government (State level)	2	9	11
Industry/Private sector	25	20	45
Other	3	2	5
Research/Academia	33	36	69
Total	109	91	200

Additional characteristics of the sample are presented in Table 2. Just over half (54.5%) of respondents were men, while 45.5% were women. A large majority of the sample were non-rural (81.5%), and a large majority had over 10 years of formal schooling (90.7%). As the current rate of secondary school net enrollment is just 66% (UIS 2022), our sample is heavily skewed towards higher levels of education. Though some agrifood stakeholder categories are likely to be more highly educated than the national average, it seems our sample may not be representative of the true distribution of education levels. Results of this survey should be interpreted with this in mind. About one quarter (26%) of the sample were up to 35 years old, while 57% were between 35 and 55 years of age, and the remaining 17% were over 55 years old. Over one third (36.5%) of respondents were somehow engaged in the fish value chain, 40% were engaged in the value chain for vegetables, and 25.5% were engaged in the value chain for fruit.

Following the data analysis, a draft report was prepared and circulated to respondents for their review and feedback. This was followed by a validation exercise held in September 2022 that brought together all respondents who were willing and able to participate. The validation meeting was a hybrid event with in-person attendees (purposely selected to include different stakeholder groups) in two locations (Ibadan and Zaria). All other respondents were invited to attend virtually, and a total of 75 people participated. The event was designed around three objectives: (1) to share the survey results with stakeholders who completed the survey, (2) to gather feedback on the research team's interpretation of findings, and (3) to hear others' views on how the survey findings to guide project activities. Details of the validation event are provided in Annex 2. Following this meeting, the report was reviewed and updated as appropriate.

² States in the north include Borno, Yobe, Bauchi, Gombe, Adamawa, Taraba, Sokoto, Kebbi, Zamfara, Kaduna, Katsina, Kano, Jigawa, Niger, Kwara, Kogi, FCT Abuja, Nasarawa, Benue, and Plateau. States in the south include Oyo, Ogun, Ekiti, Ondo, Osun, Lagos, Enugu, Anambra, Ebonyi, Imo, Abia, Edo, Delta, Bayelsa, Rivers, Akwa Ibom, and Cross River.

³ While consumers constitute an important stakeholder group, the RSM2SNF project focuses on supporting MSMEs to supply affordable, safe, and nutritious foods. Thus, the survey focused mostly on activities and stakeholders relevant to food supply and distribution.

Table 2. Characteristics of the sample (% of respondents)

Gender	Women	45.5	Stakeholder group	Farmer	23.0	
	Men	54.5		Industry/Private sector	22.5	
Age	Under 35 years	26.0		Government (Federal level)	6.0	
	35–55 years	57.0		Government (State level)	5.5	
	Over 55 years	17.0		Research/Academia	34.5	
Education	Under 10 years	9.3		Civil society organization	2.0	
	10–20 years	46.9		Donor/Development partner	4.0	
	Over 20 years	43.8		Other	2.5	
Rural status	Rural	18.5		Value chains	Fish	36.5
	Non-rural (Peri-urban or urban)	81.5			Vegetables	40.0
Location of residence	Northern Nigeria	54.5	Fruits		25.5	
	Southern Nigeria	45.5				

3. Results

3.1 Perceptions of the food system

3.1.1 Food market quality

The survey first captured the respondents' overall assessment of fish and vegetable markets in Nigeria. Specifically, respondents rated these markets on a scale from “very poor” to “very good” in terms of their affordability, availability, and food safety. Results for the full sample are presented in Figure 1. Overall, respondents judged the availability of vegetables to be greater than the availability of fish (with 35% and 10% considering availability of each to be “very good”). Vegetables were also considered to be more affordable, with 21% and 1% considering vegetables and fish, respectively, to be “very good” in terms of affordability, and 12% and 48% considering vegetables and fish, respectively, to be “poor” or “very poor” in terms of affordability.

Across regions of the country, the availability of fish was judged more favorably in the south (Figure 2, panel A). Specifically, 6% and 16% of respondents from the north and south, respectively, rated fish availability as “very good”. At the same time, it was more common for respondents from the north to regard the affordability of fish to be “very poor” or “poor”, at 53% for the north and 41% for the south. Conversely, it was more common for respondents from the south to regard the safety of fish to be “very poor” or “poor”, at 38% for the north and 45% for the south. Fewer geographic differences were evident for vegetables. While a greater share of respondents in the north thought that the availability of vegetables was “very good”, though a greater share in the south deemed it as either “very good” or “good”.

A comparison of perceptions by gender indicates that men were somewhat more likely than women to view food safety as a problem for both fish and vegetables (Figure 2, panel B). For example, 36% of women and 44% of men viewed the food safety of fish as “poor” or “very poor”. Men were also less likely than women to view the availability of fish and vegetables as “very good” or “good”. At the same time, women were somewhat more likely to rate the affordability of fish poorly.

Figure 1. Status of the availability, affordability, and safety of fish and vegetables

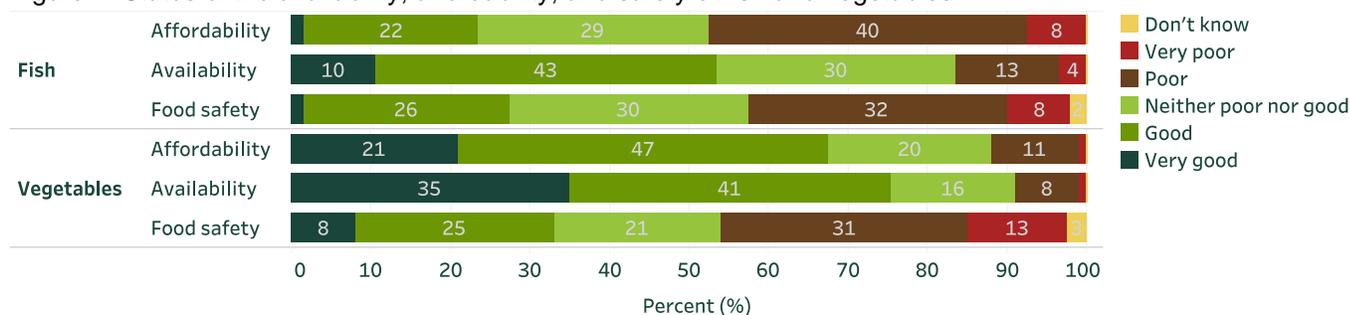
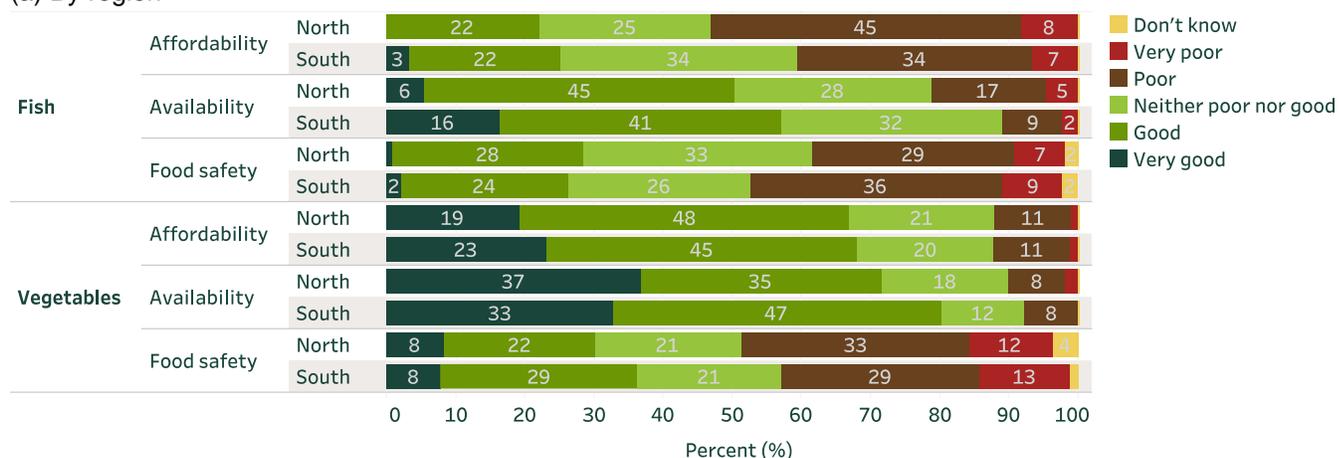
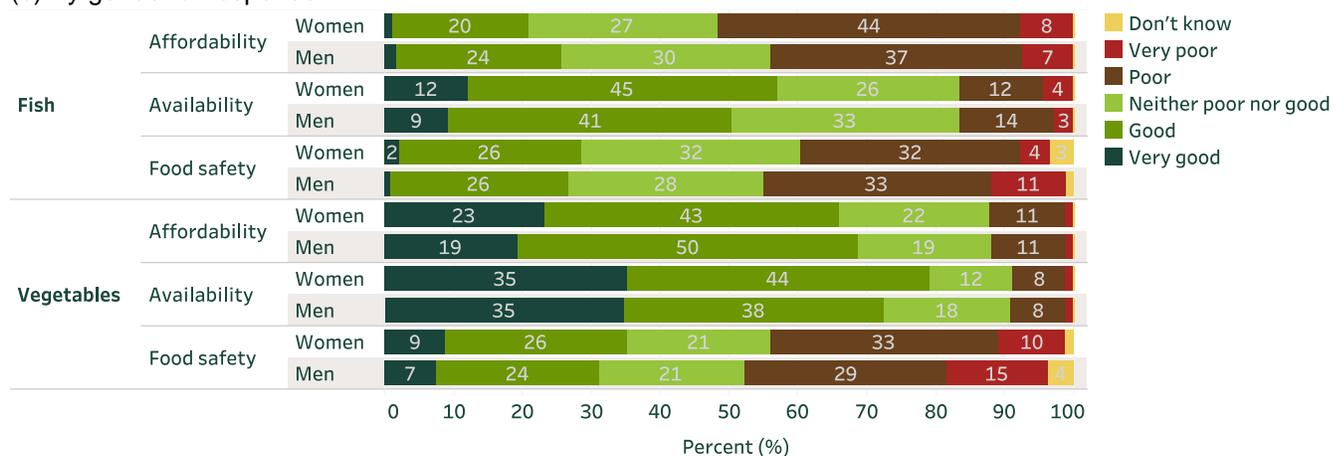


Figure 2. Status of fish and vegetables, disaggregated by subgroup

(a) By region



(b) By gender of respondent



According to Olaito (2014), over 90% of local staple foodstuffs in Nigeria are sold to consumers in traditional ("wet") markets, and prices are about 20-30% lower than in modern retail outlets (e.g., supermarkets). Given this context, the survey asked for expectations of the relative roles and future trajectories of traditional markets and modern retail outlets (e.g., supermarkets). Results for the full sample are presented in Figure 3. Respondents were less likely to agree (and more likely to completely disagree) that modern markets will replace traditional food markets as the main source of

affordable food in Nigeria, compared to their expectations regarding modern markets as a source of safe food. Specifically, 25% of respondents “completely disagreed” and therefore thought that traditional markets would remain the main source of affordable food, while just 12% “completely disagreed” and thought that traditional markets would be the main source of safe foods in the coming years.

A comparison of expectations by region indicates that respondents in the south see a larger role for modern markets (Figure 4, panel A). For example, 49% and 62% of respondents in the north and south, respectively, either “completely” or “somewhat” agreed that modern markets rather than traditional markets would be a major source of safe foods. A comparison across genders indicates that men tend to see a larger role for modern markets (Figure 4, panel B). For example, 22% of men and 11% of women “completely agreed” that modern markets will replace traditional food markets as the main source of affordable food.

