

YOUTH EMPLOYMENT AND ENTREPRENEURSHIP

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Gender and Youth Economic Opportunity in Nigeria's Cassava, Poultry, Horticulture and Oilseeds Value Chains: A Literature Review

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Acronyms

AMPU	Autonomous Mobile Processing Units
COSCA	Collaborative Study of Cassava in Africa
FAO	Food and Agriculture Organization
HQCF	High quality cassava flour
IFAD	International Fund for Agricultural Development



IFPRI	International Food Policy Research Institute
ILRI	International Livestock Research Institute
kg	Kilogram
SMEs	small- and medium-scale enterprises
LSPs	large-scale processors
NGO	Non-governmental organization
PIND	Foundation for Partnership Initiatives in the Niger Delta
VPU	Village processing unit



Executive Summary

In Nigeria, rising urbanization and incomes are boosting consumer demand for cassava, poultry, horticulture and oilseed products, creating promising opportunities for expanded youth employment and entrepreneurship across the agrifood sector. Governments, partner agencies and the private sector are putting more attention on policies and training programs to help prepare youth to take advantage of emerging opportunities. However, there is a danger that a broad focus on “youth” may ignore existing gender constraints that limit young women’s participation in training and employment opportunities.

This paper examines four rapidly expanding agrifood value chains that are strategic priorities of the Nigerian government: cassava, horticulture, oilseeds and poultry. The authors review the existing literature and describe the major activities within each value chain, allocation of tasks by gender, opportunities for expanding youth employment, and constraints that may affect young women’s participation. The review describes policy, program and knowledge gaps that need to be addressed in order to improve gender inclusive design and implementation of youth training programs.

The authors find a range of opportunities for increasing youth employment and entrepreneurship across the value chains studied. Training programs can help attract youth to these opportunities and modernize the value chains by promoting advanced technologies, including information and communication technologies (ICT), mechanization and irrigation.

Within each value chain are gender-related constraints which, if not addressed, will limit the ability of young women to benefit from agrifood training, employment and entrepreneurship opportunities. These include widely-held perceptions of women’s roles, capabilities, strength and reliability. For example, since men are traditionally seen as the primary income earners, women are less likely to be given jobs with advancement potential. Jobs involving machine operation or new technologies are often given to men, who are perceived to be stronger and more capable than women. Key policies also limit women’s access to resources, including education, land and finance. With generally lower education levels, women are assigned to low skilled jobs such as peeling cassava. Without land, women are constrained to small plots and low production levels. Lacking collateral, young women are unable to access formal credit markets.

The authors identify examples of gender constraints and recommend options to address them. Across the value chains that are the focus of this study, priority interventions include work with potential employers to address gender stereotypes that hinder the recruitment of young men and women for specific jobs along the value chain, and policy revision and institutional change to address gender specific barriers that constrain young women’s access to education, land and financial resources, and affect business development more generally.

Other findings and recommendations include:

- To improve access to loans, women may be able to join existing associations or form new groups in order to take advantage of special funds available for group lending which do not require collateral.
- As increasing mechanization in the cassava value chain reduces the heavy physical demands of traditional cassava production and processing, there are opportunities for youth to secure related employment and enterprise opportunities. To counter the bias to hiring



men for jobs involving machinery and other advanced technologies, special efforts are needed to attract young women to training for machine operation, and to work with employers to accept young women as interns, employees or contractors.

- Women are traditionally associated with cassava processing, which can be done in or near the home. Entrepreneurship training may encourage young women to develop small and medium scale enterprises that can take advantage of the growing demand for processed cassava products.
- Rural women have long been responsible for household poultry production, both meat and eggs. The shift from household production to larger scale operations for commercial sale requires more advanced technical knowledge and resources. Currently, women employed in commercial poultry operations are limited to the more delicate tasks of egg collecting and sorting. Jobs which require machine operation or are related to veterinary care are most often given to men. Efforts are required to provide young women with more advanced technical training, and to encourage employers to provide internship, job and contracting opportunities for young women interested in commercial poultry production.
- In the horticulture sector, women already produce the majority of horticultural crops at the household level. As horticulture production expands for the commercial market, more external resources are required to purchase inputs, additional labor and transport services. Commercial horticulture production is currently dominated by men. Policy changes are needed to expand women's access to credit, land, technical training and business coaching, in order to help them make the transition from household plots to larger, more commercial horticulture production. Processing-related employment and enterprises may also provide significant opportunities for women to expand income-generating activities, if resource constraints can be addressed.
- In the oilseed sector, women are already important in household-level shea butter and palm oil production, processing, and marketing, but are less engaged with commercial production of these and other oilseeds, including multipurpose soybeans, a relatively new crop for Nigeria. There are opportunities across the oilseed sector for expanded involvement by young women in small- and larger-scale processing. Expanding young women's access to education, training, and credit resources will be critically important to help them take advantage of new employment and business opportunities.

1.0 Introduction

Nigeria's agrifood system currently provides employment for millions. Given high rates of unemployment among both young men and women, policy makers are now examining how Nigeria's expanding agricultural sector might also create opportunities for Nigeria's many under- and unemployed youth. However, a simple focus on creating more jobs for "youth" may unintentionally exacerbate existing gender-related constraints affecting young men and women's access to jobs and business opportunities.

1.1 Objectives and methods

In this report, the authors review the existing literature to examine gender issues along four key agrifood value chains in Nigeria: cassava, horticulture, oilseeds and poultry. These rapidly expanding value chains are strategic priorities of the Nigerian government and are thought to offer significant opportunities for expanding youth employment and entrepreneurship (Allen et al.,



2016). The authors examine patterns of gender-disaggregation in activities along the targeted value chains, explore factors that may explain the observed patterns of participation, and identify options for expanding the participation of young women in the selected value chains.

The specific objectives of this review are to i) map participation of men and women by age group at different nodes of each of these value chains; ii) identify the gender and age-specific factors that explain where men and women are working and what they do within the value chains; iii) identify the areas for maximum employment and entrepreneurship opportunities for young men and women, and associated challenges and resource requirements; and iv) identify organizations that are working on gender, particularly in the populous southwestern states of Lagos, Oyo, Osun and Ogun.

The methodology for this analysis is a literature review. The report focuses mainly on Lagos, Osun, Oyo and Ogun States of southwest Nigeria. This region constitutes one of the country's major agricultural production and processing areas, serving the greater Lagos urban population. The review also incorporates relevant material on gender issues in employment and entrepreneurship from other regions of Nigeria. The report findings are intended to inform policy revision and improve training program design to encourage more gender equitable access to employment and enterprise development opportunities in Nigeria's agrifood sector.

1.2 Gender in Nigeria's agrifood system

In Nigeria, women represent 62% of the agricultural labor force, which is equivalent to 89% of the total employed female population (Federal Office of Statistics, 2009). The heavy involvement of women in the agricultural sector suggests that improving the performance of the agricultural sector, through value addition and improved markets for example, can increase the benefits gained by women (Arndt and Robinson, 2006; Abdulsalam-Saghir et al., 2012).

Despite the significant roles women play in agriculture and food security, existing evidence suggests there are gender disparities in agricultural productivity. These differences are quite often attributed to gender differences in ownership and access to agricultural assets and services, including land, finance, farm inputs, and extension services, and in control over proceeds derived from their engagement in agricultural activities (World Bank, 2012; FAO, 2011; Abdulsalam-Saghir et al., 2015). Seventy percent of farmers in Nigeria are women. However, they control less land (constituting less than 20% of all land title holders), and are less likely to use purchased inputs such as fertilizers, improved seeds, mechanical tools and equipment (Abdulsalam-Saghir et al., 2015). Researchers find that men are also responsible for most production decisions, including the allocation of land and what crops are grown. Men can also easily reclaim land given to spouses, especially if such land is discovered to be very fertile (Siwoku et al., 2012). The power imbalance in decision making over assets in agricultural households seemed to be supported by the misuse and misinterpretation of culture, local customs, and religious beliefs. Women are traditionally seen as subservient and supportive farm hands, providing cheap agricultural family labor with little or no remuneration, and not recognized as 'serious' farmers (Abdulsalam-Saghir et al., 2015). Women's low status as unpaid family labor is perpetuated by social relations within the household and intensified in commercialization, such that women's contributions to household resources go unrecognized and uncompensated (ibid).

In addition to their heavy involvement in farm-related activities at the household level, women are also heavily engaged in informal trade. However, their engagement is more at the local level rather



than in regional or international markets. Consequently, they may be excluded from formal value chain trading arrangements designed to link rural areas to cities/towns which can be more rewarding with flexible options for job and livelihood diversification. The transition from subsistence farming to commercial production also alters the values and norms of production and processing relations (Morvaridi, 1992). The following sections examine the existing evidence on gender roles and issues along the focus value chains of cassava, poultry, horticulture, and oilseeds.

2. Cassava value chain

2.1 Importance of the cassava value chain in Nigeria

Cassava (*Manihot esculenta* Crantz) is a root crop cultivated and consumed as a staple in all six geo-political zones of Nigeria. Nigeria is the world's largest cassava producer, producing an estimated 53 million tonnes in 2013 (FAOSTAT, 2013). According to the Foundation for Partnership Initiatives in the Niger Delta (PIND), production of cassava in Nigeria has been growing at an average of 4% per year over the last 10 years, and Nigeria's production of cassava accounts for approximately 21% of the total global output of cassava (PIND, 2011b). An estimated 30 million farmers, male and female, are involved in the cultivation of cassava in Nigeria.

Cassava makes an important contribution to household food security in Nigeria (Abdulsalam-Saghir, 2011). Fresh cassava roots are processed into many forms, such as *gari*¹, *fufu*² and flour. Cassava provides a relatively cheap source of carbohydrates in fresh and processed food preparations for both rural and urban communities (Adebayo et al., 2003). Analysts estimate that Nigerian households consume cassava in some form at least once a day on average. In rural areas, cassava is a preferred food consumed by more than 80% of the population. Cassava contributes more edible energy per hectare per day in the diets of rural farm families than any other crop (PIND, 2011; Adebayo et al., 2003). The crop is also a major source of income generated from the direct sale of fresh roots and processed products (Kiriti and Tisdell, 2003).

In addition to human consumption, cassava is an important raw material for industries. It is processed into high quality cassava flour (HQCF), starch, livestock feed, ethanol, glucose and adhesive for the pharmaceutical industries, and flour for the confectionery industries. These, among other uses, have the potential to generate local and foreign exchange earnings. Cassava is often referred to as a women's crop (Butterworth et al., 2008; Forsythe et al., 2016). The association of women to cassava is often explained by the relatively low resource requirement of the crop, which makes it easier for women to plant and manage.

2.2 Gender mapping of the cassava value chain

The cassava value chain reflects different gender roles for men and women in production and processing activities. Martin, Forsythe, and Butterworth (2008) characterize the gender division of labor in cassava activities, based on research from the Collaborative Study of Cassava in Africa (COSCA) in six African countries. The authors reported that women are responsible for the majority of the cassava processing, transportation, and harvesting tasks, while men are often associated with cassava production tasks. Women's role in cassava processing is highly labor-intensive with attendant drudgeries associated with the use of traditional non-mechanized

¹ Flour made of fermented cassava tubers.

² Wet paste made of fermented cassava tubers.



processing equipment. However, men's involvement in cassava processing activities increases as processing becomes more mechanized, presenting opportunities for lucrative income generating ventures (Martin et al., 2008). Other researchers have corroborated this finding and noted the trend of men taking leadership positions such as farm managers and machines operators of such enterprises as cassava processing became increasingly commercialized and mechanized (Adebayo et al., 2008).

Social affiliations and gender norms within the household and community, along with ethnicity, are keys to accessing livelihood assets, including fresh roots, land, credit and labor (Forsythe et al., 2015). Table 1 demonstrates the existing roles that men and women of different age groups take in the cassava value chain in Nigeria, based on the constraints and norms. Figure 1, discussed in more detail below, illustrates the different actors, activities, processes and influencers involved in the cassava value chain.

Opportunities for women to improve their status along the value chain are limited. At the local level, women are unable to access the necessary capital to make investments. At the intermediary level, very few women hold permanent or management-level positions and stereotypes of women often hinder female advancement within the workplace (Butterworth et al, 2008). Subsequently, it is important to address gender issues along the value chain in order to have an equitable and positive impact on the livelihoods of men and women.



Table 1: Gender mapping of the cassava value chain

Functions	Gender Involvement	Nature of Function	Age Range		
Subsistence Farmers	Older women	Entrepreneurs/employees	40–50		
	Older men	Entrepreneurs/employees	40–75		
	Young men	Employees	25–35		
	Young women	Employees	18–25		
Commercial Farmers (a) Small Scale	Older women	Entrepreneurs	40–70		
	Older men	Entrepreneurs	40–60		
	Young men	Employees	18–45		
	Young women	Employees	18–45		
(b) Medium Scale	Older men	Entrepreneurs	30–50		
	Young men	Employees	18–35		
	Young women	Employees	18–25		
(c) Large Scale	Older men	Entrepreneurs	45–65		
	Older women	Employees	35–55		
	Young men	Employees	18–35		
Processing	(a) Household Level	Older women	Entrepreneurs	30–65	
		Young women	Employees	18–25	
	(b) Village processing units	Older women	Entrepreneurs/employees	25–55	
		Older men	Entrepreneurs	40–55	
	(c) Small & Medium Scale	Older women	Entrepreneurs	40–55	
		Older men	Entrepreneurs/employees	40–50	
		Young men	Employees	20–35	
	(d) Large Scale	Young women	Employees	18–35	
		Older men	Entrepreneurs	40–55	
	Marketing	(a) Bulking Agents/ Collectors	Young men/women	Employees	18–30
			Older men	Entrepreneurs	35 – 45
			Older women	Employees	35 – 50
(b) Cooperatives		Young men	Employees	18 – 25	
		Older men	Entrepreneurs	35 – 65	
(c) Retailers		Older women	Entrepreneurs	35 – 65	
		Older men	Entrepreneurs	40 – 55	
	Older women	Employees	18 – 30		
	Young men	Employees	18 – 30		



2.2.1 Cassava production: Role of men, women and young people

At the production level, PINDb (2011) identifies four types of cassava producers in Nigeria. These include small-scale subsistence farmers, small-scale commercial farmers, medium-scale commercial farmers and large-scale farmers.

Subsistence farmers: These are men and women smallholder farmers living in rural areas. This group of farmers accounts for about 95% of the cassava farmers in the rural areas with 50:50 male to female ratio. These farmers usually plant cassava on areas ranging from 0.2 to 1 hectare (ha), usually across multiple scattered plots. They use traditional production methods, i.e., crude implements such as hand hoes and cutlasses, and family labor including the spouse and young children. Most of the women farmers in this category may be landless and financially constrained. As a result, they face challenges in procuring improved cassava varieties, fertilizers and herbicides, and lack access to land to carry out larger-scale farming. Women in this category may not be able to obtain loans from formal institutions because they do not have collateral security to do so, compared to their male counterparts (Butterworth et al., 2008). Cultural norms, government policies, lack of agricultural assets, etc. explain the unequal gender division of resources required to participate at the different nodes of the production part of the value chain (Abdulsalam-Saghir et al., 2015). As such, neither men nor women subsistence farmers operate their farms as viable expanding enterprises, nor do they produce the volumes of cassava needed to participate in formal sector marketing. Women are particularly disadvantaged due to inheritance practices based on patriarchal traditions. Men inherit land from their fathers to cultivate, and this affords them the opportunity to be entrepreneurs of their own farms (Abdulsalam-Saghir et al., 2012).

Commercial farmers - Farmers in this group are entrepreneurs who operate their farms as an enterprise. This group of farmers could be further subdivided into small, medium and large-scale commercial farmers.

