



Rapid Assessment of the Vegetable Sector in Nigeria

Kaduna State

Kano State

(Photo: EWS-KT Nigeria)

Introduction

The vegetable sector is rapidly developing in Nigeria with major implications for the livelihoods of small-scale farmers (including women and youth), entrepreneurs, businesses in the various sub-sectors, market players, as well as rural and urban consumers. The sector has been identified as a critical component of the collaboration between the Embassy of the Kingdom of the Netherlands (EKN) and the Federal Ministry of Agriculture and Rural Development of the Government of Nigeria. As a result of this commitment, several investments have been made in the horticulture and vegetable seed sector. These include:

- Seeds for Change (S4C) project in Kano, implemented by Netherlands-African Business Council (NABC) and six Dutch companies.
- Transforming Nigeria's Vegetable Markets project in Kaduna and Kano, part of the Sustainable Development Goal Partnership Facility, implemented by East-West Seed Knowledge Transfer (EWS-KT), in collaboration with Wageningen University & Research (WUR) and several other partners.
- Collaborative Seed Programme (CSP), part of the Nigeria-Netherlands Seed Partnership, coordinated by WUR and implemented in collaboration with Sahel Consulting, the National Agricultural Seeds Council, and partners in both Nigeria and the Netherlands. CSP, which is currently in its start-up phase, addresses vegetable seed systems and has a broader focus on the entire seed sector.

Rationale and purpose

The leading organizations involved (EWS-KT, NABC and WUR) realize that their individual actions in horticulture need to be embedded in a larger framework to strengthen the sector, not only in the production areas and markets where they operate, but also for sector governance and the creation of an enabling environment.

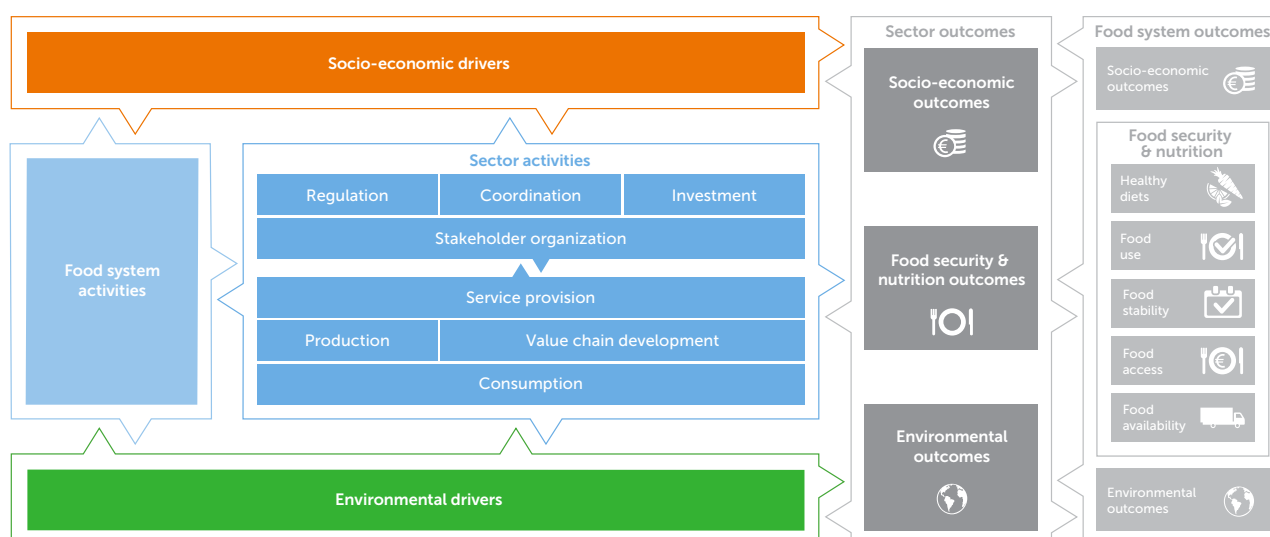
In this regard, conducting a rapid assessment of the horticulture sector is believed to be the first stepping stone in this joint action process. The purpose is therefore to gain a better understanding of the challenges; engage with partners in transforming these challenges into ambitions that contribute to sector transformation; reinforce their relationships with relevant stakeholders; inform local, regional, and national stakeholders in this process of strategic development; and ultimately embed their actions in a larger transformation strategy for the horticulture sector.

Food systems and sector transformation framework

The food systems approach is increasingly used as an interdisciplinary conceptual framework to better understand transitions in the supply of healthy food, sustainable resource use and social inclusion. Moreover, food systems are widely used to drive policy instruments; the development policies of the Government of the Netherlands, for example, are aimed at sustainable solutions for the food and agricultural sectors (Van Berkum et al., 2018¹). Sector transformation is a subset of the food systems approach that focuses on one particular agri-food sector within the larger food system. Sector transformation takes into consideration the production and market base, their relationships with services, finance and regulations, but also governance and coordination. The sector framework has closely linked to the food system framework with its food security and nutrition, socio-economic and environmental outcomes. Figure 1 shows how agri-food sectors can be integrated in the food system framework.

1] Van Berkum, S., J. Dengerink, R. Ruben, 2018. *The food systems approach: sustainable solutions for a sufficient supply of healthy food*. WEcR, the Hague, <https://doi.org/10.18174/451505> (2018).

Figure 1. Integrated sector and food system framework, Source: Borman et al., 2021²



Rapid assessments

Since May 2020, WUR, in collaboration with partners across Africa, has been conducting rapid assessments that provide valuable insights into how the COVID-19 pandemic and the associated social and economic crises are affecting the functioning of various agri-food sectors in sub-Saharan Africa. In some sectors, assessments were conducted in a series of 2-3 iterations, to monitor how the crisis impacted seasonal sector dynamics, and how effective, in some cases, the mitigating actions were. The rapid assessment documents produced by WUR and partners inform decision-makers at country level in government, industry, research, civil society and farmers' organizations, on where the impacts of COVID-19 are most severely felt in specific agri-food sectors, and subsequently identify and prioritize the immediate actions required to cope with the challenges identified. The rapid assessments result in concise, actionable documents referred to as 'Alerts' (e.g., Ethiopia sesame alert, Rwanda horticulture alert). In most cases, these documents are taken up for decision-making and guidance at senior government levels, but they also inform and guide public and private stakeholders on collective action. The series of rapid assessments can be accessed through this [link](#).

Rapid assessments have been conducted in several countries where WUR works together with partners on processes of sector transformation. Where appropriate, the sector transformation programmes in which WUR collaborates assume responsibility for informing decision-makers; where relevant and appropriate, the programmes initiate and support action.

Methodology

A. Defining boundaries and institutional settings

For each vegetable production area, the leading partner, in collaboration with WUR, defines the most appropriate institutional setting for conducting the rapid sector assessment – i.e., which organization/institution is best positioned to 'host and own' the assessment process.

There should be clear linkages to a producer or market association, a cluster or aggregation of producers and companies; the state and/or local government should also be involved. This step results in defining the boundaries for conducting the rapid sector assessment, in terms of crops, markets and geographical coverage. It requires therefore the involvement of WUR and partner organizations, including the leading organization. It sets the scene, and unless this step is completed the rapid sector assessment cannot start. If the links to producers, producer organizations, aggregation of producers, markets and/or platforms are not viable, the partners may consider diverting to another geographical or production area.

