TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY

SKILLS NEEDS ANTICIPATION

WORKPLACE SKILLS AND SATISFACTION SURVEY (AGRICULTURE SECTOR)

Table of Contents

List of Abbreviations

AFF	Agriculture, Forestry and Fisheries
AFMECH	Agriculture, Fishery and Mechanization
CBFMA	Community Based Forest Management Agreement
DA	Department of Agriculture
DENR	Department of Environmental and Natural Resources
GDP	Gross Domestic Product
GVA	Gross Value Added
HVC	High Value Crops
LGU's	Local Government Units
NTESDP	National Technical Education and Skills Development Plan
PSRTI	Philippine Statistical Research and Training Institute
PSA	Philippine Statistics Authority
PSIC	Philippine Standard Industrial Classification
PSOC	Philippine Standard for Occupational Classification
SNA	Skills Needs Anticipation
TESDA	Technical Education Skills and Development Authority
TVET	Technical Vocational Education and Training
WSS	Work Skills Satisfaction Survey

List of Tables

List of Figures

Annex

EXECUTIVE SUMMARY

Agriculture is a prime mover of the Philippine economy, with an estimated 30 million hectares of agricultural land cultivated by almost 5 million farmers. The sector contributed about 10.2% of the country's Gross Domestic Product (GDP) in 2020, and employed 24.8% of the economically active population, particularly in rural communities. Due to its terrain and tropical climate condition, farming and fisheries have been the most prominent agricultural sub-sectors in the Philippines. Crop production, mainly sugarcane, palay or rice, coconut, and bananas, was among the highest nationwide and the top export products. In recent years, fruits and nuts, along with animal or vegetable fats and oils, contributed to the country's largest share of the total agricultural exports. Livestock, hog, cattle, and goat were the country's other signature products, while chicken and duck were the leading poultry products. However, the past few years saw a decline in the sector, posting a -0.3% contract in 2021 despite the 1.4% increase in the fourth quarter, due to the prolonged COVID-19 pandemic as well as calamities. Also, the continuous growth of the population posts an imminent threat to the country's food security for the coming years with a projected increase of 49 million between 2010 and 2045 (PSA, 2010 Census).

Methodology

- A descriptive cross-sectional design was used to characterize the variables involved in the study.
- The SNA Manual developed by TESDA with the technical assistance of the International Labour Organization (ILO) served as a basis in the development of the survey questionnaire.
- The questionnaire is subdivided into 12 sections: (1) Profile of the Company, (2) Basic organizational background, (3) Critical human resources, (4) Skills in the business, (5) Emerging skills associated with industry developments, (6) Green jobs and the Logistics sector, (7) Learning and development, (8) Work and employment practice, (9) Business strategy, (10) Work processes and technology, (11) Organizational performance, and (12) Workforce matters.
- Respondents were sampled from 112 companies from various farm holdings, the database is provided by the government agencies, government-owned and controlled corporations and agricultural associations.
- Stratified random sampling was used to identify the sample size per commodity crop and circular systematic sampling to select the actual respondents who will participate in the study.
- The following subsectors were considered as the strata: For perennial crops: banana, pineapple, mango, rubber, coffee, Sugarcane, and Cacao. For non-perennial crops, corn and rice are included.
- A substitution replacement was used for some of the sampled farm holdings where the enumerators had difficulty contacting or obtaining cooperation. However, there is no substitution applied for respondents who have expressed their non-commitment for reasons such as hectic schedules and prior commitments, among others.
- The survey yields a sample size of 29 respondents with a 25.66% response rate.
- The survey was administered by an enumerator through Structured interview (via Zoom), self-administered via an online survey, and phone interview. In all modes of data collection, jotform was utilized.

- For the proper implementation and standardization of the survey, the survey guide was developed and disseminated to the participating farm holdings.
- The survey was conducted from October to mid-December 2021.
- The survey collected data on 29 participating farm/holdings from eight subsectors. No responses were received from the pineapple sub-sector. Out of 29 farm holdings, three were surveyed via Zoom interview, while ten were surveyed via phone call.
- The validated responses were used to generate tabulations and correlate various indices.