Figure 3. Role of traditional versus modern markets in Nigeria

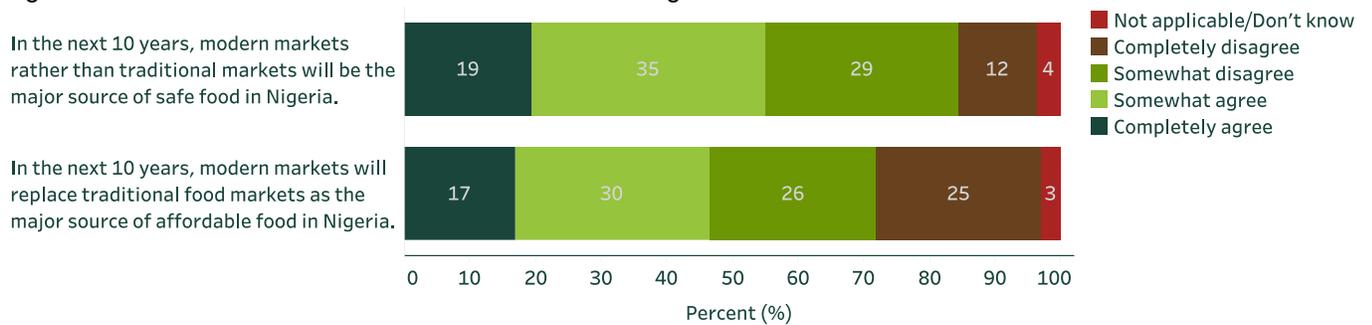
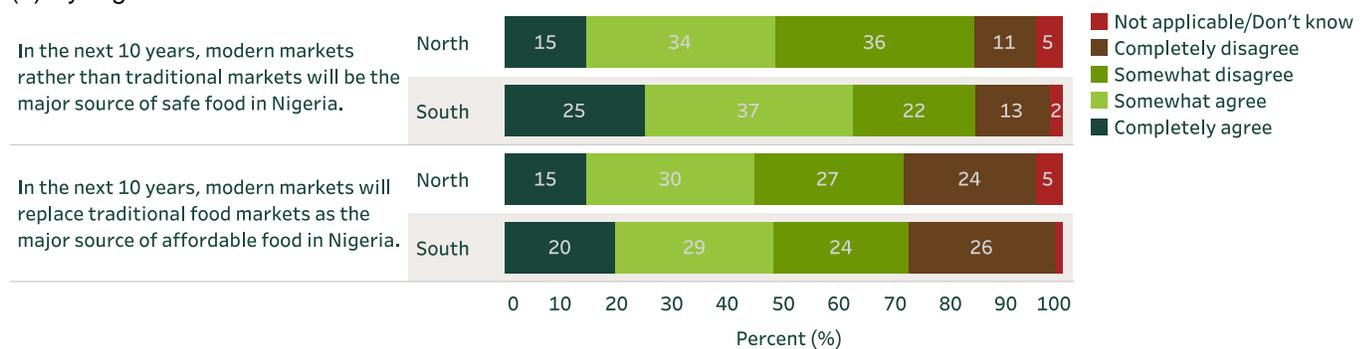
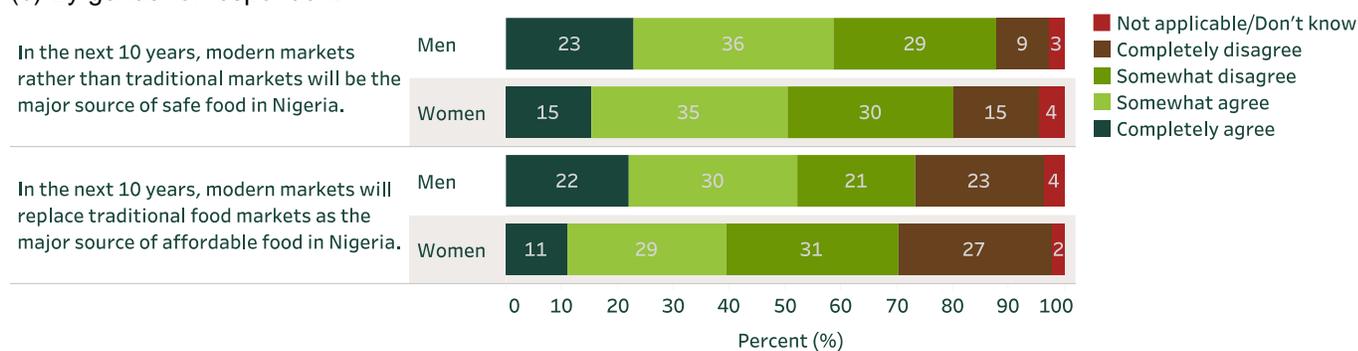


Figure 4. Role of traditional versus modern markets in Nigeria, disaggregated by subgroup

(a) By region



(b) By gender of respondent



3.1.2 Challenges for the affordability of fish and vegetables

In the spirit of the best-worst scaling approach to ranking preferences, respondents were asked to consider a list of nine challenges related to the affordability of fish or vegetables, in turn, and to select the three that were most and least serious/important. Responses of “most serious” were given a value of 1; responses of “least serious” were given a value of -1; and options that were not selected as either were given a value of 0. These values were then summed over the sample to arrive at an ordinal and cardinal ranking of these challenges.

The responses for fish are illustrated in Figure 5. By far, the greatest perceived challenge was the high cost of inputs and equipment such as fertilizer for fish farming or boats for fish capture. With far less intensity/unanimity, the second greatest challenge noted was the availability or high cost of infrastructure, such as high-quality storage facilities, while the third greatest challenge was the unavailability or high cost of electricity. At the other end of the spectrum, the respondents considered the least serious challenges to include a lack of competition in the fish market, the burden of formal taxes and other fees, and corruption along the value chain.

To compare the perceptions of different subsamples, the values were averaged within each group, resulting in a range from -1 (if all respondents in the group had selected a given option as least serious) to +1 (if all respondents had selected the option as most serious). These average values are presented for each stakeholder group in Figure 6. While there is general alignment across stakeholder groups, it is noteworthy that representatives of government at the federal level were least likely to view the high cost of inputs as a challenge to the affordability of fish. Representatives from civil society/development partners and industry were most likely to consider security challenges to be a problem. In Figure 6, responses are also compared among respondents from the north and south of the country. Those in the south tended to view the high cost of inputs, the unavailability or high cost of electricity, and the poor quality of infrastructure to be of greater importance (relative to other challenges) than those in the north. At the same time, respondents in the north were much more likely to view security challenges related to the production/capture and/or transport of fish to be a problem.

The survey asked a parallel set of questions for vegetables, and the responses of the full sample are presented in Figure 7. Again, the high cost of inputs for vegetable production were regarded as the greatest challenge, by far, for the affordability of vegetables. Security challenges were somewhat more pressing for vegetables than for fish, perhaps because of the geography of vegetable production (such as tomatoes, onions and peppers) which is more concentrated in the north. As with fish, challenges related to a lack of competition, formal taxes, and corruption were not viewed as key drivers of the affordability of vegetables.

Across stakeholder groups, farmers were most likely to view the high cost of inputs as a challenge for the affordability of vegetables, but least likely to view low productivity as a challenge (Figure 8). Representatives of government at the federal level were most likely to view the availability or high cost of electricity as a meaningful challenge, though this sentiment was not shared by representatives of industry/private sector. Across regions of the country, security challenges again stand out for being more prominent in the north than in the south.

Figure 5. Challenges for the affordability of fish

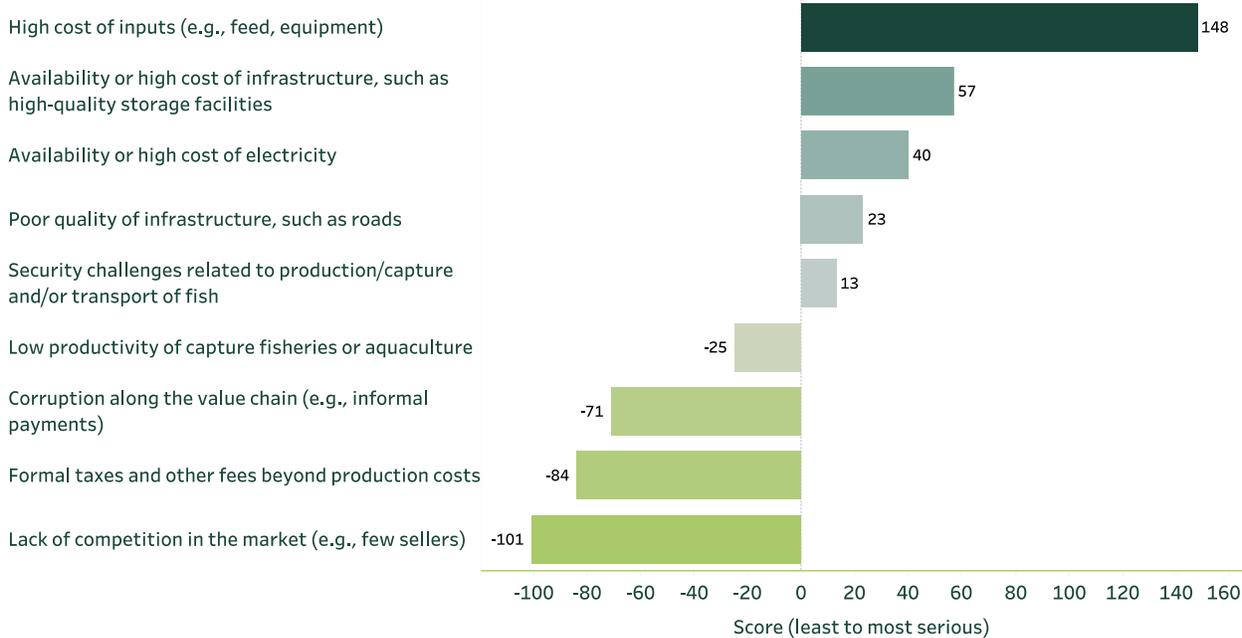


Figure 6. Challenges for the affordability of fish, disaggregated by subgroup

	Stakeholder group						Geography	
	Civil society/ Donor	Farmer	Government (Federal level)	Government (State level)	Industry/ Private sector	Research/ Academia	North	South
High cost of inputs (e.g., feed, equipment)	0.92	0.83	0.33	0.91	0.67	0.78	0.68	0.81
Availability or high cost of infrastructure, such as high-quality storage facilities	0.67	0.33	0.50	0.09	0.24	0.20	0.28	0.29
Availability or high cost of electricity	0.00	0.37	0.25	0.18	0.16	0.16	0.13	0.29
Poor quality of infrastructure, such as roads	-0.08	0.02	0.17	-0.18	0.18	0.23	0.07	0.16
Security challenges related to production/capture and/or transport of fish	0.33	-0.15	-0.08	-0.09	0.24	0.10	0.19	-0.09
Low productivity of capture fisheries or aquaculture	-0.17	-0.09	-0.42	0.09	-0.24	-0.06	-0.13	-0.12
Corruption along the value chain (e.g., informal payments)	-0.50	-0.28	0.00	-0.18	-0.49	-0.39	-0.37	-0.34
Formal taxes and other fees beyond production costs	-0.25	-0.61	-0.25	-0.27	-0.31	-0.46	-0.39	-0.45
Lack of competition in the market (e.g., few sellers)	-0.92	-0.41	-0.50	-0.55	-0.44	-0.57	-0.47	-0.55

Note: Each category is inclusive of respondents with a focus on all products, not only fish.

Figure 7. Challenges for the affordability of vegetables

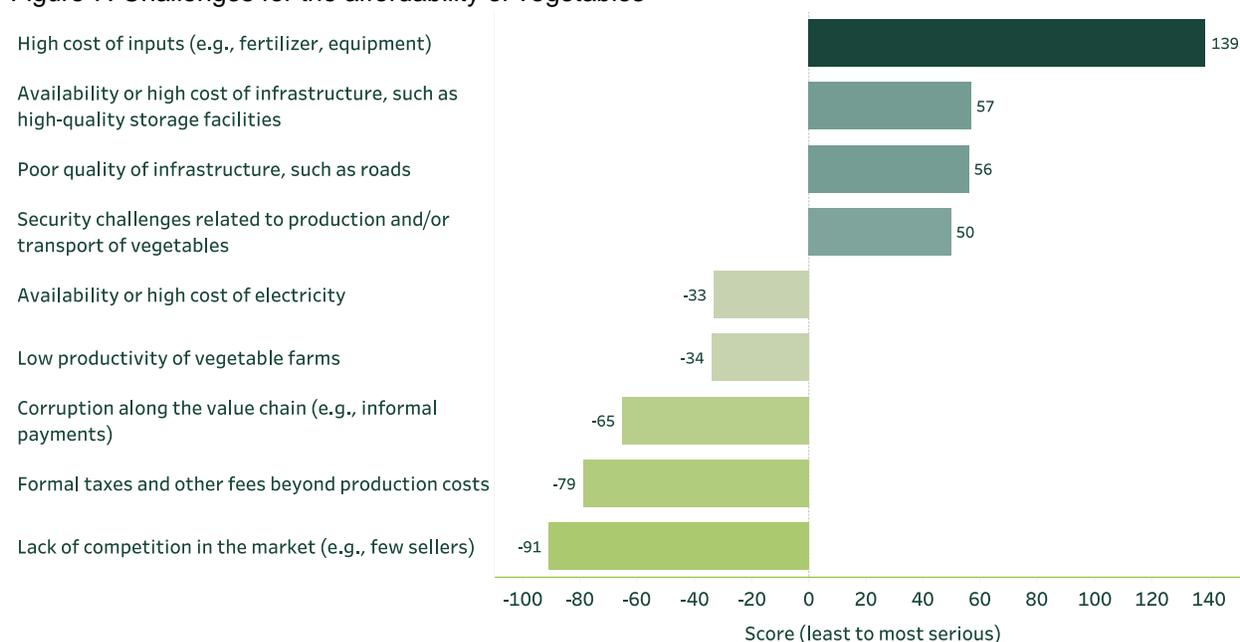


Figure 8. Challenges for the affordability of vegetables, disaggregated by subgroup

	Stakeholder group						Geography	
	Civil society/ Donor	Farmer	Government (Federal level)	Government (State level)	Industry/ Private sector	Research/ Academia	North	South
High cost of inputs (e.g., fertilizer, equipment)	0.67	0.76	0.67	0.73	0.64	0.70	0.70	0.69
Availability or high cost of infrastructure, such as high-quality storage facilities	0.17	0.33	0.33	0.55	0.29	0.22	0.27	0.31
Security challenges related to production and/or transport of vegetables	0.42	0.24	0.25	-0.27	0.42	0.16	0.37	0.11
Poor quality of infrastructure, such as roads	0.25	0.24	-0.33	0.09	0.36	0.39	0.24	0.33
Low productivity of vegetable farms	0.08	-0.35	-0.08	0.18	-0.22	-0.09	-0.25	-0.08
Availability or high cost of electricity	-0.33	-0.26	0.50	0.00	-0.44	0.00	-0.20	-0.12
Corruption along the value chain (e.g., informal payments)	-0.17	-0.28	-0.50	-0.09	-0.38	-0.36	-0.32	-0.33
Formal taxes and other fees beyond production costs	-0.50	-0.37	-0.42	-0.45	-0.31	-0.45	-0.38	-0.42
Lack of competition in the market (e.g., few sellers)	-0.58	-0.30	-0.42	-0.73	-0.36	-0.57	-0.42	-0.49

Note: Each category is inclusive of respondents with a focus on all products, not only vegetables.

3.1.3 Challenges for the safety of fish and vegetables

Respondents were next asked to consider a list of six challenges related to the food safety of fish and select the two most and two least serious challenges. Results are presented in Figure 9. The greatest challenge was regarded to be the lack of knowledge regarding food safety on the part of agrifood system actors. This was followed by the manner in which farmed fish are treated with antibiotics and/or consume things containing toxins. There was somewhat less agreement among the survey respondents on the least serious challenges, with the least important challenge being dishonesty (neglect, negligence, or deceit) on the part of fish traders, processors, and vendors. It therefore seems that agrifood stakeholders view the problem of food safety in fish as one of ignorance but not malice.