B. Defining sector activities and designing the survey

- The methodology for the rapid sector assessment uses the integrated sector and food system framework (Figure 1). A brainstorming session is held by the assessment team, which includes some experts and key informants with an in-depth knowledge of the sector; these are joined by representatives of sector platforms. During this session, sector activities are identified.

²Borman, G.D., De Boef, W.S., Dirks, F., Saavedra Gonzalez, Y., Subedi, A., Thijssen, M.H., Jacobs, J., Schrader, T., Boyd, S., Ten Hove, H.J., Van der Maden, E., Koomen, I., Assibey-Yeboah, S., Moussa, C., Uzamukunda, A., Daburon, A., Ndambi, A., Van Vugt, S., Guijt, J., Kessler, J.J., Molenaar, J.W., Van Berkum, S., 2021. Putting food systems thinking into practice: integrating agricultural sectors in a multi-level analytical framework. *Global Food Security* [submitted].

- The team assesses the sector's performance in terms of sustainability, competitiveness, transition to healthy diets, sustainable resource use and social inclusion.
- The questions are then transformed into a survey questionnaire, guided by - but not necessarily structured along - sector activities. The survey questions link each activity to the transformation of the sector.
- Responses range from 'severely negative performance' to 'highly positive performance', including 'neutral in terms of performance'. Respondents can also indicate if a question is not applicable, or if they are unaware of the impact.
- The survey should comprise around 30 questions in total, of which no more than 25 questions should be selected for each stakeholder group. Due to their involvement in different sector activities, panellists are given questions that are tailored to each stakeholder group.

C. Establishing a panel of experts

A panel of 40 to 80 experts, or respondents, is established. The panel comprises relevant stakeholders representing government, from various departments and levels of administration; producers and producer organizations, such as cooperatives and unions; farmers' organizations; private sector, including input supply companies, processors, traders, exporters, commercial service providers and their platform organizations; financial institutions; research and educational organizations; regulatory bodies; civil society organizations; and development organizations. The leading organization plays a critical role at this stage in ensuring the proper composition of the panel. A minimum of six people from each stakeholder group are included in the panel, allowing for an adequate degree of representation. The geographic distribution of the experts - over administrative levels within a production area, such as local government areas (LGAs) - can be taken into consideration. For example, if two distinct groups of LGAs are considered as sub-groups within a production area, subsampling by stakeholders covering two groups of LGAs is included in the design, creating further options to gain insights into geographic variations among the responses.

D. Running the survey

Participants receive information on the rapid sector assessment through the leading organization and its partners. Subsequently, the leading organization shares a link to an online survey questionnaire, which respondents can fill out either on a smartphone or on a different device. The software allows for adaptation of the questions to the stakeholder profile of the respondent. In case of no internet access, the survey can also be conducted by telephone interview.

Completion of the survey takes a maximum of 15 minutes. The survey is managed online by WUR, which also provides the leading organization with the link. The team can monitor the number of participants as well as each participant's response in real time. The survey is open for a limited period - from 48 to 96 hours.

E. Analysing data, developing a dashboard, and identifying key challenges

The results of the survey are processed, transforming the level of impact into numeric scores; for each question, the frequency of the various scores is calculated. This is complemented by the calculation of a stakeholder-weighted average score, meaning that the average score of respondents in each stakeholder group is computed, and subsequently the average of the stakeholder group concerned is calculated. Considering that the number of respondents is not equal for each stakeholder group, it is important that each stakeholder group and not each respondent is given an equal weight in the calculation of the average score.

The team then develops a dashboard based on the outcomes of the survey. Where possible, questions and responses are grouped together and structured along sector activities, allowing for the dashboard to give an overview of the situation. The results presented in the dashboard are based on individual questions and topics, and inform the identification of challenges. Questions with many respondents indicating a high negative performance are identified and grouped into specific challenges. Challenges can be linked to individual activities in the value chain, or to more general operations within the sector activities. The team identifies key challenges; if required, key informants are consulted.

F. Conducting focus group discussions to elaborate ambitions

Each FGD brings together six to eight experts, who are selected from the panel of experts based on their key expertise and their practical experience in the sector. The multi-stakeholder composition of the FGDs ensures insights into and ownership of the challenges. The composition, combined with the triangulation of responses from key informants and sector specialists, prevents a bias in favour of the interests of individual stakeholders or stakeholder groups within the sector. The FGDs are organized virtually or in a hybrid setup (where in-person and virtual participation is supported). The meetings are usually organized in 60-90-minute virtual meetings through Zoom, facilitated by one or two members of the regional consultants' team, who divide tasks between facilitation and note taking. Where possible, a

WUR staff member joins the meeting, mainly as an observer. Ahead of the meeting, participants receive information on the rapid sector assessment, the dashboard, and outcomes of the survey. The meeting starts with a brief introduction, presenting the key challenges, and the ways in which they can be transformed into ambitions. The core of the meeting is to brainstorm on refining ambitions and identifying stakeholders responsible for taking the initiative and driving actions to achieve the ambitions. For each ambition, the participants define their time horizon (short-, medium- or long-term). To structure this, FGD participants are split up into smaller discussion groups, making use of the break-out facilities of the digital meeting platform. Parallel break-out sessions comprise 3-4 participants representing different stakeholders. Each discussion group delves deep into one or two key challenges/ambitions and discusses actions required to achieve the ambitions, which will contribute to increasing the performance of the sector. They identify relevant stakeholders and their level of operation (local, production area, value chain, specific market, state or national), and the drivers/catalysts for the action. Outcomes of the separate discussion groups are presented and validated in the plenary session. The final outcomes are briefly summarized by the facilitator before closing the meeting. It is recommended that two or three FGDs are organized, which will facilitate the selection of key challenges to be addressed at least twice, allowing for triangulation of workshop outcomes.

G. Composing the rapid sector-assessment document

Based on the outcomes of the survey and FGDs, the team composes the rapid sector-assessment document. Each challenge includes a description of the challenges and ambitions, and details the actions proposed to achieve the ambitions. The dashboard, indicating from which specific survey questions the challenges stem, is shared in the rapid sector-assessment document. Copy-editing of the English text ensures quality in information sharing locally and nationally. The document is well designed, and pictures support the messaging.

H. Validating the rapid sector-assessment document

In some cases, an additional expert consultation is organized, in which key decision makers or stakeholders are invited to validate ambitions and associated actions, and arrive at a consolidated position among stakeholders to recognize and assume responsibilities driving actions. The outcomes of the verification meeting are used to finalize the document.

I. Sharing the rapid sector-assessment document

The rapid sector-assessment document is published and used for awareness-raising and advocacy efforts, and is widely shared in relevant traditional and social media. Leading organizations follow-up activities and meetings with high-level officials and wider stakeholders using digital platforms, to raise awareness on the challenges, and to urge government bodies and others to take immediate actions. These include briefings to ministries of agriculture and the organization of national platform meetings and press conferences.

J. Using the document in the development of a horticulture sector road map

The rapid sector-assessment documents form a locally grounded and stakeholder-owned input to the development of a horticulture sector road map that can drive the transformation of the sector and structure interventions and investment in the sector by development organizations, financial organizations, and their partners.