Highlights of the Results of Study

1. Profile of the Agriculture Sector
    - Most of the employees are skilled agricultural workers except for the coffee subsector, wherein the managers have the highest percentage of employees.
    - Most jobs under each participating agricultural establishments are male-dominated except for corn, wherein the establishment has an equal percentage of male and female workers.
    - In terms of employment status, bananas, rubber, coffee, and sugarcane have the highest full-time/permanent employment. For seasonal, Mango and Cacao have the highest percentage of employment. Likewise, Cacao is the only commodity crop that has the same percentage of full-time/permanent and seasonal workers.
    - In terms of the highest educational attainment, 32.28% or the majority of the employees for most of the agricultural establishments completed Primary Education (1-6) followed by graduates of the Lower Secondary Education Old Curriculum with 24.65%.
    - In terms of the highest educational attainment per worker in agricultural establishments, coffee establishments have the highest number of graduates, which is 74.43%, college graduates. It is followed by 66.66%, Primary Education (1-6) completed for corn establishment.
    - Concerning the age bracket, 46.24% of the workforce is aged 18 to 34, while 31.91% are aged 35 to 44, and 21.85% are 45 and above. Establishments in Corn farm holdings have the youngest workforce among the agricultural establishments, with 85% of the workforce in the 18-34 age bracket.
    - Majority of agricultural establishments are not part of multinational companies except for banana and coffee. Thus, 3 out of 29 respondents participated and have main offices in the Philippines and Saudi Arabia.
    - For all agricultural establishments, the majority of employees earn a gross monthly salary within the minimum wage or below, except for the Cacao establishments that have above minimum wage to less than Php. 26,000.00.

2. Recruitment in the Agriculture Sector
    - In terms of vacancies in agricultural establishments, 25.15% are college graduates, followed by Lower Secondary Education Old Curriculum Graduates, 24.70%, and Primary Education (Grade 1-6) 23.33%.
    - Majority, or 72.53%, of employees left the farm/holdings due to the end of the contract, and only 20.85% left due to resignation. Five out of eight agricultural establishments (mango, rubber, coffee, rice, and corn)

identified the end of the contract as the reason why their employees left.

- In terms of technical-vocational education, only 2.73% of the agricultural establishments employ tech-voc graduates.
- In terms of turnover per primary crop, the majority of the agricultural establishments have not identified fast turn over except for rubber, which has the highest number of fast turnover, 83.33%, followed by banana, 40%. Moreover, the Skilled Agricultural Workers have the highest percentage of occupational types with fast turn over.
- Most of the respondents mentioned that the reasons for fast turnover among agricultural establishments are due to unattractive conditions of employment, long working hours, not enough people who are interested in the type of work, staff not interested in long-term commitment and shift to other employment opportunities locally or abroad.
- By policy, more than 13.73% of the respondents require a college degree or higher while 6.67% require tech-voc graduate.
- Additionally, by policy, more than 62.84 of the positions require continuous learning or developmental activities), induction training of more than 2 weeks (25.61% of the Establishments), and at least 3 years of industry-relevant experience (11.54% of the Establishments).

3. Attrition in the Agriculture Sector

- Majority of the reasons specified for the fast turnover of employees across the agricultural establishment are local and overseas employment, better opportunities, health conditions, and personal matters.
- The majority (72.53%) of employees left the farm/holding due to end of contract and only 20.85% of employees left due to resignation. Five out of the eight farm/holdings identified the end of the contract as the reason why their employees left (mango, rubber, coffee, rice and corn) while the remaining establishment say that resignations were their primary reason for leaving.
- Majority of the agricultural establishments have identified jobs that are difficult to replace such as farm managers, nursery workers, farmers, machine operators. However, the agricultural establishment for rubber has no identified jobs that are difficult to replace.

