

JUNE 2018

**TECHNICAL REPORT AND BROAD ANALYSES ON THE TRAVERA
PROJECT**

**THE TRADE AND VALUE CHAINS IN EMPLOYMENT-RICH ACTIVITIES
(TRAVERA): SURVEY OF SELECTED ROOTS AND TUBERS (YAM, CASSAVA AND
SWEET POTATO) VALUE CHAIN IN GHANA**

COMMISSIONED BY

INTERNATIONAL LABOUR ORGANISATION (ILO)

CONDUCTED BY

INSTITUTE OF STATISTICAL, SOCIAL AND ECONOMIC RESEARCH (ISSER)

UNIVERSITY OF GHANA

Table of Contents

1.1 Introduction.....	8
1.2 Project background	8
1.3 Main objective	9
2.1 Scope of work	9
2.1.1 Thematic scope	9
2.1.2 Geographical scope.....	10
3.1 Methodology	10
3.1.1 Data Collection instruments.....	10
3.1.2 Sampling	10
3.1.3 Tools development.....	12
3.2 Enumerators training.....	12
3.3 Second training	12
3.4 Field data collection.....	12
3.5 Update meetings.....	13
3.6 Data entry and analysis	13
4.1 Broad analyses of the survey	13
4.2 The Structure of the roots and tubers export value chain.....	19
4.2.1 Distribution of firms by crops and region	19
4.2.2 Age of firms by crop and region	20
4.2.3 Firm type and crop concentration	20
4.2.4 Possession of a license by firms from government agencies	21
4.3 Share of company ownership.....	22
4.2.6 Annual turnover for 2016.....	23
4.2.7 Current market channels and potential future usage	24
4.2.8 Annual cost of inputs for 2017.....	26
4.2.9 Transportation of products	26
4.2.10 Obstacles to transportation of products.....	28
4.2.11 Membership of association	29
4.3 The demand for the selected roots and tubers (exports in the value chain)	31
4.3.1 Firm engagement in exports.....	31
4.3.2 Extent of interest in commencing exports.....	33
4.3.3 Share of total sales exported in 2017	33

4.3.4	Importance of certain requirements on product purchase	34
4.3.5	Certification of export products	36
4.3.6	Benefits of supplying to the export market	37
4.3.7	Obstacles militating against starting or increasing export	38
4.3.8	Business constraints	40
4.3.9	Actions to improve competitiveness of export product	42
4.3.10	Firm capabilities.....	43
4.4	The Quantity and quality of employment in the value chain	44
4.4.1	Number and nature of employment status	44
4.4.2	Labour turnover.....	46
4.4.3	Experience and educational level of employees	46
4.4.4	Employment contract	48
4.4.5	Employee skill rating	48
4.4.6	Personnel manual	49
4.4.7	Family Members as employees	50
4.4.8	Registration with the national social security agency	52
4.4.9	Wage rate	53
4.4.10	Orientation and training	54
4.4.11	Training methods	55
4.4.12	Firms Participation in any External or Internal Training Courses	56
4.4.13	Factors Contributing to Obstacles to Training	57
4.4.14	Informal feedback on employee performance.....	58
4.4.15	Ease of recruitment	60
4.4.16	Documentation of Job description	60
4.4.17	Recruitment challenges	62
4.4.18	Actions taken to overcome recruitment challenges and retention of workers	63
4.4.19	Compliance with national labour regulation	65
4.5	Rules and supporting functions to develop the value chain	65
4.5.1	Beneficiaries of Research and Development (R&D)	65
4.5.2	Sources of Finance	66
4.5.3	Lack of finance as a critical constraint to firm's production and marketing decisions.....	67
4.5.4	Obstacles against access to credit	69
5.5.5	Potential Allocation of additional financial capital.....	70

5.5.6 Opportunities and threats within the roots and tuber value chain in Ghana.....	71
5.1 Summary and conclusions	75
Appendix 1: General employee characteristics by crop and job description	77
Appendix 1: Labour and output at the farm level	78

List of Tables

Table 1: Distribution of firms by crop type and region.....	19
Table 2: Age of Establishment by crop and region (%).....	20
Table 3: Possession of a license by firms from government agencies by crop and region.....	22
Table 4: Share of company ownership.....	23
Table 5: Annual turnover in 2016 (both domestic and export market).....	24
Table 6: Annual turnover in 2016 adjusted with the number of employees (both domestic and export market).....	24
Table 7: Current market channels and potential usage in the future (proportions).....	25
Table 8: Total Annual Cost of inputs in 2017.....	26
Table 9: Severity of obstacles to transportation of products (ranked 1-very severe to 4-no obstacle).....	29
Table 10: Firms engaged in export by crop and firm type (Proportion & Frequency).....	32
Table 11: Extent of Interest in Exporting (Percentage and Frequencies).....	33
Table 12: Share of total Sales exported in 2017 (assumed if interested in starting exports).....	34
Table 13: Importance of requirements buyers, intermediaries and final consumers may have on product (Scale: 1-Not important to 4-Extremely important).....	36
Table 14: Certification of export products for conformity.....	36
Table 15: Benefits of supplying to the export market (Rank: 1=Not important; 4=Extremely important).....	38
Table 16: Obstacles militating against starting or increasing export (1=very severe; 4=No obstacle).....	40
Table 17: Constraints militating against starting a business (scale 1=Not important; 4=Extremely important).....	41
Table 18: Actions to increase competitiveness of product or compete effectively against imports into Ghana (1=Not important 4=Extremely important).....	43
Table 19: Importance of capabilities for business performance (1=Not important; 4=Extremely important).....	44
Table 20: Labour use by crop (mean).....	45
Table 21: Labour Use by establishment (mean).....	45
Table 22: Labour turnover.....	46
Table 23: Experience and Education of Employees by crop (%).....	47
Table 24: Formality of employee contract.....	48
Table 25: Rating of Skills of Employees (1=Not good at all to 4=Excellent).....	49
Table 26: Personnel manual and length of manual possession.....	50
Table 27: Family Members as Employees.....	51
Table 28: Registration of Firms with the National Social Security Agency.....	52
Table 29: Basis for Wage Rate & Competitiveness of Wage Rate.....	53
Table 30: Frequency of Orientation and Training for Employees (%).....	55
Table 31: Effectiveness of Training Method (1=Not effective; 4=Extremely effective).....	56
Table 32: Firms Participation in any External or Internal Training Courses.....	57
Table 33: Factors of Obstacles to Employee Training (1=Not important; 4=Extremely important).....	58
Table 34: Ease of Recruitment (1=Very difficult; 4=Very easy).....	60
Table 35: Written Position Description for at least two-thirds of the jobs in the firm.....	61
Table 36: Update of Job Description Profile (Frequency).....	61
Table 37: Recruitment Challenges (1=Not important; 4=Extremely important).....	62

Table 38: Actions taken to Overcome Recruitment Challenges and Retention of Workers (Rank: 1=Not at all; 4=Very Frequently).....	64
Table 39: Problems Concerning Compliance with National Labour Regulation	65
Table 40: Sources of Finance for investment (%)	67
Table 41: Severity of obstacles militating against access to credit (1-very severe and 4-no obstacle).....	70
Table 42: Potential Allocation of Additional Financial Capital.....	71
Table 43: Opportunities and threats in yam, cassava and sweet potato value chain	71

List of Figures

Figure 4. 1: Distribution of crop type by region.....	Error! Bookmark not defined.
Figure 4. 2: Type of Establishment and Crop Concentration	21
Figure 4. 3: Transportation of products to buyers by crop and firm type (proportion)	28
Figure 4. 4: Proportion of Employers as Members of an association	30
Figure 4. 5: Informal Feedback on Employee Performance (%)	59
Figure 4. 6: Beneficiaries of Research and Development	66
Figure 4. 7: Lack of finance as a constraint to production & marketing decisions	67

1.1 Introduction

Agriculture remains an important sector of the economy of Ghana although its contribution to GDP has decreased over the years while it still employs majority of the population. For a long time, Ghana's agricultural growth and development revolved around cocoa which has state intervention along its value chain. Even though tons of root and tuber crops such as cassava, sweet potato and yam are produced in significant quantities, they have not received the same level of attention as tree crops. The production, distribution and marketing of the root and tuber crops are highly unstable and volatile as seasonality affects the pricing. Yet, these three crops do not only have value locally but also export importance for the country. They are also food security crops as significant amounts are consumed at the household level. However, the post-harvest losses of these crops is high due to production, processing, transportation and storage related problems. Meanwhile, the international markets, especially countries in the European Union require some of these crops especially cassava, yam and sweet potato for various manufacturing purposes. This gap in demand and supply can be attributed to lapses in the value chain of these crops which also has implications on youth employment and jobs in general.

In recognition of the importance of agriculture production for the economy of Ghana, the government of Ghana through its Food and Agriculture Sector Development Policy (FASDEP II) has prioritized the development of value chains of food and other crops. Additionally, the Planting for Food and Jobs Programme recently launched by the Ghanaian government responds to some production, processing and marketing concerns of the agriculture sector of the economy. The ILO's "Strengthening the Employment Impact of Sectoral and Trade Policies" (STRENGTHEN) proposes to be situated within the value chain enhancement for job creation and economic development framework in tandem with the general policy framework of the country. It is particularly interested in the value chain development of the country's three most important root and tuber crops- cassava, sweet potato and yam.

1.2 Project background

The ILO is implementing a project funded by the European Union entitled "Strengthening the Employment Impact of Sectoral and Trade Policies" (STRENGTHEN). The overall objective of the project is to strengthen the capabilities of country partners to analyze and design sectoral and trade policies and programmes that enhance employment creation in terms of quantity and quality.

One component of this project is "Assessing and Addressing the Effects of Trade on Employment – Phase 2 (ETE II)". This component will support developing countries in harnessing international trade and trade-related foreign investment towards providing more opportunities for decent work within developing countries and raising the number of developing-country workers who are productively employed.

TRAVERA is a programme foreseen within ETE-II. The aim of TRAVERA is to help developing-country firms, especially small- and medium-sized enterprises, integrate into export value chains in a way that results in higher employment and increasing levels of productivity and incomes for workers.

TRAVERA will focus on export-oriented activities and be based on the ILO's Value Chains Development (VCD) approach.

1.3 Main objective

The main objective of the TRAVERA survey is to identify opportunities and threats within the export value chain in relation to creating more and better jobs.

The remainder of the report is structured as follows: Section 2, presents the scope of the study, Section 3 describes the methods used to conduct the study. Section 4 gives a description of the value chain of the three crops and presents the broad analysis with a summary and some conclusions in section 5.

2.1 Scope of work

The survey covered the value chain of three tuber crops namely cassava, yam and sweet potato to assess the production, processing, marketing and export dimensions of these crops. The actors in the value chain such as farmers (who are primary producers), processors, transporters, firms and regulators would be selected value chain categories to be engaged for the research.

2.1.1 Thematic scope

The survey exercise was divided into four different aspects, which guided the data collection process. The aspects included;

1) The basic structure of the roots and tubers export value chain and the actors in it, how they are linked and organized.

This involved identifying the key actors in the value chain and their characteristics. The different processes and what is involved from production, processing and marketing – that take place in the value chain. It also identified and assessed the different market channels through which products and services reach the final consumer. Linkages that exist between actors at the same level of the value chain and between actors at different levels of the value chain were identified.

2) The demand for the products sold by the selected roots and tuber export value chain, past and future trends, export-related opportunities and constraints on firms that prevent the realization of these opportunities.

The change in demand for the products sold by the export value chain from the past and currently and the possibilities for the increased future demand and supply opportunities was investigated. The results shall be used to analyse any changes in consumer preferences with respect to different varieties of the products and any quality standard restrictions that exist. Find out if there is a need for fair-trade, environmental, or ethical (especially in relation to labour) labelling and identify the major constraints firms encounter in taking advantage of direct and indirect export opportunities.

3) The quantity and quality of employment in the value chain.

Questions were asked about the quantity and quality of employment within the value chain. That is how many jobs exist and how they are distributed by gender, age, occupation, skills and firm

size. This section of the survey also analyses the nature of the jobs either informal or formal in contracts, wages paid for these jobs distributed by gender, age group, occupation, skills level and firm size. The section also assesses the constraints related to employment, productivity, recruitment, compliance to labour regulations, laws and the level of safety and health.

4) Rules and support to develop the competitiveness of the value chain while providing increased employment and good working conditions.

The study sought to establish which rules and supporting functions that currently exist and are linked to the identified constraints on firms from taking advantage of direct and indirect export opportunities and which ones do not exist but would improve business performance and increase employment and working condition in the value chain. This section identified actors in both public and private sector who apply these rules and perform these supporting functions.

2.1.2 Geographical scope

Data for this research was sourced from the southern, middle, and northern belts of the country. Firms and farmers within the export value chain of the crops under study were the major sources of data in the locations visited. The gathering of data from farmers on the roots and tubers was based on the district (s) with the highest production of the crop in the country. Using agricultural facts and figures report for 2015 by the Ministry of Food and Agriculture (MoFA), we identified the highest producing districts in the country for the crops under study. Details discussed in the sampling section.

3.1 Methodology

3.1.1 Data Collection instruments

The study adopted a mixed method approach: quantitative and qualitative. The quantitative method relies on a survey of firms and farms using the ILO Global Questionnaire. For the qualitative aspects of the methodological approach for data collection, interview guides developed by ISSER were used.

3.1.2 Sampling

With an objective of addressing the four key thematic areas of the study, that is value chain structure, demand, nature of employment and business environment, we set out to collect data from key players at the farm, firm and institutional levels. The farm interviews sought to gather information on the production processes associated with the three crops (cassava, yam and sweet potatoes) and the linkages that farmers have with other players in the chain. The firm interviews gathered data on processors and marketers/exporters and the roles they play within the value chain. The institutional interviews sought to gather information from policy makers and umbrella groups which deals directly or indirectly with infrastructure issues, legal regimes and play supporting roles in the value chain.

First, initial discussions at ISSER and basic literature search suggested that, firms engaged in marketing/exporting the crops (especially yam and cassava) were mainly stationed in the Greater Accra Region of Ghana, although there were a handful in other regions. There were also some processors stationed in the Greater Accra Region. However, the concentration of farmers was

mainly outside the Greater Accra Region. These farmers were mainly small scale in nature – but there were a few which were commercial (large scale).

Second, a further search on the internet and contacts with Ministry of Trade and Industry, Ministry of Food and Agriculture, Ghana Export Promotion Authority and National Board for Small Scale Industries provided us with several lists of firms engaged in the processing, marketing/export of the crops. These sets of lists served as the frame from which firms were selected for interviews. However, there was no reliable list for farmers at the national level. There were however indications that District Agricultural Offices could help us obtain such a list at least at the community level.

Third, considering the data available by region on the highest producing district of the crop, we selected the Wa Municipal in the Upper West Region for yam farmer interviews and Sekyere East District of the Ashanti Region for the cassava farmer interviews. For sweet potato, we did not have enough data to decide which of the two top producing regions (Central and Volta) had the highest producing District. Therefore, the two regions were included; with half of the potato sample being assigned to each of them.

Fourth, based on this background and our project implementation plan the next step was to allocate the targeted sample of 100 firms and 100 farms (200 in total) across regions and by crop. By region and using the sampling frame obtained from the State Institutions listed above on firms, we administered the quantitative survey to marketers/exporters in the Greater Accra Region. The other firms were sampled from outside the Greater Accra Region – some based on the list from the public institutions and others based on referrals by other firms and farmers.

Sixth, using the importance of the crop in terms of area cultivated and volume harvested, 40 interviews were conducted for yam farmers in the Wa Municipal¹. Similarly, 40 interviews were targeted for cassava farmers in the Sekyere East District². In the case of sweet potatoes, we targeted 20 farm interviews in total, 10 in the Volta Region (Ho Municipal) and 10 in the Central Region (Cape Coast Municipal). In the Wa Municipal enumerators had access to a farmer list provided by the Municipal Ministry of Agriculture Office. Enumerators used this list to first verify if the farmers in the list were still engaged in the production of the crop. Those farmers who were willing and were still involved in the value chain were interviewed. These farmers also led enumerators to other farmers who were also involved in the yam cultivation.

The case of cassava farmers in the Sekyere East District varied a bit – here the district office did not have a written down list of cassava farmers. The Officers at the District Agriculture Office instead linked the enumerators to Extension Agents in the highest producing communities of the District. These Extension agents led the enumerators to some cassava farmers who were producers of cassava. In total the Extension Agents linked the enumerators with about 25 farmers. The remaining 15 famers were brought in through snowballing. In the potato case, Extension Agents in the Cape Coast Municipal linked enumerators with a prominent potato processor who had a network of farmers (a pseudo out grower scheme) – the enumerators interviewed these potato farmers and they also linked them with a few more. In the Ho Municipal the Agricultural Extension agents also linked enumerators with farmers.

¹ The highest producing of yam District in Upper West

² The highest producing District of Cassava in Ashanti Region

Seventh, in connection with the qualitative interviews, the plan was to interview representatives of institutions which directly shape the policy issues surrounding the value chains of the three crops. We are therefore targeting the Ministry of Agriculture, The Ministry Trade and Industry, The Ghana Export Promotion Council and the National Board for Small Scale Industries. In addition, we plan having interviews with market queens of the various crops to understand the how the crop in marketed within the country and the various linkages that exist among local/central markets, producers and exporters. Although we already have interview guides prepared for the qualitative exercise, we hope to beef it up with initial findings coming out of the survey and the potential gaps that ought to be filled.

3.1.3 Tools development

Research instruments relevant for the gathering of quantitative and qualitative data was developed for the study by ISSER. The materials were streamlined based on the objectives of the study and paid critical attention to the gathering of employment data from these subsectors. The ISSER Qualitative tool was however swapped with the ILO global questionnaire which was submitted later after the first batch of data collection using the ISSER questionnaires. The ILO questionnaire was then adopted in totality.

3.2 Enumerators training

Following the design of instruments and the recruitment of enumerators, a two-day training on the quantitative and qualitative instruments designed by ISSER was undertaken and the instruments pretested on the third day for corrections to be made. The process was not uni-directional in just guiding the enumerators to understand the questions but also took into consideration perspectives from enumerators who were mostly well experienced in data collection and their input were used to update the questionnaires. All tools were reviewed, the enumerators performed role plays to try and administer each set of questionnaires prior to the pre-test. A debriefing meeting session was held to get feedback from the pre-test and necessary adjustments were made.

3.3 Second training

A second training session for enumerators was organized to train the enumerators on the ILO global questionnaires, which was provided midway into the data collection. TRAVERA research. Thus, the initial tools which hitherto were designed by the project implementing team and administered to some firms in Accra were abandoned. The idea was to use the same questionnaire as directed by ILO in order not to deviate from the thematic areas of data collection as applied in other countries.

3.4 Field data collection

Following a recall of enumerators for training with the new ILO questionnaire, the week (26th February to 3rd of March) marked the official commencement of field work with the new instrument. Feedback from enumerators showed a good response to the questionnaire. Through snowballing approach, enumerators were able to get other firms engaged in the value chain activities of the roots and tubers under study. In the week spanning 2nd to 7th April, all enumerators had completed their interviews in their respective Districts across the country and had returned materials to the ISSER project office. The grand total of questionnaires administered both within and outside Greater Accra is 198.

3.5 Update meetings

Upon completion of the field work the ISSER project team held a debriefing meeting with enumerators to get information on the field exercise and issues common issues that cut across and would be key for analysis. After this a meeting was scheduled with ILO which never took place. However subsequently the team meet with ILO to resolve issues raised. This included a physical meeting and a Skype meeting with both teams. This helped to streamline further activities to be undertaken to end bring the survey to a successful end.

3.6 Data entry and analysis

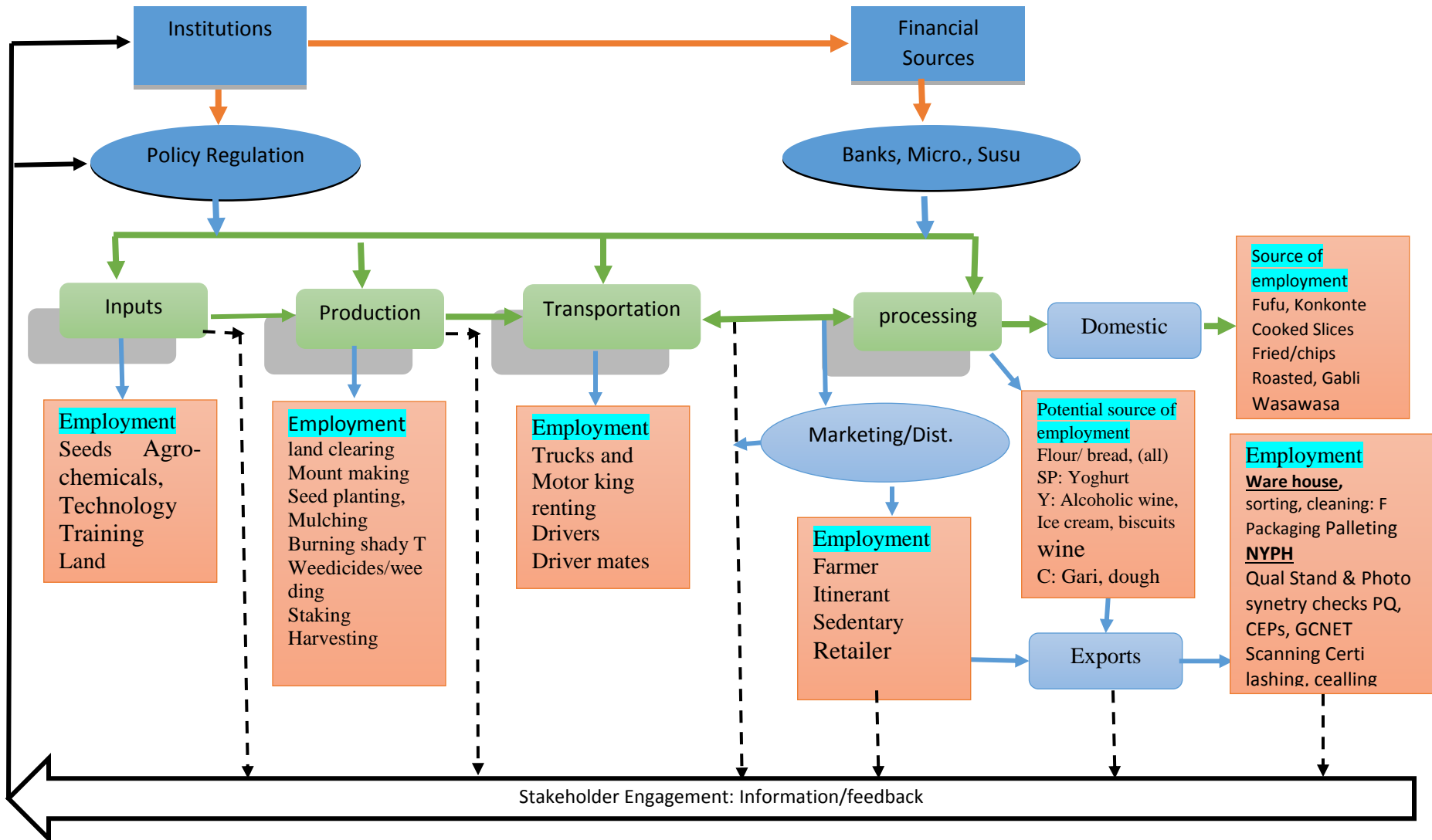
The completed questionnaires were handed over to the ISSER Monitoring, Learning and Evaluation Unit (MLE) for data entry. Broad analyses of the data suggested that we had 198 value chain operators/firms in the cultivation, processing, marketing and distribution of the selected root and tubers - across 7 regions in Ghana. These regions include Ashanti, Central, Greater Accra, Upper West, Volta, Brong Ahafo, and Eastern Regions. The characteristics of these value chain operators/firms as well as the distribution of the selected roots and tubers are discussed along the four main thematic areas in Section 4. These themes include structure of the various crops in the value chain; the demand for the roots and tubers export value chain; the quantity and quality of employment in the value chain and then; and the rules and supporting functions which help to develop competitiveness of the value chain.