- **Small-scale commercial farmers:** These farmers manage about 1–5 hectares of cassava, using hired labor consisting of older and young men from neighboring areas and states. A major characteristic of this group is the use of improved (increased yield) varieties of cassava stems for planting. On average, their yield is about 11-15 tonnes per hectare (mt/ha) which is quite low. Unlike subsistence farming and its equal male to female ratio, women constitute only 30% of small-scale commercial farmers in South-south and Western Nigeria (Sanni et al., 2009). Men and women in a household may manage their own plots separately.
- **Medium-scale commercial farmers:** Medium-scale farmers manage about 6–10 hectares of contiguous fields and are semi-mechanized. Young men are hired to operate machines such as tractors to clear and plough farms. Older women are hired to haul harvested cassava roots. The farmers use improved varieties and get yields of about 22–30 mt/ha. Women constitute about 10% of medium-scale commercial farmers (PIND, 2011b).
- **Large-scale farmers:** Increasing consumption of cassava products both at rural and urban areas has translated to rising prices for cassava production, thereby providing incentives for large-scale cassava production and the emergence of more stable, formal cassava markets at the industrial level. Large-scale cassava farmers are quite few in Nigeria, with farm sizes ranging from 10–100 hectares. Wealthy male traditional rulers, chiefs and elites, who have the resources and management capabilities to start entrepreneurial farm businesses, have set up some of these businesses. Mechanized farming is adopted by this category of farmers and yield output is about 25–35 mt/ha.



Across the major types of cassava farms discussed above, the main activities in cassava production are land clearing, ploughing and making mounds, planting of cassava stems, weeding, harvesting, packing and head loading/haulage, with gender differentiated roles as shown in Table 2. Butterworth et al. (2008) and Martin et al. (2008) found that men are more involved in cassava production—they perform up to 70% of land clearing, ploughing, mound making and harvesting on their own farms. Men are often more involved in cassava farming tasks that require physical strength. Hired laborers, including older men and their spouses from neighboring areas, and young men, are commonly used for clearing, making mounds, and agrochemical application.

Women on the other hand are assumed to be physically weaker and stereotyped by the society to undertake only some physical cassava production activities. Thus, they are not as involved in land preparation, yet they are responsible for 70–80% of the planting, weeding, and harvesting on their own farms. They also conduct similar non-remunerated activities on the farms of their spouses (Nweke and Enete, 1999). At times, some of the production activities are jointly conducted by both men and women. Children between the ages of 10–18 years provide production labor to the plots of both parents, although priority is given to the father’s plots. Abdulsalam-Saghir et al. (2015) affirmed that young people provide about 20% of the labor for cassava production, doing activities such as weeding, agrochemical application, hauling and transporting, as indicated in Table 2. Young people offer mostly non-remunerated services during holidays or after school.

Table 2: Gender roles of men, women and young people in cassava production

Activity	Responsibility		Hired Labor	Young People	
	Men (35–60 years)	Women (25–45 years)	Men (25–45 years)	Male (18–30 years)	Female (18–30 years)
Clearing			X	X	X
Mounding			X		
Planting	X	X		X	X
Agrochemical application			X	X	
Weeding	X	X			
Harvesting		X			X
Packing					
Carrying/Transport		X		X	X
Selling in market		X			

Source: Abdulsalam-Saghir et al. (2015)



2.2.2 Cassava processing: Role of men, women and young people

Nigeria's growing urban population, and an emerging middle class, is driving a rapidly increasing demand for higher quality processed and packaged cassava products (UDESWA, 2015). New employment and entrepreneurship opportunities for women and young people are emerging throughout the cassava value chain as a result.

To take advantage of shifting consumer demand and expanding employment opportunities, research and development organizations in Nigeria and beyond are focusing on adding value to cassava and making markets work for the poor. Deliberate efforts have been made by the Nigerian Government to find ways to create more income and market opportunities for smallholder farmers. The federal government has instituted public policy interventions to encourage value chain actors, especially in the private sector, to incorporate smallholders in supply chains that provide fresh or semi-processed wet cake/paste to small- and medium-scale enterprises (SMEs) (Abdulsalam-Saghir et al., 2013).

In 2002, the government established a policy that requires flour millers to substitute 10% high quality cassava flour (HQCF) for wheat flour, creating a composite flour for use in baked goods (Abdulsalam-Saghir et al., 2012). The policy stimulated an increase in the demand for cassava roots for industrial uses. The effort incentivized many farmers, including women, to expand their cassava farms, and to sell cassava roots directly to SMEs and large-scale processors in the formal markets. Through incentives provided by SMEs and large-scale processors, many women, who were initially trapped in less remunerative, labor-intensive activities (such as manual field clearing, periodic field weeding, peeling cassava), were able to acquire their own farms and move up the ladder. Clusters of smallholders were formed around SMEs to participate in and benefit from cassava value chain opportunities. The government effort also improved the quality of work usually offered to women along the cassava value chain. Some women owned processing SMEs with financial and inputs support from non-governmental organizations (NGOs) such as Cassava Adding Value for Africa (CAVA) funded by the Bill and Melinda Gates Foundation. These efforts helped smallholder households and women in particular generate increased incomes from cassava processing and product sale (Abdulsalam-Saghir, 2011).

Butterworth et al. (2008) identifies three types of cassava processors, based on the scale of processing facilities, in Nigeria. These levels include household level, village processing units (VPUs), and small and medium commercial operations.

Processing at the household level: Cassava processing at this level is highly labor-intensive, largely non-mechanized and predominantly conducted by women with some help from children, especially young females. Table 3 details the responsibilities of individual household members in cassava processing. Individual households can only process about 30 kg of cassava root on average per day. Cassava roots are processed into local foods such as *gari*, *lafun*² and starch for household consumption, and sell what is not needed by their own households door-to-door in the neighborhood and at nearby local markets (Butterworth et al., 2008).

According to Nweke et al. (2002) women typically carry out 90% of the household processing work, including peeling, soaking, drying, bagging and transporting cassava products. Processing methods depend on the type of cassava end product to be derived. Most processing activities (Table 3), such as cassava peeling, are carried out by older women with some help from children. Young

² A powder form of cassava, similar to *fufu* except in production method.



women generally fetch water for washing peeled cassava with some help from their male counterparts. The washing itself is conducted by older women with occasional help from young female children. In general, older males are responsible for the milling of peeled roots. Bagging of cassava wet paste is carried out by older women (Table 3). Older women press the wet paste to extract water, with some help from older men. After pressing the water from the wet paste, the paste is then sieved, fried and bagged by mostly older women and young women (if available). Women in this category are usually too financially constrained to purchase processing technologies and equipment that would enable them to mechanize operations (Sanni et al., 2009).

Young people, especially young men, currently participate in few aspects of household cassava processing and do not seem to see the entrepreneurial and employment opportunities offered. The reason may be the societal gender stereotype that assigns cassava processing primarily to the female gender. Young people may also be discouraged by the drudgery involved in traditional hand processing, and lack the needed financial resources and skills to take up mechanized processing. Given the cultural and social acceptance of women as cassava processors, young women given access to resources and training may be able to excel in owning and operating processing units individually at the household level. In addition, since young women frequently face time constraints with other household and family responsibilities, the time flexibility and convenience of a household cassava processing venture may prove especially attractive and practical for young women.

Table 3: Gender roles of men, women and young people in household cassava processing

Activities	Responsibility		Hired labor	Young people	
	Men (20–45 year olds)	Women (18–55 year olds)	Men (30–45 year olds)	Male (18–20 year olds)	Female (16–25 year olds)
Peeling		X			X
Fetching water				X	X
Washing		X			X
Grinding	X		X	X	
Bagging		X			
Dewatering		X			
Sieving		X			X
Frying		X			X
Bagging		X			

Source: Gratitude Report, 2012

Processing at village processing units (VPUs): VPUs are able to process much larger volumes of cassava roots than households. VPUs comprise a shed, a grater, 1–2 presses, and 1 modern roaster (usually owned by the group or by men). Total output per day is generally about 200 kg of dried product. Most VPU processing activities are conducted by women’s groups consisting of adult women, with the exception of milling and pressing the peeled cassava roots, which is mainly



carried out by older men. Cassava is processed into traditional products like *gari*, wet *akpu*³ and starch. Women's groups use the VPUs and facilities for grating, milling cassava and frying. Men are usually the owners of milling machines and are paid for their use. VPUs can create employment opportunities for young people who can be trained to help in operating machines for processing. Young people can also be empowered financially to individually or jointly own processing units, as well as render processing services to other individuals or groups.

Women's groups play an important role in the VPUs. Women's involvement in cassava processing, either as individuals or in groups/cooperatives, is likely to be affected by several factors, including access to land, access to financial resources for production inputs and processing machinery, as well as access to improved women-friendly equipment and adequate extension advisory services (Abdulsalam-Saghir et al., 2016). These factors motivate women to work in groups or cooperatives, with opportunities to access low interest loans via revolving loans based on trust with no collateral requirement. Other advantages of working in groups/cooperatives include increased access to community land with a potential for individual land ownership, a united and stronger voice to lobby the government to meet group needs and demands, and increased access to inputs. These challenges and factors have implications for engaging young girls in new cassava processing enterprises.

Processing by small and medium cassava processors: Small and medium processing enterprises are mostly owned by older male entrepreneurs. These enterprises are usually located near cassava farming communities to enable easy and timely supply of cassava roots for processing. The cassava processing SMEs are highly mechanized, typically with a mechanical drier, industrial press and other mechanized equipment, and men operate this equipment. Cassava is processed into HQCF, starch and high grade *fufu* for export (Tocco et al., 2012; Ahmadu and Idisi, 2014; Riisgard et al., 2008). Women are socially and culturally stereotyped as not having a natural aptitude for the 'harder' heavy, mechanically operated processing machines and equipment, and they are automatically assumed not to possess required technical skills to operate such machinery. Since the machines were constructed without gender considerations, there may be constraints such as complicated operational manuals, unwillingness to empower women to acquire such skills and social norms which cede operation and ownership of heavy and mechanized machines to men, making it difficult for women to be gainfully employed in this work. Various stereotypes result in women being excluded from certain occupations due to a lack of skills that they cannot gain due to assumed unsuited biological or psychological predisposition in comparison to men.

Cassava SMEs process an average of one ton of dried cassava product per day, requiring about 10 staff consisting of men (old (30–60 years) and young (16–29 years)) as permanent employees to operate the machines. Young women are engaged casually or seasonally in the packaging of processed products. On average, about 10–15 older (adult) women are hired casually on a daily basis during harvest seasons to peel cassava roots. This employment and its income stream are not stable, and are strictly dictated by entrepreneurs. This also has major implications for remuneration, the quality of jobs available, and benefits. Of all the job opportunities at cassava processing SMEs, the peeling of cassava attracts the lowest pay, when compared to other job opportunities such as plant manager and operators. The pay differential is a result of the different level of skills that are required in the two jobs. In addition, the mechanized driers are expensive, costing as much as \$100,000 (PIND, 2011b), well beyond the financial resources available to

³ Another term for *fufu*; fermented cassava meal.



women entrepreneurs. Women more generally lack the collateral security that formal lending institutions demand to secure loans. This reflects the stereotype of women as economic dependents, and not in need of financial services such as loans, savings and insurance. Therefore, women are highly constrained to become entrepreneurs with SMEs (Kleih et al., 2008).

There is an opportunity for youth to become entrepreneurs and owners of cassava processing SMEs, and employers of other youths. However, access to capital or financial resources and skills (soft and technical skills) remain important challenges for youth. These challenges are particularly difficult for young women because of the difficulty in acquiring land or other assets that could be used for collateral, and other forms of gender discrimination that constrain their access to financial resources and acquisition of skills. Young people who have the requisite skills may also be able to take advantage of employment opportunities in existing processing operations. Young men and women can be trained on how to operate processing machines and have access to resources, but efforts will be needed to break down gender biases regarding mechanical operation of processing machines, focusing on young women.

Processing with large-scale processors (LSPs): These entrepreneurs produce 100 to 2000 tons of industrial starch, ethanol, and HQCF dry product per day. They supply big end users such as pharmaceutical companies and flour millers. Large processors have investment costs of \$660,000 or more. The large amount of money needed to set up this type of processing industry and keep it running may make it difficult for women entrepreneurs to own such a processing industry without having financial assistance for purchase of equipment. The entrepreneur processors employ both casual and permanent staff, usually 20–30 persons, consisting of young and older men (PIND, 2011b). They require a steady flow of cassava roots from contract farmers who are clustered around these processing industries and also from their own farms to make their operations cost effective. Throughout southwest Nigeria, out of about ten large processors, there is only one woman who owns an LSP for cassava processing. There are employment opportunities for both young men and women in such industries even if they may not have the financial capacity to own their own LSP operations.

Autonomous mobile processing cassava units (AMPUs): A relatively recent development with entrepreneurial and employment opportunities for youth are autonomous mobile processing cassava units (AMPUs). AMPUs are processing plants that are situated in a container, and can be moved around to process cassava roots directly on the farms. The cassava is processed into wet cake for onward supply and transportation to HQCF processing factories. AMPUs can effectively capture cassava produced within a 20 kilometer (km) radius. These AMPUs can also help to address the transportation challenges encountered by farmers in moving cassava roots from rural areas to urban processing centers on a timely basis. These may be associated with LSPs, and the investment cost is high, around \$500,000 depending on the unit specifications (PIND, 2011b).

2.2.3 Cassava marketing: Role of men, women and young people

Young girls and women are more likely than young men to have entrepreneurship or marketing experience in Nigerian agriculture because they are often given “traditionally female” roles as managers and salespeople for family businesses. As a result, they are more likely to have some rudimentary skills in entrepreneurship. Business ownership or entrepreneurship provides a more flexible working environment in terms of time requirements and location of businesses. They are therefore more attractive to young women and girls who can engage with the business while still meeting ongoing family obligations and commitments.



PIND (2011b) identifies three categories of cassava traders, including collectors/bulking agents, farmer cooperatives and retailers.

Bulking agents/collectors: Bulking agents are usually men (mostly older men) who go to high cassava-producing zones in rural areas to purchase cassava roots (in the ground or already harvested) directly from farmers. Payment to the farmer is usually made after the bulking agent completes the final sale of the product. Bulking agents usually hire young men from the village to harvest cassava. Older women load cassava roots into hired vehicles for onward deliveries to open markets and factories, where cassava roots are sold in bulk for processing. Collectors usually earn at least 15% profit after sales (PIND, 2011b). It is estimated that the collectors account for about 20% of the volume of traded cassava roots.

Bulking cassava roots is a good business opportunity for young people (both male and female) who are able to travel to remote rural areas to bulk cassava and sell it to SMEs, large processors, or regional markets in cities. Young people may be able to organize themselves into groups to collect, transport and sell the cassava to processors, making payment to farmers once the sale to processors has been completed. Bulking also creates employment opportunities for young people who can cluster around known large-scale collectors who may employ young people and pay for their services. This venture is also a fast way of making money that can be an ongoing activity or diversified into other opportunities.

Cooperatives: These are often mixed groups of men and women farmers and processors that are registered and recognized formally. Men are usually the heads of cooperatives, irrespective of the ratio of women to men. This group accounts for 2–8% of cassava that is traded as raw roots or semi-processed cassava products to SMEs and large processors. Farmers and processors in these groups have their own individual farms, and they may also benefit from farms jointly owned by their group. The high cost of transport is usually a constraint to market participation and, so, in most cases, the cooperatives hire vehicles to collect cassava from members' farms for onward delivery to rural markets and factories. The mode of payment by processors to cooperatives is cash on delivery and, in some cases, on credit based on trust. Liability and profits are shared amongst members based on their individual contributions and loan acquisitions, and may also benefit according to the cassava they produce and trade through the cooperatives.

Women may organize in cooperatives to collectively establish revolving loan funds that are then available to members at low interest rates. This can enable women to purchase their own land and acquire other farm inputs. Loans from cooperatives are usually made on trust between members and do not usually require collateral. Youth may also be able to join or establish cooperatives to tap into finance and related opportunities to start their own entrepreneurial ventures.

Retailers: Cassava retailers are mainly found displaying *gari*, wet *fufu* and other cassava food products in open markets, road sides, supermarkets, and stores for final sales to consumers, restaurants, hotels and other institutions. Some farmers (mostly older women) also function as retailers who process cassava into local food products, such as *gari* and *fufu*, for sale in rural markets (Sanni et al., 2009). Young men and women may excel in processing cassava products to supply to various retail markets or sell directly at retail markets, if they can be trained and empowered to produce value added cassava products to meet both local and international demands. Another set of retailers (mostly men) are found along the major highways displaying cassava products for sale. These traders have temporary shelters and storehouses displaying 50 kg bags of *gari* ready for sale to passersby and other community dwellers.