4. Performance of Employees

- The majority (65.32%) of the farm/holdings employees can perform the job but not beyond. This majority holds for most enterprises except for coffee and cacao, whose employees have the potential to perform more demanding duties than they currently have.
- Most respondents cited the reasons for having underperforming employees are the lack of soft skills (100%), socio-emotional (100%), language skills (100%), management and leadership skills (100%).
- Agricultural establishments belonging to the perennial group have actions and interventions for underperforming employees Increase training activity/spend or increase/expand trainee programs (100%), Review appraisals/performance (100%), Conduct mentoring (100%), and Intensify supervision of staff (100%) were top actions/interventions

that the farm/holdings are implementing always/regular; while the conduct of retraining (50%) and apply the corresponding disciplinary procedure of the company (50%) were second in the ranking.

- In terms of agricultural establishments undertaken actions or interventions to employees with the potential to perform more demanding duties, commodity crops such as banana, rubber, coffee, sugarcane, cacao and rice have actions undertaken, likewise, Corn and mango did not identify actions or interventions to employees with potential to perform more demanding duties. The most common interventions identified by the agricultural establishments are learning and development (training, mentoring, etc.) salary increases, job reassignments, promotions, and other incentives.

5. Current and Future Skills Demand
    - About 68.97% of the respondent's establishments have retained their employee size from 2021 to 2022. Respondents from Mango, Rubber, Coffee, Rice, and Corn are included in this group. Only the respondents from the Sugarcane establishment had a decrease in their employment.
    - The only respondent from the sugarcane establishment said that there will be a decrease in their workforce.
    - Skills that were not applicable (i.e nonexistent) to any of the farm/holdings from across the different establishments are processing specialist, storage clerk, warehouse manager, promoter (product), processing operating supervisor, national/regional/provincial sales manager, sales worker, marketing manager, processing operation manager, agricultural clerk, agronomy technician, purchasing officer, crop sorter and processing staff/worker.
    - Agricultural Extension worker is the job which is projected to have the highest shortage at 18.52% followed by agriculture technician at 17.86%. Farmer placed third highest with 17.24%.
    - It is important to note that skills that scored the highest in no change also were at the top in terms of shortage, this can signal that skill shortage, surplus and stagnation can depend on the type of agricultural establishment.
    - For skills that are projected to have a surplus it only accounts for 3.45% to 7.14%.
    - Based on whether or not the skills listed were applicable to the farm/holdings, chemical sprayer (Pesticide, fungicide, etc.) skill was identified to be applicable to all agricultural establishments.
    - Agriculture Extention Workers, Farmer Manager and Overseer, and Farmer were the top skills that most agricultural establishments say are hard-to-fill.
6. Emerging Skills Associated with Industry Developments in the Agriculture Sector
    - In terms of the Fourth Industrial Revolution, data gathered from the respondents shows that majority of the identified emerging skills are “not applicable” such as Drone Technology Operation (51.72%), Hydroponic Technology Techniques (96.55%), Geo Tagging Operation and Geo Mapping Operation (58.62%).

- In addition, Soil Scanning Device Operation and Analysis (48.28%), Value Added Agriculture Techniques (51.72%) and Technical Skills for equipment/tools (51.72%) are considered as more skills demanded.
- The majority of the emerging skills associated with the New Normal are considered as “Not Applicable” according to the respondents. Same with the STEM-related courses, Digital Literacy (62.07%) and Engineering Design Thinking (68.97%).

7. Green Jobs in the Agriculture Sector
    - The majority of farm/holdings had taken no action so far and no plan in the near future when it comes to continuing to decarbonization (58.62%); protecting ecosystem and biodiversity (51.72%); reducing energy, materials and water consumption (55.17%); and minimizing waste and pollution (44.83%). This holds true for all establishments except for bananas.
    - In terms of green jobs, the majority of the agricultural establishments have organization provisions from any aspects of green jobs such as solid waste management, waste segregation, decomposition, use of organic fertilizer, composting and among others. Moreover, agricultural establishments for sugarcane and corn have no identified provisions.
    - In terms of government support, respondents from sugarcane farm/holdings (100) with plans and actions on green jobs have taken advantage of tax incentives/import duty exemption programs. Additionally, the Department of Agriculture (DA) and the Department of Environment and Natural Resources (DENR) are the most common governments that the farm/holding have received or sought assistance.
    - Four out of eight agricultural establishments received support or are seeking support from any government agency. Agricultural establishments such as mango, rubber, rice and corn did not receive or seek support from any government agency.
    - Among the support received from the government are technical assistance to ensure labor law compliance to green jobs (75%), Program registration, assessment, and certification including green goods and services (75%), Data/Information request as reference in the formulation of strategies and potential green jobs development (50%), and Skills development relating to Green Jobs/Skills (50%).