When these responses are compared across stakeholder groups in Figure 10, an interesting divergence emerges between representatives of government at the federal and state levels. Specifically, those at the state level were most likely to fault weaknesses in the legislation and the existence of guidelines for street vending. Meanwhile, representatives of the federal government were more likely than other stakeholders to consider a lack of infrastructure (e.g., clean water points) to maintain food safety and

adhere to food hygiene regulations to be a challenge. Responses were mostly aligned across regions of the country.

A parallel set of questions were asked about vegetables, with results from the full sample shown in Figure 11. The most serious challenge to the safety of vegetables was considered to be the lack of knowledge regarding food safety, and this was followed by the lack of infrastructure to maintain food safety and food hygiene. As with fish, dishonesty on the part of food system actors was not regarded as a pressing challenge, nor was the use of unclean water for irrigation.

When these responses for food safety in vegetables are compared across stakeholder groups in Figure 12, there is again a divergence between representatives of federal and state government. Specifically, those from the federal government were most likely to view the use of unclean water for irrigation as a challenge and least likely to view weak food safety legislation as a problem. Across regions of the country, respondents from the south were more likely than those from the north to view weak food safety legislation as a problem for food safety in vegetables.

Figure 9. Challenges for the safety of fish

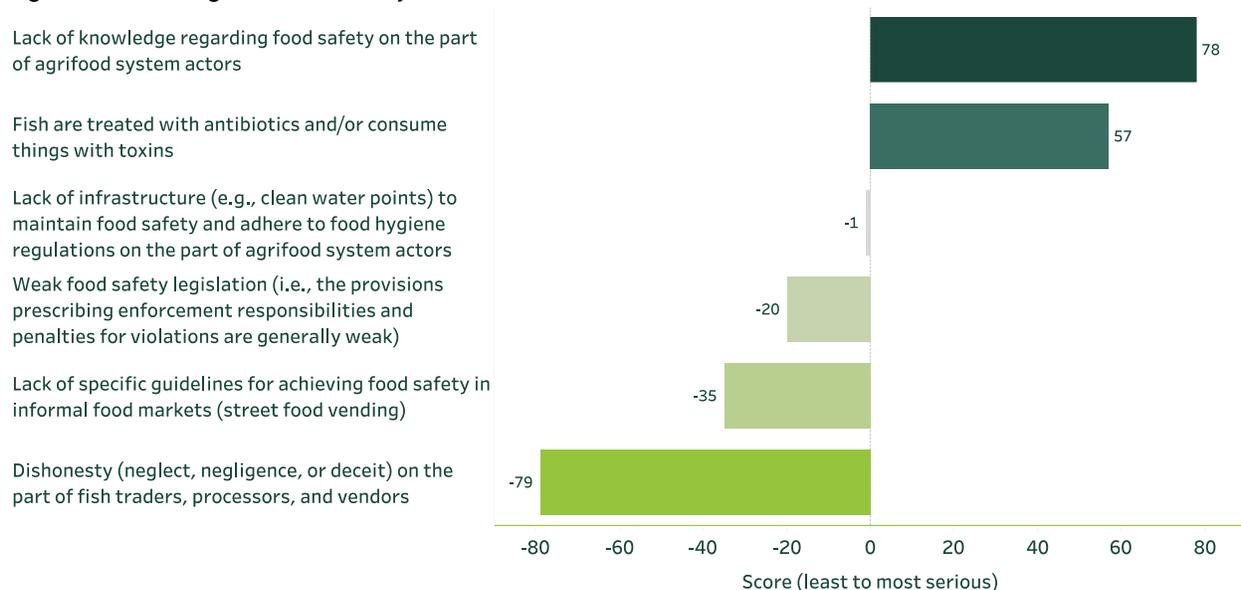


Figure 10. Challenges for the safety of fish, disaggregated by subgroup

	Stakeholder group						Geography	
	Civil society/ Donor	Farmer	Government (Federal level)	Government (State level)	Industry/ Private sector	Research/ Academia	North	South
Fish are treated with antibiotics and/or consume things with toxins	0.42	0.37	-0.08	0.00	0.47	0.20	0.33	0.23
Lack of knowledge regarding food safety on the part of agrifood system actors	0.33	0.40	0.82	-0.20	0.55	0.35	0.48	0.32
Lack of infrastructure (e.g., clean water points) to maintain food safety and adhere to food hygiene regulations on the part of agrifood system actors	-0.25	0.00	0.18	-0.30	-0.05	0.09	-0.06	0.06
Weak food safety legislation (i.e., the provisions prescribing enforcement responsibilities and penalties for violations are generally weak)	0.08	-0.16	-0.18	0.40	-0.25	-0.08	-0.19	0.00
Lack of specific guidelines for achieving food safety in informal food markets (street food vending)	0.00	-0.16	-0.45	0.30	-0.30	-0.17	-0.13	-0.24
Dishonesty (neglect, negligence, or deceit) on the part of fish traders, processors, and vendors	-0.58	-0.47	-0.36	-0.20	-0.41	-0.41	-0.42	-0.40

Figure 11. Challenges for the safety of vegetables

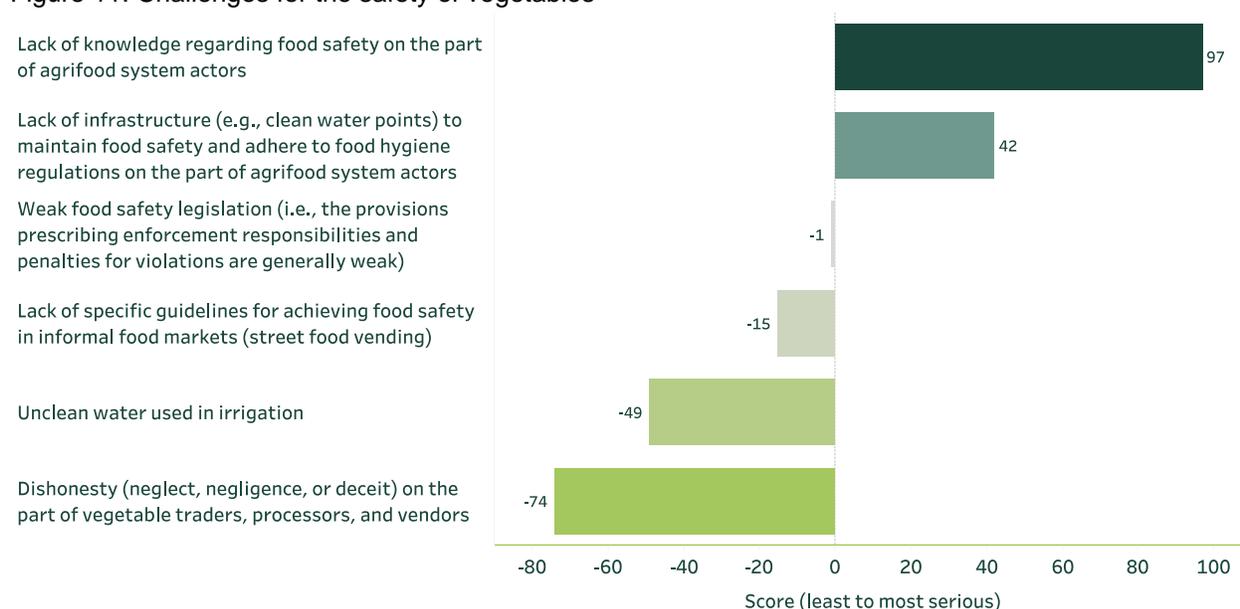


Figure 12. Challenges for the safety of vegetables, disaggregated by subgroup

	Stakeholder group						Geography	
	Civil society/ Donor	Farmer	Government (Federal level)	Government (State level)	Industry/ Private sector	Research/ Academia	North	South
Lack of knowledge regarding food safety on the part of agrifood system actors	0.33	0.50	0.58	0.18	0.49	0.54	0.49	0.48
Lack of infrastructure (e.g., clean water points) to maintain food safety and adhere to food hygiene regulations on the part of agrifood system actors	0.33	0.17	0.00	0.18	0.27	0.19	0.17	0.25
Weak food safety legislation (i.e., the provisions prescribing enforcement responsibilities and penalties for violations are generally weak)	0.17	-0.02	-0.50	0.00	-0.09	0.13	-0.08	0.09
Unclean water used in irrigation	-0.17	-0.35	0.25	0.09	-0.27	-0.28	-0.18	-0.32
Lack of specific guidelines for achieving food safety in informal food markets (street food vending)	-0.08	0.09	-0.17	-0.09	0.02	-0.23	-0.07	-0.08
Dishonesty (neglect, negligence, or deceit) on the part of vegetable traders, processors, and vendors	-0.58	-0.39	-0.17	-0.36	-0.42	-0.35	-0.32	-0.43

3.1.4 Efforts to improve the affordability and/or safety of fish and vegetables

After asking about challenges for the affordability and safety of fish and vegetables, the survey gathered preferences for potential solutions to these challenges. Specifically, the survey asked, “If the government could increase its spending on programs to improve the affordability and/or safety of fish (or vegetables) in Nigerian markets, which of the following areas do you think should be the highest and lowest priority for additional investment?” From a list of nine options, respondents selected the three most important (highest priority) and three least important (lowest priority) efforts.

Results for fish are shown in Figure 13. Although low productivity was not highlighted as a challenge for the affordability of fish in Figure 5, efforts to increase the productivity of fishers or fish farmers through research and/or training were regarded as the greatest priority here. Perhaps this implies that it is the area that government is regarded as most capable of influencing, even if it is not the greatest challenge in the fish value chain. The second most-prioritized program was one that would provide subsidies or cash transfers to fishers/fish farmers and MSMEs post-production with the aim of improving productivity, reducing post-harvest losses, and adopting safety practices. The two least-prioritized programs included efforts to address corruption and reduce bureaucracy, consistent with the views evident in Figure 5 and Figure 7.

The order of these priorities for fish is mostly consistent across stakeholder groups (Figure 14), although it is noteworthy that farmers were most likely to prioritize the provision of subsidies or cash transfers. Representatives of government were more likely than other stakeholders to de-emphasize the importance of infrastructure improvements to reduce transportation costs. The order of these priorities is also mostly aligned across regions of

the country. Curiously, respondents from the north did not prioritize government efforts to address security concerns in production and transport; this may be because the government is not regarded as effective on this front, even if the concern is pressing.

Results for vegetables are shown in Figure 15. Again, efforts to increase the productivity of vegetable farmers through research and/or training were regarded as the greatest priority, followed by the provision of subsidies or cash transfers for vegetable farmers and MSMEs post-production. As with fish, the two least-prioritized programs included efforts to address corruption and reduce bureaucracy. The ordering of priorities generally indicates that agrifood stakeholders value food affordability more than safety.

Across stakeholder groups, some interesting divergences emerge (Figure 16). For example, while infrastructure-based efforts to reduce food loss/waste (e.g., cold storage) was the third most prioritized intervention in the full sample, representatives of industry/private sector were less likely than other groups to prioritize such a program, even as cold storage might be of particular use to wholesalers. At the same time, representatives of industry/private sector were more likely than most other groups to prioritize infrastructure improvements to reduce transportation costs. Across regions of the country, respondents from the north were much more likely to prioritize (or less likely to de-prioritize) efforts to address security concerns in production and transport, again highlighting the relative insecurity in the north, even if this was not their greatest priority.

Figure 13. Programs to improve the affordability and/or safety of fish

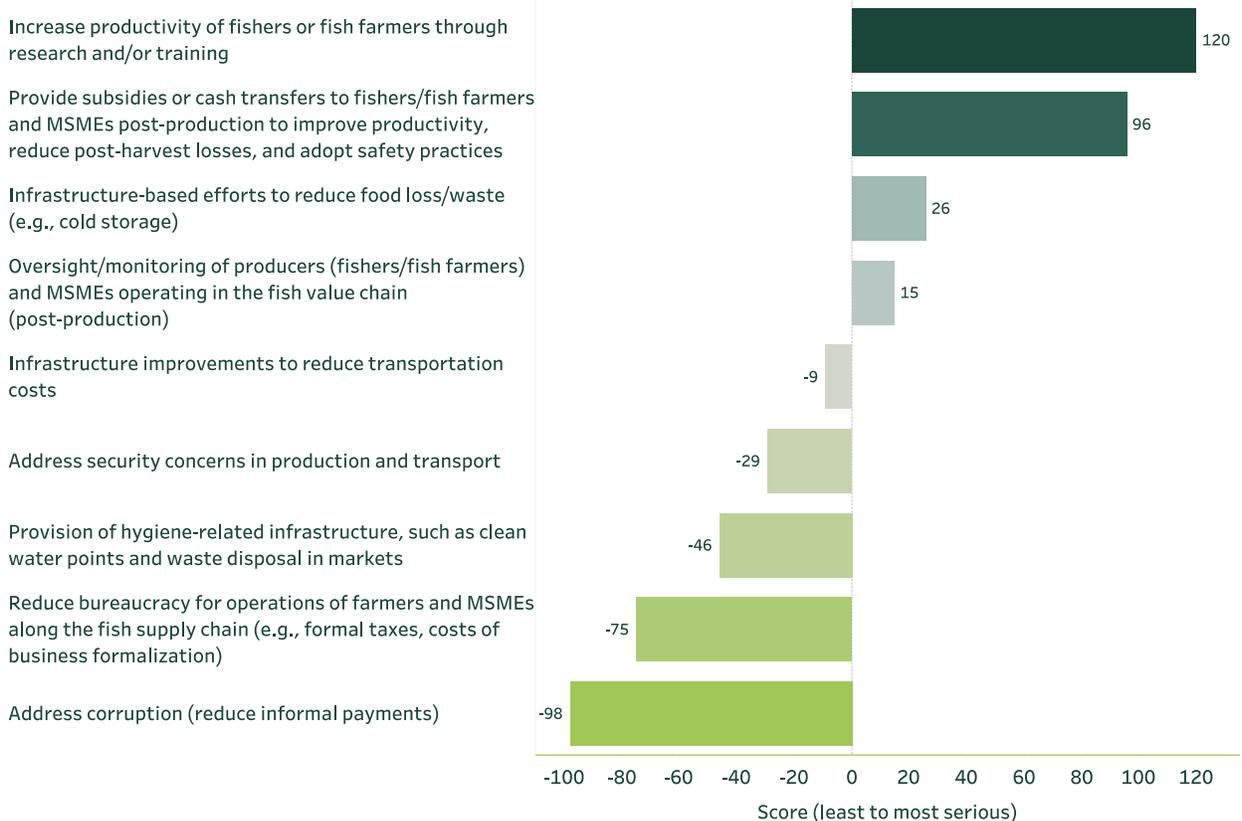


Figure 14. Programs to improve the affordability and/or safety of fish, disaggregated by subgroup