Retailing is a highly lucrative business, but young people are rarely found retailing cassava products. This may be due to their more limited access to business start-up capital or ignorance about what retailing opportunities could give them. Large-scale retailers could employ young people to serve as suppliers, distributors and as conduits to retail cassava value added products, helping youth to develop their skills at the same time. The socially and culturally defined gender roles influence understanding of what is appropriate behavior, responsibilities and entitlements for different gender and age groups, and may limit what opportunities are seen as appropriate for young women or more appropriate for young men (Butterworth et al., 2008). This may be due to presumed risks and insecurity involved in retailing, especially for young women who may have to migrate to the urban areas to hawk by the road sides or travel to neighbouring markets without parental/guardian supervision.

2.3 Potential opportunities for young people along the cassava value chain

Based on the literature, researchers identify the following entrepreneurial and employment opportunities that can benefit young men and women in the cassava value chain (see Figure 1).

- **Cassava root production:** Young people can be provided with land and other required resources, including production skills, to produce roots to meet the high demand for the commodity in local and industrial markets. Young people can also establish improved cassava variety stems that they can sell to other farmers for planting.
- **Grading and bulking:** Young people (both men and women) can leverage the huge demand for cassava for value added foods. They can own bulking agencies or be employed as bulking agents. They can organize themselves in groups of 5–10 to aggregate the cassava, and some cassava products, for onward supply to end users.
- **Trading and redistribution:** Young people, especially young women, can establish retailing businesses to buy, add more value to, and repackage processed cassava products to ensure standardization at various markets. Such branded and repackaged cassava products can be sold to various local and international market outlets.
- **Provision of information:** Young people can be trained in packaging agricultural information that will be sought after and made more accessible to cassava stakeholders. Timely and useful agricultural information on when and how to plant and apply inputs, weather forecasts, processing information, and information on available markets for cassava and its products, etc. can be periodically packaged, supplied and sold to farmers and processors who need the information most. Young men would excel in owning such business ventures because they have more mobility and time to use the internet services and other means to get and supply such information.
- **Input procurement/supply and provision/lease of agricultural machines:** With soft loans young people can establish input sales businesses for fertilizers, agrochemicals, new and useful technologies, etc. Young women often have sales skills that have been honed in family businesses that can be helpful in owning or working in input procurement shops. If they are financially empowered and trained in requisite skills in marketing and record keeping, young women can excel in such ventures. Such entrepreneurial opportunities will not take them far away from their family and other obligations. Young people can also be financially empowered to obtain technologies such as tractors and processing equipment,



and rent/lease such implements or render services such as hiring/operating services to clear, plough, harvest etc. to farmers and processors at negotiable price.

- **Fabrication and repair of farm/processing machinery:** As demand for cassava and other agricultural products increase, more farmers are moving from subsistence to more commercialized agriculture. As such, there is also an increase in the usage of improved farm implements and other machinery used on and off the farm. As farmers' key into opportunities that mechanized farming offers with the use of machineries, new businesses may be developed to address 'wear and tear' of machines and parts, which may constantly need repairs. Depreciated parts may need new fabrication to salvage such machines. Young people can leverage the demand for repairs and fabrications by acquiring technical skills in machine and equipment fabrication and repair, and sell such services to farmers.
- **Quality cassava processing units and provision of good storage facilities:** A key problem faced by farmers and processors is the extreme perishability of cassava roots, leading to heavy post-harvest losses of the product. Young people can be financially empowered and trained to establish quality cassava processing units as individuals and as groups to provide additional services in their locality. Young women can excel in this venture as an individual or in groups because processing is part of their domestic chores, and processing is already gendered as women's work. Young people could also establish good quality warehouses for storage of cassava products to help reduce post-harvest losses.
- **Provision of transportation and logistics:** One of the major issues affecting the price of cassava root and its products is the high cost of transporting processed and semi-processed cassava roots to various end users. These transport costs are mostly borne by farmers and processors. Young people can be encouraged to work in existing transport and logistics businesses and establish new ones as an income-generating activity that helps to relieve the scarcity of transport services in rural areas.
- **Agritourism:** Agritourism continues to gain more prominence among agricultural stakeholders and partners for the purpose of sharing knowledge, networking, and acknowledging and rewarding best practices. Farmers from different countries and communities are frequently taken by project sponsors to other locations to interact with and share experiences with others. Also, elite farmers and processors who want to keep up to date on methods in other countries embark on such agritourism for experiential learning. Young people may be able to leverage these trends to establish agro-travel agencies that could offer such services to interested clients. Such youths would serve as the link between tourists and the host countries to smooth travel and tourism processes.
- **Cassava waste handling/management:** With the continuing increase in demand for cassava by SMEs and large-scale cassava processing factories, waste from cassava processing is on the rise. Abdulsalam-Saghir et al. (2015) and Adeuyi et al. (2016) reported that about 3.6 million tons of cassava peels are generated at present and pose disposal problems which are growing more urgent. To help solve the problem posed by accumulation of cassava peels, young people could convert peels to economic gains through value addition options, such as production of livestock feeds, mushroom production, biogas production, and other ventures. Young people can be empowered technically and provided with resources to undertake opportunities to provide renewable energy and establish livestock feed factories in which peels are the raw material. This could mean a win-win



situation for such young people. They can create wealth accessing the peels, which processors view as a waste product and simply leave in heaps to rot or burn, while at the same time decreasing environmental pollution. Young people can pack the peels, helping processors get rid of wastes at no cost, and then reprocess the peels to earn income.

- **Dried cassava chips:** There is a potential demand of 900,000 tons of dried cassava chips per annum with 300,000 tons going to the regional food market, an estimated 80,000 tons/year to the local animal feed market, and 520,000 tons destined for the export markets. The dried chips market requires 3.4 million tons of fresh roots that young men and women could potentially bulk from smallholder farms to supply to industries for processing (Sanni et al. 2009).



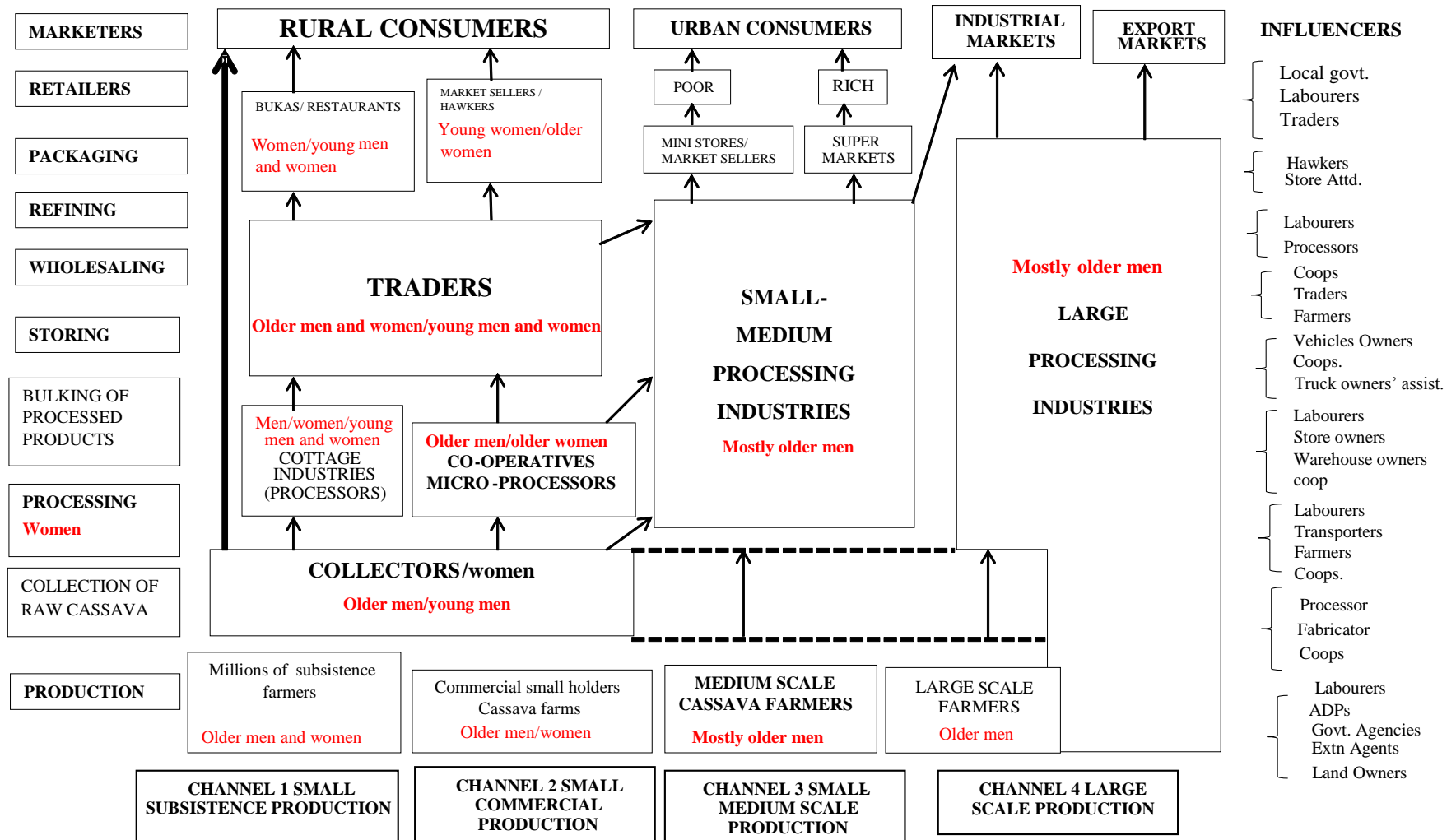


Figure 1: Cassava value chain mapping

Source: Adapted from Sanni et al. (2009)



2.3.1 Opportunities and constraints to entrepreneurship and employment in cassava

In Nigeria, urban-based modern food factories have readily absorbed cassava products, on a pilot level, as ingredients in the manufacture of convenience food items, such as bakery products, custard, biscuits, wafers and instant noodles. It is estimated that more than 90% of cassava production is processed into food for human consumption (Nweke et al., 2002; Philip et al., 2004). Urban and rural households and institutions such as hotels, eateries, schools, and hospitals in the region consume large quantities of cassava products.

In major producing areas, there are scattered large markets, which act as assembly centers for cassava products from numerous surrounding smallholder units. Such assembly markets, especially those markets that are well known for the supply of top quality cassava food products, are generally well attended by both male and female traders from far and wide. The increasing rate of urbanization and demand for convenient ways of shopping are also changing the way cassava foods are sold. In addition to bulk sales, some of these foods are now being packaged in small sizes for sale in major supermarkets, such as Shoprite, in major cities and also for the export markets. The volume of cassava food products sold in retail packs is increasing, with more and more local stores entering these markets. For young men and women to leverage entrepreneurial and employment opportunities that cassava value chains offer, they must have access to a range of resources: 1) financial services; 2) technical and capacity development in soft and technical skills; 3) innovations, technologies and technological know-how; 4) infrastructures; 5) markets and market linkages; and 6) beneficial partnerships and a network of actors, including the private sector. Clearly the opportunities and access must not be limited by gender stereotypes. Also, related value addition issues, such as certification and standardization by multi-regulatory bodies, taxes, proper packaging and labelling, should be tackled to allow young people to participate and benefit maximally on each node of cassava value chains.

2.3.2 Gender constraints and potential interventions along the cassava value chain

From the foregoing, it can be seen that there are many entrepreneurial and employment opportunities for young men and women in cassava value chains, if only some of the constraints are tackled. Some of the constraints faced particularly by women are: 1) not owning agricultural assets such as land; 2) lack of access to formal financial opportunities; and 3) lack of gender sensitive extension services. Lack of access to and control over land and other mentioned assets results in women having far less capacity and interest than men in investing in expanded or intensive cassava production and processing.

Another constraint is limited time availability, especially for women with small children, due to conflicts between reproductive roles and production roles. Mechanization and other technologies may be uncomfortable to use (e.g. a *gari* roaster, milling machine, press that involves the use of more physical strength), while limited capital and lack of credit constrain the possibility for young women to purchase raw materials and improved equipment. Financial constraints and time demands limit women to working in local markets to sell their products rather than marketing in the larger urban centers. Women also have limited opportunities to access extension services in situations where culture dictates restrictions on movements outside the domestic sphere. Women's daily workload leaves no time to seek services that are only available in the public sphere. Gender inequality in the cassava subsector is deeply rooted in gender relations that are crucial for production, processing and marketing of cassava products.



To overcome that bias means working to ensure that gender relations are such that women are supported at family, household and community levels, can obtain land and property rights, and have access to credit and financial services, agricultural inputs, advisory services, and markets. Advisory services are seriously constrained in overcoming the biases (Danida, 2008).

2.3.3 Employment opportunities in the cassava-based industrial markets

Cassava root is an important raw material for some industries, notably those involved in food processing, textile making, pharmaceuticals, and breweries. Opportunity for employment and entrepreneurial opportunities lies with the industrial usage of cassava through expansion of competitive cassava production and improved products. The growth potential of the industrial cassava food sectors in Nigeria is strong. The expansion of this non-traditional food market will foster growth in cassava production and processing, especially the provision of diversified alternative products and sales outlets. This will ensure import substitution for starch, continued import substitution for glucose and opening up the export market for starch (native and modified). Import substitution can absorb up to 900,000 tonnes of HQCF, equivalent to nearly 4.5 million tonnes of cassava roots.

The three major industrial cassava products in Nigeria include: (1) HQCF; (2) starch, which can be divided into the native starch and the modified starches (e.g. production of dextrin and glucose); and (3) chips or pellets for animal feed.

Table 4 indicates annual demand, current supply, and additional numbers of players that are required to meet the growing demand for cassava products for industrial uses. Young people can feature most prominently and be empowered to be major players. Presently, the supply of cassava roots is large and increasing, yet it cannot meet the demand at the industrial level to produce ethanol, glucose, HQCF and industrial starch. If young people are given support and resources to join the production and processing stream along the cassava value chain, they can gain employment and/or establish businesses to meet the demand.

Table 4: Cassava industrial strategy

Products	Annual Demand	Current Supply	Fresh Cassava Root	Additional Players Required	Cost per Player (\$)
Starch (tonnes)	269,000	20,000 million	1,345,000	13 million	2 million
Ethanol (litres)	200 million	9 million	8,000,000	2 million	46.6 million
HQCF (tonnes)	504,500	60,000 million	1,778,000	8 million	9 million
Glucose Syrup (tonnes)	90,000	30,000 million	123,200	2 million	17 million

Source: Sanni (2017)



2.4 Organizations and their roles in capacity development and skill acquisition

There are several organizations working in the selected states of Lagos, Oyo, Osun and Ogun that would be valuable partners in a program to develop youth employment, especially for young women, in the cassava value chains. In Table 5, researchers identified academic and research institutions, private sector agents, State ministries, and faith-based organizations who could be excellent partners, specifying appropriate areas of action for each.