8. Policies/Programs for the Employees in the Agriculture Sector
    - Most agricultural establishments (65.3%) said that their employees are able to perform the job, while only 0.4% are unable to perform the jobs assigned.
    - Reasons why employees are unable to perform the job in the agricultural establishments are Lack of soft skills , Lack of socio-emotional skills, Lack of language skills, Lack of management and leadership skills, and lack of digital skills.
    - Most Agricultural establishments have actions and interventions for underperforming employees. Increase training activity / spend or increase/expand trainee programs (100%), Review of

appraisals/performance (100%), Conduct mentoring (100%), and Intensify supervision of staff (100%) were top actions/interventions that the farm/holdings are implementing always/regular; while conduct of retraining (50%) and apply corresponding disciplinary procedure of the company (50%) were second in the ranking.

- Most farm/holdings only have standard operating procedure policies (89.66%)only 27.59 % of farm/holdings have policies covering training plan, training budget, staff development plan, and development of high potential employees.
- 50% respondents on agricultural establishments, banana, coffee, sugarcane and cacao have policies in terms of business plan, training plan, training budget, staff development plan, development for high potential; staff, feasibility study preparation and standard operating procedure policy.

9. Performance of TVET Graduates and/or TVET Certified Employees

- Among the TVET graduate employees, three out of eight agricultural establishments employed TVET graduates: banana (2.94%), Sugarcane (50%), and Corn (1.25%). Moreover, ftwo out of eight agricultural establishment employed TVET Certified persons: banana (2.25%) and sugarcane (15%).
- For agricultural establisments that have employed TVET graduates and TVET certified employees are generally satisfied with their work and performance. Among the participating Establishments that have employees who are TVET graduates, 80.00% gave a satisfactory rating while TVET certified employees were given a 100.00% satisfactory rating.
- In terms of TVET workforce, among the participating agricultural establishments that have employees who are TVET graduates, 80.00% gave a satisfactory rating, while TVET-certified employees were given a 100.00% satisfactory rating.

CHAPTER 1
INTRODUCTION

The Philippines is primarily an agricultural country with a large portion of Filipinos living in rural areas and supporting themselves through agricultural activities. This activity makes the farm sector a prime mover of the Philippine economy, with about one-third of its 30 million hectares (ha) of agricultural land cultivated by almost five (5) million farmers.

The sector contributed about 10.2 percent of the country's 2020 Gross Domestic Product (GDP) and employed about 24.8 percent of the economically active population, having it as one of the economy's key drivers, particularly in rural communities.

Due to its terrain and tropical climate condition, farming and fisheries have been the most prominent agricultural sub-sectors in the Philippines. Crop production, mainly sugarcane, palay or rice, coconut, and bananas, was among the highest nationwide and the top export products. In recent years, fruits and nuts, along with animal or vegetable fats and oils, contributed to the country's largest share of the total agricultural exports. Livestock, hog, cattle, and goat were the country's other signature products, while chicken and duck were the leading poultry products.

For the past few years, the sector has been declining, posting a -0.3 percent contraction in 2021 despite the 1.4 percent increase in the fourth quarter; this is due to the prolonged COVID-19 pandemic and calamities. Also, the continuous growth of the population poses an imminent threat to the country's food security for the coming years, with a projected increase of 49 million between 2010 and 2045 (PSA, 2010 Census).

With the government's thrust, the Technical Education and Skills Development Authority (TESDA) has been performing its mandate of providing relevant skills training, certification, and accreditation. TESDA developed TRs related to machinery and other existing TRs in the AFF sector. Efforts to provide appropriate training programs are continuously conducted. In contrast, this study will be part of the process for the program and policy-making of TESDA and complement and continue the government's framework for the development of the AFF sector.