	Stakeholder group						Geography	
	Civil society/ Donor	Farmer	Government (Federal level)	Government (State level)	Industry/ Private sector	Research/ Academia	North	South
Increase productivity of fishers or fish farmers through research and/or training	0.42	0.57	0.75	0.64	0.67	0.55	0.58	0.63
Provide subsidies or cash transfers to fishers/fish farmers and MSMEs post-production to improve productivity, reduce post-harvest losses, and adopt safety practices	0.25	0.76	0.50	0.36	0.49	0.38	0.50	0.45
Infrastructure-based efforts to reduce food loss/waste (e.g., cold storage)	0.08	0.20	0.08	-0.09	-0.04	0.25	0.10	0.16
Oversight/monitoring of producers (fishers/fish farmers) and MSMEs operating in the fish value chain (post-production)	0.08	0.22	0.08	-0.09	-0.11	0.12	0.03	0.13
Infrastructure improvements to reduce transportation costs	0.25	-0.13	-0.42	-0.36	0.07	-0.03	-0.03	-0.07
Address security concerns in production and transport	0.08	-0.35	-0.08	0.09	-0.11	-0.12	-0.12	-0.18
Provision of hygiene-related infrastructure, such as clean water points and waste disposal in markets	-0.08	-0.22	-0.33	-0.09	-0.33	-0.19	-0.24	-0.22
Reduce bureaucracy for operations of farmers and MSMEs along the fish supply chain (e.g., formal taxes, costs of business formalization)	-0.42	-0.52	-0.08	-0.27	-0.18	-0.45	-0.34	-0.42
Address corruption (reduce informal payments)	-0.67	-0.52	-0.50	-0.18	-0.44	-0.51	-0.49	-0.49

Figure 15. Programs to improve the affordability and/or safety of vegetables

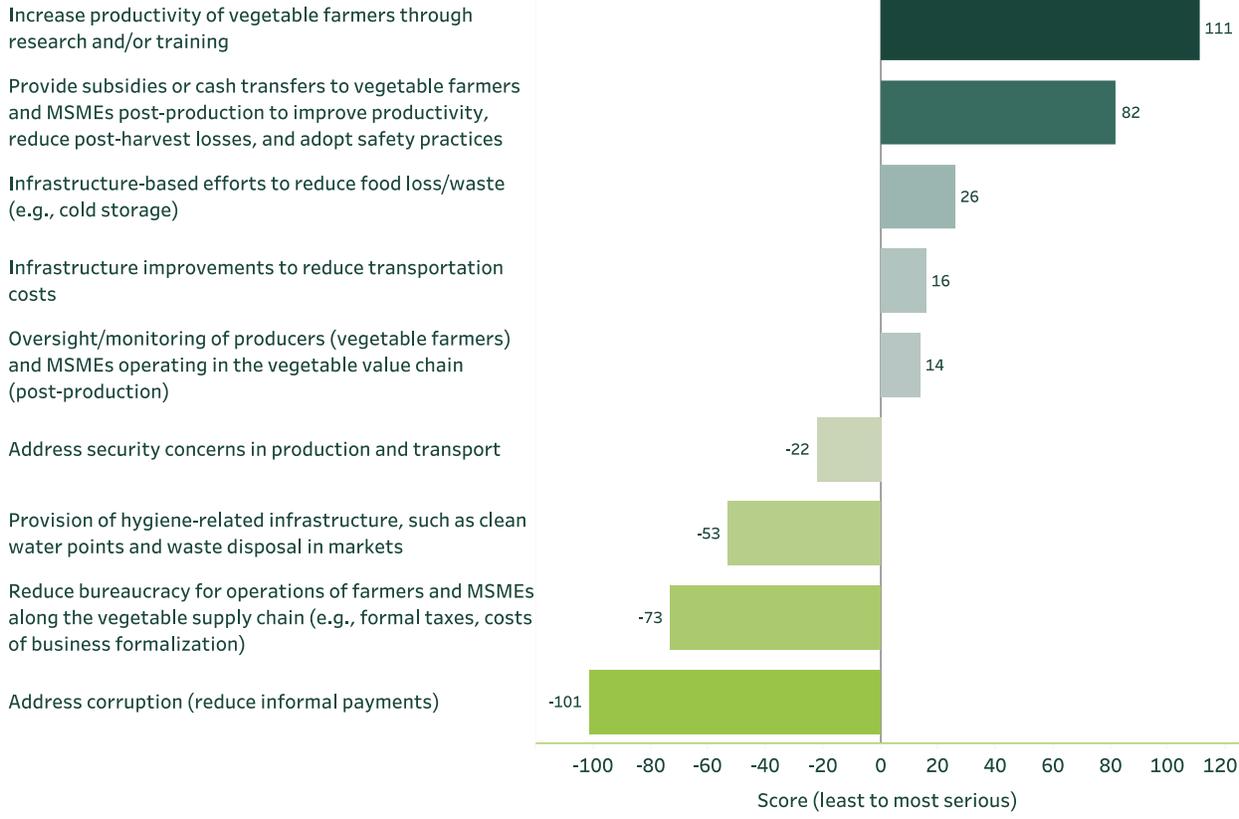


Figure 16. Programs to improve the affordability and/or safety of vegetables, disaggregated by subgroup

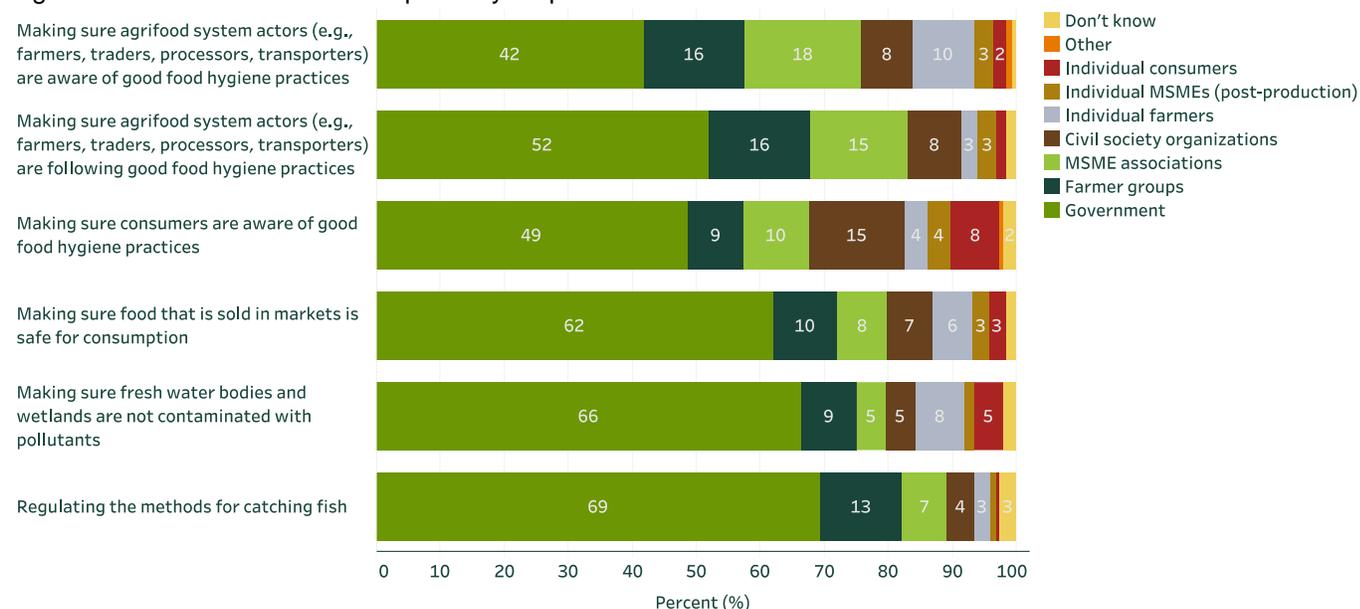
	Stakeholder group						Geography	
	Civil society/ Donor	Farmer	Government (Federal level)	Government (State level)	Industry/ Private sector	Research/ Academia	North	South
Increase productivity of vegetable farmers through research and/or training	0.25	0.70	0.83	0.64	0.64	0.39	0.54	0.57
Provide subsidies or cash transfers to vegetable farmers and MSMEs post-production to improve productivity, reduce post-harvest losses, and adopt safety practices	0.33	0.67	0.17	0.64	0.33	0.29	0.44	0.37
Infrastructure-based efforts to reduce food loss/waste (e.g., cold storage)	0.17	0.15	0.00	0.27	-0.09	0.28	0.10	0.16
Oversight/monitoring of producers (vegetable farmers) and MSMEs operating in the vegetable value chain (post-production)	0.00	0.20	0.08	-0.18	0.07	0.07	-0.04	0.20
Infrastructure improvements to reduce transportation costs	0.25	0.00	-0.25	-0.27	0.27	0.09	0.09	0.07
Address security concerns in production and transport	0.17	-0.37	0.33	-0.18	-0.04	-0.12	0.05	-0.30
Provision of hygiene-related infrastructure, such as clean water points and waste disposal in markets	-0.08	-0.52	-0.42	-0.36	-0.18	-0.12	-0.28	-0.25
Reduce bureaucracy for operations of farmers and MSMEs along the vegetable supply chain (e.g., formal taxes, costs of business formalization)	-0.33	-0.33	-0.42	-0.18	-0.42	-0.41	-0.41	-0.31
Address corruption (reduce informal payments)	-0.75	-0.50	-0.33	-0.36	-0.58	-0.48	-0.50	-0.52

3.1.5 Responsibilities in management of the food system

For a set of governance functions in the agrifood system, the survey gathered views on what entity (or who) should be primarily responsible. The options included government, various groups (farmer groups, MSME associations, and civil society organizations), and various individuals (farmers, post-production MSMEs, and consumers), as well as the option to select “other” or “don't know”. Results for the full sample are presented in Figure 17. Across all functions or tasks associated with environmental protection and ensuring the safety of food available in markets, government is viewed as most responsible among these options. For example, 69% of respondents viewed the government as responsible for regulating methods of catching fish, a governance function with impacts on fish populations and the sustainability of fisheries. About two-thirds of respondents viewed government as responsible for making sure freshwater bodies and wetlands are not contaminated with pollutants and for making sure food in the market is safe for consumption. However, government was deemed to be somewhat less responsible for raising awareness among consumers and other agrifood system actors (e.g., farmers, traders, processors, and transporters) around the topic of good food hygiene practices. Rather, civil society organizations and MSME associations were seen as having more of a role to play in consumer awareness and agrifood system actor awareness, respectively. Eight percent of respondents thought that individual MSMEs bear most of the

responsibility for making sure they are aware of good food hygiene practices. We did not note many interesting patterns in a disaggregated analysis.

Figure 17. Entities that should be primarily responsible for different functions



3.1.6 Roles of women and men in the food system

To understand the roles of women and men in the value chains for fish and vegetables, respondents were asked to consider various functions along each value chain and specify whether they thought women or men were more engaged or whether they were equally engaged. Results are presented in Figure 18. Across the full sample, men were viewed as being more engaged in the provision of inputs for production (for both fish and vegetables) and more engaged in the production of fish. Specifically, 82% of respondents perceived that men were more engaged than women in capture fisheries, and 64% felt that men were more engaged in aquaculture. At the same time, women were viewed as being more engaged than men in the processing, trading, and retailing of both fish and vegetables. Specifically, 80% of respondents indicated that women were more engaged in the retailing of both fish and vegetables. It is noteworthy that these roles are highly gendered, with just 13–31% of respondents perceiving that men and women are equally engaged at each node.

These responses are disaggregated by gender of the respondent in Figure 19. While the views of male and female respondents were generally aligned, female respondents were somewhat more likely to view women as more engaged in the retailing of fish and vegetables and the production of vegetables. For example, 87% of female respondents and 75% of male respondents viewed women as more engaged than men in the retailing of fish. When these responses are disaggregated by region of the country in Figure 20, it is somewhat more common in the south for women to be viewed as more engaged than men in the processing and trading of fish, and in the trading and retailing of vegetables. For example, 48% of respondents in the north and 67% in the south indicated that women were more engaged in trading of fish, and 56% and 71% of respondents in the north and

south, respectively, indicated that women were more engaged in trading of vegetables. The dominant religions also vary over space, and this likely explains some of the regional variation in gender roles.