Table 5: Organizations and their supporting roles in training or entrepreneurship activities

Organizations	Supporting role
States' Ministries of Women Affairs and Youth Development	<ul style="list-style-type: none"> • Develop appropriate policies that will promote gender equality in cassava production, processing and export • Partner with NGOs, government, and international organizations for appropriate gender inclusive interventions
States' Ministries of Agriculture	<ul style="list-style-type: none"> • Develop appropriate policies that will promote production, processing and export • Develop gender transformative agenda to change orthodoxies around various gender stereotype • Provide grants and funding opportunities to strengthen agricultural extension for proper consideration of gender issues
Women in Agriculture branch of States' Agricultural Development Programmes	<ul style="list-style-type: none"> • Disseminate and train producers on use of improved varieties • Lobby and advocate for gender equality
Academic and research institutions (e.g. Federal University of Agriculture, Abeokuta; International Institute of Tropical Agriculture)	<ul style="list-style-type: none"> • Provide curriculum for soft and technical skills • Provide lecture and mentoring services • Conduct training and research on cassava and its products; disseminate findings • Deploy high yielding varieties to farmers • Provide technical backstopping on new technologies and processes for positive impact on cassava development



Organizations	Supporting role
Private Sector	<ul style="list-style-type: none"> • Offer training and mentoring services • Supply inputs, such as improved varieties, fertilizer, etc. • Supply equipment for processing purposes • Strengthen capacity of fabricators for maintenance and innovative gender neutral equipment • Disseminate information • Provide needs assessment, monitoring and evaluation • Build capacity for cassava value chain actors, particularly producers, processors and marketers
Oyo State Youth Empowerment Scheme	<ul style="list-style-type: none"> • Build capacity and assist with employment opportunities • Collaborate with other institutions, groups
Youth Empowerment Scheme of State of Osun	<ul style="list-style-type: none"> • Build capacity and employment opportunity • Collaborate with other institutions, groups
National Cassava Growers Associations	<ul style="list-style-type: none"> • Offer group dynamism and collectiveness • Advocate and lobby
Nigerian Cassava Processors and Marketers Association	<ul style="list-style-type: none"> • Offer group dynamism and collectiveness • Advocate and lobby
Association of Manufacturers of Equipment and Fabrication of Nigeria	<ul style="list-style-type: none"> • Fabricate equipment for processing
Justice of Development Peace and Movement/Commission	<ul style="list-style-type: none"> • Gender and diversity inclusiveness • Partner with government organizations, NGOs and international organizations to empower youth



3.0 Poultry value chain

3.1 Background

In Nigeria, poultry is one of the major enterprises in the livestock sector. About 10% of the country's population is involved in some way in the economically important and rapidly growing poultry sector (Okonkwo and Akubuo, 2001). The Nigerian poultry sub-sector is experiencing rapid growth and transformation, which is linked to the transformation of diets as incomes and urbanization increase. Poultry is both a protein and income source for many households and the poultry subsector in Nigeria is quite complex.

In addition to diversity across scale (e.g. small, medium and large scale producers, processors and distributors) as well as along the gender and age of actors, there are important spatial dimensions to the source of key inputs such as maize and day old chicks that have significant implications for the dynamics and sustained growth of the subsector (Liverpool-Tasie et al., 2016). The sector ranges from subsistence farmers with a few birds, to medium-scale enterprises for eggs or meat, to large-scale integrated production. For subsistence producers, poultry serves as a protein source for household consumption as well as an income source. As such, poultry production “widens and sustains three major pathways out of poverty: (1) securing the assets of the poor; (2) improving smallholder productivity; and (3) increasing market participation by the poor” (ILRI, 2007). Especially in rural areas, the development of small-scale poultry production enterprises is seen as a key element of any efforts to eradicate extreme poverty and hunger (FAO, 2010).

In particular, the role of family poultry in poverty alleviation, food security and the promotion of gender equality in developing countries is well documented by Gueye, (2003). Poultry farming generates cash income and employment opportunities for both men and women. It also improves the nutritional status of the entire household by increasing consumption of valuable protein foods (i.e. meat, eggs). Most young men and a few young women are impatient about the “long process” in getting rewards from poultry production; they would rather engage in less difficult jobs that provide a quick return on investment. However, the gains in poultry supersede the attendant drudgery. The market for poultry is consistently vibrant—prices of poultry products tend to remain steady over time and the demand for poultry and poultry products is relatively high throughout the year. Hence, poultry production constitutes an economic enterprise that is conducive to improving rural livelihoods (FAO, 2005).

3.2 Gender and employment/entrepreneurship in the poultry value chain

The poultry business is an activity that is open to all, irrespective of religious inclinations or cultural beliefs, yet a division among gender lines remains. Women most often work in poultry businesses as employees, while their male counterparts tend to serve in entrepreneurial roles. Women are perceived to be careful and adapt with delicate activities such as egg picking and sorting, while men dominate in more labor-intensive activities, such as packing litters and erecting pens and cages. Findings from focus group discussions with Nigerian youth and representatives of the public and private sectors indicate that women are preferred by employers for production activities such as hatchery rearing, feeding, watering, protection and egg collection.

The poultry business in Nigeria is practiced at both subsistence and commercial levels. At the subsistence level, women are the main actors, as this requires few external inputs and can be very low cost. Poultry is an affordable livestock for resource-poor households and provides regular output (Nielsen et al., 2003). However, subsistence level poultry farmers generally face numerous



constraints, including limited access to extension services, high cost of raw materials for feed, limited access to veterinary services, high cost of drugs, limited access to credit and lack of access to relevant technological information. These factors combine to create a lack of incentive for both men and women to increase productivity in poultry production.

For women, the human and financial resource constraints are even more limiting. Generally, women farmers are 20–30% less productive than men—not because of poor managerial skills, but because most women have far fewer resources than men (FAO, 2011). Observations show that actors in the poultry value chain have a preconceived mindset that men are better poultry farmers and farm managers than women (old and young alike). However, if women had equal access to agricultural resources and services, they would produce 20–30 percent more food, resulting in improved health, nutrition and education for their families.

Adebayo and Adeola (2005) identified that subsistence and small-scale producers along the poultry value chain in rural Ogun, Oyo and Osun States experience constraints due to low literacy levels; poor access to inputs, finance, and extension services; unfavorable labor, infrastructure and government policies; and low buying power. Producers face challenges with recurrent gluts, sales surges that are limited to seasonal/festive periods, poor coordination and collaboration among stakeholders, poor processing and storage facilities, high unit cost of production, and delayed allocation of land to developing farms. Since men have greater access to resources to tolerate risk, women producers are generally more vulnerable in poultry production.

As mentioned briefly above, there are specific tasks that are mostly determined by gender. While boys may be involved in constructing sheds, girls are most likely to work alongside their mothers on the different tasks related to the daily management and tending of poultry stock. Men generally perform more skilled tasks such as veterinary services, as they tend to have greater literacy levels and are more likely have training in husbandry and health practices (vaccination, treatment against internal parasites, etc.). Therefore, men are mainly responsible for maintaining poultry health (FAO/IAEA, 2002). However, women’s greater daily contact with poultry exposes them to higher health and safety risks, such as contracting highly pathogenic avian influenza. This and other occupational health and safety issues should be addressed in projects and programs in the poultry sub-sector.

3.3 Gender mapping of the poultry value chain

Table 6 and Figure 2 show the involvement of gender in the functions along the value chain. The basic characteristic of a value chain is market-focused collaboration—different business enterprises work together to produce and market products and services effectively and efficiently. Market-based collaboration allows businesses to respond to the marketplace through linking production, processing and marketing activities to meet market demands. Poultry value chains are designed to increase competitive advantage through collaboration in a venture that links producers, processors, marketers, food service companies, retailers and supporting groups such as shippers, research groups and suppliers. One of the central ideas of the agricultural value chain concept is the differentiation of the total agro system and the specialization of each element so as to optimize the entire system. Modern agriculture aims to utilize the value chain concept to minimize problems associated with agricultural loss, wastages and output underutilization by ensuring an efficient optimization of links between producer and final consumer.



Table 6 and Figures 2 and 3 below were modified from the PIND (2013) documents on chicken meat and egg value chain, with the activities categorized as functions within the value chain or support services. Figures 2 and 3 illustrate the relationships between main actors in the poultry meat and egg value chains in Nigeria.

Table 6: Gender involvement in the poultry value chain

Functions	Gender Involvement	Nature of Participation	Age Range
Live bird processors	Young men	Employees	18–24
	Young women	Employees	18–24
	Old women	Entrepreneurs	Above 30
Importers	Old men	Entrepreneurs	Above 30
Broiler producers	Young men	Employees	18–24
	Young women	Employees	18–24
	Old women	Entrepreneurs	Above 30
Day-old chick distributors	Young men	Employees	18–24
	Young women	Employees	18–24
	Old women	Entrepreneurs	Above 30
Support Services			
Feed	Old men,	Entrepreneurs	Above 30
	Young men	Employees	18–24
Veterinary services	Old men,	Entrepreneurs	Above 30
	Young men	Employees	18–24
Extension services	Old men and women	Employees/entrepreneurs	Above 30
Small-scale farmers	Young men	Employees/entrepreneurs	18–24
	Young women	Employees/entrepreneurs	18–24
	Old women	Employees/entrepreneurs	Above 30
	Old men	Employees/entrepreneurs	Above 30
Large-scale farmers	Young men	Employees	18–24
	Young women	Employees	18–24
	Old women	Employees/entrepreneurs	Above 30
	Old men	Employees/entrepreneurs	Above 30
Egg picking and collection	Young women	Employees	18–24
	Old women	Employees/entrepreneurs	Above 30

Source: Michigan State University focus group findings, September 2017



The poultry value chain consists of meat and egg value chains which are each accompanied by a set of primary and supporting activities.

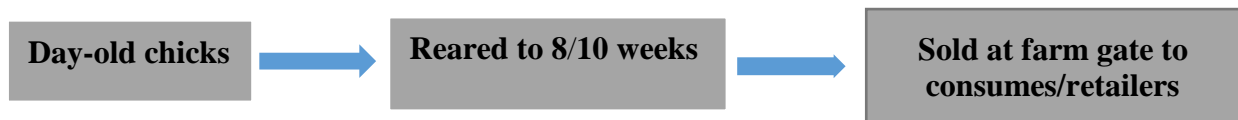
Primary Activities

- *Inbound Logistics*: Assistance purchasing day old chicks
- *Operations*: Processing, packing and dressing of chickens and eggs; branding for supermarkets
- *Outbound Logistics*: Transportation; providing a brand name for consumers
- *Marketing and Sales*: Dressing and processing of chicken to attract sophisticated markets (e.g., banks, companies and corporate organizations), rather than local markets, which normally do not command a high market price
- *Services*: Enlisting with regulating bodies or other quality control agencies to ensure products' acceptability to a wider market

Support Activities

- *Procurement*: Linking the organization with markets
- *Human Resource Management*: Assisting organization to attract good customers; maintain good relationships with customers
- *Technological Development*: Create a database for places of attachment, helping them keep records

Chain A



Chain B

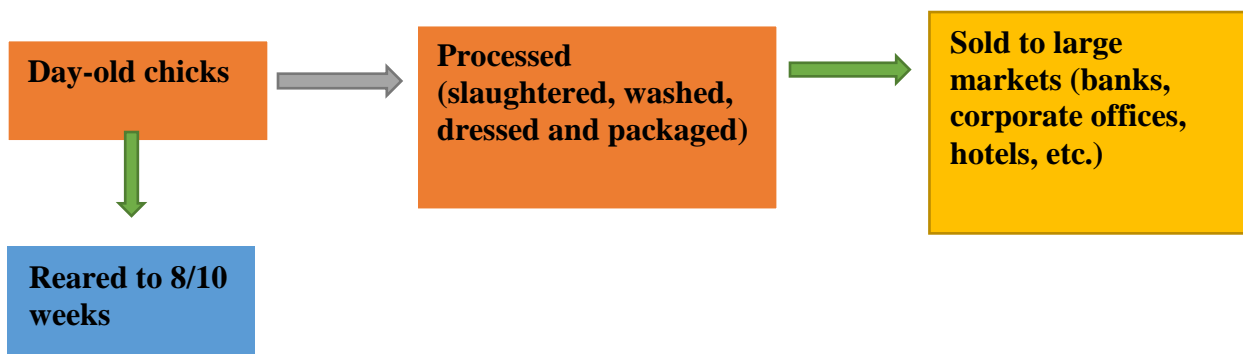


Figure 2: Chains A and B: Poultry meat value chain



In the poultry meat value chain, men and women are involved in production of live birds. Post retail processing and packaging involve women, boys and girls mostly. Men and women are more involved in live birds marketing, medium scale integrated producers, and day-old chicks distribution. Poultry farmers can take advantage of the loopholes in Chain A for possible intervention. Instead of selling at the farm gate, the birds could be processed and sold as packaged goods. In addition, some parts of the bird (head and legs) could be sold to dog owners at a cost. Rather than continue with the traditional steps in Chain A, which renders the investment not worthwhile, employees or entrepreneurs can seize this an opportunity.

Egg Production could also follow the same trend:

Day-old chicks/Point of lay/Point of cage → Reared to laying size → Lay Eggs → Pack and brand eggs to shelf products retailed at supermarkets

OR

Day-old chicks/Point of lay/Point of cage → Reared to laying size → Lay eggs → Sold at farm gate

Chain A for egg production is longer and has more opportunities for entrepreneurs or employees participating in the Students Industrial Work Experience Scheme.

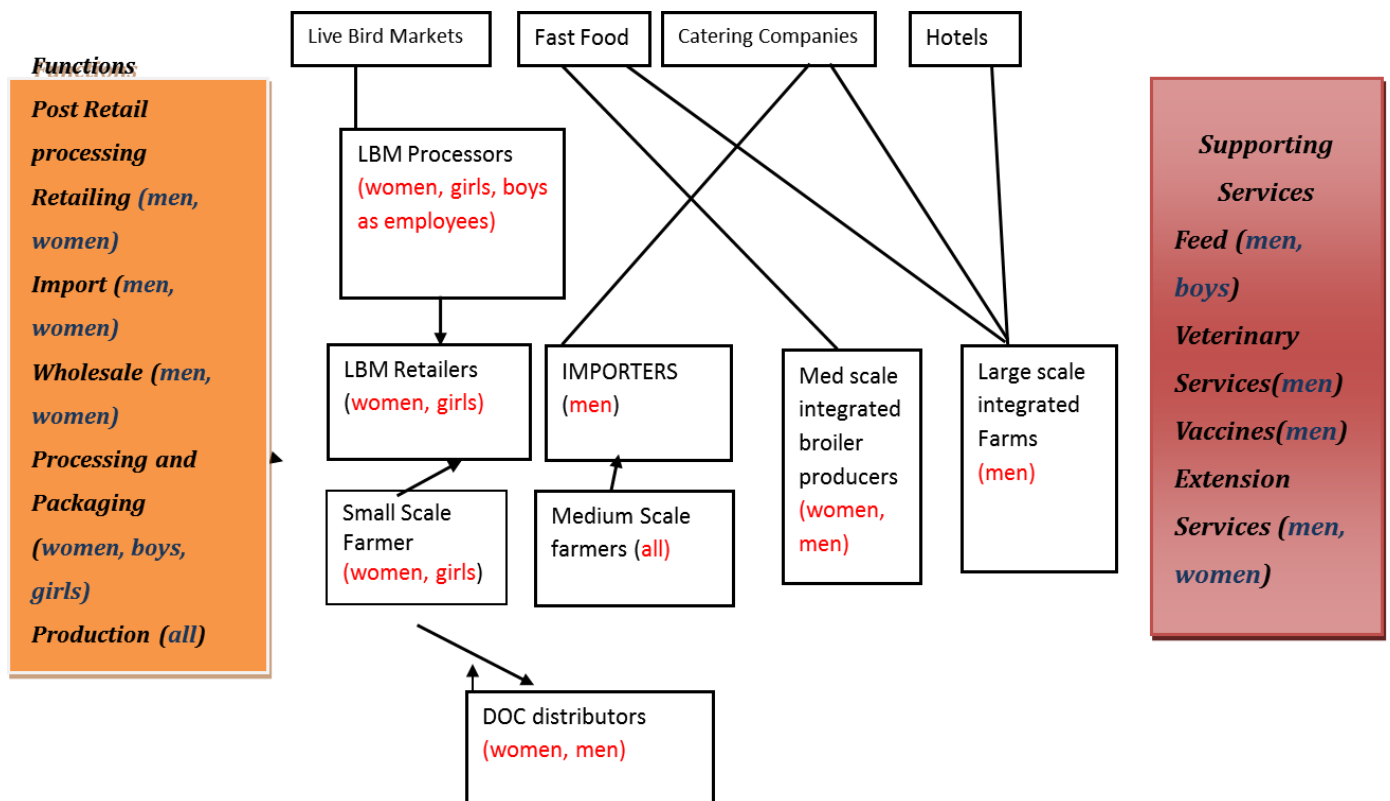


Figure 3: Chicken meat value chain

Source: Adapted from PIND (2013)