4.1 Broad analyses of the survey

Based on the qualitative and the quantitative data collected, this Section presents broad analyses of the data using descriptive statistics and in some cases some graphs. The discussions are also interspersed with some of the findings coming out of the qualitative interviews – here we mostly use quotes of the narratives presented by respondents. We begin these discussions in the next section with the structure of the roots and tubers value chains but first let us take a brief overview of the value chain and the potential threats, opportunities and jobs that are being created now and in the future.

The value chain briefly describes the business activities and employment potential of Yam, cassava and sweet potatoes from production to marketing. See Figure 4.1. It starts by indicating the importance of policy regulations to the industry. It also indicates that policies that are generated need to be implemented by various institutions and these institutions need to be well resourced to be able to do so. The diagram also shows that financial support is crucial for the entire industry as confirmed by respondents. We discuss the various notches of the chain in turn.

Figure 4. 1: Roots and Tubers Value Chain



Source: Authors' construction based on qualitative interviews, 2018

The value chain briefly describes the business activities and provides a snapshot of areas of employment of yam, cassava and sweet potatoes from production to marketing. Details of employment potential with data is presented in the rest of the report. It starts by indicating the importance of policy regulations to the industry. It also indicates that policies that are generated need to be implemented by various institutions and these institutions need to be well resourced to be able to implement the policies. The diagram also shows that financial support is critical for the entire industry as confirmed by respondents. The description starts with the notion that for the industry to make impact adequate inputs that are accessible to the farmers should be made available. These include land, seeds, agro-chemicals and production technology. The markets which surrounds each of these inputs could create various forms of jobs. Inputs are directly linked to production which feeds into job creation. After production, the produce is transported either directly to the market for sale, processed or stored in a shed awaiting potentially competitive prices. If whole tubers are sold directly in the domestic market then the distribution is mainly by women, however if sold on the international market men lead in the export and each has unique type of employment that it creates.

In the diagram, the stakeholder engagement suggests that each of the actors, by their years of experience have wealth of knowledge that they can significantly contribute to policies. It is important that during policy formulation representatives from each sector is involved to ensure that the policies so generated represents the needs of the entire value chain. It is only through this process of policy formulation that policy makers can make use of feedback so that policies can be made based on appropriate data sources.

Policies and institutions

Policy regulations are a necessary part of development. For businesses to thrive, there must be strong policies and institutions that ensures the implementation of such policies. In previous policies, government were advised to stay out of the market so that the market could function efficiently through competition. However, in recent times it is realized that the market and government are not arenas of choice, government through its institutions are a requirement for markets to function efficiently. The diagram illustrates the importance of policy and strong institutions in all stages of the crops value chain. In the agricultural sector many policies have been developed in different subsectors with the aim of improving the sector and ensuring growth. However, many businesses in the sector suffer from weak institutional support, unfavorable policy environment, political interference and policies that do not reflect the concerns of the stakeholders. For instance, in the diagram the dotted lines indicate weak stakeholder engagement in policy processes. These can greatly affect opportunities and defeat the good intention of growing the sector.

Financial Institution

For any business to succeed and contribute to the development of a nation efficient financial institutions are critical. However, interviews show that financial support is lacking and almost all respondents had to self-finance their businesses. They identified financial sources as the Formal Banks, Rural Banks, and “Susu” Savings Groups. Findings from interviews reveals that Rural Banks and the Susu Savings Groups (informal) are more flexible when it comes to access to

loans than the Formal Banks. This therefore means that such banks are unable to give adequate loans to large scale businesses within the chain.

In terms of the gender of clients preferable to them, most of the financial institutions preferred females to males because in their opinion, female clients are more capable of managing their resources and are trustworthy therefore tend to pay back loans easier than their male clients do. Exporters and processors stated that in terms of financial support government is not doing enough to support the sector.

Interview granted by FAGE suggested that, since its existence from 1992 it has played an advocacy role to ensure market development issues and other weaknesses such as grievances of actors are addressed. In ensuring market development, they aid in access to finance and other services in exportable goods. In an interview they stated that although they have not had many occasions where yam actors have reported challenges, about a year ago, they facilitated a partnership with Enterprise Insurance Company. This means that interested yam exporters can now have marine insurance cover for all their exports. FAGE charges 0.35% of total goods insured.

Inputs

Agricultural inputs are critical determinants of outputs in any form of production. Inputs are quite diverse, and their requirements can be crop specific. In Ghana most of the inputs used are imported, however interview shows that the root crop sector does not require heavy input application. The most important inputs for this sector the seeds. Fortunately, through research, there has been a technology to produce yam seeds, cassava cuttings and sweet potato vines that suits the environment and resist parasites. However, being an important determinant of product price, any fluctuations in their cost affects the profits of the producers significantly – government policies which will ensure stability in seed supply and their prices will be welcomed by producers.

Production

Men dominate the production of root crops in large quantities; women involved maybe female-headed households and some few others who produce small acreages for the consumption of the household. The gender difference maybe be due to the high labour requirements particularly yam which requires high manual work. Additionally, due to the sensitive nature of yams, it is planted early morning between 5 am to 11am at which time women will be undertaking domestic chores at home. This notwithstanding, women's contribution in production is very significant. The production process was listed as follows:

- 1 land clearing
- 2 Mount making
- 3 Seed planting,
- 4 Mulching
- 5 Burning of shady trees if any
- 6 Weedicides for first weeding
- 7 Staking when the yam germinates
- 8 4 -5 times weeding
- 9 Harvesting

The steps given in the production processes seem to overshadow women's contribution however, they are the major transporters of yam seeds by carrying on their head to the planting sites and by the same means transport harvested yams to yam sheds for storage. They are highly visible in the distribution of the 3 crops in the domestic market.

Transportation

Transportation is an inevitable component of an industry. It is a key driver in any activity and the influence of its services on the performance of an industry cannot be overemphasized. In Ghana one does not need research to recount the number of times transportation cost has influenced market prices and sometimes resort to demonstrations by drivers. It is thus evident that managing transportation cost is important for preserving profits and ensuring efficiency in business as well as enhancing the supply chain. Additionally, transportation has direct influence on food security and efficient transportation system is a potential source of direct and indirect job creation. Unfortunately, in Ghana, the transportation constraints that businesses face are many and this has led to certain decisions that can have negative effects on the nation particularly in agriculture. The factors influencing high transportation costs are country specific, while other countries maybe worried about increases in fuel prices, in Ghana, apart from high fuel prices, poor road network, high prices of spare parts, poor condition of vehicles, frequent accidents and breakdowns are among the numerous constraints that can affect the supply chain in businesses. These have been responsible for many businesses to rethink and adopt other supply chain strategies. For example, Mr Batu stated that the transportation costs and prices of the commodity influences his decision as to where to sell his yams:

“I have a shed in the market, I study the prices in the Kokomba yam market and then compare it with what is in the north so whichever will favour me, then I sell. I can either refuse to sell in the north and come and sell in the market at Kokomba”

This is a typical example of how transportation can affect food availability. Most women traders resort to consolidation for cost sharing as a strategy to reduce high transportation costs. That is a group of women come together and rent a truck and share the cost. At the international level shipping agencies have also found consolidation beneficial, by using multiproduct containers, pallets and other means to optimize capacity utilization. Individual strategies toward reducing transportation costs does not benefit the larger population, it is therefore important that government get involved to support businesses for the benefit of the entire nation.

Distribution:

Traditionally, the distribution and trade of agricultural food commodities in Ghana is highly gender differentiated. Women dominate the sector and depending on the scale they are categorized into itinerant, sedentary and retailers as presented in Figure 4.1. The current norm maybe understood from the point of

culture, food and its processing is considered a woman's domain. The trend is changing though, particularly in the yam sector, men, mostly yam farmers are also trading however, they prefer to be engaged as itinerant or sedentary and not retailing.

Itinerant traders are the main sources of supply to domestic markets. They move from major markets in the cities to the hinterlands and buy the crops from the farm gates and supply to major market centers. Itinerant traders can be termed as whole sellers who upon reaching their destination sell to **sedentary** traders or bulk buyers who sell to retailers. **Retailers** are the largest group in the distribution chain. They sell directly to consumers hence they sell smaller quantities from 1 tuber to any number at the consumers' request. These categories of traders are not permanent as roles interchange from sedentary to itinerant and vice versa or retailer to sedentary depending on their financial situation in a particular time. However, it must be noted that the market is a very complex space where women do not only dominate but control and regulate market access

From the study the most important of this trade is the employment generation where in some cases the trade is an inheritance, passed on from generation to generation. The traders are able to meet their economic and social needs and also contribute substantially to the family and household needs.

Exports

The export sector is dominated by men and yam is the leading export crop among the 3 selected tubers. Yams especially "Puna" are exported to most European and African markets. According to exporters The United Kingdom is the largest importer, almost 80% of the nation's yams are sent to UK. Other countries include: Holland, Belgium, Italy and US. Unlike yam, cassava is rarely exported as a tuber, it is rather exported in processed form as "gari" or said to be processed into flour and mixed with plantain as NEAT Fufu. The export of the sweet potato sector is not well developed; however, its economic potential and benefits cannot be overemphasized. Interviews at WIAD spells out its potential for the country and employment. Exporters of root crops have established a regulating body known as the Ghana Roots Crops and Tuber Export Union (GROCTEU) that serves as the mouth piece of members. to be able to take advantage of opportunities and to channel their grievances through one umbrella body. Through the efforts of the association, MOTI has supported in the establishment of the National Yam Park House (NYPH). This is a one stop shop where inspection and certification is conducted for goods to be exported. Despite the male dominance in export, gender specific roles are identified at the warehouse where produce are processed for export.

Offloading is purely a male activity, as is seen as labour intensive traditionally, gender ascribed roles frown on women who engage in such aggressive and rough activities as it requires climbing on top of big trucks. The offloaded yams are **Sorted and cleaned** by women. They sort sizes that are accepted for international export and also for cleaning off soil from all tubers. The sorted and cleaned yams are **Wrapped and packaged** by men. Tubers are carefully wrapped in plain sheets and well packaged in boxes (Size depends on country of export) sealed or secured with ropes, they are then arranged on pallets and transported to the NYPH for further processing for export.

NYPH: At the park house, forwarders take over the rest of the process to ensure that the goods reach the designated destination. Here, the packaged yams are offloaded, inspected, rearranged on pallets secured and latched. They are then loaded into containers to the scanner where they are certified and approved for release to the port. From here the consignment is sent to MPS where the container is plugged till it is shipped. Activities at the pack house is mostly undertaken by men.

Processing

One of the key areas in agriculture that researchers and development experts have over the years been concerned with is value addition. Value addition does not only project a particular crop but attracts premium and creates employment through backward and forward linkages. It must be mentioned that in Ghana the processing of the selected crops is not well developed particularly for the international market. Among the crops sweet potatoes is critical as its market at the international level is weak. In Ghana, NEAT Foods Processing Company is known to export the selected crops internationally as flour. However, it was stated that through research the crops are processed into various products as presented and these areas if well-developed could be a potential source of employment to the nation. It was particularly mentioned that through research alcohol was produced from yam to produce wine, particularly water yam which is not so much preferred for consumption. Local processing is common, but these are mainly for food and not for industrial use as indicated in domestic processing in the diagram.

4.2 The Structure of the roots and tubers export value chain

This section looks at the characteristics of firms and the various operators across the root and tuber value chain business. Attention is paid to different market channels through which products and services get to the final consumer and the linkages which exist among actors at the same level of the value chain. We begin with the distribution of firms by crop and region in the next sub-section.

4.2.1 Distribution of firms by crops and region

Table 1 shows the distribution of the firms interviewed by crop and region. Overall 198 firms were interviewed across 7 regions of Ghana. Out of this number, 86 concentrated on cassava, 76 on yams and 36 on potatoes. Ashanti Region had the highest number of firms (51) and Eastern region had the least (4).

Table 1: Distribution of firms by crop type and region

Region	Crop			Total
	Yam	Cassava	Sweet Potato	
ASHANTI	0	51	0	51
BRONG AHAFO	0	11	0	11
CENTRAL	1	2	16	19
EASTERN	2	2	0	4
GREATER ACCRA	34	11	0	45
UPPER WEST	39	0	0	39
VOLTA	0	9	20	29
Total	76	86	36	198

Source: Authors' computation from the Ghana TRAVERA survey dataset, 2018

4.2.2 Age of firms by crop and region

Beyond the distribution of firms by crop and region, another important characteristic of the firms has to do with how long they have been operating. Table 2 shows the age distribution of the sampled firms by crop and region. Each of the three age categories of firm (0-5; 6-10; and 21 years and above) had at least 20% of the sampled firms within it. Suggesting that, there are significant proportions of both newer and much older firms within the sample. There is however evidence to suggest that potato firms are more likely to fall within the age group of 0-5 years (60%). On the contrary, more yam firms are quite old, falling in the age category of 21% and above (over 35%). At the regional level, Volta seems to have the highest proportion of newer firms (58.3%). On the other hand, Eastern region has the highest proportion of older firms (75%).

Table 2: Age of Establishment by crop and region (%)

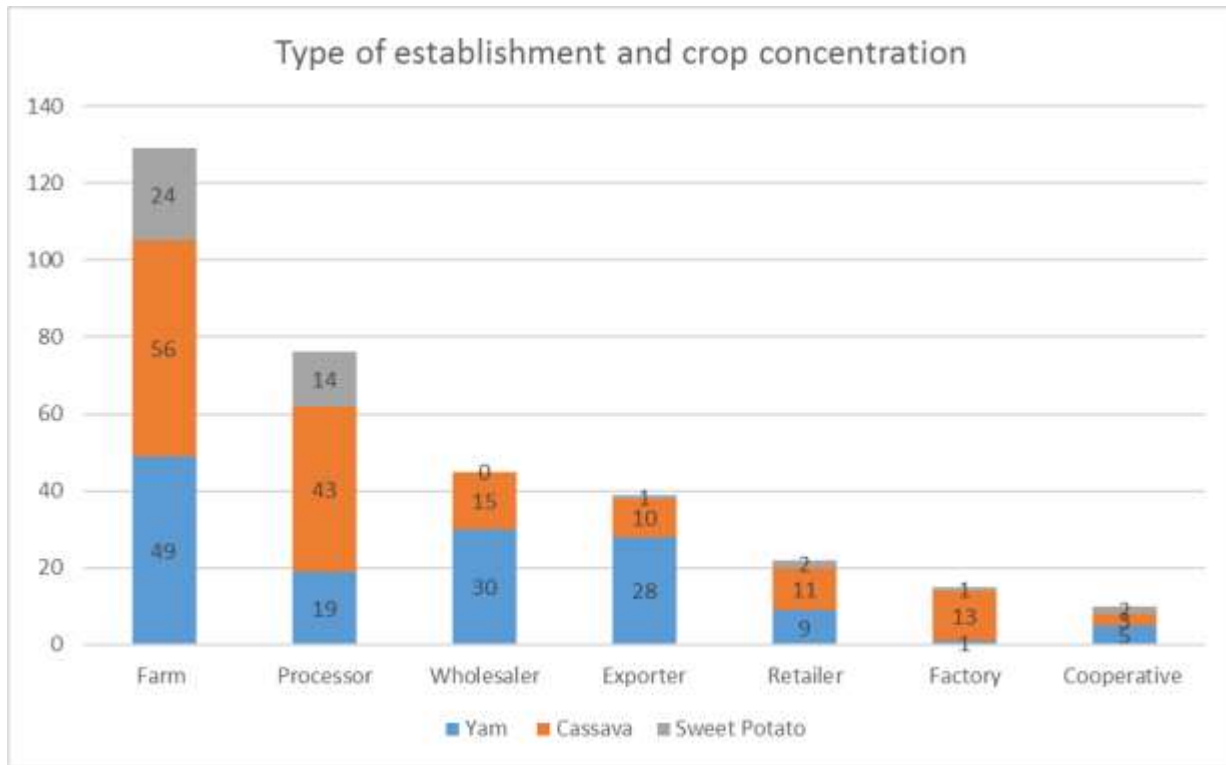
	Age of establishment (years)										Total	
	0 to 5		6 to 10		11 to 15		16 to 20		21 and above			
Crop code												
Yam	13	18.6	12	17.1	9	12.9	11	15.7	25	35.7	70	100
Cassava	14	17.1	21	25.6	14	17.1	13	15.9	20	24.4	82	100
Sweet potato	21	60.0	6	17.1	2	5.7	4	11.4	2	5.7	35	100
Total	48	25.7	39	20.9	25	13.4	28	15.0	47	25.1	187	100
Region												
Ashanti	6	12.0	13	26.0	11	22.0	5	10.0	15	30.0	50	100
Brong Ahafo	0	0.0	3	27.3	1	9.1	5	45.5	2	18.2	11	100
Central	10	55.6	6	33.3	2	11.1	0	0.0	0	0.0	18	100
Eastern	1	25.0	0	0.0	0	0.0	0	0.0	3	75.0	4	100
Greater Accra	11	27.5	6	15.0	7	17.5	9	22.5	7	17.5	40	100
Upper West	4	10.8	8	21.6	2	5.4	5	13.5	18	48.7	37	100
Volta	16	59.3	3	11.1	2	7.4	4	14.8	2	7.4	27	100
Total	48	25.7	39	20.9	25	13.4	28	15.0	47	25.1	187	100

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

4.2.3 Firm type and crop concentration

Figure 4.1 presents the various value chain operating firms in the selected regions and the concentration of the selected root and tuber crop by each firm. It is observed that farm establishments have the highest concentration of all three crops (129), followed by processors (76), wholesalers (45), exporters (39), retailers (22). Factory establishments are the least in the value chain for all the selected crops (15). For the crops, cassava is more concentrated across the various value chain establishments followed by yam and then sweet potato.

Figure 4.1: Type of Establishment and Crop Concentration



Source: Authors' computation from the TRAVERA survey dataset

4.2.4 Possession of a license by firms from government agencies

Table 3 also shows the distribution of the selected firms who have acquired license from government agencies across crop type and region. Overall, nearly four out of every ten of all the sampled firms possess license from government agencies. For the selected crops, it is observed that about 53 % of these firms possess license for yam, 31 % for cassava and 16 % for sweet potato. Across the regions, all the 3 firms interviewed in the Eastern Region and responded to this question had possession of government licenses. On the other hand, 89 % of the 38 firms in the Greater Accra had license. In addition, 75 % of the 9 firms in the Brong Ahafo region possess license as compared to 43% of the 42 firms in Central and 17% of the 26 firms in the Volta regions. It is also noted from Figure 2.3 that, out of the 49 firms interviewed in the Ashanti Region, only 10 % had acquired government license while for the Upper West Region, 7 % of the 30 firms interviewed possess license from government agencies.

Interviews with informal traders who operate locally in the domestic market show that they also register their businesses. According to GEOBAT he registered his company long before he ventured into export. He indicated that the registration of the company was done when he was a trader at the Kokomba yam market before entering into the international market. A cassava processor had this to say:

“After processing the cassava dough, when we take it to the market, we must register with the authorities before we are able to sell. So, I have done all the necessary registration. Also, as processors of food, we were asked to go for medical tests before we are permitted to operate, and I did that as well” (Madam Efua cassava processor).

Table 3: Possession of a license by firms from government agencies by crop and region

	Proportion	N
Crop code		
Yam	0.5	76
Cassava	0.3	83
Sweet potato	0.2	31
Region		
Ashanti	0.1	50
Brong Ahafo	0.8	10
Central	0.4	17
Eastern	1.0	3
Greater Accra	0.9	45
Upper West	0.1	39
Volta	0.2	26
Total	0.4	190

Source: Author’s computation from the Ghana TRAVERA survey dataset, 2018

4.3 Share of company ownership

The establishment of businesses brings into fore the ownership structures put in place. Business ownership structures have long-term implications and determines many of its legal responsibilities. It is observed from Table 4 that, on average, more than 90 % of all firm types across the value chain are owned by domestic private with a very small proportion (less than 10%) owned by domestic government or foreign private/government entity.