Rapid assessment of the vegetable sector in Kaduna and Kano states

- EWS-KT and NABC assumed responsibility to conduct the survey and organize the FGDs in Kaduna and Kano states respectively; WUR supported the implementation through various steps.
- During the design phase, WUR developed a questionnaire consisting of a set of 37 questions with inputs from the local teams. For each question, only relevant stakeholders were identified. Table 1 provides the list of questions.
- Local teams contacted the stakeholders identified. At least five representatives of each stakeholder group were contacted in both regions. Due to the COVID 19 pandemic, the survey was conducted using phone interviews. Respondents were asked to rate each of the questions as 'very poor', 'poor', 'average', 'good', 'very good'; or 'not applicable', if a question was not relevant to them, or if they were not able to provide an answer. Their answers were entered directly into an online survey tool, which compiled the surveys of all the interviewees. Overall, 111 surveys were conducted between the two regions of Kano and Kaduna. Details of the respondents per region can be found in Table 2.

Table 1. List of questions integrated in the survey.

Sector activity & driver	Level of impact of current circumstances on:
Production	<ol style="list-style-type: none"> 1. How do you rate the appropriate and efficient use of inputs for vegetable production? i.e., adequate seed rate for hybrid seeds vs open-pollinated varieties (OPVs)? 2. How do you rate farmers' understanding of the costs vs. benefits of investing in inputs and/or improved practices? 3. How do you rate farmers' capacity to invest in inputs and/or improved practices? 4. How do you rate the management or reduction of post-harvest losses at farm level (e.g., sorting, grading)? 5. How do you rate the linkage of farmers to various buyers and markets? 6. How do you rate the availability of labour for vegetable production (e.g., harvesting)? 7. How do you rate farmers' capacities to perform crop protection practices?
Value chain development	<ol style="list-style-type: none"> 8. How do you rate water management practices at farm level? 9. How do you rate the competition between vegetable production and other farming systems (i.e., cereals or livestock)? 10. How do you rate the known effects of climate change (i.e., higher temperatures, erratic rainfall patterns) on current vegetable production? 11. How do you rate youth engagement in vegetable production (i.e., young people increasingly growing vegetables)? 12. How do you rate youth engagement in supporting services along the vegetable value chains?
Services	<ol style="list-style-type: none"> 13. How do you rate water management practices at farm level? 14. How do you rate the competition between vegetable production and other farming systems (i.e., cereals or livestock)? 15. How do you rate the known effects of climate change (i.e., higher temperatures, erratic rainfall patterns) on current vegetable production? 16. How do you rate youth engagement in vegetable production (i.e., young people increasingly growing vegetables)? 17. How do you rate youth engagement in supporting services along the vegetable value chains? 18. How do you rate the awareness on the nutritional value of vegetables? 19. How do you rate the participation of women in vegetable production?
Stakeholder organization	<ol style="list-style-type: none"> 20. How do you rate the participation of women in value addition and markets within the sector?
Consumption	<ol style="list-style-type: none"> 21. How do you rate the performance of producer organizations (i.e., services provided to members)? 22. How do you rate farmers' ability to find alternative/higher-end markets for their (higher-quality) produce?
Coordination	<ol style="list-style-type: none"> 23. How do you rate the post-harvest practices throughout the vegetable value chain to maintain product quality? 24. How do you rate the quality of transportation of vegetables from farm gate to local markets?

Sector activity & driver	Level of impact of current circumstances on:
Regulation	<p>25. How do you rate the quality of private extension services on vegetable production?</p> <p>26. How do you rate the access to financial services by sector stakeholders (other than farmers)?</p>
Investment	<p>27. How do you rate the availability of labour along the vegetable value chains (for activities other than production)?</p> <p>28. How do you rate the access to information services (weather, price, or market information)?</p> <p>29. How do you rate the consumption of vegetables at household level?</p>
Socio-economic drivers	<p>30. How do you rate the existing rules and regulations at the level of vegetable production, including agro-dealers?</p> <p>31. How do you rate the existing rules and regulations at the level of post-production (i.e., wholesale/processing)?</p> <p>32. How do you rate the level of investment in the sector (i.e., investment in irrigation schemes/ expansion of vegetable production/value addition)?</p> <p>33. How do you rate the ability to maximize margins within the sector?</p> <p>34. How do you rate the level of existing infrastructure that allows stakeholders to maximize their operations/practices (i.e., roads, internet access, storage facilities, power)?</p>
Environmental drivers	<p>35. How do you rate the real demand* for good quality and safe vegetables (*a demand backed up by the willingness to pay)?</p> <p>36. How do you rate the collaboration between stakeholders in the value chains (i.e., supply and demand, trade, logistics)?</p> <p>37. How do you rate the existence of a joint sector vision (initiated by either the government or private sector)?</p>

Table 2. Survey respondents

Stakeholders identified	Kaduna	Kano	Total
Commercial farmers	4	7	11
Development	3	5	8
Extension officers	0	4	4
Financial institutions	2	3	5
Government	2	4	6
Labourers	4	4	8
Processors	10	3	13
Producer organizations	7	5	12
Research	1	5	6
Service providers	3	4	7
Smallholder farmers	1	5	6
Traders	10	6	16
Transporters	5	4	9
Total	52	59	111



The WUR team compiled a dashboard based on the outcomes of the survey, where responses to the questions were structured according to sector activities and drivers within the sector framework. Eight areas were identified and found to be major challenges:

- A.** Management or reduction of post-harvest losses at farm and value-chain level, including the quality of transportation.
- B.** Linkage of farmers to various markets, including processing.
- C.** Quality of public and private extension services and agro-dealer advisory services.
- D.** Access to financial services for various stakeholders all along the value chain.
- E.** Collaboration between stakeholders, including the joint sector vision.
- F.** Effects of climate change on vegetable production in Nigeria.
- G.** Youth and gender engagement in the vegetable sector, both in production and the value chain.
- H.** Awareness on nutrition.

Various limitations were identified by the local teams, who ran the survey through phone interviews. The translation of the questions into the local language, Hausa, may have led to mistakes while enumerating the questions. Not all enumerators had the agricultural background to accurately translate the questions for the respondents. The questionnaire was found to be long when conducted by phone; respondents' interest decreased over time, leading to less precise answers. Some questions were difficult to rate by the respondents who were not used to this type of survey.

The FGDs focused on more precisely identifying the challenges and the potential actions that could be taken to address these challenges. In the FGDs, a discrepancy was observed in the answers of the respondents of the phone survey and contributions by the attendants during the FGD.

The local partners documented the outcomes of the FGDs, which they shared with the WUR team. The WUR team subsequently produced a dashboard based on the FGD outcomes to the survey, which was used in developing the rapid assessment briefs for each state.

Partnership and collaboration

The rapid assessment is developed by Wageningen Centre for Development Innovation (WCDI), part of Wageningen University & Research (WUR), in partnership with East-West Seed Knowledge Transfer (EWS-KT) and Netherlands-African Business Council (NABC). EWS-KT has linked the activities to the project 'Transforming Nigeria's Vegetable Markets', part of the Sustainable Development Goal Partnership Facility (SDGP), financed by the Government of the Netherlands through the Netherlands Enterprise Agency (RVO). The NABC further supported the implementation of the rapid assessment in association with its Seeds for Change project, financed by the Embassy of the Kingdom of the Netherlands.