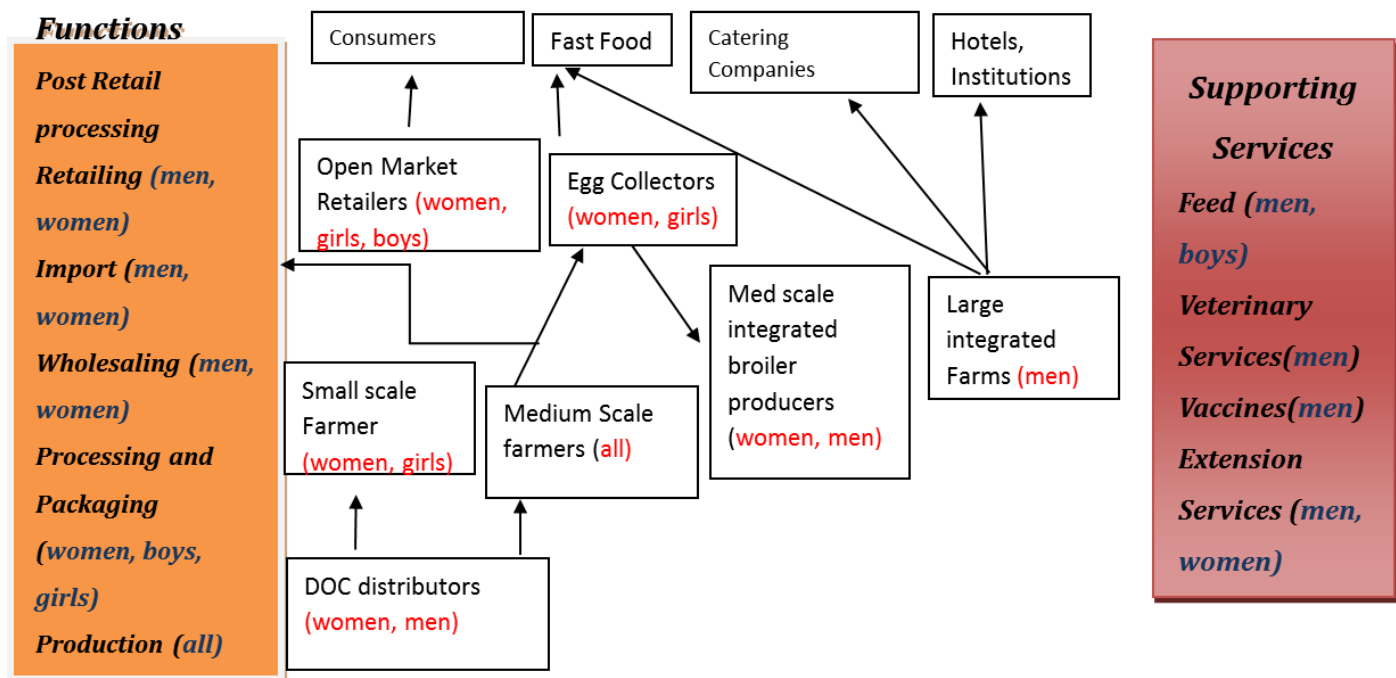


Figure 4: Chicken egg value chain

Source: Adapted from PIND (2013)

3.3.1 Constraints associated with gender participation in the poultry value chain

Women and men experience different challenges when accessing, managing and controlling poultry production assets. Most women farmers face limitations due to social challenges, which often prevent them from reaching their full potential within poultry production and compromises overall household food security and nutrition. Women play a significant role in providing the nutritional requirements for the household, especially for the children, and have the potential to promote a balanced diet that includes eggs and other poultry products (IFAD, 1999). Thus, when rural women access and control the poultry products they own or manage, household coping strategies may be affected, resulting in a positive impact on overall household wellbeing and, in particular, nutrition (FAO, 2012).

Gender disparities in poultry production can negatively impact women’s ability to earn a stable income, therefore limiting overall household income. Women sometimes find it difficult to access credit facilities. If such services are accessed, the funds are typically used to meet household consumption demands, and not spent on income-generating activities. Women are also influenced by the particular dynamics that characterize specific poultry production sub-sectors. Some trends, patterns and key challenges appear in most regions and countries, and arise from expressions of inequality between men and women (IFAD, 2003).

3.3.2 Promising opportunities for young people in the poultry value chain

Value chain maps in Figures 2, 3 and 4 assist in identifying key entry points for youth employment and entrepreneurship. However, young men and women do not have equal access to the information, education, and resources to take advantage of opportunities.



Maximum employment opportunities are listed below.

1. Feed milling

- Owner of a feed mill or toll mill
- Manager of a feed mill
- Food technologist helping custom millers constitute feed for different consumers
- Hauling, milling and bagging
- Feed distribution: Collecting orders from poultry farmers and distributing either custom made or branded feed

2. Cages, Feeders

- Fabrication and repair
- Delivery and set up
- Supply/distribution and repair

3. Day-old chicks

- Hatchery ownership
- Working at a hatchery: Setting of eggs inside the hatchery; removing of eggs from the hatchery; supervision of the proceeds from the hatchery
- Sale of day-old chicks
- Distributor of day-old chicks: Transportation and logistics

4. Veterinary services

- Drug distributors, including operating cold trucks
- Vaccination, treatment and consultancy

5. Transport

- Maize and feed transportation

6. Poultry Bird production

- Farm managers
- Feed suppliers
- Picking eggs
- Cleaning pens
- Sale of chicken manure

7. Poultry bird retail

- Live bird Traders: Wholesale, including various logistical arrangements
- Live bird Traders: Retail
- Live bird processing: Cleaning and dressing the chickens
- Cold room: Wholesale
- Cold room: Retail

8. Food Industry

- Supply of live birds
- Logistics: Linking actors
- Supply of dressed birds



Sex segmentation in opportunities in poultry value chain are traceable to factors such as beliefs and assumed roles attributable to males and females. The factors affecting sex segmentation in poultry value chain opportunities include:

- Laziness assumed among young men;
- Impatience of all youth and desire for fast profit;
- Discouragement from parents regarding young women's engagement outside the home;
- Changes in development strategies which favor those who have access to information and resources—generally young men;
- Lack of direct interventions addressing gender issues and supporting entrance of young women; and
- Few NGOs supporting gender participation in the poultry sector.

Organizations that are working on gender in the target geographic areas

- Poultry Association of Nigeria
- Animal Science Association of Nigeria
- State veterinary hospitals
- Hatchery Owners Club in Nigeria
- Ministry of Women Affairs
- State Agricultural Development Programmes
- Women in Agriculture

4.0 Horticulture value chain

4.1 Background

Horticulture is an important sub-sector of Nigeria's economy that provides food, generates foreign exchange, creates employment and provides raw materials for processing industries (Nwafor et al., 2010). Some of the important horticultural crops grown in Nigeria are indigenous while others are introduced, but adapted, exotic species. Major fruits produced in Nigeria include mango, pineapple, plantain/banana, citrus, guava, pawpaw; vegetables include onion, tomato, okra, pepper, amaranthus, carrot, melon, *Corchorus olitorus* (ewedu), *Hibiscus sabdariffa* (sobo), *Adansonia digitata* (baobab leaves), and others (Fakayode et al., 2012).

The National Horticultural Research Institute, headquartered at Ibadan, was established in 1975 with the mandate of developing sustainable production and utilization of horticultural crops. The institute's objectives include collection, characterization and conservation of germplasm of fruits, vegetables and ornamentals plants, and genetic improvement of tropical fruits and vegetables (Denton et al., 2000). The National Root Crops Research Institute and Cocoa Research Institute of Nigeria are sister research centres that have some species of garden crops as part of their mandate crops.

According to Ali et al. (2002), horticultural crops on the average provide twice the amount of employment per hectare of production compared to cereal crop production in Nigeria, thereby contributing to the income of both the rural and urban dwellers. In most developing countries, women dominate as principal producers of most horticultural crops. In Nigeria, they are also



predominantly involved in the value-addition activities from production to marketing (Ibeawuchi et al. (2015). Generally, major actors in the horticultural value chain include input suppliers, producers, marketers (assemblers, wholesalers and retailers), exporters and consumers. Presented on Figure 5 are the elements of the tomato value chain, which is similar to the value chain of other horticultural crops.

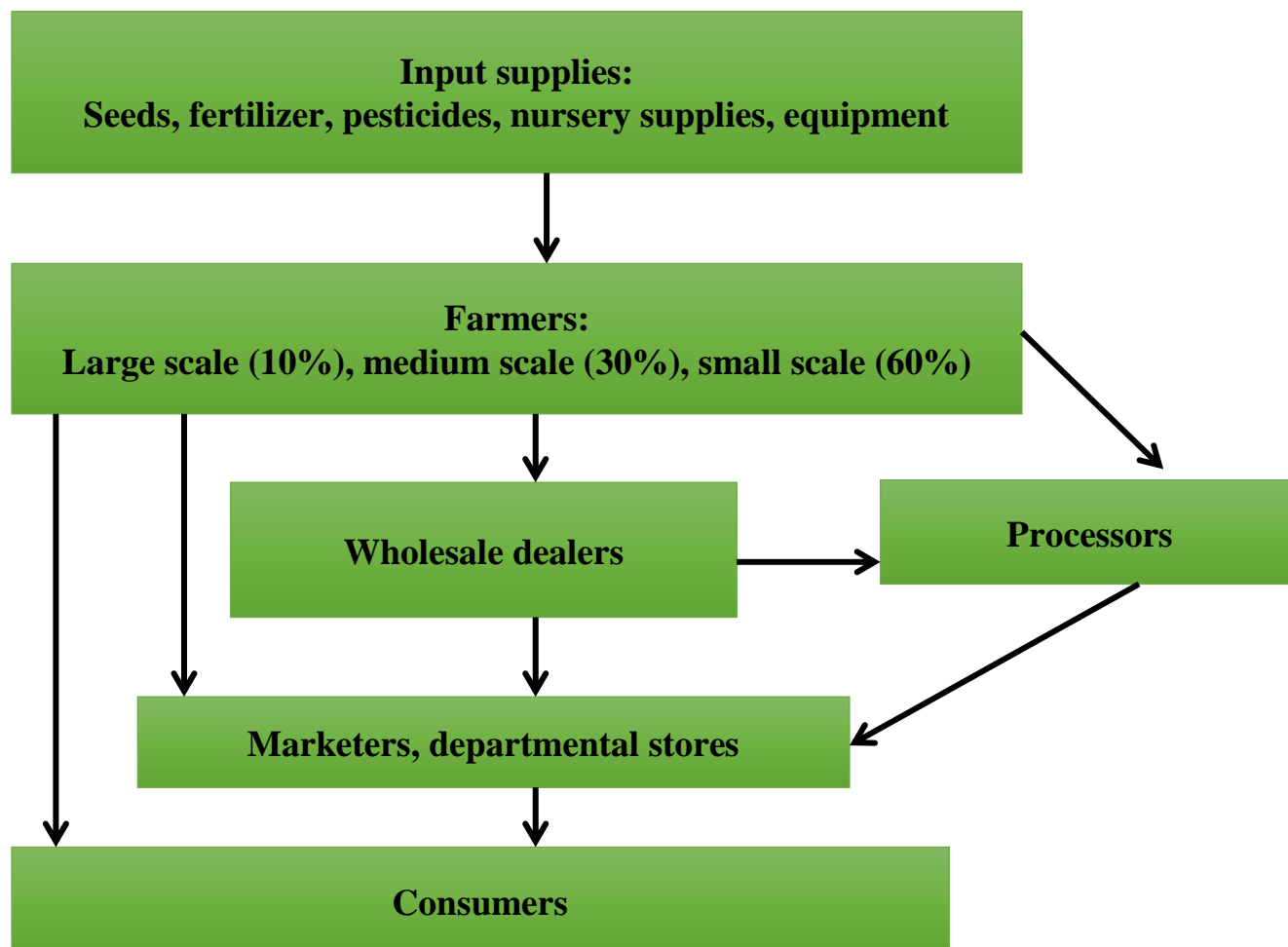


Figure 5: Elements of the tomato value chain in Nigeria

Source: Ugonna et al. (2015)

4.2 Gender issues and youth involvement along the value chain

International Food Policy Research Institute (IFPRI) (2005) reported that the social and economic status of women was enhanced through horticultural activities, thereby leading to household food and nutrition security. Most women, especially in rural households, partake in backyard gardening of horticultural crops to feed their family; the remaining crops are taken to local markets or sold to other households. Income earned from subsistence ventures is used to meet other household needs. Presented in Table 5 is the gender involvement in some horticultural crops production and marketing in Ogun, Oyo and Osun states.



Table 7: Horticultural crops production and marketing by gender in key states

Commodities	State	Production		Marketing		Cited by
		Male (%)	Female (%)	Male (%)	Female (%)	
<i>Tomato</i>	Ogun	51.14	48.86			Ayandiji & Adeniyi (2011)
	Osun	75.5	24.3			Adepoju (2014)
		92.7	7.3	0	100	Sekumade and Toluwase (2014) Adejobi et al. (2011)
				11.2	88.8	Oladejo (2015)
	Oyo			17.5	82.5	Adeyuyi and Adekunle (2015)
				15.2	84.8	Oladejo and Oladiran (2014)
<i>Pepper</i>	Ogun	85	15			Sanusi and Ayinde (2013)
<i>Vegetables</i> (Fluted pumpkin, Okra, Tomato, Amaranthus, Celocia and Chocorus)	Ogun	42	58	32	68	Amujoyegbe et al. (2015)
				21.7	78.3	Isitor et al. (2016)
	Oyo	81	22			Odebode (2007)
<i>Pineapple</i>	Osun	88.3	11.7			Adegbite and Adeoye (2015)
		86	14	20	80	Baruwa (2013) Adesope et al. (2009)
<i>Watermelon</i>	Oyo	94.5	5.5			Adeoye et al. (2011)
<i>Cucumber</i>	Oyo	96.7	3.3			Adeoye and Balogun (2016)

4.2.1 Youth involvement in horticultural production

Ayandiji and Adeniyi (2011) and Adepoju (2014) reported 69.3% and 52.3%, respectively, of tomato farmers in the study areas are below 41 years, which indicates that over half of the farmers are in their economic active age. Also, for leafy vegetables and pepper production, Fakayode et al. (2012), Amujoyegbe et al. (2015) and Sanusi and Ayinde (2013) reported greater than 50% of the farmers are in their youthful energetic and productive age (30–49 years).

The mean age for cucumber farmers, reported by Adeoye and Balogun (2016), is 46.4 years, and 71% of watermelon farmers are less than 50 years old. These numbers reveal the involvement of young and middle aged individuals who are known to be active and innovative (Adeoye et al., 2011).

However, for pineapple, middle aged and older farmers in the in range of 41–60 years, with a mean age of 53.7 years, were reported to be involved in its production (Baruwa, 2013; Adegbite &



Adeoye, 2015). This shows that the farmers are relatively old, considering that the average life expectancy in Nigeria is 42 years. This generally high age of pineapple farmers could have negative implications on the future of pineapple cultivation in the study area (FAOSTAT, 2009).

Authors, such as Adesope et al. (2009), Achoja and Okoh (2013), Oladejo and Oladiran (2014) and Isitor et al. (2016), reported on the age of marketers for horticultural crops. Data shows that 65% are less than 50 years old, 61.6% are below 41 years old, 54.5% are in their active age—with the mean age being 43.3 years—and 58.3% are below 41 years.

4.2.2 Analysis of gender-based opportunities and constraints to employment

According to Obuobie et al. (2006) vegetable production can make a significant difference to smallholder farmers' income and wellbeing, as a proper mixture of vegetables can make up for shortages in animal protein.

Since male farmers consider indigenous vegetable production to be the purview of women (Amujoyegbe et al., 2015), and because women are expected to sell off remaining vegetables to boost households' income, it is an opportunity for female farmers to excel in production and marketing. For women whose financial resources are limited, involvement in vegetable cultivation could help meet vegetable demand even in urban areas because such ventures serve as a cushion during urban food crises or vegetable shortages.

The study conducted by Oluwasola (2015) revealed that the benefit-cost ratio of 3.33 indicates that for every 100 Nigerian Naira invested on vegetable farming, 233 Nigerian Naira will be realized in addition to what was invested, which suggests that vegetable production in the study area is profitable. This is therefore seen as a business opportunity for unemployed youths.