Table 4: Share of company ownership

Ownership	Crops						Establishment															
	Yam		Cassava		Sweet Potato		Farm		Cooperative		Factory		Wholesaler		Retailer		Processor		Exporter		All	
	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N
Domestic Private	98.7	75	100	84	100	35	100	128	100	9	100	14	100	44	100	22	100	75	97.4	38	99.5	194
Domestic Government	0	26	0	22	100	1	2.7	37	0	6	0	8	0	26	0	4	0	23	0	7	2.0	49
Foreign Private or Gov't	7.4	27	4.8	21	0	0	0	36	0	6	14.3	7	4	25	0	4	4.6	22	25	8	6.3	48

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

4.2.6 Annual turnover for 2016

A business' annual turnover for an income year is generally the gross amount of income received by the business in the income year in the ordinary course of carrying on a business. Table 5 therefore shows average turnover in the year 2016 by crop and type of establishment. It is observed that, an amount of GH¢1986251.00 was realized as the average annual turnover in 2016 for both domestic and export markets across the various firms. By crop type, we also observe that firms in the yam value chain recorded the highest average annual turnover compared to the others. Firms in the yam value chain indicated an amount of GH¢4,642,747.00. Those in the cassava value chain had a turnover of GH¢428,111.10 and the sweet potato value chain made an amount of GH¢8,160.59 for the year 2016 for their average turnover for both domestic and export markets.

Across the firm type, though there were more farm establishments, on average, the highest annual turnover for 2016 was made by exporters with an average amount of GH¢9,655,822.00. This may be due to higher returns in foreign exchange for exporting the crop products. However, the least amount of GH¢543,840.00 was recorded by cooperatives, perhaps due to their numbers in the value chain under this survey. See also Table 6 which presents turnovers normalized by the number of employees in each firm.

Table 5: Annual turnover in 2016 (both domestic and export market)³

	mean (outliers suppressed)	mean	N
Crop			
Yam	4,642,747.00	6779782.00	74
Cassava	428,111.10	594135.20	83
Sweet potato	8,160.59	8160.59	34
Total	1,986,251.00	2886359	191
Establishment			
Farm	1,081,942.00	2,327,143.00	127
Cooperative	543,840.00	543,840.00	10
Factory	598,430.80	598,430.80	13
Wholesaler	1,719,516.00	1,719,516.00	43
Retailer	826,615.90	826,615.90	22
Processor	731,614.90	928,472.00	70
Exporter	9,655,822.00	14,400,000.00	36

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

Table 6: Annual turnover in 2016 adjusted with the number of employees (both domestic and export market)

	Average turnover per employee	N
Crop		
Yam	248,507.10	73
Cassava	10,948.00	82
Sweet Potato	836.74	33
All	101,416.80	188
Establishment		
Farm	82,456.50	126
Cooperative	36,795.11	10
Factory	16,507.50	13
Wholesaler	106,538.90	41
Retailer	64,692.66	21
Processor	26,059.72	70
Exporter	499,369.00	36

Source: Authors' computation from the Ghana TRAVERA survey dataset, 2018

4.2.7 Current market channels and potential future usage

Businesses across the value chain employ the services of various media through which they sell their products to the final consumer. The choice of a market channel may depend on the firm

³ Column 1 mean of this Table is computed using an outlier program which suppresses all observations above the 99th percentile

type and the overall objectives of the firm in the distribution of the final goods. And in fact, the efficiency of the market channel has implications on the turnover and output levels of the firm.

Table 7: Current market channels and potential usage in the future (proportions)

Market Channel	currently using this market Channels		Potential to use this channel in the future (1=No potential; 4=Very high potential)							
	Proportio	N	Yam		Cassava		Sweet Potato		All	
			Mean	N	Mean	N	Mean	N	Mean	N
Ghanaian export company	0.20	189	1.5	55	2.7	65	2.5	32	2.2	152
Foreign export/import company	0.09	179	1.7	61	2.6	68	2.2	34	2.2	163
Informal agent or trader	0.16	174	1.8	58	2	58	1.6	30	1.9	146
Major retail chains in the target market	0.26	172	2.0	59	2.4	55	2.9	14	2.3	128
Sales persons employed by your business in the target market	0.13	169	1.8	64	2.2	63	1.8	20	2.0	147
Wholesaler in the targeted market	0.51	176	2.3	41	2.9	34	2.8	12	2.6	87

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

Table 7 gives an idea of the various market channels being used by firms for the various crops currently and their potential usage of these channels for the selected crops in the future. First, among the various market channels, 45 % of firms currently sell their products through wholesalers in the targeted market followed by 23 % to the major retail chains in the target market and 19 % to a Ghanaian export company. Only 8 % of the firms sell their products to foreign export/import company.

Second, on a scale of 1 to 4 from Table 7, across all the three crops, the selected firms will in the future still prefer to sell their products through wholesalers in the targeted market followed by major retail chains in the target market. This is like what is observed by their current market channels. Also, this reflects the future sales of all the selected crop types. However, it is observed that, in the future, firms will equally choose to sell their products to either a Ghanaian export company or a foreign export/import company. The least medium to be considered by firms in the future will be through an informal agent or broker.

Third, although firms generally prefer to sell their products through wholesalers in the targeted markets in the future, across the crops, firms in the cassava value chain are more likely to use this medium followed by sweet potato and then, yam. Similar projections hold for Ghanaian export companies as well as foreign export/import companies. However, firms in the future are more likely to sell sweet potatoes in the major retail chains in the target market followed by cassava and then yam.

4.2.8 Annual cost of inputs for 2017

An organization's output is largely determined by the inputs of its production function, all things being equal. It is therefore expected that the quality of inputs and associated cost will determine the quality of the business output and ultimate profit. From Table 8, we observe that, in general, the cost of raw materials and intermediate goods represents the highest expenditure, on average, incurred by firms in 2017. This is followed by transportation cost. The least input cost was on communication services used in the production process. For firms under the selected crop type, a similar trend was observed. However, on average, the cost of raw materials and intermediate goods was highest in the yam value chain (GH¢388,600.30), followed by cassava (GH¢60,702.64) and then, the sweet potato value chain (GH¢28,566.67). However, beyond the cost of raw materials and intermediate goods, while, on average, firms in the yam value chain indicated transportation cost (GH¢127,500.50) as the next highest input cost, those in the cassava (GH¢39,597.36) and sweet potato (GH¢25,500.95) value chain indicated labour costs instead (which includes wages and bonuses).

However, across the firm type, it is observed that while all other firm establishments indicated the cost of raw materials and intermediate goods as the highest input cost to the firm, cooperatives on the other hand indicated labour costs as the highest input cost to their businesses in the value chain.

Table 8: Total Annual Cost of inputs in 2017

List of inputs	Crop						Establishment															
	Yam		Cassava		Sweet Potato		Farm		Cooperative		Factory		Wholesaler		Retailer		Processor		Exporter		All	
	Avg. Amt.	N	Avg. Amt.	N	Avg. Amt.	N	Avg. Amt.	N	Avg. Amt.	N	Avg. Amt.	N	Avg. Amt.	N	Avg. Amt.	N	Avg. Amt.	N	Avg. Amt.	N	Avg. Amt.	N
Basic facilities(electricity, fuel, water)	22,998.53	68	7,920.84	81	4,667.42	19	2,164.02	107	18,988.80	10	19,282.92	13	29,601.67	43	9,684.20	20	22,180.21	67	21,177.83	35	13,655.77	168
Communication services used in production	12,790.50	70	1,061.10	81	481.58	19	477.86	110	1,326.00	10	1,012.31	13	14,970.00	43	1,430.00	20	10,156.55	67	7,946.11	36	5,826.08	170
Labour-including wages, bonus	38,684.08	73	39,597.36	81	25,500.95	21	13,545.44	115	86,116.00	10	50,055.38	13	32,056.23	43	27,146.67	21	42,065.91	67	106,408.00	35	37,524.82	175
Raw materials and intermediate goods	388,600.30	72	60,702.64	81	28,566.67	12	95,393.09	108	65,744.44	9	182,669.20	13	305,063.50	43	473,857.50	20	110,416.00	64	728,683.50	34	201,448.10	165
Transportation cost	127,500.50	72	13,003.02	81	1,610.69	29	3,460.25	121	50,463.00	10	7,800.00	13	117,531.60	43	82,790.48	21	36,922.57	68	252,149.90	35	56,483.47	182

Source: Author's computation from the TRAVERA survey dataset

4.2.9 Transportation of products

Based on key informant interviews it was revealed that the mode of transportation depends on the level of business. For the domestic market, the preferred mode of transport is by road while most exporters' ship their products by sea or air lift. However, shipping is the most preferred because it is less expensive as compared to air lifting and larger volumes can be transported as well. Though export by air is more expensive this is done at the beginning of the yam season when there would have been scarcity in European market, air lifting of the first yams of the

season becomes more lucrative in Europe. This was confirmed in an interview at Calzion Export Limited where it was stated that:

“I don’t do vegetables...you know vegetables are mainly exported by air but yam is mostly exported by sea even though a few people airlift as well but that is very expensive.” (interview with Mr. Tetteh)

The preferred means of transport in the domestic market is by road where produce are transported in trucks or “motor king⁴”. From the interviews, it is realized that the choice of vehicle depends on the business. For instance, according to Mr Batu of GEOBAT Farms, who has to transport yam tubers to the Kokomba market where he mostly sells his yams he prefers trucks to transport the yams from northern Ghana to the South. On the other hand, Madam Afua, a processor who prefers to process cassava dough to gari because dough making is cheaper and less labour intensive prefers “motor king”. This is because she does processing, in the communities where she buys the cassava and it is easier to go through the processing chain which may have shorter distances from one stage to the other than a truck. She also added that:

“...all the processors in the area have a single transporter who comes to do the transportation for us during market days and we all pay him. Our station in the market is also not the best considering the nature of the cassava dough”.

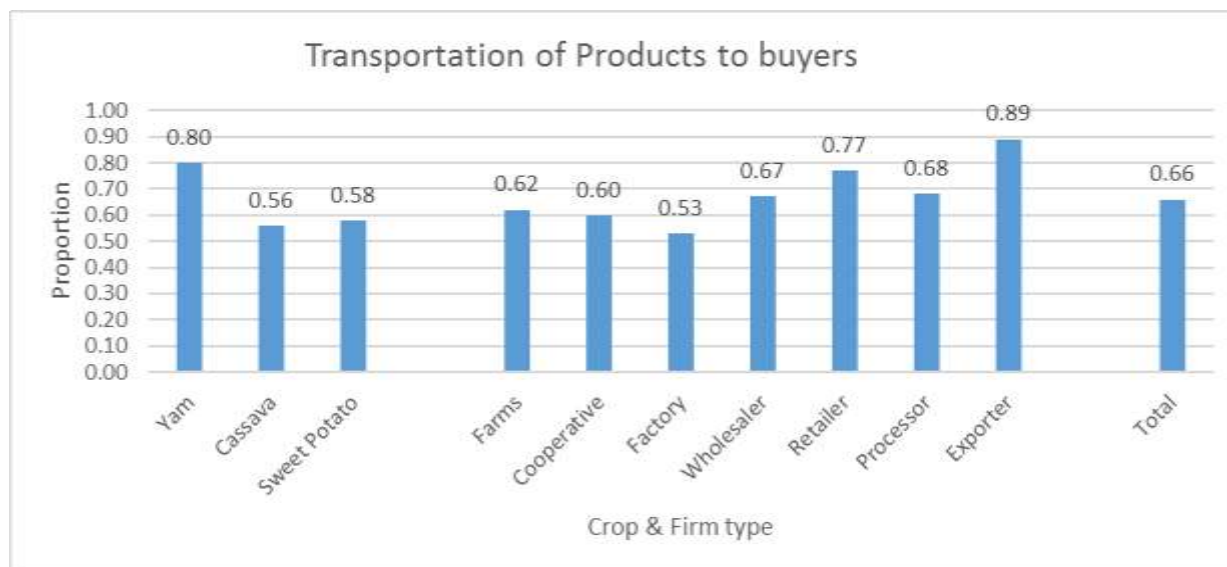
It was also noted that sellers do not always have to transport the products, though that is the practice in many cases. In some instances, buyers also go to the farm gate to buy and transport to the various markets for sale. Mr Batu indicated that:

“...buyers, who are mostly women come from Takoradi, Bawjiase, Winneba, Nsawam and many places to buy in bulk. He added that women still dominate in the retailing side of the yam value chain”.

This notwithstanding, statistical analysis at the firm level show that many farms transport to buyers. Figure 4.2 shows the proportion of firms in the value chain that transport their products to buyers. It can be observed that, across crop and firm type, 66% of all the firms interviewed transport their products to buyers. For crop type, it is shown that about 80% of firms in the yam value chain transport their products to buyers followed by sweet potato (58%) and cassava (56%).

⁴ This is a three-wheeled motor bicycle

Figure 4.2: Transportation of products to buyers by crop and firm type (proportion)



Source: Authors' computation from the Ghana TRAVERA survey dataset, 2018

In addition to this, Figure 4.2 also indicates that more than half of all firm types transport their products to the buyers. Across firm establishments in the value chain, 89 % of exporters transport their products to the buyers followed by retailers (77%). About 53 % of factory establishments transport their products while 60 to 68 % of the remaining firm establishments transport their products to buyers.

4.2.10 Obstacles to transportation of products

As indicated in Table 9, transportation remains one of the main issues confronting businesses across the value chain. This is evident in the large numbers of post-harvest losses partially due to the inability of the final goods to get to their various destinations as required. Table 9 highlights the severity of obstacles that firms face in the value chain in transporting the products to the buyers. From the table, it is observed that across all firm type and crop in the value chain, poor road facility is ranked, on average, as the most severe obstacle in transporting products followed by high cost of truck rentals, risks of accidents, inadequate trucks and then bribe by road agents and traffic police. Similarly, across the crop type, it is observed in Table 9 that beyond poor road facility the yam and sweet potato value chains also indicated risks of accidents and inadequate trucks as equally severe obstacles in the transportation of products respectively. In the cassava value chain, the next major obstacle beyond poor road facility is high cost of truck rentals in transporting the products to the buyers.

Table 9: Severity of obstacles to transportation of products (ranked 1-very severe to 4-no obstacle)

List of transportation problems	Crop						Establishment															
	Yam		Cassava		Sweet Potatoc		Farm		Cooperative		Factory		Wholesaler		Retailer		Processor		Exporter		All	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Bribe by road agents and traffic police	2.6	68	3.7	79	3.7	32	3.3	116	2.9	10	3.4	15	2.8	44	3.1	21	3.3	68	2.6	34	3.3	179
High cost of truck rentals	1.6	69	2.7	79	1.8	32	1.9	116	2.2	10	2.5	15	1.9	44	2.0	21	2.5	68	1.8	35	2.1	180
Inadequate trucks	2.4	69	3.2	79	2.5	32	2.5	116	2.8	10	3.6	15	2.7	44	2.7	21	3.2	68	3.2	35	2.8	180
Poor road facility	1.4	69	2.2	78	2.5	32	1.8	116	1.7	10	3.1	15	1.9	44	1.3	21	2.1	67	1.9	35	2.0	179
Risks of accidents	1.4	69	3.3	79	3.3	32	2.6	116	1.9	10	3.2	15	1.9	44	2.3	21	2.7	68	2.0	35	2.6	180

Source: Author’s computation from the Ghana TRAVERA survey dataset, 2018

Table 4.8 also shows that, on average, all firm types indicated poor road facility as the most severe obstacle to transportation of products except for firms under factory establishments which indicates the high cost of truck rentals. In addition, on average, whereas all firm types indicated bribery by road agents and traffic police as the least severe obstacle to transportation of products, exporters and factory establishments indicated inadequate trucks as the least severe obstacle. Unreliable transportation services can also be an obstacle to transporting products. According to Madam Efua Sika, a cassava processor at Bawjuasi:

“...cassava is very perishable so after harvest and peeling she sends it directly to the processing centre to prevent it from going bad. I don’t rely on just one driver so that in case the driver isn’t available the time I’d be transporting; I wouldn’t be disadvantaged.”

4.2.11 Membership of association

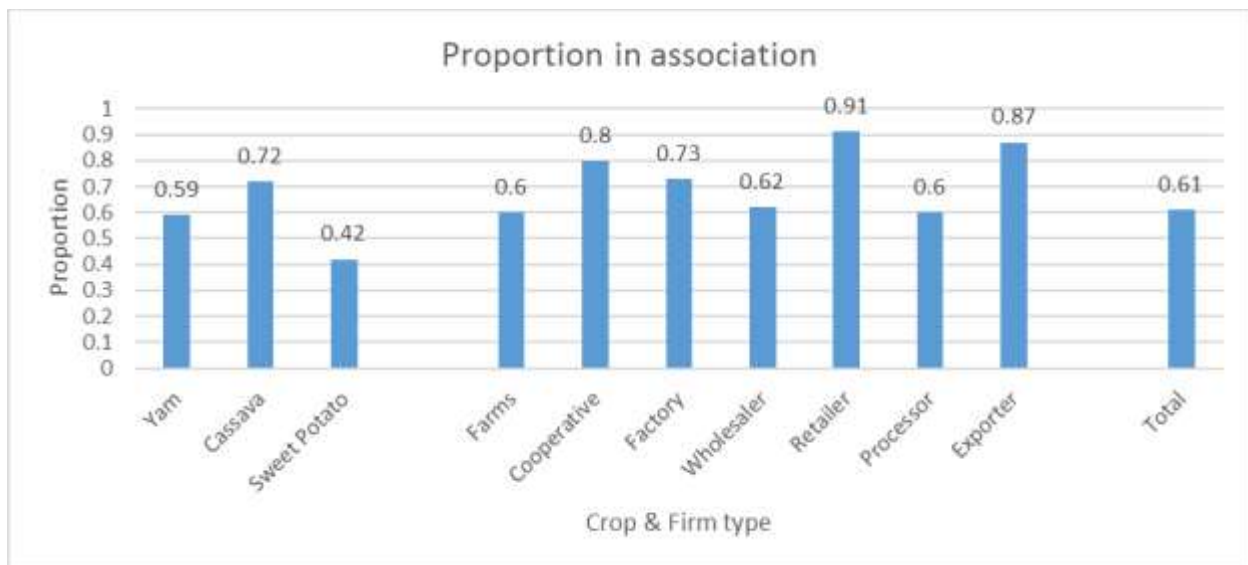
Belonging to an association may increase the bargaining power of actors in the value chain. Hence respondents (firm owners) were asked whether they belonged to a farmer/trade/producer association/organization. From Figure 4.3, it is observed that about 61% of respondents in the value chain is a member of an association. Across the selected crop type, about 72% of respondents in the cassava value chain belonged to an association followed by those in the yam (59%) and sweet potato (42%) value chains. In addition, across the firm type, it is observed that at least 60 % of all respondents belonged to an association with the highest proportion recorded by retailers (91%) in the value chain followed by exporters (87%) and cooperatives (80%).

Data coming out of the qualitative study suggests that, apart from the benefit of increased bargaining power, associations also ensure peaceful coexistence among its members as well as welfare packages for marriages and funerals. Madam, Efua Sika, a cassava processor emphasized that some of the benefits they derived from the association include; the peaceful co-existence between cassava dough processors in the market. She indicated that before the establishment of the association, they used not to agree on going to the market in turns (that is to have a sales schedule for members) but with the association, they now have an agreement. She added that as part of welfare commitment, members contribute 5 Cedis when a member is getting married and when a close relative of a member passes away. This is a clear indication of how associations can build social network and foster close relationships and cooperation. Through associations, members are able to come together as one and fight for their interest. To agree to a schedule for selling is a way of regulating market entry in order to control market prices. The time table allows few traders in the market at a time therefore glut reduced and a balance is created where desired prices can be maintained.

Mr Batu who is a member of the Ghana Root Crops and Tubers Exporters **Union** (CROTEU) and Ghana Assorted Foodstuff Exporters Association stated the reason for the establishment of CROTEU as:

“in the beginning everybody was just operating any how without control, so we thought it wise that we should come together to form a union and by forming a union you need to join an association that are in yam exporting. So during that time, we were having only 4 yam export association and before you can join the GROTEU you needed to be part of the association”.

Figure 4.3: Proportion of Employers as Members of an association



Source: Author’s computation from the Ghana TRAVERA survey dataset, 2018

4.3 The demand for the selected roots and tubers (exports in the value chain)

Across the value chain, it is highly recognized that products are not only produced and/or consumed in the local market but also for the foreign markets. Exports bring in foreign exchange and increases the local competitiveness of market products. This section looks at the demand for the products sold by the selected roots and tuber export value chain, past and future trends, export-related opportunities and constraints faced by firms. We begin these discussions with how firms engage with the export markets in the next sub-section.

4.3.1 Firm engagement in exports

Firms across the value chain are expected to engage in exportation of products to trade-off excess supply from the local market. Table 10 shows the proportion of firms engaged in either direct or indirect export of the selected root and tuber crop across crop type and type of firm establishment. It is observed that 52 out of the 198 firms under the survey, representing 27% of all the firms interviewed, are engaged in a direct or indirect export of their products. Out of this, 46% are in the yam value chain, 18% in the cassava value chain and 6% in the sweet potato value chain. For the firm type, it is observed that beyond the exporters (97%), retailers (36%), wholesalers (33%), processors (24%), and farms (12%) export their products directly or indirectly with the rest recording less than 10%.

On the qualitative front, although firms generally prefer to sell their products through wholesalers in the targeted markets in the future, across the crops, firms in the cassava value chain are more likely to use this medium followed by sweet potato and then, yam. Similar projections hold for Ghanaian export companies as well as foreign export/import companies. However, firms in the future are more likely to sell. Among the 3 selected crops, yam is seen as the most economic crop in demand, whether as income generation, employment and food security. It is the preferred crop on the export market and though there are many varieties, “puna” especially is preferred. In an interview respondents referred to the yam business as “hotcake business” and “gold”.

“We don’t call buyers to come and buy, they come themselves. We don’t market it through radio stations or televisions but the buyers themselves come to buy them”

(interview with GEOBAT Farms).

“You know, the Ghana puna⁵ yam is gold on the export market. You don’t even need to market before people come and buy. I already have customers who are always ready to come and buy, numerous customers. I normally export the ‘puna’ but when the ‘puna’ is extinct or no longer in the system then I start exporting the white yam but the puna has a better taste than the white yam. So the customers also prefer the puna. In the whole world, I think Ghana’s puna is best yam. Brazilians also export yam but their yam is not as good as the yams exported from Ghana so in the whole world, Ghana’s puna yam is the best in the market. The consumers also prefer the puna to the other varieties. The containers that leave this country in a week, about 20 containers are yam and mostly they are puna.

⁵ A variety of yam grown in Ghana

(interview with Calsion Exports).