1.1 Objective of the Study

Generally, this study intends to determine the employers' desired skills and competencies of its workers in the next 5 years and beyond as well as to determine their level of satisfaction on the competencies and performance of TVET graduates in the Agriculture, Manufacturing and Tourism Sectors.

The analysis of the survey results will provide information to bring TVET programs attuned with the needs of the labor market/industry and anticipation of the needed skills of the Agriculture, Manufacturing and Tourism. This will provide information and evidence that can serve as a basis for the discussion and review of policies that can be formulated to improve and enhance the system.

- Provide quantitative measures on skills, e.g. skills gaps, skills shortages, skills utilization in the workplace;
- Assess factors that are likely to impact on skills use;

- Identify emerging future skills; and
- Determine the satisfaction of employers on the competencies and performance of TVET graduates in the workplace.

1.2 Scope and Limitations of the Study

The GDP and GVA of the Agricultural Crops are the basis for identifying the scope of the study, which covers the Perennial and Non-perennial Crops. Please take note that the Plant Propagation cuts across both Perennial and Non-perennial Crops which are included in the value chain.

1. **Perennial Crops**
   Also known as non-temporary crops, are crops/plants that last for more than two growing seasons, either each season or growing continuously. Many fruit and nut crops are naturally perennial; other examples are rubber trees and oil palms.

2. **Non-Perennial Crops**
   Otherwise known as temporary crops, these are crops/ plants that do not last for more than two growing seasons (years) and crops that need to be replanted each year. Crops under these types are cereals (i.e., rice and corn), legumes (beans), oil seeds, ground nuts, sugarcane, tobacco, fiber crops, leafy and fruit-bearing vegetables, melons, and root crops

3. **Commodity Crops**
   This sub-classification cuts across both perennial and non-perennial crops, typically grown in large volumes and at high intensity, specifically for sale to the market (as opposed to direct consumption or processing). Many commodity crops re-enter the food production industry in some ways: fiber, fillers, starch, etc.

For Perennial Crops, the survey included seven commodity crops based on government thrust, incentives, priority, and cooperation. These perennial commodities are as follows:

1. Banana
2. Pineapple
3. Mango
4. Rubber
5. Coffee
6. Sugarcane
7. Cacao

While there were two commodity crops representing the non-perennial crops. The selection of crops was based on the same indicators as the perennials. These non-perennial commodity crops are:

8. Rice
9. Corn

An industry consultation was conducted to validate the developed inception report for the study. Based on the result, the stakeholders suggested including

all phases of the agriculture value chain from production to processing. In some cases, those farm/holdings that cater to multiple phases of the value chain will be considered

The respondents of the study are the household sectors should be the owner or the person-in-charge of the farm; for companies, at least a senior position in the farm/holding, such as Human Resources (HR) head or Operations Supervisor. However, collaborative efforts of multiple facility employees are permitted.

Additionally, if there are household farms/holdings and companies that produce and process various crops, the scope of the information must be limited only to the identified facility's location and commodity crop. As such, the discussion of the results shall only cover the respondents of the participating Establishments representing the specified location and commodity crop.

Moreover, the list of respondents are provided by the different government agencies (GAs), government-owned and controlled corporations (GOCCs), and agriculture associations; these may either be household or non-household sectors.

- Department of Agriculture (DA)
- Philippine Banana Growers and Exporters Association (PBGEA)
- Accredited Civil Society Organizations (CSO's)
- Philippine Council for Agriculture and Fisheries (PCAF)
- Sugar Regulatory Administration (SRA)
- Department of Trade and Industry (DTI)

The type of crops and corresponding commodity crops produced by the identified agricultural establishment was used as the strata. The scope and descriptions of these commodity crops were validated with the industry during the inception report validation questionnaire and meeting. A copy of the questionnaire was sent to those who attended the validation meeting for further comments and validations.