Table 5 shows that in all three states more male farmers are involved in the listed horticultural crops than female farmers—except for vegetable production. The three major highlighted constraints for more female involvement are:

- 1. Access to land:** According to Adepoju (2014), females are deprived of direct land ownership in some study locations. Therefore, some women will have to hire land for farming activities, increasing production costs. Fakayode et al. (2012) also opined that most lands used for vegetable production are inherited through the family, and due to the custom of passing land on to the male children, it is rare that women inherit land.
- 2. Women's heavy workload:** (Fakayode et al., 2012; Baruwa, 2013). Many women are saddled with multiple tasks and roles in their productive, reproductive and community obligations, which limit time for other viable and economic ventures that could be beneficial to them and their household.
- 3. Limited access to credit facilities:** Inadequate access to flexible and affordable credit facilities by both producers and marketers (Isitor et al., 2016) is another constraint women face. Additionally, women are less likely than men to have access to collateral for formal credit.

However, there are some constraints to horticultural crops production that affect men and women. Examples of such constraints are listed for various value chains below.

Tomato: Spoilage, due to poor road networks and lack of appropriate storage facilities for fresh produce, is a major constraint faced by producers and marketers. There is also the



constraint of inadequate access to flexible and affordable credit facilities by both the producers and marketers (Isitor et al., 2016). According to Ugonna et al. (2015), most of the inputs for fresh tomato production are expensive because they are not produced in Nigeria. This therefore makes accessibility difficult because most of the farmers are small-scale with limited financial resources, affecting their ability to access improved inputs and produce at a commercial level.

Pepper: The increasing commercial value of pepper and its rising income potential has brought about the involvement of more male farmers in its production, thereby making the commodity's production competitive (Omotayo et al., 2016). However, the majority of women in some study areas also participated in pepper preservation, processing or marketing as a means of income generation.

Melon: One major constraint for more female involvement in melon production is the physical nature of farming activities, such as land clearing, land preparation and weeding, which are typically performed by men. The study conducted by Odebode (2007) indicated that women have reduced production yields compared to their male counterparts due to greater difficulties in hiring labor.

Pineapple: Male dominance in pineapple production was attributed to the labor-intensive nature of the enterprise, which could be very hectic and time consuming, especially for females, who would have to combine this activity with their domestic work. Women's heavy workload is therefore a constraint to their involvement in pineapple production. A study carried out by Esobhawan et al. (2014) on the "Profitability and Factor Productivity Analysis of Pineapple Production Business among the Gender Producers in Edo State, Nigeria" revealed that a higher proportion of female producers' total pineapple production cost went to labor cost, compared to male producers, because females relied almost entirely on hired jobs. This results in lower profitability for women, thus making the business more feasible for men.

4.3 Conclusion

The review on horticulture shows male dominance in the production of most horticultural crops in Ogun, Oyo and Osun States, Nigeria. However, more females are involved in the marketing activities of the commodities in the class of horticultural crops. The active involvement of youths in horticultural production and marketing indicates that agriculture still serves as one of the major means of employment. Unemployed youths (both male and female) could take advantage of pineapple cultivation, as the study by Adegbite and Adeoye (2015) revealed that involvement by older farmers could threaten the future of pineapple production. Also, some studies (Fawole, 2008; Adegbite et al., 2014) revealed that pineapple production is a profitable business. The results of the study analysis further showed that inadequate credit accessibility (81.5%), transportation (72.3%), storage (63.5%) and marketing (60%) were the major non-gender based constraints preventing increased plantain production in southwestern Nigeria.



5.0 Oilseeds value chains

5.1 Background

Nigeria produces 1.3 million tonnes of vegetable oil, compared to the national demand of 1.6 million tonnes (Proshare, 2016). The deficit of 0.3 million tonnes is met through imports, which cost the nation an average of USD 500 million per annum. Oilseeds are used mainly to produce vegetable oil and oilseed meal, the latter of which is used to produce food fats and oil products, as well as animal feed for poultry, hogs, and cattle. The four main resource regions of Nigeria (South East, North Central, South West and North West) differ in their endowments in the production and processing of oilseeds.

Major oilseeds produced in Nigeria include palm kernel, peanut, cottonseed, beniseed and soybeans (Aremu et al., 2015). Minor oilseeds include shea nuts and sunflower. Consumption per capita of vegetable oil is estimated at 10.4 kg. Most dominant oilseeds in South West Nigeria are found in Oyo, Osun, Ogun states.

Over 60% of Nigeria's total vegetable oil is sourced from processing fresh bunches of palm fruit into red palm oil and palm olein (www.fao.org). The oil palm contributes 72% of the nation's vegetable oil production. The average yield in Nigeria is 8–10 tonnes fresh fruit bunches per hectare. Palm oil exports declined from 167 tonnes in 1961 to 25 tonnes in 2008.

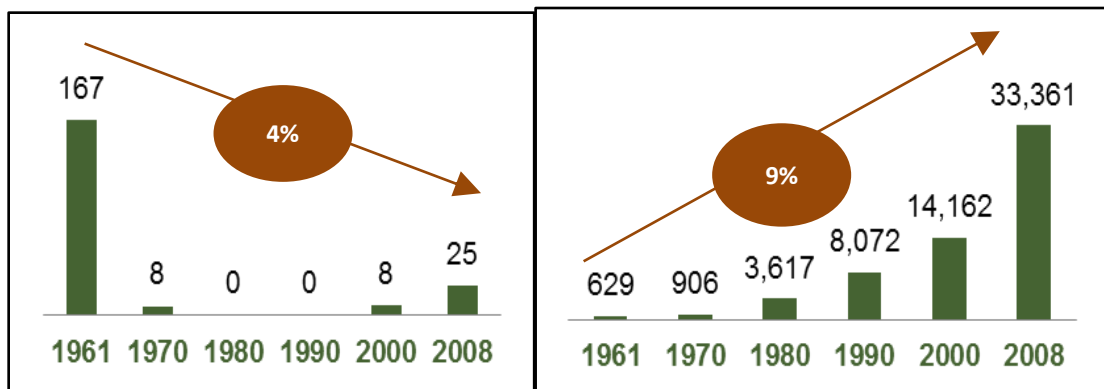


Figure 6: Nigeria's export volumes compared to global export volumes 1961 – 2008

Nigeria's palm oil production increased slightly from 910,000 tonnes in 2012/2013 to 930,000 tonnes in 2013, an increase of 2% (PIND, 2011a). This increase was confirmed due to policies of the government's Agricultural Transformation Agenda (ATA), which increased a duty of 35% on the import of crude palm oil/crude vegetable oil. The policies are beginning to have an effect and are assisting farmers to expand palm tree plantations and increase productivity. Although Nigeria's palm oil production has shown some response, the production deficit remains high, at about 600,000 tonnes per annum. As a result, the country imports palm oil to satisfy local demand from Malaysia and Indonesia. The competition from Asian countries is compelling government and development partners to invest in the distribution of subsidized hybrid seedlings to farmers to replace old, low-yielding trees.



Soybean (*Glycine max (L.) Merrill*), a legume native to East Asia, was introduced to Nigeria in 1908. Over the years, progress in breeding and processing research has led to the expansion of soybean cultivation in Nigeria, and the growth of soybean processing and utilization in Nigeria's domestic market. As a result, soybean has emerged as an important food crop in Nigeria. The beans contain about 40% high quality protein and about 20% oil. Soybean meal is a preferred source of protein in compound feed used by the Nigerian poultry industry.

For groundnut, Nigeria is one of the largest producers, accounting for 25% of world groundnut exports (IFPRI, 2013). Groundnut is an important legume crop composed of 25% protein and more than 40% oil. In 2004, the country had 3500 hectares cultivated, which produced 2750 tonnes (NBS, 2013). Prior to the petroleum oil boom, groundnut accounted for 70% of total Nigerian exports (World Geography of Peanut, 2013). Groundnuts are consumed widely in Nigeria, frequently as roasted or boiled nuts in the Western and Southern parts of the country (Adebesin et al., 2011). Groundnuts are also used in making groundnut soup in the southern zone of Nigeria. The crop is currently grown throughout the country, with the exception of the riverine and swampy areas. Leading production states include Niger, Kano, Jigawa, Zamfara, Kebbi, Sokoto, Katsina, Kaduna, Adamawa, Yobe, Borno, Taraba, Plateau, Nasarawa, Bauchi, and Gombe.

Sunflower is another oilseed crop with high oil content and economic value, which portends its great potential for poverty alleviation among smallholder farmers. Sunflower cultivation and utilization is still in the early stages in Nigeria. Given the relative lack of awareness about the commercial, nutritional, and medicinal potential of sunflower for rural farm families, Torimiro et al. (2013) studied and assessed the use of sunflower among smallholder farmers in two southwestern states (Ogun and Ekiti) of Nigeria, as well as in Botswana. While fewer Nigerian farmers were aware of sunflowers and the options, those who grew the crop used it for a variety of needs, including human consumption and animal feed. This suggests that greater extension outreach on sunflower may result in more farmers growing it and using it to meet needs.

Sesame seed production in Nigeria saw a tremendous increase from a mere 80,000 tonnes in 2003 to about 158,000 tonnes in 2012. This increase was driven by the external demand for the seed, pushing it to the third largest exported commodity after oil and cocoa, both in terms of quantity and foreign exchange earned from its export (FAO, 2012). Over 70% of the sesame seed produced in Nigeria is exported to Asian countries. Japan is currently the world's largest importer of sesame seed, followed by Taiwan and Korea (FAO, 2010; Anon., 2009).

The oilseed industries represent a promising avenue for poverty alleviation, food security and increasing economic stability in Nigeria. If fully developed, the oilseeds industry has the potential to provide employment for millions of unskilled and semi-skilled people, as well as contribute to the gross domestic product.

5.2 Oilseed value chain activities and gender roles

Generally, oilseed production is experiencing a great shift, and more women have become involved in soybean production as improved varieties and household utilization technologies have become readily available. Over the past decades, trade in shea butter has been on the rise because of increased demands in the European Union, Asia and the United States. This has had significant positive consequences on the local women who are the main stakeholders (95%) in the processing of shea. In addition, shea is fast becoming an export crop in many West African countries. Today, the shea tree is the second most important oil crop in Africa after the palm nut tree by production



value (Sanginga and Bergvinson, 2015). Groundnut is an important cash crop for many households, accounting for up to 50% of rural cash earnings, and a major source of employment (ICRISAT, 2014).

Palm oil production remains a major vocation in many household communities. It involves hundreds of thousands of small-scale, low income producers and tens of thousands of small-scale, low income processors. It provides income for many poor farmers and their dependents. It is thought that an efficient and strong palm oil sector in Nigeria will enable the poor to be part of the solution to poverty through provision of employment and a means of livelihood. In most cases, women are in charge of processing the oil palm fruits into red palm oil and of selling the product in the local or national market. Youth are involved in harvesting palm bunches and pruning palm oil fruits. In commercial production, women have limited access to capital and resources and are involved in menial jobs to survive. Youth are generally not involved in palm oil functions, though their preference is to serve as mill operators where they can earn a decent wage (PIND, 2011a).

Players in the oilseed sector more broadly include farmers, input suppliers, homesteads, smallholders and estates; mostly women and middle-age actors, some youth; companies, as well as ministries, public agencies, business associations, NGOs, cooperatives, research institutes and others. Akanngbe et al. (2011) reported that groundnut processing is dominated by women in Oyo State, where over 90% of processors were female. Soya is farmed extensively, mainly by small-scale farmers, which may account for its low yields. Despite this, Nigeria's experiment in the use of soya as a food crop offers a lot of promise. Women in Northern Nigeria have come up with the idea of using the beans to make *daddawa*, a local condiment which is usually made from the seeds of locust bean (*Parkia biglobosa*), a leguminous tree from the savanna regions. As reported by AMREC (2007), the mean age of soybean farmers in Nigeria is between 45 and 60 years. In terms of gender, there were more males than females in soybean production in all of the states. It was observed that women were involved in every stage of soybean production, helping their husbands in planting and harvesting, in particular. Women are fully involved in harvesting and household level processing. Producers tend to be members of farmers cooperatives and associations. In all, 63.5% belonged to a local association; the importance of local organizations in the empowerment of rural people cannot be over emphasized. The local associations have credit facilities, market brokers, aggregators and distributors and their leadership ensure fair play amongst members.



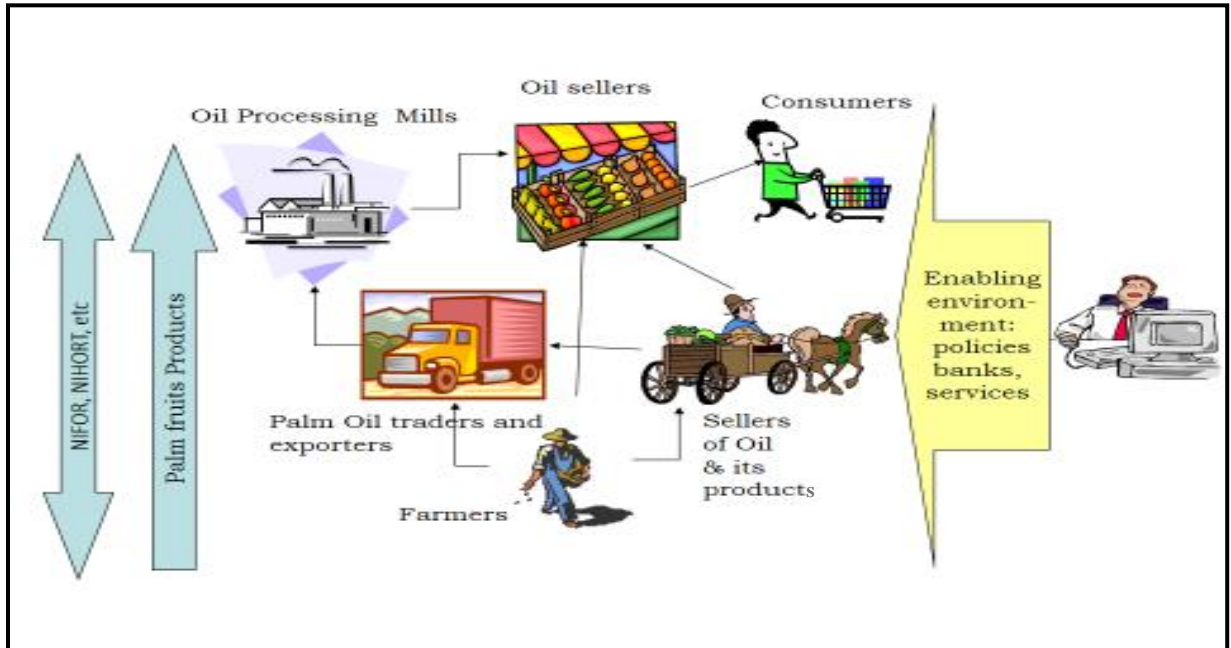


Figure 7: Actors along the oil palm value chain

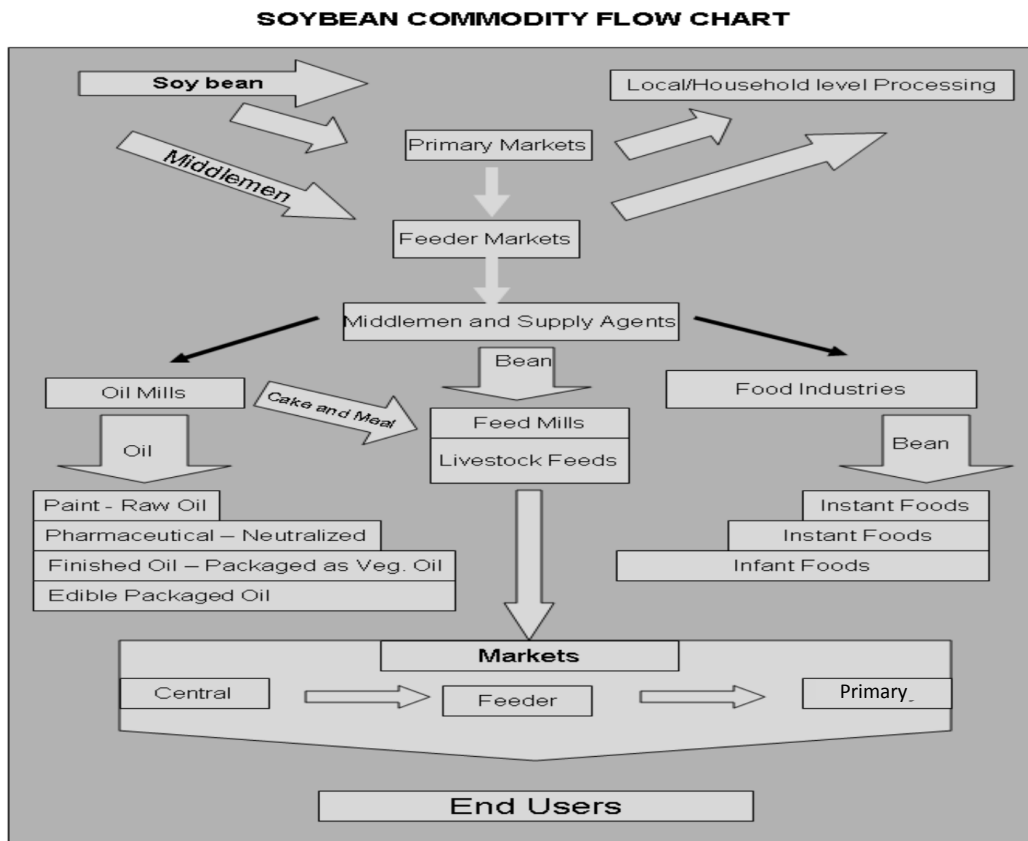


Figure 8: Soybean commodity flow chart

Source: AMREC (2007)



There are many traders or private companies engaged in importing, wholesaling or retailing inputs (seed, fertilizer, pesticides, etc.) to oilseed growers. The growers are the major actors who perform most of the value chain functions, from the arrangement of farm inputs to post-harvest handling and marketing. The private sector ensures consistent supply chain and quality management, government plays an advocacy role, and donors help to facilitate with capacity building/mentoring and pilot studies. Commission agents are identified and appointed and are responsible for the distribution of seeds, fertilizers, agricultural tools and small machineries. The government subsidizes the cost of transportation for the supply of most inputs to the farm. The commission agents receive commissions from the government for their work. However, farmers who live in remote areas, far away from a road head, do not receive a timely supply of fertilizers, seeds and chemicals (Van der Wal and Wangchuk, 2002). The number of farmers who use certified seeds, chemical fertilizers and other services is very limited.

