Horticulture sector roadmap for Southwest Nigeria

Assessing the current and potential future of the horticulture sector in the six states

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SAHEL Consulting AGRICULTURE & NUTRITION LTD.

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Southwest Nigeria shows potential to become a leading supplier of horticultural produce, driven by its proximity to major markets like Lagos, and an increase in population and urbanization. While the sector is largely informal and underinvested, it holds promise for year-round production and market growth. This study outlines the sector's current situation and presents a vision for 2045 with milestones for 2030 for sector stakeholders, including foreign (and Dutch) businesses. Foresight and participatory scenario development workshops were conducted to explore the possible futures of the horticulture sector in each of the six states in the Southwest. The study recommends seven key strategies; fostering multi-stakeholder collaboration and dialogue, increasing government support, improving access to finance, upgrading supply chain infrastructure, providing farmer training, transferable business and management skills for youth, and promoting awareness among consumers on healthy diets. Coordinated action across these areas are needed to steer the sector towards the preferred scenario.

Keywords: horticulture, Nigeria, sector transformation, food systems, foresight, scenario, investment

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List of acronyms

CSO	Civil Society Organization
EKN	Embassy of the Kingdom of the Netherlands
FGDs	Focus Group Discussions
FMoARD	Federal Ministry of Agriculture and Rural Development
FMoH	Federal Ministry of Health
FMoE	Federal Ministry of Education
FGD	Focus Group Discussion
FUNAAB	Federal University of Agriculture, Abeokuta
GAP	Good Agricultural Practices
GDP	Gross Domestic Product
GLV	Green Leafy Vegetables
IART	Institute of Agricultural Research and Training
IITA	International Institute of Tropical Agriculture
IFAD	International Fund for Agricultural Development
KIIs	Key Informant Interviews
LSMSS	Living Standards Survey
NABC	Netherlands-African Business Council
NASS	National Agricultural Statistical Survey
NIHORT	National Horticultural Research Institute
(i)NGOs	(international) Non-Governmental Organizations
OGADEP	Ogun State Agricultural Development Programme
OGFIMS	Ogun State Farmer Information Management System
PEBEC	Presidential Enabling Business Environment Council
PO	Producer Organization
RVO	Netherlands Enterprise Agency [Rijksdienst voor Ondernemend Nederland]
SBCC	Social and Behaviour Change Communication
SHFs	Smallholder Farmers
SMEs	Small and Medium Enterprises
SW Nigeria	Southwest Nigeria
TVET	Technical and Vocational Education and Training
VSLA	Village Savings and Loan Association

1 Executive summary

Southwest Nigeria: a growing opportunity for horticulture

The horticulture sector[1] in Southwest Nigeria (see maps 1.1.) has real potential to supply much-needed fresh vegetables to the quickly growing and urbanizing population in the region, besides other states and neighbouring countries in the coming years. The key underlying reasons for this are as follows;

- With wider adoption of agricultural innovations, it can provide an all-year round alternative source from the North, giving consumers a greater guarantee of fresh, healthy produce throughout the year and helping stabilize prices.
- The Southwest includes some of the most commercially developed, educated and digitally adept states and actors of the country.
- Although supply chains are still weak, wet season production currently supplies a portion of the region's cities, with potential for production growth to keep pace with population growth in the future.
- Infrastructure in terms of roads are good relative to the rest of the country, alongside port access.
- Lagos, as a major market driver, creates ripple effects in other key urban markets across the region, leading to a high year-round demand for a range of quality standards.

Where is the sector now?

Despite this potential, the regional horticulture sector is still in its nascent stage due to;

- Structural under-investment by the public sector in previous years both in absolute terms (e.g. lack of support services to producers, tax breaks, etc.) and in relative terms (higher investment into the sector in the Northern states, especially Kano, Kaduna and Plateau States).
- With the exception of a small portion of the retail sector it remains informal, unregistered and, on the producer side, subsistence-oriented.
- Few banks choose to allocate much of their portfolio to the agriculture sector, but if they do, prefer those companies higher up the supply chain, while investments are especially needed at producer-level to extend harvest seasons.

What are the next steps to developing the sector?

There is no silver bullet to addressing the growing pains in the sector. But feedback with actors along the supply chains, support services and financial sector during workshops consistently highlighted that there is

1. An interest and largely overlapping regional vision for developing the sector in the long term
2. A large informal network of collaboration and – to varying degrees – trust across these actors
3. A need for greater coordination for these different actors to understand their role in developing the sector.

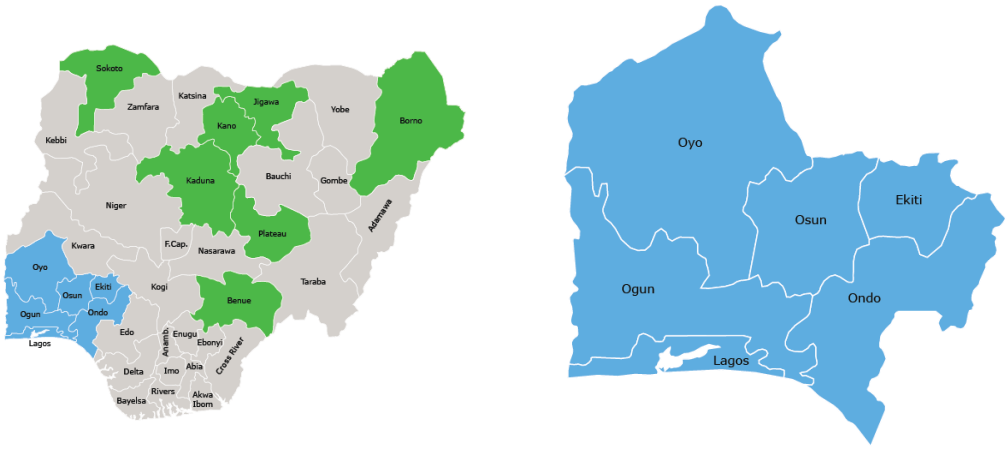
Out of the seven key areas, the study therefore recommends prioritizing the development of a multistakeholder approach; this would be done through a coordinating body, or platform, that can help strengthen the existing network of actors through an overlapping strategy and vision. The seven key areas provide more detail on recommended activities as the building blocks for this strategy.

Should donors like the Netherlands Embassy provide (more) funding to the region?

Yes, but conditionally. The Netherlands Embassy in Nigeria has already invested considerable funds through subsidy programs like HortiNigeria, Greenport, YAS and CSP into the region and nation-wide over the previous years. Now that the Netherlands is shifting to a combi-track approach in Nigeria (e.g. private-sector led investment strategy to attract especially Dutch businesses), further investments should

1. Build on those already made through programs, but conditionally on other stakeholders also co-investing funding, labour and time to improve the operating environment and investment climate.
2. Be tailored to supporting those Dutch businesses interested but unwilling or unable to independently navigate the local context.

[1] This study looks at vegetables within the horticulture sector, not fruits, flowers or other types of crops.



Maps 1.1 *Nigeria, including other main horticulture production states (green) and Southwest states (blue)*

What does this study cover to address this?

Given this context, this study does not focus on any one donor strategy, but on enabling the conditionality for donors, financial institutions and foreign (including Dutch) businesses to be willing to make further investments in the region. At the moment these entities are able but largely unwilling to do so, because of the broader issues at play (inflation, security, informality, corruption), together with the alternative of the Northern states. To change this, ultimately the local stakeholders will need to lead this development through a more coordinated manner and a common vision, alongside investment in the shorter term to move towards that vision. This study maps the current situation in more detail, then describes that future as laid out by stakeholders across the six states, and then defines seven key areas within which recommendations are made for the different stakeholders to play a role in implementing. This is summarized below.

Current state of play (chapters 4 and 5)

Unlike other types of agriculture, horticultural production in Southwest region remains largely informal and subsistence-oriented, though the sector, especially in Lagos, Oyo and Ogun, have a number of commercial-oriented enterprises. Unlike in the North, where irrigation is practiced more widely, subsistence farmers rely on rain-fed agriculture which limits year-round cultivation. In Lagos urban farming is on the rise due to limited space and high demand for fresh produce. Protected cultivation systems, such as net-houses and greenhouses, are being introduced. However, rising populations together with urbanization are putting pressure on land usage, especially in Lagos, though in all states to varying degrees. While Lagos is relatively food secure due to its higher income levels, other states face more severe challenges. Agricultural productivity is constrained by poor infrastructure, limited access to markets, weak regulatory frameworks and inconsistent food safety standards.

Farmers rarely bring their produce directly to markets, and transportation and packaging remain significant challenges. The inadequate infrastructure leads to high post-harvest losses, particularly for vegetables like tomatoes. Some more innovative (and younger) commercially-oriented farmers are using social media to sell their produce directly to retailers or consumers. Lagos remains a major distribution hub, with Mile 12 International Market serving as the key hub for the region's horticultural trade. It is particularly important for the Southwest in the dry season, while in the wet season it remains important for Lagos and other major cities but the smaller townships and rural communities become almost entirely self-reliant, producing enough to feed themselves and trade regionally, some of which goes to Mile 12.

The lack of formalization limits the ability of farmers and midstream actors to secure investments and improve operations. In all states, there is a pressing need for better regulation, particularly in food safety standards and land use policies. Market actors face limited access to advanced inputs, such as safer chemicals, modern irrigation techniques, and improved packaging solutions. More broadly, Nigeria faces significant challenges with inflation driving up the cost of living, widespread corruption undermining governance and economic growth, and security concerns.

A desired vision for 2045 (chapter 6)
There was consensus across the workshops that for the Southwest region to improve its horticultural production it should enable a variety of business models which speak to both economies of scale and efficiency on the one hand, and capabilities of small-scale and informal sector on the other; this potential speaks to a future in which there's a balance maintained between smallholder farmers that don't have the business acumen, or willingness, to scale up, while enabling those that do want to grow to be able to do so. Alternative scenarios highlighted food security being enabled through the support of cooperatives and technology development, as well as having more integrated farming systems that accommodate multiple SMEs.

What stakeholders want to avoid is a continuation of the current status quo; a weak operating environment and lack of enforcement of food safety standards will likely push any investments into larger scale businesses, and keep small-scale subsistence farming as a high-risk, low capacity and inconsistent livelihood that is disconnected from the market. Alternatively, investing in larger businesses without a regulatory environment could increase (mis)use of pesticides and other chemicals.

2030 milestones (chapter 6)
Based on the longer term (2045) desired future, shorter term milestones were proposed for 2030 by stakeholders and further developed (see table 6.3). These were used as the basis for the seven key areas and recommendations.

Seven key areas for sector development (chapter 7)
The recommendations focus on seven key areas and include specific activities for each stakeholder type, and highlights the role each of the stakeholder types have to play. The roadmap emphasizes that systemic transformation requires multiple, interconnected interventions over time. The key areas include the following, of which the priority should be the first, e.g. to establish a multistakeholder platform.

- 1 recommends a market-led, multistakeholder platform to address challenges in the horticulture sector.
- 2 calls for more supportive involvement from SW Nigerian states, as seen in the North, to ensure inclusive growth and enhance food security.
- 3 highlights the need to improve financial access for sector growth, addressing the mismatch between practitioners' needs and financial instruments.
- 4 emphasizes the need for better supply chain infrastructure, such as transport and cold storage, to reduce post-harvest losses and stabilize prices.
- 5 proposes developing sector-specific capacity development for farmers.
- 6 focuses on transferable business and management skills, especially for youth.
- 7 advocates for improving consumer awareness of healthy diets through media and education campaigns, promoting the benefits of vegetables and enforcing food safety standards.

During the concluding stakeholder workshop, participants highlighted building farmer capacity, developing a multistakeholder platform, and more general training and skills development (key areas 1, 5, 6) as the most important short-term areas.

Table 1.1 *Overview of summary tables*

SW horticulture in 2024: current state of play (chapter 5)

	Production	Midstream: aggregation, transport, processing & markets	Consumers
Inputs & services	High costs and insufficient access to advanced and safer inputs due to inflation and the absence of suppliers within most states (except for Lagos). Unsafe chemicals due to inadequate regulation and monitoring.	Access to professional input services is limited. Gap in the availability of produce-specific packaging and transportation solutions. Market services, including clean water and hygienic selling spaces at markets, are problematic.	The sector often struggles to respond to consumer demands and preferences.
Enabling environment	Regulatory (public sector) are not enforced, while private sector governance is largely informal. Food safety standard policies at state and federal levels are inconsistent or largely unenforced. Support for businesses at all scales, including tax incentives, is limited. Land pressure; insufficient strategic land use planning and policies, leading to unsustainable land management practices. Some collaboration and aggregation for smallholders through cooperatives.	Poor efficiency due to outdated processes and limited access to modern technologies, resulting in post-harvest losses and reduced profitability for midstream actors. Enforcement of food safety regulations is weak and incentives for complying with minimum standards are mostly absent. Lack of traceability. Coordination among midstream actors (and Farmers) is largely informal and decentralized, leading to fragmented operations and inefficiencies. Online platforms & social media enabling producers to connect to markets (esp. Lagos).	Unenforced food safety regulations or promotion of healthy diets results in the absence of consumer access to safe vegetables.
Human capacity & remuneration	Farmers have limited technical and business skills to manage their operations and sustain a fair financial income. Opportunities for continuous skill and knowledge improvement are scarce, leaving farmers ill-equipped to adopt new technologies and practices. Some adoption of innovations (solar powered drip irrigation, net-houses) are being adopted.	Midstream actors lack the necessary technical skills and business acumen to operate efficiently. Opportunities for skill development and continuous learning are rare.	Awareness among consumers about the benefits of vegetables as part of a healthy, balanced diet is not available. Vegetables are widely consumed, but not in the right quantities due unaffordability and accessibility for consumers.

Recommendations & activities for 2025-2030 (chapter 7)

Key areas	Recommendations	Stakeholders
1. Establish a **multistakeholder platform** led by private sector with other stakeholders	Establish a multistakeholder platform focused on SW horticulture sector to lead and coordinate the roll-out of the other recommendations and address sector challenges, including: • Support tailored (financial) services, technologies (post-harvest practices), trainings accessible to smallholder and commercial-scale businesses and, where feasible, vertical integration (key areas 5 and 3). • Co-invest in strategic infrastructure projects with a focus on (cold) storage, transportation, and irrigation (key area 4). • Improve public-private dialogues to tackle regulatory and sector-wide challenges (key area 2). • Promote sector-wide access to sector information on pricing and access to resources.	• Nigerian private businesses • Foreign businesses • Nigerian banks • Donors • Six SW state governments
2. Improve **policy and regulatory** support along the supply chain	• Regulatory support across the value chain to enhance the coordination and prioritization of activities, especially addressing the needs of the informal sector which dominates the horticulture sector. • Address the application of Good Agricultural Practices (GAP) and improved access to input, to improve current production practices and to increase food safety. • Ensure land access for farmers, especially given the increasing land pressure in some of the states in the southwest.	• Nigerian federal government • Six SW state governments • Donors • International business
3. Develop **tailored financial** products for smallholders, SMEs and midstream actors	• Develop a long term financial strategy to manage and reduce sector risks, and so be tailored to the actor types, horticultural produce, geography and demography. • Underwrite tailored loan provision through local banks and other financiers to stakeholders along horticultural value chains to start and scale commercial production, aggregation, transport and retail. • Integrate loan promises into capacity development by private and public actors.	• Central Bank of Nigeria, private banks, other domestic lenders • Donors • Insurance providers
4. Develop production and supply chain **infrastructure**	• For production, provide irrigation solutions and water pumps to extend the season and increase yields, while improving access to local storage facilities. • Invest in storage facilities, particularly (cold) storage, and improve market infrastructure, to extend shelf life and maintain quality of produce. • Develop cooled mobile transport systems through logistics partners to continue to reduce post-harvest losses along the supply chain.	• Federal and state government • Nigerian business • Donors
5. Build **farmer capacity** to shift to commercial-scale production and SME approach	• Comprehensive training programs on sustainable farming must be developed for extension officers and farmers, covering areas such as pest management, soil fertility, irrigation, and proper post-harvest handling with a view to reducing on-farm losses and extending the production season. • Enhance connections between farmers and market actors to increase market access and efficiency. • Engage more people in horticulture, from household to business levels, while investing in capacity-building for skilled and unskilled labor, to strengthen the sector's workforce.	• Business: Public and private training institutions; • MoA: Agricultural extension services. • MoE: TVET curricula development • Donors
6. Develop **training** schemes and transferable skills for shifting in/out of horticulture sector	• Develop a network of educational institutes to develop business and other transferable skills for especially the young population. • Build on the experience of existing institutes and programs that already supports young entrepreneurs • Link to other leading initiatives across the African continent working on youth leadership	• TVET institutes and universities with business programs • Training/coaching businesses • Ministry of education • Donors
7. Develop consumer awareness of **healthy** diets and safe food	Build on existing strategy and policies to promote healthy diets for consumers through: • Social and Behavior Change Communication (SBCC) campaigns and training programs for the public, including revised education curriculum. • Social marketing and media strategies. • Working with local civil society organizations, relevant government bodies and networks.	• Nigerian state and federal government (FMoHADMR, FMoH, FMoE); bureau of food (safety) standards • (I)NGOs and CSOs • Schools • Media

SW horticulture in 2030: milestones towards a desirable future (chapter 6)

Table W. SW horticulture in 2030: milestones towards a desirable future

	Production	Midstream: aggregation, transport, processing & markets	Consumers
Inputs & services	More human capacity (including labourers) leads to all-year round, innovative production systems including a fully operational irrigation infrastructure. More sustainable horticulture farms produce more volume, better planned and high quality horticulture products while using affordable inputs, tools and machinery for responsible farming.	Midstream actors use renewable energy. Mechanisms in place for standardization and quality control to mitigate midstream (mal)practice Improved storage capacity and practices	Improved awareness and more demand for access to affordable horticulture products
Enabling environment	Improved access to and use of local varieties and access to good quality starting material, including seedlings. Enforced policy action: • Governance, including the dedication of land for horticulture production but also protection of vulnerable / natural areas. • Applying GAP, including farming inputs and safer chemicals (improve productivity while maintaining environment). Enforcement mechanisms in place to ensure national food safety standards.	Co-funded infrastructure projects, such as (cold) storage and transportation networks, have become operational, to enhance efficiency and reduce losses. Improved Public and private coordination, leading to policies specifically designed for the informal sector to ensure that all actors benefit. New partnerships established to build resilience, improving sector ability to withstand economic and environmental challenges. Conducive policies that allow foreign companies to actively support the development of SW horticulture sector.	Upgraded marketplaces across major cities, particularly in Lagos and Ibadan provide hygienic selling spaces, sufficient water supply, proper handling and safe storage options. Food-based dietary guidelines are adopted and guiding healthy lifestyle campaigns to which private sector actors also adhere. Policies and monitoring mechanisms supporting the affordability of vegetables are enforced.
Human capacity & remuneration	Strengthened human capacity on production, innovations, GAP, and business skills. Increased number of more sustainable horticulture farmers: • Expanded pool of skilled horticulture labourers • Well-trained extension services present in the field Increased offering of training and education on horticulture by public and private parties through network of training centers and/or existing organizations	Measurably improved horticulture sector loan portfolio (higher loan volumes and lower default rates). Blended finance mechanisms in place, including VSLAs in communities, blended finance for start-ups, soft loans for SMEs and smallholders through FOIs. Adoption of 'innovations' (solar powered irrigation, (cold) storage, greenhouses, etc) through loan provision. Evidence of (young) people moving in and out of food sectors.	Increased consumer awareness of healthy diets and food safety; consumers are sensitized about the relevance of healthy diets. Improved access and affordability of vegetables, reduced cost of diets.

SW horticulture in 2045: four scenarios (chapter 6)

A: less likely and undesirable. Innovations, technology and GAP improves food security but supply chains are shortened and rural/urban populations all have to focus on food security. Organizational models emphasize cooperative management and community collaboration. Oyo and Lagos use technology and cooperative efforts, enhancing production and sustainability. Ogun and Ondo highlighted the focus on home gardening and affordable technologies but face youth engagement and GMO safety issues. Despite improved practices, environmental challenges like water pollution and deforestation persist. Technology and collaboration are crucial amid informal regulation.

B: Desirable. Five out of six states preferred the large-scale, safe, and affordable scenario, except Ogun, which had mixed preferences. These states support a mix of state regulation and private investment, with a focus on food safety, tax incentives, and accessible healthy food. Integrated farming systems and technology are emphasized, with Lagos focusing on urban farming. Opinions on large-scale businesses vary, aiming to prevent monopolies and support small enterprises (e.g. formerly smallholders). Environmental concerns are addressed differently, from minimizing impact to promoting nature.

C: likely and undesirable for most states, assuming current trends continue. Small-scale horticultural farming will likely remain informal, unsafe, and unaffordable due to weak operating environments, lack of innovation, and insufficient support. Farmers face unreliable seeds, agrochemical misuse, and limited technology, leading to low-quality, unsafe food. Climate change and economic disparities worsen these issues, while inadequate financial services and government policies further destabilize the sector.

D: Less likely and undesirable. Investments scale up business without regulating and steering them towards a more socially equitable and better regulated operating environment. Large-scale agribusinesses dominate agriculture, prioritizing profit and relying on agrochemicals, GMOs, and mechanization, causing environmental and health issues. Small farmers are marginalized, leading to heritage crop loss and food insecurity. Wealthy consumers access safe produce, while poorer ones suffer. Poor labor conditions and biased policies drive rural-urban migration, increasing hunger and unrest. Regulation and balanced policies are urgently needed.

SW horticulture in 2045: a desirable future (chapter 6)

Table Z: 2045 a desirable future for the SW horticulture sector

	Production	Midstream: aggregation, transport, processing & markets	Consumers
Inputs & services	Affordable and available input supply system for sector actors (including farmers) that leverages on tailored tech solutions. Access to advanced, safer inputs, barring of unsafe chemicals.	Access to professional input services – cold storage units, finance. Produce-specific packaging and transport to deliver safe and quality produce. Market services (clean water and selling space).	Horticulture sector is responsive to consumer demands and preferences: new varieties of produce provided.
Enabling environment	Regulatory (public sector) and non-regulatory (private sector) structures in place at state and federal level to support commercial development of SME producers. • Quality standards of input, services (see areas listed in column below). • Landscape and spatial planning mechanisms for the benefit of farmers and urban planning • Farming practices are environmentally neutral or regenerative.	Public and private coordination. Businesses are incentivized to collaborate and aggregate through cooperatives, integrated value chains and farm systems, applying regulatory and non-regulatory means. • Incentives for food safety regulations and enforcement (including traceability). • Hygiene standards. • Clean and developed workspace for wholesalers and retailers. • Avoidance of monopolistic behaviour. • Practices are environmentally neutral or regenerative.	Trustworthy government that enforces food safety regulations, and actively promotes consumption of healthy diets. Rely on end trust of VC actors and the services they provide.
Human capacity & remuneration	Farmers have high level of technical skills and business acumen. Farmers able and willing to continuously improve skills and knowledge. Farmers not looking to further professionalize business able to find other opportunities in or outside of hort sector. Fair financial compensation (e.g. living income).	Mid-stream actors have high level of technical skills and business acumen. Mid-stream able and willing to continuously improve skills and knowledge. Fair financial compensation (e.g. living income).	Consumers are aware of the benefits of vegetables as part of a healthy, balanced diet. Vegetables in healthy diets are affordable and accessible.

Key highlights

The sector in SW region is currently largely informal, receives insufficient public support and lacks access to quality input services, which disincentivises institutional investment. However, all six states illustrate local-level examples of production innovations alongside business investments being made, especially in (peri)urban areas. Lagos, Oyo and Ogun states have the greatest commercial growth capacity.

The sector is made up of many actors informally working together. These seven key areas recommend actions by these different actors to address the existing challenges in the coming five years to shift to an improved horticulture sector. First and foremost a governing body should be established that builds a coalition of interested parties around these key areas. This will coordinate and connect subsequent efforts and promote it to potential investors.

Based on the longer term vision for 2045, milestones are laid out for the sector along the areas of inputs & services, enabling environment and human capacity & remuneration for 2030. The multistakeholder platform can use this as guidance for coordination of activities by others across the region in the coming give years.

Four plausible futures for 2045 were developed and mapped out by stakeholders, of which one was selected as most desirable, while others highlight either a mixed vision or a generally negative one. The desirable future emphasizes supporting the development of informal small-scale businesses up to SME-scale, as well as greater integration, along horticultural supply chains.

The desirable 2045 future is mapped out in more detail along the same food system areas of inputs & services, enabling environment and human capacity & remuneration. This future vision should be used by the multistakeholder platform as reference to emphasize a common vision across stakeholders, and to develop a longer term strategy to developing the Southwest horticulture sector.

2 Introduction

Background
Responding to a Nigerian food system that is struggling to provide healthy diets to a booming and urbanizing population, the Netherlands Embassy in Nigeria is seeking to improve the horticulture sector through investment in several states that are the 'vegetable basket' of the country. This study is part of a wider policy and series of ongoing programmes that the Embassy is implementing; the Collaborative Seed Program (CSP), HortiNigeria, the Greenport Impact Cluster and the recently launched Youth in Agribusiness are programmes that work to improve horticulture and agriculture more generally in either specific states or across the nation. Besides these programmes, the Embassy, RVO, WUR and other entities have delivered a number of studies related to this geographic region and the horticulture sector over recent years. These ongoing investments in Nigeria to develop the horticulture sector fit within a broader strategy of the Ministry of Foreign Affairs for Dutch expertise to develop horticulture for improved food and nutrition security – amongst others in Ghana and Rwanda (Koomen et al.,2024).

Objective of the study
This study seeks to inform key stakeholders, including the Netherlands Embassy of Nigeria, how and where investments can be made in the coming years with a view to developing the horticulture sector in the Southwest region of the country. This study is made up three parts that build upon one another; first, an overview of the current situation, or state of play, of the horticulture sector in Southwest Nigeria. Second, a mapping of the longer- and shorter-term potential futures that lie ahead for the sector. Third, given the current situation and potential futures, recommendations, and activities for all key stakeholders to work towards a desirable future by 2030, and which lays the groundwork for longer term sectoral development.

Scope of the report
This study addresses the horticulture sector in Southwest Nigeria, a region covering six states; Lagos, Oyo, Ogun, Osun, Ondo and Ekiti. The sector itself remains largely informal and, besides broader political-economic challenges, faces structural under-investment. It nevertheless illustrates real potential to provide much-needed nutritious food to a rapidly growing and urbanizing population in the coming years. Given this, the study provides relevant analysis and recommendations, and engages with a broad selection of key stakeholders in the region to use these recommendations to further develop the sector. It is made up of the following sections;

- The **executive summary** provides a concise overview of the entire study, highlighting key findings, analysis and recommendations.
- The **methodology** explains how the study was conducted during the run of 2024, relying heavily on primary data collection through interviews and workshops.
- **Broader Southwest trends** gives a summary overview of trends on population growth, urbanization, food & nutrition security, and business environment.
- The **Southwest horticulture sector in 2024** provides an overview of what is a nascent industry with large growth potential.
- The chapter on **desirable and alternative future scenarios** maps a series of more and less desirable futures for the horticulture sector in 2045, and milestones for 2030.
- The **recommendations and activities** for all stakeholders provide a roadmap to develop the sector in the coming five years, building towards milestones for 2030.
- The **annex** captures the more detailed data collected.

3 Methodology

3.1 Study design

The study focused on six states: Lagos, Ekiti, Ondo, Ojo, Osun, and Ogun. It was implemented in three phases during the run of 2024. It was composed of a preparatory phase (January) followed by three, partially overlapping, implementing phases. Each of the implementing phases were led by a question (or questions), with the results of each of the phases feeding into the next one (table 3.1). An action research approach was applied using mixed quantitative and qualitative methods for data collection and analysis, combined with validation exercises ensuring solid triangulation. By employing this framework, the study aimed to provide a detailed and nuanced picture of the horticulture sector in Southwest Nigeria, addressing both state-specific and multi-state regional dynamics.

Table 3.1 *Action research plan*

	Leading question	Research questions	Methodology type			
			Desk-based research	Data collection: interviews & FGDs	Data collection: workshops	Validation: interviews & workshops
1 Mapping the current state	Q1: what is the current state of play of the horticultural sector in the SW region? Information on 'The state of SW horticulture sector in 2024' collected through desk-based research, crop selection, primary data collection and analysis.	1.1. What are key crops being produced, and where? 1.2. How is the movement of Horti produce to the cities? 1.3. What does the current actor landscape in the 6 states look like?				
2 Explore possible futures	Q2: what are the possible futures (2045) for the horticulture sector in the SW region? Using foresight, future scenarios were developed through in-country scenario workshops	2.1. What are perceived and explicit uncertainties, drivers, trends, etc. relating to horticulture production and consumption (foresight)? 2.2 Which possible futures can be identified from stakeholders' perspectives (2x2 matrix)?				
	Q3: What does the roadmap look like to get to 2030? Back-casting exercises and validation through online workshop	3.1. What intermediate steps can be identified at the regional level for improving the horticulture sector in 20 years from now?				
3 Identify investments	Q4: Recommendations: What key areas to focus on and invest in? Further analysis and consolidation of findings into recommendations and activities', validated through 1-1 interviews	4.1. What are the roles and contributions of all stakeholders in the horticulture sector? 4.2. Which investment areas can be identified?				

Phase 1: An overview of the horticulture sector

An overview of current selected products flows was developed, particularly focusing on the transition from production in rural areas to peri and urban markets. This included understanding the challenges and opportunities at each stage of the value chains, selected product flows, and key stakeholders involved.

Crop selection approach

In each of the six states a specific crop was selected based on regional agricultural practices, economic importance, and potential for development. The selection process involved consultations with local agricultural experts and stakeholders to identify the most relevant crop for each state. Crops like GLVs are the key for a healthy diet and are widely cultivated in Nigeria. Others like tomato and onion are economically important. They were selected based on scoring against multiple key variables (see Annex 9.1.1 for an overview of the scores per state and crop). The selected crops were then presented to stakeholders (during the agricultural fair held in Lagos in March 2024) for feedback and validation.

Table 3.2 *Focus crops selected for this study*

State	Crop 1	Crop 2	Crop 3	Crop 4
Lagos	tomato	GLV	onion	
Ekiti	GLV	tomatoes	pepper	okra
Ogun	cucumber	tomato	GLV	
Ondo	GLV	pumpkin	cucumber	
Osun	tomato	GLV	cucumber	
Oyo	GLV	onion	pepper	

GLV = green leafy vegetables.

Data collection and analysis

Information was collected through a combination of literature, secondary data, and primary data. Both academic literature and relevant grey literature was used. Secondary data was used from various sources like the National Bureau of Statistics (NBS), FAOstat, the National Agricultural Statistical Survey (NASS) from 2012, and from the Living Standards Survey (LSMSS) for the Southwest states.

Primary data was collected by key informant interviews (KIIs) and focus group discussions (FGDs) conducted in each of the six states. Stakeholders were identified using a stakeholder analysis matrix to create an overview of who is active in which part of the horticulture value chain and the wider food system. Key informants included government officials, agricultural extension officers, midstream actors, and farmers, while the FGDs comprised diverse groups of farmers and other stakeholders within the horticulture sector. In total 209 people were engaged in the KIIs and FGDs. In each state three FGDs (including young and women producers) were done including eight respondents each (total FGD participants per state n=24) and ten KIIs were conducted (see Annex 9.1.2). The data obtained was assessed on a per-state basis to capture the unique insights and challenges faced by each state. It included the following steps:

- Transcription: Interviews and discussions were transcribed literally, and relevant themes and statements were identified.
- Thematic analysis: The data were subjected to thematic analysis to identify common patterns and unique issues within each state's horticultural sector.
- Comparative analysis: Insights from the state-specific analyses were then compared using different food system lenses, including sustainability, economic viability, social inclusivity, and food security. This comparative analysis highlighted both common challenges and state-specific nuances, enabling a comprehensive understanding of the horticultural landscape in the Southwest.
- Synthesis of findings: The comparative analysis provided a basis for synthesizing the findings across all six states. This synthesis was crucial for identifying overarching themes, regional trends, and policy implications for the horticulture sector.