Rapid Assessment of the Vegetable Sector in Kaduna State

(Photo: EWS-KT, Nigeria)

Topic 1

The capacity and organization of vegetable producers and value chains

Topic 2

The quality of input supply services

Topic 3

The organization and structure of advisory and extension services

Topic 4

Farmers' and value chain actors' access to financial products and services

Topic 5

The use of environmentally sound and sustainable production systems

Topic 6

Rise in illegal practices and decrease in law enforcement

Topic 1

The capacity and organization of vegetable producers and value chains

Challenges

- Farmers lack capacity in and knowledge of production strategies (e.g., seasonality), and value chain and market functions, required to make their production a profitable and sustainable commercial endeavour.
- Youth are actively engaged in vegetable production and becoming more connected through social media.
- Women are largely excluded from decision making and the majority of field activities.
- Farmers are seldom organized in groups or other ways; communication amongst farmers is poor. Consequently, they lack information on inputs and markets. This weakens the position of farmers in the value chain. The lack of information and organization can lead to major oversupply, where farmers obtain very low prices from middlemen and traders.
- Smallholder farmers are not well-integrated in the supply chain and remain vulnerable to supply shocks and volatility in market prices. The linkage between farmers and other value chain actors is not structural. The limited mobility of farmers forces them to work with local middlemen, but their business model hampers the development of sustainable value chains that ensure all value chain actors gain a fair share.
- Farmers produce for a small number of unsophisticated output markets. Value chain actors include several processors and a few that invest in storage facilities, cold chains, or improved transportation. Quality standards for market differentiation are not yet in place in the value chain. This situation prevents both farmers and value chain actors from pursuing better opportunities.
- Limited efforts are made by the government and public bodies to bring stakeholders together to coordinate production and market access. These initiatives are dependent on the willingness and interest of the Minister of Agriculture and public representatives to achieve progress in the sector. No regulation forces these actors to be more active in production and market coordination. Poor policy and institutional support prevent local economies and smallholder businesses from thriving.

Ambitions

- Improved aggregation and representation of farmers and producer organizations in the supply chain, as well as the development of new types of supply chains more favourable to the actors mentioned, foster sector development and strengthen commercial viability, particularly for the producers.
- Showcasing profitable and sustainable production practices through women and youth led initiatives will help reduce cultural barriers and improve value chain efficiency.
- Public and private quality standards are created and implemented, allowing farmers to reach more sophisticated output markets.
- Branding is used as a quick win solution to drive quality changes in markets, particularly in regards to safety quality of products
- Communication gaps within and between farming communities, but also elsewhere in the chain, are reduced, contributing to improved decision-making by all actors and ensuring the commercial viability of vegetable production and related activities, including trading and processing.
- A good coordination of the market minimizes market failures and improves the commercial viability of various businesses, including farmers, all along the supply chain.
- Relevant public entities are obliged by legal means to make tangible improvements addressing market failures, and they understand the importance of bringing together actors in the supply chain to achieve this.
- Improved access to market information through digital platforms covering cover historic data and analysis on trends of farm gate prices.

Strategic actions

- Mobilize stakeholders, particularly public bodies, through external programmes, to gather information, coordinate production and market access, and address market failures.
 - Establish and enforce regulations for connecting actors and fostering fair partnerships, especially between producers and other value chain actors.
 - Support the creation of information-sharing systems to minimize risks and market failures, improve the coordination of domestic supply chains, promote diversification or specialization of production, and foster entrepreneurship.
 - Create more time and space for radio programmes, as the most favoured communication channel, and for social media platforms, because of their large outreach (in distance and number); these are considered the most relevant channels for raising awareness and sharing information.
 - Strengthen the capacities of farmer communities and producer organizations, by enhancing their commercial and entrepreneurship skills, and raising awareness on improved farming practices. Promote collaboration between these actors to improve their representation in the supply chain.
 - Foster collaboration between producers on storage and transportation models as entry points to improve their position in the supply chain.
 - Create new types and more favourable supply chains for producers to increase market opportunities.
 - Reduce informal taxes at roadblocks, increasing producers' profitability.
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Topic 2

The quality of input supply services

Challenges

- Farmers do not normally use quality seed of improved and particularly hybrid varieties for commercial vegetable production as they have limited awareness of and access to such varieties.
- Farmers are not aware of, and have been given misleading information on, the benefits and value for money in using hybrid varieties.
- The involvement of government in the sector through the distribution of substandard or fake seed has a detrimental impact on farmers' perception of the value of quality seed.
- Today, increased efforts to combat misinformation and enforce regulations have the potential to limit the spread, sale and use of fake inputs.
- Despite cordial relationships with farmers, agro-dealers do not have sufficient knowledge of inputs and farming practices to provide good recommendations.
- Advice given by agri-input retailers is often more based on the profit margin of products than the actual needs of their clients.
- The input sector is considered inefficient, with agro-dealers controlling the distribution of quality seed of improved vegetable varieties, fertilizers, and crop protection products in the state. Farmers, particularly those in remote areas, often need to travel far to gain access to inputs.
- Farmers, due to their limited capacity to invest and their vulnerability to shocks, look for low-cost and risk-averse inputs and practices.

Ambitions

- Quality seed of improved (hybrid) varieties and other high-quality inputs adapted to local conditions are widely promoted, particularly through radio programmes and social media, and are supported by national and international, public, and private bodies.
- Efforts to increase awareness on these high-quality inputs are combined with practical demonstrations to showcase their benefits and convince farming communities to use them.
- Sound and transparent information on high-quality inputs, including risks and benefits of their use, is communicated to farming communities.
- Public and private suppliers of quality inputs work closely with agro-dealers.
- Trained local agro-dealers deliver accurate information on the use of quality inputs to farmers.

Strategic actions

- Mobilize input suppliers to engage with and train agro-dealers on the use of these quality inputs.
 - Conduct farmer managed demonstrations on the use of improved quality seed in farming communities, both by public and private bodies. Communicate the precise agronomic and economic results of these demonstrations to farming communities.
 - Encourage spin-offs of these demonstrations with volunteering and capacitated farmers.
 - Involve trained local agro-dealers in demonstrations and events.
 - Promote and report larger-scale and commercial use of these improved inputs with the application of good agricultural practices (GAP) by pioneers in farming communities.
 - Encourage farmers to communicate precise agronomic and economic results from commercial fields to peers in the community.
 - Organize horti-fairs for exhibiting varieties and promoting the use of good-quality inputs. Invite agro-dealers, extensionists, input suppliers and farmers.
 - Disseminate information and knowledge on improved inputs through communication channels such as radio or social media. Interview pioneer farmers who are using improved quality inputs.
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Topic 3

The organization and structure of advisory and extension services

Challenges

- Public extension has limited outreach; the services provided are usually considered of a low quality. This low quality often arises from the fact that public extension agents have knowledge of cultivating major food crops - such as maize, rice or sorghum - but not vegetables.
- Extension agents often do not reside in their assigned communities, affecting the quality of their outreach and impact, and making it difficult for them to be accepted in the communities. The situation is further exacerbated by extension agents, particularly from the private sector, demonstrating a limited understanding of local context and culture.
- Both the technical and commercial capacity of extension agents is inadequate; their knowledge and information sources are restricted due to poor funding. In the public sector, their recruitment is not transparent. Selection is not based on competence and motivation but rather on informal networks. Lack of incentive and the weak structure of their organization (e.g., salary and logistics) further aggravate the situation.
- Recommendations of extension agents, both public and private, are perceived by farmers as misleading. Previously unsuccessful or rather negative experiences (e.g., distribution of substandard or fake seed) have reduced farmers' trust in government bodies.
- Projects and extension promoting production and value chain development, since their activities are short-term, do not have the necessary longevity to ensure the sustainability of breakthroughs increasing production, productivity, and profitability.