5.3 Potential for employment expansion in the oilseeds value chain

Economic growth and prosperity are central to long-term poverty alleviation for social and environmental sustainability. The vegetable oil industry represents one of the most effective avenues for poverty alleviation, job creation and economic stability in Nigeria. The industry has the potential of providing employment for millions of skilled and semi-skilled people. Below is a list of points that are key to understanding opportunities for employment and entrepreneurship in the oilseeds sector.

- Demand for oilseeds and products is growing from the poultry, feed milling sector, cosmetic/soap industries, and the food processing industries.
- The consumption of soybean has increased over the years, driven by the poultry, fishery and edible oil industries. Under its Agricultural Transformation Agenda, the Federal Ministry of Agriculture of Nigeria forecasted a growth of 51% for the fishery industry and 20% for the poultry industry between 2012 and 2020. Soybean meal is a vital and preferred source of protein in compound feed and accounts for 20% to 30% in poultry feed and 20% of fish feed composition. Furthermore, soybean oil is recognized by various industries as an alternative to palm oil.
- Production of oilseeds and products is trending upwards in Nigeria, but domestic supply still lags behind growing demand. Value chain products from oil palm include crude palm oil, palm kernel oil, palm kernel cake and palm kernel. Others products include palm kernel shell, used as fuel for firing boilers, empty bunch refuse, used for mulching/organic manure, and palm oil mill effluents. Not all products have commercial value.
- Sesame is commercialized in a number of forms. Most sesame is processed directly into oil by the grower or within the producing region but can also be sold in various stages of processing, for various uses, such as meal, paste, confections, and bakery products. Nigeria earned \$123.3 million United States dollars from export of sesame seed in 2017.
- Available data from FAOSTAT (2013) shows that Nigeria has very high potential for shea nut production within a high production zone that includes Benin, Burkina Faso, Cote D'Ivoire, Ghana, Mali and Nigeria.
- The potential for shea production capacity is not fully exploited because producers, particularly women and the private sector in countries in which shea trees grow, are not fully involved in the value addition sales of the nuts or butter that is being handled by a



few households dominated by women and their children within Nigeria. The shea sector is considered one of the promising value chains that could increase income generation for rural women.

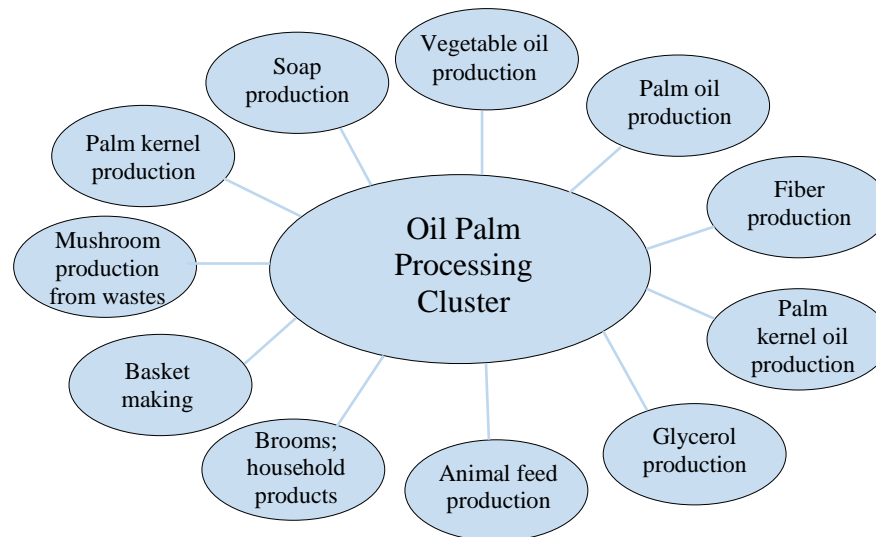


Figure 9: Oil palm processing cluster

Source: Onwualu, 2010

5.4 General constraints to employment in the oilseeds value chains

Some of the structural challenges affecting the productivity and development of the oilseeds sector in Nigeria have been identified. Cultivation methods among smallholder farmers remain traditional, with low levels of mechanization and low productivity. Also, the agricultural sector is heavily dependent on rain-fed cultivation, which limits the scope of production. There exist weak agricultural credit and loan opportunities, an unorganized market structure, unfavorable weather, small land holding sizes and inadequate technology development, all of which contribute to low productivity in the oilseed smallholder sector. Key constraints are addressed in more detail below.

- 1. Poor and untimely supply of rural finance services:** There is difficulty accessing loans from banks due to the bureaucratic nature of formal financing in Nigeria.
- 2. Inconsistent government agricultural programs and policies, especially concerning importation of oilseed-based materials:** The government ban on the importation of vegetable oil has not been effective because of the lack of diligent enforcement of the ban. This, according to processors, affects marketing of their products.
- 3. Inefficient marketing of domestic oilseed products:** This makes it difficult for them to compete with cheaper imports.
- 4. Relatively low levels of capital available for small- and medium-scale processors and high interest rates on agricultural loans:** The high interest rate on available credit in most financial institutions makes investment in the oilseed value chain low, like other commodity value chains with great potential in contributing to the country's gross domestic product.



5. Poor infrastructure: Irregular electric power supply, bad roads and a poor road network negatively affect oilseed production and processing activities.

6. Availability and cost of storage for stocks: Storage facilities are limited and costly, and processors tend to purchase large stocks of soybeans in anticipation of scarcity and possible price increases.

7. Use of the same processing machines for soybean and groundnut: One factor contributing to scarcity of soy-based materials being experienced by feed millers, is the use of same processing machines for soybean, groundnut and other oilseeds. Since the processing machines are the same, processors can only process one at a time. This means that during the period when groundnut is being processed, soy cake, meal and oil will not be available.

The following impede competitiveness in the oilseeds sector and pose major constraints to increasing productivity:

- Sizes of plantations are small, at 5 hectares on average, and few large-scale operations exist;
- The production system remains focused on semi-natural groves;
- Yields per hectare are very poor when benchmarked with other countries;
- Inefficient value chain;
- Low and affordable oilseed product prices;
- High cost of transportation;
- Lack of appropriate knowledge for new category of farmers and processors (including retirees, young businessmen, etc.) who are investing in mini processing mills;
- Some traditional processors prefer the use of mini processing technology because of the drudgery involved in traditional processing techniques and its adverse health implications, but they lack credit facilities.

If more vegetable oil production is to be realized from oilseed production, a key challenge will be to improve the yield of the vast area of oilseeds in the semi-wild groves around homesteads and ensure effective smallholders and estates put more land under production. However, the latter effort is usually difficult for women and youths.

5.5 Existing resources and additional requirements to expand youth employment

Given the importance of the oilseeds industry in Nigeria, it has received significant attention from the government over the years. Specialized institutes have been set up, presidential initiatives that support production with international funding have been rolled out, and import bans and significant import duties have been implemented. Various organizations are working in the sector and all seek to promote gender equity. In the key geographic areas, these organizations are:

- Nigerian Institute for Oil Palm Research
- Federal Ministry of Agriculture and Rural Development and State;
- National Accelerated Industrial Crop Production Programme;
- Palm Oil Registration and Licensing Authority;
- Vegetable Oil Development Programme;
- Oil Seeds Association of Nigeria;



- Vegetable and Edible Oil Producers of Nigeria;
- Ministry of Women Affairs; and
- Nigerian Stored Products Research Institute.

Michigan State University researchers held focus group discussions in May 2017 with private sector stakeholders and youth, asking what resources might be required for the development of the oilseeds value chains that can maximize the employment or entrepreneurial opportunities for young women and men. The recommendations include the following:

1. Access to user-friendly oilseed processing equipment that can be operated by young women and men;
2. Availability of a credit facility with single digit interest rates
3. Establishment of community oilseed processing centers, outfitted with modern and efficient equipment in locations with large production of oilseeds; and
4. Development of training manuals on oilseeds production and processing as well as utilization of oilseeds processing by-products.

Young women and men are currently provided limited opportunities in oilseeds value chains mostly due to lack of credit facilities, land and technical knowledge especially related to processing machineries. These youths are found more in picking, loading and offloading produce, and other physically demanding activities as casual workers or unskilled laborers.

Opportunities for employment and business development along these value chains for young women and men include plantation, input supply, weed management, supply of high yield short duration seedlings to replace wild/old groves, ownership of mini processing mills, and market intelligence and forecasting.

Major resource/skill constraints limiting participation of youth in the oilseeds value chain are lack of technical, business, and social skills. Most are not aware of opportunities within the value chain. Women are, in some instances, excluded in the value chains especially in land acquisition, working capital and heavy-duty operations.

Special governmental and donor-driven programs are currently supporting youth engagement in the agricultural value chains. Some provide equal opportunities to women and men, especially the youth. However, the numbers of participants in these programs, availability of skill training (technical and soft), and improvements in the enabling environment remain limited.



References

- Abdulsalam-Saghir, P.B., Bennett, B., Quaye, W., Viet Phu Tu, Sanni, L.O. and Martin, A.M. 2015. Gender Analysis of Households' Decision-making to Reduce Post-Harvest Losses of Cassava in Ghana, Nigeria and Vietnam. *Food Chain*, 5:1–2. Practical Action Publishing, United Kingdom www.practicalactionpublishing.org <http://dx.doi.org/10.3362/2046-1887.2015.011> , ISSN: 2046-1879 (print) 2046-1887
- Abdulsalam-Saghir, P., Sanni, L., Siwoku, B., Adebayo, K., Martin, A.M. and Westby, A. 2012. Cassava: Adding Value for Africa – Strategic Market Initiatives that Support Wealth Creation for Women along the Cassava Value Chains in Southwest, Nigeria, *Journal of Agricultural Science and Environment*. 12(2): 70-82, Published by Federal University of Agriculture, Abeokuta, Nigeria
- Abdulsalam-Saghir, P.B., Bennett, B., Quaye, W., Viet Phu Tu, Sanni, L.O. and Martin, A.M. 2016. Appraisal of Smallholder Farmers' Decision making to Reduce Post-Harvest Losses and Add Value to Cassava Peels in Ghana, Nigeria and Vietnam *African Journal of Root and Tuber Crops* 12 (1) Published by *International Society for Tropical Root Crops African Branch (AB)*
- Abdulsalam-Saghir, P. (2011). Cassava: Adding Value for Africa: Gender and Diversity as a Driven Force. Agricultural Innovations for Sustainable Development. *Technical Centre for Agricultural and Rural Cooperation (CTA)* Manners, G and Sweetmore, A (Eds); 3(2): 38-44 Available online at www.cta.int & www.fara-africa.org
- Abdulsalam-Saghir. P.B., Aromolaran, K.A. and Ajeigbe, S.A. 2010. The Perception of Male and Female Rural Youths Towards Agriculture as A Vocation in Obafemi-Owode Local Government Area of Ogun State. Proceedings of the 17th Annual Congress of the Nigerian Rural Sociological Association (NRSA), A. A. Ladele and Obinne, C.P. (Eds) Pp. 49-55. Published by NRSA
- Achoja, F. O. and Okoh, R. N. (2014). Post-Harvest Properties of Tomato and Effect on Its Marketing Efficiency. *Turkish Journal of Agricultural and Natural Sciences*, 1(1): 52–58.
- Adebayo, K., Lamboll, R., & Westby, A. 2008. Social Implications of the Development of Cassava Postharvest Systems in Africa. Expert Consultation Meeting at the Natural Resources Institute , (http://www.nri.org/projects/GCPMD/files/2_Adebayo_paper.pdf). University of Greenwich, United Kingdom
- Adebayo, O.O. and Adeola, R.G. 2005. Socio economic Factors Affecting Poultry Farmers in Ejigbo Local Government Area of Osun State “*Journal of Huan Ecology* 18(1): 39-41.
- Adebayo, K., J. L. White, M. J. Morris, A. O. Dipeolu, I. A. Ayinde, T. S. Wandschneider, L. O. Sanni, O. B. Oyewole, K. Tomlins, and A. Westby 2003. “Innovativeness and stakeholderhip in the fufu processing systems in southwest Nigeria.” *ASSET: An International Journal (Series A)* 3, no. 4: 15-27.
- Adebesin , A. A., Fagade, O. and Saromi, O. T. 2011. Microbiological quality of some groundnut



- products hawked in Bauchi, a Nigerian City. *Journal of Food Technology* 6(2): 53.
- Adebesin , A. A., Fagade, O. and Saromi, O. T. 2011. Microbiological quality of some groundnut products hawked in Bauchi, a Nigerian City. *Journal of Food Technology* 6(2): 53.
- Adegbite, O. and Adeoye, I. B. 2015. Technical Efficiency of Pineapple Production in Osun State, Nigeria. *Agris on-line Papers in Economics and Informatics*, 7; 3-12.
- Adejobi A.O., Babatunde R. O. and Idowu E. O. (2011). Weight and Measurement Issues in Retail Marketing of Fresh Tomatoes: Evidence from Osun State, Nigeria. *ARPJ Journal of Agricultural and Biological Science*, 6(4): 20-26.
- Adeoye, I. B., Olajide-Taiwo, F. B., Adebisi-Adelani, O., Usman, J. M. and Badmus, M. A. 2011. Economic Analysis of Watermelon based Production System in Oyo State, Nigeria. *ARPJ Journal of Agricultural and Biological Science*, 6(7): 53-59.
- Adeoye, I.B., OA Oni, S.A. Yusuf, K.O. Adenegan. 2013. Plantation Value Chain Mapping in Southwestern Nigeria. *Journal of Economics and Sustainable Development*, 4(16): 137-145.
- Adeoye, I. B and Balogun, O. L. (2016). Profitability and Efficiency of Cucumber Production among Smallholder Farmers in Oyo State, Nigeria. *Journal of Agricultural Sciences*, 61(4):, 387-398.
- Adepoju, A. O. (2014). Postharvest losses and welfare of tomato farmers in Ogbomosho, Osun State, Nigeria. *Journal of Stored Products and Postharvest Research*, 5(2): 8-13.
- Adesope, A. A. A., Awoyinka, Y. A. and Babalola, D. A. (2009). Economic analysis of group marketing of Pineapple in selected markets of Osun-State, Nigeria. *acta SATECH*, 3(1): 47 – 52.
- Adeuyi, O.O, Abdulsalam-Saghir, P.B, Adamu, C.O, & Ayinde, I.A. 2016. Gender Analysis of Value Addition to Yam and Cassava Peels among Rural Households in Southwest Nigeria. *African Journal of Gender and Development*, (3)1:17 – 27
- Adewuyi, S. A. and Adekunle, C. P. 2015. Socio-economic determinants of tomato retail marketing in Ibadan southwest Local Government Area of Oyo State, Nigeria. *African Journal of Agricultural Research*, 10(13): 1619-1624.
- Agricultural Media Resources and Extension Centre (AMREC), 2007. Mapping of soybean production areas in Nigeria, Promoting Pro-Poor Opportunities in the Commodity and Service Market (PrOpCom), Abuja.
- Ahmadu, J. and Idisi, P.O. 2014. Gendered participation in cassava value chain in Nigeria. *Merit Research Journal of Agricultural Science and Soil Sciences* (ISSN: 2350-2274) Vol. 2(11)
- Ali, M., Farooq, U. and Shih, Y.Y. 2002. Vegetable research and development in the ASEAN region: a guideline for setting priorities. In: C.G. Kuo (ed). *Perspectives of ASEAN cooperation*



in vegetable research and development. Shanhua, Taiwan: Asian Vegetable Research and Development Center. p. 20-64.