Phase 2: Scenario development and backcasting

Scenario development
Foresight and participatory scenario development workshops were conducted to explore the possible futures of the horticulture sector in each of the six states in the Southwest. The overall purpose was to devise pathways for local/regional stakeholders to strengthen the horticultural sector to produce safe and nutritious foods, and to identify which possible futures could be identified from their perspectives. The objectives of the workshops were as follows.

1. Consolidate an understanding of the different aspects of the horticulture sector and how they connect to the overall food system in the region.
2. Understand foresight and scenario analysis as a framework for exploring change and the implications for the interests of different actors.
3. Experience the value of using participatory tools for engaging stakeholders.
4. Develop general scenarios for strengthening the horticulture sector which can be built upon to guide the road map development.

Three one day workshops were conducted covering stakeholders from all six states: Workshop 1 (Lagos and Ogun), Workshop 2 (Oyo and Osun), Workshop 3 (Ondo and Ekiti). Annex 9.2 provides details of the agenda, together with the types and numbers of participants involved. In total 112 people participated in the workshops (78 men (70%) and 34 women (30%)), each state being represented by between 16-21 people to include a representative sample of stakeholder types including young people. Over 50% of the participants were farmers or farmers enterprises. Phase 1 results were used to determine perceived system drivers, challenges, and key trends for each of the states. These results were used to identify the critical uncertainties for the future of horticulture in SW Nigeria. Future aspirations highlighted were business structures, (affordable) healthy diets, and sustainability, because they represent key challenges in the face of population growth and urbanization. The timeframe of 2045 was chosen, because 20 years is roughly equivalent to one generation being born and growing up to become young adults.

For the identification of plausible futures, a two-by-two scenario matrix was used (see figure 3.1). In subgroups participants identified key features for each of the four quadrants and developed narratives for each scenario showing what that future could look like. Each of these were then presented and discussed in plenary with other participants, followed by voting on which was considered most desirable together with justifications.

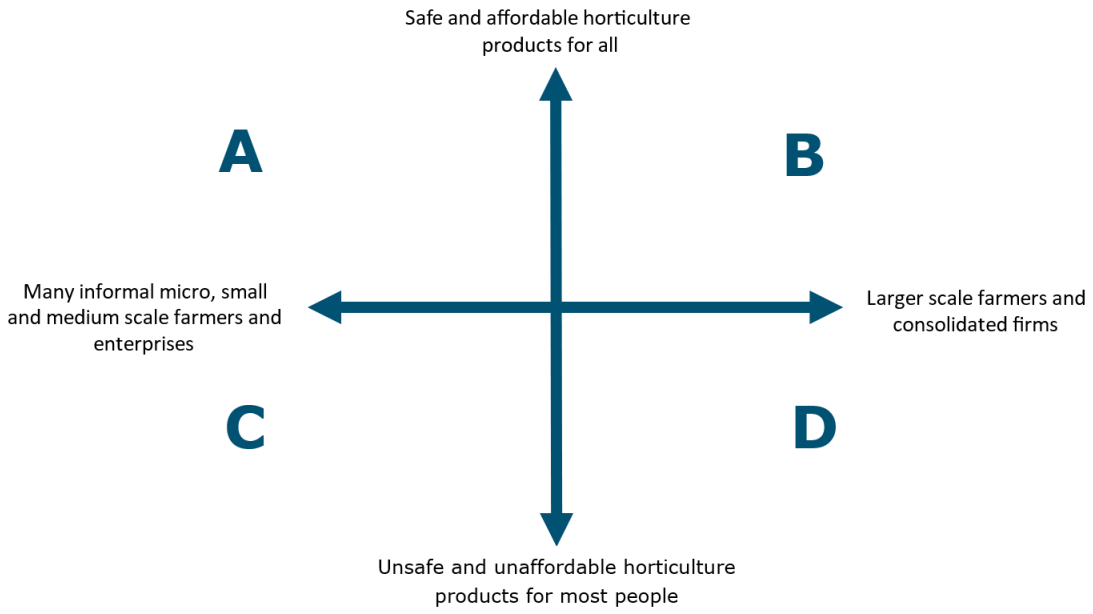


Figure 3.1 *Scenario matrix guiding scenario development*

The team collected and synthesised all workshop output and summarized the scenarios by scenario and by state. Next, the most desired scenario was selected to set out in more detail using a food systems framework (Van Berkum et al, 2018; Borman et al., 2022). This was shared for validation in an online session, during which stakeholders provided more specific feedback on what they saw as key activities for the coming five years. This formed the basis for the backcasting exercise.

Backcasting
Using the current situation, the 2045 desired scenario, and the input around short-term recommended activities, 2030 milestones were developed.

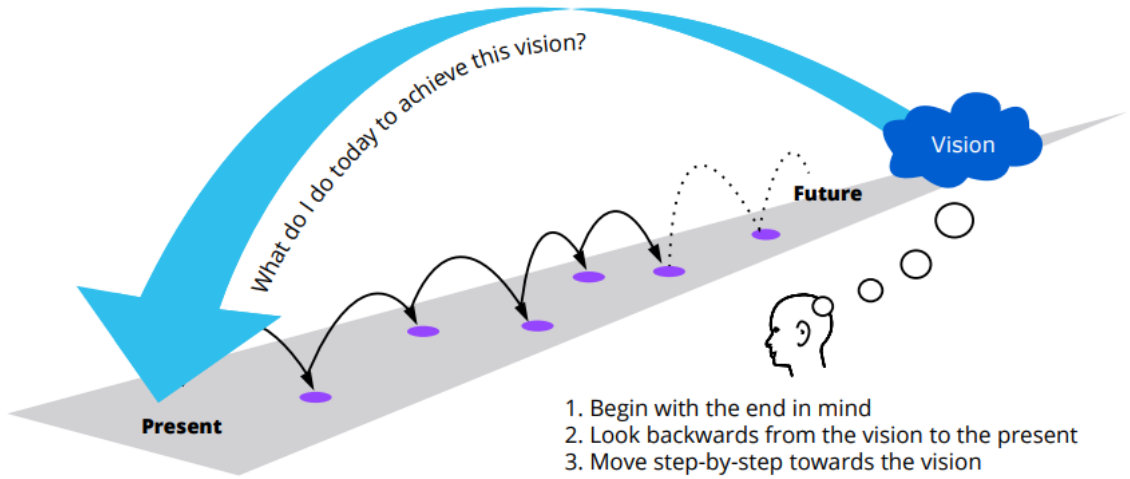


Figure 3.2 *Backcasting process*
Source: The Natural Step (2011).

Inspired by the ABCD backcasting approach[2] (figure 3.2) we developed a tailored approach whereby we used the scenario workshops to build a shared understanding of the horticulture sector (awareness creation and visioning) through examining in interactive workshops the ecological, social, and economic trends. Participants envisioned a future 20 years ahead, identifying goals that may require transformative changes. These scenarios informed rethinking practices and pinpoint entry points for change. The results were summarized and consolidated into narratives.

The baseline mapping was done in Phase 1, analysing products, services, crops, the political economy challenges, and opportunities in the horticulture sector. The assessment also examined social context and organizational structure to identify ways to introduce positive change. These baseline findings were used to analyze scenarios and assess implications, and were fed into synthesis scenario narratives and phase 1 results.

In an (online) validation workshop milestones were defined through identifying key conditions. Next, actions were identified and prioritized including identifying key conditions for strengthening the horticulture sector in Southwest Nigeria, focusing on crop selection, market flows, and enabling environments. Based on milestones and actions, key areas for change were described.

Phase 3: Roadmap – recommendations and activities
On the basis of the aggregated information from the first two phases, seven key areas were developed with specific recommendations and activities, tied to stakeholder types. This was drafted, discussed, and validated with key stakeholders through one-to-one interviews. A final stakeholders workshop was organised to discuss, validate and prioritise the recommendations and activities. The results were also presented during an in-person workshop to invited stakeholders, during which the final points of feedback were incorporated into the report.

[2] https://www.thenaturalstep.de/solution/abcd-process/

3.2 Methodological considerations

The strength of this study was its mixed methods and phased design allowing for data and methodological triangulation. The study was based on extensive primary data collection with stakeholders across all six states as well as from other parts of the country involved in the region, without which the granularity and nuance of the sector would not have been captured. Stakeholders were selected from across all backgrounds, including the Nigerian private sector, state and federal government, financial institutions, farming and producer organizations, research institutes, civil society, along with Dutch private and public sector actors.

There were also a number of limitations during each phase, as follows;
Phase 1: National, regional and sector-specific data were inconsistent and often only collected years earlier. The team drew on these resources where necessary and attempted to cross-correlate with feedback during interviews, FGDs, and workshops to confirm or adjust that information, in order to provide a more up-to-date and robust picture of the current situation of the horticulture sector.
Phase 2: While the workshops were well-attended, not all key stakeholders were represented in all workshops. This was due to a combination of lack of availability of staff as well as lack of representation of certain stakeholder types in each of the states.
Phase 3: Not all stakeholder types attended the online workshop to provide input on key activities for 2025-2030. While especially Dutch businesses and supporting organizations were consulted during 1-1 interviews, the overall result may have been different had they also participated in the group exercise.

4 Broader Southwest trends

4.1 Chapter highlights

In terms of overall outlook the Southwest region has clear macroeconomic potential for developing the horticulture sector. However, challenges such as low food security and an uneven business environment must be addressed. In the short term more opportunities lie in Lagos, Ogun and Oyo, given their relatively advanced urbanization and commercialization.

- Economically Oyo, Ogun, and Lagos are more commercialized, while Ekiti, Ondo, and Osun remain more dependent on agriculture as an income source.
- Population growth in the Southwest region is as high as the national average. A growing middle class in cities is driving increased food demand, including for healthier diets.
- All six Southwest states are urbanizing, albeit at difference paces; Oyo, Ogun, and Lagos lead in urbanization and commercialization compared to other states in the region.
- Nutrition and food security levels vary across the states but remain low overall. The demand for healthier diets is increasing, driven by urban middle-class growth.
- The ease of doing business is improving on paper, but challenges persist in practice, including inflationary costs, corruption, and security concerns, particularly of concern for foreign businesses.

4.2 Current situation and expected outlook

4.2.1 Economic context

Lagos is Nigeria's economic powerhouse, contributing about 20% to the nation's GDP. The state's economy is diverse, with major sectors including finance, manufacturing, telecommunications, and oil & gas. The Lagos State Government's policies aim to transform Lagos into a smart city, driving innovation and infrastructure development. By contrast, the other Southwest states jointly contribute 8-10% to the nation's GDP (see table 4.1).

- Ekiti's economy is primarily agrarian, with agriculture contributing significantly to its GDP (about 40%). The state is known for the production of cocoa, yams, cassava, and palm oil. Efforts are being made to diversify the economy through tourism and small-scale manufacturing.
- Ondo's economy, like Ekiti's, has a strong contribution from agriculture (43%). It is a leading producer of cocoa, rubber, and palm oil, and has significant oil reserves.
- Oyo has a mixed economy with significant contributions from agriculture, trade, and manufacturing. The state's strategic location and rich agricultural land make it a hub for food production and distribution.
- Osun's economy is driven by agriculture, mining, and commerce. The state is a major producer of cocoa, palm oil, and cashew nuts. There are also significant deposits of gold and other minerals.
- Ogun's economy is service-based but also has strong contributions from industry and agriculture. The state has become a major industrial and service hub, attracting manufacturing companies due to its proximity to Lagos and access to good road networks.

Table 4.1 *GDP of the Southwest states and contributions of various sectors in billion Naira (selection of most recent data available from different years)*

	2017				2022
	GDP	Agri	Industry	Services	GDP
Ekiti	1,390	555	193	642	2,347
Ogun	2,810	754	848	1,207	5,026
Ondo	2,933	1,251	671	1,011	5,102
Oyo	2,506	607	428	1,472	3,654
Osun	1,470	507	141	822	2,300
Share of the 5 states	11,109	3,674	2,281	5,154	18,429
National GDP	113,711	23,952	25,639	64,120	164,410
Joint contribution to the national GDP	10%	15%	9%	8%	11%
Contribution of Lagos to the national GDP	20%	0.7%*	9.3%*	90%*	25%

Source: NBS (2019); BudgIT (2022).

4.2.2 Population

Based on current trends, the national population will grow tenfold between 1950 (37 million) and 2050 (377 million). Today it is 227 million, of which 63% are 24 years or under.[3] Almost 20% of the Nigerian population lives in the Southwest.

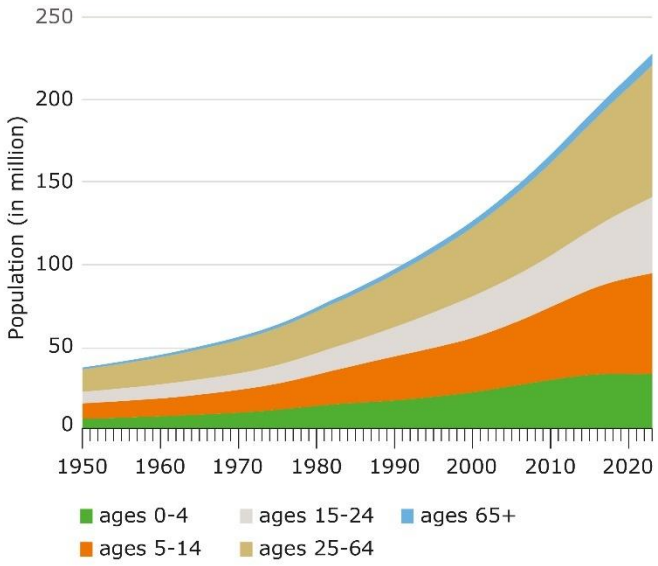


Figure 4.11 *Population by age group in Nigeria*
Source: Lagos State Government Website.

Lagos is the most populous state in Nigeria, with an estimated population of over 24 million[4] people, and forecasts estimate that this number will exceed 30 million by 2030 due to high birth rates and internal migration. The population of Ogun is growing at a similar rate to that of Lagos (see table 4.2). While Oyo's population is growing less quickly, these three states all have a higher total, and urban, population by comparison to Osun, Ondo and Ekiti.

[3] https://ourworldindata.org/population-growth

[4] Source: https://lagosstate.gov.ng/about-lagos/. Figures vary on the size of Lagos City and Lagos State due to differing definitions, demarcation of city limits and formal vs. informal urbanization trends. This figures refers to Lagos State, which also includes other cities besides Lagos City (as referred to in table 4.2).

Table 4.12 *Population growth of states and major cities, 2006-2023*

State	2006	2023	2006-2023 growth	Major cities by state (2023)		Urban population as % of state population
Lagos	9,113,605	15,772,884	73%	Lagos city	15,388,000	98%
Oyo	5,580,894	7,512,855	35%	Ibadan	3,649,000	67%
				Oyo	736,072	
				Ogbomoso	433,030	
				Saki	178,677	
Ogun	3,751,140	6,445,275	72%	Ifo	985,320	64%
				Abeokuta	820,700	
				Sagamu	467,620	
				Agbara	458,740	
				Mowe/Ibafo	429,590	
				Sango Ota	358,620	
				Owode/Ilaro	307,630	
				Ijebu Ode	287,210	
Osun	3,416,959	4,237,396	24%	Ile-Ife	560,000	47%
				Osogbo	645,000	
				Ilesa	325,000	
				Iwo	250,443	
				Ikire	222,160	
Ondo	3,460,870	5,469,707	58%	Akure	730,000	34%
				Ikare	465,000	
				Ondo Town	375,000	
				Owo	276,574	
Ekiti	2,398,957	3,398,177	42%	Ado Ekiti	435,000	27%
				Efon-Alaaye	279,319	
				Ise-Ekiti	190,063	

Sources: NBS; Worldometers.

4.2.3 Urbanization

Besides a young population, the urbanization level is also high. Nationally urbanization is estimated at 30% per year on average. Since 2018 more than half the population has lived in cities and by 2050 it is forecast to reach 70% (see figures 4.2a and b). Lagos is the most urbanized state in Nigeria, with nearly all of its population residing in urban areas. The state's rapid urbanization is driven by its status as an economic hub. The government is addressing the challenges of urbanization by investing in infrastructure, housing, and transportation to manage the city's growth and improve the quality of life for residents. Ekiti is predominantly rural, with urbanization occurring slowly. The capital, Ado Ekiti, is the primary urban centre. The state government is focusing on urban development plans to stimulate economic activities and improve living conditions in urban areas. Oyo has a balanced urban-rural population distribution. Ibadan is one of the largest cities in Nigeria and a significant urban centre. The state is investing in urban infrastructure and services to accommodate the growing urban population and enhance economic development. Osun is predominantly rural, with urbanization centred around cities like Osogbo, the capital. The state government is implementing urban renewal projects to modernize infrastructure and improve the living standards in urban areas. Ondo has a growing urban population, with major urban centres like Akure. Urbanization in Ondo is driven by its economic activities in agriculture and oil. The state is investing in urban infrastructure to support its expanding urban population and economic growth. Ogun is experiencing urbanization, particularly in cities like Abeokuta and Ota. The state's proximity to Lagos makes it an attractive location for industrial development and urban expansion. The state government is focusing on improving urban infrastructure and services to manage urban growth effectively.

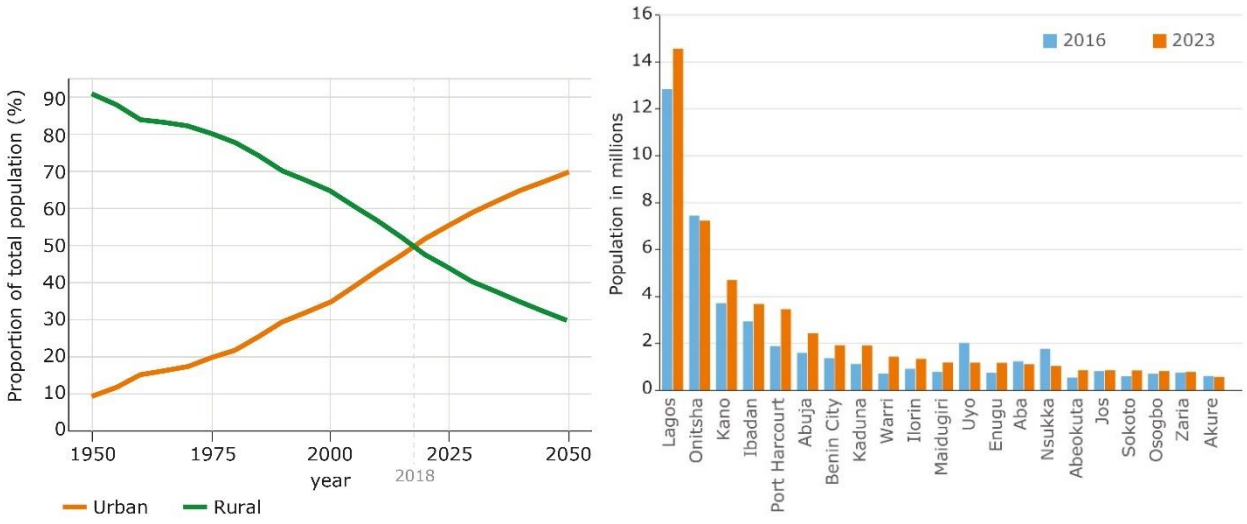


Figure 4.2 *A) Population in urban and rural areas; B) Population of largest cities 2016-2023*
Source: Maziyza-Dixon et al. (2021).

4.2.4 Nutrition status and food security

Nigeria is experiencing multiple malnutrition burdens, where undernutrition, including micronutrient deficiencies, exists alongside overweight, obesity, and associated diet-related non-communicable diseases. Data show that 37% of children under five years of age are stunted while 68% suffer some degree of anaemia. Overweight and obesity are also common among adults with a prevalence rate of about 33% (Maziya-Dixon et al., 2021). Research indicates that barriers to healthy food consumption of urban Nigerians include lack of availability, lack of convenience and food safety issues (Hollinger and Staatz, 2015; Raaijmakers et al., 2018).

Beyond inadequately balanced diets, trends in SW Nigeria are concerning in terms of food insecurity. In all six states at least a third of the population indicated sometimes not having access to enough food (see figure 4.3). While overall Lagos is relatively food secure due to its diversified economy and extensive markets, it still has food insecurity, concentrated in particularly low-income areas. Ekiti faces the greatest challenges in nutrition and food security, especially among children. All six states indicate that they have initiatives to address at least basic food security, and sometimes nutritional access and achieving balanced diets; these include boosting (urban) agricultural production and food distribution programmes, targeted support to vulnerable populations including children and pregnant women, and awareness raising through education.

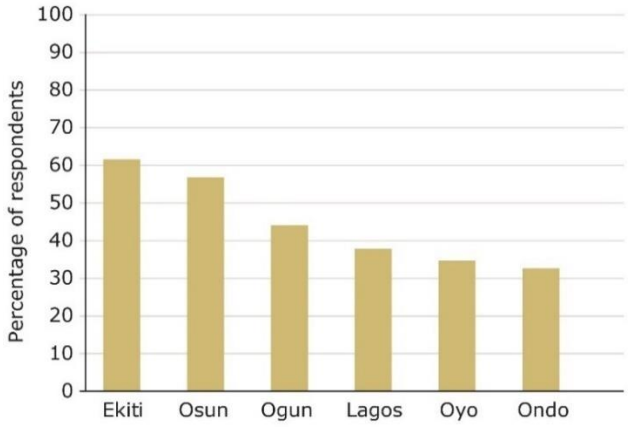


Figure 4.3 *Share of the respondents that did not have enough food*
Source: NBS (2021).

4.2.5 The enabling business environment

As a proxy for the enabling environment, we used the doing business indicators measured by the Presidential Enabling Business Environment Council (PEBEC) in the Subnational Ease of Doing Business Report (PEBEC, 2023). The report addresses the ease of doing business across 6 indicators and 16 sub-indicators. Lagos ranks below the national average in terms of ease of doing business in Nigeria, despite its developed infrastructure, financial services, and port facilities. The government continues to implement reforms to reduce bureaucratic hurdles and improve business regulations. The ease of doing business in Ekiti is improving, with initiatives to streamline business registration and attract investment in agriculture and tourism. However, infrastructure development remains a critical area for improvement. Oyo has been improving its business environment, focusing on reducing regulatory burdens and enhancing infrastructure. The state is also promoting public-private partnerships to boost economic activities but remains on the lower part of the nation's score. Osun has been working to improve its business climate by simplifying business processes and investing in infrastructure (going slightly up from 5.57 in 2021 to 5.73 in 2023). The overall business environment performance score for Ondo have weakened from 6.16 to 5.67 due to lower scores on most indicators. However, reforms are underway to improve infrastructure to attract more investors. In Ogun the local government continues to implement reforms to attract investment and improve infrastructure (PEBEC, 2023).

Figure 4.4 *Ease of doing business 2021-2023*
Source: PEBEC (2023).

5 The Southwest horticulture sector in 2024

5.1 Chapter highlights

Southwestern consumers remain dependent on the Northern states, particularly Kano and Kaduna, for key horticultural crops (tomatoes, onions, peppers), sourcing 80% on an annual basis. This comes in part from Northern states investing more in large scale irrigation schemes. However, looking more closely by season, rural/urban and crop type reveals the following;

- The major cities of Southwest are dependent year-round on Northern horticultural supplies.
- During the rainy? season rural communities are largely self-sufficient (e.g. subsistence). The rural communities also supply cities in the region during the wet season, directly as well as via Mile 12 (e.g. originating from surplus or commercially oriented agripreneurs).
- While Southwest states depend on the North for tomato, onion and sweet pepper, especially in the dry season, they produce enough cucumber and various green leafy vegetables (especially many indigenous varieties) to meet demand throughout the year.
- Lagos depends on Mile 12 market throughout the year. Other SW cities are only seasonally dependent on this major market hub and even supply it with produce in the wet season.
- Southwest states already have several more commercially oriented production areas near urban centres. During the wet season these supply most Southwest cities, making them much less dependent on Northern produce.
- As urban commercial centres grow in other SW states, and digital platforms connect producers and retailers/consumers, this dependence on Northern produce will decline, enabling retailers and consumers to source from multiple locations.

The findings illustrate that

1. Southwest can produce enough to meet demand but is limited by lack of investments to raise and extend production (inputs, irrigation, protected cultivation), and supply chain transport and storage (bespoke crates, vehicles, temperature controlled).
2. Despite lack of public investment, small-scale businesses and SMEs are already taking the initiative to locate in peri-urban areas and supply cities throughout the region.
3. Commercially-oriented farming is more prevalent in Lagos, Oyo and Ogun.

5.2 Horticulture in Nigeria and the Southwest

The production area for vegetables has slightly increased since 2018. The produced volume of vegetables has increased due to increasing the production area, rather than an improvement in the yield per hectare. The key crops in terms of volume produced are tomatoes, okra and onion, while tomatoes, pepper and onion are the most important ingredients for making most Nigerian meals. Table 5.1 gives an overview of the most important crops.

It is estimated that, together, the states of Kaduna, Kano and Jos Plateau produce over half of the tomatoes and onions in Nigeria. Figure 5.1 presents the share of production of selected crops for each state (by percentage of total tonnes produced). This data was collected by the National Agricultural Statistics Service in 2011, but the relative differences observed between the states are likely to still be representative.

Table 5.11 *Vegetable production in Nigeria*

		2018	2019	2020	2021	2022
Carrots and turnips	Area harvested (ha)	26,902	26,867	26,751	26,743	26,736
	Production (T)	237,480	238,128	237,303	237,628	237,952
	Yield (kg/ha)	88,275	88,633	88,709	88,855	89,002
Chillies and peppers, green (Capsicum spp. and Pimenta spp.)	Area harvested (ha)	101,817	102,531	102,442	103,049	103,661
	Production (T)	762,632	767,574	766,624	768,654	770,683
	Yield (kg/ha)	74,902	74,863	74,835	74,591	74,347
Green corn (maize)	Area harvested (ha)	198,650	199,476	200,443	201,509	202,717
	Production (T)	766,468	774,578	778,788	786,662	780,009
	Yield (kg/ha)	38,584	38,831	38,853	39,039	38,478
Green garlic	Area harvested (ha)	138	98	169	165	172
	Production (T)	1,800	1,275.52	2,208.08	2,154.06	2,249.74
	Yield (kg/ha)	130,583	130,619	130,628	130,655	130,681
Okra	Area harvested (ha)	1,357,067	1,463,373	1,473,150	1,567,439	1,911,037
	Production (T)	1,692,881	1,751,216	1,758,180	1,803,030	1,911,818
	Yield (kg/ha)	12,475	11,967	11,935	11,503	10,004
Onions and shallots, dry (excluding dehydrated)	Area harvested (ha)	549,890	568,225	589,610	595,850	596,146
	Production (T)	1,416,960	1,464,280	1,517,270	1,534,430	1,554,965
	Yield (kg/ha)	25,768	25,769	25,733	25,752	26,084
Onions and shallots, green	Area harvested (ha)	14,235	14,097	14,141	14,157	14,132
	Production (T)	233,681	244,743	244,444	240,956	243,381
	Yield (kg/ha)	164,164	173,616	172,864	170,198	172,224
Other vegetables, fresh n.e.c.	Area harvested (ha)	760,614	776,486	761,519	766,206	768,070
	Production (T)	6,892,725.70	6,882,495	6,939,176	6,904,798	6,908,823
	Yield (kg/ha)	90,621	88,636	91,123	90,117	89,950
Tomatoes	Area harvested (ha)	842,734	759,043	766,445	809,602	702,275
	Production (T)	3,500,000	3,449,022	3,390,170	3,477,981	3,684,566
	Yield (kg/ha)	41,531	45,439	44,232	42,959	52,466
Vegetables total	Area harvested (ha)	3,852,049	3,910,196	3,934,670	4,084,721	4,324,947
	Production (T)	15,504,629	15,573,313	15,634,165	15,756,295	16,094,451
	Yield (kg/ha)	40,250	39,827	39,734	38,574	37,213

Source: FAOstat.

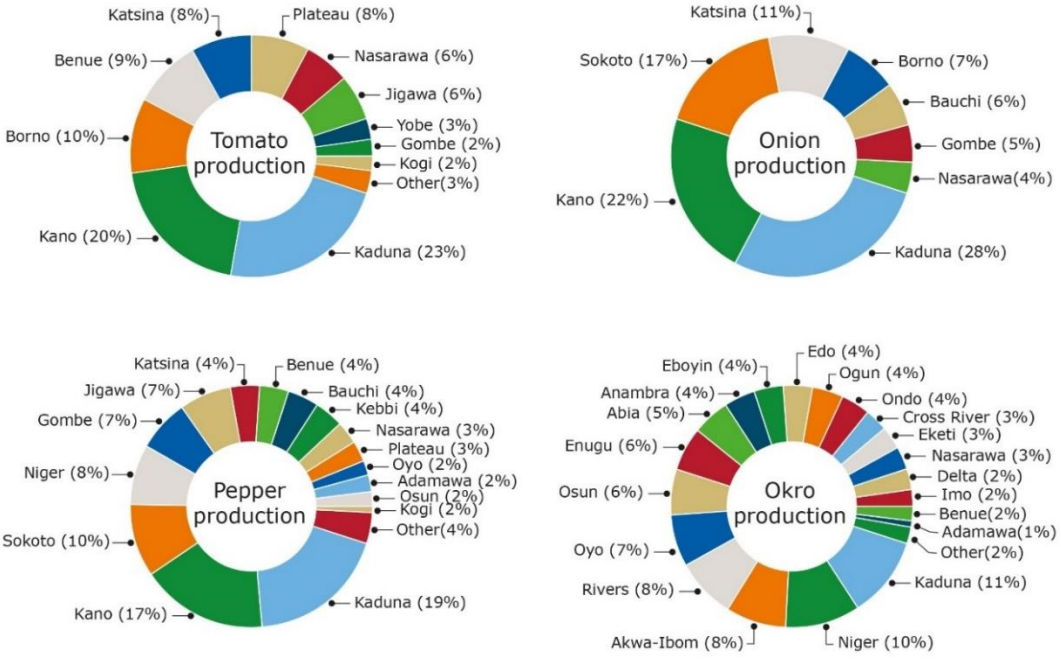


Figure 5.11 *Division of different crops produced per state, in % of total tonnes*
Source: NASS (2011).

Box 5.1 Nigeria's production, consumption, and healthy diet

It is challenging to determine recommended production figures of specific horticultural produce for the Southwest region, in part because while the data exists it is dispersed across markets, producers and traders and is not aggregated and presented back to the sector (one of the activities in the first key recommendation aims to address this – see section 7). However, broad-based studies reveal the following:

Nationally, consumption of vegetables differs between rural and urban areas, at respectively 87g/day and 110.2g/day, though neither meet the recommended intake of 240g/day as part of a healthy diet.[5] This consumption shortfall is not due to national production, as the estimated availability of vegetables per capita is 181.4g/day.[6] It is more likely to be due to a combination of consumer awareness, accessibility and affordability (Boy et al., 2024). Also, given the nature of these perishable goods, post-harvest losses in transport and storage are also considerable.

Shifting to the **Southwest**, a rough estimate of production requirements can be made for the coming five years; assuming the Southwest population will continue to grow at 1.9%, the six states will have almost 50 million mouths to feed by 2030. Using current and recommended vegetable consumption rates, together with an average post-harvest loss of 25%, shows that to meet existing demand the Southwest would need to produce 1.5m tonnes annually. However, assuming with rising urbanization and consumer awareness that this demand will go up towards the recommended intake over the coming five years, demand could rise to almost 4.3m tonnes by 2030, or as much as 5.4m tonnes taking post-harvest losses into account (see figure 5.2). However, this perceived demand and where traders prefer to source from will be strongly determined by consumer preferences and the cost of production. Southwestern stakeholders will need to take this into account in setting meaningful production targets for the coming years.