The demand for yam exports has increased, Mr. George Batu, Geobat Farms, Oyarifa explained; Europeans are beginning to eat yam so the exporting of it has become very high. He admitted that the Africans in Europe prefer buying yam than foreign food. Brazilians also export yam but their yam is not as good as the yams exported from Ghana so in the whole world, Ghana's pona yam is the best in the market. Mr. Maxwell Osei Kusi, the Director of the Ghana Export Promotion Authority (GEPA), admitted in an interview that among the three root crop tubers, currently yam is the leading export commodity. This is in the sense that a lot more of yam is exported than the others. However, other exports such as gari as a cassava derivative mainly go to UK and USA. Sweet potato, he noted is a product that is in the developmental stages and has been catching quite a bit of attention of late.

Table 10: Firms engaged in export by crop and firm type (Proportion & Frequency)

	Proportion	Frequency	N
Crop			
Yam	0.46	35	76
Cassava	0.18	15	83
Sweet Potato	0.06	2	36
Total	0.27	52	195
Establishment			
Farms	0.12	15	128
Cooperative	0.2	2	10
Factory	0.5	7	14
Wholesaler	0.33	15	45
Retailer	0.36	8	22
Processor	0.24	18	74
Exporter	0.97	37	38

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

4.3.2 Extent of interest in commencing exports

Firms which are not engaged in either direct or indirect export of the selected crops across the value chain expressed their intent on the extent at which they will commence exports. Table 11 presents the results of their responses. It is observed that, across both the crop and firm type, 58 employers out of the 142 responses have not thought about exporting their products and 12 employers simply do not have an interest in exporting at all. However, a total of 72 employers have some interest in starting to export their products.

Across the crop type, it is observed 25 out of the 41 employers under the yam value chain as well as 29 out of the 67 employers under the cassava value chain have not thought of exporting their products at all. However, a total of 15 employers in the yam value chain, 34 in the cassava value chain and 23 in the sweet potato value chain are identified as those that have some interest in exporting their products.

For the firm type, it is first and foremost observed that the number of exporters under this category are less because a larger proportion of them are already in the exporting business. In addition, we also realize that 17 out of the 30 wholesalers and 23 out of the 55 processors have not thought about exporting their products at all.

Table 11: Extent of Interest in Exporting (Percentage and Frequencies)

Interest of Exporting	Crop						Establishment															
	Yam		Cassava		Sweet Potato		Farm		Cooperative		Factory		Wholesaler		Retailer		Processor		Exporter		All	
	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.
Haven't thought about it before	61.0	25	43.3	29	11.8	4	44.3	50	62.5	5	14.3	1	56.7	17	28.6	4	41.8	23	0.0	0	40.85	58
No interest in starting exporting	2.4	1	6.0	4	20.6	7	5.3	6	0.0	0	0.0	0	6.7	2	0.0	0	12.7	7	0.0	0	8.45	12
Fair interest in starting exporting	4.9	2	7.5	5	26.5	9	14.2	16	0.0	0	0.0	0	0.0	0	14.3	2	7.3	4	100.0	1	11.27	16
Strong interest in starting exports	12.2	5	11.9	8	26.5	9	15.0	17	25.0	2	14.3	1	6.7	2	14.3	2	16.4	9	0.0	0	15.49	22
Very strong interest in starting exports	19.5	8	31.3	21	14.7	5	21.2	24	12.5	1	71.4	5	30.0	9	42.9	6	21.8	12	0.0	0	23.94	34
Total	100	41	100	67	100	34	100	113	100	8	100	7	100	30	100	14	100	55	100	1	100	142

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

4.3.3 Share of total sales exported in 2017

Firms which expressed some level of interest (fair, strong and very strong interest) in commencing exports in 2017 were asked to indicate the share of their total sales (for both

domestic and export markets) that will be exported directly to foreign markets or indirectly through intermediaries assuming the firm were already engaged in exporting. From Table 12, it can be observed that, out of the 56 firms which expressed interest in commencing exports in 2017, on average, more than half of their total sales were exported directly to foreign markets. However, it can also be observed from Table 12 that on average, over 30% of total sales across both crops were exported indirectly through intermediaries.

Table 12: Share of total Sales exported in 2017 (assumed if interested in starting exports)

	Exported directly to foreign markets	N	Exported indirectly through intermediaries	N
Crop				
Yam	52.3	47	31.9	45
Cassava	54.7	50	35.3	47
Sweet Potato	53.3	49	32.7	47
Total	51.5	56	33.2	53

Source: Authors' computation from the Ghana TRAVERA survey dataset, 2018

4.3.4 Importance of certain requirements on product purchase

Buyers, intermediaries and final consumers of market products across the value chain identify certain requirements that attracts the market demand for these products. These requirements, as indicated in Table 13, sends a signal to employers in the roots and tubers value chain on the purchasing requirements of the products in the market. Overall, across the various crop type, it can be observed that, buyers, intermediaries and final consumers may place a higher demand on products graded by their quality followed by a certain/specific product variety and on how the product is frequently supplied. However, since employers in the yam and cassava value chain perceive buyers, intermediaries and final consumers to relatively rank higher products graded by their quality above all else, responses from the sweet potato value chain show that a specific variety of the product is regarded as relatively more important than the other requirements.

As earlier mentioned, key informants suggested that “puna” is the most preferred variety because of the taste, this is followed by white yam. George Batu reiterated that, some foreigners from Nigeria have settled in Ghana for the last five years to study the production of yam especially the puna variety. He intimated that, “The Nigerians have yam but they cannot produce the puna because of the nature of their soil and some of them are even in our villages producing puna now; puna has the highest demand so the price is also high than all the other varieties.” Furthermore, the size of root tubers particularly yam is one requirement that attracts the market demand for these products. Whereas the domestic market and South African market prefer larger tubers, in Europe and America, they prefer smaller sizes. Mr. Tetteh of Calzion Export Limited, further explained that in Europe, yams are sold according to weight.

“When they take it to their supermarkets, they scale and sell according to the weight but in South African and other African countries they don’t sell it in kilos, they just look at the size and price it accordingly.”

To be able to enter the European market there are certain requirements that exporters must adhere to. For instance, in export, yam packaging is so meticulous, the yams have to arrive without bruises and no traces of roots, the reason the tubers are wrapped in paper before putting in the box and women carefully clean the tuber of any sand to ensure phyto-sanitary standards are adhered - importing countries’ requirements. Mr. Batu indicated in an interview that:

“in the rainy season the yams still have mud and a lot of dirt on them so the women come and wash and brush them but these times that we are no longer in the rainy season, there are no mud on the yams so we just cut off the roots and package them. I have a packaging material and the labourers wrap the yams after cutting and cleaning in a paper and then arrange them in the box and seal it up”.

Exporters also indicated that they have had to send a sample of their products to potential buyers in Europe for certification before they establish a business partnership. Other buyers have also come do conduct their personal inspection of ware houses before engaging in business with the exporter. Mr Batu and Calzion Exports stated that they got some buyers by visiting the country they intended to export.

“For South Africa, I went there myself. I took the liberty to travel there and look for customers myself. In UK and US, sometimes I get my customers from the internet and sometimes too my friends residing there introduce them to me” (Interview with Calzion exports).

There are also preferred cassava varieties for processors, according to Madam Efua, the varieties include: ‘Madu-maku’ it is very whitish and it is usually the biggest of the cassava tubers. There is also the ‘Esi Abaka’ (has the fastest maturity rate, it matures after 6 months), ‘Maame Baasari’, Agege’ (is small in size with a high-water content) and a few more however, the preferred variety for processing gari and cassava dough is ‘Madu-meku’. This is the preferred because, it has the least water content and its tubers are comparatively bigger so when they process they get more. According to her, the Ayensu Starch Factory introduced a new variety locally referred to as ‘Kuffour Bankye’ because it was introduced during President Kuffour’s tenure.

Table 13: Importance of requirements buyers, intermediaries and final consumers may have on product (Scale: 1-Not important to 4-Extremely important)

Requirements	Crop						All	
	Yam		Cassava		Sweet Potato			
	Mean	N	Mean	N	Mean	N	Mean	N
Certain variety of the product	3.4	76	2.2	84	3.4	36	2.9	196
Environmental requirements	1.9	74	2.1	84	2.5	35	2.1	193
Frequent supply of the product	3.0	75	2.4	84	3.3	36	2.8	195
Health requirements	2.6	72	2.2	80	3.2	36	2.5	188
Minimum supply of the product	2.6	74	2.1	83	3.0	36	2.5	193
Packaging	2.5	73	2.1	84	2.6	35	2.4	192
Products graded by the quality	3.4	71	3.0	82	3.0	22	3.2	175

Source: Author's computation from the TRAVERA survey dataset

4.3.5 Certification of export products

Export products from the various firms under the value chain are expected to meet certain requirements to enable them to conform to fair trade, environmental, or ethical labelling with foreign technical regulations before they are shipped.

Table 14: Certification of export products for conformity

Type of certification	Crop						All	
	Yam		Cassava		Sweet Potato			
	Freq.	N	Freq.	N	Freq.	N	Freq.	N
Environmental	28	52	6	66	0	20	34	138
Ethical labelling	25	49	6	66	0	20	31	135
Fair-trade	18	42	8	67	0	20	26	129
Social responsibility	14	41	3	63	0	20	17	124

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

From Table 14, it is observed that, in all the firms interviewed under this survey, firms in only the yam and cassava value chain had some level of certification of their products before they are being exported. In general, over 30 firms have their export products certified for environmental and ethical labelling while 26 firms and 17 firms are certified for fair-trade and for social responsibility respectively. Across the selected crop type, though the distribution of firms who have certified their export products were observed only for firms in the yam and cassava value

chain, the number of firms recorded in the yam value chain were proportionally more than those in the cassava value chain. However, in all the crop type, the least certification by firms in the two value chain businesses was on their social responsibility.

Exports to the European Union (EU) market require a GLOBALGAP certification. Mr. George Batu in an interview revealed that Geobat is a GLOBALGAP certified company, trained by the Centre for the Promotion of Imports from developing countries (CBI) from Netherlands and they issued the certificate to them. Likewise, he added that some clients abroad require a Hazard Analysis and Critical Control Point Certification; a client requested for this type of certification in 2013; fortunately, he had also gone for a training course on the HACCP so was able to provide him with evidence. Within the domestic setting, Plant Protection and Regulatory Services Directorate of the Ministry of Food and Agriculture is responsible for quarantining and clearing yams for exports. After they check the yam, they issue a quarantine certificate. Mr. Tetteh posited in his interview that, after the Ministry issues the certificate, he sends it to his clients abroad as a way of confirming the yams have been rightly checked and quarantined before he can give the final go ahead to export.

He added that without the quarantine certification, you cannot export food products outside the country. He further explained that the Standards Authority as well does checks on the cartons and packaging to see if they are of high quality. In an interview with representatives from FAGE and GROTEU, they added that GLOBAGAP is a food and safety standards set by supermarket chains in Europe and now it has become global so the name is Global Good Agricultural Practices. Apart from the standards and certifications mentioned, they added that we have also sustainability standards like Fair Trade, UTZ, Rain Forest Alliance and No Child Labour which are sustainability standards. These are private standards and are not regulated by law but buyers have come together and said they will only buy products that satisfy these conditions. Most times, they will come down to the production levels or to the buyer and work with the buyer to help the farmers produce according to these standards.

4.3.6 Benefits of supplying to the export market

Generally, it is expected that firms that engage in the export of their products are able to attract certain benefits to boost their business operations. Some of these benefits may include higher income due to foreign exchange, knowledge and exposure to larger foreign markets and the transfer of business ideas, knowledge and sharing of business values. From Table 15, across both crop and firm type, on average, higher income through foreign exchange, is ranked as the most important benefit by which firms export their products with the least important beneficiary being the transfer of technology and business management know-how. An observation across the crop type also show similar results. However, Table 15 indicates that firms in the sweet potato value chain, on average, equally identify higher income and the business contacts with foreign buyers as extremely important benefits of supplying to the export market.

To help firms access these export markets and reap the benefits thereof, a recent CBI program, for example selected Mr. George Batu of Geobat was as a yam exporting company together with about 23 companies from Ghana, Burkina Faso, Mali, Benin and Senegal for a trade fair. As part of the programme, they were sent to Europe and trained on how to market by themselves to be

able to enter the European market. Also they were made to write Export Marketing Plan at De Hague in the Netherlands. Through this initiative he was able to establish contacts with foreign buyers as well as increase his knowledge of the foreign market.

Table 15: Benefits of supplying to the export market (Rank: 1=Not important; 4=Extremely important)

Benefits of exporting product	Crop						Establishment															
	Yam		Cassava		Sweet Potato		Farm		Cooperative		Factory		Wholesaler		Retailer		Processor		Exporter		All	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Business contact with foreign buyers	3.4	75	3.1	80	3.5	27	3.2	120	3.0	10	3.3	15	3.2	45	3.0	21	3.3	67	3.4	38	3.3	182
Diversification of income sources	3.1	73	3.4	80	3.3	27	3.4	120	2.8	10	3.3	15	3.0	45	3.1	21	3.1	67	2.9	36	3.3	180
Higher income	3.5	75	3.6	80	3.5	27	3.7	120	3.2	10	3.5	15	3.4	45	3.2	21	3.4	67	3.6	38	3.5	182
Knowledge of foreign markets	3.4	75	2.9	79	3.3	27	3.1	120	3.2	9	3.5	15	3.4	45	3.0	21	3.3	67	3.4	38	3.2	181
More reliable and regular income	3.1	74	3.4	80	3.4	27	3.3	119	3.1	10	3.3	15	3.1	45	3.0	21	3.1	67	3.1	38	3.3	181
Transfer of technology	2.7	75	2.5	80	3.1	27	2.7	120	2.8	10	2.8	15	2.8	45	2.3	21	2.7	67	2.4	38	2.6	182
Transfer of business management know-how	2.9	74	2.3	80	3.0	27	2.7	119	2.8	10	2.9	15	3.0	45	2.3	21	2.5	67	2.7	38	2.6	181

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

4.3.7 Obstacles militating against starting or increasing export

The presence of certain business constraints including higher costs, institutional or service support systems may militate against a firm's desire in starting to export despite the advantages in exporting products to other markets. Overall, as noted in Table 16, on average, financial cost and access followed by the high logistic cost were indicated by employers as most severe obstacle that discourage them from commencing export. However, the lack of skilled labour in the value chain is generally seen as the least obstacle in starting to export in Ghana. A closer look across the crop type indicates that beyond financial cost and access, on average, whereas employers in the yam value chain identify lack of support from the government as the next severe obstacle to start export, those in the cassava value chain in addition to government support, equally identify lack of market information and market access as the next severe obstacle to start export. For employers in the sweet potato value chain, it is observed that, beyond the financial cost and access, the high logistic cost, high utilities cost (including energy and electricity cost) and government support is regarded as the next severe obstacle militating against starting to export.

In addition, Mr. Maxwell Osei Kusi from GEPA lamented that one militating factor preventing companies from increasing exports is due to the misconduct of some of our companies or exporters. He bemoaned that some of the companies do not send their products to standards authority for certification, or to Food and Drugs Authority for the necessary certificates to cover the risks. He said "they are not subjecting their processes to proper industrial quality checks and things like that so when the products unfortunately end up in the market, the Europeans and Americans test them and when they test them, they sometimes find out intolerable levels of what we call Maximum Residue Levels, "MR." Products from Ghana are limited in terms of access to

markets so when our products get there, they are subject to rigorous tests. Representatives from FAGE and GROTEU lamented the lack of commitment on the part of government to be realistic. They reiterated that as a country, we are taking on too many things at the same time so there is no attention to detail. If we want to move this economy, we need to take agriculture seriously and have specific goals for each of the crops that we want to tackle. We don't have to take all at the same time. Let's start with those that we eat here and gain sufficiency in them. If we gain sufficiency in those we eat here, we can then move on and link them to industry.

In response to a question on increases in export, respondents were of the view that yams were always produced in abundance until last when they experienced some decreases that affected exports. They recount high production of yam except for the year before which they say was due to weather failure, that is inadequate rainfall. Lack of finances, unstable prices were also given as contributing to decreases in export. Calzion Exports stated that:

“The system is becoming hard and to be able to generate money to export in large quantities is not easy and then also the yams too have become very expensive these days so since the yams are now expensive, I cannot buy more quantities like before. Then also, the way we increase prices of products in Ghana is not the same in other countries. In other countries, maybe once in a year, they'll increase prices of products but in Ghana, day in day out, prices are changing...almost every week prices are changing. So due to that, it disturbs the business”

According to the processor, there are peak and lean seasons: she further explained that, when schools reopen in Ghana gari processing becomes very lucrative. Immediately after school, the gari processing business becomes less attractive which makes the cassava processing business unstable. She pointed out that cassava is always available but the prices are unstable:

“Cassava is usually available all year round because farmers plant them seasonal. If any processor tells you cassava is not available for processing, then it is the farmers who do not want to sell to her because maybe she does not pay the farmers well or on time. The farmers communicate with each other so if you are a buyer and you do not treat a single farmer well, all the other farmers will get to know and they will avoid selling to you.

Let me give you an example. Recently farmers harvested their cassava and went to sell them to the Ayensu Starch Factory. One of my children was even part of the farmers who went to sell to the factory. It's been more than 5 months since the sale but the farmers have not been paid. The factory is in the outskirts of the community. When the factory started, the farmers preferred to sell to them than to us. We the processors even became worried and jealous of the factory because we were losing our farmers to them but now that the factory is unable to pay farmers, the farmers are now running back to us. There are farmers who have not been paid for cassava they supplied to the factory about 8 months ago. 8 months! So now the farmers are running back to us and we are also hesitating to accept them back”

(Interview with Madam Afua).

Table 16: Obstacles militating against starting or increasing export (1=very severe; 4=No obstacle)

List of obstacles	Crop						Establishment												All			
	Yam		Cassava		Sweet Potato		Farm		Cooperative		Factory		Wholesaler		Retailer		Processor		Exporter		All	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Financial cost and access	1.2	76	1.6	85	1.3	28	1.2	125	1.0	10	2.2	15	1.6	45	1.1	21	1.7	72	1.7	38	1.4	189
High logistic cost	1.7	74	2.4	85	1.8	28	1.9	124	1.4	10	2.6	15	1.9	44	2.4	21	2.1	72	2.0	36	2.0	187
High utilities cost(energy & electricity cost)	2.3	75	2.9	85	1.8	28	2.7	124	1.5	10	2.9	15	2.5	45	2.6	21	2.1	72	1.8	38	2.5	188
Lack of skilled labour	3.0	75	3.4	84	2.7	28	3.1	123	2.7	10	3.5	15	3.1	43	3.2	21	3.2	71	3.1	38	3.1	187
Lack of support from the government	1.4	75	1.9	84	1.8	28	1.4	124	1.4	10	2.5	15	1.7	44	1.2	21	2.0	72	1.6	37	1.6	187
Limited use of technology and innovation	2.2	76	2.9	85	2.2	28	2.3	125	1.6	10	3.2	15	2.4	45	2.8	21	2.5	72	2.9	38	2.5	189
Lack of market information and market access	1.6	76	1.9	85	2.1	28	1.6	125	1.8	10	2.5	15	1.8	45	1.4	21	2.0	72	1.9	38	1.8	189
Not encouraging profit	2.6	76	2.3	84	2.7	28	2.6	124	2.9	10	2.8	15	3.0	45	1.8	21	2.7	71	2.1	38	2.5	188
Procedural obstacles or procedural inefficiency	2.1	76	2.8	84	2.4	25	2.5	122	1.9	10	2.7	15	2.1	45	2.5	21	2.5	71	2.1	38	2.5	185
Quality of agricultural inputs	2.6	75	3.2	83	2.3	23	3.0	120	2.7	9	3.3	15	3.0	43	2.7	20	3.2	67	2.2	38	2.9	181
Risky business	2.0	75	2.4	85	2.4	27	2.2	123	2.1	10	2.4	15	2.2	45	2.0	21	2.4	72	2.4	38	2.3	187
Satisfied with the local market	3.3	74	2.4	85	2.8	26	2.8	122	3.5	10	3.4	14	3.4	44	2.6	21	3.0	70	3.0	37	2.8	185
Technical regulations and requirement on food products for export are too strict	2.5	72	2.9	83	2.2	25	2.6	117	1.6	10	3.1	15	2.5	45	2.8	21	2.6	72	3.0	37	2.7	180

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

4.3.8 Business constraints

Table 17 shows the constraints which militates against starting a business on a scale of 1 to 4 by crop and type of establishment. It is generally observed that, on average, across both crop and type of establishment, access to finance has been the main challenge in starting a business across the value chain in Ghana whiles the least threat for business establishment is labour regulation. Across the selected crop types, the results show that, on average, beyond access to finance, firms in the yam value chain are also constrained highly by the lack of market information and transportation for exports. In addition, employers in the cassava value chain are also highly constrained by access to machinery and technology and lack of market information. For firms in the sweet potato value chain, beyond access to finance, on average, other factors highly regarded as constraints to starting a business are access to machinery and technology and utility costs.