Ambitions

- Competent public and private extension services expand their outreach to remote areas, ensuring that farming communities receive good recommendations on how to improve production techniques and productivity.
- Introduction and demonstration of the benefits of applying accessible and affordable GAP, and using good-quality inputs, lead to their wide adoption, benefiting farming communities and making breakthroughs in their farming systems. It also contributes to generating sufficient income among adopters, enabling them to reinvest in good quality inputs for seasons to come.
- Links between farming communities and extension officers are strengthened.
- Extension officers reach out to community leaders and spend sufficient time in the area to ensure breakthroughs for more productive, sustainable and resilient farming systems.
- Improved extension services and the provision of up-to-date information contribute to an increased trust in government bodies.

Facilitation of focus group discussion by the EWS-KT team
(Photo: EWS-KT, Nigeria)



Strategic actions

- Guarantee the ability of public and private extension agents and agro-dealers to deliver accurate recommendations and advisory services, and strengthen both their capacity in GAP and the sustainable use of inputs through various programmes.
 - Invest in public agricultural research and extension to improve its quality, innovation capacity and outreach.
 - Improve recruitment process and guidelines for new public extension agents. Recruit and train more extension agents to increase the outreach of extension services among farming communities. Ensure enough women are recruited to reach female farmers.
 - Support and encourage extension agents, community facilitators, and leaders to reach out to and establish trust with local communities.
 - Provide extension agents with the resources to reside and freely operate in local areas. Invest enough time and resources in field activities for extensionists to guarantee good-quality demonstrations and training in the sustainable use of high-quality inputs, including quality seed of improved (hybrid) varieties, and the application of GAP to foster adoption among farmer communities.
 - Develop digital approaches to sharing technical knowledge and experiences between peers.
 - Introduce, demonstrate, and provide the opportunity to try-out quality inputs and agricultural practices that are accessible, affordable, and adapted to local conditions.
 - Improve agricultural research and data collection on agro-economic results of various trials and interventions but also on market trends, rural entrepreneurship, and natural resource management, to provide up-to-date information to farmers, but also other actors in the value chain, including potential investors and policymakers.
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Discussion of the main challenges and strategic actions in subgroups (Photo: EWS-KT, Nigeria)

Topic 4

Farmers' and value chain actors' eligibility for and access to financial products and services

Challenges

- Farmers do not have the financial resources for, or access to, tailored financial products to invest in quality inputs such as seed, fertilizers, and crop protection products.
- Farmers do not have their own capital or collateral, which curbs their ability to invest in or access financial products and services required for vegetable production. Unclear land tenure rights further negatively impact this situation, as they discourage farmers from investing in high-quality inputs, leading to decisions based on reducing risk and limiting their capacity to provide institutions with collateral. These circumstances, combined with the high interest rates that financial institutions and money lenders charge, have created a vicious circle that needs to be broken.
- Apart from the farmers, traders and other value chain actors have limited education, business and financial skills to be eligible for financial services.
- The aforementioned restricted capacity in production and lack of farmers' organization, combined with limited financial literacy and business skills, prevent farmers and value chain actors from breaking the cycle.
- Insufficient access to and use of financial services result in limited use of inputs and other investments required to increase productivity, making the process and business of vegetable production a risky endeavour. This negatively impacts the development of a sustainable and inclusive commercial vegetable sector.

Ambitions

- Land tenure rights are legally recognized and can be used as collateral by farmers.
- Demonstration of the economic viability of vegetable farming (through the adoption of GAP and improved quality inputs) stimulates interest among financial institutions and value chain actors to invest in vegetable production.
- Financial literacy and improved knowledge of farm management, combined with business advisory services, lead to improved decision-making and minimization of risks.
- Financial institutions and money lenders agree on fair repayment periods and interest rates for farmers.
- The ability to invest in better quality inputs and the adoption of GAP help to optimize the production and use of inputs, leading in turn to a maximization of margins at various levels of the supply chain, particularly at the farm level, and to reinvestments in the sector.

Strategic actions

- Capacitate farmers in record keeping and farm management, as well as in technical knowledge on the sustainable use of good quality inputs and GAP, to demonstrate the economic viability of their activity and therefore facilitate access to funding.
- Enhance business and financial skills, and provide business advisory services, for processors, traders and other businesses involved in the value chain.
- Create and collect economic data on business activities within the value chain.
- Reform financial regulations and design policies to guarantee fair repayment periods and interest rates on loans and credits.
- Work with financial institutions to explore opportunities and mobilize value chain actors to invest in vegetable production. Improve access to innovative financial services, including for smallholder farmers. Expand their opportunities in business activities and capacity in risk management.
- Establish and capacitate business advisory services for farmers, processors, and other actors within the supply chain to reduce risks and optimize margins.
- Encourage aggregation of farmers to mobilize personal funds and engage with financial institutions. Aggregation of producers would provide financial institutions with better security for repayments and therefore encourage them to reduce their interest rates.

Topic 5

The use of environmentally sound and sustainable production systems

Challenges

- Natural resources are put under increasing pressure, especially the sustainable use of water, soil and trellising material.
- Current production systems are vulnerable to pest and disease outbreaks. Farmers and extension agents lack the capacity to identify pests and diseases, which results in the incorrect use of pesticides.
- Substandard and fake inputs are abundant in the market, leading to inefficient production practices that are unsafe to producers and consumers. As the active components of substandard inputs are not known, they threaten soil and water quality and as such are environmental risks. They are also considered a threat to the health of farmers and consumers.
- Farmers lack capacity in - and do not apply - soil and fertility management practices, which results in flooding and erosion. Furthermore, the practices that they do use impact negatively on soil fertility.
- Environmentally damaging practices and deforestation are common and impact on the environment, in terms of land, water, soil, and biodiversity, and on the livelihoods of rural people.
- In order to achieve sustainable vegetable production, farmers need to use sustainable production systems.

Ambitions

- Application of climate-smart and -resilient farming practices by capacitated farmers mitigates the impacts of climate change and strengthens the sustainability and resilience of vegetable cultivation among farmers.
- Farmers optimize the use of agro-chemicals and external inputs, maximizing their effect on the field while minimizing their impact on the environment. High-quality inputs are used judiciously and sustainably to ensure soil quality and fertility, and limit their impact on biodiversity.
- Agro-dealers sell only quality inputs and regulatory authorities ensure that no fake inputs are sold or circulating.