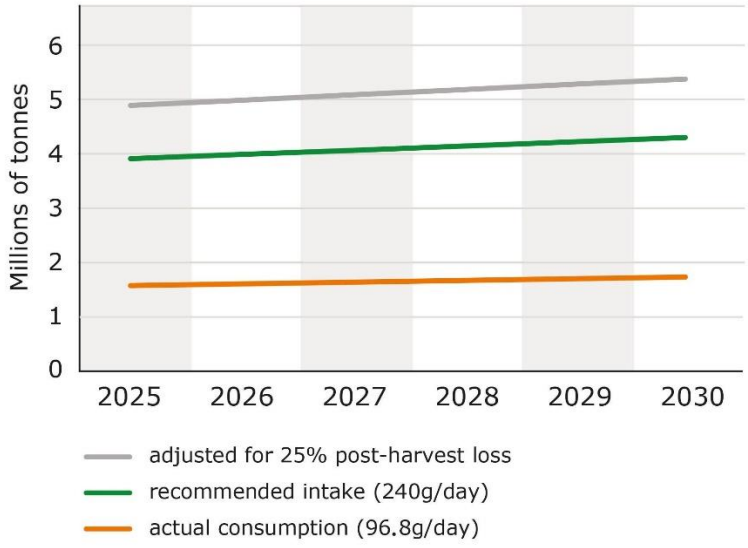


Figure 5.2 *Production forecasts for Southwest region*
Source: future trends extrapolated by authors based on past trends and figures to-date.

Tomatoes are produced in most states in Nigeria, but especially in Kaduna and Kano, which jointly produce more than 50% of all tomatoes in the country. In the Northern states they are grown using irrigation systems, while in the Southwest part of the country they are grown on small plots under rain-fed conditions (Ayandiji and Adeniyi Omidiji, 2011). Most peppers (36%) and onions (50%) are produced in Kaduna and Kano. The two major pepper species grown in Nigeria are *capsicum annuum* (bell pepper, cayenne, chili) and *capsicum frutescens* (elongated chili or bird chili). The types of pepper suitable for commercial production in the country are the large fruited sweet pepper, the medium corrugated fruited hot pepper, and the small-fruited chilli/red pepper. Most production of peppers and onions is done by smallholders. Onion production is limited to the northern part of Nigeria. The dominant states involved in the production of onions are Kaduna, Kano and Sokoto.

[5] Global Burden of Disease https://www.healthdata.org/research-analysis/gbd
[6] Food systems dashboard. https://www.foodsystemsdashboard.org/indicators/food-environments/food-availability/availability-of-vegetables/map

The northern parts of the country are facing outbreaks of violence, and this posed serious risks for the production of vegetables (Plaisier et al., 2019; Akanwas et al., 2023). The risks faced during transportation are also a concern (Purokayo and Stephen, 2022). Many stakeholders in the Southwest argue that producing in the Southwest contributes to a more secure supply of food and that this offers opportunities for further development of the sector.

Key horticultural crops in the Southwest include vegetables (tomatoes, peppers, onions, and leafy greens), fruits (bananas, pineapples, mangoes, oranges, and watermelons), and tubers (yams and sweet potatoes). The horticultural sector in Southwest Nigeria is predominantly made up of smallholder farmers, who cultivate small plots of land typically under 2 ha (Chiaka et al., 2022) using traditional farming methods. There is however a gradual shift towards commercial farming. Urban farming is also emerging, particularly in Lagos, driven by the high demand for fresh produce and limited space, leading to the use of greenhouses (RVO, 2022).

5.3 Flow mapping

This section looks at general trends in flow of produce, with key trends summarized in two maps covering the wet and dry seasons – see maps 5.1 and 5.2, and additional details in table 5.2.

5.3.1 Market channels

Horticultural produce in Southwest Nigeria is primarily sold in local markets, which serve as the main distribution channels for fresh vegetables (RVO, 2019). The major markets in the Southwest, such as Mile 12 in Lagos and Shasha Market in Ibadan, serve as wholesale hubs that attract farmers, dealers, and wholesalers. Wholesale traders and retailers meet in informal markets. After arrival at the wholesale market, the produce is sold to retailers, usually women. In Lagos alone, there are more than 30 informal markets. Every neighbourhood has its own fresh produce market. Buyers purchase produce from Mile 12 and offer it for resale in neighbourhood markets throughout Lagos and Ibadan. Most of these resellers are also women (93%) and are aged between 31 and 40 (58%). They completed primary education (79%) and 50% of them have 6 to 10 years of retail experience (Adeoye et al., 2009). This market channel includes convenience stores and small groceries (e.g. corner shops). With a population of over 3 million, Ibadan has Shasha and Bodija as the main informal (wholesale) markets. The leading wholesale market, Mile 12, is highly organised and has an important role in organising the sector. It is by far the biggest in Southwest Nigeria and has been in business for over 40 years (see box 5.2). As an alternative, the Lagos State government aims to develop the Lagos Central Food Logistics Hub, situated in Ketu-Ereyun, Epe, to facilitate urban trade (see box 5.3). Some studies report various forms of exploitative behaviour and even the formation of cartels in the markets (RVO, 2019).

Availability of produce-specific packaging and transportation solutions is often inadequate, leading to the delivery of produce that is often not safe to eat or of good quality. Plastic crates (to reduce post-harvest losses) are increasingly being adopted for north to Southwest transportation, but this has only just started within the Southwest.

There is also an emerging trend of supermarket chains and grocery stores sourcing directly from local farmers, ensuring a steady supply of fresh produce. Next to this, there are various online platforms and social media initiatives that enable producers to connect to markets. This trend is mainly observed in Lagos and nearby states. For example, an Ogun farmer mentioned that they are increasingly leveraging digital channels to expand their customer base and ensure steady sales of their produce. Integrated value chain concepts, such as one-stop shops as alternative supply models, are emerging in Lagos. These short value chains, linking farmers and consumers are increasing due to tech developers and investors coming from outside the sector that can introduce novel technologies that enable home delivery and other forms of market innovation.
Export markets of tomatoes and onion are also important, with some traders exporting to neighbouring West African countries such as Benin.

Box 5.2 Mile 12 market

Mile 12 market in Lagos, established in 1977, is a crucial hub within Nigeria's food system. It plays a key role in distributing fresh produce, primarily sourced from the Northern regions to various parts of Lagos. The market serves as a central point for the city's food supply chain, ensuring that a wide range of agricultural products reaches consumers daily. The market is located along Ikorodu Road on space comparable to a football field. However, many activities are also carried out outside the walls of the market. The market environment operates under challenging conditions, including severe traffic congestion, poor sanitation, and environmental degradation. These issues are exacerbated by a lack of adequate infrastructure, particularly in storage and transportation, leading to significant food wastage and public health concerns.

The market's chaotic environment stems from unregulated activities and insufficient government oversight, contributing to a poor infrastructure. The market is estimated to have over 500,000 regular traders daily trading on different commodities, including traders from neighbouring countries like Togo, Benin, Ghana, and Cameroon. The market serves as a key source of tax revenue for Lagos. Traders and consumers alike navigate narrow, congested spaces amidst heaps of waste, making the market a hotspot for potential health hazards. Despite its critical role in ensuring food security, the market's deteriorating conditions threaten its long-term viability.

Efforts to modernize Mile 12 could serve as a template for broader reforms in Nigeria's food system. Improving infrastructure, enhancing regulatory frameworks, and introducing sustainable practices could significantly reduce food wastage, improve public health outcomes, and secure the livelihoods of millions who depend on such markets.

Source: Field interviews and Guardian Nigeria (2016).

Box 5.3 Lagos Central Food Logistics Hub

The Lagos Central Food Logistics Hub, situated in Ketu-Ereyun, Epe, spans 120 hectares and represents a cornerstone of Lagos State's five-year Agricultural and Food Systems Roadmap (2021–2025). This ambitious project is designed to enhance food security and tackle critical challenges such as post-harvest losses. According to its developers, the hub aims to scale up Lagos' food self-sufficiency while solidifying the state's position as a leading agricultural hub in West Africa.

Scheduled for completion in the final quarter of 2024, the project is a public-private partnership utilizing a Design-Build-Finance-Operate-Transfer (DBFOT) model. This approach enables the government to collaborate with private investors to develop vital infrastructure without assuming the entire financial burden upfront, while the private sector benefits from managing and operating the facility.

The hub is designed to accommodate over 1,500 trucks daily, facilitating the efficient transport of produce from farms to markets and processing centres. It will feature state-of-the-art storage solutions, including cold rooms and processing facilities, all powered by a reliable off-grid energy system.

Upon completion, the hub is expected to directly benefit more than 5 million farmers along the agricultural value chain and ensure continuous food supplies for over 10 million residents for at least 90 days during periods of scarcity. By reducing post-harvest losses, cutting out intermediaries, and improving access to modern processing facilities, the project aims to transform Lagos' agricultural landscape and strengthen its food security.

Source: Lagos State Ministry of Agriculture and Food Systems (2023); Origin Tech Group (2024).

5.3.2 Seasonality

Most of the vegetables consumed in the Southwest are sourced from the northern states, accounting for over 80% of the total supply. The remaining 20% comes from the Southwest states, as stated by various aggregators. Vegetable production is influenced by the region's rainfall pattern, with two main growing seasons:

The wet or rainy season, from May to October, provides ample water for crop cultivation and is the primary growing period for most horticultural crops in the Southwest. During the rainy season, vegetable production is at its peak, driven by the availability of water for cultivation. In the wet season, the Southwest relies on regional farms to satisfy mat needs. By contrast, northern parts of the country face serious pest and disease pressures during the rainy season, making cultivation much more challenging.

The dry season, from November to April, poses more challenges due to reduced water availability. Adoption of irrigation remains limited in the Southwest. In the dry season, the lack of irrigation systems results in a heavy reliance on vegetable imports from northern Nigeria, where extensive public irrigation schemes allow continuous production. Produce from the north travels around 1,000 kilometres to reach southern urban markets. Additionally, the Southwest imports vegetables from neighbouring countries, such as Togo and the Republic of Benin, to meet consumer demand.

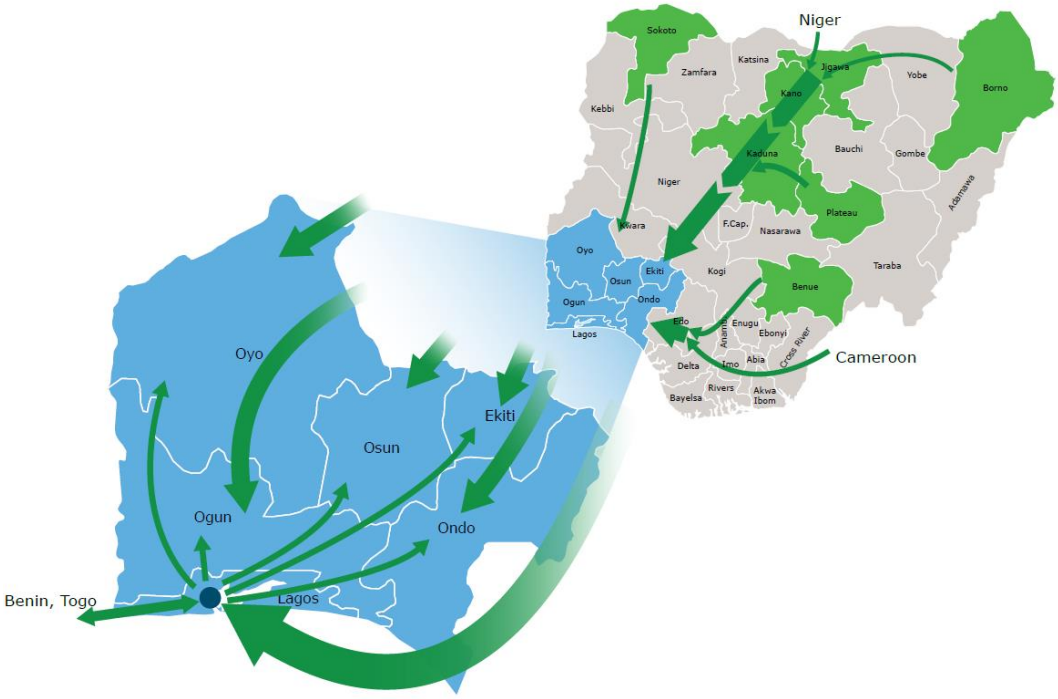
Certain vegetables, particularly highly perishable products like green leafy vegetables (GLVs) and, to some extent, cucumbers, are produced year-round in peri-urban areas closer to the final markets in the Southwest. Additionally, neighbouring countries sometimes act as a source of tomatoes for the main markets in the Southwest in the off season, and the Niger Republic is an important source of onions during the dry season. However, these sources are not always reliable due to border restrictions.

5.3.3 The value chain: product flow visualization

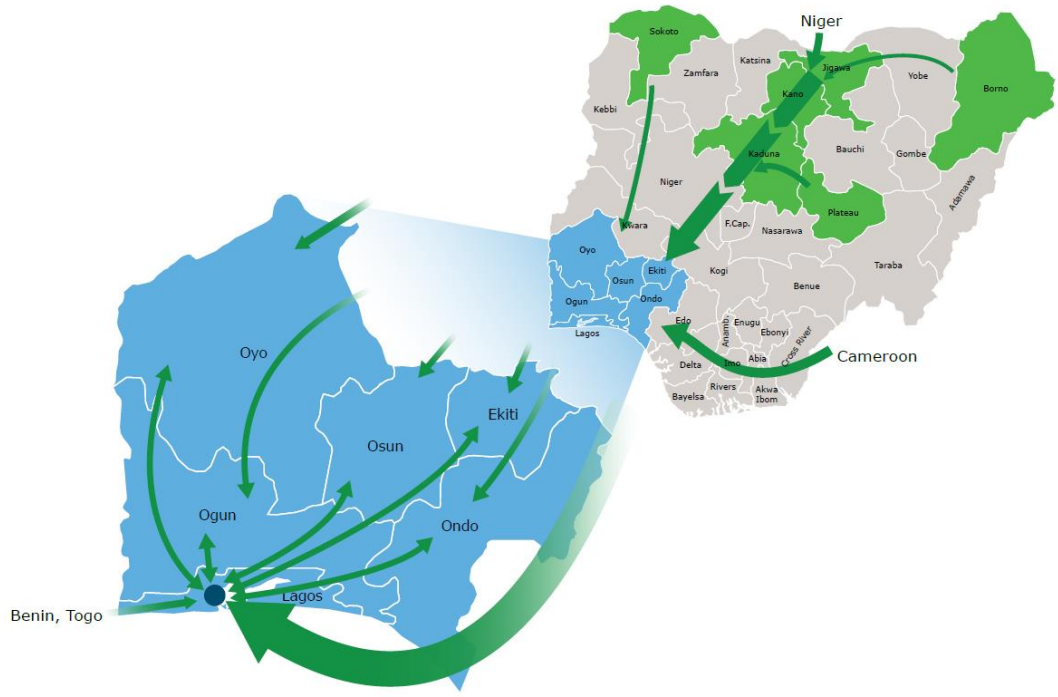
Based on the identified market channels and the observed crop production seasons we have visualized the product flow map in the dry and wet seasons (thickness of arrows is indicative of amount of produce). Additional details of changing flows can be found in table 5.3.

Table 5.3 *General and produce-specific trends during wet and dry seasons*

	Wet season (May-October)	Dry season (November-April)
General flow trends	Almost all of what the SW states produce in wet season is consumed directly (e.g. subsistence) and via local and regional markets (markets within the states), though some also reaches Mile 12. Lagos remains dependent on the North throughout the year for key crops (tomatoes, peppers, and onions) which come to the city via Mile 12. To a lesser degree, major cities like Ibadan and Abeokuta also rely on supply from the North to supplement SW regional sourcing. In rural communities, most of the horticultural consumption is produced locally, though production centres supply cities within the same state as well as rural communities. Produce is imported from neighbouring countries (Niger, Cameroon) to SW to compensate for Northern state production fluctuations (due to increased disease pressure and lower yields).	20% of what is consumed is produced locally and either consumed within the community or sold within the state. The remaining 80% of produce consumed in SW comes from Northern states. While Lagos gets almost all of its produce from the North via Mile 12, for the other five states about 60% of produce goes directly to major markets in those states (Akinleye market in Oyo, Ogere market in Ogun, Ojo Oba market in Osun and Bodija market in Ibadan, Oyo). Besides urban SW consumption, fresh produce comes from the North and, via Mile 12, is exported to neighbouring countries (Benin, Togo).
Tomato	During the wet season local production from Southwest states (such as Lagos, Ogun, and Oyo) supplies a significant portion of the market. Production is limited by rain-fed production, leading to a high disease pressure and poor quality.	The majority of tomatoes consumed in the Southwest come from the northern states like Kano, Kaduna, and Plateau, where irrigation allows for continuous production. At times, tomatoes are also imported from neighbouring countries such as Niger, Benin, Benin and Cameroon.
Cucumber	Cucumber is largely cultivated in the Southwest year-round, particularly in peri-urban areas close to Lagos and Ogun. However, the volume decreases in the dry season.	Trading cucumber over long distance is challenging due to perishability. So imports from northern Nigeria or neighbouring countries like Benin are limited.
Pepper	Hot pepper production in the Southwest can meet a significant portion of local demand. But sweet pepper (Tatashe) is supplied from the north.	During the dry season, supplies are often sourced from the North (states like Sokoto and Kaduna). The dry season production relies on irrigation in northern Nigeria, with some imports from countries like Cameroon.
Pumpkin	Pumpkin is primarily produced within the Southwest and is available throughout the wet season due to favourable rain-fed conditions.	Production diminishes in the dry season, leading to increased reliance on northern Nigeria or imports from West African countries such as Ghana or Benin.
Onion	During the wet season, local production in the Southwest contributes only small volumes to the market, but northern supply remains present.	Onions are mostly sourced from the North (Sokoto, Kano and Kaduna) throughout the year, but especially during the dry season. In the dry season, there is also a reliance on imports from Niger and other neighbouring countries.
Green leafy vegetables	From SW states	From SW states with some small supplements from other states.



Map 5.1 *Product flow in dry season*



Map 5.2 *Product flow in wet season*

5.4 Value chain segments

5.4.1 Production

The horticultural sector in all the Southwest states of Nigeria is dominated by smallholder farmers, using traditional, low-input methods, leading to a low soil fertility and crop yields (van der Waal, 2015), though there are also higher producing production centres (see map 5.3). Key challenges mentioned by the farmers interviewed stated that access to finance and capital, pest and disease pressure in the wet season, access to and affordable inputs, sufficient labour and unpredictable markets are among the key obstacles.

Challenges related to access to finance and capital
Farmers are often stuck in farming as their only source of income, resulting in a reliance on subsistence farming. Fair financial compensation, such as a living income, is not the norm, leading to economic instability and discouraging sustainable involvement in horticulture. This economic instability is more pronounced in Ekiti and Ondo, where alternative income opportunities are limited.

Almost all interviewed farmers in the Southwest indicated that they have water shortages, which necessitates investment in irrigation systems and boreholes. These systems are expensive to install and operate, particularly in areas lacking electricity. The need to burn expensive diesel fuel for water pumps adds to the overhead costs, impacting the profitability of the business. Some interviewees indicated that solar powered pumps are a potential solution to reduce energy expenses, provide a more sustainable water supply, and enhance overall profit margins in the long term.

To cope with unsuitable weather conditions and to grow crops that do better in controlled environments, farmers are increasingly investing in greenhouses. However, these are highly capital-intensive and not affordable for many (small-scale) farmers. Lack of access to capital for such investments can limit production quality and market competitiveness.

Farmers experience difficulty securing loans from banks due to the banking sector's limited understanding of the agribusiness sector. The complex and demanding requirements, such as business plans and records, paired with high interest rates, make it hard for farmers to access necessary finance.

Pests and diseases
Pest infestation and disease outbreaks are common in the wet season in the Southwest, particularly in open-field farming. Effective pest management requires investment in pesticides, and advanced farming techniques such as protected cultivation, which adds to the overall financial burden.

In all states, there is an observable uptake of protected cultivation as an answer to the high pest and disease pressure in the wet season, implemented by commercially oriented farmers and, in some states, supported by development organizations. For instance, in Lagos and Ogun, there has been significant support from NGOs and government programmes to promote this. These initiatives are less prevalent in Ekiti and Ondo, where commercial agriculture is still in its nascent stages.

Inputs
Fertilizers, seeds, and pesticides are becoming increasingly expensive, in part due to inflation. For instance, the cost of fertilizer mentioned by an interviewed farmer rose from 40,000 naira to 53,000 naira within a month. Similar price hikes for seeds and other inputs place a significant financial strain on farmers. Ensuring access to quality inputs becomes challenging without adequate financial means. About 60% of farmers rely on self-collected seeds, while 30% purchase from dealers (Daniel & Adetumbi, 2004).

Farmers state they sometimes travel far (e.g., from Ogun to Ibadan) to procure quality inputs, increasing transportation costs and tying up capital. This necessity arises from the unavailability or inconsistency of local input supplies. Also, there are no dedicated nurseries in the region which means accessing quality seedlings is difficult.

An important barrier to increase agricultural productivity is the limited knowledge of farmers regarding proper fertilizer application and soil management. Many farmers lack training in soil science, crop-specific fertilizer requirements, and the correct dosage and timing of chemical applications. This poor knowledge not only reduces the effectiveness of fertilizers but can also lead to detrimental effects like soil salinization and acidification. Farmers in the Southwest often lack the technical and business skills necessary to manage their operations effectively. Opportunities for continuous skill and knowledge improvement are scarce, leaving farmers ill-equipped to adopt new technologies and practices. This is particularly the case for Ekiti and Osun, where extension services are limited.

Labour availability
The scarcity of skilled labour in the vegetable sector means that the available labour demands higher wages. Additionally, efforts to train unskilled labourers can be expensive, requiring farmers to spend more on labour costs.

Market unpredictability
The market price of produce often crashes when supply exceeds demand, particularly during peak seasons. However, input costs (seeds, fertilizers) remain high regardless of market conditions. This discrepancy increases the risk of running at a loss, particularly if farmers have already invested heavily in production without adequate financial planning or support.

Farmers indicated that they are vulnerable to market fluctuations and exploitative practices from intermediaries who may refuse to buy produce at pre-agreed prices, forcing farmers to sell at significantly lower rates elsewhere.

Highlights by state
All states face similar fundamental challenges, but the difficulty and specific nature of these issues vary. Lagos and Ogun show higher potential for more rapid advancement in the horticulture sector due to their strategic location and favourable market access. In contrast, states like Ekiti and Ondo require more support in terms of infrastructure, education, and market development to catch up with the other states.

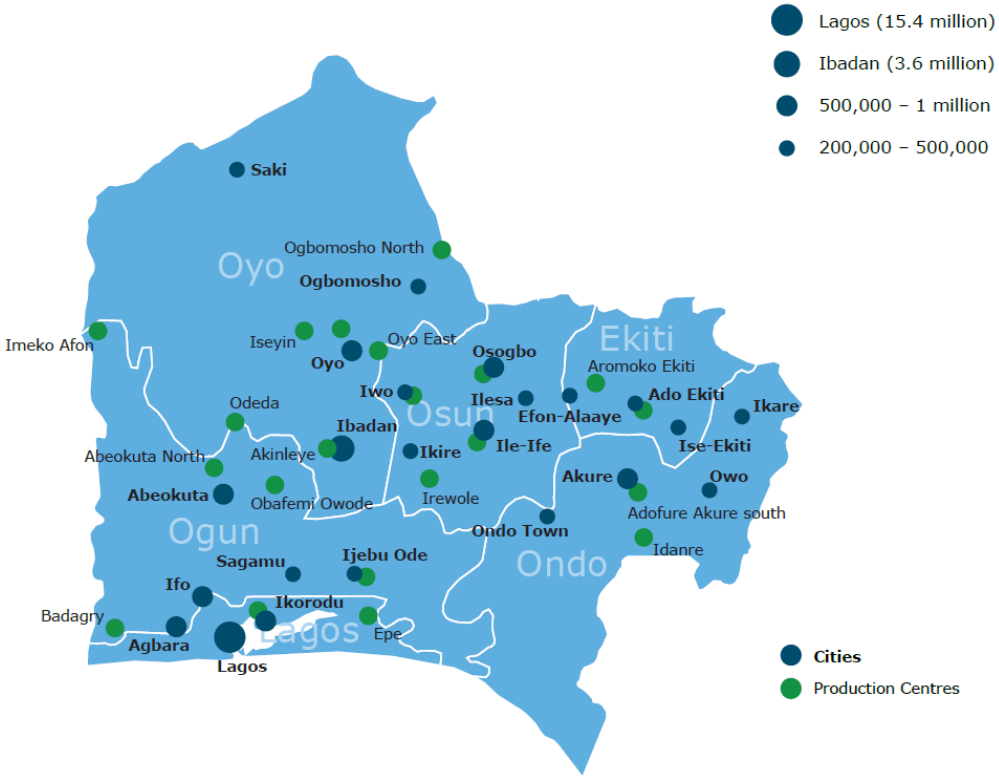
In Oyo, the agricultural landscape is diverse, but farmers struggle with access to affordable and reliable inputs. The state's proximity to major urban centres like Lagos provides a potential market advantage, yet the lack of proper irrigation infrastructure limits the productivity of smallholder farmers. Ondo faces similar issues with input supply and irrigation.

Ekiti, with its relatively high elevation, has distinct challenges regarding water availability for irrigation. The topography makes it difficult to implement irrigation systems, and smallholder farmers often rely on inconsistent rain-fed agriculture. Extension services are limited in Ekiti resulting in a low knowledge level of farmers.

Osun, with its mix of smallholder and emerging commercial farms, shows some progress in adopting technological solutions. However, the adoption rate is slow due to financial constraints and limited technical knowledge among farmers.

Ogun, with its vast arable land, has many comparable challenges observed in other states, such as inadequate input supply and irrigation issues. However, Ogun's proximity to Lagos is a clear advantage for swift market access and could attract investments in horticulture.

Lagos, being the commercial hub of Nigeria, has less land available for farming due to an increasing urban expansion. As a result, the state's horticulture sector is characterized by urban and peri-urban farming, which faces challenges related to space and resource constraints. However, Lagos also shows the highest potential for adopting advanced horticultural practices due to better access to markets, and by far the best access to inputs compared to other states.



Map 5.3 *Major horticulture crop production centres in the Southwest*

5.4.2 Midstream

Midstream actors have a dominant position in linking producers to consumers and only a minority of the farmers take their produce to the market; some farmers are within reachable distance from the market and have access to some sort of transportation. Based on the information provided by the interviewed midstream actors, the top challenges mentioned are price instability, price of transport, and the lack of supply during the dry season.

Price instability

Stakeholders across the horticultural value chain, particularly aggregators and retailers, frequently cite price instability as a critical challenge. From their responses, it's clear that this issue causes significant difficulties in the market. One aggregator mentioned that the instability in prices makes it hard to plan investments, while another highlighted the "Number One challenge" of dealing with fluctuating prices when trying to manage their own supply chains.

Retailers also express frustration over the constant change in prices, which makes it challenging to provide stable prices to consumers. One retailer described this challenge, emphasizing how it affects their ability to purchase and stock products consistently. The frequent fluctuations create uncertainty, and retailers find themselves forced to navigate a delicate balancing act of maintaining stock levels without overpaying during price spikes.

Aggregators and wholesalers, who typically handle larger quantities, are particularly vulnerable to sudden market changes. Their large investments in purchasing crops become riskier when prices suddenly drop, leading to potential losses. The interviewed actors often lack financial buffer or strategies to protect themselves against such market risks.

Price of transport

Transport costs emerge as a major bottleneck for the midstream actors, with several stakeholders emphasizing how the cost of moving goods from farms to markets significantly cuts into their profitability. Retailers and aggregators alike highlighted issues related to road conditions, which not only increase the

time taken to move goods but also add to the costs. Poor road infrastructure means vehicles require more maintenance, and travel times are longer, contributing to the overall expense.

Another contributor to the high transport costs, as mentioned by a stakeholder, is the high costs of petrol. One Lagos based aggregator describes the situation as follows:

"Petrol is too costly. Diesel is expensive. All the drivers complain about the high cost of buying fuel. Before, they carried a bag of cucumber for 500, 400, and 300 naira. But now it's 1,500 naira."

This statement highlights the stark increase in transportation fees, which can be traced directly to escalating fuel prices. The aggregator further noted that these rising costs have been exacerbated by recent government policies:

"The high cost of petroleum is from our government, because it's the government that removes subsidies from petrol and diesel. So the cost of petrol and diesel is caused by this problem."

The removal of subsidies on petroleum products has led to higher costs for diesel and petrol, which directly impacts transportation fees. This increase makes it more expensive for traders to move goods from farms to markets, ultimately reducing their profit margins and creating additional pressure throughout the supply chain:

Lack of supply

The lack of supply during the dry season stands out as a recurring theme among interviewed stakeholders. Farmers, aggregators, and retailers point to seasonality as a central factor impacting the availability of horticultural products. One aggregator noted that, during the dry season, it becomes increasingly difficult to source sufficient quantities of crops due to the reliance on rainfall-dependent agriculture in the Southwest.

This shortage of supply, according to several responses, is intensified by the limited access to irrigation technology and water sources. In regions where irrigation systems are available, they are often costly to implement and maintain, putting them out of reach for many small-scale farmers. As a result, production is mainly limited to the rainy season, leading to a stark contrast in crop availability between the wet and dry seasons from the Southwest.

Retailers described how this inconsistency in supply forces them to scramble for products during the dry season, often leading to compromises in quality and price. Aggregators, in turn, find it difficult to maintain steady operations, as they cannot guarantee a continuous supply chain to their buyers. The lack of predictability in production volumes, combined with high transport costs, creates a scenario where actors must make difficult choices regarding which crops to prioritize and when to buy and sell in order to manage the risks associated with dry season shortages.

Labour

Labour is another key challenge highlighted by the stakeholders, reflecting the difficulties in accessing adequate and affordable labour to support horticultural activities. Retailers and wholesalers describe how the lack of reliable labour impacts various stages of the supply chain, from harvesting to sorting, packaging, and transporting goods.

One retailer mentioned that the shortage of skilled labour means they often rely on temporary workers who lack the necessary experience or knowledge about handling delicate horticultural products. This inexperience can lead to increased losses due to improper handling, resulting in damaged goods that are less marketable. Furthermore, the lack of skilled labour affects quality grading and packaging, which are crucial for maintaining produce standards in the market.

Aggregators noted that labour shortages are not just about availability but also about affordability. During peak seasons, the demand for labour spikes, driving up wages and making it difficult for traders to maintain their profit margins. In contrast, during the off-season, workers may migrate to other forms of employment, leaving traders with insufficient manpower when they need to ramp up activities again. Additionally, the

labour challenge is intertwined with issues like inadequate access to training, limited mechanization, and reliance on traditional farming practices, which contribute to inefficiencies in the value chain.

Some stakeholders also pointed to the lack of government support or labour policies that could help regulate wages or provide training programmes for agricultural workers. This gap in support further complicates the ability of traders and farmers to secure and retain a reliable labour force, ultimately impacting their capacity to meet market demands effectively. In particular the labour is perceived as even more scarce in Lagos, as mentioned by an aggregator based in Lagos: *"Labour is not always available... because of nearness to the city, we found out that labour is scarce, and cost is high"*.