Table 17: Constraints militating against starting a business (scale 1=Not important; 4=Extremely important)

Constraints	Crop						Establishment															
	Yam		Cassava		Sweet Potato		Farm		Cooperative		Factory		Wholesaler		Retailer		Processor		Exporter		All	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Access to finance (cost of finance)	3.9	76	3.6	86	3.9	35	3.9	128	3.9	10	3.4	15	3.6	45	3.8	22	3.6	76	3.6	39	3.8	197
Access to machinery and technology	2.6	76	2.8	86	3.4	35	2.9	128	3.1	10	2.9	15	2.3	45	2.3	22	2.8	76	2.4	39	2.8	197
Economic and regulatory policy	2.6	75	1.7	86	2.1	34	2.1	126	2.7	10	1.8	15	2.5	45	2.1	22	2.3	76	2.6	38	2.1	195
Lack of information regarding market demand	3.2	76	2.8	86	2.6	34	3.2	128	2.9	10	1.8	15	2.8	45	3.2	22	2.7	76	2.8	39	2.9	196
Labour regulation	1.5	76	1.4	85	1.8	35	1.4	127	1.5	10	1.4	15	1.3	45	1.6	21	1.5	76	1.8	39	1.5	196
Skills of existing workers	1.4	76	1.6	85	2.0	35	1.6	127	1.8	10	1.9	15	1.4	45	1.7	21	1.6	76	1.8	39	1.6	196
Transportation for exports/cold chain	2.9	68	2.1	74	2.8	32	2.6	107	3.1	9	2.3	15	2.9	45	3.0	21	2.5	68	2.7	38	2.5	174
Utilities cost (electricity, water)	2.5	72	2.0	86	3.0	33	2.0	122	3.0	10	2.6	15	2.3	45	2.1	22	2.7	76	3.2	39	2.4	191
Quality of agricultural raw materials	2.2	74	1.7	85	2.2	32	1.8	124	1.4	10	1.8	15	1.7	45	2.1	20	1.8	74	2.7	38	2.0	191

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

As can be seen in Table 17, all the respondents emphasized on lack of finance as the most constraining factor to business. However, respondents were unhappy about unfavourable policies and lack of government commitment in the yam export sector. They pointed out charges of 60cents per box paid on each box when exporting which is different from the export duties. They explained that such taxes are disbursed as follows: 53% is given to GROTEU and the Ministry of Trade takes 47%. Another concern was the fact that GROTEU does not have a warehouse for members of the association but rather renting a warehouse. They are of the view that yam exports bring a lot of revenue to the nation hence government is expected to construct a permanent warehouse for GROTEU. In reference to cocoa, the respondents indicated that government is always much focused on cocoa to the disadvantage of other crops. They believe that strong policies are made to protect the cocoa sector such that there is no way one can bypass the cocoa marketing board to sell cocoa to any other company. They believe the yam sector is neglected because they say cocoa is not perishable but the yam is perishable.

“...If it was Burkina Faso which had this yam business, they would have made good use of it than we are doing. I am saying this because we have been going to trade fairs and they also come for those trade fairs as well. When they are coming to these trade fairs, they have ministers and government officials coming with them but no Ghanaian minister or government official has ever gone with us. It is only usually the Ghanaian Ambassador for the country in which the fair will be held who might come there. Even if the minister of trade cannot go, at least officials or executives within the ministry could go to these fairs with us and support us but they don't”

(interview with GEOBAT FARMS).

They reiterated that yam is generating a lot of money to government. The government gets not less than 7 million dollars a year from just the yam that passes through the port for export. So if

the government should build the warehouse and put measures in place so that no one should bypass that warehouse to export their yam that revenue could grow further. There are some yams that are also passing through the airport every day and the exporters don't pay anything I mean government doesn't get anything from that. Another area of worry expressed was the paperless policy that they've brought to the port:

“You know with this new policy, when the systems are down you cannot work or operate so due to that, sometimes they can leave your container without working on it. The system is such that everything is online and so sometimes we cannot even make inputs and because of that they will leave your container without working on it until the next time they will be working. For me, that is the only problem I have with that policy”

(Calzion Exports)

4.3.9 Actions to improve competitiveness of export product

Across the value chain, firms engage in several activities to make their products more competitive and increase their effective competitiveness against imports into Ghana. From Table 18, it is generally observed that access to good quality inputs as well as investing in new equipment is identified by employers as very key in increasing the competitiveness of their products against imports into Ghana. Simplification of the taxation process is observed to be the least issue to be concerned with, in their bid to ensure competitive products in the export market. As it is observed across the crop type, beyond access to good quality inputs, employers in the yam value chain also identified the increase in the quality of products, followed by improvement in the quality of education and training system as the next key action to improve product competitiveness. However, employers in both the cassava and sweet potato value chain ranked the investment in new equipment as the most important action to be taken to make their products compete effectively against imports into Ghana.

According to Mr. Maxwell Osei Kusi from GEPA, Ghana Export Promotion Authority has a plan towards ensuring that yam production is increased but also the quality of the yam is improved considerably so that the shelf life of the yam on the export market will be much better than it is now and the buyers will have more confidence to buy from us in Ghana. They are working closely with Ghana Root Crops and Tubers Exporters Union which is the umbrella body for all yam exporters in Ghana. The organization, he explained, has developed some plans of helping the association to reach out to their out-grower farmers and we will be doing a lot of training for the farmers as well. We have also initiated a seed yam improvement activity where we are giving support to the Ghana Yam Development Council which is the policy or advocacy group for the yam sector in Ghana so that they can cultivate improved yam seedlings for dissemination to the farmers so that they can improve the stock. In sweet potato production, we have identified the sweet potato innovative platform through which we are channeling support. He gave an example of giving support to multiply sweet potato vines at Sogakope. Other actions include a provision in the work-plan of GEPA to give support to research institutions such as the CSIR to go into research in processed yam.

Table 18: Actions to increase competitiveness of product or compete effectively against imports into Ghana (1=Not important 4=Extremely important)

Actions to be taken	Crop						Establishment															
	Yam		Cassava		Sweet Potato		Farm		Cooperative		Factory		Wholesaler		Retailer		Processor		Exporter		All	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Access good quality inputs	3.4	75	2.7	84	3.3	35	3.1	127	3.6	10	2.3	15	3.0	45	2.8	22	3.2	73	3.4	38	3.1	194
Improve quality of education and training system	3.0	75	2.5	84	3.0	35	2.8	127	3.6	10	2.5	15	3.0	45	3.0	22	2.8	73	3.0	38	2.8	194
Increase quality of products	3.1	74	3.0	84	3.2	35	3.1	127	3.7	10	2.9	15	3.2	45	3.1	22	3.2	73	3.0	37	3.0	193
Introduce new product lines	2.3	75	2.8	84	2.8	35	2.5	127	3.7	10	3.1	15	3.0	45	2.8	22	3.2	73	2.2	38	2.6	194
Introduce new technological lines	2.6	74	3.2	83	3.3	35	2.9	127	3.6	10	3.4	14	3.2	44	2.8	21	3.3	72	2.5	38	3.0	192
Invest in new equipment	2.7	75	3.3	83	3.4	33	3.1	124	3.0	10	3.1	15	2.8	45	2.5	21	3.3	72	2.9	38	3.1	191
Recruit new workers	2.0	74	1.9	82	2.3	35	2.1	125	2.4	10	1.8	14	1.8	44	2.0	22	2.0	72	1.8	37	2.0	191
Reduce the cost of utilities	2.5	75	2.3	84	3.1	34	2.2	126	3.1	10	3.1	15	2.6	45	2.1	22	3.0	73	3.3	38	2.5	193
Simplify taxation process	2.7	73	1.8	84	2.8	33	2.2	125	2.5	10	1.9	15	2.2	44	2.3	22	2.4	71	3.2	37	2.3	190
Train the existing workers	2.9	74	2.4	84	2.7	34	2.7	126	3.7	10	2.5	15	3.2	45	2.8	22	2.8	72	2.7	38	2.6	192

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

4.3.10 Firm capabilities

All kinds of businesses are endowed with certain capabilities that enables them to perform functionally and to improve upon their overall effectiveness and efficiency in both the local and foreign market. Some of these capabilities are illustrated in Table 19 and these include operations, product development, sales and marketing, compliance with regulatory requirements, value chain and other functions of the firms. Overall, it is observed that, on average, among the other capabilities of the firms, the operations of the businesses are ranked relatively higher as a very essential capability in the performance of firms in both the local and export markets. Specifically, for all crops and firm types, employers ranked efficiency and costs management as well as the responsiveness/delivery times of firm products as relatively more important than any other firm capability. Also, under product development, generally, it is observed that, on average, product improvement was ranked as relatively more important followed by product innovation. For sales and marketing, the expansion of domestic markets followed by product management were ranked by employers as more important above the other sub-categories for all crop and firm type. In addition, regulatory affairs of the company are also identified as relatively extremely more important under the regulatory requirements for both crop and firm type. In terms of value chain, developing local supplier base as well as managing supplier relationships is comparatively ranked as more important than the others in the same category. Finally, for other business functions, it is observed that financial management followed by sustainable environment are relatively more important capabilities a firm is supposed to possess in order to ensure strong standing for local and export markets.

Table 19: Importance of capabilities for business performance (1=Not important; 4=Extremely important)

Capabilities	Crop						Establishment												All			
	Yam		Cassava		Sweet Potato		Farm		Cooperative		Factory		Wholesaler		Retailer		Processor		Exporter		All	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Operations																						
Efficiency and costs management	3.6	76	3.4	66	3.5	35	3.4	109	3.3	10	3.8	15	3.7	45	3.4	20	3.5	76	3.7	39	3.5	177
Quality management	3.5	76	3.2	66	3.4	35	3.3	109	3.4	10	3.4	15	3.6	45	3.4	20	3.4	76	3.7	39	3.4	177
Responsiveness/delivery times	3.5	76	3.4	66	3.6	35	3.3	109	3.3	10	3.7	15	3.7	45	3.5	20	3.6	76	3.8	39	3.5	177
Product development																						
Introducing new products	2.0	75	3.0	66	3.1	35	2.5	109	2.8	10	3.4	15	2.8	45	2.6	20	3.0	76	2.1	38	2.6	176
Product improvement	2.5	75	3.1	66	3.4	35	2.8	109	2.9	10	3.4	15	2.9	45	2.8	20	3.2	76	2.5	38	2.9	176
Product innovation	2.2	75	3.2	66	3.3	35	2.7	109	2.8	10	3.5	15	2.9	45	2.7	20	3.2	76	2.5	38	2.8	176
Sales and Marketing																						
Expansion of domestic market	3.2	76	3.6	66	3.7	35	3.6	109	3.5	10	3.5	15	3.5	45	3.5	20	3.4	76	2.9	39	3.4	177
Export channel and intermediaries management	2.4	76	3.3	62	2.5	34	2.5	104	2.3	10	3.5	15	2.8	45	2.8	20	2.6	72	3.2	39	2.7	172
Brand development	2.0	76	3.0	66	3.3	35	2.4	109	2.9	10	3.7	15	2.7	45	2.3	20	3.0	76	2.5	39	2.6	177
Product management	2.6	76	2.9	66	3.5	35	2.7	109	3.2	10	3.7	15	3.2	45	2.6	20	3.1	76	3.0	39	2.9	177
Compliance with regulatory requirements																						
Regulatory affairs	2.5	74	2.2	65	2.6	22	2.3	99	2.8	10	2.8	15	2.8	44	2.2	19	2.6	70	2.7	38	2.4	161
Domestic regulatory compliance	2.4	74	2.1	64	2.5	22	2.2	99	2.7	10	2.7	15	2.7	44	2.2	19	2.5	69	2.3	38	2.3	160
Regulatory compliance for export markets	2.1	74	2.1	62	2.6	22	1.9	96	2.2	10	3.0	15	2.3	44	2.1	19	2.2	67	2.7	38	2.2	158
Labour law compliance	2.4	74	2.0	65	2.6	21	2.2	98	3.0	10	2.2	15	2.8	44	2.3	19	2.5	70	2.5	38	2.3	160
Value Chain																						
Developing local supplier base	3.2	75	3.2	65	3.6	34	3.4	107	3.3	9	2.9	15	3.4	45	3.2	20	3.2	76	3.1	39	3.3	174
Sourcing from most suitable international suppliers	1.3	75	2.3	64	2.4	34	1.9	106	1.6	9	2.3	15	1.8	45	1.9	20	1.9	75	1.8	39	1.9	173
Managing supplier relationships	3.2	75	3.2	65	3.4	33	3.1	106	3.0	9	3.6	15	3.5	45	3.7	20	3.2	76	3.6	39	3.3	173
On-going purchasing operations	2.7	75	2.7	65	3.1	30	2.6	105	2.9	9	3.1	15	2.9	45	3.1	20	2.8	74	3.0	39	2.7	170
Logistics and warehouse management	2.6	74	2.5	65	3.1	24	2.3	98	2.8	9	3.1	15	2.8	45	2.9	20	2.7	74	3.2	38	2.6	163
Improving and reconfiguring the value chain	2.7	73	2.5	62	3.1	31	2.6	102	3.1	9	2.7	15	2.9	44	2.8	20	2.9	73	3.1	37	2.7	166
Other business Functions																						
Human resource management	2.2	74	2.5	65	3.2	34	2.4	106	2.7	9	2.4	15	2.4	44	2.7	20	2.6	75	2.5	39	2.5	173
Financial management	3.1	73	3.5	65	3.6	34	3.3	105	3.6	9	3.7	15	3.6	44	3.7	20	3.4	75	3.4	39	3.3	172
Information technology	1.9	73	2.6	64	2.9	33	2.1	103	1.8	9	3.2	15	2.2	44	2.2	20	2.5	75	2.8	38	2.4	170
Sustainable environment	2.6	74	2.9	65	3.4	34	2.7	106	3.2	9	3.5	15	3.0	44	2.6	20	3.1	75	3.0	39	2.8	173

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

4.4 The Quantity and quality of employment in the value chain

This section looks at the nature of employment and recruitment processes including the labour turnover at each level of the value chain. In addition, employee wage rate as well as contractual agreements and training will also be looked at.

4.4.1 Number and nature of employment status

Table 20 displays the labour use in the value chain across crops, establishments and by gender. Across all crops, it is observed that, on average, more people are employed seasonally than on permanent basis. Also, the employment across sex for all crop type is marginally higher for females than for males in the value chain. For permanent employment across the selected crops, on average, more males (3.0) are employed than females (1.4) in the yam value chain as compared to more females (7.9) than males (5.5) in the cassava value chain. However, for sweet potato, on average, 5.4 males and females are permanently employed.

Table 20: Labour use by crop (mean)

		All		Yam		Cassava		Potato	
		Mean	N	Mean	N	Mean	N	Mean	N
Permanent	Male	6.9	160	3.0	71	10.3	66	8.9	23
	Female	4.8	156	1.4	66	7.9	66	5.4	24
Casual	Male	7.3	191	9.2	74	6.6	86	4.5	31
	Female	8.9	189	11.5	73	8.7	85	3.6	31

Source: Authors' computation from the Ghana TRAVERA survey dataset, 2018

Table 21: Labour Use by establishment (mean)

		All		Farm		Cooperatives		Factory		Wholesale		Retailer		Processor		Exporter	
		Obs	Mean	Obs	Mean	Obs	Mean	Obs	Mean	Obs	Mean	Obs	Mean	Obs	Mean	Obs	Mean
Permanent	Male	160	4.4	96	2.5	10	2.6	15	7.3	42	2.9	18	2.6	74	5.7	39	7.5
	Female	156	4.8	93	1.8	10	3.8	15	15.7	42	6.2	18	3.7	75	7.5	34	6.2
Casual	Male	191	7.3	127	8.0	9	10	14	1.4	44	8.9	22	7.8	72	7.7	38	7.8
	Female	189	7.4	125	5.2	10	8.2	15	19.9	44	11.5	19	4.6	73	10.9	38	12.8

Source: Authors' computation from the Ghana TRAVERA survey dataset, 2018

For seasonal employment, it can also be observed that, on average, more males than females are employed in the yam and sweet potato value chain compared to the cassava value chain. Specifically, the results from Table 4.1 show that, on average, 9.2 males and 7.5 females are seasonally employed in the yam value chain. In addition, on average, 4.5 males and 3.6 females are seasonally employed in the sweet potato value chain compared to 6.6 males and 8.7 females in the cassava value chain. See also Table 21 for a similar output at the establishment level.

Madam Efua Sika, a cassava processor at Bawjuasi reaffirms the submission that more females are employed in the cassava value chain as compared to males. She asserts that, after harvesting the cassava from the farm, she employs women to gather the harvested cassava and peel afterwards. The peeled cassava is then processed into cassava dough and packed into sacks for sale. On the contrary activities that involve the use of strength such as harvesting cassava, packing and carrying the processed cassava is done by males. She admits that, "Honestly, I prefer to employ men to do the packing because after packing, they must lift the sacks and that requires lots of strength however there are a few women who are very strong and they do it just as the men do. In the yam value chain on the contrary seasonal employees are dominated by males." Mr Tetteh of Calzion Farm limited explains that female workers usually carry seedling to be put into moulds on the farms as well as carry harvested yams into storage facilities; the male workers clear the land, raise the moulds, plant and weed as the farm. He discloses that, "We don't use machines, so we need the strong people."

4.4.2 Labour turnover

Labour turnover is an important indicator for the stability of a firm. The turnover rate may reflect the general working condition and structure of the organization. A high turnover rate may indicate poor working conditions, which reflects poorly on an organization. Table 22 shows the labour turnover for the selected firms in the value chain across crops for the period 2015-2017. Generally, for all the crops combined within the period, the average number of workers recruited across the various years is higher than the average number of workers who left. However, across the selected crops for the period 2015-2017, it is observed that, on average, recruitment of workers was highest in the yam crop value chain followed by cassava and then sweet potato.

Table 22: Labour turnover

Labour turnover	Year	Yam		Cassava		Sweet Potato		All	
		Mean	N	Mean	N	Mean	N	Mean	N
People who left	2015	1.3	60	1.4	82	0.7	22	1.3	164
	2016	2.7	67	1.9	83	0.7	23	2.0	173
	2017	1.7	68	1.5	84	0.6	24	1.4	176
People recruited	2015	7.5	60	2.2	82	0.0	19	3.9	161
	2016	7.1	68	2.1	84	0.3	23	3.8	175
	2017	7.9	69	2.6	84	0.7	25	4.4	178

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

In 2015, it is observed that, on average, 1.3 workers and 1.4 workers left the yam and cassava value chain respectively whiles 0.7 workers left the sweet potato value chain. In the same year, the average number of workers that were recruited was 7.5 and 2.2 for yam and cassava value chains respectively whiles where there was no recruitment for the sweet potato value chain. Although, on average, the number that left the value chain for both yam and cassava increased in 2016 from the 2015 figure, the number of people recruited fell for the same period for both crops. Sweet potato recorded the same average turnover of 0.7 workers for those who left in 2015 and 2016 but there was an average recruitment of 0.3 persons in 2016. In 2017, although the average number of workers that left was lower compared to 2016 for all crops, the average number recruited in that year was the highest compared to all the previous years in 2015 and 2016.

4.4.3 Experience and educational level of employees

Firms across the value chain business identify the previous work experiences of employees to be critical for the smooth operation of the business. One of the advantages of work experiences is that it reduces the training cost of hiring new employees and it brings to bear new ideas from the

previous work of the employee especially if the employee is from a similar value chain sector in the industry. Hence employees without experience prior to their hiring may incur additional training cost to the firm. Interviews with exporters and processors who employ labour show that seeking labour is not linked to education but the energy requirement of the activity which is highly gendered. The processor for instance stated that mostly men who do the harvesting of the cassava (Because it requires uprooting from the ground and one needs to be strong to uproot particularly in the dry season when the ground is dry) and women do the gathering and peeling of the cassava after harvesting. She added that:

“Honestly, I prefer to employ men to do the packing because after packing, they must lift the sacks and that requires lots of strength however there are a few women who are very strong and they do it just as the men do”

Experience is important but this is ensured by adopting strategies example strengthening the social relationship with workers in order to win their trust and they remain committed and loyal to the employer. This will retain them and as they engage in a particular activity they gain experience.

From Table 23, it observed that, overall, 23% of the employees across all the selected crops in the value chain did not have any work experience prior to their employment. For the selected crop type, it can be seen from Table 4.3 that the highest proportion of employees without experience is observed in the cassava value chain (25.1%) followed by sweet potato (22.8%) and then yam (20.7%).

Table 23: Experience and Education of Employees by crop (%)

Category		Yam	Cassava	Sweet Potato	All
Experience	No experience before being employed	20.7	25.1	22.8	23.0
Education	No education	66.8	41.2	40.2	50.4
	Primary/JHS	23.9	46.8	63.2	41.6
	SHS	34.6	16.3	48.5	29.3
	Bachelor or higher	7.9	5.6	21.1	7.7

Source: Author’s computation from the Ghana TRAVERA survey dataset, 2018

Also under Table 23 is the educational level of current employees in the various firms under the selected crop value chain. Generally, it can be observed that, on average, the higher the educational level, the lesser the number of employees found in that level. Overall, about 50.4% of the current employees under this survey do not have any form of education across the various value chain with 7.7 % having bachelors or higher. For the selected crops across the value chain, Table 4.3 shows that, on average, unlike the yam value chain where the largest proportion of

employees do not have any education, the largest proportion of employees in the cassava and sweet potato value chain have attained primary/JHS level of education.

4.4.4 Employment contract

The contractual nature of firms and the binding agreement between firms and employees are further illustrated in Table 24. First, it is observed that, about 15% of all the selected firms under the survey has formal contract staff. Out of this, the highest proportion was recorded by firms in the cassava value chain (16%) followed by yam (14%) and sweet potato (11%). Second, Table 24 also shows that more than half of all workers across the value chain for all crops had formal contractual agreement with the various firms. The results show that this proportion was highest for workers of firms in the cassava value chain (52.1%), followed by workers in the sweet potato value chain (51.3%) and then workers in the yam value chain (50.6%).

Findings from interviews show that employment is based more on trust built over years of working together than formal contracts. Though some exporters have employed few permanent staff, at this level, there is no formal contractual arrangement but there seem to be an unwritten contract between employer and employee as they all confirm that they work with the same workers every year.

Table 24: Formality of employee contract

	Proportion of Firms with Formal contract staff		Share of employees with formal contract	
	Proportion	N	Mean	N
Yam	0.14	76	50.6	11
Cassava	0.16	86	52.1	12
Sweet Potato	0.11	36	51.3	4
All	0.15	198	51.4	27

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

4.4.5 Employee skill rating

The skills of employees are regarded as one of the most important inputs in determining the overall productivity of all firms. Table 25 therefore shows the rating skills of the current employees across the value chain for the selected crops. The rating was from a low of 1 (Not good at all) to a high of 4 (Excellent). The results show that, overall, the highest rating skill, on average, was attributed to team work followed by the ability to learn new ideas/methods and concepts with the least rating attributed to foreign language skills.