Figure 18. Roles of men and women in the fish and vegetable value chains

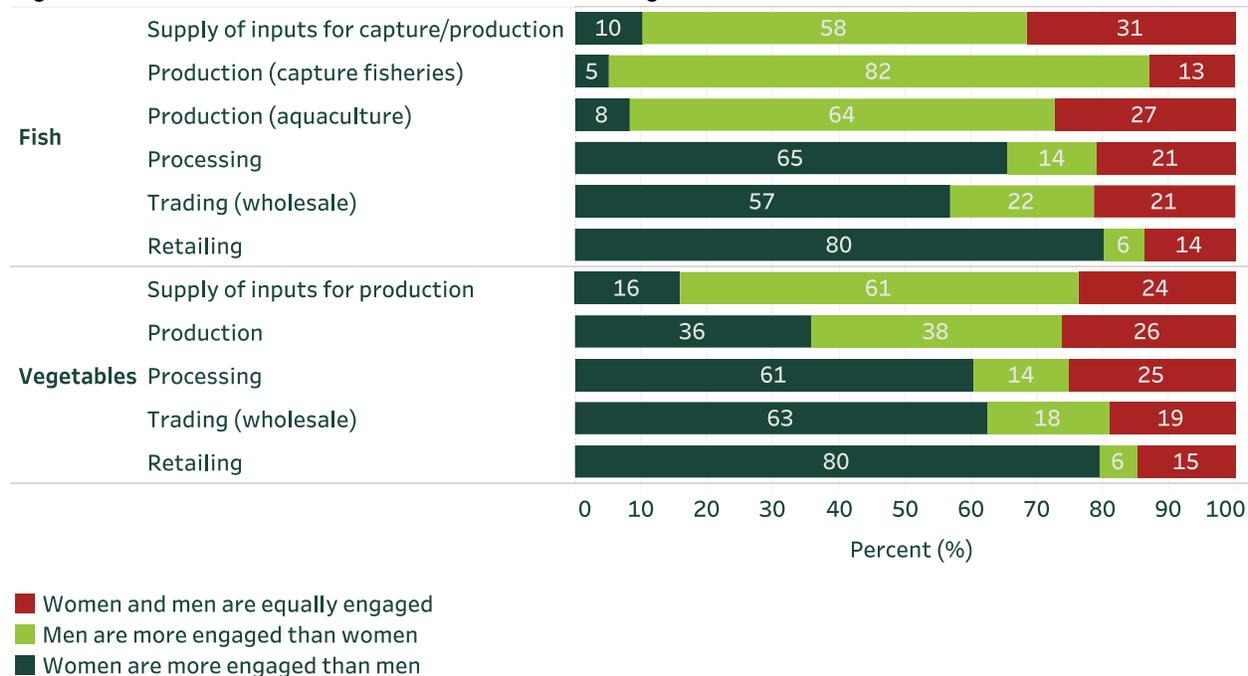


Figure 19. Roles of men and women in the fish and vegetable value chains, disaggregated by gender of respondent

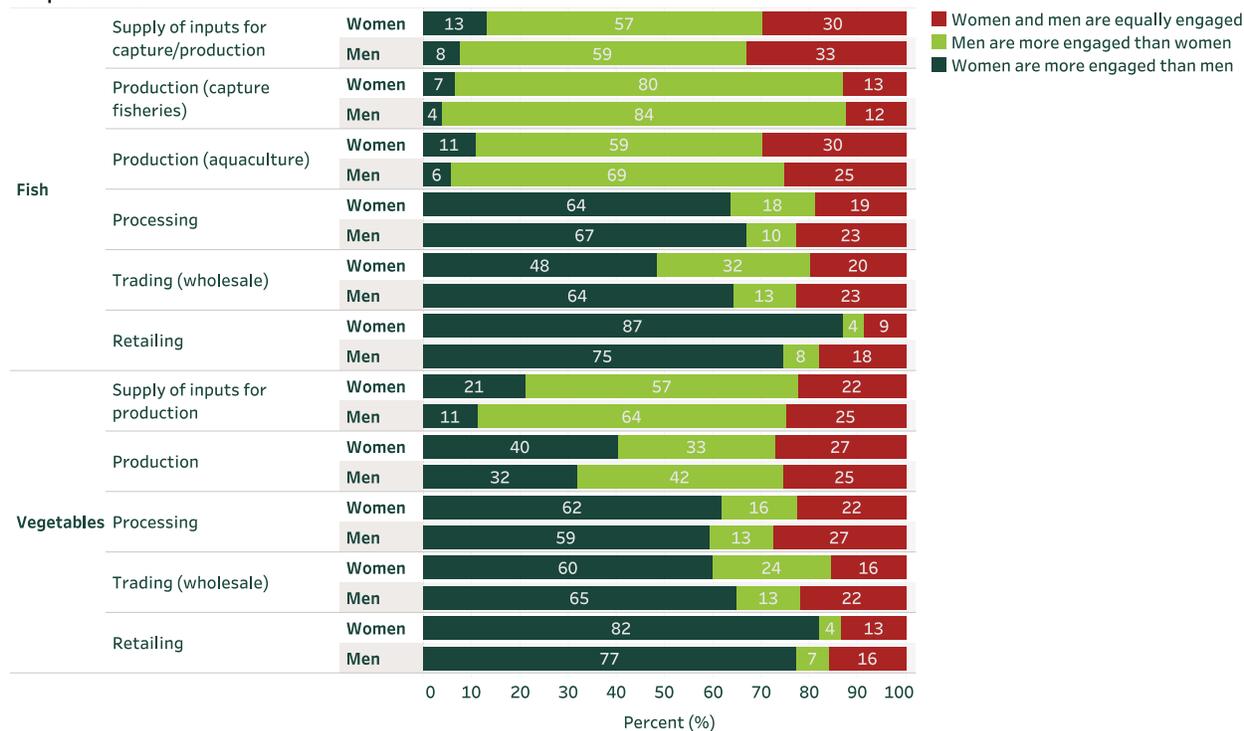
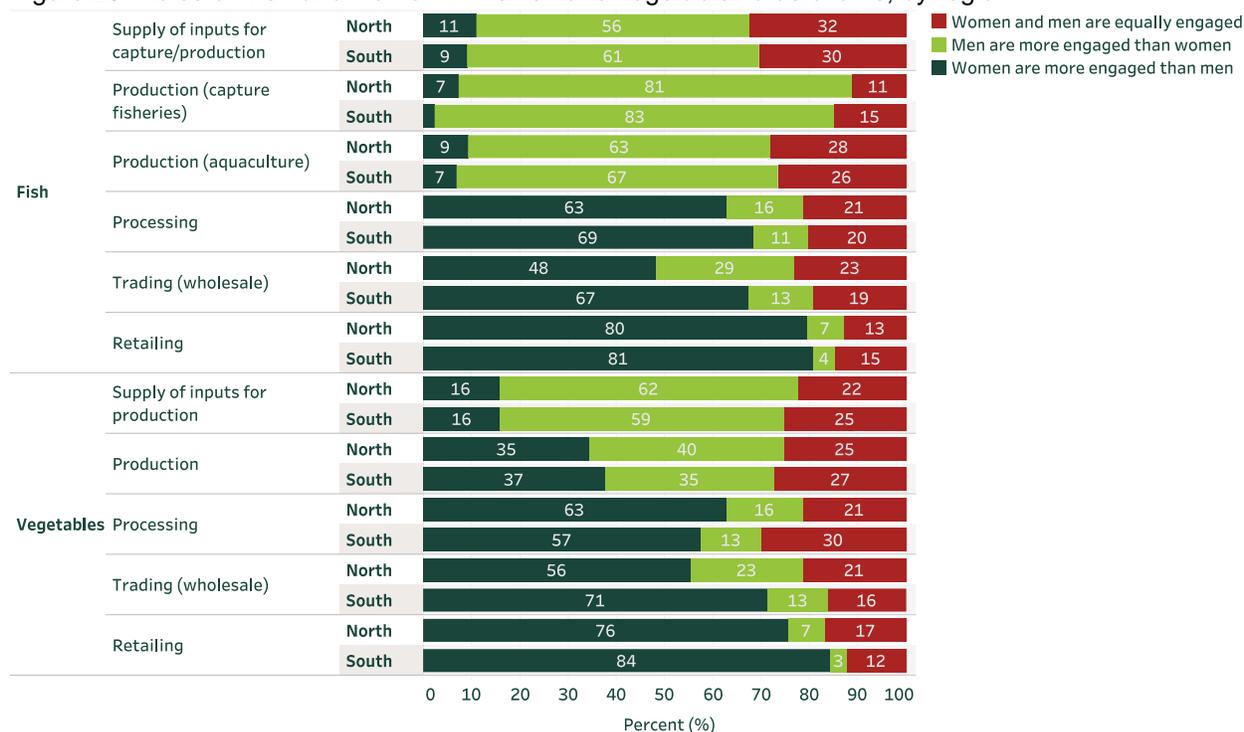


Figure 20. Roles of men and women in the fish and vegetable value chains, by region



3.2 Perceptions of legislation and government-led activities

In addition to capturing perceptions of how the agrifood system in Nigeria functions, the survey also aimed to capture the level of stakeholder familiarity with, and satisfaction with, key pieces of relevant legislation. These policies and bills are listed in Figure 21. Just 10–24% of respondents characterized themselves as “very familiar” with any policy/bill. The Micro, Small, and Medium Enterprise Policy (2021–2025) claimed the greatest level of familiarity, with 65% of respondents either “very familiar” or “somewhat familiar” with the legislation. This was followed by the Agriculture Promotion Policy (2015–2020), with 57% of respondents at least somewhat familiar. Respondents tended to be least familiar with the Food Safety and Quality Bill, which has not been passed into law, and the National Policy on the Environment. These findings seem to indicate that policy makers could improve in raising awareness of all legislation of relevance to the fish and vegetable value chains, with some policies in greater need of sensitization than others.

Respondents who claimed at least some familiarity with each policy or bill were then asked to evaluate the extent to which the policy/bill provides support for agrifood MSMEs (Figure 22). Across these policies/bills, 41–57% of respondents felt that support for MSMEs was adequate. At the same time, 23–35% of respondents did not know enough to answer the question, which is again indicative of a need for greater sensitization. Among the respondents that were familiar with the Micro, Small, and Medium Enterprise Promotion Policy, 55% felt that it did provide adequate support for MSMEs that operate in the fish and vegetable value chains, while 18% felt the opposite. While the share of respondents that thought this policy did not adequately support MSMEs was lower than for other

policies in this list, it is noteworthy that 18% of respondents who answered this question, and 25% of respondents who answered either “yes” or “no”, deemed this policy to be inadequate in its support for MSMEs—the focus of the policy.

Figure 21. Familiarity with agrifood policies

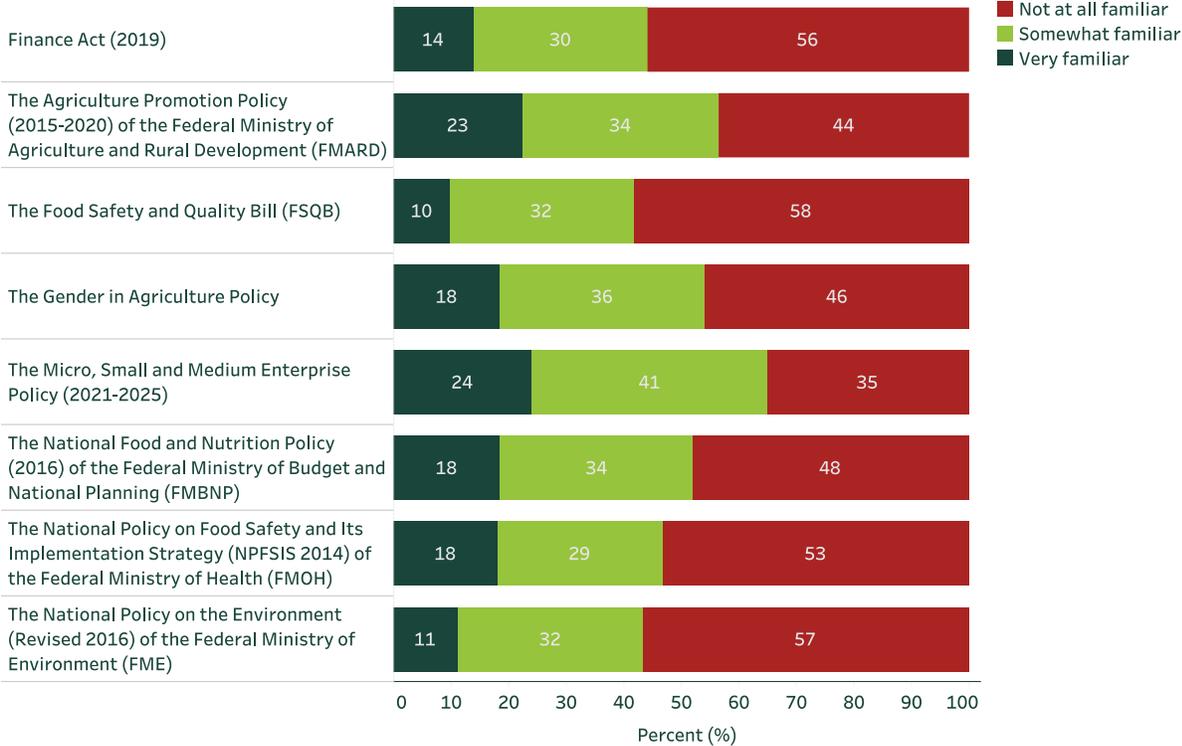
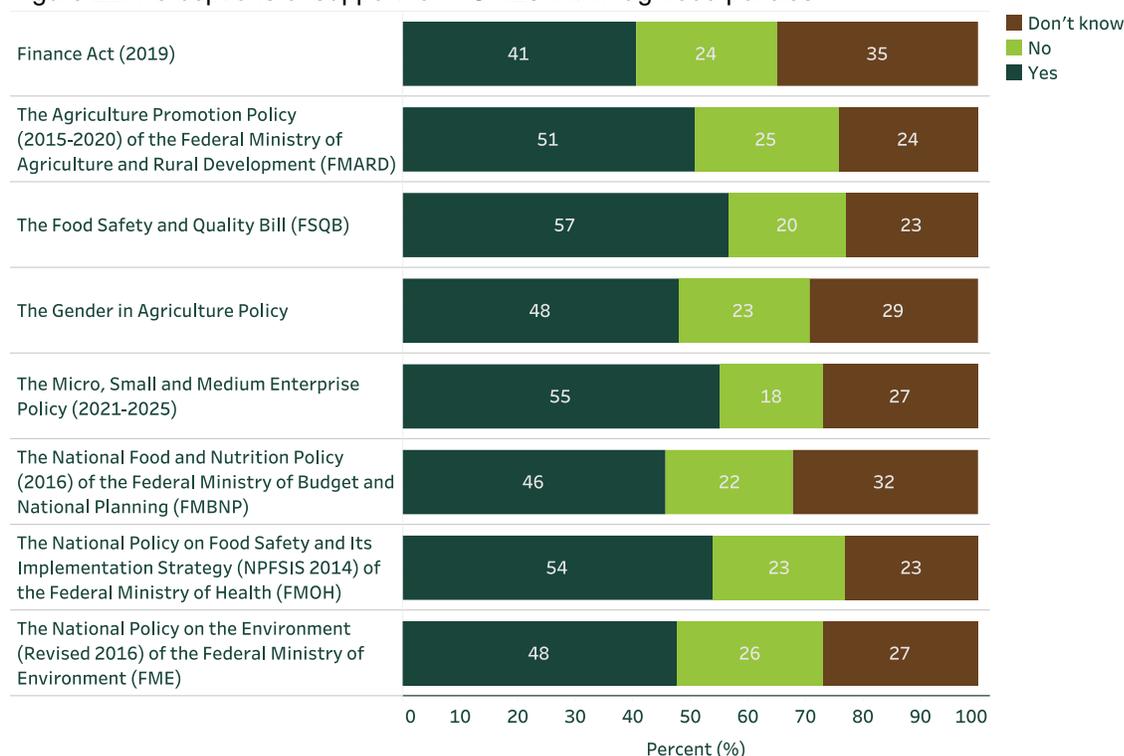


Figure 22. Perceptions of support for MSMEs within agrifood policies



Note: These values are defined only for respondents that were at least “somewhat” familiar with each policy/bill.