At the markets
Market services, including clean water and hygienic selling spaces, are often absent, affecting the overall safety of the produce sold. As a result, hygiene standards at most markets in the Southwest are low, with wholesalers and retailers often operating their business with poor workspace conditions that do not meet basic cleanliness and food safety requirements. An interviewed vendor at a market in Lagos explained that after the state government ordered the demolition of markets using umbrellas as stalls, new stalls with roof sheets were built and floors were tiled with asphalt and interlocking blocks, but credited the market chairman, not the government, for these developments, adding that *"maybe our market leaders are not informing us of government efforts, but the chairman is the one working to develop the market."*

Traders in the informal markets who were interviewed indicated that they are in need of more professional facilities (e.g. cold and regular storage, packing) and services (e.g. finance). Having access to these types of facilities and services could contribute to more efficiencies in the entire value chain. In addition, midstream actors often lack the necessary technical skills to operate efficiently, and opportunities for skill development and continuous learning are rare.

A fair financial compensation is not always provided due to the factor mentioned above (increasing prices and volatility market), resulting in economic instability that discourages long-term involvement and investment in the midstream segment of the value chain, especially for more formal actors coming from outside the horticulture sector.

Formal retail sector
Formal retailers like supermarkets are widespread in Lagos and adopt different sourcing models based on their operational structures and priorities. For instance, some supermarkets rely on the open market, working with dedicated traders to meet their supply needs. Others, have a centralised distribution system, source directly from local farmers to ensure a required hygiene and traceability, reducing reliance on intermediaries. However, these centralised models may still incorporate imported products from international suppliers, such as South Africa or Europe, to complement local offerings and maintain quality standards. These models illustrate the balance supermarkets strike between local procurement and imports to meet consumer expectations.

5.4.3 Consumers

Consumers in the entire Southwest of Nigeria are currently facing difficulties in meeting the recommended intake of vegetables and maintaining a diverse diet, as discussed in section 3.2.4.[7] Regarding the drivers of vegetable and fruit consumption, recent studies found that consumption is much associated with seasonality and related availability (Brouwer et al., 2019). Consumers tend to be more encouraged if the price is low (often in times of high availability). However, a study also indicated that health is considered to be one of the main motives for vegetable consumption (Raaijmakers et al., 2018). Additional motives, identified in the same study, are mood, natural, price, convenience and familiarity. Ethical concern (e.g. origin of the produce) was considered least important. The same study indicated that the total urban consumption of vegetables was 2.5 portions per day, whereas it is recommended to eat at least 4 portions (200 g). Vegetables were considered a standard element of meals, but a limited variety of vegetables was commonly consumed, both in terms of types of vegetables eaten and the degree of processing (mostly fresh), and

[7] Note that this section uses literature as source material, not interviews.

outlets (mostly traditional informal markets). Other studies gave a range of 1-2 portions a day, for example the study by Olatona et al., (2018). Households in the Southwest region have a comparatively higher probability of consuming vegetables and a stronger demand for them, while those in the north-central region show a lower probability of consuming and demanding vegetables than those in the Southwest (Ogundari and Arifalo, 2013).

For high class consumers, consideration is also given to food safety, nutritional value etc. The study by Raaijmakers et al., (2018) shows that higher consumption of vegetables relates to higher knowledge of vegetables and belief in ones' own ability to prepare the vegetables; health was considered the most important driver by the high class respondents; and that consumers in higher economic classes consume more raw vegetables and a greater variety of vegetables, especially the ones that are considered exotic (e.g., broccoli, cauliflower).

Consumer barriers

Several potential barriers for healthy food choices (including fruit and vegetables) of urban Nigerians are identified in literature, including limited availability, high price, limited convenience and possible food safety issues (Brouwer et al., 2019; Raaijmakers et al., 2018). For example, convenience, the time to prepare the meal, and the availability of vegetables limits the consumption of fruit and vegetables, but this increases the popularity of out of home consumption among all economic classes. For example, street foods are popular and their popularity is increasing as they are considered to be convenient, quick, reasonably priced, tasty and a good alternative for home cooked meals. Various studies also indicate that the costs for fruit and vegetables are an important barrier (Herforth et al., 2020; Brouwer et al., 2019).

Food safety

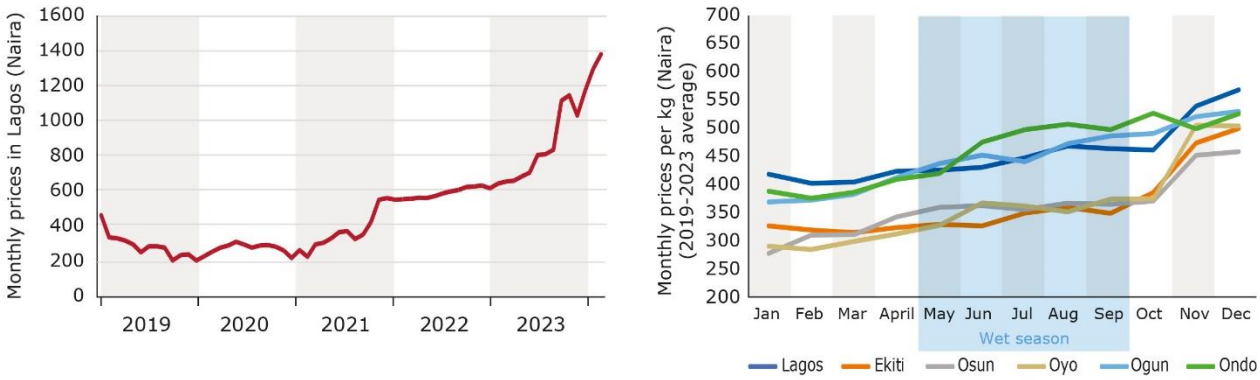
Food safety risks are notably high, making it difficult for consumers to rely on the horticulture value chains for safe food with produce being exposed to potential hazards at all stages in the value chain. This relates to the use of the pesticides and bacterial contamination at the farm level and downstream in the value chain. The root cause for this is the lack of effective enforcement of government policies aimed at ensuring food safety regulations to protect the Nigerian population.

Women as consumers

The role of women in household roles also contributes to the prevalence of malnutrition among mothers, due to the limited time they have to focus on their own nutrition. Women are responsible for feeding the family and an increase in women's overall empowerment has been shown to be positively associated with food availability and dietary diversity at the household level (HLPE, 2017; Ene-Obong et al., 2017). Women have a special role to play in ensuring diversity in foods consumed by their households. Their role in food utilization for food security is a critical determinant of household food security (Quisumbing et al., 2014). The contribution of women to food and nutrition security is therefore significant and a gender focus should be considered for designing gender-sensitive and specific nutrition interventions.

Pricing

To understand the seasonality of vegetables in the Southwest, we analysed recent tomato prices provided by the Nigerian National Bureau of Statistics. The data shows a clear upward trend in prices (figure 5.2A), (and which largely correlate with the general inflation rate). Additionally, a distinct seasonal pattern emerges when considering the 4-year average (see figure 5.2b). Notably, there is a price surge towards the end of the year, coinciding with increased consumer demand during festive activities. This presents a significant opportunity for the Southwest to capitalize on market demand by implementing improved irrigation practices.



Figures 5.3 *A,B) Tomato prices per kg.*
Source: NBS (2024).

5.5 Value chain governance

The vegetable value chains are highly organised but agreements and arrangements between value chain actors are almost always informal (RVO, 2019). Coordination among midstream actors (and farmers) is largely informal and decentralized, leading to fragmented operations and inefficiencies. All business is operated based on verbal agreements and shared norms rather than formal contracts. Midstream actors are often organized in groups; members support each other by sharing market information, transport costs, and sometimes even financial resources. In all states cooperatives and associations are present. Small-scale farmers often form informal cooperatives or marketing groups to pool their produce and negotiate better prices with traders or buyers; this is also often reported among actors in the midstream segment of the value chain, especially at the larger markets like Mile 12 (Lagos) and Sasha (in Akure, Ondo).

Formalized and consistently enforced regulations are lacking, and there is a pressing need for better-regulated frameworks to ensure standardized practices. Incentives for adhering to food safety regulations are insufficient, weakening overall enforcement and adherence. Surprisingly in Osun, it was reported that there is some sort of enforcement at the market by governmental officials regarding quality. However, during validation sessions, stakeholders highly doubted this.

The vegetable sector in the Southwest faces significant challenges in establishing a robust enabling environment. Both regulatory (public sector) and non-regulatory (private sector) frameworks are underdeveloped. There is a lack of consistent policies at the federal and state levels to set minimum standards for food quality. Support for diverse business types, including tax incentives, is limited. Land pressures further complicate the situation, with insufficient strategic land use planning and policies, leading to unsustainable land management practices. Especially in densely populated states like Lagos, there is already serious pressure on land available for agricultural activities due to an increasing pressure for urban development.

Collaboration and aggregation for smallholders through cooperative incentive systems are also underutilized, limiting farmers' ability to pool resources, share knowledge, and access larger markets. By fostering stronger cooperative structures, smallholders could benefit from increased bargaining power, reduced costs through shared inputs, improved access to technology, and enhanced productivity, leading to more sustainable and profitable agricultural practices.

On most Nigerian markets there is a market authority that represents the interests of the market traders and vendors towards the local government. In addition, traders and vendors are united in crop-specific associations that control trade. For example, on Mile 12 the crop-specific associations are important bodies that also govern north-south trade in terms of supplied volume and access to the market.

In Nigeria, food safety is compromised as trade covers large distances and the sector lacks any form of traceability. Limited access to modern and dedicated transportation results in significant post-harvest losses, reduced profitability, and reduced food safety. For instance, as current transport is also used for other purposes, transport can be used for goats one day and vegetables the next, creating serious health risks. Food safety remains a critical issue due to weak post-harvest handling practices, a lack of governmental enforcement of regulations and a lack of incentives for compliance from consumers, compromising the quality and safety of produce reaching the market in the entire Southwest.

5.6 The Dutch private sector in Nigeria

Currently the involvement of the Dutch horticulture private sector is limited, although various seed suppliers are active. The business climate in Nigeria is perceived as highly unpredictable, with Dutch companies facing several challenges, particularly around security and market volatility. One of the key risks mentioned by an input supplier is the lack of personal mobility within the country due to safety concerns. For example, regions that may be accessible one week might become unsafe the next, limiting the ability of foreign staff to operate freely. This unpredictability also affects local staff, making it difficult to maintain consistent on-the-ground operations. On the other hand, while security is a greater issue in the North, Dutch (seed) companies would still prefer to work there due to the larger existing market and therefore greater demand. The Southwest is recognized as having potential but is seen to remain relatively small-scale in the near-term future.

In response to these risks, Dutch companies have adopted a cautious yet proactive approach. They rely on local country managers to be their "eyes and ears" in the market and mitigate risks by working closely with local distributors. For example, an interviewed Dutch seed company stated that it has one distributor responsible for importing seeds and distributing them to growers, while the company ensures strict payment terms by invoicing in euros. This allows them to manage currency risk and maintain financial control despite Nigeria's volatile exchange rate. This example is also followed by other suppliers.

To further mitigate risks, these companies focus on building a robust distribution network, recognizing the importance of Nigeria as a market they cannot afford to ignore. Though the challenges are significant, they are attempting to expand their local presence by seeking additional distributors and reinforcing their partnerships. The approach prioritizes local collaboration while minimizing direct exposure to Nigeria's business and security risks.

Doing direct investments by setting up subsidiaries is considered to be risky and appears to be rare; the challenge of moving profits out of the country is also perceived an obstacle for direct investments.

5.7 Summary overview

Table 5.4 is a summary overview of the current state of horticulture in the Southwest.

Table 5.4 *Overview of the current state of horticulture in the Southwest*

	Production	**Midstream: aggregation, transport, processing & markets**	**Consumers**
Inputs & services	High costs and insufficient access to advanced and safer inputs due to inflation and the absence of suppliers within most states (except for Lagos). Unsafe chemicals due to inadequate regulation and monitoring.	Access to professional input services is limited. Gap in the availability of produce-specific packaging and transportation solutions. Market services, including clean water and hygienic selling spaces at markets, are problematic.	The sector often struggles to respond to consumer demands and preferences.
Enabling environment	Regulatory (public sector) are not enforced, while private sector governance is largely informal. Food safety standard policies at state and federal levels are inconsistent or largely unenforced. Support for businesses at all scales, including tax incentives, is limited. Land pressure; insufficient strategic land use planning and policies, leading to unsustainable land management practices. Some collaboration and aggregation for smallholders through cooperatives.	Poor efficiency due to outdated processes and limited access to modern technologies, resulting in post-harvest losses and reduced profitability for midstream actors. Enforcement of food safety regulations is weak and incentives for complying with minimum standards are mostly absent. Lack of traceability. Coordination among midstream actors (and farmers) is largely informal and decentralized, leading to fragmented operations and inefficiencies. Online platforms & social media enabling producers to connect to markets (especially Lagos).	Unenforced food safety regulations or promotion of healthy diets results in the absence of consumer access to safe vegetables.
Human capacity & remuneration	Farmers have limited technical and business skills to manage their operations and sustain a fair financial income. Opportunities for continuous skill and knowledge improvement are scarce, leaving farmers ill-equipped to adopt new technologies and practices. Some innovations (solar-powered drip irrigation, net-houses) are being adopted.	Midstream actors lack the necessary technical skills and business acumen to operate efficiently. Opportunities for skill development and continuous learning are rare.	Awareness among consumers about the benefits of vegetables as part of a healthy, balanced diet is not available. Vegetables are widely consumed, but not in the right quantities, due to unaffordability and accessibility for consumers.

6 Horticulture sector potential futures

6.1 Chapter highlights

This chapter highlights what a representative sample of stakeholders saw as a viable and desirable future for the horticulture sector, developed during a series of workshops. Although the six states currently differ in terms of land access and commercial development of horticulture, there is a largely overlapping common vision of how the sector should look like in the long-term; key features of this include

- Access to markets and capacity development for smallholder, small-scale enterprises and SMEs, though usually preventing larger businesses to dominate the sector.
- Scale to be achieved through collaboration of SMEs which can offer multiple services in specific locations – produce for consumers, inputs, and services for producers.
- Shorter supply chains would more easily connect these two sides of the supply chain, physically as well as digitally.
- Environmental impact could be managed in different ways, from managing nature to GAP which reduces chemical usage.

There was also consensus that with a lack of financing and public sector support, or concentration of financing in larger businesses, small-scale horticulture production would remain a sector of last resort for most people. Financing should therefore go together with better regulation of the sector, including food safety standards. Similarly, greater coordination amongst the stakeholders across the states will help develop the sector. Given this longer-term vision for 2045, milestones for 2030 were provided as guidance for the recommendations.

6.2 Four scenarios

This section provides summaries of the four scenarios, categorized as desirable (scenario B), somewhat likely and somewhat desirable (scenario A), likely and undesirable (scenario C), and less likely and undesirable (scenario D). Table 6.1 is a simplified summary of the scenario descriptions.

Table 6.1 *Summary of scenarios*

A. Safe & affordable food. Informal SMEs: Somewhat likely, somewhat desirable. ✓ Innovations, affordable technology and GAP. ✓ Cooperative management. ✓ Community collaboration, home gardening. ✓ Home gardening and affordable technologies. × Shorter supply chains means more consumers have to produce food to be food secure. × Lack of youth engagement and safety issues. × Environmental challenges - water pollution, deforestation.	**B: Safe & affordable food. Large scale farming and business:** ✓ Possible and desirable. ✓ Inclusive: small-to-large-scale business along VCs. ✓ Integrated farming systems, technology, urban farming. ✓ Mix of state regulation and private investment. ✓ Yes to larger-scale businesses, no to monopolies ✓ Manage environment (ranging from minimizing impact to promoting nature).
C. Unsafe & unaffordable. Informal SMEs: Likely and undesirable. × Weak operating environment, no innovation, insufficient support. × Inadequate financial services. × Small-scale farming informal, unaffordable. × Unreliable seeds, agrochemical misuse, limited tech. × Rising climate impact.	**D. Unsafe & unaffordable. Large scale farming & business: Less likely and undesirable.** × Only wealthy consumers can access safe produce. × Large-scale agribusiness dominates agriculture. × Smallholders marginalized, raising food insecurity, heritage crop loss. × Excess use of agrochemicals leads to environmental, health issues. × Poor labour conditions and biased policies will encourage rural-to-urban migration.

Desirable (scenario B)
Five of the six states voted for the **large-scale formal, safe, and affordable** scenario as the preferable one – Ogun being the partial exception as they specified between A and B because of the absence of smallholders in their specific B scenario. All descriptions are typified by an interplay of state regulation around topics ranging from food safety to tax incentives, together with private investment. State and federal level government are both proactive – setting regulations around food safety, supporting small-scale businesses with tax breaks, etc – and reactive – responding to stakeholder preferences to balance between business development without big businesses taking over and, through a price board, making sure healthy food is accessible to poorer consumers as well.

Two scenarios (**Oyo, Ekiti**) specifically described an integrated farming system that brought producers and consumers closer together. On the production and processing side, this would be more efficient based on technology (GHs, improved seed varieties) and GAP, and would be more bio-circular, minimizing waste (aquaponics, integrated systems). On the other hand, consumers could come to these market-farms for more than just vegetables, also getting meat and staples. Food would be traceable and could also be ordered online. **Lagos** and **Ondo** particularly emphasize circularity and environmentally positive impact, not just being carbon-neutral but positive, by planning trees. As the most urbanized area, Lagos is described as integrating more urban and peri-urban farming solutions.

'Large scale' was described differently across the scenarios; some saw it as scaling-up through collaboration of informal and formal production and processing SMEs, while others interpreted it as integrated businesses or single businesses that have grown. Some were more sceptical or suspicious of large single businesses and saw the collaborative model as more beneficial for informal smallholders and medium-sized enterprises. Others thought larger businesses were OK. It was generally thought to be important to avoid monopolistic behaviour, to prevent large businesses from dominating in their field and so price-setting; rather, there should be a focus on the interplay of different business models and types to complement one another, and to ensure smaller scale businesses are not squeezed out of existence.

Environmental impact was mentioned to greater and lesser degrees; some simply wanted to minimize impact, while others sought to promote nature through growing trees. **Osun** was concerned that a higher input-output system could lead to negative environmental impact through wildlife and land degradation. On the other hand **Lagos** sought to make best use of space through vertical farming and greenhouses, e.g. being resource- conscious and land-conscious.

Likely and undesirable (scenario C)
If current trends continue, then participants considered the **small-scale informal, unsafe & unaffordable** scenario most likely. With the population increase in the coming 20 years driving up demand for produce, but in the face of a weak operating environment, lack of innovation, and insufficient support, small-scale horticultural farming will continue to face significant challenges, remain largely informal, and be a sector of last resort. Farmers will struggle with unreliable seeds, misuse of agrochemicals, and limited adoption of modern technologies, leading to the production of low-quality and unsafe food. Climate change will exacerbate these issues, further destabilizing production. The farming sector will be unattractive, resulting in a dwindling labour force and a lack of interest from younger generations. Women will face barriers in participating in horticulture, widening economic disparities.
Financial services and investment in the sector will be largely absent, causing hardships for local market actors and resulting in massive price fluctuations. Intermediaries will struggle to aggregate enough produce and meet consumer demand. Unsafe produce will reach consumers, with only wealthier individuals affording safer options and poorer consumers struggling with whatever is available. The lack of effective government policies and support will leave the sector to fend for itself, with minimal intervention to improve the situation.

Somewhat likely, somewhat desirable (scenario A)

In this scenario of **small-scale, informal yet safe and affordable** horticultural produce, states use various strategies to ensure consumer supply, with different consequences. **Oyo** and **Lagos** adopt new technologies and cooperative efforts, where smallholder farmers (SHFs) use mid-tech solutions like greenhouses and smart irrigation systems. These enhance production efficiency, traceability, and sustainability, with young people using mobile apps for crop monitoring and weather forecasting. Conversely, **Ogun** and **Ondo** emphasize home gardening with affordable technologies like home-grown kits and capacity building in indigenous languages but question youth engagement. Without skills development, diversifying crops remains challenging, leading to variable yields and potential food waste.

Different organizational models are highlighted: **Osun** focuses on improved cooperative management, while **Ogun** and **Lagos** emphasize community collaboration and aggregation hubs. Urban and rural households grow their food, with urban spaces utilizing rooftops and converted areas for gardening. Market structures evolve to include aggregation hubs and specialized markets, where environmentally conscious consumers access safe, affordable produce. Enhanced production methods and branding improve traceability and affordability, bolstering food security.

Communities increasingly engage in barter systems, emphasizing indigenous foods and healthy diets. Integrated pest management and reduced pesticide use reflect a shift towards sustainable practices. Despite these efforts, water pollution from agrochemical leaching and deforestation due to farmland expansion pose significant environmental challenges.

Technology and community collaboration are vital in the absence of formal regulation. States like **Ogun** and **Ondo** are sceptical of these initiatives' effectiveness in delivering safe food, especially with increased agrochemical use. **Ogun** suggests that while food safety may improve, diversity might decline. Other states are more optimistic. The broad definition of technology includes simple GAP and innovations ensuring all foods are traceable, promoting a self-regulating system over third-party regulation. Shorter supply chains will arise as households grow their food, increasing bartering and potentially reducing formal markets and government revenue. Lagos remains optimistic, predicting environmentally conscious supply chains. In contrast, **Ondo** stakeholders worry that informality and small-scale farming could lead to unemployment, food insecurity, malnutrition, and health issues. Osun stakeholders envision empowered, thriving small-scale farmers but acknowledge the risk of displacing indigenous crops for higher-yielding varieties.

While the scenario presents a mixed outlook, the focus on sustainable practices, community engagement, and technological innovation suggests a pathway to enhanced food security and economic stability.

Less likely and undesirable (scenario D)

In this scenario of **large-scale formal, unsafe & unaffordable,** large-scale, formal agribusinesses dominate and are driven by profit maximization, with the agricultural sector relying heavily on agrochemicals, and advanced mechanization. This model, backed by private investment and focused on monocropping, leads to extensive environmental pollution and health issues among consumers. Small-scale farmers are marginalized, causing the decline of heritage crops and traditional farming practices. The food system becomes highly stratified, with wealthy consumers accessing safe, organic produce, while poorer consumers struggle with food insecurity and health problems. The focus on large-scale production for export and elite markets exacerbates social inequalities, with poorer communities left to fend for themselves. Labour conditions in corporate farms are poor, with low wages and limited rights, particularly affecting female youth. Government policies favour large-scale agribusinesses, neglecting small-scale farmers and leading to increased rural-urban migration. Without proper regulation and strategic investment, this approach results in increased hunger, civil unrest, and environmental degradation, highlighting the urgent need for balanced, inclusive, and sustainable agricultural policies. High investment costs focus on wealthier consumers and export potential, making food unsafe and unaffordable for many. Those who cannot afford quality food are forced to purchase unhealthy and unsafe alternatives, impacting their health and well-being. This strategy benefits only a small audience and could fail if chemical usage is not regulated. State and federal-level regulation and enforcement are crucial to addressing the negative incentives of private investors.

6.3 State-level summaries

Lagos
In Lagos, two scenarios were deemed positive. If small-scale farmers predominate (scenario A), they will use sustainable technologies and cooperative structures, supported by government policies. Alternatively, large-scale farming (scenario B) could drive agriculture in the state using circular systems and accommodating smallholder farmers. The most **probable** scenario was deemed as C. The most **desirable** scenario combines elements of B (sustainable and circular systems) and A (small-scale farming as a way of living).

Ogun
None of the described scenarios were outright optimistic for Ogun. For A to work, simple, functional and affordable technologies, along with training, would be needed. Diversification would decline, however. Supply chains would weaken and households/communities would become self-dependent. This was not considered a likely or preferred scenario. B on the other hand meant grow or perish, with little room for smallholder farming. This was the same for D but wherein healthy food was only available to those that could afford it. The most **probable** scenario was somewhere between B and D, e.g. a mix of small- and larger-scale producers. The more **desirable** scenario was nudging towards D wherein greater intensification would take place. However, they were not in favour of large-scale business and instead preferred SHF clustering (in a similar fashion to existing farmer associations). They recognized that Lagos is their key market. Besides investment, key strategies and public intervention are;

- Consistent government policy on agriculture
- Adoption of new and improved tech for SHF
- Promotion of cluster farming by SHFs – improves access to credit and economies of scale
- Improving rural infrastructure to slow rural to urban migration

Oyo
In Oyo if main trends continue then C is considered the most **probable** scenario, namely one of increasing demand with little government oversight and investment appetite, and a perverse incentive to increase fertilizer usage to meet demand, but at the risk of food safety. A or B are more **desirable**; in the case of A, without public sector interventions, technology is relied on to improve yields and ensure safe and affordable produce for consumers. For B both improved practices (irrigation) and tech (greenhouses) along with cold chains will improve production and smooth supply, while government will support introduction of better seeds. More generally, small-scale would remain but become more integrated and be closer to consumers – both physically as one stop markets that include multiple services, as well as virtually, e.g. able to order produce through an app. Traceability of foods to their origin would become more commonplace, and some produce would be exported.
Without government regulation the undesirable D scenario wherein scaling up would ignore poorer consumers could arise.

Osun
In Osun, four scenarios were explored. Scenario A envisions small-scale farmers organizing into cooperatives, using modern genetic varieties and sustainable practices, supported by limited government intervention. Scenario B shows a peak-performance horticulture sector dominated by large-scale farmers, with significant youth employment but negative environmental impacts. Scenario C highlights the struggles of reconciling population growth with insufficient agricultural land, leading to limited and unsafe produce, and a sector unattractive to investors and labourers. Scenario D presents a future where corporate farming prevails, driven by profit maximization, resulting in environmental degradation, food insecurity, and rural-urban migration, with minimal government support for sustainable agriculture. The most **probable** scenario is C or D, depending on the severity of the actions of the businesses involved. The most **desirable** scenario is B.

Ondo
In Ondo, a possible future centred around small-scale farming would suggest that urban food systems would bolster resilience as households produce their own food, and some surplus, for sale. However, the scale of farming operations is crucial. If large-scale businesses prioritize profit over environmental impact, the vibrant horticulture sector for all could fade. The most **probable** scenario is C, where challenges like environmental

degradation persist. Yet, the most **desirable** scenario blends elements of A and B. In other words, small-scale farming thrives alongside efficient, eco-friendly businesses, ensuring sustainability while meeting the needs of all stakeholders.

Ekiti

Like in other states, in Ekiti scenarios C and D indicate either a lack of investment, or skewed investment, together with weak public-sector support, such that only the wealthy are able to source sufficient and safe produce. Scenario C is considered the more **probable** scenario if current trends continue. Scenario B is considered the most **desirable**. This was a state wherein consumers cook at home or eat out as food is considered safe, as government enforces rules on unsafe foods, shutting down places using banned agrochemicals. Much greater investment has gone into the agricultural sector. An example of a more successful farm is Awa farms, which has developed into a specialized, integrated farming system using certified and recyclable seeds, minimal use of synthetic agrochemicals, fully irrigated organic farm, all powered by green energy. Besides horticulture it also produces fish and chicken, minimizing wastage, and even grow trees to offset carbon emissions.

6.4 Milestones desirable future in 2045

Table 6.2 outlines the desirable future for the Southwest horticulture sector in 2045. It envisions a future where affordable resources, sustainable practices, professional and dedicated stakeholders and strong regulations shape a thriving sector.

Table 6.2 *A desirable future for the SW horticulture sector*

	Production	**Midstream: aggregation, transport, processing & markets**	**Consumers**
Inputs & services	Affordable and available input supply system for sector actors (including farmers) that leverages on tailored tech solutions. Access to advanced, safer inputs, barring of unsafe chemicals.	Access to professional input services – cold storage units, finance. Produce-specific packaging and transport to deliver safe and quality produce. Market services (clean water and selling space).	Horticulture sector is responsive to consumer demands and preferences; new varieties of produce provided.
Enabling environment	Regulatory (public sector) and non-regulatory (private sector) structures in place at state and federal level to support commercial development of SME producers. • Quality standards of input, services (see areas listed in column below). • Landscape and spatial planning mechanisms for the benefit of farmers and urban planning • Farming practices are environmentally neutral or regenerative.	Public and private coordination. Businesses are incentivized to collaborate and aggregate through cooperatives, integrated value chains and farm systems, applying regulatory and non-regulatory means. • Incentives for food safety regulations and enforcement (including traceability). • Hygiene standards. • Clean and developed workspace for wholesalers and retailers. • Avoidance of monopolistic behaviour. • Practices are environmentally neutral or regenerative.	Trustworthy government that enforces food safety regulations, and actively promotes consumption of healthy diets. Rely on and trust of VC actors and the services they provide.
Human capacity & remuneration	Farmers have high level of technical skills and business acumen. Farmers able and willing to continuously improve skills and knowledge. Farmers not looking to further. professionalize business able to find other opportunities in or outside of horti-sector. Fair financial compensation (e.g. living income).	Mid-stream actors have high level of technical skills and business acumen. Mid-stream able and willing to continuously improve skills and knowledge. Fair financial compensation (e.g. living income).	Consumers are aware of the benefits of vegetables as part of a healthy, balanced diet. Vegetables in healthy diets are affordable and accessible.

The common elements/drivers across the scenarios

There are a range of common elements mentioned across the scenarios, some of which are drivers towards a more investor-friendly environment that enables the more desired future. A selection are listed below:

- Investor appetite: the environment can absorb investments and illustrate minimization of risk, while not skewing the market towards large-scale business.
- Regulatory environment: state and federal levels can set floors (minimum standards of food quality) and ceilings (avert monopolies, price-gouging of inputs) and provide consistent support for a range of business types.
- Enabling environment: supports collaboration and aggregation for smallholders through cooperative incentives and integrated farm systems.
- Technology: green houses, better seeds, irrigation, and organic fertilizer especially for smallholder farmers.
- Capacity: human skill
- Environment: carbon emissions and nature
- Employment: the sector becomes more attractive for agripreneurship, including for women and youth
- All-scale business inclusive: from small-scale informal to large-scale collaborative, or integrated (e.g. big business), albeit preventing monopolistic behaviour.

6.5 Backcasting to 2030

Based on the longer term 2045 desirable future, milestones have been developed for 2030 as an indicator for progress towards the 20-year vision. Table 6.3 captures these milestones and vision for the horticulture sector by 2030. Amongst others, production aims to see more human capacity, sustainable farming practices, and access to affordable inputs and machinery, leading to higher volumes and quality of horticulture products. In the midstream, renewable energy adoption, enhanced quality control, and improved storage will be widespread, reducing post-harvest losses. Consumers will have increased awareness of healthy diets and better access to affordable, safe horticulture products by 2030. Policies on land access, food safety, and collaboration between public and private sectors will be enforced to create a more supportive environment. Finally, by 2030, partnerships between local and foreign investors will drive innovation, improve financing, and expand horticulture training and capacity-building efforts. These milestones are expanded upon in the following chapter as part of the recommendations and activities.

Table 6.3 *2030 milestones*

	Production	**Midstream: aggregation, transport, processing & markets**	**Consumers**
Inputs & services	More human capacity (including labourers) leads to all-year round, innovative production systems, including a fully operational irrigation infrastructure. More sustainable horticulture farms produce more volume, better-planned and high-quality horticulture products while using affordable inputs, tools and machinery for responsible farming	Midstream actors use renewable energy Mechanisms in place for standardization and quality control to mitigate midstream (mal)practice Improved storage capacity and practices	Improved awareness and more demand for access to affordable horticulture products
Enabling environment	Improved access to and use of local varieties and access to good quality starting material, including seedlings. Enforced policy action: • Governance, including the dedication of land for horticulture production but also protection of vulnerable / natural areas. • Applying GAP, including farming inputs and safer chemicals (improve productivity while maintaining environment). Enforcement mechanisms in place to ensure national food safety standards.	Co-funded infrastructure projects, such as (cold) storage and transportation networks, have become operational, to enhance efficiency and reduce losses. Improved public and private coordination, leading to policies specifically designed for the informal sector to ensure that all actors benefit. New partnerships established to build resilience, improving sector ability to withstand economic and environmental challenges. Conducive policies that allow foreign companies to actively support the development of SW horticulture sector.	Upgraded marketplaces across major cities, particularly in Lagos and Ibadan provide hygienic selling spaces, sufficient water supply, proper handling and safe storage options. Food-based dietary guidelines are adopted and guiding healthy lifestyle campaigns to which private sector actors also adhere. Policies and monitoring mechanisms supporting the affordability of vegetables are enforced.
Human capacity & remuneration	Strengthened human capacity on production, innovations, GAP, and business skills. Increased number of more sustainable horticulture farmers; • Expanded pool of skilled horticulture labourers • Well-trained extension services present in the field Increased offering of training and education on horticulture by public and private parties through network of training centres and/or existing organizations.	Measurably improved horticulture sector loan portfolio (higher loan volumes and lower default rates). Blended finance mechanisms in place, including VSLAs in communities, blended finance for start-ups, soft loans for SMEs and smallholders through POs. Adoption of innovations (solar powered irrigation, (cold) storage, greenhouses, etc) through loan provision. Evidence of (young) people moving in and out of food sectors.	Increased consumer awareness of healthy diets and food safety: consumers are sensitized about the relevance of healthy diets. Improved access and affordability of vegetables, reduced cost of diets.