Strategic actions

- Pilot innovative and appropriate technologies which reduces the risks of adverse weather conditions and the increasing pressure from pest and diseases.
 - Strengthen the capacity of extensionists, agro-dealers and farmers in climate-smart and -resilient farming practices, particularly in relation to soil conservation, the identification of pests and diseases, and the sustainable use of pesticides and fertilizers.
 - Sensitize and capacitate farming communities in natural resource management, aiming in particular at reducing bush burning, land clearance and deforestation.
 - Establish and enforce stricter policies for land clearance and deforestation.
 - Support and invest in research on sustainable farming systems, including horticulture.
 - Implement stricter policies aimed at preventing the production and sale of fake inputs. Strengthen regulatory authorities and provide sufficient resources to enable them to better function and carry out the enforcement of regulations.
-

Topic 6

An enabling environment promoting trust, stability, and collaboration in the sector

Challenges

- While informal sectors are often characterized by relations built on trust, dishonesty between actors is common. Contracts between farmers and buyers, but also among other value chain actors, are not always respected. Many actors are driven by short-term gains and lack established structural and reciprocal business relationships. A symptom of this unhealthy and less sustainable business environment is an abundant presence of common substandard or fake inputs; irrespective of whether the sector is formal or informal.
- Inter-communal tension and criminal gangs put significant pressure on farming communities and at times prevents farmers from using land which could be productive. Moreover extension workers, service providers and traders become reluctant to travel.
- The volatile political and policy environment is not conducive to the development of a sector that requires farmers and value chain actors to invest significant resources. Instability and discontinuity in the policy environment are disincentives to investment. At the federal, state, and local levels, ministries and other relevant bodies need alignment and coordination to create stability and trust among farmers and actors, and incentivize investment in a relatively capital-intensive production sector such as horticulture.
- A poor legal system, where policies are not well enforced and corruption is high, reduces transparency within the sector.
- The lack of congruence in the legal and policy environment reduces trust among value chain actors, who are reluctant to collaborate, build sustainable business relationships, or address common challenges. The trust in these actors and relationships is not adequate for sensitizing farmers and other actors to the benefit of, and potential for, investing in horticulture.
- Given the limited extent to which farmers and value chain actors are organized, they do not have the weight and thus voice to influence the policy and legal, but also the business environment. Neither stakeholders nor coordinating bodies receive revenues with the capacity to act and become a voice triggering change.
- The lack of confidence and trust in the sector and society hampers the effectiveness of actors in campaigns advocating horticulture as a business for small-scale farmers and particularly the youth. It also negatively impacts promoting the nutritional benefits of vegetable consumption.

Ambitions

- Farmers organize themselves in viable producer groups, cooperatives, and organizations, facilitating their access to inputs, machinery, and services, as well as increasing their power to negotiate in the value chain.
 - Communication and coordination between value chain actors is stronger, more transparent and inclusive, contributing to the creation of an environment more conducive to the development of the vegetable sector.
 - A more conducive environment, for policy development and enforcement among others, stimulates trust between actors in the sector and promotes a more inclusive and sustainable development of the sector.
 - Value chain actors collaborate and organize themselves to solve common challenges, align on short- and long-term goals, and define a clear vision for the development of the sector, reducing market failures and promoting investments in the sector for further development.
-

Strategic actions

- Introduce farmers to the concept of producer groups, cooperatives or organizations, and the potential benefits in terms of strategy (e.g., planning of production, economies of scale), increased bargaining power, services (e.g., irrigation), and collaborations (e.g., processing).
 - Reform public administration and services, and improve and enforce policies targeting a reduction in market failures.
 - Invest in infrastructure, public goods, and services, particularly in rural areas, in order to increase access to and affordability of good quality inputs or services, creating an enabling environment for significant and large-scale breakthroughs in the vegetable sector and value chain.
 - Stimulate collaboration between actors all along the value chain.
 - Develop a common horticulture sector development strategy or horticulture road map for guiding the development of the sector.
 - Ensure continuity in policies by establishing committees of diverse stakeholders, and working together to address various challenges in the horticulture sector and different value chains, with the aim of mobilizing resources and increasing collaboration and coordination between stakeholders on issues such as nutritional awareness, affordability of and access to quality inputs, sector organization, processing, packaging, storage and transport, post-harvest losses, and the creation of a conducive environment.
 - Design and plan horticulture development programmes using a sector-driven, multistakeholder and holistic approach, and engage competent services and organizations to lead their implementation.
 - Support the establishment of responsible governance and shared vision, aiming towards the competitive, inclusive, and sustainable development of the horticulture sector. Design strategies and sufficient budgets to achieve the targeted development.
-



Traditional cultivation of African eggplant in Kaduna, Nigeria (Photo: EWS-KT, Nigeria)



Rapid Assessment of the Vegetable Sector in Kano State

(Photo: NABC)

Topic 1

The quality of input supply services

Topic 2

Post-harvest loss management at the value chain level

Topic 3

The quality of advisory and extension services

Topic 4

Access to financial services

Topic 5

Mitigation and adaptation to climate change

Topic 6

Awareness on safety and nutritional value of vegetables

Topic 1

Challenges

The quality of input supply services

- Most farmers use their own farm-saved or uncertified seed obtained on the local markets, which have a proven to have limited performance. Farmers show limited awareness of the benefits of quality seed improved (including hybrid) varieties, which also contradict with the existing low-investment and risk-averse farm strategies.
- High-quality inputs including quality seed of improved (including hybrid) varieties are hardly available outside the production clusters.
- Existing markets offer little economic incentive to encourage farmers to purchase and utilize quality seed, improved (hybrid) varieties and better-quality inputs.
- Limited knowledge on efficient use of farm inputs, such as crop protection and fertilizers products as well as hybrid varieties, leads to crop failure and poor profitability or money losses. Fake or substandard farm inputs and imitation of input packages confuse farmers. Both of these issues feed distrust in potential benefits of improved farm inputs and reluctance to invest in such products.
- Often there are no adequate demonstration plots to demonstrate the input-output relationship in a business model fashion to convince farmers about best practices for inputs use. Farmers claim that demonstration plot sizes currently are more 'experimental' rather than designed to fit a commercial and scalable business model.
- Clear input-output practices with regards to agronomy and business, and their consequences, are difficult to grasp from experimental plots. As a result, farmers tend to distrust the quality and importance of inputs.

Ambitions

- Reliable suppliers with quality inputs at affordable prices are present in and outside production clusters.
- Improved vegetable output supply chains recognize the quality of production by bringing added value to good-quality produce.
- Communication of agronomic and economic information on efficient use of quality inputs to farmer communities is set up and put into use.
- Transparent communication of agronomic and economic results of pioneer farmers using improved quality inputs to the rest of farming communities contributes to increased awareness and improved decision-making.