Allen, A., Howard, J., Kondo, M., Jamison, A., Jayne, T., Snyder, J., Tschirley, David, and Yeboah, Kwame Felix. 2016. Agrifood youth employment and engagement study (AGYEES). Report for Mastercard Foundation. East Lansing, Michigan: Michigan State University.

Amujoyegbe, B. J., Oyedele, D. J., Idowu, M. K., Ayinde, J. O. and Adebooye O. C. (2016). On-farm adoption of under-utilized indigenous vegetable production among small holder farmers in Nigeria: Implication for economic empowerment and genetic conservation. *Journal of Agricultural Extension and Rural Development*, 7(9): 283-289.

Aremu, M. O., Ibrahim, H and Bamidele, T. O. (2015). Physicochemical Characteristics of the Oils Extracted from Some Nigerian Plant Foods – A Review. *Chemical and Process Engineering Research*, 32: 36-52

Arndt, C., Robinson, S. 2006. Trade reform and gender in Mozambique, *Nordic Journal of Political Economy* 1(32): 73-89.

Ayandiji, A, O. R. and Adeniyi O., D. 2011. Determinant Postharvest Losses among Tomato Farmers in Imeko-Afon Local Government Area of Ogun State, Nigeria. *Global Journal of Science Frontier Research*, 11(5)

Baruwa, O. I. 2013. Profitability and Constraints of Pineapple Production in Osun State, Nigeria. *Journal of Horticultural Research*, 21(2); 59-64.

Siwoku, O. B., Adebawale, A. A., Abdulsalam-Saghir, P. B. and Sanni, L.O. 2012. Cassava and Yam Value Chain Analysis for South – West Nigeria. European Union Gratitude Report

Butterworth, R., Abdulsalam-Saghir, P. and Martin, A.M. 2008. Gender and Diversity Report, Nigeria; Cassava: Adding Value for Africa (C:AVA) project. University of Greenwich, Chatham, United Kingdom: *Natural Resources Institute*. Available online at <http://cava.nri.org/about-the-project/reports-and-publications>

Danida 2008; Preparatory study of U-growth component Gender Equality for Rural Economic Growth and Poverty Reduction

Denton, O. A., Alasiri, K. D. and Adejoro, M. A. (eds.). 2000. NIHORT: 25 Years of research into horticultural crops development in Nigeria (1975- 2000). National Horticultural research Institute (NIHORT), Ibadan, 1-4(8-9).

Enete, A., Nweke, F. and Tollens, E. 2002. 'Contributions of men and women to food crop production labor in Africa: information from COSCA', *Outlook on Agriculture* 31(4): 259–65
URL: <http://dx.doi.org/10.5367/000000002101294155>



- Esobhawan, A.O., Dokun, O.I. and Odia, A.E. (2014). Profitability and Factor Productivity Analysis of Pineapple Production Business among the Gender Producers in Edo State, Nigeria. *SCSR Journal of Development*, 1(3): 1-7.
- Fakayode, S. B., Rahji, M. A. Y. and Adeniyi, S. T. 2012. Economic Analysis of Risks in Fruits and Vegetable Farming in Osun State, Nigeria. *Bangladesh Journal of Agricultural Research*. 37(3); 473-491.
- Fasoyiro, S. B. and Taiwo, K. A. 2012. Strategies for Increasing Food Production and Food Security in Nigeria. *Journal of Agricultural & Food Information* 13 (4).
<http://dx.doi.org/10.1080/10496505.2012.715063>
- Federal Office of Statistics, 2009. *General Household Survey*. Federal Government of Nigeria- National Bureau of Statistics (NBS) Report, Nigeria
- FAO, 2011. The State of Food and Agriculture 2010-2011: Women in Agriculture. Rome: Food and Agricultural Organization. URL: <http://www.fao.org/docrep/013/i2050e/i2050e.pdf>
- Food and Agriculture Organization (FAO), 2000. Uganda, Gender Differences in Control over and Use of Income (not dated, no author, but Adapted from FAO). IFAD'S Gender Strengthening Program for East and Southern Africa. Uganda Field Diagnostic Study (draft). Rome.
<http://www.ifad.org/learning/sector/agriculture/51.htm>
- Food and Agriculture Organization Statistics (FAOSTAT). 2013. Crop Production 2008, Statistic Division, Food and Agricultural Organization of the United Nations.
- FAO/IAEA Co-ordinated Research Programme, 2002. Rural poultry production in two agro-ecological zones of Uganda. In: Characteristics and parameters of family poultry production in Africa <http://www-naweb.iaea.org/nafa/aph/public/12-rural-illango.pdf>
- FAO 2003. The review of household poultry production as a tool in poverty reduction with a focus on Bangladesh and India <http://ageconsearch.umn.edu/bitstream/23762/1/wp030006.pdf>
- FAO 2005, The contribution of poultry to rural development
<http://www.fao.org/waicent/Faoinfo/agricult/againfo/themes/es/infpd/documents/Mack.pdf>
- FAO, IFAD, World Bank 2007. Gender in Agriculture Sourcebook
<ftp://ftp.fao.org/docrep/fao/011/aj288e/aj288e00.pdf>
- FAO 2010. Roles of women in agriculture <http://www.fao.org/docrep/013/am307e/am307e00.pdf>
- FAO 2012. Invisible guardians - Women manage livestock diversity
<http://www.fao.org/docrep/016/i3018e/i3018e00.pdf>



- FAOSTAT (2009). Top 5 facts sources: Food and Agriculture Organization of the United Nations. www.top5ofanything.com/index.
- Forsythe, L., Posthumus, H. and Martin, A.M. 2016. A crop of one's own? Women's experiences of cassava commercialization in Nigeria and Malawi. *Journal of Gender, Agriculture and Food Security* 1(2); 110-128.
- Forsythe, L., Martin, A.M. and Posthumus, H. 2015. Cassava market development: a path to women's empowerment or business as usual? *Food Chain*. 5(1-2): pp. 11-27. DOI: <http://dx.doi.org/10.3362/2046-1887.2015.003>
- Foundation for Partnership Initiatives in the Niger Delta (PIND) 2011a. A report on Palm Oil Value Chain Analysis in the Niger Delta. 69pp.
- Ibeawuchi, I.I., Okoli, N.A., Alagba, R.A., Ofor, M.O., Emma-Okafor, L.C., Peter-Onoh, C.A. and Obiefuna, J.C. 2015. Fruit and Vegetable Crop Production in Nigeria: The Gains, Challenges and The Way Forward. *Journal of Biology, Agriculture and Healthcare*, 5(2); 194-209.
- IFAD 1999, LIVESTOCK Memory check <http://www.ifad.org/pub/memory/e/insert2.pdf>
- IFPRI. 2005. Women. Still the key to food and nutrition security. Washington D.C.: International Food Policy Research Institute.
- Ikpi, A.A, Akinwumi JA. 1979. The future of poultry industry in Nigeria. Proceeding of first National seminar on poultry production, Zaria. Nigeria. 484. Glo. Adv. Res. J. Agric. Sci.
- ILRI 2007, Markets that work - Making a living from livestock http://mahider.ilri.org/bitstream/handle/10568/567/AnnualRep2007_Markets.pdf.pdf?sequence <http://www.fao.org/WAIRDOCS/LEAD/X6106E/X6106E00.HTM>
- Isitor, S. U., Otunaiya, A. O. and Iyanda, J. O. 2016. Efficiency of Vegetable Marketing in Peri-Urban Areas of Ogun State, Nigeria. *Journal of Agricultural Science*; (8)3; 1916-9752.
- Liverpool-Tasie, L.S.O., Omonona, B.T., Sanou, A. and Ogunleye, W.O., 2016. Is increasing inorganic fertilizer use for maize production in SSA a profitable proposition? evidence from Nigeria. *Food Policy*.
- Kiriti, T.W. and Tisdell, C. 2003. 'Commercialisation of agriculture in Kenya: case study of policy bias and food purchases by farm households', *Quarterly Journal of International Agriculture*, 42(4); 439-457.
- Kleih, U, Sanni, L., Dipeolu, A., Abass, A, Abdulsalam-Saghir, P., Butterworth, R. , and Siwoku, B. (2008). Value Chain Analysis for Nigeria. Submitted to Cassava: Adding Value for Africa (C:AVA), Natural Resources Institute, UK



- Martin, A., Forsythe, L and Butterworth, R “Gender implications of developing cassava post-harvest systems” presented at Expert Consultation on Cassava Processing, Utilization, and Marketing, December 11-12, 2008, in Anselm Enete, Felix Nweke and Eric Tollens, “Contributions of men and women to food crop production labour in Africa: information from COSCA”, *Outlook on Agriculture* Vol. 31, No 4, 2002, pp 259–265.
- Mbanelo, M. 1990. Women: A potent labour force in grassroots development. A paper presented At the national conference on development at the grassroots in the 1990s, 16-17 may, Hotel presidential, Enugu, Nigeria.
- Morvaridi, B. 1992. Gender Relations in Agriculture: Women in Turkey. *Economic Development and cultural Change* 40(3); 567-586.
- Nielsen, B. L. , M. Litherland, and F. Noddegaard. 2003. Effects of qualitative and quantitative feed restriction on the activity of broiler chickens. *Appl. Anim. Behav. Sci.*83:309–323.
- Nwafor, O.E., Adepoju, S.O., Mba, A.A., Okonkwo, M.C., Emefiene, M. and Aminu, K. 2010. *Proceedings of 24 Annual National Conference of Farm Management Association of Nigeria (FAMAN) held at Adamawa State University Mubi. between 11-14th October, 2010.*
- Nwankwo, E. C. 2016. Women in palm oil processing in South-East Nigeria challenges and prospects in a dwindling economy. *Journal of Development and Agricultural Economics*, Vol. 8(11); 251-259.
- Nweke, F.I. 1994. *Processing Potential for Cassava Production Growth in Sub-Saharan Africa*, Ibadan, Nigeria: IITA.
- Nweke, F.I., and Enete, A.A. 1999. Gender surprises in food production, processing, and marketing with emphasis on cassava in Africa. IITA.
- Nweke, F. I., Dunstan, S. and John K. L. 2002. *The Cassava Transformation: Africa’s best kept secret*. Michigan State University Press. East Lansing, Michigan.
- Nweke, F. I., Dunstan, S. and John K. L. 2002. *The Cassava Transformation: Africa’s best kept secret*. Michigan State University Press. East Lansing, Michigan.
- Obuobie, E., Keraita, B., Danso, G., Amoah, P., Cofie, O. O., Raschid-Sally, L. and Drechsel, P. (2006). *Irrigated Urban Vegetable Production in Ghana: Characteristics and Risks*. IWMI-RUAF-CPWF, Accra, Ghana.
- Odebode, S. O. 2007. Gender Participation of Melon Farmers in Ibarapa Area of Oyo State, Nigeria. *Agricultural Journal*, 2(1); 108-111.
- Okonkwo, W .I. and Akubuo, C. O. (2001). Thermal analysis and evaluation of heat requirement of a passive solar energy poultry chick brooder in Nigeria. *Journal of Renewal Energy*, 9: 1 (2001).



- Oladejo, J.A. 2015. Effects of Credit Accessibility on Performance of Tomato Market in Osun State, Nigeria. *Journal of Emerging Trends in Economics and Management Sciences (JETEMS)*, 6(7): 277-283.
- Oladejo, J. A. and Oladiran, J.O. 2014. Marketing Analysis and Consumption Pattern of Tomato in Oyo State, Nigeria. *International Journal of Agriculture Innovations and Research* 2(5); 2319-1473.
- Oluwasola, O. (2015).Vegetable Production, Livelihood Diversification and Employment Generation in Oyo State, Nigeria. *Journal of Agricultural Sciences*, 7(8): 165-174.
- Phillips, T., D. S. Taylor, Sanni, L. and Akoroda, M. 2004. A Cassava Industrial Revolution in Nigeria. The potential for a new industrial crop. IFAD/FAO, Rome.
- PIND 2013. A Report on Catering Services and Poultry Industry Value Chain in the Niger Delta, Nigeria
- PIND 2011b. A Report on Cassava Value Chain Analysis in the Niger Delta, Nigeria
- Riisgard L, Bolwig S, Matose F, Ponte S, du Toit A and Halberg N. 2008. A strategic framework and toolbox for action research with small producers in value chains. Copenhagen: Danish Institute for International Studies (DIIS). http://www.diis.dk/graphics/Publications/WP2008/WP08-17_Strategic_Framework_and_Toolbox_for_Action_Research_with_Small_Producers_in_Value-Chains.pdf
- Sanni, L.O., Maziya-Dixon, B., Okoruwa, A.E., Arowosafe, B., Lemchi, J., Ogbe, F., Ezedinma, C., Okechukwu, R.U., Akoroda, M., Okoro, E., Ilona, P., Babaleye, T., and Dixon, A. 2007. *Cassava Utilization Training for Bakers, Caterers, and Processors in the South-South and SouthEast of Nigeria*, IITA, Ibadan.
- Sanni, L. O., Onadipe, O. O., Ilona, P., Mussagy, M. D., Abass, A. and Dixon, A. G. O. 2009. *Successes and Challenges of Cassava Enterprise in West Africa: Case study of Nigeria, Benin and Sierra Leone*. ISBN 978-131-200-5. IITA, Ibadan, Nigeria. 35 pp.
- Sanginga, N. and Bergvinson, D. 2015. Oilseeds and Cowpeas. Action Plan for African Agricultural Transformation presented at the Feeding Africa, Dakar, Senegal, 21-23. 28pp.
- Sanusi, M. M. and Ayinde, I. A. 2013. Profitability of Pepper Production in Derived Savannah Zone of Ogun State, Nigeria. *IJAFS* 4 (1&2); 401-410.
- Sekumade, A. B. and Toluwase, S.O. W. (2014). Profitability and Production Efficiency of Indigenous Tomato Cultivation among Farmers in Osun State, Nigeria. *IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)*, 7(11): 13-23.



- Tocco, B., Davidova, S. and Bailey, A. 2012. Key Issues in Agricultural Labour Markets: A Review of Major Studies and Project Reports on Agriculture and Rural Labour Markets. Factor Markets Working Paper 20. Brussel: Centre for European Policy Studies
- Torimiro, D. O., Yusuf, O. J., Subair, S.K., Amujoyegbe, B. J., Tselaeesele, N. and Ayinde, J. O. 2014. Utilisation of Sunflower crop among smallholder farmers in sub-Saharan Africa: Evidence from Nigeria and Botswana. 6(9): 298-304.
- Ugonna, C. U., Jolaoso, M. A. and Onwualu, A. P. 2015. Tomato Value Chain in Nigeria: Issues, Challenges and Strategies. *Journal of Scientific Research & Reports* 7(7): 501-515.
- Usoro, E. J. 1974. The Nigerian Palm Oil Industry. Ibadan: University Press. 1-3.
- World Development Report, 2012. Gender Equality and Development. World Bank Washington, D.C.

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