7 Conclusions: Roadmap 2025-2030 and stakeholder roles

7.1 Chapter highlights

The Southwest region has the potential to become a more productive and competitive region of horticultural produce. There are however no quick fixes that will easily transform the horticulture sector in Southwest in the short term. Moreover, without local stakeholders taking the initiative this will not happen, no matter how much money donors put into it. The following recommendations provide a roadmap for different stakeholder types to develop the sector in the coming five years and to make it more investment-ready. They were presented, discussed and endorsed by key stakeholders during a final workshop.

- The seven key areas to work towards 2030 milestones begin with a multistakeholder platform to shift what is already happening informally to a (semi)formal coordinated space. This platform should be established first before working on the other key areas.
- The other six areas address what needs to take place within the supply chains, operating environment, support services and consumer side. The prioritization of these efforts will depend on which actors are able and willing to take the initiative across the region.
- In a concluding workshop, stakeholders endorsed the recommendations, voiced a willingness to act on them and how they could contribute.
- The seven key recommendations are summarized below and in table 7.1. More detailed activities by key area are available in annex 9.5.

7.2 The seven key recommendation areas

Key areas 1 and 2 relate to the operating environment. **Key area 1** recommends a multistakeholder platform that is market-led, though emphatically representative of the full range of voices – from smallholder farming to financial institutions – will do justice to the already rich fabric of informal connections and relationships that exists amongst stakeholders across the Southwest. There is a clear interest and willingness for this kind of sector- and region-wide coordination and leadership, without which challenges and constraints can only by acknowledge but not addressed. **Key area 2** highlights that the states themselves will need to play a more supportive role if the sector is to succeed for all; while Northern states have invested into horticulture, the Southwest has focused on staple crops or non-agricultural sectors. Awareness of the sector's future importance for food security in the region is on the rise, but more can be done to ensure that horticultural development is truly inclusive. The states can work with the platform and existing (informal) organizations to enable this.

Key area 3 relates to improving financial access for all businesses, organizations and individuals that need it to improve their infrastructure, resources and capacity. As in many agricultural sectors, there is a mismatch between practitioner needs and existing financial instruments. Risks must be managed and overhead costs covered without making loan provisions insurmountable for the lender. There are plenty of good practice examples to build on however, if there is a willingness from different kinds of financial institutions.

Key area 4 highlights the need for improved supply chain infrastructure, without which harvest and post-harvest losses will continue to be incurred. Improved transport and storage will already drastically increase quality maintenance in the short term, while (renewable energy supplied) cold storage and transport will extend shelf life at market in the medium term. Reducing perishability will make an important contribution to price stability of produce.

Table 7.1 *Key recommendations and activities*

Key recommendation area	Activities	Stakeholders
1. Establish a **multistakeholder platform** led by private sector with other stakeholders.	Establish a multistakeholder platform focused on SW horticulture sector to lead and coordinate the roll-out of the other recommendations and address sector challenges, including; • Support tailored (financial) services, technologies (post-harvest practices), trainings accessible to smallholder and commercial-scale businesses and, where feasible, vertical integration (key areas 5 and 3). • Co-invest in strategic infrastructure projects with a focus on (cold) storage, transportation, and irrigation (key area 4). • Improve public-private dialogues to tackle regulatory and sector-wide challenges (key area 2). • Promote sector-wide access to information on production, pricing and access to resources.	• Nigerian private businesses • Foreign businesses • Nigerian banks • Donors • Six SW state governments
2. Improve **policy and regulatory** support along the supply chain.	• Regulatory support across the value chain to enhance the coordination and prioritization of activities, especially addressing the needs of the informal sector which dominates the horticulture sector. • Address the application of Good Agricultural Practices (GAP) and improved access to input, to improve current production practices and to increase food safety. • Ensure land access for farmers, especially given the increasing land pressure in some of the states in the Southwest.	• Nigerian federal government • Six SW state governments • Donors • International business
3. Develop **tailored financial** products for smallholders, SMEs and midstream actors.	• Develop a long term financial strategy to manage and reduce sector risks, and so be tailored to the actor types, horticultural produce, geography and demography. [8] • Underwrite tailored loan provision through local banks and other financiers to stakeholders along horticultural value chains to start and scale commercial production, aggregation, transport and retail. • Integrate loan provision into capacity development by private and public actors.	• Central Bank of Nigeria, private banks, other domestic lenders • Donors • Insurance providers
4. Develop production and supply chain **infrastructure.**	• For production, provide irrigation solutions and water pumps to extend the season and increase yields, while improving access to local storage facilities. • Develop access to good quality starting material such as seedlings produced in nurseries. • Invest in storage facilities, particularly (cold) storage, and improve market infrastructure, to extend shelf life and maintain quality of produce. • Develop dedicated transport systems through logistics partners to continue to reduce post-harvest losses along the supply chain.	• Nigerian business • Donors • Federal and state government
5. Build **farmer capacity** to shift to commercial-scale production and SME approach.	• Comprehensive training programmes on sustainable farming must be developed for extension officers and farmers, covering areas such as pest management, soil fertility, irrigation, and proper post-harvest handling with a view to reducing on-farm losses and extending the production season. • Enhance connections between farmers and market actors to increase market access and efficiency. • Engage more people in horticulture, from household to business levels, while investing in capacity-building for skilled and unskilled labour, to strengthen the sector's workforce.	• Business: Public and private training institutions. • MoA: Agricultural extension services. • MoE: TVET curricula development • Donors
6. Develop **training** schemes and transferable skills for shifting in/out of horticulture sector.	• Develop a network of educational institutes to develop business and other transferable skills for especially the young population. • Build on the experience of existing institutes and programmes that already supports young entrepreneurs. • Link to other leading initiatives across the African continent working on youth leadership.	• TVET institutes and universities with business programmes • Training/coaching businesses • Ministry of education • Donors
7. Develop consumer awareness of **healthy diets** and safe food.	Build on existing strategy and policies to promote (vegetable based) healthy diets for consumers through: • Social and behaviour Change Communication (SBCC) campaigns and training programmes for the public, including revised education curriculum. • Social marketing and media strategies. • Working with local civil society organizations, relevant government bodies and networks.	• Nigerian state and federal government ((F)MoARD, (F)MoH, (F)MoE), bureau of food (safety) standards • (I)NGOs and CSOs • Schools • Media

[8] Note that these recommendations build in part on AgriLogic's Financing Agribusiness report provided to the Embassy in April 2022 (Steemers et al., 2022).

Key areas 5 and 6 relate to training and capacity building. **Key area 5** is focused on the development of sector-specific capacity of farmers. Currently there are too few extension officers to provide farmers with updated training and support. In the absence of these, going through producer organizations, input suppliers, and other bodies to reach those farmers interested in scaling up production, can help boost and extend the production season and better link farmers to markets. **Key area 6**, though related, emphasizes the need for non-sector specific, or transferable, skills in organization and business management – which can be applied in any industry, not just horticulture or other agricultural sectors. This is particularly important for young women and men looking to generate an income in the short term and who can benefit from this kind of skills training.

Key area 7 addresses aspects around improving healthy diets. While most people regularly consume locally or home grown (leafy) vegetables, consumer awareness of the benefits of vegetables as part of a balanced diet tends to be low. Additionally, vegetables are often neither affordable nor easily accessible. Media and civic campaigns, and educational interventions can help increase this awareness and ensure consumers make demands of actors in the sector and the SW states to ensure food safety standards are properly applied and enforced.

Where in the Southwest?
These recommendations pertain to all six states in the Southwest, but while they aim to ensure as inclusive and systemic a change as possible, progress and development in one place should not be held back by the lack of it somewhere else. Each state has its own idiosyncratic characteristics in terms of (arable) land resources, public governance and priorities, urbanization, organizational and institutional capacities, etc. which mean that initiatives and investments will get more uptake and traction in one region within or across states than another. Lagos is unique both in terms of urban populace, consumer demand, and the gravitational force and influence of Mile 12 on the horticulture sector and other produce. It has also higher degrees of digital literacy amongst farmers. Ogun benefits from its proximity to Lagos while still having arable land available, in a similar vein to Oyo as the region's largest state with the second largest city. Solar-powered drip irrigation is identified in Lagos and Oyo, alongside hydroponics, protected farming and sack farming to make up for scant and fragmented land access.
On the other hand, Osun, Ekiti and Ondo have proportionally larger rural and less commercially-developed smallholders, though all are quickly urbanizing. Ondo's farmers have raised production of cucumber in response to market demand, even reporting an excess sometimes. In both Oyo and Osun, at least informal enforcement of produce quality along the local supply chains in the states are reported to being maintained. Processing companies don't exist in any other states than Lagos, though they exist in other states and the market for more fresh produce to be processed is always there, so much so that produce is even imported from abroad to meet demand.
Broader and more specific characteristics and initiatives such as these within and across each of the states will determine how the horticultural sector will evolve. The following recommendations and activities should adjust to these changes over time.

7.3 What these recommendations mean for stakeholders

Below we give a summary overview of the five stakeholder types involved in the SW horticulture sector. Each paragraph provides a brief overview of their contributing role to the horticultural sector's futures, drawn from the seven key areas, together with a description of their distinguishing opportunities and challenges.

Nigerian business
This is the most varied stakeholder type of each of these categories, including everyone from individual young agribusiness leaders to smallholders represented by Producer Organizations (POs) and midstream SMEs, and from input suppliers to training bodies that work across the country, not just in the Southwest states. Ultimately the development of the horticulture sector will succeed or fail on the initiatives of these actors. By 2030 Nigerian businesses across the supply chains should be more resilient to market changes, aware of other key actors across the network, and supplying (urban) consumers most of the year with quality produce. For them the **opportunities** are greatest, given the growing and urbanizing population in SW; from training to inputs and service provision. Nigerian entrepreneurs and private businesses will be central to building local

capacity and creating the infrastructure necessary for a thriving horticulture sector. At the same time, the **challenges** are also great; as a nascent industry in a part of the country wherein the states invest relatively little into improving the operating environment, the investment risks are high, and so require much greater collaboration, or at least coordination, to begin developing the sector through a private-sector lens.

Banks and other lenders

Banks and other financial institutions are crucial in providing the necessary capital to drive the sector's growth, in particular to farmers and the Nigerian private sector to facilitate their investments. By 2030, these investors should offer financial products tailored to the horticultural sector (informal) actors all along the value chains, empowering farmers to invest in high yielding solutions and midstream actors to improve (cold) storage facilities – critical for maintaining the quality of horticultural products after harvest. If done well, the **opportunities** are a well-balanced portfolio made up of larger, low-risk lenders (retailers, warehouses, input suppliers) that balance risks of defaults by small-scale producers and start-ups. The **challenges** are to grow this portfolio in the first place, as the industry is still in an early stage.

Nigerian state and federal government

The SW Nigerian states and federal government should play an even more proactive role in creating the enabling environment needed for the horticulture sector to thrive. By 2030, the government will have implemented and enforced policies that ensure the availability of affordable farming inputs based on market demand, will be working alongside private and other organizations to build skills and capacity, co-develop supply chain infrastructure, extend the off-season production by connecting farmers to irrigation and enforced food safety standards that consumers will be demanding. These policies will establish a conducive environment for smallholder farmers and ensure that horticulture remains both environmentally responsible and economically viable. The **opportunities** for the six states are obvious; given the growing consumer demand of their citizens that are currently spending more money on produce from the northern states than their own, this money could remain in the region while also creating jobs for young entrepreneurs. It can also create an investment-ready environment. The **challenges** for them are to become more responsive to and engaging with the varied market demands; businesses expect more from the public sector than they can provide with their budgets – but communicating through a multistakeholder platform on what they can and can't do can help show their willingness.

Donors (countries, foundations, etc.)[9]

If different public donors, international foundations and development agencies are to pour money into the SW horticulture sector, it should be done in a coordinated manner (e.g. in agreement with the multistakeholder platform) and conditional on the sector itself investing time and resources into making the sector more investor-ready. If this is done then by 2030, donors will have helped make produce affordable and accessible by funding capacity-building programmes and awareness raising to equip farmers and midstream actors with the skills and knowledge necessary to adopt good agricultural practices and to improve current market practices, co-developed supply chain infrastructure (post-harvest technology, transportation, cold chain logistics, market hygiene), and helped provide consumers with the knowledge and skills to eat a balanced diet. The **opportunities** for donors are to take on the riskier parts to developing the sector, while investing in areas that take longer to show results. Donors can and should also work through multiple in-country actors to catalyse activity, such as lowering interest on bank loans. The **challenges** are to structure their investments so as not to be perceived as grants, nor to be replacing the role that the state and federal government entities should be playing.

Foreign business (including Dutch)

Foreign companies, especially from the Netherlands, can play an important role in providing the needed technical expertise and technology for advancing the horticulture sector in Southwest Nigeria. Foreign businesses, by engaging with and investing in partnerships (public-private or private-private), will facilitate access to inputs such as (climate-resilient) seeds, fertilizers, and farming equipment, making modern horticulture practices more accessible to farmers with a commercial mindset. By 2030, commercially-

[9] Besides the EKN, the following programmes and donors have supported vegetable supply chain development in Southwest Nigeria; the Green Innovation Centre for the Agriculture and Food Sector (GIZ), Rethinking Food Markets and Value Chains for Inclusion and Sustainability project (CGIAR), Heifer International Naija Unlock (Heifer), Strengthening vegetable value chain in Nigeria (Evergreen-2Scale partnership). However, all of these programmes ended in 2024 or earlier.

orientated farmers in the SW will have adopted improved farming technologies that will contribute to both productivity and product quality contributing to a profitable business model. This includes access to seedlings from hybrid varieties produced in dedicated nurseries. Businesses in the midstream segment of the value chain can also benefit from technologies supplied by foreign companies in the field of improved handling, storage and packing solutions. These businesses thereby have the **opportunity** to input on the direction of the SW horticulture sector as it develops and be able to build relationships with local actors. The **challenge** for foreign businesses is to manage the risks, especially in an environment of unstable currency fluctuation, repatriation of business earnings, and untransparent business practices.

7.4 Stakeholder feedback

During the final workshop wherein the results of this study and the recommendations were presented, stakeholder participants were asked to first discuss and then vote on the key recommended areas. Following the polling results a plenary discussion was held. The results are illustrated in the table below, alongside a summary of key reflections;

- In the polling, farmer capacity building received the most votes. Developing business acumen and sector-specific skills is considered to be the greatest need. The establishment of a multistakeholder platform and training & skills development were tied for second, while policy & regulatory support and production & supply chain infrastructure were both third.
- As reflected in the voting, while improving access to finance remains important, it was recognised that sector knowledge and capacity development are priorities. Similarly, consumer awareness should be a medium- rather than a short-term goal.
- The poll and discussion reflected the findings of the study; while some areas may be considered more important than others, there is no clear 'silver bullet' on where to prioritize activities and investments. Developing the sector will remain an iterative process.
- Developing a multistakeholder platform can be valuable, though make sure to build on what's already there to avoid duplication of efforts.
- Understanding the sector better will help to develop it; harvest the existing data and turn it into a knowledge resource for stakeholders.
- Various stakeholders made a call to collaborate and support the sector;
  - the Chamber of Commerce said that they were willing to convene key stakeholders and help implement the recommendations.
  - Access Bank indicated that they already work on access to finance in agriculture, and manage risk by designing end-to-end financial products that target actors along an entire supply chain.
  - NIRSAL (Nigeria Incentive-Based Risk Sharing System for Agricultural Lending) highlighted the Nigerian Agri Development Fund (https://www.nadf.gov.ng/), established in 2022 to improve access to finance to develop agriculture and national food systems.

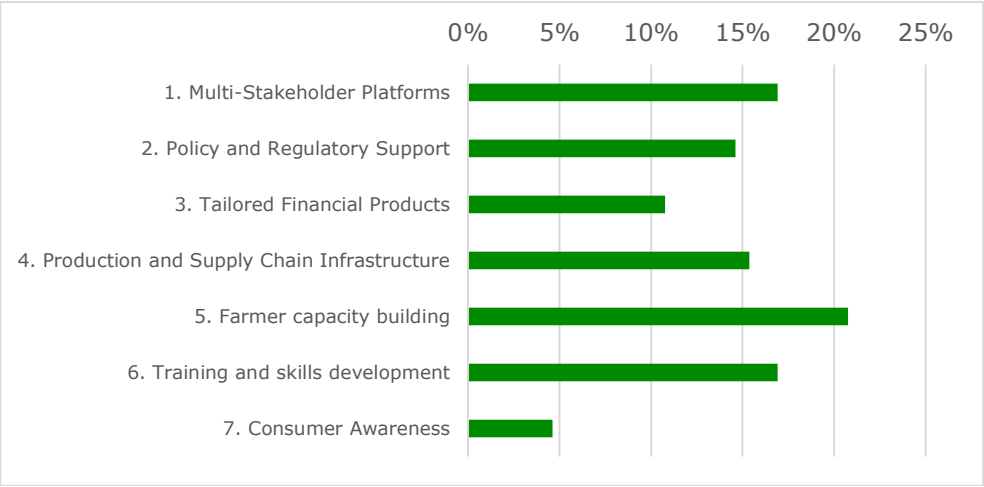


Figure 7.1 *Prioritization of recommended areas by workshop participants.*

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9 Annex

9.1 Phase 1

9.1.1 Ranking per crop and state

For long and shortlisting of priority crops by state, 10 indicators were selected covering areas of sustainability, inclusiveness, and resilience, taking environmental, economic, and social objectives into account. Produce was ranked (1 to 5) against these indicators, using desk research and local stakeholder engagement.

Table 9.1 *Ranking of crops*

	Data Availability							Climatic Factors							Competitive Factors (Enablers)						
Crops	Ekiti	Lagos	Ogun	Osun	Ondo	Oyo	Total	Ekiti	Lagos	Ogun	Osun	Ondo	Oyo	Total	Ekiti	Lagos	Ogun	Osun	Ondo	Oyo	Total
Pumpkin	1	2	1	1	2	1	8	4	3	3	3	3	4	20	3	4	4	3	3	3	20
Leafy Vegetables	2	2	1	2	2	1	10	4	4	4	4	4	4	24	3	4	4	3	3	3	20
Pepper	2	3	2	2	2	2	13	4	3	3	3	3	4	20	3	4	4	3	3	3	20
Onion	1	4	2	2	2	1	12	3	4	3	3	3	2	18	2	4	4	3	3	3	19
Tomatoes	4	4	4	4	4	4	24	3	4	4	3	3	4	21	3	4	3	3	3	3	19
Cabbage	1	1	1	1	1	1	6	3	2	3	3	3	3	17	2	3	3	2	2	2	14
Okro	4	4	4	4	4	4	24	4	2	4	3	4	3	20	3	3	3	3	3	3	18
Melon	2	1	2	1	2	2	10	2	2	2	2	2	3	13	3	3	3	3	3	3	18
Broccoli	1	1	1	1	1	1	6	1	3	2	1	1	1	9	1	3	1	1	1	1	8
Carrot	1	1	1	1	1	1	6	4	4	4	3	3	4	22	2	3	3	2	2	2	14
Cauliflower	1	1	1	1	1	1	6	1	3	2	1	1	1	9	1	3	1	1	1	1	8
Cucumber	1	1	2	1	1	1	7	4	3	3	3	3	4	20	3	4	3	3	3	3	19
Watermelon	1	1	1	1	1	1	6	4	5	4	4	4	4	25	3	4	4	3	3	3	20
Radish	1	1	1	1	1	1	6	1	3	2	1	1	1	9	1	3	1	1	1	1	8
Eggplant	1	1	1	1	1	1	6	3	4	4	3	3	4	21	3	4	3	3	3	3	19
Sweet Pepper	1	1	1	1	1	1	6	4	4	3	3	3	4	21	3	4	4	3	3	3	20
Beetroot	1	1	1	1	1	1	6	3	4	3	3	3	2	18	2	3	3	2	2	2	14
Green beans	1	1	1	1	1	1	6	3	4	4	3	3	3	20	2	3	3	2	2	2	14
Green pea	1	1	1	1	1	1	6	1	3	2	1	1	1	9	1	3	2	1	1	1	9
Leaf Cabbage	1	1	1	1	1	1	6	3	3	3	3	3	3	18	2	3	3	2	2	2	14
Clove Basil*	1	1	1	1	1	1	6	4	4	4	4	4	4	24	3	4	3	3	3	3	19

9.1.2 Key informant interviews and focus group discussion

Table 9.2 *Types of stakeholders involved in KIIs and FGDs*

Interview category	Ogun	Osun	Oyo	Ekiti	Ondo	Lagos
Aggregators	2	2	2	2	2	2
Farmer associations	1	3	3	-	3	1
Dealers	2	-	-	2	-	2
Commercial farmers	2	2	2	2	2	2
Formal market associations	2	2	2	1	2	2
Retailer	-	-	-	1	-	-
Rural wholesalers	2	2	2	2	2	2
Focus group discussion (women)	1	1	1	1	1	1
Focus group discussion (producers)	1	1	1	1	1	1
Focus group discussion (youth)	1	1	1	1	1	1
Total FGD participants	**24**	**24**	**24**	**24**	**24**	**24**
Total per state	**35**	**35**	**35**	**34**	**35**	**35**
Total overall	**209**					

9.1.3 Lagos

Introduction
Lagos is the main urban market for vegetables. As part of this study, we focused on tomatoes, green leafy vegetables (GLVs), and onions.

Value chain flow mapping
Vegetable production in Lagos is mainly concentrated in the farming regions of **Epe**, **Ikorodu**, and **Badagry.** Most of the tomatoes and onions consumed in the state come from the northern states accounting for over 80% while the remaining 20% comes from the Southwest states including Lagos, as highlighted by a local aggregator. GLVs are mainly produced in Lagos or some neighbouring states.

During the wet season (typically May to October), most tomatoes and GLV consumed in Lagos come from within Lagos itself and surrounding states. However, during the dry season (typically November to April) in Lagos, these Southwest states struggle to meet the demand, and this is when Lagos relies on supplies from major northern Nigerian states that have access to public irrigation sources. Cameroon can sometimes act as a source of tomatoes. Interviewed dealers indicated that the following states supply the majority of the tomatoes and onions in Lagos:

- Kano (a major producer of tomatoes, and onions).
- Kaduna (tomatoes).
- Sokoto (tomatoes and onions).
- Jigawa and Bornu (onions).
- Niger (tomatoes).

In Lagos, the majority of onions consumed throughout the year originate from the northern regions of Nigeria. While local onion production has begun with a small number of farmers, it remains insignificant compared to the total demand within the city. Additionally, the Niger Republic is an important source of onions during the dry season in Lagos, but these sources are not always reliable due to border restrictions.

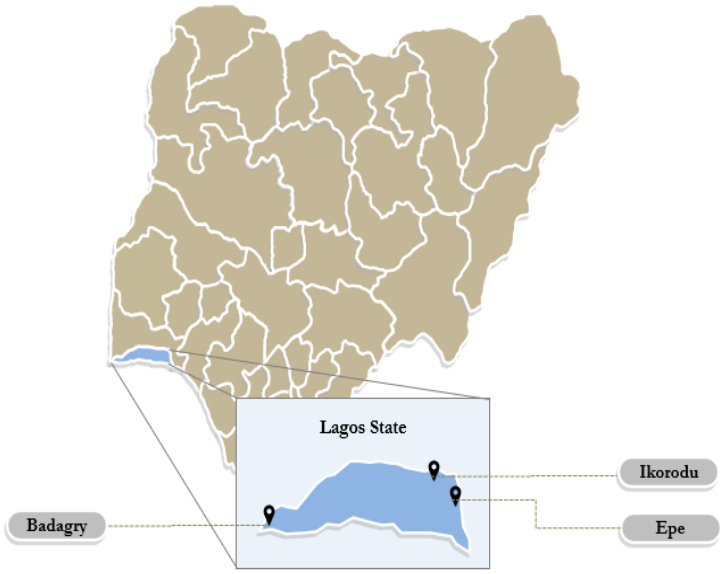
Value chain activities

Input supply
Various suppliers offer a wide range of inputs, including seeds, herbicides, pesticides, fertilizers, greenhouse materials and equipment, and irrigation kits. Service providers such as Eweko Concepts, Thrive Agric, and Agromall offer physical and online platforms for farmers to connect directly with input suppliers, logistics providers, and aggregators, streamlining their access to essential resources and potential buyers. Eweko Concepts, through its farmer cooperative, facilitates market linkage between farmers and input suppliers. Thrive Agric and Agromall, through their online platforms, empower smallholder farmers by providing high-quality inputs and connecting them directly with buyers and suppliers. Although these platforms exist, there has been limited adoption by farmers in Lagos as most farmers are not aware of the advantages of some improved inputs and are reluctant to adopt online platforms.

There has been an increase in the adoption of solar-powered drip irrigation by the more advanced vegetable farmers in Lagos due to rising petrol prices, enhancing year-round vegetable cultivation. As one respondent in Lagos noted "All of us here now adopt the use of irrigation systems... we don't depend on rainfall, and we are trying to adopt the use of a solar-powered irrigation system whereby you don't use the generator."

Rapid urbanization is leading to the conversion of arable land for real estate development, and labour costs are rising as fewer people are willing to work in horticulture. As stated by vegetable farmers and aggregators in Lagos: "Economies of scale for labour are not cheap at all. It's not even available sometimes. Particularly in Epe, labour is scarce and costly. While some areas in Ogun, Osun, and Ekiti manage labour issues better, Lagos, due to its proximity to the city, faces severe labour shortages." Another farmer added, "Another major concern in Epe is that there will not be enough land for farming in the next five years because of real estate."

Production
Horticultural crop production in Lagos is predominantly concentrated in the farming regions of Epe, Ikorodu, and Badagry.



Map 9.1 *Main production areas in Lagos*

Small-scale producers largely occupy these areas. Due to the rapid urbanization rate of Lagos and the consequent scarcity of agricultural land, the stakeholders indicated that there has been a shift towards protected farming methods, including the adoption of advanced techniques such as hydroponics and container and sack farming. All to maximize productivity in limited spaces. This transition reflects a growing trend towards innovative agricultural practices in the state aimed at addressing the challenges posed by urban expansion.

There are also several farmer cooperatives and farmer groups in Lagos. For example the Epe Vegetable Farmers Group, Eko Farmers (APPEALS), and Eweko Concepts. These groups support member farmers through shared resources, training, and collective bargaining power, enhancing productivity and market access. As stated by a respondent in Lagos: *"Even though our farms are scattered around Epe, we collaborate as a cluster. Eweko Concepts, our Business Support Service provider, assists us with business development and connects us to buyers (off-takers)."*

Marketing, transportation, and distribution
Almost all vegetables that arrive in Lagos enter via the Mile 12 market (see Box 5.2). Most of the products traded in this market originate from other Nigerian states. For example for tomatoes, the journey is long. The tomatoes are transported in non-refrigerated lorries or trucks. Transportation can take several days without any temperature control. This often results in significant spoilage, with losses for tomatoes reaching up to 10% or higher. After arrival at the markets, the risks for loss further increase.

Additional crop losses are incurred due to shortened shelf life because of limited storage and cooling facilities on all markets in Lagos. Although efforts are being made by private actors to remedy this as stated by an aggregator in Lagos: *"In Mile 12 market, there is a cool room beside the people selling tomatoes over there built by the market leader. They call it ECOTUTU. Crops are kept there, and they normally pay there to keep produce till the next day. It is very big. Like 5 metric tons container size cool room built with solar power. All this is what we are expecting the government to do for us in this market, but they are not doing it for us."*
Also, a commercial farmer stated that his cooperative is currently constructing a cold room to aid storage of horticultural crops as he mentioned, *"We have the cold room storage system in the Eweko concept that they are already working on."*

Producers of tomatoes and GLV from Lagos primarily sell their produce at major markets like Mile 12, Ajah, Sangotedo, Ogere Central, Ibaraba, and Ayetoro in Epe. They are increasingly bypassing middlemen to sell directly to the wholesalers and retailers in the open markets and hotels, aiming to enhance their profit margins as highlighted by an interviewed tomato farmer: *"In the Southwest, farmers often bypass wholesalers and sell their goods directly to buyers such as hotels or open markets to eliminate middlemen and ensure timely payments".* Lagos farmer
As such vegetables produced in and around Lagos have to compete with produce from the northern states. In terms of proximity products from Lagos have a clear advantage since costs for transportation are lower and the freshness of the produce is also better.

Convenience stores are increasing, with state governments showing interest in investing in market hubs at local government levels. Aggregation centres are growing, enabling more bulk supplies at reduced costs, which is expected to shift sales from traditional markets to convenience stores and small grocery stores.

In Lagos, the informal market segment currently dominates with about 95% of the market. However, based on feedback from stakeholders interviewed, the formal market, including supermarkets, is poised for growth. This shift is driven by an emerging middle class increasingly willing to spend money on convenience. Various stakeholders interviewed have indicated that this trend will likely lead to a rise in the formal market's share in the future.

Formal markets include online digital sales targeting busy professionals and younger generations focused on healthy living, with quality being a major consideration and producers are increasingly adopting Agric E-commerce websites, mobile apps (WhatsApp), and agri-tech companies like "Thrive Agric, AgroMall, Foodlocker, and Vendease," that connect producers directly with consumers, inputs, finance, facilitating easier market access. This is due to the high digital literacy rate of farmers in Lagos when compared to other Southwest and Northern states driven by increased youth involvement in the horticulture sector and the presence of a well-developed digital infrastructure.

To incentivize farmers to bring tomatoes, and onions to the market despite uncertain sales, Mile 12 dealers cover a portion of transportation costs if the products remain unsold as stated by a stakeholder interviewed: *"If a farmers bring produce to the market and we do not sell, we cover the cost of transportation. Like if it is N10,000 for example, and the market does not sell well, we can ask the farmer to pay N7,000 while I as a Diloli (dealer) will bear N3,000. To encourage them to bring more produce and for them to continue their farm work and not be discouraged"* Mile 12 Dealer. This helps to ensure a continuous supply of these crops in the market, thereby contributing to price stability.

Demand and consumption
Lagos is the most populous state in Nigeria, with an estimated population of over 24 million people. Forecasts suggest that this number will exceed 30 million by 2030 due to high birth rates and internal migration. As such Lagos is a large market for vegetables.

The demand for tomatoes and onions fluctuates seasonally, influenced by the volume from the north and Southwest, as well as the current weather season and festive periods in June (Salah) and December (Christmas). An increased supply of tomatoes and onions from the North typically results in lower prices and higher demand as dealers and wholesalers are compelled to offload their stock due to inadequate storage facilities.

In Lagos, the rising population, combined with a growing exodus from farming, has resulted in a decrease in supply and an increased demand for vegetables as mentioned by a respondent: *"The consumer demand has gone higher and there's a lot of competition in the market now... There are more requests for habanero. There are more requests for pepper. So also, a lot of tomato."* Lagos state aggregator.