Strategic actions

- Introduce extension officers in farming communities through local leaders to improve the impact of messages on the use of high-quality inputs.
 - Capacitate farmers and producer organizations to use quality inputs and good agricultural practices (GAPs), as well as bookkeeping, and understand the economic benefits that those practices bring.
 - Mobilize input suppliers to solicit and train agro-dealers on the use of quality inputs.
 - Promote and support pioneer farmers in using high-quality inputs on a commercial scale and collecting sound agronomic and economic data. Encourage spin-offs of demonstration plots from capacitated farmers.
 - Organize horti-fairs to display a variety and use of good-quality inputs. Invite agro-dealers, extensionists, input suppliers and farmers.
 - Mobilize the Kano State Government and the private sector to better control the local agricultural input market to limit the proliferation of fake products and packaging and curtail the supply of uncertified inputs, especially seeds, in rural markets.
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A close up shoot of tomatoes on the vine (Photo: NABC)

Topic 2

Post-harvest loss management at the value chain level

Challenges

- Use of poor-quality inputs in vegetable production results in poor-quality outputs that are more prone to post-harvest loss (PHL). Many vegetable producers are not conscious of the relationship between the quality of inputs used in production and PHL. Incidences of pests and disease are more devastating to the quality of output obtained from use of local inputs (local varieties and locally sourced seed); such pests and diseases contribute significantly to the level of PHL, especially of vegetables such as tomato and pepper.
- Poor harvest and post-harvest practices increase output losses, and limit profitability and capacity to invest in quality inputs.
- Poor practices include: premature harvesting, late harvesting, crude methods of harvesting and non-adherence to GAPs in harvest (e.g., non-use of improved packaging and transportation crates and overutilization of fertilizers in the quest for higher outputs) and post-harvest handling all along the vegetable value chain.
- Poor packaging methods and materials among marketers increase PHL. For example, the use of oval-shaped local baskets to package tomatoes increases weight and pressure on the commodity at the bottom of the baskets, thereby increasing PHL.
- Poor transportation facilities (e.g., poor roads linking production clusters to markets) and use of obsolete vehicles without a cooling facility, characterized by frequent breakdowns resulting in longer travel hours, hinder the fast delivery of the perishable commodities to faraway markets in the southern part of Nigeria.
- Multiple road blocks from production clusters to markets and tax-collection procedures, sometimes illegal, on the roads and at markets increase the delivery time and enhance PHL.
- Middlemen withhold and delay sales until the commission fees meet their expectations. The delay increases PHL and leads to producers' income loss. Inadequate markets and price-information-sharing limit vegetable producers' capacity to make quick and reliable decisions on sales. Sometimes the information is deliberately kept between commission agents to monopolize the vegetable market.
- Collection of vegetables is irregular between bulking centres/markets in Kano State and the markets in the southern part of the country. This leads to delays along the supply chain, and increases transaction costs and PHL.
- Theft during uploading at markets outside Kano State (markets in southern parts of the country) limits producers' income.

Ambitions

- Transparent post-harvest practices and market information are shared with producers.
- Reliable processing companies, including fair post-harvest handling (e.g., regular off-take and fair prices) in and around the production clusters, are established. This gives producers the possibility to decide on their output market to maximize their production profitability.
- Cooperation in marketing between producers strengthens their linkages with post-production stakeholders, including middlemen, traders, processing companies and other service providers (transporters), hence creating efficiency along the value chain to reduce PHL.
- A robust market information system is established, providing trade information on a regular basis to stakeholders of the value chain.
- The Kano and Nigerian governments finance improved transportation facilities and fight corruption alongside the trade roads between production and market areas.
- Entrepreneurship and investments in post-harvest practices (e.g., packaging, storage facilities, cold chain) and transportation (e.g. adapted and dedicated vehicles) reduce PHL and contribute to the development of the vegetable value chain.

Strategic actions

- Capacitate farmers on GAP and efficient use of inputs to maximize production quality.
 - Sensitize farmers on good harvest practices to minimize losses and optimize quality of production.
 - Mobilize actors in the stakeholder group to invest in post-harvest practices, insisting on action regarding the existing economic shortfall due to poor post-harvest practices and management, as well as poor quality of transportation infrastructure.
 - Structure and develop a robust market-information system involving various stakeholders including producers, middlemen, traders and processing companies.
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Women on a market in Kano, Nigeria (Photo: NABC)

Topic 3

The quality of advisory and extension services

Challenges

- Inadequate human and financial resources and poor motivation of the extension agents limit the effectiveness of the service.
- There is no regular review of extension information, and many of the extension agents in the field require additional training to be effective in the service delivery.
- The extension staff training schools under the Kano Agricultural and Rural Development Authority (KNARDA) located in Panda, Kadawa and Rano areas of Kano State are not adequately functioning.
- Vegetable farmers believed they have a fair access to the private extension services. However, the service providers are too few and inadequate to cover the entire state. They have specific targets and address only specific issues. These services are time limited and can end as soon as their targets are met.
- Agro-dealers provide some advisory services such as demonstration plots, organization of farmer meetings, conducting field days and training of trainers. These extension services are not adequate to cover the extension needs of the value chain actors, and not all agro-dealers perform these functions. There is a poor linkage between these service providers and the rural areas where the production clusters operate. Demonstrations established and managed by agro-dealers do not always represent real-life situations but are merely promoting the agro-dealers' products.
- Vegetable farmers are not adequately organized to operate as cooperatives, and this limits their capacity to access the delivery of extension services in the state.

Ambitions

- Better investment in the public extension services allow field officers to be hired and capacitated in vegetable production and a functional, effective and responsive extension service delivery system. Competent public and private extension officers deliver sound messages to farmer communities and expand their activities to larger areas in more remote regions.
- Agro-input dealers are trained on GAP and efficient use of good-quality inputs, delivering adequate and relevant knowledge to farmer communities.
- Linkage with private extension services are strengthened, and good exit strategies from projects organized by private companies or NGOs have a long-term impact in farming communities, contributing to an increased knowledge and adoption of GAPs.
- Farmers are organized into cooperatives of producers or collaborate to mobilize extension services agents and service delivery.

Strategic actions

- Invest in public extension services, including on vegetable farming.
 - Guarantee the presence of competent public or private extension officers delivering useful recommendations to farmers.
 - Introduce, demonstrate and facilitate quality inputs.
 - Organize actors, especially farmers, into cooperatives to pool resources and access extension services.
 - Define clear exit strategies for projects focussing on providing extension services to farmer communities to maintain impact in the long term.
-

Topic 4

Access to financial services

Challenges

- Farmers make risk-averse decisions as way to deal with market failures, high interest rates, long payback periods, unclear land-tenure rights and lack of collaterals reduce their ambition to mobilize funds from money lenders.
- The overall access and use of loans in vegetable production in Kano State is infrequent, hampering the investment in good-quality inputs or machinery, keeping the productivity and profitability of vegetable farming low.
- The culture for cooperative saving and fund mobilization is not effectively embedded among farmers in Kano State, hindering their capacity to invest.
- Farmers often lack collaterals to access loans from commercial banks, and the high interest rates discourage them from obtaining loans.
- The deficient-financing capacity as well as their substandard knowledge on financial literacy, entrepreneurship and business management of most stakeholders along the value chain keep the efficiency and profitability of the vegetable sector low.

Ambitions

- Stakeholders in the value chain are capacitated in financial literacy and business management, leading to improved decision-making that optimizes their economic results.
- Actors along the vegetable value chain have financial support to acquire quality inputs and equipment for production, processing and marketing of vegetables.
- Land-tenure rights are acknowledged by the government, giving the farmers an opportunity to obtain loans, with land proposed as collateral.
- Showcasing the profitability of vegetable production and marketing raises interest among financial institutions and value chain actors to invest in the vegetable sector.