Table 25: Rating of Skills of Employees (1=Not good at all to 4=Excellent)

Employee Skills	Yam		Cassava		Sweet Potato		All	
	Mean	N	Mean	N	Mean	N	Mean	N
Ability to learn new ideas, methods, and concepts	3.1	75	3.0	64	2.9	35	3.0	174
Advanced IT application/computer skills	1.6	73	1.5	64	1.3	33	1.5	170
Attitude/personality (work ethic, punctuality, appearance, manners)	3.3	76	3.0	64	3.3	36	3.2	176
Communication	3.0	76	2.8	64	2.7	36	2.9	176
Customer services	2.8	74	3.0	46	2.7	30	2.8	150
Equipment operation and safety	2.7	72	3.0	46	2.6	30	2.8	148
Food safety and handling	2.9	58	2.9	44	2.6	28	2.8	130
Foreign language	1.4	74	1.3	45	1.2	34	1.3	153
Green skills (e.e. recycling, avoidance of waste, safe treatment, of waste, recovery of valuable materials)	1.7	73	2.3	46	1.4	30	1.9	149
Management responsibility/taking a lead	2.5	75	2.5	46	1.9	34	2.4	155
Logistics	2.2	72	2.3	44	1.6	27	2.1	143
Literacy/numeracy skills	2.3	76	2.7	46	2.1	33	2.4	155
Measuring, grading and feeding batches of raw materials	2.9	71	2.8	46	2.0	24	2.7	141
Problem solving	2.9	74	2.6	46	2.1	34	2.6	154
Production and inventory management	2.8	72	2.5	45	2.0	27	2.6	144
Taking initiative	2.7	75	2.4	46	2.3	36	2.5	157
Team work	3.4	74	3.1	45	3.1	34	3.2	153
Warehousing and shipping	2.3	61	2.2	45	1.7	23	2.2	129
Working with numbers	2.7	71	2.8	46	2.5	35	2.7	152
Operating computerized/automatic machinery	1.7	61	1.5	44	1.5	24	1.6	129
Operating non-computerized/non-automatic machinery	2.8	71	2.4	46	2.1	27	2.5	144
Quality control and assurance	2.2	70	2.5	46	1.6	25	2.2	141

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

Across the selected crops from Table 25, it is observed that, on average, the highest rating skill for employees in both the yam and sweet potato value chain was attributed to the attitude/personality of the employee. However, in the cassava value chain, the highest skill on average was attributed to the team work of employees. It is also observed that, on average, acquisition or knowledge in a foreign language as a skill, recorded the least rating by employees across all the three crops.

4.4.6 Personnel manual

Personnel manuals document all intended employment policies and procedures which also helps to facilitate training of employees. The manual may contain employment benefits, ethics and workplace policies and is designed to help employees acquaint themselves with the enterprises' procedures in the value chain.

Table 26 shows the business situation with regard to personnel manual in the value chain. Firstly, out of the 192 responses, it is observed that a higher proportion of the firms do not possess any manual concerning the employees. That is, 171 firms, representing about 89.1 % in the selected root and tuber value chain do not have any written personnel policies to guide the employees. 15 of these firms had a comprehensive written personnel manual and the rest had a partially developed personnel manual.

Table 26: Personnel manual and length of manual possession

Crop	Personnel manual (Frequency)			Time length of possession of personnel manual
	Comprehensive written personnel manual	Partially developed personnel manual	No written personnel policies	Average Period (Years)
Yam	5	2	67	10.8
Cassava	8	3	74	7.3
Sweet Potato	2	1	30	5.5
All	15	6	171	8.9

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

Second, Table 26 also shows that the average length of period businesses across the selected root and tuber value chain have had a personnel manual is about 9 years. The distribution across the crop type shows that businesses in the yam value chain, on average, have had the longest period (approximately 11 years) in the possession of personnel manuals for their employees followed by businesses in the cassava value chain (approximately 7 years), and sweet potato value chain (approximately 6 years).

4.4.7 Family Members as employees

Businesses are sometimes characterized by the presence of family members as employees of the firm. This could be as a result of so many factors including business continuity. However, there could also be negative effects in employing family members especially in cases where competence on the job is overlooked. From Table 27, it is observed that, overall, about 59 % of all the firms under the survey in the value chain have some family members as employees. Across the crop type, this proportion was highest in yam value chain followed by cassava and sweet potato. For the firm type, the highest proportion was recorded by wholesalers and retailers with the least being exporters.

Table 27: Family Members as Employees

Family Members as employees	Firms with family members as employees		Number of family members	
	Proportion	N	Mean	N
Crop				
Yam	0.79	76	5.1	60
Cassava	0.56	86	3.8	47
Sweet Potato	0.22	36	1.9	8
Total	0.59	198	4.3	115
Establishment				
Farm	0.60	129	4.8	76
Cooperative	0.60	10	8.7	6
Factory	0.67	15	3.1	10
Wholesaler	0.73	45	4.9	33
Retailer	0.73	22	4.6	16
Processor	0.61	76	4.2	45
Exporter	0.56	39	4.0	22

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

In addition, Table 27 further establishes the average number of family members employed in the value chain. It can be shown that, on average, approximately 4 persons are family members who have been employed in the value chain business. For the selected crop type, approximately 5 persons are family members employed, followed by cassava (approximately 4 persons) and sweet potato (approximately 2 persons). Also, for the firm type, the average number of family members as employees is highest in cooperatives (8.7) and lowest in factory establishments (3.1).

Employing family labour seem to be a secured way of ensuring that businesses run efficiently. Mr Batu of GEOBAT farms stated that he has engaged two of his brothers to take care of his yam farm though there are other casual workers.

Calzion Exports who prefer to buy yams from others for export stated this as the reason:

"I think it is not easy to go into the production...my personal issue has to do with trust. You establish the farm and give it out to someone to manage it, you are not there so before you realize, the person is doing a whole different thing on the farm. If you are not lucky, after harvesting, you will not get the quality you need to supply for export. And then also before you know, your farm manager himself is supply the yams to other people behind your back. The only way to stop this is if you're checking up on the farm and the manager frequently and I don't have enough time to do that. So that is the reason I am not interested in going into the farming or production of yam".

4.4.8 Registration with the national social security agency

Subscription to the national social security serves as a foundation of economic stability by promoting income stability among employees especially when they retire from active work. From Table 4.25, 36 out of the 193 responses, representing about 19 %, indicated that their workers are registered with the national social security agency. Out of this number, about 28 % are in the yam value chain, 15 % in the cassava value chain and about 6 % in the sweet potato value chain.

Across the firm type, Table 28 shows that, out of the 36 firms who have registered with the national social security agency, about 56 % of these firms are exporters and over 20% are retailers and factory establishments. Though farm establishments are the largest in this survey, about 9% of its employees are registered the national social security agency.

Table 28: Registration of Firms with the National Social Security Agency

	Firms registered with national social security agency		Share of employees registered with national social security agency	
	Proportion	N	%	N
Crop				
Yam	0.28	76	31.0	21
Cassava	0.15	85	56.1	13
Sweet Potato	0.06	32	17.5	2
All	0.19	193	39.3	36
Establishment				
Farm	0.09	125	34.9	11
Cooperative	0.11	9	2.0	1
Factory	0.21	14	90.0	3
Wholesaler	0.11	45	46.0	5
Retailer	0.27	22	27.3	6
Processor	0.19	73	49.8	14
Exporter	0.56	39	41.9	22

Source: Authors' computation from the Ghana TRAVERA survey dataset, 2018

In addition, Table 28 also shows the proportion of workers who have registered with the national social security agency. Overall, on average, out of the 36 responses, 39.3 % of employees across

the value chain are registered with the national social security agency. The average distribution of these employees across the selected crop type shows that about 56.1 % of these employees are in the cassava value chain followed by 31 % in the yam value chain and 17.5 % in the sweet potato value chain. Also, across the firm type, the average proportion of workers who have registered with the national social security agency is highest in the factory establishments and lowest in cooperatives.

4.4.9 Wage rate

The wage rate is one of the most significant motivations in the performance of employees. All other things being equal, a higher and competitive wage rate across the value chain will necessitate efficient output. Table 29 shows the extent to which businesses across the value chain base their wage rate as well as the competitiveness of these wage rates. To begin with, it is observed that, across the various crop types, about 55 % of all the firms (representing 108 firms) partially or sometimes base their wage rates on other employers' rate in the same sector of the value chain with equal proportion (22.7% representing 45 firms each) either paying for what they can afford or specifically on other employers' rate. For employers in the yam value chain, while 39.5 % of the wage rate is partially/sometimes based on other employers' rate, 34.2 % are based specifically on other employers' wage rate and 26.3 % are based in what the employers can afford. For the cassava value chain, 72.1 % of employers partially/sometimes base their wage rate on other employers' rate while 14 % either pay for what they can afford or specifically on other employers' rate. In the sweet potato value chain, 44.4 % of employers partially/sometimes base the wage rate on other employers' rate while 36.1 % pay for what they can afford with 19.4 % specifically on other employers' rate.

Table 29: Basis for Wage Rate & Competitiveness of Wage Rate

Wage Rate	Yam		Cassava		Sweet Potato		All	
	%	N	%	N	%	N	%	N
Extent of basing wage rate								
We pay what we can afford	26.3	20	14.0	12	36.1	13	22.7	45
Partially/sometimes on other employers' rate	39.5	30	72.1	62	44.4	16	54.6	108
Specifically on other employers' rate	34.2	26	14.0	12	19.4	7	22.7	45
All	100	76	100.0	86	100.0	36	100.0	198
Competitiveness of wage rate in the sector								
Better than most	38.2	29.0	24.4	21	27.8	10	30.3	60
About the same	61.8	47	74.4	64	72.2	26	69.2	137
Less than most	0	0	1.2	1	0	0	0.5	1
All	100.0	76	100.0	86	100.0	36	100.0	198

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

For competitiveness of wage and benefit package, Table 29 reveals that across the value chain for all crop types, about 69.2 % of employers agree that their wage rate and benefit package for their employees is about the same in the same sector. Also, 30.3 % of employers argue that theirs is better than most other employers in the same sector while 0.5 % agree that their wage and benefit package is less than most employers in the same sector. With the exception of employers in the cassava value chain, none of the employers in the yam and sweet potato value chain reported that their wage rate was less than most employers in the same sector.

4.4.10 Orientation and training

The essence of orientation and training is to formally introduce the employees to the value chain business and to help them adapt to the working environment to produce maximum output. As a result, firms are usually encouraged to continuously review their training practices to adapt to current developments. Table 30 presents the frequency at which employers give clear and complete orientation to employees as well as how often employees are trained in the value chain. For orientation frequency, it is observed that, overall, across the value chain for both crop and firm type, about 83 % of employers engage in some form of orientation of for their employees with 17.2 % who do not offer orientation at all. For employers under the selected crop type, on average, about 81.7 % in the yam value chain, 91.8 % in the cassava value chain and 63.9 % in the sweet potato value chain give some form of clear and complete orientation for employees to the business. However, compared to the rest, less than 10 % of employers in the cassava value chain do not offer orientation to their employees. In addition, across the firm type, it is also observed that, all employers in the factory value chain offer a clear and complete orientation while less than 10 % of retailers, processors and exporters do not give any form of orientation to the workers.

Table 30: Frequency of Orientation and Training for Employees (%)

Frequency of Orientation	Crop						Establishment															
	Yam		Cassava		Sweet Potatc		Farm		Cooperative		Factory		Wholesaler		Retailer		Processor		Exporter		All	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Not at all	18.4	14	8.1	7	36.1	13	23.3	30	20.0	2	0.0	0	17.8	8	4.6	1	7.9	6.0	5.1	2	17.2	34
Seldom	30.3	23	30.2	26	25.0	9	34.1	44	40.0	4	33.3	5	31.1	14	22.7	5	29.0	22.0	15.4	6	29.3	58
Sometimes	30.3	23	24.4	21	36.1	13	23.3	30	30.0	3	20.0	3	26.7	12	13.6	3	40.8	31.0	30.8	12	28.8	57
Frequently	21.1	16	37.2	32	2.8	1	19.4	25	10.0	1	46.7	7	24.4	11	59.1	13	22.4	17.0	48.7	19	24.8	49
All	100.0	76	100.0	86	100.0	36	100.0	129	100.0	10	100.0	15	100.0	45	100.0	22	100.0	76.0	100.0	39	100.0	198
Frequency of Training																						
Not at all	26.3	20	25.9	22	36.1	13	37.5	48	10.0	1	6.7	1	17.8	8	4.6	1	10.7	8	10.3	4	27.9	55
Seldom	27.6	21	18.8	16	11.1	4	22.7	29	50.0	5	40.0	6	40.0	18	22.7	5	30.7	23	12.8	5	20.8	41
Sometimes	36.8	28	27.1	23	50.0	18	23.4	30	40.0	4	40.0	6	35.6	16	40.9	9	48.0	36	51.3	20	35.0	69
Frequently	9.2	7	28.2	24	2.8	1	16.4	21	0.0	0	13.3	2	6.7	3	31.8	7	10.7	8	25.6	10	16.2	32
All	100.0	76	100.0	85	100.0	36	100.0	128	100.0	10	100.0	15	100.0	45	100.0	22	100.0	75	100.0	39	100.0	197

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

Table 30 also indicates the frequency at which time is set for training of individual employees across the value chain business. It is observed that, on average, about 72 % of employers across all crop and firm type specifically set aside time to train their employees with 27.9 % who do not offer training at all. For the selected crop type, it is noted that that on average, about 73.6 % of employers in the yam value chain, 74.1 % in the cassava value chain and 63.9 % in the sweet potato value chain engage their employees in training. For the firm type, Table 4.10 shows that only firms under the factory and retail establishments have less than 10 % of employers who do not specifically set time to train individual employees whiles the rest are above this rate.

4.4.11 Training methods

Employers engage in different training methods at various points in time to ensure employees become abreast with new updates in the value chain. However, some methods are seen to be more efficient than others. With this, Table 4.28 shows how effective employers rank each training method outlined. It is observed that, across both crop and firm type, employers on average rank on-the-job training followed by internally conducted training sessions as the most effective training method whereas training received by product suppliers is ranked the least. This may be because employers are more up to date with the daily developments in the value chain business and hence training by product supply dealers may only partially address the objective of maximizing both labour and product output in the business. Inadvertently, on-the-job training and internally conducted training sessions are reflected across the selected crop type as the most effective training method. However, beyond these two, employers in the yam and cassava value chain also identify training through trade association conferences or seminars as a very effective training method whereas those in the sweet potato value chain identify training by outside consultants instead.

Table 31: Effectiveness of Training Method (1=Not effective; 4=Extremely effective)

Training Methods	Crop							
	Yam		Cassava		Sweet Potato		All	
	Mean	N	Mean	N	Mean	N	Mean	N
Employees pursue training and development on their own time	2.6	55	2.9	7	2.0	2	2.6	64
Internally conducted training sessions	2.8	44	3.6	29	3.5	15	3.2	88
On-the-job training	3.1	55	3.9	63	3.6	14	3.5	132
Trade association conferences or seminars	2.7	37	3.4	20	2.3	3	2.9	60
Training by outside consultants	1.3	28	3.2	13	3.0	8	2.1	49
Training by product supply dalers	1.3	30	3.0	6	2.0	1	1.6	37
University/extension sponsored seminars or workshops	1.3	29	3.1	14	2.3	3	2.0	46

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

Also, Table 31 shows that employers in the various firm establishments except cooperatives and wholesalers, on average, identify on-the-job training as the most effective training method for employees. Processors, on average, identify both on-the-job and training pursued by employees on their own as equally important. However, for cooperatives and wholesalers, employers regard employees who pursue training and development on their own time as the most effective training method.

4.4.12 Firms Participation in any External or Internal Training Courses

As a way of ensuring continuous improvement in work output, employees are encouraged to participate in training courses to help in the delivery of their assigned tasks in the business. Table 32 therefore shows the frequency and proportion of employers whose employees participated in any external or internal training course over the last 12 months prior to the survey. It is observed that, across the value chain, out of the 198 firms interviewed, employees of 55 firms undertook some form of training courses over the last 12 months prior to the survey. This is distributed across the selected crop types: yam value chain (24), cassava (18) and sweet potato (13). In terms of proportion, about 36 % of all the 36 firms under the sweet potato value chain participated in any external or internal training course. Similarly, employees of about 32 % of all the 76 firms under the yam value chain as well as about 21 % of the 86 firms under the cassava value chain participated in a training course for the last 12 months prior to the survey.

Interviews revealed that, training by government is almost nonexistent - this also came out as one of the concerns. In order to meet international specifications as an exporter one needs to be trained to understand and practice certain international requirements. GEOBAT Farms which has been trained on Hazard Analysis and Critical Control Point (HACCP) explains that there should

be hazard analysis on the product. The product should not be contaminated with any chemical hazard or even physical hazard. These standards are given by the foreigners. He said:

“I am a GLOBALGAP certified company and I was trained by CBI from Netherlands and they gave me the certified”.

According to him, the Centre for Promotion of Exports (CBI) from developing countries in the Netherlands which is under the Ministry of Foreign Affairs of the Netherlands support by paying exporters from developing countries to attend trade fairs. They pay about 10,000 Euros for each company to come and exhibit their products”. In all these they wished government was also committed to ensuring that they are trained.

Table 32: Firms Participation in any External or Internal Training Courses

	Freq.	Proportion
Crop		
Yam	24	0.32
Cassava	18	0.21
Sweet Potato	13	0.36
All	55	0.28
Establishment		
Farm	29	0.22
Cooperative	2	0.20
Factory	6	0.40
Wholesaler	11	0.24
Retailer	12	0.55
Processor	14	0.18
Exporter	18	0.46

Source: Author’s computation from the Ghana TRAVERA survey dataset, 2018

4.4.13 Factors Contributing to Obstacles to Training

Despite the benefits attached to employee training, it has also been identified that there can be several factors that may cause difficulties/challenges in providing training to employees. Some of these factors have been listed in Table 33. It can be observed that, amongst all others, employers across the value chain identify the difficulty in funding the training as the most important factor that can be a hindrance to employee training with the least challenging factor being the selection of the right people into the training. For the crop type, beyond funding difficulties, firms across the value chain also identified ‘no/poor information on courses/trainers’ as the next extremely important factor to hinder employee training. However, whereas employers in the yam value chain identified ‘low quality of courses on offer/low quality of trainers’ as the

least important factor, employers in the cassava and sweet potato value chain identified ‘difficulty to select the right people into training’ and ‘low quality of courses on offer/low quality of trainers’ respectively as the least prohibiting factor to employee training.

Table 33: Factors of Obstacles to Employee Training (1=Not important; 4=Extremely important)

Challenges to training	Crop						Establishment															
	Yam		Cassava		Sweet Potato		Farm	Cooperative	Factory	Wholesaler	Retailer	Processor	Exporter	All								
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N						
No or poor information on courses/trainers	2.3	74	2.3	85	2.7	29	2.5	121	3.1	9	2.4	15	2.8	45	2.4	21	2.4	76	1.7	39	2.4	188
No or lack courses/trainers available	1.6	74	2.3	85	2.7	29	2.1	120	2.0	10	2.4	15	2.0	45	2.2	21	2.0	75	1.7	38	2.1	188
Low quality of courses on offer/low quality of trainers	1.3	74	1.9	83	2.6	28	1.8	117	1.3	10	1.5	15	1.5	45	1.8	21	1.6	74	1.6	38	1.8	185
Difficult in funding the training	3.3	75	2.9	85	3.4	28	3.3	120	3.6	10	2.5	15	3.1	45	3.3	21	3.1	75	2.9	38	3.2	188
Difficult to select the right people into training	1.8	74	1.3	85	2.7	28	1.7	119	1.5	10	1.7	15	1.7	45	1.7	21	1.8	75	2.0	38	1.7	187

Source: Author’s computation from the TRAVERA survey dataset

An observation across the firm type from Table 4.30 also shows that, on average, beyond ‘difficulty in funding training’ as the most important prohibiting factor, all other firms with the exception of exporters identified ‘no/poor information on courses/trainers’ as the next important prohibiting factor to training employees. Exporters, however, identified ‘difficulty in selecting the right people into training’ as the next most important factor. In addition, on average, all firm types with the exception of retailers identified ‘low quality of courses on offer/low quality of trainers’ as the least important prohibiting factor to employment training. Retailers, however, identified the ‘difficulty in selecting the right people into training’ as the least factor.

They are also of the view that if government creates a gap in supporting the industry then other people take advantage of them. Madam Afua recounts a case where she narrated as:

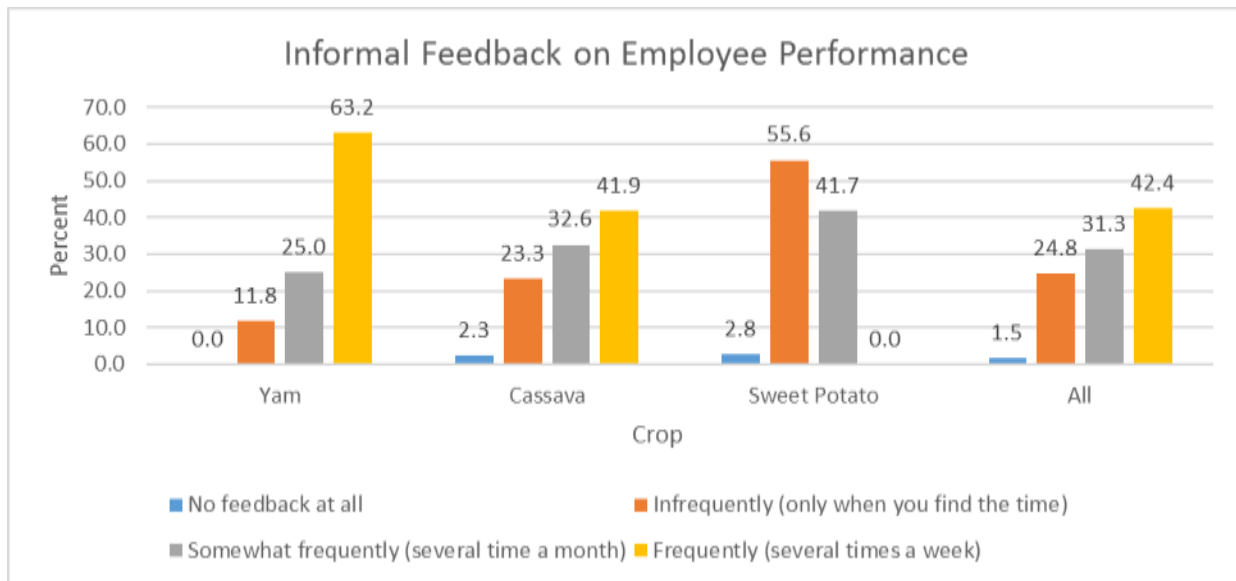
“we were approached by some individuals who tried to get us to form an association so they can support but they wanted to help provide us with a machine used in processing the cassava and also teach us innovative ways of processing the cassava. I think they were government officials but I am not entirely sure. The processing machine they were going to give us wasn’t going to be for free though but it was cheaper and with flexible payment terms. After listening to them, we lost interest in their initiative because we didn’t like their terms. Now there is a new government so we are waiting to see if this government would also come with the intention of helping us as well”.