Processing
Most tomatoes, onions, and GLVs produced in the state are sold through farm gate aggregators and are consumed fresh. This leaves domestic processors struggling to secure enough affordable tomatoes all year round. This challenge is especially acute during the off-season, making it difficult to afford tomatoes for

domestic processing. As a result, importing processed tomato products is considered cheaper than domestic processing. As an intermediate solution, some of the major processors in Nigeria have been importing large volumes of tomato concentrates from countries like China and India a reliable input for their processing needs. However, they are now working with dedicated contract farmers to ensure a steady supply of raw materials. In general, tomato processing is seen as having significant potential since many processed tomato products are imported. Given its growth potential, KIIs support the idea that further opportunities exist in the processing sector.

Supporting actors
Financial Institutions: Despite increasing bank funding for input suppliers, and aggregators in Lagos, the lending towards actors involved in smallholder farmers' overall financing for primary production remains low. The current funding from the financial institutions is only aimed at formal actors in the agriculture sector. Banks perceive small-scale production as unstructured, risky, and time-consuming, falling outside their area of expertise. They prefer lending to larger, more organized segments of the value chain, hoping for a trickle-down effect that benefits smallholder farmers through their interactions with these bigger players.

Research Institutions: Interviewed actors argue that there is a disconnect between the research institutions and the needs of farmers. Epe farmers expressed a lack of practical research and knowledge transfer. They noted that research should focus on developing locally adapted tomato varieties and improved cultivation techniques. The potential of under-utilized crops like Ugwu is another missed opportunity. Research could explore the commercial viability of such crops to create new income streams for farmers.

Government
The Lagos government has launched some initiatives to bolster horticulture production within the state, including the

- Lagos Agripreneur Program (LAP): Established in 2020 as a social intervention programme, it aimed at exposing the youth to agriculture across four value chains including vegetables via training utilizing modern agricultural techniques and practices towards job and wealth creation.
- "OUNJE EKO" Food Discount Markets: Launched in March 2024, this aims to create a direct link between horticulture producers and consumers, ensuring better prices for farmers and fresh produce for Lagosians.

Governance in the horticulture value chain
Market-driven pricing: Farmers generally don't set the price; instead, the prevailing market price dictates the final cost. Lagos' Mile 12 market serves as the benchmark for pricing most agricultural products. Farmers adjust their prices based on the current market value at Mile 12. These prices can vary depending on factors like seasonality and supply/demand. Although market forces play a significant role, there's some room for negotiation, especially with premium buyers who value quality and consistent supply. Pre-arranged agreements with specific buyers offer some negotiation leverage. Farmers can potentially secure a slightly higher price than the open market based on quality and established relationships.

- Direct sales strategy: Farmers in Lagos are increasingly bypassing wholesalers and selling directly to buyers, including hotels and open informal markets, to secure better returns for their crops. Aggregators play a facilitating role, not an exploitative one. They connect farmers with buyers and ensure timely payments. Farmers work together through cooperatives to determine a fair average price when selling to a buyer brought in by the aggregator. The aggregator profits by charging the buyer, not by taking a cut from the farmers' earnings.
- Cooperatives and associations: Small-scale farmers often form informal cooperatives or marketing groups to pool their produce and negotiate better prices with traders or buyers. These groups operate based on verbal agreements and shared norms rather than formal contracts. Group members support each other by sharing market information, transport costs, and sometimes even financial resources. This collective action helps farmers achieve economies of scale, access better markets, share risks, and strengthen their bargaining power, providing a governance structure rooted in cooperation and shared goals. Also traders are organized in formal associations on each market, often organized per product.

- There are few formal cooperatives in Lagos. They offer a wider range of services to their members including aggregation, marketing, financial services, input supply, and farm machinery services. Some of these cooperatives are:
  - EWEKO concept cooperative in Epe that supports farmers with aggregation, market linkage, and logistics as stated by a stakeholder interviewed: "*We have off-takers in Epe or an aggregator that works with an off-taker. Like Eweko integrated services is an aggregator. So they collect the produce from us and take it to the off-takers. For instance, if I'm selling to Eweko, what I do is bring it to the aggregation centre. They sort out the logistics and how it will get to the off-takers or market.*"
  - Eko Farmers Appeals Cooperative Multipurpose Society. This cooperative, launched in collaboration with the Lagos government in 2023, focuses on empowering farmers across various agricultural value chains. They offer services like input supply, joint marketing and training, and capacity building.

Conclusion
Consumers in Lagos heavily rely on northern Nigerian states for tomatoes and onions, especially during the dry season, while local production is concentrated in Epe, Ikorodu, and Badagry. Rapid urbanization and rising labour costs challenge local farmers, who are increasingly adopting innovative farming techniques and forming cooperatives for better market access. Despite informal market dominance, the formal market is poised for growth driven by a rising middle class and the increase of digital platforms. Transportation and storage challenges, particularly at the Mile 12 market, lead to high spoilage rates, emphasizing the need for better infrastructure. Government initiatives and financial support have yet to fully benefit smallholder farmers, highlighting a need for more targeted interventions.

9.1.4 Oyo

Introduction
Oyo is a key agricultural hub with diverse crops that sustain its economy. As part of this study, we focused on pepper, green leafy vegetables (GLVs), and onion.

Value chain flow mapping
With its expansive arable land and varied climate, Oyo has the potential to be a leading hub for Nigeria's horticulture sector. During the wet season, 80% of the peppers and GLVs consumed in the state come from within the state and other Southwest states. However, during the dry season (typically November to April) in Oyo, these Southwest states struggle to meet the demand, and this is when the state relies on supplies from major northern Nigerian states that have access to public irrigation sources.

GLVs are produced in Oyo and the Southwest region all year round. Almost all of the onions consumed in the state come from the Northern states like Sokoto, Plateau, Kano, Jigawa, Kaduna, and Bornu accounting for over 90%. In comparison, Nigeria's remaining 10% of onion production comes from the Southwest states, with Oyo leading as the region's top producer.

Value chain activities

Input supply
In Oyo, there is a scarcity and high cost of farm inputs like herbicides, seed, and labour which also reflects and leads to a high cost of the produce. Farmers in the state currently struggle because of the difficulty in acquiring tractors and irrigation equipment, unlike Northern farmers who have access to tractors and subsidized fertilizers. As stated by an aggregator "If we could acquire farm implements such as tractors, irrigation systems, and vehicles, operations would significantly improve, reducing the current struggles." In Oyo, farmers receive no subsidies and have to buy all their inputs at the prevailing market rate which becomes a hindrance to large-scale cultivation of crops as desired.

There is limited adoption of irrigation in the production of horticultural crops when compared with farmers in the North who received government support and access to irrigation facilities as mentioned by an Oyo farmer, "the Southwest producers of wet season products have a readily available supply, doubling that of the Hausas. However, the Northern producers have a competitive advantage due to government support and

access to irrigation facilities." In a recent commitment to boosting agriculture, the federal government has begun renovating dams across the state to expand irrigation systems and enable year-round cultivation.

Production
Horticultural crop production in Oyo is predominantly concentrated in the farming regions of Akinleye, Iseyin, Oke-Ogun, Ogbomoso, and Oyo (South and North). These areas are largely occupied by small-scale producers who form the backbone of horticultural activities. The primary horticultural crops produced are GLVs such as amaranthus, celosia, spinach, and ugwu, alongside peppers and tomatoes.

There is a seasonal pattern in the production of vegetables. Crop production is typically at its peak during the rainy season, necessitating imports from the north to supplement food supplies during the dry season as mentioned by an Aggregator: "When is the rainy season there will be more production so supply will be more than demand and the price will come down when is the dry season when they are bringing from the north is more stable."

Marketing, transportation, and distribution
The major supply markets for producers in Oyo are Mile 12 market, Ogere Central Market Ibaraba, Bodija market in Ibadan, Iseyin market, Oja Oba market, and Ayetoro market in Epe, Lagos. Oyo farmers have a comparative advantage in the market thanks to their fresh produce. Unlike crops transported long distances from the north, Oyo's vegetables arrive at the market within a day via truck, preserving their freshness and marketability.

To avoid long journeys north, dealers in Oyo collaborate with farmers in Kano, Sokoto, and Kaduna. This collaboration allows them to order peppers and onions directly, with deliveries ensuring a steady supply for sale.

In the state, producers are increasingly bypassing dealers and aggregators to sell directly to final consumers as mentioned by a respondent: "In the Southwest, farmers often bypass wholesalers and sell their goods directly to buyers such as hotels or open markets to eliminate middlemen and ensure timely payments." To reach buyers, Oyo farmers utilize a variety of distribution channels. They connect with customers through social media platforms like WhatsApp groups, participate in local markets, and offer direct sales at their farms (farm gate sales).

Demand and consumption
The consumer demand for tomatoes and peppers fluctuates with higher demand typically seen during festive periods. Also, demand increases during the dry season as there is higher production and supply which brings down the price.

Consumer demand for tomatoes, peppers, and leafy vegetables is driven by specific preferences for certain varieties and freshness. Product appearance significantly impacts price, with consumers typically offering lower prices for produce with visible deterioration. Freshness is highly valued, and the longer vegetables remain unsold, the lower their market value becomes as stated by a dealer in Oyo: "Customers tend to negotiate lower prices for products that have deteriorated in physical appearance. There is a preference for fresh products, so the value of vegetables decreases the longer they remain unsold."

Processing
Most of the tomatoes and peppers produced in the state are sold and consumed fresh limiting the availability and supply of crops for processing. Despite the abundance of fresh tomatoes during the wet seasons and peppers, processing facilities are relatively underdeveloped in Oyo. This limits the ability to convert surplus produce into value-added products like tomato paste, puree, or dried peppers. We are not considering the dynamics of the international tomato processing industry that make it very difficult for the nascent processing industry to mature and to be competitive.

Supporting activities
Financial Institutions: Limited access to finance and facilities hampers efficient and productive farming practices for smallholder farmers in the state. This is largely due to the inability to provide the required

collateral needed for the loan. Despite increasing bank funding for warehouses, input suppliers, processors, and aggregators, smallholder farmers' overall financing for primary production remains low. The current funding from the financial institutions is aimed at formal agriculture actors. Banks perceive small-scale production as unstructured, risky, and time-consuming, falling outside their area of expertise. They prefer lending to larger, more organized segments of the value chain, hoping for a trickle-down effect that benefits smallholder farmers through their interactions with these formal players.
Research institutions: Oyo hosts several renowned research institutions dedicated to agricultural, scientific, and socio-economic research. These include the International Institute of Tropical Agriculture (IITA), Institute of Agricultural Research and Training (IART), University of Ibadan (UI), National Horticultural Research Institute (NIHORT), Nigerian Institute of Social and Economic Research (NISER), and Nigerian Stored Products Research Institute (NSPRI). Despite their research outputs, the impact on local farmers remains limited.

Many farmers are unaware of the existence or benefits of improved seed varieties and farming practices developed by these institutions and often lack the financial resources to adopt new technologies and practices.

Policies
Unlike farmers in the North, Oyo farmers receive very little government support as they have to buy inputs at market prices without subsidies and have limited access to irrigation infrastructures. Yet Oyo government has launched some initiatives to bolster horticulture production within the state, including the following:

- Sustainable Action For Economic Recovery (SAFER): This initiative initiated in May 2020 provides financial support to farmers to mitigate the effects of subsidy removal by the federal government. In February 2024, the Oyo Government disbursed an additional N340 million to eligible crop farmers across the state's seven zones, adding to the N1 billion already provided under SAFER.
- Oyo State Youth in Agribusiness Tomatoes Project: This launched in 2021 empowers young people in the state by equipping them with the technical, business, and entrepreneurial skills necessary to be successful in tomato agribusiness. The project leverages Oyo State Agribusiness Incubation Park centres.
- Agribusiness Education Project (STEP): This 200,000 USD initiative launched in 2020 in partnership with the International Institute of Tropical Agriculture (IITA), promotes agricultural education in primary and secondary schools. A pilot programme is currently underway at Fashola, Ibadan, with plans to replicate it in all Local Government Areas (LGAs) of Oyo. The goal is to introduce young people to agriculture at an early age and encourage them to consider careers in agricultural entrepreneurship.

These programmes by the state government show their commitment to addressing various aspects of agricultural development in Oyo, from financial aid and skills training to fostering a new generation of agripreneurs.

Governance
Direct sourcing through credit-based transactions: There is a constant supply of Onion and pepper in the state due to a collaborative network between local dealers and suppliers from the northern states of Nigeria. This system eliminates the need for lengthy journeys for Oyo -based sellers. Large sellers and dealers forge informal agreements with farmers in Kano, Sokoto, and Kaduna, ensuring a steady and consistent supply of essential produce. These agreements typically involve weekly deliveries of vegetables, most commonly peppers and onions, directly to Oyo, streamlining the supply chain and guaranteeing fresh produce for local consumers. These transactions are usually credit-based as payments are made after the produce has been supplied.

Direct Sales Strategy: Following a trend across the Southwest region, Oyo farmers are increasingly adopting a direct marketing approach. By passing wholesalers and dealers, they connect directly with buyers, including hotels and open markets. This innovative strategy offers several advantages. Firstly, farmers receive timely payment for their produce, eliminating the delays often associated with traditional market channels. Secondly, by cutting out the middleman, farmers enjoy enhanced profit margins, allowing them to reinvest in their farms and improve their livelihoods.

Market-Driven Pricing: Farmers generally don't set the price; instead, the prevailing market price dictates the final cost. These prices can vary depending on factors like seasonality and supply/demand. Although market forces play an important role, there's some room for negotiation, especially with premium buyers who value quality and consistent supply. Pre-arranged agreements with specific buyers offer some negotiation leverage. Farmers can potentially secure a slightly higher price than the open market based on quality and established relationships on the other hand, limited storage may force farmers to sell at lower prices to avoid spoilage.

Conclusion
Oyo's horticulture sector thrives on its vast arable land and diverse climate, focusing on peppers, and green leafy vegetables (GLVs). During the wet season, most peppers and GLVs consumed are locally produced, while onions are largely sourced from northern states. In the dry season, Oyo relies on northern supplies due to limited local production. Farmers face high input costs and limited irrigation, unlike their northern counterparts who benefit from subsidies and better access to equipment.

Direct sourcing from northern farmers and direct sales to buyers, including hotels and open markets, help Oyo farmers improve profitability and market access. Major markets for farmers include Mile 12, Bodija, and Iseyin markets.

9.1.5 Ekiti

Introduction
Agriculture is a dominant sector in Ekiti's economy with estimates suggesting that it contributes to over 30% of the gross domestic product and employs over 70% of the population (directly or indirectly). Although the horticulture sector in the state provides substantial employment opportunities, particularly for smallholder farmers and rural communities, there is often a scarcity and high cost of essential farming inputs such as seeds, fertilizers, and pesticides. For Ekiti we focused on GLVs, tomatoes, pepper and okra.

Value chain flow mapping
The value chain flow map for horticulture in Ekiti outlines the different stages and activities involved in the production and distribution of horticultural crops.

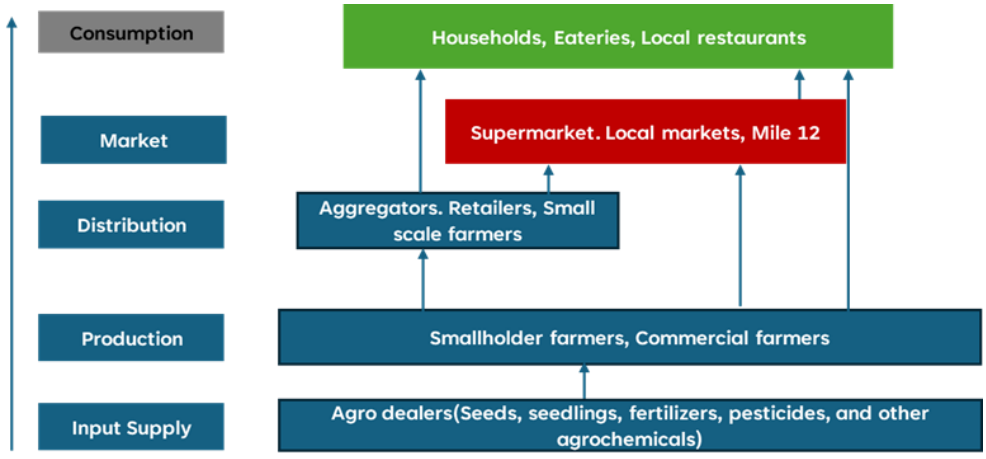


Figure 9.1 *Horticulture value chain map*

During the wet season (May to October), Ekiti and surrounding states in the Southwest are self-sufficient, meeting the demand of consumers for tomatoes, okra, and pepper. In the dry season (November to April) the Southwest states struggle to produce enough vegetables due to limited water resources. This is when Ekiti, like other states in the region, turns to supplies from major northern Nigerian states. In total 80% comes from northern states where farmers have access to public irrigation systems and can maintain production throughout the year. In Ekiti, open-field cultivation remains prevalent in major areas such as Erio

Ekiti, Aromoko Ekiti, and Ado Ekiti. The produce from these areas is primarily sold in the key urban markets including Shasha Market in Ekiti, Igede, Awo, Erio, and Itagbolu, as well as Shasha Market in Kure, Ekiti.

Value chain activities

Input supply
Several input suppliers and agro-dealer shops across the region supply farmers with essential agricultural inputs like seedlings, fertilizers, irrigation materials, and pesticides. These inputs are primarily sourced from Ado Ekiti, Ikere-Ekiti within the state, as well as Akure and even Osogbo in neighbouring Osun. However, despite the availability of these resources, farmers indicated that the high costs of these inputs remain a challenge. This financial burden makes it difficult for farmers to acquire the necessary supplies, leading to calls for increased government intervention through price controls or subsidy programmes.

Limited irrigation facilities and infrastructure restrict the year-round cultivation of tomatoes and peppers in Ekiti. Additionally, the fragmented nature of farms, specific soil conditions, topography, and extensive forest cover hinder the widespread use of farm equipment and machinery. Conventional tractors may not be effective due to these factors, and most smallholder farmers cannot afford specialized equipment.

Labour remains a challenge for farmers in Osun due to the high rate of youth migration to Southwest cities. Additionally, the high cost of foreign labour, driven by a weakened Nigerian currency, has resulted in a severe labour shortage. As a result, farms are understaffed and struggling to maintain or expand cultivated land, thereby limiting production.

Production
The production of horticultural crops like tomatoes, pepper, and okra in Ekiti is dominated by smallholder farmers using traditional farming techniques. Recently, commercial farmers have begun using protected farming techniques to improve product yield and quality, enabling all-year-round cultivation. Protected farming helps optimize yields and quality by resisting pest infestation, a major threat to horticultural production within the state as mentioned by a respondent: *"You know in the Southwest here, we have very rich soil, and wherever you find this rich soil, you also have abundant pests. When you have rich soil, you have thriving pests to contest with you in the open field. But in the north, because of the level of heat, most of those bacteria and soil nematodes that affect your open field production cannot withstand the heat. That's why we do more soil sterilization here so that we're able to kill those bacteria."*

A respondent mentioned that while both youth and women play a role in horticultural crop production, their involvement remains limited. Most farmers are older individuals, highlighting an age gap in the workforce. This situation is exacerbated by rural-urban migration, as many young people perceive agriculture as an unattractive and arduous means of generating income and migrate to Lagos. It was also mentioned that there is a noticeable decline in the availability of labour in rural areas. Another challenge mentioned by the interviewed farmers is climate change. The unpredictability of weather patterns was often mentioned, but also a shifting growing season. Both have contributed to a decrease in agricultural productivity.

Agricultural production primarily occurs during the rainy season months from May to November, leading to low supply during the dry months of December and April. During these periods of reduced production, the dependency on horticultural produce from the northern regions becomes pronounced. The North's ability to supply crops during the off-season is critical for maintaining market stability and meeting consumer demand.

Processing
Crops are often harvested early and undergo sorting, grading, and packing at the farm to maintain freshness and quality. A case was mentioned during the interviews, where farmers are encouraged by aggregators to harvest too early as this helps to improve the shelf lives of these crops before they are eventually sold off. Due to the nature of horticultural crops, farmers and traders are at risk of losing their harvest to spoilage as a result of the lack of storage facilities. Also, there is no known presence of processing within the state. Most of the vegetables produced are consumed fresh.

Marketing, transportation, and distribution
Wholesalers and aggregators play a major role in distributing horticultural crops. When producers and aggregators are met with excess demand more than what they can produce, they collaborate with other farmers to ensure that the market demand is met. They transport these products to local markets and supermarkets, ensuring widespread availability. Retailers, on the other hand, sell horticultural products directly to consumers through various outlets, including open markets and grocery stores. Tomatoes, peppers, and okra grown in Ekiti are primarily sold in the urban markets within the state, including Shasha Market in Ekiti, Igede, Awo, Erio, and Itagbolu, as well as Shasha Market in Kure.

Marketing is usually carried out through word-of-mouth by visiting markets of all kinds. However, farmers may also employ digital platforms such as WhatsApp, Instagram, Facebook, and LinkedIn when necessary. The cost of transporting crops from farms to local urban markets has been increasing. This rise in transportation costs has led to higher prices for the crops.

Demand and consumption
There has been a shift in the demand for tomatoes and bell peppers, driven by heightened awareness of their health benefits, with an increasing preference among local consumers. Ekiti consumers have a preference for northern tomatoes, with UTC and locally-grown tomatoes being considered viable alternatives. There has also been an increase in the adoption of hybrid by farmers as mentioned by a respondent "*People are now getting used to this hybrid northerners tomatoes and most of our farmers here now are planting this hybrids, so local tomatoes are going into extinctions so the demand for it is also going into extinction. Local farmers are now seeing better advantages and opportunities in the hybrid so they are leaving the local tomatoes and going to the hybrid.*"

High transportation costs push the price of crops higher, leading to lower demand. This forces farmers to sell at lower prices to avoid spoilage, as one respondent stated: *"Because of the economy, there's no money, so some customers always try to get lower prices. Sometimes we have to sell for less just to make some money for the day and prevent the produce from spoiling."*

Supporting actors
Similar to other Southwest states, smallholder farmers in Ekiti face challenges securing funding from financial institutions. These institutions often view them as too risky due to a lack of formal structures and collateral. Consequently, banks tend to favour funding formal horticultural actors involved in aggregation, warehousing, input supply, and processing, rather than smallholder farmers.

The influence of research institutions like the Federal Polytechnic Ado Ekiti's Centre for Research, Innovation and Development (CRID) and Ekiti State University's Office of Research and Development (ORD) appears limited. Their research output hasn't been effectively disseminated to smallholder farmers in Ekiti. Consequently, most farmers remain unaware of, or unable or unwilling to afford and adopt, the new farming techniques and improved seed varieties recommended by these institutions.

The Ekiti government has launched an initiative to promote the horticulture sector; the Youth Commercial Agriculture Development Programme (YCAD). This programme launched in 2012 aimed at engaging young people in commercial agriculture to promote economic development and self-sufficiency. The programme was launched to transform agriculture into a viable business option for youths, thereby reducing unemployment and encouraging sustainable agricultural practices.

Currently, there are no other agricultural programmes and there is limited government support to farmers in the state.

Value chain governance
The structure of Ekiti's horticulture value chain involves coordination and collaboration among stakeholders to ensure quality and efficient production and distribution of horticultural produce.

- **Farmers' organization and associations**: There is an established presence of farmers' organizations which aids in facilitating access for smallholder farmers in the state. Through farmers' organizations, smallholder

farmers can access training opportunities, and interventions from government and development organizations. They also facilitate access to the market and guide farmers on good agricultural practices.
- **Aggregator-driven market access**: Efforts to improve market linkages and access to major markets for horticultural products are primarily driven by aggregators. These aggregators collect produce directly from farms ("at the farm gate"). However, due to the perishable nature of the products, some farmers still prefer to deliver their produce to markets themselves, particularly local markets. Additionally, farmer organizations play a role by facilitating market access for their members. This was pointed out by an interviewed aggregator: "*We buy everything from the farmers except for the bad ones, we can also sort into small sizes and big sizes and then sell to different markets. we have different centres for collection, we have six of them in Erio-Ekiti, so basically what we do is that we go for radio announcements. we advertise and people will come.*"

Conclusion
Horticulture in Ekiti faces significant challenges, including high costs and scarcity of essential farming inputs such as seeds, fertilizers, and pesticides. The sector is providing substantial employment opportunities, particularly for smallholder farmers and rural communities. Local horticulture production is seasonal, with Ekiti relying heavily on supplies from northern states during the dry season due to limited water resources and irrigation facilities in the Southwest.

Smallholder farmers dominate horticultural production in Ekiti, primarily using traditional farming techniques. These farmers face several critical issues, including labour shortages driven by youth migration to urban areas. Additionally, climate change poses a significant threat, with unpredictable weather patterns and extreme events reducing agricultural productivity. Limited irrigation facilities further restrict year-round cultivation, compounding these challenges. The high costs of acquiring necessary inputs remain an obstacle.

Marketing and distribution of horticultural produce are facilitated by aggregators and informal channels. Aggregators play a crucial role in collecting produce directly from farms and ensuring market access, while farmers often use word-of-mouth and digital platforms for sales.

9.1.6 Osun

Introduction
We focused on cucumber, tomatoes and GLVs.

Value chain flow mapping
Agriculture plays a major role in Osun contributing to both its livelihood and food security, employing up to 70% of the population (directly or indirectly) and contributing to over 20% of its gross domestic product (GDP). Horticulture in Osun involves the cultivation of a range of fruits and vegetables. The state's climate and soil conditions are conducive to growing various horticultural crops.

Most of the tomatoes consumed in the state, come from the Northern states like Sokoto, Plateau, Kano, Jigawa, Kaduna, and Bornu accounting for over 80% while the remaining 20% comes from the Southwest states. GLVs and cucumbers are mainly produced in Osun or some neighbouring states.

Tomato production peaks during the rainy season, necessitating imports from the northern during the dry season while cucumbers and other vegetables like Spinach, Ugu (fluted pumpkin), and amaranthus are commonly grown. These leafy greens are staples in local diets and are cultivated throughout the year.

Value chain activities
Sector stakeholders include input suppliers, producers, processors, marketers, transporters, distributors, and consumers. Additionally, there are supporting actors such as financial institutions, research institutions, and the government.

Input supply
Several companies and agro dealer shops supply essential inputs such as seedlings, fertilizers, irrigation materials, and herbicides to farmers. These inputs are sourced from Ibadan in Oyo, one of the key business hubs in the Southwest, and Oshogbo, the state capital.

Despite the availability of these inputs in the state capital and neighbouring states, the producers advocate for more government support through input subsidies. High input prices are a major concern for farmers. These prices make it difficult to afford the quality and quantity of supplies needed, ultimately limiting farm size and overall production.

Osun's agricultural input demand, particularly for fertilizers and herbicides, remains modest. This moderation stems from the widespread perception among farmers that fertilizer application negatively impacts the shelf life of vegetable crops. This belief leads to a cautious approach – farmers are hesitant to use fertilizers, especially when market conditions or demand are unpredictable. This perception, whether entirely accurate or not, can be attributed to a lack of proper education or training on balanced fertilizer use.

Production
Smallholder farmers dominate the horticulture sector in Osun. Many of these farmers rely on traditional practices, which limits their productivity and efficiency. However, there is a gradual shift towards improved techniques and technologies. This is evident in the growing presence of commercial farmers who apply protected cultivation and irrigation systems to boost production, particularly during the dry season.

The three main horticultural crop production zones in the state are the Iwo zone (comprising Iwo and Ikire), the Ife-Ijesa zone (comprising Ife and Ilesa), and the Osogbo zone (comprising Ikirun and Osogbo).
In Osun, urbanization and the migration of youths to urban areas have led to a shortage of labour, limiting the size of land cultivated and decreasing food production. The high rate of youth migration to Southwest cities coupled with the high cost of foreign labour due to a weakened Nigerian currency has resulted in a severe labour shortage in Osun's agricultural sector. Farms are understaffed and struggling to maintain or expand cultivated land, thus, limiting production.

There is a seasonal nature of production in the state due to a limited adoption of irrigation. Supply fluctuates between the dry and wet seasons, affecting market prices accordingly. Other broader economic factors such as inflation, and currency fluctuations impact agricultural production costs and the overall supply of produce.

Processing
Osun's horticulture sector lacks processing facilities. Most crops are sold fresh by farmers directly to aggregators. This presents an investment opportunity, as highlighted by one respondent who stated: "Currently, we are unable to process the produce. The only potential action the government could take is to invest in processing facilities."

Marketing, transportation, and distribution
Tomatoes, cucumbers, and GLVs produced in the states are sold in markets, with the major ones being Modakeke market in Ife, Akindeko market in Oshogbo, Area 4, and Mefoworade in Ife South. These markets function through associations that facilitate the movement of produce. Farmers from within the state, aggregators from neighbouring states, and even those from the north, all bring their crops to these markets, ensuring a steady flow of fresh produce to final consumers.
Osun relies heavily on tomatoes imported from the north during dry seasons. However, the long travel time impacts quality due to the perishable nature of the fruit, as highlighted by a local dealer. "The government should support irrigation investment in each state during dry seasons," they said. "Look at those tomatoes from the north! A large basket costs 50,000 naira, and most of them spoil. With irrigation support, we can achieve good production here too, not just rely on the north."
Osun's producers struggle with a poor road network, forcing them to collaborate with transporters and distributors to get their crops to market. This lack of reliable means of transportation makes farm-gate sales impossible, as a respondent stated: "The roads are bad, and we don't have a dependable transport system. We mostly rely on bicycles, or even have to carry produce on our heads to reach markets or accessible

locations for distributors and transporters. Distributors typically won't come to the farms, so we have to take the crops to them for collection and transport to market."
The shift from traditional markets to more modern options like convenience stores and formal supermarkets is likely to continue as the state develops. However, the pace of this shift may depend on economic factors. If inflation remains high and consumer incomes stagnate, traditional markets will likely retain their dominance. This is because affordability will remain a top priority for many consumers, potentially outweighing the convenience and potentially higher quality products offered by modern stores.

Demand and consumption
Consumer preferences for vegetables vary in Osun. Local, indigenous vegetables are a staple food, consumed daily by a wide range of people. This translates to a high demand for these indigenous green leafy vegetables (GLVs). In contrast, exotic vegetables like cabbage, broccoli, and lettuce have a limited market. Their consumption is primarily concentrated within select groups or a small portion of the urban population, resulting in low local demand.

Also, the demand for cucumber is seasonal as more are in demand with increased supply during the wet season as stated by a respondent "The demand for certain crops fluctuates with the seasons. For example, during cucumber season, people rush to buy them because they won't be available once the season ends." Osun marketer. Soaring food inflation, particularly for tomatoes, has dampened consumer demand. The high price makes them unaffordable for most people, as a commercial farmer in Osun pointed out: "Inflation is hitting people hard. They can't buy it like they used to because it's just too expensive. Most people simply don't have the money."

Supporting actors
- Financial institution: Osun's horticulture sector faces a funding challenge: financial institutions extend less than 3.8% of the credit to it, severely hindering stakeholder productivity. This limited access to credit disproportionately affects smallholder farmers, who rarely benefit from available loans. Several factors contribute to this situation. The primary concern for financial institutions is the volatility of horticultural crop production. Additionally, the lack of collateral and formal structures within the sector raises risk concerns for lenders.
- Research institutions: Osun faces a critical gap in agricultural extension services. With a ratio of just 1 extension agent to 10,000 farmers, effectively sharing new research and techniques remains a challenge. There is a need to empower local farmer groups and cooperatives to enable them to facilitate the peer-to-peer sharing of knowledge. Farmers are not also willing to adopt new techniques or improved seed varieties due to cultural beliefs, risk aversion, and limited education. Many farmers in Osun adhere to traditional farming methods, believing they are sufficient. Limited agricultural knowledge and fear of financial risk prevent them from adopting modern, potentially more profitable techniques.