Strategic actions

- Capacitate farmers in record-keeping and farm management, as well as in technical knowledge on sustainable use of good-quality inputs and GAP, to demonstrate the economic viability of their activity and therefore facilitate access to funding.
 - Capacitate other value chain actors in finance and business management to maximize their economic results.
 - Work with financial institutions to explore models for value chain actors to invest in vegetable production.
-

Topic 5

Mitigation and adaptation to climate change

Challenges

- Vegetable farmers have noticed rising temperatures, causing pest and disease incidences that result in low outputs and less return from vegetable production.
- Short rain duration and poor distribution, coupled with limited use of improved varieties that are resistant to such changes, result in loss of yield and income among vegetable producers in Kano State.
- Rising temperatures have also affected the quality of vegetable outputs, leading to faster deterioration especially after harvest, thereby accelerating PHL at farm and market levels. This resulted in loss of income and capacity to expand production.
- Many farmers lack knowledge on the importance of sustainable land management practices and the effects of too much pressure on the use of land to cultivate food and cash crops. This has increased the deforestation and the overexploitation of natural resources and also encouraged farmers to engage in unsustainable production practices.

Ambitions

- Vegetable farmers have adjusted their crop-production calendar. This includes use of early-maturing varieties of staple crops (such as millet, cowpea and maize) to allow early production of vegetables.
- Farmers continue monitoring temperatures and feed the information system. Information is shared with other stakeholders, including extension and research contributing to more farming communities.
- Farmers use quality seed of improved vegetable varieties with drought-tolerance and/or resistant to certain pests and diseases; they adapt vegetable production to emerging and new conditions resulting from climate change in.

Strategic actions

- Capacitate farmers including demonstrations to improve knowledge and skills of vegetable value chain actors on strategies for production, storage, processing and marketing to reduce the effects of climate change.
- Sensitize of farmers on the use of GAPs, and discourage them from use of practices (e.g., slash and burn) that accelerate climate change.
- Mobilize the private sector and research for the development of varieties adapted to changing environmental conditions, as well as the development of crop calendars allowing for vegetable production.



A close up shoot of a bell pepper (Photo: NABC)

Topic 6

Awareness on safety and nutritional value of vegetables

Challenges

- The production practices of some farmers are detrimental to the nutritional value of the crops. Such practices include overutilization of inorganic fertilizers with the intent to attain higher yield or excessive use of pesticides without due consideration to their effects on consumer health. Any control on excessive use of these chemicals by the farmers is more of an economic consideration rather than for health or nutritional reasons. Production is purely cash oriented.
- There is no well-established market that sells traceable healthy and/or nutritious products, neither inside nor outside Kano State. A differentiation on prices received by farmers based on the type of fertilizers used (inorganic or organic) is absent. Marketing is still rudimentary, and grading based on nutritional status is equally missing.
- Few high-end consumers are conscious of the health hazards associated with some production practices (e.g., type and amount of fertilizer and other agro-chemicals used). At market level, consumers are rather more attracted to cleanliness and the absence of diseases and insect infestation on the vegetables. However, more educated consumers are conscious of the nutritional value of vegetables as a component of dietary intake.

Ambitions

- Quality also plays a role in price-setting. This encourages farmers to become more conscious and adopt practices that are pro-nutritional value in the long run. Awareness of the nutritional aspects of vegetables encourages value chain actors to cooperate in order to develop the vegetable sector.
- GAP training improves efficiency in the use of chemical products, leading to healthier productions.
- A quality chain is developed allowing actors alongside the value chain to evaluate the quality of products (maximum residue limits are set), as well as providing better prices for best-quality products.

Strategic actions

- Create competent organizations able to check and guarantee the quality of production.
- Sensitize value chain actors on safety measures at production, processing, marketing and consumption levels to create a price–nutritional value relationship in the long run.
- Capacitate farmers on the efficient use of pesticides to limit the presence of residues in the final product.



A group of farmers exchanging with a trainer (Photo: NABC)

Dashboard

Assessment of the drivers and activities of the vegetable sector in Kaduna and Kano states
Outcomes of a survey conducted in May 2021

Survey questions were rooted in [the integrated food system and sector framework](#), which also provides the structure of this dashboard.

Color coding

■ Poor
 ■ Average
 ■ Good
 ■ Very good

Socio-economic drivers											
	Total	Kano	Kaduna		Total	Kano	Kaduna		Total	Kano	Kaduna
Participation of women in vegetable production				Participation of women in value addition and marketing				Awareness on the nutritional value of vegetables			
Participation of youth in vegetable production				Youth engagement in supporting value chain services							
Regulation				Coordination				Investment			
	Total	Kano	Kaduna		Total	Kano	Kaduna		Total	Kano	Kaduna
Existing sector rules and regulations				Farmers' influence in the sector compared to others				Level of sector investments			
				Collaboration between stakeholders				Ability to maximize margins			
				Existence of a joint sector vision				Existing infrastructure to maximise sector operations			
Stakeholder organization											
	Total	Kano	Kaduna								
Performance of producer organizations											
Service provision											
	Total	Kano	Kaduna		Total	Kano	Kaduna		Total	Kano	Kaduna
Farmers' access to finance				Quality of government extension services				Agrodealers' ability to advise on good crop management			
Access to financial services of other sector stakeholders				Quality of private extension services				Relationship and trust between agrodealers and farmers			
Production				Value chain development							
	Total	Kano	Kaduna		Total	Kano	Kaduna		Total	Kano	Kaduna
Appropriate and efficient use of inputs				Linkage of farmers to various buyers and markets							
Availability of labour for production				Farmers' ability to serve higher-end markets							
Crop protection practices				Post harvest practices along the value chain to maintain product quality							
Reduction of post-harvest losses at farm level				Quality of transportation							
Farmers' understanding of the return on investment in inputs and improved practices				Performance of processing industry vis-à-vis existing demand							
Consumption											
	Total	Kano	Kaduna		Total	Kano	Kaduna		Total	Kano	Kaduna
Consumption of vegetables at household level				Demand for food quality and safe vegetables							
Environmental drivers											
	Total	Kano	Kaduna		Total	Kano	Kaduna		Total	Kano	Kaduna
Water management practices at farm level				Competition between vegetable production and other farming systems				Known effects of climate change			



Sweet corn mulch trial, Ahmadu Bello University (Photo: EWS-KT, Nigeria)

This Rapid Assessment of the Vegetable Sector in Nigeria is published within a series of 'Rapid Assessments' in multiple (sub)sectors and countries, and is a Sector Transformation publication of WCDI.

Please cite as: *WUR, EWS-KT & NABC, 2021. Rapid sector assessment of the vegetable sector in Nigeria.* WUR, Wageningen, 29 July 2021.

Responsible WUR team: Yeray Saavedra Gonzalez, Johann Bonnand, Flo Dirks, Salome Boyd, Hermine ten Hove and Walter de Boef.

Responsible EWS-KT & NABC team: Ruth Ardzard Saleh, Godfrey Alechenu David and Stuart Morris

Copy editor: Elizabeth O'Keeffe and Gary Anderton, Wageningen In'to Languages
Design: RCO.design (brief) & Anita Simons (dashboard)

For more information:

Wageningen Centre for Development Innovation
info.cdi@wur.nl | www.wur.eu/wcdi

East-West Seed Knowledge Transfer (EWS-KT)
Stuart.morris@eastwestseed.com
<https://kt.eastwestseed.com>

Netherlands African Business Council (NABC)
info@nabc.nl | www.nabc.nl

WCDI project lead: Yeray Saavedra Gonzalez
Email: yeray.saavedragonale@wur.nl

EWS-KT project lead: Elijah Mwashayenyi
Email: elijah.mwashayenyi@eastwestseed.com

NABC project lead: Anitra van der Kraan
Email: anitra.vanderkraan@nabc.nl