4.4.14 Informal feedback on employee performance

On certain occasions, employees may need feedback on their job performance to help them align and work effectively towards the overall objective of the business in the value chain. Figure 4.4

shows the distribution of the proportion of employers that provide informal feedback to employees on their job performance across the selected crop value chain. It can be observed that, overall, out of the 198 responses for all crop type, 42.4 % frequently give feedback several times a week, 31.3 % give feedback several times in a month, 24.8 % infrequently give a feedback while 1.5 % of employers do not provide any feedback at all.

Figure 4.4: Informal Feedback on Employee Performance (%)



Source: Author’s computation from the TRAVERA survey dataset

For the selected crop type across the value chain, Figure 4.1 also shows that, out of the 76 employers in the yam value chain, at least each employer gives some level of informal feedback to employees on their job performance with 63.2 % of them providing feedback several times a week and 11.8 % providing feedback infrequently. In addition, for employers in the cassava value chain, 41.9 % of the 86 employers frequently give a feedback several times a week while 2.3 % do not provide any feedback at all. Finally, out of the 36 responses from the sweet potato value chain, it is observed that employers do not provide information frequently at least within the week. More than half (55.6%) of these employees only provide feedback when they have time while 2.8 % do not provide any form feedback at all.

Analysis of interviews shows that informal feedback on employee performance is observed in the number of years working relationship. Respondents reveal that if they are not satisfied with one’s performance they will not engage his/her services of again.

“They work very well. If they don’t work well, they know I wouldn’t hire them if they don’t work satisfactorily so they work very well”

(interview with Processor).

4.4.15 Ease of recruitment

Recruitment of employees of various categories is associated with availability of such resource persons and the cost associated in terms of remuneration and employment benefits. Table 34 indicates the ease at which recruitment is undertaken by the various employers in the value chain. It is observed that, on average, across both crop and firm type, it is easier recruiting low skill workers than high skill workers. This may be due to the high supply of the low skill labour force within the value chain and the relative affordable cost of employment (in terms of remuneration) to the employers than the high skilled workers.

It was agreed among all respondents that recruitment of employees is not a problem due to high unemployment rates in the country. Mr. Tetteh of Calzion Export Company admits that:

“...they are the ones who will even be chasing me for the job. So, when they finish, then I just pay them and they go.” The processor admits that due to the high unemployment rates some casual workers even come to her house to ask if there is any job for them.

Table 34: Ease of Recruitment (1=Very difficult; 4=Very easy)

Ease of recruitment	Crop						Establishment															
	Yam		Cassava		Sweet Potato		Farm		Cooperative		Factory		Wholesaler		Retailer		Processor		Exporter		All	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Recruiting in general	3.5	76	3.6	86	2.8	35	3.5	129	3.5	10	3.4	15	3.6	45	3.4	21	3.4	76	3.2	39	3.4	197
Recruiting low skill workers	3.8	75	3.7	86	3.3	35	3.7	129	3.8	10	3.7	15	3.8	45	3.9	21	3.6	76	3.7	38	3.7	196
Recruiting medium skill workers	2.9	75	3.1	86	3.0	35	3.0	129	2.9	10	3.5	15	2.8	44	3.0	21	2.9	75	2.8	39	3.0	196
Recruiting high skill workers	2.3	76	2.7	86	2.2	35	2.4	129	1.4	10	2.8	15	2.1	45	2.0	21	2.2	76	2.1	39	2.4	197

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

4.4.16 Documentation of Job description

Job descriptions are documented for employees to clearly define their roles, skills required and their expected output as much as it fits the general objective of the business. Job descriptions also help employees to know how they would be evaluated, their reporting relationships as well as the working conditions in the business. Table 35 describes employers with written job descriptions for two-thirds of the jobs in the firm and Table 36 describes how frequently these job descriptions are updated in the workplace.

From Table 4.15, it is observed that 13 out of the 198 employers interviewed under this survey indicated that they have a written position description covering at least two-thirds of the jobs in the value chain business. For the selected crop type under this survey, it is observed that 3 out of the 76 firms in the yam value chain, 7 out of the 86 firms in the cassava value chain as well as 3

out of the 36 firms in the sweet potato value chain have a written job description for at least two-thirds of the jobs in their firms.

Table 35: Written Position Description for at least two-thirds of the jobs in the firm

	Freq.	Percent	N
Crop			
Yam	3	3.95	76
Cassava	7	8.14	86
Sweet Potato	3	8.33	36
All	13	6.6	198

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

Table 36 further highlights the frequency with which employers update the job description profile by crop. It is observed that across the selected crop value chain, 6 firms do not update their job description at all, 4 firms update every year, 5 of them updates once every 6 months with 1 firm from the sweet potato value chain updating their job description once every 3 months. Specifically, from Table 4.33, we have 3 firms from the yam value chain and 2 firms from the cassava value chain which updates their job description once every 6 months with 2 firms each in the cassava and sweet potato value chain updating once every year. For the firms that do not update at all across the selected crop value chain, we have 1 firm from the yam value chain and 5 firms from the cassava value chain.

The interviews show that businesses at this level are formal because of export requirements but they exhibit high informality at certain stages of their operations especially when it comes to employment. There are no formal procedures for recruiting staff and therefore no written descriptions of jobs. This is undertaken verbally and depending on the type of job available they will either recruit a male or female.

Table 36: Update of Job Description Profile (Frequency)

	Yam	Cassava	Sweet Potato	All
Once every 3 months	0	0	1	1
Once every 6 months	3	2	0	5
Once every year	0	2	2	4
Not updated at all	1	5	0	6

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

4.4.17 Recruitment challenges

Employers may sometimes face recruitment challenges ranging from several factors including low number of qualified applicants with the required skills, the location of the firm, the number of years of experience required in the job position advertised among others. Table 37 displays some of these challenges as rated by the various employers in the value chain. It can be observed that, on average, across both the selected crop and firm type, the nature of the employment is highly regarded as the major challenge. Specifically, on average, employers regard seasonal employment as the biggest challenge to recruitment followed by the lack of work experience the company demands from prospective employees. However, in general, the number of applicants who apply for a job is regarded as the least challenge to recruitment across the value chain. This may be because there is an influx of high labour supply in the market, all things being equal. However, these high labour supply may only be constrained by the requisite skills needed for the job among other factors.

Table 37: Recruitment Challenges (1=Not important; 4=Extremely important)

Recruitment challenges	Crop						Establishment															
	Yam		Cassava		Sweet Potato		Farm		Cooperative		Factory		Wholesaler		Retailer		Processor		Exporter		All	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Lack of qualifications the company demands	1.6	76	1.4	67	2.2	34	1.6	109	2.4	10	1.7	15	1.6	45	1.5	19	1.6	75	1.7	39	1.7	177
Lack of work experience the company demands	1.8	76	1.5	67	2.9	34	1.9	109	2.2	10	1.7	15	1.6	45	1.6	19	1.7	75	2.2	39	1.9	177
Low number of applicants generally	1.2	76	1.1	67	1.7	35	1.2	110	1.3	10	1.4	15	1.2	45	1.4	19	1.3	75	1.2	39	1.3	178
Low number of applicants with the required attitude, motivation or personality	1.7	76	1.3	67	2.0	35	1.5	110	1.5	10	1.5	15	1.3	45	1.5	19	1.5	75	1.6	39	1.6	178
Low number of applicants with the required skills	1.4	76	1.3	67	1.9	35	1.3	110	1.5	10	1.4	15	1.2	45	1.5	19	1.5	75	1.5	39	1.4	178
Not enough people interested in doing this type of job	1.4	76	1.3	67	2.1	35	1.5	110	1.3	10	1.5	15	1.4	45	1.4	19	1.6	75	1.4	39	1.5	178
Poor career progression/lack of prospects	2.1	76	1.4	67	1.9	34	2.0	109	2.5	10	1.5	15	2.0	45	1.7	19	1.9	75	1.5	39	1.8	177
Poor terms and conditions (e.g.) offered for post	1.3	76	1.4	67	2.5	35	1.6	110	1.1	10	1.3	15	1.2	45	1.3	19	1.7	75	1.5	39	1.6	178
Too much competition from other employers	1.4	76	1.4	67	1.7	35	1.5	109	1.2	10	1.1	15	1.2	45	1.3	19	1.4	74	1.5	39	1.5	177
Remote location	2.0	71	1.5	64	2.0	35	2.0	103	2.2	9	1.6	15	1.6	43	1.9	17	1.8	73	1.9	38	1.8	170
Seasonal work	3.0	66	1.9	49	2.4	33	2.6	89	2.6	9	2.3	13	2.4	38	2.5	14	2.2	68	2.6	36	2.5	148

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

Across the selected crop type, Table 37 also shows that while employers in the yam and cassava value chain on average rank 'seasonal work' to be the most important challenge to recruitment, employers in the sweet potato value chain on the other hand regard the 'lack of work experience the company demands' as the most important recruitment challenge.

Interviewees did not suggest any challenge with recruitment. This maybe because they do not look for particular skills because their businesses are still young and can do with low expertise. For example, Mr Batu indicated that because his company is quite young he cannot employ permanent workers now.

Additionally, processing for the local market does not require strict adherence to standards, it is at the processors discretion. In a question as to who is responsible setting standards of their products, the processor had this to say:

“I think it depends on the processors. You must ensure that your dough or gari is of high quality so you don’t lose customers or so you can attract several other customers. Personally I have a unique way of processing my dough for instance and that ensures that it is always of high quality. Sometimes I use ‘kokonte powder’ in processing and that helps me get the best quality for my dough. At other times, I use palm kernel also in processing and that also helps me get the quality I want”.

(interview with Processor)

4.4.18 Actions taken to overcome recruitment challenges and retention of workers

Employers usually initiate mitigating factors to address the challenges associated with recruitment and retaining of workers. Some of these factors may to either directly increase the benefit packages associated with the job or embark on internal restructuring measures to update employees on existing trends in the value chain among others. Table 38 presents a list of actions taken by employers across the value chain to curb recruitment challenges and retain workers. It is therefore observed that across the value chain, on average, employers regard increases in salaries as the more frequent action taken to mitigate recruitment challenges and retain existing workers. However, in general, employers on average regard the recruitment of foreign nationals as the least action taken to mitigate the recruitment and retention of workers.

Overcoming recruitment challenge is the ability of the employer to find means of retaining workers so that there will be no need for recruitment all the time. This is ensured by treating workers well, building trust and strengthening social relationship.

“The labourers are always available in this community but it depends on how well you treat them. If you treat them well, you’ll be home and they would come and ask if you need or require their services”

(interview with Processor).

Mr Batu of GEOBAT FARMS stated that:

“Humans are humans and it doesn’t matter where you meet them, if you treat them well, they themselves will come back to you when you they know the time you will need them the following year. Just this past season, I employed 8 males who were raising my yam moulds and before they could finish working on the farm, one of them felt sick for one week. So I spent about 400 to 500cedis on him for his healthcare and he thought I would deduct that from his pay but I didn’t. I took care of the health cost and still paid him for his services duly. So such a person, when it is time to cultivate again next year, he will come back. Meaning I have built a good relationship with them so they are always happy to come and work for me and they also work to my satisfaction. So even if all of them wouldn’t come, at least one would come back”

Table 38: Actions taken to Overcome Recruitment Challenges and Retention of Workers (Rank: 1=Not at all; 4=Very Frequently)

List of actions	Crop												Establishment											
	Yam		Cassava		Sweet Potat		Farm		Cooperativ		Factory		Wholesale		Retailer		Processor		Exporter		All			
	Rank	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank	N	Rank	N		
Increasing salaries	1.8	76	1.6	64	1.4	34			1.6	109	2.1	10	1.5	15	1.6	45	1.7	19	1.4	73	1.9	39	1.6	174
Increasing the training given to existing workforce	1.3	76	1.3	64	1.6	34			1.3	109	1.5	10	1.3	15	1.2	45	1.4	19	1.4	73	1.5	39	1.4	174
Redefining existing jobs	1.6	76	1.2	64	1.2	34			1.4	109	1.4	10	1.1	15	1.4	45	1.2	19	1.3	73	1.4	39	1.4	174
Increasing advertising/recruitment spend	1.1	76	1.1	64	1.1	34			1.1	109	1.3	10	1.1	15	1.1	45	1.1	19	1.1	73	1.1	39	1.1	174
Increasing/expanding trainee programs	1.1	76	1.1	64	1.1	34			1.1	109	1.3	10	1.1	15	1.1	45	1.1	19	1.1	73	1.1	39	1.1	174
Using new recruitment methods or channels	1.4	76	1.2	64	1.2	34			1.2	109	2.3	10	1.3	15	1.5	45	1.4	19	1.4	73	1.1	39	1.3	174
Recruiting workers who are foreign nationals	1.0	76	1.1	64	1.0	34			1.0	109	1.0	10	1.1	15	1.0	45	1.1	19	1.0	73	1.0	39	1.0	174
Bringing in contractors to do the work, or contracting it out	1.2	76	1.2	64	1.0	33			1.2	108	1.1	10	1.3	15	1.1	45	1.1	19	1.2	72	1.1	39	1.2	173
Being prepared to offer training to less well qualified recruits	1.3	75	1.6	64	1.2	34			1.3	108	1.2	10	1.4	15	1.2	45	1.1	19	1.5	73	1.5	38	1.4	173
Increase labour productivity in the establishment	1.5	76	1.5	64	1.5	34			1.4	109	1.8	10	1.5	15	1.3	45	1.2	19	1.5	73	1.6	39	1.5	174
Increase working hours in the establishment	1.4	76	1.1	62	1.3	33			1.2	106	1.1	10	1.3	15	1.1	45	1.1	18	1.2	72	1.3	39	1.3	171

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

Table 38 also indicates that across the crop type, beyond the increase in salaries, employers in the yam value chain on average regard the redefinition of existing jobs as the next frequent action taken to overcome difficulties in recruitment and retention of workers. Employers in the cassava value chain on average equally regard increase in salaries and their readiness to offer training to the less well qualified recruits as the relatively more frequent action taken to mitigate the recruitment and retention challenges. However, on average, employers in the sweet potato value chain rather agree to the increase in the training given to existing workforce as the more frequent action taken to overcome the challenges of recruitment and retention of workers.

4.4.19 Compliance with national labour regulation

The national labour regulation is a body set up mainly to ensure coherence and harmony between firms/employers and their employees. Some of the functions typically include the settlement of industrial disputes and other related labour complaints. Table 39 shows that only 5 firms, representing 2.7 % of the 187 responses across the selected roots and tubers value chain have problems with the national labour regulation. However, this is distributed between 4 firms in the cassava value chain and a single firm in the yam value chain only.

Table 39: Problems Concerning Compliance with National Labour Regulation

	Freq.	Percent	N
Crop			
Yam	1	1.3	76
Cassava	4	4.8	84
Sweet Potato	0	0.0	27
All	5	2.7	187

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

4.5 Rules and supporting functions to develop the value chain

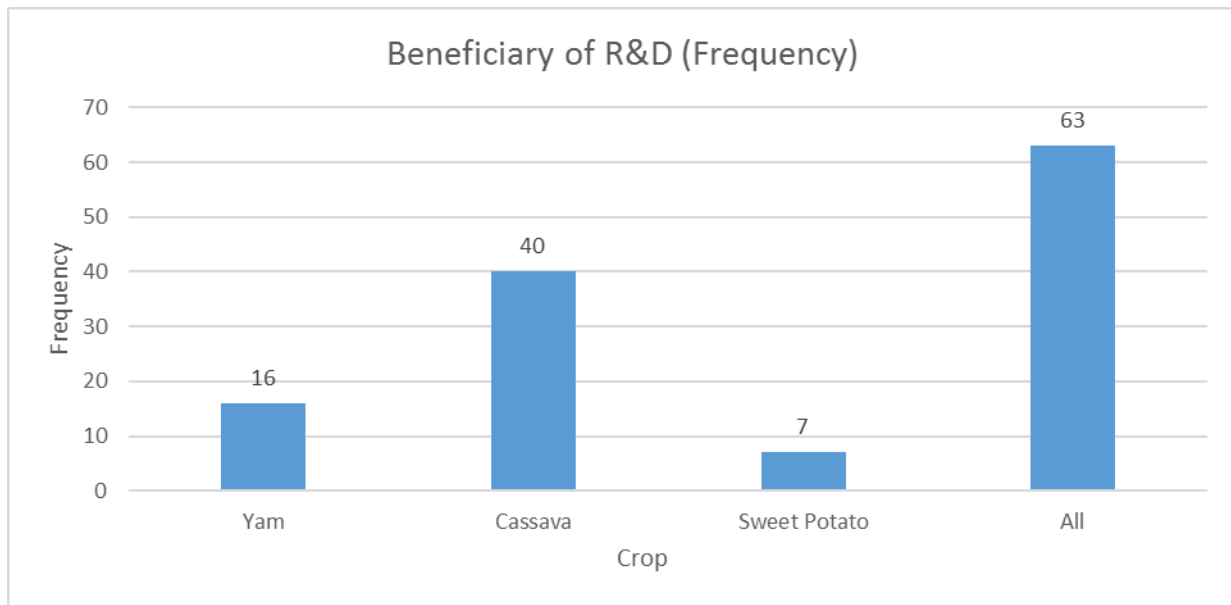
This section looks at the rules (i.e. regulations, standards, laws, and informal rules and norms) and supporting functions (i.e. infrastructure, coordination, research and development, information, skills and training, social dialogue, and business and financial services) to develop the competitiveness of the value chain while providing increased employment and good working conditions.

4.5.1 Beneficiaries of Research and Development (R&D)

The importance of research and development in various enterprises has been identified as a crucial component of innovation and a key factor to developing competitive advantages in the product market. As a result of this, the survey sought to find out whether businesses/enterprises across the value chain benefit from any agency or institution that conducts research and

development for their product and market. It is therefore observed from Figure 4.5 that, overall, out of the sampled firms (195 responses out of 198) across the value chain, 63 of them responded to benefiting from any agency or institute that conducts research and development for their product and the market. The distribution across the value chain for the various crop types shows that, the majority of the beneficiary firms are in the cassava value chain. It is realized that, firms across the sweet potato value chain are the least beneficiaries of any research and development.

Figure 4.5: Beneficiaries of Research and Development



Source: Author’s computation from the Ghana TRAVERA survey dataset, 2018

4.5.2 Sources of Finance

The sources of finance available to firms are very crucial for the general operation of the business as ensuring the sustained growth of the firm. Table 40 displays the sources of finance for investment by firms in the root and tuber value chain. Generally, across both crop type and type of establishment in the value chain, internally generated funds/retained earnings are the main source of finance for investment. Specifically, it is observed that for firms in the yam, cassava and sweet potato value chain obtain 74.6 %, 70.7 % and 34.1 % of their funds internally. The results also indicate that across firms, 64 % of funds are internally generated/retained earnings. This comprises of 71.7 % for farms, 74.7 % for cooperatives, 70.1 % for factory, 77.6 % for wholesalers, 59.6 % for retailers, 62.1 % for processors and 53.4 % for exporters in the value chain.

Responses from the interviews also confirm that the major source of finance is internal. Though they have information about other financial sources such as the bank, they stated that the banks are not supportive. Respondents referred to Export Finance that receives 1% of national import taxes

yet they are not supportive. According to them, Export Finance rather prefers to support mango producers because they perceive mango not to be perishable because it is a tree crop, but they argue that mango is more perishable than yam. The rural bank and “susu” savings group were also mentioned as other financial sources

Table 40: Sources of Finance for investment (%)

Variable	Crop						Establishment															
	Yam		Cassava		Sweet Potato		Farm		Cooperative		Factory		Wholesaler		Retailers		Processors		Exporters		All	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Internal funds/retained earnings	87.5	75	84.0	84	63.3	34	84.5	126	78.9	9	79.3	14	84.1	44	75.0	22	78.8	74	80.6	39	81.7	193
Loans from private banks	11.4	33	6.0	44	40.6	8	7.3	57	0.0	7	0.0	12	3.6	36	0.0	8	11.5	41	23.3	15	11.4	85
Loans from microfinance institutions	6.4	32	4.5	38	0	1	2.5	48	15.7	7	12.5	12	6.4	36	6.7	9	4.8	31	10.5	11	5.3	71
Loans from cooperative associations	1.3	24	12.0	41	0	1	8.3	48	0.0	7	0.0	12	2.2	32	31.7	12	6.3	32	4.3	7	7.9	66
Investment from foreign investors	0.0	23	3.8	36	0	1	0.0	41	0.0	7	7.7	13	3.0	33	0.0	7	3.8	32	0.0	6	2.3	60
Advances from customers	2.1	26	4.9	36	24.2	12	4.5	47	2.5	8	6.8	14	3.0	35	11.3	8	8.3	41	15.0	9	7.0	74
Purchase on credit from suppliers	2.5	26	0.7	34	29	10	4.9	47	2.9	7	3.5	13	2.1	35	1.25	8	6.0	35	7.2	9	5.4	70
Loans from family members friends and relatives	6.2	26	3.1	36	28.6	7	5.9	46	5.7	7	3.3	12	3.9	33	0	7	7.4	35	10.0	10	6.8	69

Source: Author’s computation from the Ghana TRAVERA survey dataset, 2018

4.5.3 Lack of finance as a critical constraint to firm’s production and marketing decisions

Financial resources have been identified as a critical component for firm’s production and marketing decision making processes. In this regard, inadequate financial resources will have dire consequences on the business operations of the various value chain establishments. From Figure 4.6, it is realized that about 93 % of representing 183 out of 196 responses indicated that inadequate finances act as a critical constraint to firm’s production and marketing decisions. Out of this number, 74 firms for both the yam and cassava value chains out of the 76 and 84 firms respectively also indicated lack of finance as a major constraint. For firms in the sweet potato value chain, all but one, that is, 35 out of 36 firms in the value chain identified the lack of finance as a critical constraint. It is therefore realized that, across the value chain for the selected roots and tubers crop types in Ghana, financial resources are highly regarded as critical to the overall production and marketing decisions.