3.3 Engagement with other stakeholders

Another objective of this survey was to understand how stakeholder groups relate to and interact with one another and how respondents view their own role in the agrifood system. This has implications for how well the agrifood system can address the challenges discussed in section 3.1 and how motivated survey respondents may be in contributing to the goals of the RSM2SNF project. Toward this end, respondents were asked to evaluate their level of agreement with various statements related to engagement among stakeholder groups.

Results related to engagement with government are presented in Figure 23. Among non-government respondents, 52% either “completely agreed” or “somewhat agreed” with the statement “There is continuous dialogue related to policy on food availability, affordability, safety, and nutrition issues between government sector representatives and my stakeholder group.” However, just 40% either “completely agreed” or “somewhat agreed” with the statement “My stakeholder group’s perspectives in these policy dialogues are listened to and considered closely by government.” When results are disaggregated by stakeholder group, representatives of industry/private sector were least likely to agree that their voices were heard by government (Figure 24, pane A). In a similar vein, farmers were most likely to “completely disagree” that their voices were heard by government. This finding has important implications for how well policy makers are likely to understand the private sector (inclusive of both production and post-production enterprises) and craft legislation to meet their needs, and it may tie into the

earlier finding (section 3.2) that a considerable share of respondents did not perceive agrifood legislation to adequately support MSMEs. When results are disaggregated by region of the country, respondents in the south were more likely than those in the north to “completely agree” or “somewhat agree” that their perspectives are heard by government. Stakeholders in the north seem to feel more marginalized in the policy process.

Respondents were also asked about their group's and their own individual engagement with other stakeholder groups (Figure 25). About one quarter (26%) of respondents “completely agreed” with the statement “My stakeholder group communicates and interacts frequently with other stakeholder groups in an effort to improve the availability, affordability, and safety of nutritious foods.” Representatives from civil society/donors were most likely to “completely agree” with this statement, while farmers and representatives of industry/private sector were most likely to “completely disagree” (Figure 26).

Respondents generally viewed their own individual engagement in more favorable terms, with 68% completely or somewhat agreeing with the statement “I, personally, communicate and interact frequently with people in other stakeholder groups in an effort to improve the availability, affordability, and safety of nutritious foods” (Figure 25). However, this varied across male and female respondents, with 42% of men and 24% of women “completely agreeing” that they interacted frequently with others to improve the food system (Figure 27).

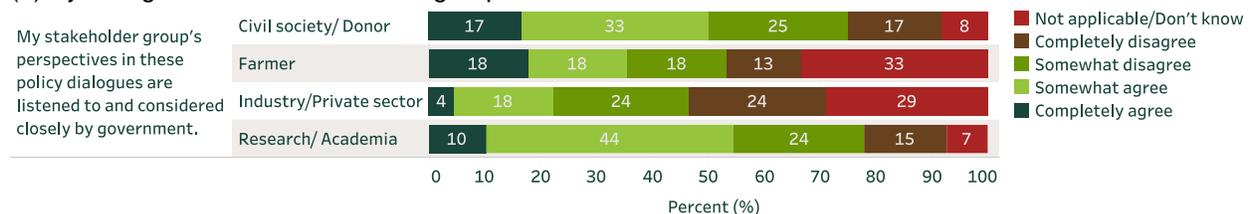
Figure 23. Engagement with government (or other levels of government)



- Not applicable/Don't know
- Completely disagree
- Somewhat disagree
- Somewhat agree
- Completely agree

Figure 24. Engagement with government, disaggregated by subgroup

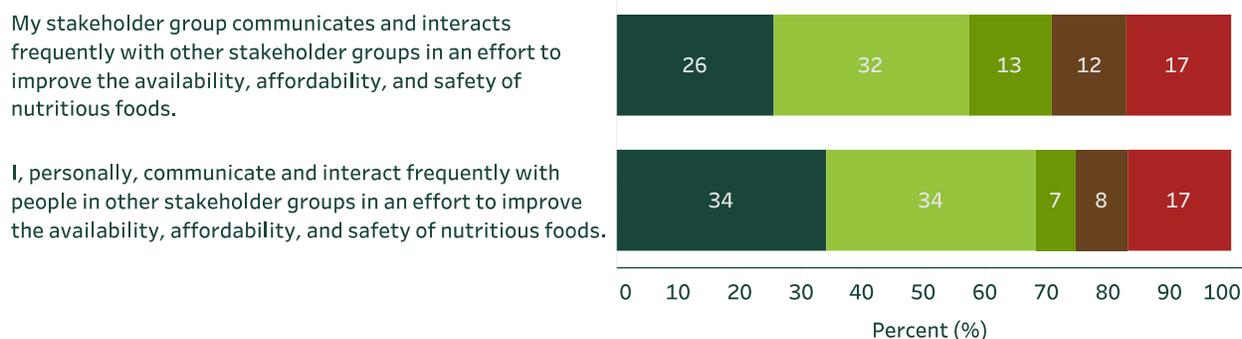
(a) By non-government stakeholder group



(b) By region



Figure 25. Engagement with other stakeholder groups



- Not applicable/Don't know
- Completely disagree
- Somewhat disagree
- Somewhat agree
- Completely agree

Figure 26. Group engagement with other stakeholder groups, by stakeholder group

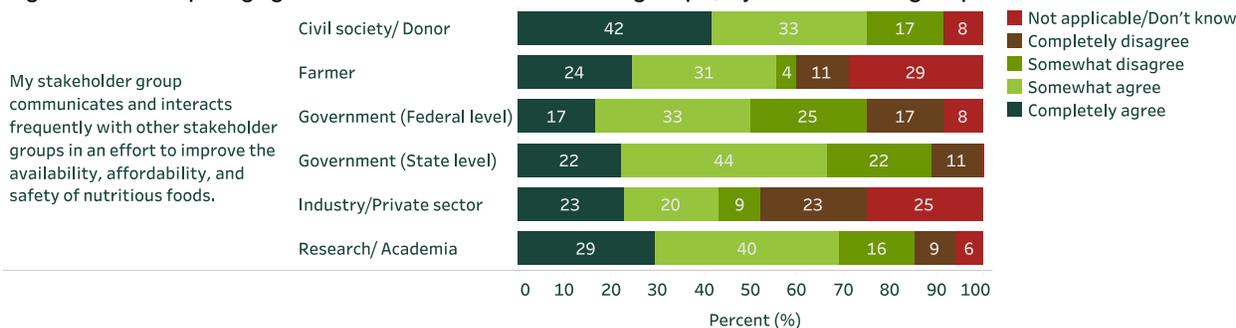


Figure 27. Personal engagement with other stakeholder groups, by gender of respondent



4. Discussion

4.1 Overarching themes

This stakeholder perceptions survey aimed to discern how agrifood stakeholders in Nigeria perceive the state of their food system, with a focus on the value chains for fish and vegetables. The questionnaire elicited priorities related to challenges and possible solutions to these challenges, and it sought perspectives on gender roles and inter-stakeholder relations to paint a complete picture of the food system from the viewpoint of its stakeholders. Several overarching themes can be drawn from the results.

First, the ranking of challenges and potential solutions for affordability and safety was often quite similar for fish and vegetables. Across the full sample of respondents, for both fish and vegetables, the high cost of inputs for production was regarded as the greatest challenge for affordability, and a lack of food safety knowledge was seen as the greatest challenge for safety. In terms of efforts to improve affordability and/or food safety, the greatest priorities for both fish and vegetables were interventions to raise the productivity of producers through research and/or training and the provision of subsidies or cash transfers for producers and post-production MSMEs. While this alignment across the two perishable products may point to some synergies in programs or investments, an intervention such as research/training obviously cannot be shared across products (unlike improved infrastructure, which could plausibly benefit both value chains).

Second, across the topics of food affordability and safety, there seems to be a clear preference for efforts to bring down prices rather than improve safety. When presented with a list of programs that could address either issues of food safety/food hygiene or affordability, respondents prioritized those aimed at affordability rather than those aimed at monitoring of food system actors and the provision of hygiene-related infrastructure. This is indicative of the stress felt by low-income consumers who are worried that they cannot even access nutritious foods, with food safety seemingly deemed a lower-order concern. The relative de-emphasis of food safety and hygiene indicates that greater sensitization is warranted around these topics, which are pressing concerns in Nigeria (Ajayeoba et al. 2016; Ladan et al. 2021). This has implications for the potential role of the RSM2SNF project. However, people are unlikely to be receptive to this message if efforts to address food hygiene/food safety would seem to raise the price of food.

Third, in relation to drivers of food affordability, there seems to be a dominant focus on the costs of inputs and a lesser focus on reducing post-production food losses. The imperative to raise productivity and provide financial support was emphasized among potential programs to improve food affordability/safety, while efforts to reduce post-harvest losses were relatively de-emphasized. Participants at the validation event (see Annex 2) suggested several explanations for this focus on the costs of production. They noted that global inflation and the declining value of the naira have raised the cost of running generators to power feed mills, as well as the cost of equipment imports. Furthermore, subsidies for agricultural inputs have historically been more prevalent and more helpful but have since been rolled back. Insecurity in the north has led to higher costs to transport the grain used in fish feed and other goods, as transporters must now bribe security personnel on the highway. Finally, it was suggested that people notice the pecuniary expenditures made in the course of producing fish and vegetables more than they take note of other (less obvious) costs, such as food losses.

The focus on the costs and outcomes of production may indicate that these are the most important drivers of affordability. Alternatively, it may reflect some path dependency in thinking about the food system, as government programming has historically given more attention to producers than to other nodes of the value chain. The priorities of stakeholders came through clearly in this survey; additional research is perhaps still needed to understand whether this is an accurate view of the drivers of food affordability.

Fourth, efforts to address bureaucracy and corruption were not prioritized by agrifood stakeholders. The least important challenges for affordability were a lack of market competition, the burden of formal taxes, and corruption, while the least important challenge for safety was dishonesty on the part of agrifood system actors. For both products, the two least-prioritized programs included efforts to address corruption and reduce bureaucracy. It seems clear that, relative to other themes, these challenges are relatively less salient for agrifood stakeholders.

Fifth, agrifood stakeholders outside of government generally did not feel that their concerns were heard by government. In fact, while they tended to perceive that a dialogue was indeed occurring, they viewed themselves as marginalized in this conversation. This likely has bearing both for the suitability and effectiveness of policies and for the level of buy-in on the part of stakeholders.

4.2 Differences by product

Respondents were asked to consider the differences between the value chains for fish and vegetables. While there was general alignment in perceptions of these two value chains, some slight differences could be observed. Vegetables in Nigeria were viewed as more widely available and more affordable than fish. In terms of drivers of affordability, security challenges were somewhat more pressing for vegetables—perhaps because vegetable production is more concentrated in the north. In terms of food safety, the second most cited challenge for the safety of fish is one that does not apply to vegetables, namely that fish are treated with antibiotics and/or consume things with toxins. Nevertheless, there was more convergence than divergence across these two nutritious but highly perishable products.

4.3 Differences by stakeholder group

The sample included producers as well as representatives of the post-production private sector, government, research/academia, and civil society/development partners. This breadth allows for a comparison of perceptions and priorities across stakeholder groups, with several noteworthy findings. Among the challenges for the affordability of vegetables, farmers were most likely to emphasize the high cost of inputs. In terms of potential government efforts to address the affordability/safety of fish and vegetables, farmers were most likely to prioritize the provision of subsidies or cash transfers. In some ways, it is not surprising that a stakeholder group would evaluate its own challenges to be of highest importance.

Some interesting differences arise around the topic of food safety legislation. Among challenges for the safety of fish, government representatives at the state level were most likely to fault weaknesses in the legislation and the existence of guidelines for street vending, though this sentiment was not matched by representatives at the federal level. And when it comes to the safety of vegetables, representatives of the federal government were least likely to view weak food safety legislation as a problem. As noted by participants in the validation event (see Annex 2), this gap between the federal government and others in terms of the role of legislation may point to a disconnect between those who make policy and those who otherwise interact with policy. It was

also noted that most of the relevant policies, as well as the activities related to implementation, are found at the state level; as such, state-level government representatives may be likely to have a more accurate perspective of the food system.