Governance
The state government supports the agriculture sector to a certain extent. This can be seen from the government's intervention in the quality of produce sold in the consumption market.
Quality Assurance Practices: To ensure high-quality produce for consumers, Osun enforces minimum standards through regular government inspections. Farmers and market vendors actively participate in this quality control process, aware that poor-quality crops can lead to market closures. As a market leader explained: "We take quality seriously here. I inspect the fruits and remove any that aren't up to standard. We don't use chemicals for ripening, and frankly, educated customers wouldn't tolerate it. The government also plays a role, arresting those who use such methods."

Cooperatives and associations: The state government, focusing on enhancing the horticulture sector, encourages the formation of farmers' associations to promote collaboration between farmers and stakeholders; these associations foster collaboration between farmers and other stakeholders, while also providing crucial support by supplying agricultural inputs. "Regarding national development, our association is involved in various activities to ensure people can access food. We send messages to market leaders across the state, inviting them to come here to pack produce for sale. Additionally, the government has played a key role in establishing our farmers' association, which we have named "Taunyja Farms - Feed the Nation."

Direct sourcing through credit-based transactions – There is a constant supply of tomatoes in the state due to a collaborative network between local dealers and suppliers from the northern states of Nigeria. This system eliminates the need for lengthy journeys for Osun-based sellers. Large sellers and dealers forge informal agreements with farmers in the North, ensuring a steady and consistent supply of essential produce. These transactions are usually credit-based as payments are made after the produce has been supplied.

Government policies, including fluctuating fuel prices and restrictions on certain chemicals, also exacerbate challenges for farmers by affecting production costs and profitability.

Conclusion
Agriculture is central to Osun's economy, employing a large portion of the population and contributing to its GDP. Despite the state's favourable conditions for horticulture, the sector faces challenges such as limited irrigation, high input costs, and inadequate processing facilities. The seasonal nature of production, coupled with labour shortages due to urban migration and poor infrastructure, further impacts productivity. Production of tomatoes, cucumber, and GLVs flourishes in the Iwo, Ife-Ijesa, and Osogbo zones, the reliance on imported tomatoes during the dry season underscores the need for improved irrigation. Financial constraints and limited government support hinder sector growth, emphasizing the need for increased investment and education on modern agricultural practices.

9.1.7 Ogun

Introduction
We focused on cucumber, tomatoes and GLVs.

Market flow
Ogun has the second-largest land mass in the Southwest, following Oyo. It serves as a significant agricultural centre in Nigeria's Southwest region. With a mix of agriculture and industrialization, Ogun has significant agricultural output, especially in horticulture, cocoa, and livestock. During the dry season (typically November to April) in Ogun, traders heavily depend on imports of green leafy vegetables, cucumbers, and tomatoes from Northern Nigeria, Togo, and the Republic of Benin to meet local demand. Conversely, during the wet season (May to October), there is a reliance on agricultural output from Ogun and other farms in the Southwest region to meet market demand.

To enhance market reach, Ogun farmers are increasingly leveraging digital channels, such as social media, to expand their customer base and ensure steady sales of their produce. Beyond local markets, Ogun farmers also supply produce to Mile 12 in Lagos, the region's largest hub for horticultural products.

Most of the vegetables consumed in the state, including tomatoes, green leafy vegetables (GLVs), and onions, are sourced from the northern states, accounting for over 80% of the supply. The remaining 20% comes from the Southwest states, including Ogun, as stated by an aggregator in Ogun.

Value chain activities

Input supply
Numerous companies in Ogun offer essential supplies for farmers, from seedlings and fertilizers (both organic and inorganic) to greenhouse materials, equipment, and even irrigation kits. These companies operate through physical stores and online platforms (Afrimash, Nigeria farmers Agrihub Platforms), making it easy for farmers to find what they need. The online presence is particularly helpful because it allows farmers to connect directly with input suppliers, logistics providers, and aggregators. This streamlined approach saves farmers time and effort, ensuring they get the resources they need and can connect with potential buyers more efficiently.

Farm mechanization in Ogun is hindered by factors such as the predominance of small, fragmented farms, specific soil conditions, topography, and extensive forest coverage, which restrict the effectiveness of conventional tractors. This situation underscores the need for specialized farm machinery tailored to the state's unique soil structure.

The demand for horticultural supplies like seeds, fertilizers, and chemicals remains strong. However, there are concerns about rising costs. Major companies like Technisem, East-West, Dizengoff, and Seminis D2 are the main providers of these horticultural inputs. Some dealers, who sell these supplies to farmers, are struggling with high fuel and transportation costs. This makes it difficult for them to get the supplies to farmers at affordable prices, thus, limiting the quantity and quality of inputs they use for production.

Ogun's agricultural sector faces a labour shortage. The depreciation of the Nigerian Naira has rendered employing foreign workers from Benin and Togo cost-prohibitive for many farmers as stated by a respondent: *"the quantity of labour in the Southwest is still a little bit lower than that of the North and the reason is that most of our youth in the Southwest don't want to go to the farm. Everybody wants to sit down in the office. So that's the first reason most people in the Southwest are not interested in serious farming."* Ogun is experiencing a severe labour shortage that is significantly curtailing tomatoes, cucumbers, and GLVs production. Many farmers are unable to cultivate their planned acreage due to the acute lack of available farm labour. As mentioned by a farmer in the state: *"If you don't have labour, as I say, in a scenario we have four labourers on a farm this year, they ran away because they started misbehaving. So, somehow, a production that we projected 30 acres, now we cannot do more than 8 acres."* This has led to a reliance on labour from Northern Nigeria and from few Southwest youths willing to work on farms, coupled with a disinclination amongst some Southwest youth to pursue agricultural work. The resulting labour scarcity has driven up labour costs and constrained the size of land under cultivation.

Production
Horticultural crop production in Ogun is predominantly concentrated in the farming regions in Odeda, Imeko Afon, Obafemi-Owode, Ijebu, and Abeokuta North Local Government Areas.
These areas are largely occupied by small-scale producers who are predominantly into the production of crops like tomatoes, pepper, pumpkin, and okra. The population growth and urban sprawl in Abeokuta and Ijebu are leading to an increasing scarcity of agricultural land.

Map 9.2 *Main production areas in Ogun*

There is a seasonal nature of production in the state due to a limited adoption of irrigation as mentioned by a respondent *"Like I said farming mostly has always been dependent on the availability of rain, in the Southwest a lot of farmers are moving from their dependence on rain to deploying irrigation systems but challenges around this have to do with the availability of water".* This means that market prices in the state still fluctuate along the dry and wet seasons despite initial introductions of irrigation equipment. Other broader economic factors such as inflation, and currency fluctuations impact agricultural production costs and

the overall supply of produce. Government policies, including fluctuating fuel prices and restrictions on certain chemicals, also exacerbate challenges for farmers by affecting production costs and profitability.

Trends in the horticulture supply chain in Ogun reveal a complex interaction of factors such as demand, production processes, and external policies. The KII respondents note a decrease in production due to the factors listed above, while there is also an increased demand, causing an increased imbalance between supply and demand. Climate change impacts production with unpredictable weather patterns affecting crop yields. Additionally, some farmers are shifting to crops that require less effort and offer better returns, like potatoes. There is a call for more supportive policies that address input costs and market prices to sustain and enhance the horticulture supply chain.

Processing
Most horticultural crops like Tomatoes, Cumbers, and GLVs produced in Ogun are sold through farm gate aggregators and are consumed fresh. There is a limited presence of processors in the horticulture sector in Ogun but with growth potential for pepper and tomato processing. Unlike cucumbers and GLVs, primarily consumed fresh and used in preparations like native stews and soups, fruit salads and cocktails, tomatoes, and peppers exhibit greater processing potential. This allows farmers to extend their product lifecycle by processing and storing these commodities for sale during the dry season when fresh supplies are limited.

Marketing, transportation, and distribution
During the wet season (May to October) a large share of tomatoes, cucumbers, and GLVs sold in Ogun are sourced from the local farms and marketed and consumed locally. However, between October and April—the dry season—a significant proportion of tomatoes sold and consumed in Ogun originate from northern Nigerian states such as Sokoto, Jigawa, Kaduna, Kano, and Niger. They are transported in non-refrigerated vehicles, such as lorries or open trunks, often over a week-long journey. This lack of temperature control during transit leads to considerable spoilage, with losses reaching up to 10%.

Further losses occur in Ogun due to limited storage and cooling facilities, which shorten the shelf life of the produce. Producers are increasingly selling directly at major markets such as Olomoro market in Abeokuta, Ibarapa Market, Kuto market, Lafenwa market, and Mile 12 market in Lagos to avoid aggregators and dealers who buy to resell and improve their profit margins.

The distribution channels adopted by the producers are physical contacts at farm gates, digital channels, and social media platforms like WhatsApp (WhatsApp groups) and direct sales to retailers and consumers in local markets as stated by a commercial farmer in Ekiti: *"So for the distribution channels, we have a social media platform where we meet farmers or buyers. There is a group for that, which I am into. Then another one is this physical contact where we go to people that are willing to buy, we will meet one on one informing people, then the local market, we just go to the local market, the local sellers to inform them we have those things and those are the major channels at which we distribute the produce."*

Locally produced vegetables in Ogun have a competitive edge over those from northern states due to lower transportation costs and better freshness. Aggregation centres are expanding, allowing for bulk supplies at reduced costs.

Demand and consumption
Consumer demand for tomatoes, cucumbers, and other vegetables in Ogun has been increasing due to a growing population. Consumer preferences for specific tomato and cucumber varieties have also influenced the market. While tomatoes experience consistently high demand, the market for cucumbers and leafy vegetables is more volatile and is subject to consumer preferences for different varieties.

Leafy vegetables see fluctuating demand, influenced by consumer preferences for different varieties and types and seasons. Although tomatoes are the most consistently in demand, there are preferences for specific types and varieties, such as tomatoes varieties like cobra, and diva, indicating that subtle shifts in preferences shape purchasing decisions as well as a preference for green cucumbers over white cucumbers, as mentioned by an aggregator in the state: *"When it comes to tomatoes, there is this major one that is generally acceptable, and that is the cobra. Then there is this other one called diva, though that one is not*

commonly cultivated it has some distinct features that make the buyers, and the consumers demand it more. Then another one is when it comes to cucumber, they prefer the green type in this region here compared to the white type." They stress that aligning with consumer preferences is crucial for driving sales.

Enabling activities

Although there has been a rise in bank funding for warehouses, input suppliers, and aggregators within Ogun's agricultural sector, smallholder farmers still face challenges with securing adequate financing for primary production. Banks often view small-scale farming as unstructured, risky, and time-consuming, making it outside their primary area of focus. Consequently, they prefer to lend to larger, more organized segments of the agricultural value chain, assuming that the benefits will eventually trickle down to smallholder farmers through their interactions with these larger entities. Empowering local producers through financial support and other means could reduce dependency on northern crops and boost local agriculture.

There is a disconnect between research institutions and the practical needs of farmers in Ogun. Although there is the existence of notable research institutions like the Institute of Agricultural Research and Training (IART), Federal University of Agriculture, Abeokuta (FUNAAB), and National Horticultural Research Institute (NIHORT) in neighbouring Oyo, farmers have highlighted a lack of applicable research and effective knowledge transfer. They suggest that research should prioritize developing locally adapted tomato varieties and improving cultivation techniques.

Government

Ogun farmers face challenges due to limited government support. The Ogun government has launched numerous initiatives to bolster horticulture production within the state, such as:

- The Ogun State Farmer Information Management System (OGFIMS) – This is a digital platform launched in April 2023 to provide farmers with access to information on best practices, market prices, and weather forecasts. It also facilitates registration for government support programmes and linkages to financial institutions and buyers.
- The Ogun State Agricultural Development Programme (OGADEP) provides extension services to farmers across the state. These services include training on new farming techniques, improved seeds and fertilizers, and support with marketing their produce. The programme has provided youth-focused agricultural training programmes and extension services to smallholder farmers in the state.

Governance

Various governance mechanisms are identified that govern the horticulture sector in Ogun:

- Government Partnership Initiative (GPI): The Ogun government demonstrates its commitment to partnering with the private sector and donors. Their collaborations with the International Institute of Tropical Agriculture (IITA) in launching the Ogun State Farmer Information Management System (OGFIMS) in 2023 and the International Fund for Agricultural Development (IFAD) in initiating the Zero Hunger Project for the cassava value chain in 2021 exemplify this commitment. These successful partnerships open the door for further collaboration with the state government, particularly regarding investments in the horticultural sector.
- Market-driven pricing: Farmers generally don't set the price. instead, the prevailing market price dictates the final cost. Lagos' Mile 12 market serves as the benchmark for pricing most agricultural products. Farmers adjust their prices based on the current market value at Mile 12. These prices can vary depending on factors like seasonality and supply/demand. Although market forces play a significant role, there's some room for negotiation, especially with premium buyers who value quality and consistent supply. Pre-arranged agreements with specific buyers offer some negotiation leverage. Farmers can potentially secure a slightly higher price than the open market based on quality and established relationships.
- Direct sales strategy: Farmers bypass wholesalers and sell directly to buyers, including hotels and open markets. Aggregators play a facilitating role, not an exploitative one. They connect farmers with buyers and ensure timely payments. Importantly, aggregators don't negotiate prices on behalf of farmers. Farmers work together through cooperatives and clusters to determine a fair average price when selling to a buyer brought in by the aggregator. The aggregator makes a profit by charging the buyer, not by taking a cut from the farmers' earnings. Lagos farmers bypass middlemen (aggregators and wholesalers who buy to resell) to secure better returns for their crops.

Conclusion
Ogun, a key agricultural hub, still relies on northern imports of vegetables during dry seasons due to limited local production capacity, which is because of a lack of irrigation facilities and the ability to mechanize. A growing population and increasing urbanization are making land for agricultural activity scarce in the Ijebu and Abeokuta farm clusters.

Locally produced vegetables are fresher but face challenges due to seasonality. In addition, farmers struggle with financing and a disconnect between their practical needs and the outputs of the research institutions.

Although government support to smallholder farmers is limited and inadequate, the state government has launched initiatives like OGFIMS and OGADEP that aim to improve access to market information, farming techniques, and infrastructure to address these issues.

9.1.8 Ondo

Introduction
For Ondo we focused on GLVs, pumpkins and cucumber.

Value chain flow mapping
Horticulture in Ondo plays a crucial role in its agricultural sector, contributing to economic development and providing livelihoods for many rural inhabitants. The state's favourable climate and fertile soils support cultivating various high-value crops, positioning it as a potential player in Nigeria's agricultural landscape.

Over the years, horticultural crops in Ondo have seen improvement. The state is now a major producer of cucumbers, which were previously sourced from the north. Other horticultural crops grown in the state include peppers, tomatoes, and green leafy vegetables such as amaranthus, ugwu, and ewedu.

Value chain activities

Input supply
Most agro dealers source farm inputs from outside the state as there is no known established presence of Agro dealing companies for horticultural crops within the state. The reliance on external sources leads to supply limitations. Consequently, these inputs are typically priced higher than they would be if sourced locally. Farmers consistently report ongoing price increases, which directly impact their production costs. In addition to material inputs, farmers especially large-scale farmers depend on labour for their operations. However, they face challenges due to labour shortages. This scarcity of workforce adds another layer of complexity to the production process. Farmers are also adopting protected farming such as the use of greenhouses.

Production
In Ondo, the major producing areas for Horticultural crops are Adofure Akure south, Idanre, and Alabata,. Farmers in Ondo utilize inputs supplied by agro-dealers. An interviewed farmer explained how he sources his inputs: *"It begins with the agro-dealers. Every farm production begins with agro-dealers because it is the agro-dealers that will supply seeds. We have some of them that supply seeds, Diekolola Farms, and Consult in Abeokuta here. Sulu Card in Ibadan, Cedar Agro also in Abeokuta here. And other agro-dealers, we work with them. We take seeds and other input from them, even in the Southwest. Yeah, there's also an agro dealer in Epe, we have gotten fertilizers from them this year."* To mitigate the high costs associated with inputs, farmers often organize themselves into associations to collectively purchase directly from input companies located outside the state, among other functions. In Ondo, there is a growing presence of commercial farmers cultivating horticultural crops in both protected and open areas.

Cucumber production in the state is produced at a large scale with farmers complaining about the existence of a glut due to low demand highlighting the need for market expansion. Pumpkin is rarely produced in the state as there is currently no established presence of its consumption instead, farmers emphasize a preference for habanero and bell pepper with tomatoes and cucumbers. Here is what a farmer had to say. *"We depend on vegetables like tomatoes, peppers, and cucumbers. Yes, the reason why we chose all those*

things is that their timing is very fast. We have some of them, like cucumber now is just six weeks, tomato is three months. So, it quickly brings money back to farmers' pockets." Another farmer added*: "The reason for producing all these vegetable crops. They are crops that are highly needed, they are daily consumables Because virtually every home will either take tomato, pepper, or vegetable every day."*

Farming practices are predominantly rain-fed, with small-scale irrigation used in Fadama farming. For irrigation farming, farmers drill boreholes on their farms, pump water into storage and extend into the farms with plumbing pipes, and connect drip tapes across the ridges all over the farm.

Harvesting and post-harvest handling
The harvest is impacted by a lack of efficient storage devices as farmers are weary of spoilage due to the fragile nature of horticultural crops and this cuts across different stages of the value chain. An aggregator had this to say. *"The main challenge is storage. Storage! I think that's the main thing. They are perishable. If we have a cooling system in our markets, cooling vans are expensive for an individual to acquire on their own. Maybe there's an organization that can start this business, establish a cooling system in markets where people have to pay, to put their stuff in the cooling system or that can rent out cooling vans at cheaper rates, a subsidized rate, and stuff like that. I think it will make a whole lot of difference and it will reduce wastage, reduce losses of people that buy to sell like us."*
Aggregation of these crops can be done at the farm gate or the market depending on the scale of production and proximity to the market. Some farmers, especially small-scale farmers, go through the rigour of selling directly to retailers and wholesalers at the markets by personally transporting their produce using motorbikes. Large-scale producers make provisions for aggregators and wholesalers to aggregate this produce at the farm gate and distribute it to major markets using third-party logistics

Processing
Horticultural crop production in the state is consumed fresh and there is no known presence of a processing company within the state. However, a particular farmers' association mentioned that they also supply to processors outside the state using third-party logistics: "So, our organization, majorly what we do is that we produce, and we take it to the major markets or the processors or off-takers*."*

Marketing, transportation, and distribution
Horticultural crops are distributed both within and outside the state with farmers associations who aggregate from members within their association for distribution to the major markets within the states. They also explore other market options such as the Mile 12 in Lagos. As mentioned by a respondent, *"We also use prevailing market price at any time to sell because if you want to take your goods to maybe an open market for example, you are not the one who will determine the price to some extent, it is the market leader. For example Mile 12, we do take our goods there on some occasions if we have more than enough, sometimes we take it to Mile 12. In Mile 12, you are not the one that will determine the price."*

Aggregators/wholesalers who aggregate at the farmgate help to distribute to the local markets, eateries, local restaurants, and sometimes directly to households. Horticultural crops are transported using a combination of local transportation options, including buses, trucks, cars, and motorcycles, as there is no specialized transportation system dedicated to these products. The major market where horticultural crops flow to and are sold in Ondo is the Shasha market. There is also the presence of supermarkets like Shoprite in Akure the state capital.

Farmers who engage in the production of horticultural crops operate a farm-to-market model with aggregators, retailers, and wholesalers aiding the distribution to major markets like the Sasha market, the Mile 12 market in Lagos, local restaurants, and other local markets within the states. Farmers' associations are also involved in the process of distributing their produce.

The Sasha market is the largest in Akure for the sale of horticultural crops. Northern producers who augment the production of these crops bring their crops to the Sasha market in Akure. Suppliers from the north supply mainly Tomatoes pepper and onions. Other crops like cucumbers and leafy vegetables are produced within the state. The state is particularly sufficient in the production of cucumbers which used to be supplied from the north. However, farmers are reluctant about the production of cucumbers due to low demand. Demand

for cucumbers fluctuates, with peak demand occurring during festive periods. Outside these periods, farmers face a sharp drop in cucumber demand. To avoid oversupply and subsequent price depreciation, farmers are compelled to limit their cucumber production. As a result, farmers shift their focus to crops with more stable demand. They prefer to produce tomatoes, peppers, and green leafy vegetables (GLV) during these times. This strategic crop rotation allows farmers to maintain a more consistent income and avoid market gluts that could lead to financial losses.

Demand and consumption
Horticultural crops such as tomatoes, peppers, and onions are essential staples in many households in Ondo, especially for daily meal preparation. These crops are also crucial for eateries and local restaurants in the state, which rely on them to prepare a variety of dishes. The high demand for fresh horticultural products drives the entire value chain.

Policies
Ondo farmers face challenges due to limited government support. The Ondo government has launched numerous initiatives to bolster horticulture production within the state, such as:

- The Ondo State Wealth Creation Agency (WECA) Initiative was established in 2017 to enhance economic opportunities for farmers through training and support for horticulture farmers to enhance productivity and market access and distribution of improved seeds and seedlings.
- The Youth in Agriculture Program (YAP) in Ondo was launched in 2012. This programme aims to engage young people in agricultural activities, including horticulture, by providing them with the necessary training, resources, and financial support to succeed in the sector.

Governance

- **Farmers' associations:** These associations play a pivotal role in organizing smallholder farmers, providing them with collective bargaining power, and facilitating access to resources such as seeds, agrochemicals, and fertilizers at cheaper prices. They also serve as platforms for knowledge sharing and capacity building among members. Also, the association aids in market facilitation for its members. "In terms of assisting our members to take their products to the market, what we usually do is most of our produce we don't sell it as individuals we aggregate our produce because what we do is simultaneously planting."
- **Market linkages:** While farmers work to facilitate market access in some cases due to the scale of production or model of business, the presence of other actors like aggregators and retailers also aids in creating the linkage between farmers and end users. Aggregators aggregate from the farmgate and distribute horticultural crops to major markets including Mile 12 in Lagos. Efforts are made to strengthen linkages between farmers and markets, including local markets, and supermarkets.
- **Innovation and investment:** To aid production, Farmers invest in drilling boreholes to aid in Irrigation farming. There is also investment in protected cultivation and other equipment to facilitate the production of horticultural crops, especially for crops like habanero pepper, bell peppers, and tomatoes.

Conclusion
Horticulture in Ondo plays a crucial role in the agricultural sector, significantly contributing to economic development and providing livelihoods for many rural inhabitants. The state's favourable climate and fertile soils support cultivating high-value crops, positioning it as an important player in Nigeria's agricultural landscape. Ondo has diversified its horticultural production, becoming a major producer of cucumbers, peppers, tomatoes, and various green leafy vegetables such as Amaranthus, Ugwu, and Ewedu. The state has achieved self-sufficiency in cucumber production, which was previously sourced from the north, although fluctuations in demand impact production levels.

The horticultural value chain in Ondo involves multiple players, from input suppliers to consumers, ensuring a steady flow of goods from farms to markets. Key actors in this value chain include input suppliers, farmers, aggregators, retailers, and wholesalers who collectively facilitate the production and distribution of horticultural crops. Despite these advancements, farmers face production limitations and continue to rely on northern suppliers for certain crops like tomatoes and peppers. Additionally, low and fluctuating demand for cucumbers leads farmers to limit production outside peak seasons and shift focus to more stable crops like tomatoes, peppers, and green leafy vegetables.

Post-harvest handling practices in the state include sorting, grading, cleaning, and packaging to maintain the quality of produce. However, storage remains a critical challenge, with a lack of efficient storage solutions leading to significant post-harvest losses. Major markets, such as the Sasha market in Akure and the Mile 12 market in Lagos, are important outlets for products produced in Ondo.

Governance of the horticultural value chain involves various stakeholders, including government support, farmers' associations, and market linkages. Farmers' associations provide collective bargaining power, access to resources, transport, and market facilitation, while government initiatives and FAO support aim to enhance the sustainability and efficiency of the value chain.

Investments in irrigation systems, protected cultivation, and other equipment are crucial for improving production efficiency and reducing reliance on rain-fed agriculture. Innovations such as greenhouse farming and borehole drilling are adopted by farmers to mitigate challenges related to climate variability and input costs.

9.2 Phase 2: Foresight and scenario development workshops

Workshop programme. Conducted 3 times, with 2 groups representing each state working in parallel.

Table 9.3 *Workshop agenda*

Time	What
8.30-9.30	Sign-in + coffee/tea
9.30-10.45	Welcome – introduction to the day, facilitators, and participants
10.45-11.45	Setting the scene, gallery walk, and discussions
11.45-12.00	Tea break
12.00-12.45	In separate groups per state: Round 1: Scenario development plausible futures
12.45-13.30	Round 2: Scenario Development Narratives & Implications
13.30-14.30	Lunch Break
14.30-15.30	Round 2: Explore different scenarios per state
15.30-16.15	Round 3: In plenary reflect on state-level scenarios
16.15-16.30	Feedback and workshop reflections
16.30-16.40	Final remarks, close

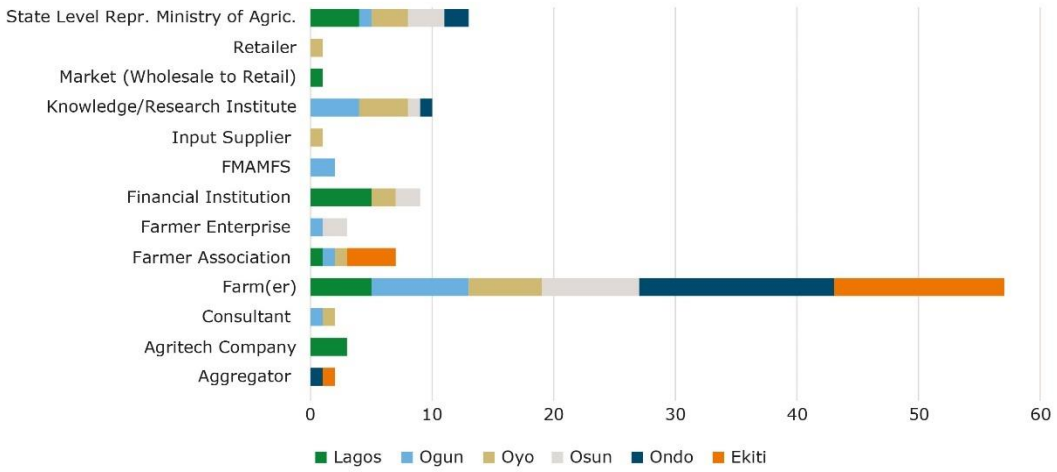


Figure 9.2 *Stakeholder representation*

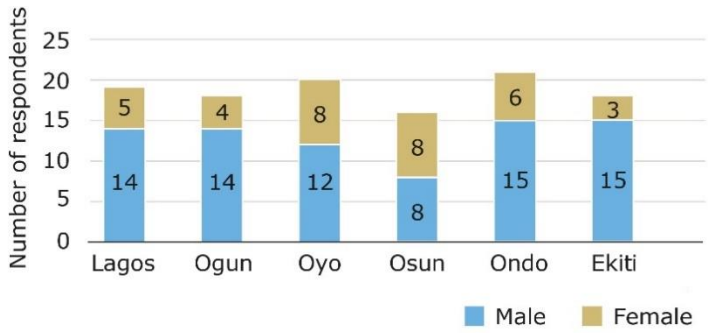


Figure 9.3 *Workshop participation by gender*

9.3 Scenario analysis

Futures to work towards… and those to avoid
The desired scenario is B, wherein a variety of business models are supported which speak to both economies of scale and efficiency on the one hand, but capabilities of small-scale and informal sector on the other; this potential speaks to a future wherein there's a balance maintained between smallholder farmers that don't have the business acumen, or willingness, to scale up, while enabling those that do want to grow to be able to do so. In this respect, approaches can also be drawn from scenario A wherein food security is enabled through support of cooperatives and technology development, alongside scenario B's description of more integrated farming systems that accommodate multiple SMEs.

On the other hand, scenarios C and D highlight what needs to be avoided; scenario C illustrates an operating environment with a weak regulatory environment and no interventions to minimize investment risks into horticulture. With an increasing demand as populations grow and urbanize, a downward ratcheting of food safety standards can occur in an attempt to meet demand, while seasonal price fluctuations will continue. Farming will remain a sector of last resort.
Scenario D illustrates how, if investment only goes towards larger business / lower risk opportunities, it can steer the sector towards prioritizing only those that can afford expensive foods while at the same type squeezing out smallholder farming.

Taking these into account will mean an investment strategy and monitoring mechanism that measures both the positive and negative impacts of interventions.

Developing an investment-ready environment
The Southwest region will need to develop a strategy to make it an attractive area to invest in the horticulture sector, that takes into account both investor perception of risks vs. return on investment on the one hand, and meets the ambitions and limitations of different stakeholders (smallholders, SMEs, cooperatives, etc.) on the other. This will require a multi-stakeholder approach that is able to adopt this longer term vision while remaining agile and practical enough to get processes going in the short term. Local stakeholders will need to own this to make any investment strategy realistic and viable for the investor 'community'. That being said, investors like national (Netherlands) and multilateral (World Bank, ECB, FAO, etc) donors may have more appetite for risk and longer term objectives than banks, and so be able to support this kind of platform.

An interplay of public policy, community, private and informal sector
Each of the four scenarios saw an interplay of key actors; smallholders, agripreneurs, state actors at state and federal level, banks, etc. How they interacted, and if one or more didn't play their role well enough, illustrated how the sector as a whole would respond. Given this point, a longer term vision and strategy can only be put into practice through the action of various stakeholders. How they change their behaviour

depending on the interventions will need to be monitored and allow for the strategy to be adapted to different needs and demands.

Trends and idiosyncrasies
While the states sometimes painted slightly different pictures of the future scenarios, the degree of similarity between them was far greater than their differences. Further to this, with the exception of Lagos as a (mega)city, none of the states described distinctly idiosyncratic scenarios, such that the common trends outweighed any marginal differences across the six states. This suggests a strong degree of homogeneity and so less of a need to differentiate by state in an investment strategy.

A range of businesses & market models is acceptable, as long as one doesn't exclude the other
There was general agnosticism regarding the type or scale of business models required to enable the more desired scenario. Instead, emphasis was laid more on an inclusive operating environment that continually allows for equal opportunities for different entity types. This includes small-scale informal, micro-, small- and medium enterprises, cooperatives, aggregation hubs and integrated farm systems that bring producers closer to consumers. Large scale was flexibly defined as both a collaboration between agripreneurs as well as actual larger scale businesses at any point along the value chains. Scenarios C and D illustrated that only having one type or another (e.g. small or large) would not enable future diets to be met but, as both scenarios A and B highlight, it's the combination of individual effort at different scales in combination with models of collaboration that would allow for flexibility in the market to adjust to consumer needs.

9.4 Individual scenario write-ups

9.4.1 A – small-scale informal, safe & affordable

Ogun A – The death of a civilization
Household-level of production will become key, with a greater focus on home grown and healthy eating. Urban HHs will remain dependent on rural areas, though cities will in part adapt by growing produce on rooftops and other places – possibly converting building space for growing food. People will eat out less and cook more at home.

Along supply chains technology impact will be low, though simple, functional, and affordable technologies for home gardening will increase (home grown kits) and capacity building will be more widespread, done in indigenous languages. This may not significantly increase yield however, and with a bias towards raising easier-grown crops, diversification will diminish and some produce will be in excess while others insufficiently (like tomato). Food capacity will thus vary and high levels of waste will remain.

Community collaboration will increase, driven by barter system, e.g. exchange of produce based on need. On the other hand food theft can also increase. Food safety education will play a greater role, with children learning about food safety early on. There will be more focus on indigenous foods and healthy diets.