Interviews with exporters, farmers and processors show that they face a common challenge; that is, lack of financial support. An exporter and the processor recount how challenging and complex it can be for business:

“Another problem is, for instance if I should buy a farm right now but I don’t get the time and finances to continue with the processing, it becomes a difficult situation. In a situation where I happen to have purchased the farm in the dry season and wasn’t able to harvest and process due to finances or any other situation, the price of the cassava dough reduces as we enter the rainy season. Then again, there is a problem with the farmer also waiting for you to harvest so he or she can replant for the upcoming season”

(interview with cassava processor).

“...On the 4th of this month I delivered a container to Netherlands and I applied for a loan to do that in December, they could provide it for me. I was very stranded and angry because it was a new customer I had gotten in Netherland whom I was delivering to and he asked when to deliver the yam and I gave him a specific date. So if I should fail, he will terminate the contract and give it to another person. Luckily for me, I had shipped yams to a customer in the US and he paid part of the money so that was what I used to finance the shipment to Netherlands. Had it not been for that, I would have lost that contract”

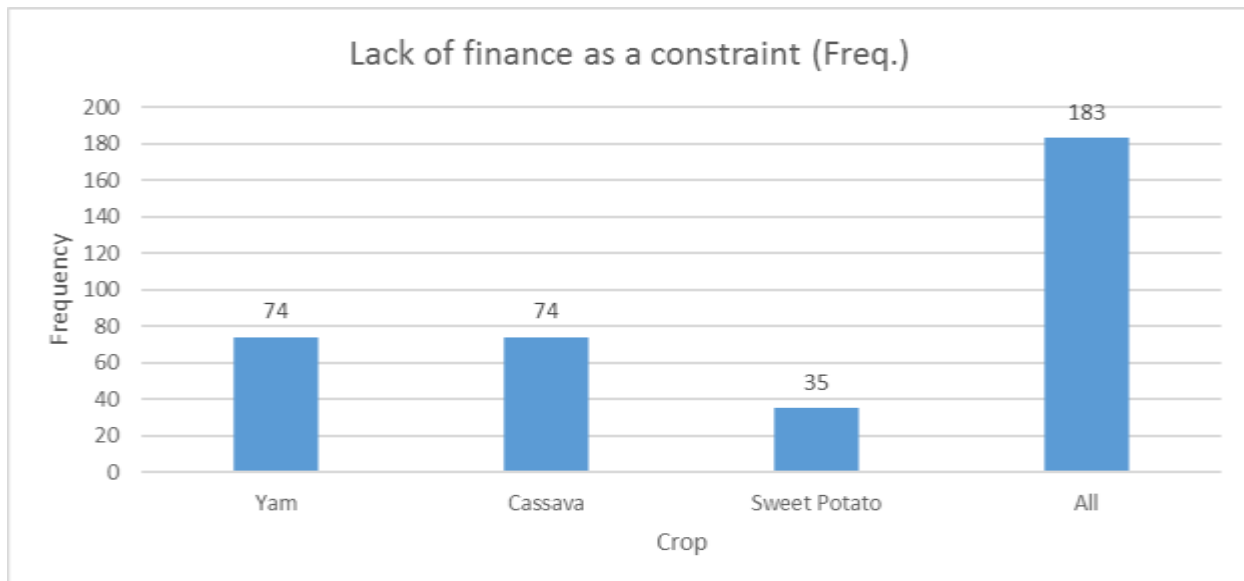
(interview with Geobat farms).

In frustration, Calzion Exports gave an analysis of the important of financial support to the nation as;

“If the government can step in then give loans to the exporters to expand their business and are able to export more, there will be foreign currency in the country and that will help the government do get revenue to develop the government. If the exporters can expand and export more, the government will earn more foreign exchange as a result and in the same way, the exporters themselves would be able to employ more people since they are expanding their business. So it is like a chain...if the government at the top supports the exporters, it will run through and help a lot of people

(Interview with Calzion Exports).

Figure 4.6: Lack of finance as a constraint to production & marketing decisions



Source: Author’s computation from the Ghana TRAVERA survey dataset, 2018

4.5.4 Obstacles against access to credit

Table 41 illustrates the severity of obstacles which militates against access to credit by firms in the value chain. The results show that, on average, across firm establishments, the unfavourable nature of interest rates and the short repayment period encountered by firms are both the most severe obstacle militating against access to credit while the least obstacle is the lack of financial institution in the area where the business operates. For the selected crops, on average, firms in the yam value chain indicated unfavourable interest rates as the most severe obstacle to credit access while firms in the cassava value chain indicated the short repayment period of loans. For firms in the sweet potato value chain, on average, both the unfavourable nature of interest rates and the short repayment period are jointly equal obstacles militating against access to credit.

However, on average, whereas firms in the yam and cassava value chain indicated lack of financial institution in this area of the business as the least obstacle militating against access to credit, firms in the sweet potato value chain indicated both the lack of financial institutions and application procedures for loans as the least severe obstacle to credit access. Mr Tetteh of Calzion Export Limited in an interview lamented how banks demand huge collateral; he confessed that interest rates on the loans are very high such that, if you secure the loan, you also have interest rate to battle with. Respondents also stated the unfavourable exchange rates and cumbersome procedures the banks require before giving loans:

“when it comes to giving out loans they will tell you to sign big documents for them but when you are going to put your money in the bank they don’t ask you for collateral. Also the interest rate is also high. and for some of them the exchange rate is difficult...I was saving with UMB and FBN called me to come open an account with them and they will help me. It has been more than 6 months now and they have not been able to help. Since Christmas, I wrote an application for 24,000cedis they have not been able to provide. Meanwhile they have asked me to bring my wife’s profile and a lot of other documents...I don’t even own the farm with my wife. I am the sole signatory to the account so why do you need my wife’s profile before giving me a loan”

(interview with Geobat Farms)

The processor presented a case about 10 years ago where the government tried supporting cassava process with loans that she was a beneficiary however, she recounts that the initiative had its own problems: She continues thus:

“...we even termed it ‘robbery’ because the repayment terms were overly difficult. The banks gave us the loans alright but almost every week, we were required to pay an amount which made it very difficult. Most people opted out of the initiative due to how difficult the repayment terms were”.

This notwithstanding, she admitted taking loans from other financial sources:

“I personally take the loan from a rural bank and it is the same bank I save with so it usually not an issue. There also a susu savings group I am part of. It is solely for the market women. So based on the amount you are able to save, you can access loans from them group and be paying in bits per month. So that is how I sort out my finances in this business.

Table 41: Severity of obstacles militating against access to credit (1-very severe and 4-no obstacle)

Variable	Crop						Establishment															
	Yam		Cassava		Sweet Potato		Farm		Cooperative		Factory		Wholesaler		Retailers		Processors		Exporters		All	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
Lack of financial institutions	2.7	74	3.5	72	2.9	35	2.9	125	1.6	9	3.5	11	2.7	39	3.4	21	3.1	65	3.6	33	3.1	181
Application procedures for loans or lines of credit are complex	1.6	74	2.8	72	2.9	33	2.2	122	1.6	9	2.5	11	1.6	39	2.0	21	2.5	65	1.8	33	2.3	179
Interest rates are not favourable	1.5	75	1.6	72	2.0	35	1.8	124	1.9	9	1.4	12	1.2	40	1.8	20	1.4	66	1.1	34	1.6	182
Lack of collateral	1.9	74	1.8	73	2.2	35	1.9	125	2.3	9	3.3	11	2.5	38	1.4	21	2.4	64	1.9	34	1.9	182
Size of loans offered is insufficient	1.9	75	2.3	72	2.5	34	2.1	124	1.8	9	2.8	11	2.2	39	1.8	21	2.3	65	1.6	34	2.2	181
Short repayment period	1.7	75	1.4	73	2.0	35	1.7	126	1.6	9	2.1	11	1.7	39	1.3	21	1.7	65	1.4	34	1.6	183
Difficulty to prove the enterprise is credit worthy	2.4	71	2.1	69	2.3	33	2.0	117	2.0	8	3.1	11	2.8	36	1.7	21	2.7	60	2.5	34	2.2	173

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

Across firms, it is observed from Table 4.38 that, except for Cooperatives which indicated the lack of collateral, on average, all firm establishments noted the lack of financial institution in the area of the business as the most severe obstacle against access to credit. For the least severe obstacle to credit access, it is observed that firms in the farm and retailer establishments indicated the short repayment period of loans while firms in factory, wholesaler, processor and export value chain indicated the unfavourable interest rates. However, for Cooperatives, the least obstacle accessing credit is equally identified on average as the lack of financial institution in the area, the application procedures for loans and the short repayment period of loans.

5.5.5 Potential Allocation of additional financial capital

Table 42 displays where enterprises would allocate additional financial capital if they were supposed to have received such funds for their business. It can be shown that, overall, firms would primarily allocate the extra financial capital to the purchase of more machinery (26%) followed by the purchase of additional raw materials (24.6%), purchase of more land/production space/office (22.3%). It is therefore observed that firms in the root and tuber value chain are least concerned about advertising (5.4%). However, across the crop type, inasmuch as firms in the yam and cassava value chain would allocate 26.4 % and 26.9 % respectively of the extra financial capital to purchase of additional raw materials, firms in the sweet potato value chain would prefer to allocate 42.6 % of these funds to the purchase of more machinery.

Table 42: Potential Allocation of Additional Financial Capital

Variable	Yam	Cassava	Potato	All
Hire more workers	21.8	21.4	14.4	20.0
Purchase more machinery	21.3	24.0	42.6	26.0
Purchase more more raw materials	26.4	26.9	13.2	24.6
Do advertising	6.1	1.0	12.4	5.4
Purchase more land/production space/office	24.3	26.6	17.5	22.3

Source: Author's computation from the Ghana TRAVERA survey dataset, 2018

5.5.6 Opportunities and threats within the roots and tuber value chain in Ghana

Table 43 catalogues the opportunities and threats within the value chain based on the quantitative survey and the qualitative interviews.

Table 43: Opportunities and threats in yam, cassava and sweet potato value chain

	Yam	Cassava	Sweet Potatoes
Opportunities			
Production potential	<p>Yam is produced in many countries: Brazil, Costa-Rica (South America), Nigeria and many others. However, Ghana has a competitive advantage because the best varieties worldwide are grown here.</p> <p>Yam and cassava grows in many parts of the country (yam grows in about 7 to 8 regions), therefore, if production is well developed the country can meet its export demand.</p> <p>There is available arable land for large scale production and labour is also generally available</p> <p>Yam can be produced through irrigation so it can be produced all year round if irrigation systems are well developed – the current government policy to construct one irrigation dam per each agricultural community could support this.</p>		
Favourable trade policy	<p>Ghana is signatory to the world trade organization rules so in terms of market access strategy, Ghana has negotiated preferential trade agreements with blocks of key trading partners (US (AGOA), UK, ECOWAS, ETLs).</p> <p>In principle, the markets are opened for Ghana.</p> <p><i>There is a current policy of government is to support export companies.</i></p>		

	Yam	Cassava	Sweet Potatoes
	<p><i>Also, since 2005 Ministry of Trade has developed a trade policy which is guiding how the export sector is organized. Through that eleven products were identified and prioritized as export products that Ghana should concentrate in maximizing its potential; root crops were part of the crops that were identified. (GEPA)</i></p>		
Investment opportunities	<p>The value chain of the root and tuber crops is varied. There are potential areas of the crops that are not well developed particularly processing. If the other products such as flour, bread, alcohol, starch, yoghurt, ice cream and pastas are well packaged and presented to entrepreneurs it could attract investments.</p>		
Proximity to European markets	<p>The location of Ghana on the West Coast of Africa gives it easy access to European markets. The root crops are produced in other parts of Africa, however, Ghana has international market advantage in the sub-region than other countries that produce the same crops due to a relatively more efficient international airport and the major ports in Tema and Takoradi.</p>		
Democratic and peaceful	<p>The highly secure and peaceful environment is an important factor for stable business and therefore an important source of attraction for a potential investor</p>		
Research, development, technology and innovation	<p>The nation is endowed with well-established research institution (Crop Research Institute and Savanna Agricultural Research Institute) through which technologies have been developed in the following areas;</p> <p>Yam: cleaned seed that are better able to withstand diseases in soil and the mini-set technology for multiplying yam seed. Also new technologies have been developed to use ridges to grow small sizes of yam that is preferred in the international market</p> <p>Cassava: Through: The production of cuttings to produce different varieties of cassava that are mainly resistant to the cassava mosaic virus. There are also early yielding varieties available</p> <p>Sweet potatoes: vines have been developed and it even includes the purple flesh sweet potatoes and an orange flesh one which contains vitamins for child development. There is a vine production center at Sogakope in the Volta Region of Ghana</p>		
Health and nutrition	<p>Yam; eating cut yam into chips to compete with the French fries. Yam is better when it comes to oil consumption during cooking. When you fry yam, it doesn't absorb much so much oil as compared with Irish potatoes.</p> <p>Yam is gluten tolerant so those who are gluten intolerant could feed on yam instead of wheat products.</p>		

	Yam	Cassava	Sweet Potatoes
	<p>Sweet potato; for growing up children, there is energy because of the sweetness and there is the beneficial effect of the carotene which is also good for the development of their body.</p> <p>The orange-fleshed potatoes are rich in vitamin A, so if one has to tackle vitamin A deficiency disease from the food-based approach, vitamin A-rich foods are very important to promote, particularly for nourishment in children.</p> <p>The School Feeding Program in Ghana can look at the orange-fleshed sweet potato, a small amount like the size of an egg which is able to meet the recommended daily allowance (<i>WIAD</i>)</p>		
Employment opportunities	The backward and forward value chain linkages coupled with the growing demand create huge opportunities for employment		
Gender	<p>The technology to use ridges means women can go into production as opposed to the mounds that has been a reason for women not producing yams because of the high energy requirement.</p> <p>Again, with the use of ridges production cost is reduced making it attractive for women and the youth</p> <p><i>Women have also been taught to produce seed yam, to produce the yam into seeds; the yam is cut, sprouted and sold which is said to be a source of income generation (FAGE).</i></p>		
Export potential	<p>Processing the root crops into flour prolongs the shelf life</p> <p>Cassava; for cassava, fresh export is very much limited. Cassava was a poor man's crop but now it has assumed the status of an industrial crop so it has export potential for industries and breweries</p> <p>Sweet potato; sweet potato could become a major export commodity because the demand could potentially increase.</p>		
THREATS			
Production	<p>Rain-fed dependent; Agriculture in Ghana is rain fed so the ability to sustain large scale supplies in big markets is farfetched.</p> <p>Seasonality; Yam is a seasonal crop and can only be produced all year round by irrigation, given that the irrigation systems in Ghana are not well developed, sustainable supply if linked to industry is limited.</p> <p><i>...good exportable yam is not in large quantities or available. You will</i></p>		

	Yam	Cassava	Sweet Potatoes
	<p><i>have to move around to be able to get a few good ones for export and the buyers always complain because sometimes when it gets to the market, it is already rotten (GEPA)</i></p> <p>Aging producers; Agricultural production is dominated by the aged in almost all sub-sectors:</p> <p><i>...I mean the young people today are not interested. If we look at the figures, the demographics of cocoa farmers, the average age is over 50 (FAGE, GEPA)</i></p>		
Lack of financial support	<p>From the study, financial support is lacking. Thus producers and exporters have had to self-finance their business which limits potential scale expansion.</p>		
Poor infrastructure	<p>Poor infrastructure has traditionally been a problem in Ghana's agriculture. Poor road network, poor transportation system, poor storage facilities are just a few that hinders the growth of the industry.</p> <p><i>...They say yam is perishable meanwhile they could have built a decent warehouse which could help store the yam for long. Why can't the government just build the warehouse and take the rent charges (GEOBAT)</i></p> <p><i>For me personally, if I should get someone to support my yam export business, I will rain yam into the foreign market like snow (Calzion Exports)</i></p>		
Weak institutional engagement with stakeholders	<p>Poor engagement of policy makers with stakeholders leads to the formation of general policies that may not have positive impact on specific sub-sectors of the economy.</p> <p><i>...The only intervention or any policy directive of a sort that has happened, happened in the 2000-2004 era when government tried to control the glut on the external market since then we have not seen much...(FAGE)</i></p>		
Gender barriers and myths	<p>Women's access to productive resources particularly, large scale land for commercial agriculture is limited.</p> <p>In an interview at WIAD, it was stated that men do not want to eat sweet potatoes because they believe it has so much sugar that can reduce their libido. This is important because we were informed that the marketing it tied to the demand so if there is no demand, you will produce and nobody picks up.</p>		

Source: Constructed by authors', 2018

5.1 Summary and conclusions

This study assessed the export value chain of selected roots and tubers – yam, cassava and sweet potato – across selected regions and firm types in Ghana. The regions included the Ashanti, Central, Greater Accra, Upper West, Volta, Brong Ahafo and Eastern. Firm types interviewed in this survey also included farms, processors, wholesalers, exporters, retailers, factory and cooperatives. This survey forms part of the TRAVERA programme being implemented by the ILO with the objective of focusing on export-oriented activities. The programme is to primarily assist and ensure that small and medium-sized enterprises are well integrated into the export value chain with the objective to improve employment (quality and quantity) as well as increases in the level of productivity and incomes of workers. The study therefore focused on four key aspects across the value chain. This includes the basic structure, the demand (export-related opportunities and constraints), the quantity and quality of employment as well as the general rules and supporting functions of the selected roots and tubers export value chain in Ghana. Analysis were done across the selected crops, regions and firm type for the various indicators derived from the objectives of the study.

In terms of the basic structure of the selected roots and tubers, it was observed that across the country, yam was mainly produced in the Upper West Region, cassava was largely produced in the Ashanti region with a significant proportion of sweet potato coming from the Volta and Central regions. It was also observed that almost half of the firms across the selected crops were between the ages of 6-20 years and about 4 out of every 10 firms had acquired license from a government agency. A large proportion of these firms were private domestic owners who channeled their outputs mainly through wholesalers in the targeted market. However, across both crop and firm types, poor road infrastructure was a major setback to the transportation of their products.

In relation to the demand for the products of the selected roots and tuber export value chain, the results show that most of the firms (7 out of every 10 firms) were not engaged in exports and a large proportion of these firms have not considered exporting their products. Despite the fact that product quality is generally seen as a very key requirement by buyers, intermediaries and final consumers, employers expressed concern regarding the high cost involved in either exporting their products or starting a business in Ghana.

In addition, the study also assessed the quantity and quality of employment across the value chain. The study shows that although employment generally increased in subsequent years from 2015 to 2017 across the value chain, there were more males than females and a large proportion of these workers were seasonally employed. Low educational attainment of employees was observed though a large proportion had some experience prior to their employment. The wage rate was identified as relatively competitive to the market rate, although few firms had registered with the national social security agency.

Finally, the survey identified some of the rules and supporting functions across the value chain. It was generally observed that a large proportion of the firms do not engage in research and

development and that most of the funds are internally generated in the running of the business. This further aggravates the plight of employers across the value chain for improved production and marketing as sources of funds are not diversified.

In terms of opportunities in the yam, cassava and sweet potatoes value chains, the study finds that the sector has a high potential for employment and to contribute significantly to the economy if supported. This is because the crops, particularly yam, is accepted on the international market - there is a significant international demand for the crops. However, production and export is left in the hands of self-financing actors whose scale of production is dependent on their financial capability. For the nation to benefit from the industry, it is important that government invest in the areas of attractive and flexible financial support, favorable policy environment, strong linkage of research and technology to industries and a strong stakeholder engagement with institutions particularly women.

Currently except for the domestic marketing and distribution where women are visible, they are not so obvious in the production process. There is therefore the need to ensure equal participation by women by assisting them to access productive resources such as land, credits and inputs. By virtue of their dominance in the market, women have rich experiences and deep knowledge of the food sector and source of vital market information they can make valuable contribution to policies for the development of the root and tubers sector.

Appendix 1: General employee characteristics by crop and job description

Variable	Managers		Production		Sale Service		Supporting		Source: Author's computation from the Ghana TRAVEL ERAS A survey dataset, 2018
	N	Mean	N	Mean	N	Mean	N	Mean	
<i>Yam</i>									
Number of workers	49	1.2	57	10.2	12	1.6	27	2.8	
Number of female workers	37	0.4	48	4.4	7	1.6	23	2.2	
No of wks. < than 24 years old	33	0.1	34	0.8	3	2.3	9	1.9	
Employee skills match/mismatch	93	2.6	83	3.0	30	2.9	88	2.9	
Average monthly wage (range 1-4)	78	1.6	81	3.6	26	3.6	70	3.3	
<i>Cassava</i>									
Number of workers	118	1.3	64	7.2	21	2.5	49	2.4	
Number of female workers	86	0.8	38	4.3	8	2.4	40	1.7	
No of wks. < than 24 years old	31	0.0	20	1.5	4	1.3	8	1.3	
Employee skills match/mismatch	132	3.1	84	2.6	32	2.5	66	2.8	
Average monthly wage (range 1-4)	21	2.4	15	2.3	6	2.0	6	2.2	
<i>Potato</i>									
Number of workers	9	2.4	5	4.8	0	–	1	1.0	
Number of female workers	1	3.0	0	–	0	–	0	–	
No of wks. < than 24 years old	1	0.0	0	–	0	–	0	–	
Employee skills match/mismatch	40	3.6	7	3.4	2	3.0	12	3.6	
Average monthly wage (range 1-4)	31	1.7	4	2.8	2	3.0	9	2.3	

Appendix 2: Labour and output at the farm level

Variable	Cassava					Yam					All				
	N	Mean	Std. Dev.	Min	Max	N	Mean	Std. Dev.	Min	Max	N	Mean	Std. Dev.	Min	Max
% female workers	112	27.5	37.2	0	100	131	38.3	35.4	0	100	243	33.3	36.5	0	100
Average age	91	32.6	4.7	3	40	118	23.3	3.1	18	30	209	27.4	6.0	3	40
Man days	91	2.4	2.7	1	20	118	18.0	12.2	2	60	209	11.2	12.1	1	60
Unit cost per worker	91	19.8	3.7	1	30	118	16.3	4.9	7	20	209	17.8	4.7	1	30
Total cost	91	100.6	109.6	1	700	118	283.9	215.1	40	1200	209	204.1	198.8	1	1200
Yield in metric tons/ha	19	40.8	20.3	10	80	19	18.9	12.9	6	63	38	29.9	20.1	6	80