Interesting differences also arise around the topic of infrastructure and electricity. When it comes to challenges for the affordability of vegetables, representatives of industry/private sector were less likely than most others to prioritize the availability or high cost of electricity. When it comes to programs to improve the affordability/safety of fish and vegetables, infrastructure-based efforts to reduce food loss/waste (e.g., cold storage) were the third most prioritized intervention in the full sample; yet representatives of industry/private sector were less likely than all or most other groups to prioritize such a program, even as cold storage might be of particular use to wholesalers and retailers. For vegetables, representatives of industry/private sector were more likely than most other groups to prioritize infrastructure improvements to reduce transportation costs, while representatives of government were more likely to de-emphasize the importance of such improvements. This disagreement in perspectives highlights a need to gather accurate and complete information on the drivers of food costs to best determine where government resources should be allocated.

When reflecting on the extent to which the government takes various stakeholder perspectives into consideration, representatives of industry/private sector were least likely to feel that their voices were heard, and farmers were most likely to “completely disagree” that their voices were heard. Many respondents were not at all familiar with various pieces of legislation. Recall that, among those who were familiar with the legislation, a non-negligible share of respondents did not perceive each policy/bill to adequately support MSMEs. This seems to indicate that policy makers may not understand the private sector (inclusive of both production and post-production enterprises) and therefore may not be designing legislation to best support Nigeria’s agrifood system.

4.4 Differences by geography

The survey surfaced key differences in the agrifood system in the north and south of Nigeria. Modern markets were viewed as having a larger role to play in the south, particularly as a source of safe foods. Fish were generally regarded as more available and affordable in the south than in the north; the reverse was not true for vegetables, which are more commonly produced in the north. Women in the north seem to play a more limited role in the value chains for fish and vegetables than women in the south, specifically in terms of the processing and trading of fish and the trading and retailing of vegetables.

Not surprisingly, security is a more salient concern for respondents from the north. For example, they were much more likely than respondents from the south to view security challenges related to the production/capture and/or transport of fish and vegetables to be a problem. With regard to programs to improve vegetable value chains (more so than fish), respondents from the north were much more likely to prioritize (or less likely to de-prioritize) efforts to address security concerns in production and transport. Nevertheless, even in the north, security was not a top priority as a focus of government interventions.

Participants in the validation event (see Annex 2) conveyed that there is a lack of trust in government to handle the issue of security. In addition, vegetables mainly come from the middle belt and northwest (e.g., Kaduna and Kano States), though insecurity is concentrated elsewhere in the north. Finally, it was suggested that there are more obvious connections between input subsidies and the cost of food, whereas the causal link between security and food prices is less direct.

Respondents from the north expressed a greater sense of marginalization from agrifood policy dialogues, relative to those in the south. Altogether, this indicates a need to better integrate voices from the north into the policy making process.

4.5 Differences by gender

The survey also surfaced some intriguing differences in how women and men view and experience the agrifood system. For example, male respondents seemed to have a more positive view of the availability and affordability of fish and vegetables, and they tended to see a larger role for modern markets as a source of both affordable and safe foods. They also had a more active view of themselves as interacting frequently with people in other stakeholder groups to improve the food system.

There seem to be distinctly different roles of women and men in the value chains for fish and vegetables. Men were viewed as more engaged in the provision of inputs for production (for both fish and vegetables) and in the production of fish, while women were viewed as more engaged in the processing, trading, and retailing of both fish and vegetables. This is consistent with prior studies (Agbeja 2004). Female respondents were somewhat more likely to view women as more engaged than men in some nodes of the value chain, such as the retailing of fish and vegetables and the production of vegetables. Overall, these highly gendered patterns indicate that any intervention to improve these value chains—from the provision of inputs for production all the way to consumption—would necessarily have gendered impacts (Ayoola et al. 2021).

5. Conclusion

Results of the RSM2SNF stakeholder perceptions survey, conducted in mid-2022, paint a detailed picture of the fish and vegetable value chains in Nigeria. These insights will inform the design of the RSM2SNF project, which aims to build knowledge and capacity around how MSMEs in the Nigerian food system can be supported to provide affordable, safe, and nutritious foods. Several examples of practical implications (among others) are enumerated below.

1. The survey revealed a clear preference for government efforts to bring down food prices (e.g., via subsidies to lower production costs or efforts to improve productivity) rather than improve food safety (e.g., via improved monitoring of food system actors and provision of hygiene-related infrastructure). As noted by participants at the validation event (see Annex 2), the poor must prioritize their basic needs before other concerns. Efforts to address food hygiene/food safety should ideally not raise the price of food. The RSM2SNF project should look for win-

win (or neutral-win) opportunities when thinking about how food safety can be improved.

2. Nevertheless, food safety and hygiene are pressing concerns in Nigeria. This indicates that greater sensitization may be needed around the importance of food safety and hygiene; RSM2SNF will work to provide this sensitization and convey the implications of poor food safety for health and productivity.
3. There is a dominant perception that the high cost of inputs and equipment is a major challenge for food affordability in Nigeria, while less concern is directed toward post-production food losses. This was a surprising finding. Additional research is needed to understand whether this perception is an accurate view of the cost build-up along value chains. RSM2SNF will pursue this research in order to identify the most important drivers of affordability for fish and vegetables.
4. Women and men play distinct roles in the value chains for fish and vegetables. These highly gendered patterns indicate that any intervention to improve these value chains would necessarily have gendered impacts. Gender-specific issues will be given attention in all RSM2SNF project activities, and the project is committed to learning about the gender dimensions of potential interventions.

Perceptions of government representatives at the federal level often differ from those of other stakeholder groups. For example, representatives of the federal government were least likely to view the high cost of inputs as a challenge for the affordability of fish, though this was viewed as a major challenge by all other stakeholder groups. Representatives of the federal government considered a lack of food safety guidelines to be the least serious concern for food safety in fish, while representatives of state governments were most likely to emphasize weaknesses in legislation and guidelines for street vending as a key challenge. These findings indicate that value may come from additional interaction among federal and state government representatives to improve the links between policy formulation and implementation. RSM2SNF plans to facilitate such interaction in stakeholder meetings. Relatedly, it was suggested at the validation event (see Annex 2) that much of the policy and activity that are directly relevant to value chain operations are found at the state level. Thus, it is particularly important for the RSM2SNF project to engage with state-level governments.

5. The survey results point to limited familiarity with agriculture and food system policies in Nigeria. Less than 25% of respondents were “very familiar” with any policy. This suggests that efforts to increase citizen awareness of government policies (and the potential opportunities and/or implications of these policies) may be welcome. RSM2SNF will prepare communication pieces aimed at raising awareness of food safety issues and associated regulations, as well as issues related to the MSME Policy.
6. The affordability of fish was viewed as lower in the poorer north, where 55% of respondents considered fish affordability to be “poor” or “very poor”, than the relatively more affluent south, where this value was 40%. This highlights a need for region-specific efforts to increase access to nutritious foods. RSM2SNF will carry out

separate but related studies in the north and south to understand the different factors that account for diverging assessments of affordability.

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Annex

ANNEX 1: STAKEHOLDER PERCEPTIONS SURVEY

Survey structure

- A. Information about yourself and the organization you represent
- B. General perceptions of the food system
- C. Perceptions of legislation and government-led activities (short section)
- D. Knowledge of food safety and agrifood MSMEs (short section)

Definitions of key terms

- The **availability** of food for consumers in Nigerian markets is a function of food production, imports, and the amount of food that is lost/wasted in the harvest and marketing process.
 - For example, higher yields for farmers and lower food loss will both increase availability.
- The **affordability** of food for consumers in Nigerian markets is a function of both supply and demand.
 - On the supply side, affordability relates to availability, transaction costs/marketing costs, and the degree of competitiveness in the market.
 - For example, high transportation cost and low availability usually make food prices higher and thus less affordable.
- **Food safety** in Nigerian markets is a function of contamination, spoilage, and hygiene when harvesting, transporting, storing, and handling food.
- **Micro, small, and medium-sized enterprises (MSMEs)** in a food value chain (post-production) include transporters, processors, wholesalers, and retailers. These are often identified as MSMEs based on the number of people self-employed or employed, ranging from 1 to about 99 workers.

A. Information about yourself and the organization/business you represent

A1. Name: _____

A2. Stakeholder group: (Select one)

- | | |
|---|---|
| <input type="checkbox"/> Government (Federal level) | <input type="checkbox"/> Farmer |
| <input type="checkbox"/> Government (State level) | <input type="checkbox"/> Civil society organization |
| <input type="checkbox"/> Government (LGA level) | <input type="checkbox"/> Research/Academia |
| <input type="checkbox"/> Industry/private sector | <input type="checkbox"/> Donor/Development partner |
| | <input type="checkbox"/> Other: _____ |

A3. Organization/Business: _____

A4. Is your work/expertise related to any of the following value chains? *Select all that apply.*

- Fisheries/aquaculture
- Horticulture (vegetables)
- Horticulture (fruits)

Other: _____

A5. Contact information:

E-mail address(es): _____

Telephone number(s): _____

A5.1 May we contact you by email or phone for future research studies? Yes No

A6. Age in years: _____

A7. Years of formal education: _____

A8. Gender:

Female Male

A9. In what state do you reside? (*Indicate "not applicable" if you reside outside of Nigeria*)

A10. Do you reside in a rural or non-rural area?

Rural Non-rural (peri-urban or urban)

B. General perceptions of the food system

B1. Think of how the food system functions in Nigeria in terms of the availability, affordability, and safety of food in Nigerian markets.

B1.1. With respect to **fish**, how do you rate the status in each dimension?

	Very poor	Poor	Neither poor nor good	Good	Very good	Don't know
Availability of fish	<input type="checkbox"/>					
Affordability of fish	<input type="checkbox"/>					
Food safety of fish	<input type="checkbox"/>					

B1.2. With respect to **vegetables** (such as tomatoes, peppers, onions, or green leafy vegetables), how do you rate the status in each dimension?

	Very poor	Poor	Neither poor nor good	Good	Very good	Don't know
Availability of vegetables	<input type="checkbox"/>					
Affordability of vegetables	<input type="checkbox"/>					
Food safety of vegetables	<input type="checkbox"/>					

B2. According to Olaito (2014),⁴ over 90% of local staple foodstuffs are sold to consumers in traditional (“wet”) markets, and prices are about 20-30% lower than in modern retail outlets (e.g., supermarkets). To what extent do you agree with each statement below?

	Completely disagree	Somewhat disagree	Somewhat agree	Completely agree	Not applicable/Don't know
In the next 10 years, modern markets will replace traditional food markets as the major source of affordable food in Nigeria.	<input type="checkbox"/>				
In the next 10 years, modern markets rather than traditional markets will be the major source of safe food in Nigeria.	<input type="checkbox"/>				

B3. In your opinion, to what extent do the issues below represent challenges for the **affordability of fish** in Nigerian markets? *Select 3 challenges that are most serious/important and 3 challenges that are least serious.*

	Most serious challenges	Least serious challenges
Low productivity of capture fisheries or aquaculture	<input type="checkbox"/>	<input type="checkbox"/>
High cost of inputs (e.g., feed, equipment)	<input type="checkbox"/>	<input type="checkbox"/>
Poor quality of infrastructure, such as roads	<input type="checkbox"/>	<input type="checkbox"/>
Availability or high cost of electricity	<input type="checkbox"/>	<input type="checkbox"/>
Availability or high cost of infrastructure, such as high-quality storage facilities	<input type="checkbox"/>	<input type="checkbox"/>
Corruption along the value chain (e.g., informal payments)	<input type="checkbox"/>	<input type="checkbox"/>
Formal taxes and other fees beyond production costs	<input type="checkbox"/>	<input type="checkbox"/>
Security challenges related to production/capture and/or transport of fish	<input type="checkbox"/>	<input type="checkbox"/>
Lack of competition in the market (e.g., few sellers)	<input type="checkbox"/>	<input type="checkbox"/>

B3.1. Which is the MOST SIGNIFICANT challenge to the affordability of fish in Nigerian markets? *Select one from the list above.*

B4. In your opinion, to what extent do the issues below represent challenges for the **affordability of vegetables** in Nigerian markets? *Select 3 challenges that are most serious/important and 3 challenges that are least serious.*

	Most serious challenges	Least serious challenges

Low productivity of vegetable farms	<input type="checkbox"/>	<input type="checkbox"/>
High cost of inputs (e.g., fertilizer, equipment)	<input type="checkbox"/>	<input type="checkbox"/>
Poor quality of infrastructure, such as roads	<input type="checkbox"/>	<input type="checkbox"/>
Availability or high cost of electricity	<input type="checkbox"/>	<input type="checkbox"/>
Availability or high cost of infrastructure, such as high-quality storage facilities	<input type="checkbox"/>	<input type="checkbox"/>
Corruption along the value chain (e.g., informal payments)	<input type="checkbox"/>	<input type="checkbox"/>
Formal taxes and other fees beyond production costs	<input type="checkbox"/>	<input type="checkbox"/>
Security challenges related to production and/or transport of vegetables	<input type="checkbox"/>	<input type="checkbox"/>
Lack of competition in the market (e.g., few sellers)	<input type="checkbox"/>	<input type="checkbox"/>

B4.1. Which is the MOST SIGNIFICANT challenge to the affordability of vegetables in Nigerian markets? *Select one from the list above.*

B5. In your opinion, to what extent do the issues below represent challenges for the **safety of fish** sold/purchased in Nigerian markets? *Select 2 challenges that are most serious/important and 2 challenges that are least serious.*

	Most serious challenges	Least serious challenges
Fish are treated with antibiotics and/or consume things with toxins.	<input type="checkbox"/>	<input type="checkbox"/>
Lack of infrastructure (e.g., clean water points) to maintain food safety and adhere to food hygiene regulations on the part of agrifood system actors	<input type="checkbox"/>	<input type="checkbox"/>
Lack of knowledge regarding food safety on the part of agrifood system actors	<input type="checkbox"/>	<input type="checkbox"/>
Weak food safety legislation (i.e., the provisions prescribing enforcement responsibilities and penalties for violations are generally weak)	<input type="checkbox"/>	<input type="checkbox"/>
Lack of specific guidelines for achieving food safety in informal food markets (street food vending)	<input type="checkbox"/>	<input type="checkbox"/>
Dishonesty (neglect, negligence, or deceit) on the part of fish traders, processors, and vendors	<input type="checkbox"/>	<input type="checkbox"/>

B5.1. Which is the MOST SIGNIFICANT challenge to the safety of fish in Nigerian markets? *Select one from the list above.*

⁴ Olaito, P. 2014. "Growth Remains Steady in Nigeria's Retail Food Sector." Report prepared for the USDA Foreign Agricultural Service. Accessed at: <http://files.eacce.org.ma/pj/1394947923.pdf>.