In an informal (e.g. ungoverned) context aggregation remains challenging, and water pollution will be high from agrochemical leaching. Deforestation will continue through increased use of farmland. Massive market shrinkage as domestic production becomes the new normal.

Oyo A – Farming the future
SHF will adopt new technologies and be an important contributor to vegetable production, helping to scale up and increase production. With urbanization continuing the focus will be on yield maximization of existing land rather than expansion.

Human health increases through improved production, branding and improved, albeit informal, market structures. Capacity building improves awareness of safe and affordable produce, which is traceable back to its source. Greater production will improve affordability and so overall food security.

Unanswered questions remain around whether GMO seeds contribute to safe consumption, whether youth are ready to stay in the sector.

Ekiti A – Indifference
Small scale farming will increase by up to 60% as horticulture production and budget allocation increases in coming 20 years.

Higher class consumers will be more challenged to get produce, though food will be accessible and affordable for consumers in grocery stores and supermarkets, and also locally for poorer consumers.

With increased production investors will focus on value addition.

Aggregation centres will increase. This will in turn generate more internal government revenue.

Lagos A – Sustainable value chains in SW Nigeria
In this scenario, small-scale farmers are clustered around productive nuclei, using low and mid-tech technologies such as green houses. Farmers are organized in cooperatives and drive the development of horticulture sector in Southwest Nigeria. Although the value chains are small on scale, they feature professional and environmentally conscious services like inputs, weather forecasting, smart irrigation systems, insurance, cooling facilities and drone services, to name a few.
Importantly, there is significant involvement of youth in horticulture, leveraging technology alongside sustainable practices. Processors in the region use energy-saving technologies in their facilities, which are proliferating in the SW.

On the market side, farmers sell their produce through aggregation hubs to specialized markets, where environmentally-conscious consumers purchase safe and affordable produce. Both state and federal governments have formulated and implemented conducive policies, including infrastructure development and transportation to ensure sectors actors thrive.

Osun A- Plant more…*chop wella*
Small-scale farmers organize themselves into cooperatives and practice cluster farming to collectively manage their farming activities. Through their collective efforts, these small-scale farmers grow a wide range of crops featuring modern genetic varieties. These improved varieties are adapted to the effects of climate change, although this has led to the extinction of some indigenous seeds.
The adoption of novel production practices is high, with integrated pest management being the leading approach to reducing pesticides and chemical use. Small-scale farmers utilize modern infrastructure such as irrigation schemes and are tech-savvy, reflected in their use of mobile apps for weather forecasting or soil and crop monitoring.
Farming in urban areas has also increased. While prices of produce in cities have risen, they remain affordable for the majority of consumers. In this context, state and federal governments adopt a hands-off approach, allowing businesses (including farmers) to drive the development of the sector.

Ondo A – Peasant farming not sustainable in 2045
In 2045, many households in the Southwest practice household farming in their backyards. Despite a decent flow of safe and affordable supply of horticultural produce from these farms to the markets, the dependence on small-scale farming has created a situation of food insecurity and hunger among population. Both food insecurity and malnutrition are high in rural and urban areas, and unemployment and crime rate have also increased.
To compound the problem, the region suffers from poor infrastructure, and citizens have little or no access to health systems. Although small-scale farmers and households produce most of the food, socio-economic development in the region is poor, coupled with environmental concerns.

9.4.2 B – large-scale formal, safe & affordable

Table 9.4 *Ogun B: Horticultural crop production outlook for large scale farming in 2045*

2024	2034	2040	2045
SHFs and large-scale farmers (LSFs) are about equal size	LSFs gain greater access to capital and expand. SHFs have increased financial stress	LSFs have greater export and job creation, access to tech. Young people are less interested in taking over.	Become large-scale sustainable businesses. Smallholder farming practice dies out.

Continuation of urbanization will challenge farmland (benefiting real estate owners).

Those farmers looking to scale up and able to access capital will benefit from increased demand, while those without capital injections will be unable to afford input costs and likely sell their land as it increases in value. If and when research delivers safe seeds, these will contribute to improved and safe yields.

There will be enough people to work on these larger scale farms with the increasing population.

Oyo B – Safe & affordable, large & formal
With a rising population there will be a constant demand for food. This will help drive up innovation adoption of improved practices (irrigation) and tech (greenhouses), which will in turn smooth out production across the year and minimize seasonality (along with cold storage facilities). Inputs will be government-subsidized and heat-resistant seeds will be introduced.
Scaling up does not mean small-scale would disappear, but there would be more integration of food services closer to the consumers, e.g. a one stop market farm closer to consumers and/or via supermarkets. Once the business model is properly developed these one stop open markets would start to develop across the state closer to urban-growing areas.
Greater export would take place, with value addition, product labelling and traceability.
Online farmers markets would be developed.
As integrated services these one-stop markets would be investable as viable business models, so financiers will help drive their growth.
Large-scale means integrating community with farming, and linking producers with consumers more directly (including through apps).

OSUN B – Restructuring the future of horticultural farming in Osun
The horticulture sector in Osun has reached its performance peak. Improvements in research, better quality of inputs, and mechanized production systems have created much employment among youths on farms. However, the farming community has dwindled, and farming is now dominated by a few large scale farmers. Subsistence farming occupies only limited farmland.

Extension agents rely on digital channels to widely disseminate their knowledge, while traders run profitable and formal businesses thanks to the abundant availability of horticultural produce. Input dealers have seen increased sales over the years, despite the proliferation of adulterated products in the market. Small-scale processors have established cottage industries across the state, and a significant amount of produce is exported yearly. Consumers have access to safe and affordable produce, contributing to an overall improvement in public health (along with other factors).

However, this high input-high output system has caused negative environmental impacts, including the loss of wildlife and land degradation.

Ekiti B – Awa farms: the home for safe and affordable food
Government enforces rules on unsafe foods, shutting down places using banned agrochemicals. Consumer preferences go towards tagged/traceable foods which pushes farms to become certified. People are more comfortable either eating in or out as food is considered safe. SW goes towards food sufficiency through improved government regulation and FDI increasing by 50% into agriculture.

A price board will control prices from farms, making sure food is affordable.

One example of this is Awa farms; a specialized, integrated farming system using certified and recyclable seeds, minimal use of synthetic agrochemicals, fully irrigated organic farm, all powered by green energy. All food produced is tagged and traceable; "In 2045 Awa farms as a certified organic farm is another segment known for very limited use of agro-chemicals. We are a specialized and integrated farm known for production of only tomatoes, fishery and poultry which ensures that waste is recycled. There is also a segment of the farm dedicated to agro-forestry; for trees to reduce the carbon burden of agriculture on climate. We have partnered with formal retail food outlets who transport the food from our farm using green-powered vehicles and tags our veg, fish and processed foods to ensure traceability. Investments in Awa farms and the commercial farms like ours has increased FDI by 50% and has consolidated FNS, increasing life expectancy rates from 40 to 70. We have also influenced the government to implement a price board to control food prices and ensure food access to all. In 2045, producers and distributors of synthetic agrochemicals are negatively impacted."

Wealthier consumers will benefit from healthy foods, farming business will be sustainable, and government will benefit from revenue generated. Poorer consumers will be more challenged, however.

LAGOS B – A self-sufficient Lagos, a Greater Lagos
Lagos boasts large scale farming systems featuring fit-for-purpose and inclusive urban and peri-urban farming solutions. Large -scale farming is characterized by resource-efficient technologies such as green houses and vertical farming, while also accommodating small-scale farming. These large scale systems (through consolidations of farms, not 'corporate' farming) system combine the use of sustainable resources like green energy with bio circularity (closed-loop systems). Varieties grown in these systems produce high yields per square meter with zero waste.
Workers benefit pension plans, health insurance and fair salaries. Lagos city sources all its horticulture produce from within the state, including the city boundaries. Consumers have developed a taste for new (hybrid)varieties.
State and federal governments are enforcing sensible policies around access to finance, tax incentives, roads and infrastructure, and inputs. Governments have also unified the certificates needed for production and marketing.

ONDO B – A balanced horticultural system
Examples of circular farming systems (e.g. Aquaponics) have been established across the state. Small-scale farmers find their place within these systems, where technology and automatization are at the forefront. Small-scale farmers produce 'at their own pace', and are supported by larger scale farms in their vicinity. Both small and larger-scale farming coexist and are at equilibrium. The technological solutions adopted have mitigated the negative effects of climate change. Youths have joined the professional working force in the sector, attracted by advanced technology and competitive salaries.

Value chains include cold stores and benefit from good road networks connecting farms to markets. Local markets readily absorb horticulture production, with consumers willing to pay a fair yet affordable price for safe products. Policies formulated and implemented by the federal and state governments play a crucial role in maintaining balance within the systems.

9.4.3 C – small-scale informal, unsafe & unaffordable

Ogun C – The disaster of small-scale horti-farming: a ticking time bomb
In a weak operating environment and little on-the-ground innovation, small-scale farming can fall apart; with no capacity development the informal sector will produce low grade and unsafe food, using unreliable seeds and misuse of agrochemicals. This will keep SHFs at a low standard where they can't upscale production, lack of skills and technology means production is inconsistent throughout the year. Farmers will likely sell their land if they can to real-estate developers, and the next generation will not be incentivized to take over. Farming will remain a last resort option.
Along the supply chain there will be no packaging or benefits from grading standards or economies of scale. As a result consumers will get unsafe produce at inconsistent prices.

Potential solutions are:
- Consistent government policy on agriculture
- Adoption of new and improved tech for SHF
- Promotion of cluster farming by SHFs – improves access to credit and economies of scale
- Improving rural infrastructure to slow rural to urban migration

Government will benefit if there's sustainable food, through foreign exchange earnings and youth employment.

LAGOS C – Growing pains! – a gloomy future for small-scale horticultural farming
Subsistence farming has become mainstream. Production is fragmented, and farmers have struggled to withstand the effects of climate change. Women face barriers to engaging in horticulture, widening the gap in their ability to create and own income compared to men. The adoption of technologies such as irrigation and high-quality inputs is very limited. Due to poor quality control systems, farmers use highly hazardous pesticides and adulterated chemicals. Other supporting services such as finance remain largely absent in the sector. The low level of investment is critical.
Local market actors face hardship in collecting and aggregating widespread produce. Lagos relies on stable and predictable flows from other states, featuring less fluctuating process. Locally, prices tend to fluctuate massively within the seasons.

Governments have dismissed calls for action and intervention, leaving the fate of the horticulture sector to the actors themselves. Consumers feel left out and are not able to afford safe products, which are present in the market but at higher prices.

Oyo C – Future prospects of vegetables in Oyo
With a growing population the increasing demand for produce, but with little public oversight, will incentivize farmers to use more pesticides and chemicals to grow more, with the consequence that produce is unsafe. For producers, the main challenges will be; rising cost of inputs and transportation, lack of finance and government support.
There will be an increase in demand for GLVs, pepper given their health benefits. Onion demand will be more constant. Prices will continue to fluctuate given seasonality, making it challenging for both retailers and consumers. During the rainy season however, Oyo can produce enough vegetables and peppers.
Processors will seek more processed goods.

Solutions are;
- Local/regional upscale of production.
- Government regulate input prices.

Osun C – Transforming unstable horticultural products
Osun struggle to reconcile the growing population and sufficient agricultural land for food production, let alone horticulture produce. The land deficit is insurmountable. The sector's unattractiveness, coupled with limited jobs availability, has dwindled the labour force. Due to limited projected growth and a high-risk profile, investors have turned their back on the sector. The effects of climate change are apparent, with researchers not being empowered to provide sustainable solutions over the years.

The limited flow of (often unsafe) produce finds its way to larger urban markets, only affordable to wealthy families. Traders continue to connect rural and urban areas, exhibiting a dominating position in the sector, controlling prices and flows. Many input dealers have exited the sector over the years due to minimal margins.

Governments have failed to formulate sensible policies for the growth of the (horticulture) sector. Nevertheless, acting on the following six themes could turn things around:
- Make more land available for food production
- Increase access to finance
- Prioritize just labour conditions
- Support market actors to provide better market structures
- Tackle climate change immediately
- Formulate and implement effective government policies

Ekiti C – The fate of food security in 2045
Due to population growth there will be high demand for food which, without an increase in production, will lead to price rises.
Most farms in SW are small-scale with many unskilled farmers. This means production will remain small-scale and unable to keep up with demand.
This will result in production of unhealthy goods (also due to use of agrochemicals), and only the rich can access better produce.

Investors may potentially benefit because of increased demand.
Retailers will suffer with produce scarcity and price fluctuations. Less will want to sell produce given this.
Rich consumers will be okay as they can afford to purchase quality produce, and will know how to identify which produce is healthy. But poorer consumers will struggle as they have no choice but to but what they can get.

Ondo C – Double jeopardy: the growing threat of poor farming
Ondo officials grapple with a harsh reality: high environmental pollution and the acute impact of climate change, especially felt by the farming community, which is only a fraction of what it used to be. Farmers tend to overuse chemicals, lacking the awareness and the knowledge of the harms of these practices. Lack and sufficient skilled labour exacerbates the situation, contributing to higher production costs.

Consumers have limited purchasing power due to the high cost of living. Those who can afford the produce still face the problem of product unsafety. Consuming fresh products has become uncommon due to certain sicknesses.

As farmers produce less and less (yet still costly) produce, both society and governments face the adverse effects of non-resilient farming systems.

9.4.4 D – large-scale formal, unsafe & unaffordable

Lagos D – Big business, big trouble
Large-scale farming business embrace the latest technologies and produce large quantities of crops on extensive land. Farmers rely heavily on agrochemicals, and the farming scene is dominated by a few players counting backed by foreign investment. Locally, farming systems are mono-cropped with little presence of heritage crops and nature.

As a result of intense farming activity, environmental pollution has become evident, affecting soil, water, and air. Consumers and households have experienced an increase in health-related issues due to the practices of these profit-driven industries.

The establishment of big businesses has led to the loss of cultural identity and the traditional food basket in Lagos, resulting in a clear deterioration of human and natural resources.

Ogun D – A tale of two cities
Consumers that can afford it would benefit, receiving foods that are organic, prepared and delivered to the households. But poorer consumers would not. Small-scale farmers would die out and consumers would have to rely on their own home gardens.
Experiment of scaled-up production and its investment will have failed with healthy food only being available to those that can afford it. Larger producers would struggle, with smaller traders benefit, possibly sourcing from the north instead. As a result there will be greater investment in the north than in SW with them instead focusing on westernization and education. With a revised land use act, greater mechanization will take place.

Oyo D – Promising triumph!
Investments will have pushed large formal agribusinesses to comprise 75% of production with SHFs being only 25%. Investments will have gone into inputs, machineries, personnel, which has driven up produce costs. There will be a high use of inorganic & agrochemical fertilizers.
Negative: poorer consumers, SHFs, informal/street vendors and retailers will struggle.
Positive: investors, rich consumers, local and state government, and larger scale entities along the chain will do OK.
The investments will have pushed for greater scale and be more export/elite focused. At the (rural) community level there will be a push to survive more independently through community social responsibility.

➔ With an investment strategy that focuses on scaling up and ROI coming from a specific audience, e.g. wealthier consumers and export, this can drive inequality between the haves and have-nots. Smallholder farming will decline and remain an activity done out of desperation rather than by choice. This is a warning against investing only in formal, large scale business practices.

Osun D – Less power, less choice, unsustainable food systems
The few remaining farmers in Osun practice "Corporate" farming, driven by profit maximization and backed by large investors. In these systems, labourers suffer from low wages and limited rights, with female youths finding it particularly difficult to be employed in horticulture. Farmers heavily rely on mechanization and technologies such as greenhouses, monocropping, which contribute to the loss of indigenous crops. This intensive farming also leads to increased level of pollution and soil degradation.

Consumers face growing food insecurity, with only a few having access to safe products. Governments have deprioritized agriculture, leaving large-scale farmers to produce for the entire population, thanks to a few conducive policies favouring their interests. Lastly, Osun is experiencing increased migration from rural areas to urban centres.

Ondo D – Large farms, more profits but more hunger and poor health
In Ondo, a monopoly of few large-scale farmers has taken root. Most horticultural produce is unsafe to consume fresh, leaving a significant environmental footprint. Small-scale farmers have been pushed out, along with a diverse genetic pool, resulting in numerous health problems plaguing society. On a positive note, many youths are employed in the few massive farms.

Government regulations have long been discontinued, benefitting those engaging in bad practices. The only way to re-steer this situation toward stability is for the government to intervene and regulate the agriculture sector with clear and decisive policies.

Ekiti D – Death in 2045
Investments are made into agriculture sector which go very wrong; there is a decline in production and/or increase in wastage, cost of living increases, as does unemployment and health risks. This drives up hunger,

civil unrest and environmental degradation. Food becomes a luxury, and while the poor are marginalized the wealthy are still buffered and have 'veto power'. Government revenue will decline.
➔ Another warning of mis-investment.

9.5 Seven key areas in detail

9.5.1 Establish a multistakeholder platform for the SW horticulture sector led by private sector with other stakeholders

In 2025, the establishment of a multistakeholder platform led by the private sector with a broad coalition of stakeholders to coordinate and lead the development of the horticulture sector, building on these and the ECDPM report recommendations to develop a multi-stakeholder sectoral vision and strategy and address key issues. These and other reports include lists of potential stakeholders for engagement and advice to engage in collective action.[10] In the first year a 'coalition of the willing' should take shape, focusing on those willing and able to take the initiative. This platform can coordinate the activities set out in this report and establish an effective governance model to ensure efficient decision-making processes and ongoing activities in successive years.

In 2026 the platform can focus on:
- Brokering partnerships between national and international stakeholders, using the financial packages being developed (see key area 3) to enable partnerships based on supply and demand. Federal and state governments can also develop financial incentives for stakeholders who actively form partnerships.
- Promoting collaborative value chain solutions such as tailored financial services, training and capacity building programmes for farmers, and post-harvest solutions.
- Co-develop a data-driven vegetable information system for the region that presents, amongst others, product pricing, supply and demand patterns in an accessible format to enhance information sharing, raise the sector's overall knowledge base and support informed decision-making.[11] This could eventually incorporate other states and scale up to national level.

From 2027 onwards, while the immediate activities of the first two years are being implemented, the platform should look towards longer term objectives that will benefit and strengthen the sector. These can be oriented around the activities and recommendations set out here but which take a longer time to develop, e.g. strengthening training capacity of different (informal) organizations, engaging with investors on portfolios of investment-ready products proposed by private sector actors, and lobbying for more public funding to go into the sector. However, these specific areas can and should be determined by the stakeholders themselves, and in line with the longer term vision outlined in the desirable future.

2030 milestones
- Public-private partnerships are established to build resilience in the horticulture sector, improving its ability to withstand economic and environmental challenges.
- New partnerships supported by foreign investors are formed, fostering collaboration and innovation within the sector.
- Co-funded infrastructure projects, such as (cold) storage and transportation networks, have become operational, enhancing efficiency across the value chain.
- Expanded market access with at least 30% of horticultural products reaching regional (and possibly international) markets.

[10] See the ECDPM political economy analysis and HortiNigeria report on a B2B digital platform (ECDPM, 2024.
[11] Note that the DAWN Commission is currently working on a data warehouse to provide a comprehensive list of available land for investment in horticulture and other food crops. This platform is intended to serve as a hub for information and advisory services, facilitating investment in the sector. https://dawncommission.org/

9.5.2 Improve policy and regulatory support along the supply chain

In 2025-2026 the six states should prioritize policy interventions on

- Create and/or enforce conducive policy and regulatory frameworks to ensure the availability of affordable and safer farming inputs, such as fertilizers and pesticides.
- Create a conducive environment for foreign companies that can support the transition of the horticulture sector in the SW. For example conducive policies regarding the repatriation of business earnings.
- Producing and disseminating crop production calendars that mitigate risks associated with seasonality. By promoting crops that thrive under diverse environmental (changing) conditions, farmers will be better equipped to manage fluctuating growing seasons.
- Support POs and other organizational bodies to regularly train farmers on GAP (see key area 5), alongside efforts to encourage fair remuneration within horticulture businesses, creating a more equitable market for both producers and labourers.

From 2027 onwards…

- Establish and/or implement appropriate policy and regulatory frameworks on land governance to ensure the protection of forest areas from agricultural development.
- Besides training, states have an obligation to implement strong regulatory frameworks for food safety, so that consumers build trust in the quality of what is being sold to them (see key area 7).
- Policies tailored to the needs of actors along the value chains in the informal sector should be developed, addressing the specific challenges they face in accessing resources, services and markets.

2030 milestones

- A planning mechanism in place to navigate seasonal production issues, minimizing market fluctuations that currently hinder the sector.
- Enforced policy actions on land governance. Including the dedication of certain areas for horticulture productions but also the protection of vulnerable areas like forests.
- Policies supporting affordable farming inputs and safer chemicals firmly established, enabling farmers to increase their productivity while maintaining environmentally sustainable practices.
- Enforcement mechanisms in place to assess horticultural products, ensuring they meet the national food safety standards.
- Policies specifically designed for the informal sector developed and implemented, ensuring that all actors along the value chain benefit from these advancements.
- Conducive policies that allow foreign companies to actively support the development of the horticulture sector in the SW.

9.5.3 Develop tailored financial products for smallholders, SMEs and midstream actors

Activities

In 2025-2026 a financial strategy for the horticulture sector should be developed that the multi-stakeholder platform, with input from Nigerian banks active in SW, can help facilitate to engage existing and future investors (banks, donors, etc) and structure investment vehicles. These should both build on existing areas of loan provision into the horticulture sector while aiming to expand into new areas. Existing areas include the following.

- Input suppliers, processors, traders (including associations) and aggregators are midstream actors that are already able to receive loans in Southwest states. For (cold) storage units and climate-controlled warehouses loan provisions should be focused on areas close to large potential production and aggregation points, including (peri)urban markets, and should have explicit loan requirements for solar panels. It is not recommended to support processors in the short term, given the consumer preference for fresh horticultural produce.
- Registered and informal producer organizations (POs) should be supported with conditional loans for their members to gain access to low-interest (micro)loans. Conditionality should be based on the POs supporting members through training, market information, bulk-purchase of inputs.
- Hubs such as those being developed in the HortiNigeria programme in Oyo and Ogun should be developed into sustainable business model structures so that young agripreneurs can receive training, access to resources, a guaranteed market and low-interest loan provisions (see also key area 6).

These investment vehicles should be developed with and through existing banks in the Southwest. Public and/or donor funding can be provided through the banks as credit guarantee schemes to reduce interest rates on loans. It is not recommended to set up an independent financial body or for public donors to work through NGOs for loan provision as these can often be interpreted as grants by recipients and risks higher default on repayments. Steer away from subsidies and support commercially viable initiatives with loans.

From 2027 onwards, besides the shorter term activities that can be executed in the first two years, the financial strategy should include the architecture for managing risks in the smallholder sector through insurance schemes, low-interest loan provision and soft loans (e.g. flexible repayment structure) in the medium to long term. As part of this, private sector actors should contribute by providing or paying for trainings and partnering with the POs to reach their members. As the hubs become developed, loans can be scaled up to scale start-ups to small or medium sized enterprises. This transition pathway should enable producers to 'graduate' from smallholding to larger-scale operations based on the business skills acquired during training. It will also help them manage risks effectively as their businesses grow.

For informal saving schemes like village savings and loans associations (VSLAs), see key area 2. Table 7.2 provides an overview of the areas for which finance could be tailored within the financial strategy.

Table 9.5 *Investment areas*

Production (smallholders)	Production (start-ups, SMEs)	Transport, aggregation, storage
• Basic agronomy, book-keeping • Irrigation equipment & training • Access to quality inputs	• Irrigation equipment & training • Protected cultivation • GAP • Low-interest soft loan provision	• Transport vehicles, crates, packaging • Solar-powered cold storage units fit-for-purpose (produce type and capacity required)

2030 milestones

- Measurably improved horticulture sector loan portfolio (higher loan volumes and lower default rates in production, transport aggregation and storage sectors).
- Flexible formal and informal finance mechanisms being used; includes VSLAs in communities, blended finance for start-ups, soft loans for SMEs and smallholders through POs.
- Increased GAP in the sector.
- Adoption 'innovations' in the sector (solar powered irrigation, (cold) storage, greenhouses, etc) as a result of loans provided.
- Adoption of insurance schemes direct to farmers and/or through POs, to manage risks of disease, climate impact.

9.5.4 Develop production and supply chain infrastructure

Activities

In 2025-2026 at production level, irrigation schemes should be developed to enable year-round farming, especially during dry seasons. Investments in irrigation technology, such as drip irrigation systems or solar-powered water pumps, can increase productivity. Access to good quality starting materials such as seedlings produced in dedicated nurseries is important to increase yield for farmers. Government and private initiatives should work together to make these technologies accessible to smallholder farmers, who often lack the capital to invest in irrigation infrastructure (see key area 3).

To reduce post-harvest losses, expand facilities in rural and peri-urban areas where farmers can quickly access storage for fresh produce, preventing early spoilage.

Along the supply chain infrastructure, public and private stakeholders should invest in building and upgrading storage facilities, particularly those equipped with (cold) storage technology. This can significantly extend the shelf life of produce, ensuring crops retain their quality and remain marketable for longer periods.

Upgrade current market infrastructure, including post-harvest handling practices, establishing hygienic selling spaces with water access for vendors, electricity, and waste management systems. This will contribute to safer

food handling and reduces the risks for contamination, benefiting both vendors and consumers. Establish cooling centres and refrigeration units in key marketplaces to extend the marketability window of perishable goods.

From 2027 onwards, support the development of cold chain logistics and transport systems; the development of cooled transport systems is critical in ensuring that crops retain their nutritional value and market quality from farm to consumer. This could involve forming local partnerships with logistics providers to ensure that perishable crops, such as cucumbers and peppers, are handled efficiently, minimizing post-harvest losses. Investments should focus on refrigerated trucks and packaging centres that link rural farming hubs with urban markets.

2030 milestones
- By 2030, invest in (cold) chain infrastructure to cover key horticulture production regions, significantly reducing post-harvest losses.
- Upgraded marketplaces across major cities, proper handling and safe storage options. These improvements should lead to reduced food safety risks and reduced contamination risks.
- A fully operational irrigation infrastructure will be available to farmers across Southwest Nigeria, with a focus on efficient water management practices that support year-round farming. This can be supported by public irrigation schemes that provide water access to large numbers or farm specific irrigation solutions.
- Developed access to good quality starting material such as seedlings produced in nurseries.

9.5.5 Build farmer capacity to shift to commercial-scale production and SME approach

Activities
In 2025, the focus should be on two aspects; first, creating and implementing a sustainable farming and GAP training programme for extension officers, lead farmers, and labourers. This programme, co-designed and facilitated by private sector actors, should cover key topics like pest management, soil fertility, and safe chemical use. Second, working with private sector actors, producer organizations, trade associations and hubs (developed in HortiNigeria) to ensure this training and support can reach a large audience, in the absence of a comprehensive network of service providers through the MoA.
Complementary to this, promoting local seed varieties through advocacy and campaigns to highlight their importance on climate resilience, biodiversity, and nutritional benefits can help contribute to delivery of quality produce. Developing tailored training programmes for both skilled and unskilled labour will add significant value to the sector (see key area 7).

In 2026, as training is rolled out, prioritize start-ups and other (young) farmers that have the highest potential to step up commercial production. As access to training expands, also introduce a shift to food safety standards, as well as modern harvesting and post-harvest techniques. Partnerships between farmers and market actors should be fostered to improve access to align production with demand, along with other market awareness initiatives.
Elevating the quality of the supporting services through capacity building should also be high on the agenda.

From 2027 onwards, advocacy should focus on increasing participation in horticulture at all levels, contributing to long-term food security in the region. In addition, supporting educational institutions to develop and implement training curricula on sustainable horticulture should remain a priority (see also key areas 1 and 6).

2030 milestones
- A network of horticultural training centres established and/or accessible through existing organizations (POs, trading associations), producing a skilled workforce proficient in modern farming methods.
- Increased capacity and understanding among farmers on production, GAP, innovations and business skills.
- Well-trained extension services present in the field.
- Improved access to and use of local varieties.
- Increased market knowledge and improved market access for smallholders and midstream actors.
- Reduced post-harvest losses.

9.5.6 Develop training schemes and transferable skills for shifting in and out of the horticulture sector

Activities

In 2025-2026 a mapping should be conducted of businesses and organizations active in business development and leadership training/coaching in the Southwest, together with similar publicly-funded training programmes. Together with experience developed through the multi-sector business development support and skills training provided through the Embassy's Youth in Agribusiness (YAS), HortiNigeria and Orange Corners programmes, these can be developed into a network of initiatives that promote entrepreneurship, especially for young women and men, across multiple sectors (including but not exclusively horticulture) in the region. This initiative should not be led by the proposed multi-stakeholder platform, but instead by a selected university, technical college or business willing and able to coordinate this. The network can connect to the horticulture-specific training (see key area 5) and collaborate with the horticulture MSP.

From 2027 onwards, once the network has been established, it can focus on sectors that are identified as high potential throughout the region, including the horticulture sector. A similar initiative is the African Food Fellowship and its partnership with the African Leadership University,[12] both of which can be contacted to provide guidance and support for a Southwest regional initiative. Training should be linked to credit guarantee schemes for business development (see key area 3).

2030 milestones

- Functioning network of organizations involved in transferable skills training.
- Increased offering of training and education on horticulture by public and private parties.
- Evidence of (young) people moving in and out of food sectors.

9.5.7 Develop consumer awareness of healthy diets and safe food

Activities

In 2025-2026 consumer awareness should be raised about GAP and food safety standards for vegetables, incentivizing demand for nutritious and safe vegetables, as part of consumers' food baskets in the region. Building on already existing intervention strategies (Herens et al., 2023) strategies and policies such as the Nigerian National Policy on Food and Nutrition (Federal Republic of Nigeria, 2017) and the more recently developed Nigeria National Pathways to Food System Transformation (2021), campaigns should focus on promoting healthy diets, vegetable consumption and food safety targeting different audiences. In addition, investments should be made in school education, updating food-based dietary guidelines, and appropriate protocols and regulatory frameworks for food processing, retail and vendors to provide safe produce. Suggested activities are:

- Develop or intensify targeted Social and Behaviour Change Communication (SBCC) campaigns and training programmes that educate the public on nutritious foods and safe food practices targeting a variety of audiences – in particular women as they typically provide meals.
- Introduce healthy diets and food safety education into school curriculums, ensuring children learn about healthy diets from a young age.
- Engage with health services, NGOs and CBOs in training and capacity building on healthy diets and vegetable consumption in both rural and urban areas.
- Engage with government and (inter)national actors and networks on the development of measures and arrangements addressing cost of diets.
- Engage with the private sector such as retailers to encourage the promotion of nutritious foods as part of awareness programmes. This can be formal retailers, but also informal retailers can be involved.[13] Next to this, involve the private sector in labelling initiatives that highlight healthy products.

From 2027 onwards the focus will continue on delivering well-grounded consumer awareness activities. Targeted campaigns promoting healthy diets and vegetable consumption are anchored in social marketing

[12] More information on these initiatives is available at africanfoodfellowship.org and www.alueducation.com

[13] See also Raaijmakers et al. (2023) where informal street food vendors actively promoted additional vegetables to traditional Nigerian dishes.

and media strategies, in school education, and health sector, guided by food based dietary guidelines. Mechanisms are in place to monitor GAP and food safety from farm to fork (see key area 2) ensuring accessibility of safe vegetable consumption. Cost of diets monitoring and fair pricing mechanism for producer and consumer are being developed ensuring fair pricing for producers and consumers.

2030 milestones

- Increased consumer awareness of healthy diets and food safety: consumers are sensitized about the relevance of healthy diets.
- Improved access and affordability of vegetables, reduced cost of diets.
- Food-based dietary guidelines are adopted and guiding healthy lifestyle campaigns to which private sector actors also adhere.
- Policies and monitoring mechanisms supporting the affordability of vegetables are enforced.

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