B6. In your opinion, to what extent do the issues below represent challenges for the **safety of vegetables** sold/purchased in Nigerian markets? *Select 2 challenges that are most serious/important and 2 challenges that are least serious.*

	Most serious challenges	Least serious challenges
Unclean water used in irrigation	<input type="checkbox"/>	<input type="checkbox"/>
Lack of infrastructure (e.g., clean water points) to maintain food safety and adhere to food hygiene regulations on the part of agrifood system actors	<input type="checkbox"/>	<input type="checkbox"/>
Lack of knowledge regarding food safety on the part of agrifood system actors	<input type="checkbox"/>	<input type="checkbox"/>
Weak food safety legislation (i.e., the provisions prescribing enforcement responsibilities and penalties for violations are generally weak)	<input type="checkbox"/>	<input type="checkbox"/>
Lack of specific guidelines for achieving food safety in informal food markets (street food vending)	<input type="checkbox"/>	<input type="checkbox"/>
Dishonesty (neglect, negligence, or deceit) on the part of vegetable traders, processors, and vendors	<input type="checkbox"/>	<input type="checkbox"/>

B6.1. Which is the MOST SIGNIFICANT challenge to the safety of vegetables in Nigerian markets? *Select one from the list above.*

B7. If the government could increase its spending on programs to improve the **affordability and/or safety of fish** in Nigerian markets, which of the following areas do you think should be the highest and lowest priority for additional investment? *Select 3 programs that are most important (highest priority) and 3 programs that are least important (lowest priority).*

	Highest priority	Lowest priority
Increase productivity of fishers or fish farmers through research and/or training	<input type="checkbox"/>	<input type="checkbox"/>
Provide subsidies or cash transfers to fishers/fish farmers and MSMEs post-production to improve productivity, reduce post-harvest losses, and adopt safety practices	<input type="checkbox"/>	<input type="checkbox"/>
Oversight/monitoring of producers (fishers/fish farmers) and MSMEs operating in the fish value chain (post-production)	<input type="checkbox"/>	<input type="checkbox"/>
Infrastructure improvements to reduce transportation costs	<input type="checkbox"/>	<input type="checkbox"/>
Infrastructure-based efforts to reduce food loss/waste (e.g., cold storage)	<input type="checkbox"/>	<input type="checkbox"/>
Provision of hygiene-related infrastructure, such as clean water points and waste disposal in markets	<input type="checkbox"/>	<input type="checkbox"/>
Address corruption (reduce informal payments)	<input type="checkbox"/>	<input type="checkbox"/>
Address security concerns in production and transport	<input type="checkbox"/>	<input type="checkbox"/>
Reduce bureaucracy for operations of farmers and MSMEs along the fish supply chain (e.g., formal taxes, costs of business formalization)	<input type="checkbox"/>	<input type="checkbox"/>

B7.1. Which of these programs should be HIGHEST priority? *Select one from the list above.*

B8. If the government could increase its spending on programs to improve the **affordability and/or safety of vegetables** in Nigerian markets, which of the following areas do you think should be the highest and lowest priority for additional investment? *Select 3 programs that are most important (highest priority) and 3 programs that are least important (lowest priority).*

	Highest priority	Lowest priority
Increase productivity of vegetable farmers through research and/or training	<input type="checkbox"/>	<input type="checkbox"/>
Provide subsidies or cash transfers to vegetable farmers and MSMEs post-production to improve productivity, reduce post-harvest losses, and adopt safety practices	<input type="checkbox"/>	<input type="checkbox"/>
Oversight/monitoring of producers (vegetable farmers) and MSMEs operating in the vegetable value chain (post-production)	<input type="checkbox"/>	<input type="checkbox"/>
Infrastructure improvements to reduce transportation costs	<input type="checkbox"/>	<input type="checkbox"/>
Infrastructure-based efforts to reduce food loss/waste (e.g., cold storage)	<input type="checkbox"/>	<input type="checkbox"/>
Provision of hygiene-related infrastructure, such as clean water points and waste disposal in markets	<input type="checkbox"/>	<input type="checkbox"/>
Address corruption (reduce informal payments)	<input type="checkbox"/>	<input type="checkbox"/>
Address security concerns in production and transport	<input type="checkbox"/>	<input type="checkbox"/>
Reduce bureaucracy for operations of farmers and MSMEs along the vegetable supply chain (e.g., formal taxes, costs of business formalization)	<input type="checkbox"/>	<input type="checkbox"/>

B8.1. Which of these programs should be HIGHEST priority? *Select one from the list above.*

B9. In your view, who should be primarily responsible for, or should lead efforts around, the following:

Select one option per row.

	Individual farmers	Farmer groups	Individual MSMEs (post-production)	MSME associations	Government	Individual consumers	Civil society organizations	Other	Don't know
Making sure agrifood system actors (e.g., farmers, traders, processors,	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

transporters) are aware of good food hygiene practices									
Making sure consumers are aware of good food hygiene practices	<input type="checkbox"/>								
Making sure agrifood system actors (e.g., farmers, traders, processors, transporters) are following good food hygiene practices	<input type="checkbox"/>								
Making sure food that is sold in markets is safe for consumption	<input type="checkbox"/>								
Making sure freshwater bodies and wetlands are not contaminated with pollutants	<input type="checkbox"/>								
Regulating the methods for catching fish	<input type="checkbox"/>								

B9.1 For each item for which you indicated that "other" should be primarily responsible in B9, please specify the other agency or entity:

	Other (specify)
Making sure agrifood system actors (e.g., farmers, traders, processors, transporters) are aware of good food hygiene practices	
Making sure consumers are aware of good food hygiene practices	
Making sure agrifood system actors (e.g., farmers, traders, processors, transporters) are following good food hygiene practices	
Making sure food that is sold in markets is safe for consumption	
Making sure freshwater bodies and wetlands are not contaminated with pollutants	
Regulating the methods for catching fish	

B10. In your view, for each function below, what are the roles of **women and men** in the delivery of affordable, safe, and nutritious food in Nigeria? *Select one option per row.*

Product	Function	Women are more engaged than men	Men are more engaged than women	Women and men are equally engaged
Fish	Supply of inputs for capture/production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Production (capture fisheries)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Production (aquaculture)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Processing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Trading (wholesale)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Retailing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vegetables	Supply of inputs for production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Processing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trading (wholesale)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Retailing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

B11. (Optional) Please use this space to clarify any of your responses in this section or point out anything that is missing in this questionnaire.

C. Perceptions of legislation and government-led activities

C1. By your assessment, how familiar are you with the following policies/bills?

	Very familiar	Somewhat familiar	Not at all familiar
The Agriculture Promotion Policy (2015-2020) of the Federal Ministry of Agriculture and Rural Development (FMARD)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The National Food and Nutrition Policy (2016) of the Federal Ministry of Budget and National Planning (FMBNP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The National Policy on the Environment (Revised 2016) of the Federal Ministry of Environment (FME)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The National Policy on Food Safety and Its Implementation Strategy (NPFSS 2014) of the Federal Ministry of Health (FMOH)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Food Safety and Quality Bill (FSQB)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Gender in Agriculture Policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Micro, Small and Medium Enterprise Policy (2021-2025)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finance Act (2019)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

C1.1. If "somewhat" or "very" familiar, do you perceive this policy/bill to adequately support MSMEs that operate in the value chains for fish and vegetables?

	Yes	No	Don't know
The Agriculture Promotion Policy (2015-2020) of the Federal Ministry of Agriculture and Rural Development (FMARD)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The National Food and Nutrition Policy (2016) of the Federal Ministry of Budget and National Planning (FMBNP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The National Policy on the Environment (Revised 2016) of the Federal Ministry of Environment (FME)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The National Policy on Food Safety and Its Implementation Strategy (NPFSS 2014) of the Federal Ministry of Health (FMOH)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Food Safety and Quality Bill (FSQB)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Gender in Agriculture Policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Micro, Small and Medium Enterprise Policy (2021-2025)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

C2. To what extent do you agree with each statement below?

	Completely disagree	Somewhat disagree	Somewhat agree	Completely agree	Not applicable/ Don't know
There is continuous dialogue related to policy on food availability, affordability, safety, and nutrition issues between government sector representatives and my stakeholder group .	<input type="checkbox"/>				
My stakeholder group's perspectives in these policy dialogues are listened to and considered closely by government.	<input type="checkbox"/>				
My stakeholder group communicates and interacts frequently with other stakeholder groups in an effort to improve the availability, affordability, and safety of nutritious foods.	<input type="checkbox"/>				
I, personally, communicate and interact frequently with people in other stakeholder groups in an effort to improve the availability, affordability, and safety of nutritious foods.	<input type="checkbox"/>				

D. Knowledge of food safety and agricultural MSMEs

D1. To your knowledge, which practices result in chemical contamination of fish that can lead to food infection, long-term diseases (such as cancer), or death? *Select all that apply.*

- Use of chemicals for preservation
- Mixing of antibiotics with fish food
- Smoking with sawdust
- Don't know

D2. To your knowledge, which practices result in chemical contamination of vegetables that can lead to acute poisoning, long-term diseases (such as cancer), or death? *Select all that apply.*

- Use of chemicals to aid ripening
- Washing with detergent

- Storing vegetables in plastic crates
- Don't know

Thank you!
Your participation in the survey is appreciated.

ANNEX 2: SUMMARY OF VALIDATION EXERCISE

The RSM2SNF project held a validation exercise for the stakeholder perceptions survey on September 28, 2022. The event had three objectives: (1) to share the survey results with stakeholders who completed the survey, (2) to gather feedback on the research team's interpretation of findings, and (3) to collect others' views on how the survey findings to guide project activities. The hybrid event had in-person participation in two locations—Zaria, Kaduna State and Ibadan, Oyo State—while other participants joined online. In total, 75 agrifood stakeholders were present. The distribution of stakeholder groups present was as follows: Academia/research (45.3%), non-farmer private sector (18.7%), farmer (17.3%), civil society (9.3%), government (4.0%), and other (5.3%).

Following a presentation of preliminary survey results, two members of the project's National Advisory Committee served as discussants, offering their reflections on the results and guidance for how the report could be improved. This was followed by a moderated question and answer session and a set of facilitated group discussions in which participants shared their own interpretations of the study findings. Three main questions were posed in the group discussions:

- (1) In the survey results, we see a dominant perception that high costs of inputs and equipment are major challenges in Nigeria's food system, and there is less of a focus on challenges to reduce post-production food losses. This is seen across all stakeholder groups (not only among farmers). Why do we see this pattern? What is driving the high costs of inputs? What is your experience with post-production losses?
- (2) The results revealed that perceptions of federal government representatives often differed from those of other stakeholder groups. Does this surprise you? What (if anything) should be done to address this?
- (3) Security is noted as a key challenge to Nigeria's food system. However, government interventions/actions to address security concerns ranked low among the priorities of respondents for both fish and vegetables. Is this surprising to you? Why do you think addressing security was ranked low among priorities for government intervention/action?

The feedback received in this validation event guided the authors' revision of this report. Comments included the following (among others):

- The report needed to clarify the reasons for the study sample composition (e.g., including a large share of relatively more educated respondents).
- More research is needed to fully understand the drivers of food costs. Similarly, more research is needed to identify bottlenecks in the registration of processed products for export.
- Particularly as the sample is skewed towards high levels of education, the authors should explore the impact of education and other factors on the formation of perceptions. Although this is beyond the scope of the current report, the survey data may be useful to tackle this question.

- Input costs are widely regarded as a pressing and intensifying concern. Among several reasons given, global inflation and the declining value of the naira raise the cost of running generators to power feed mills, as well as the cost of equipment imports; agricultural subsidies used to be more prevalent and more helpful but have since been rolled back; insecurity in the north leads to a higher cost of transporting the grain used in fish feed and other goods, as transporters must now bribe security personnel on the highway; people notice the pecuniary expenditures made in the course of producing fish and vegetables more than they take note of other costs, such as food losses.
- The diverging perceptions across federal government representatives and other stakeholders indicates that the government has lost touch with other stakeholder groups. It was also noted that implementation activities and most of the relevant policies are found at the state level, such that state-level government representatives are likely to have a more accurate perspective of the food system.
- Security was not prioritized as a focus of government interventions. Among several reasons given, there is a lack of trust in government to handle the issue of security, and there are more obvious connections between something like subsidies and the cost of food, while the connection between security and food prices is less direct/less obvious.
- The format of the questionnaire forced respondents to prioritize among food affordability and safety. The results do not necessarily imply that people do not value food safety, only that they value food affordability *more*. The poor put basic needs first.
- The RSM2SNF project should support efforts to sensitize Nigerians on the importance of food safety and hygiene to influence consumers' behavior. However, efforts to address food hygiene/food safety should ideally not raise the price of food. The RSM2SNF project should look for win-win (or neutral-win) opportunities when thinking about how food safety can be improved. An example given was the use of mild steel in equipment and surfaces used for processing vegetables. Although the initial cost of stainless steel is higher, it is preferred from a food safety perspective and, owing to its relative durability, is also a cost-saving choice in the long run.