The WSS survey will focus on the non-household sector, specific corporations with the widest operations in the agricultural industry. The selection of corporations is based on their covered area and subsector. This study will focus on generating data/information relevant to the agricultural sector's needed improvements nationwide. Desired outputs of this study include data on the current skill sets of the labor force; needed actions for improvement, i.e., mechanization/modernization; additional training, among others, and identifying new/emerging skills for further development. These will be collected, tabulated, analyzed, and reported on some summary statistics.

CHAPTER 2
REVIEW OF RELATED LITERATURE

Taxonomy of Agriculture

The Agriculture Sector is composed of the Agriculture, Forestry, and Fisheries (AFF) economic sector. According to the 2009 Philippine Standard Industrial Classification, the AFF includes the exploitation of vegetal and animal natural resources, including growing crops, raising and breeding animals, and harvesting timber and other plants, animals, or animal products from a farm or their natural habitat.

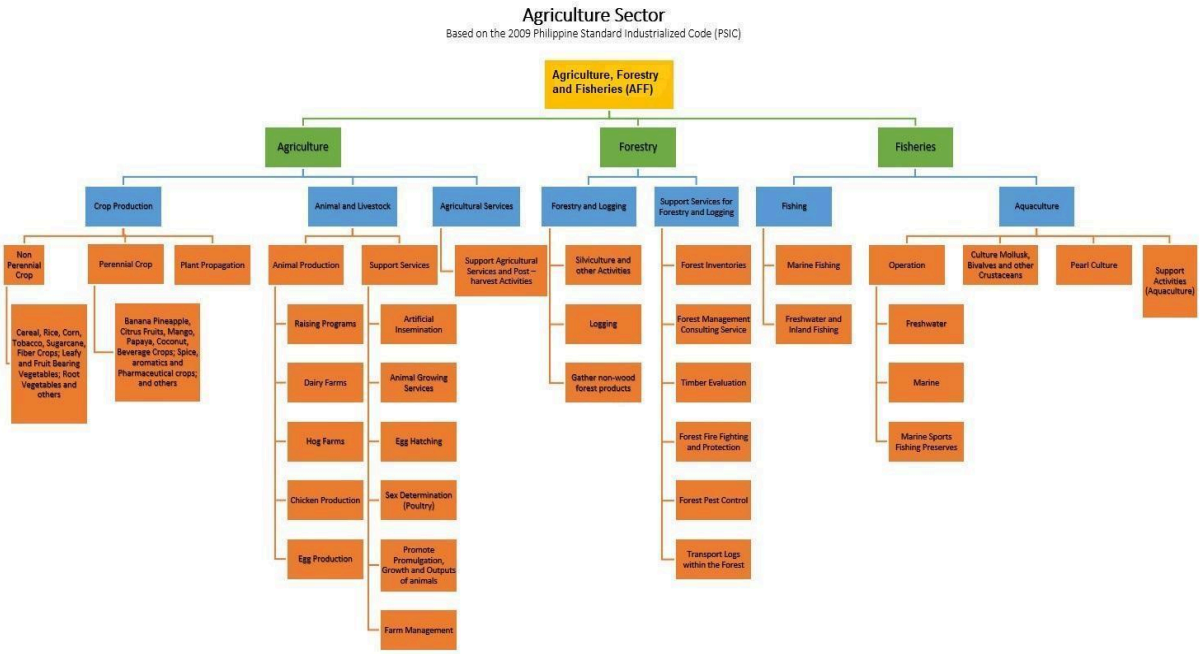


Figure 1 Main Taxonomy of the Agriculture Sector: Agriculture, Forestry and Fisheries (AFF) based on the 2009 PSIC and Nationals Accounts,

Figure 2 shows how the AFF comprises the Agriculture, Forestry and Fisheries Sectors; these sectors essentially provide raw materials to the manufacturing and service industry.

The **Fisheries Sector** is composed of fish and other marine animals that are either grown in captivity or captured in the open seas and oceans and sold for commercial consumption. Fishing and Aquaculture are the two subsectors under Fisheries where; fishing is the gathering/collecting and capturing of live-wild aquatic organisms, while Aquaculture is the process involving culturing or farming (including harvesting) of aquatic organisms using techniques designated to increase the production of the organisms using techniques established to increase the production of the organisms in question beyond the natural capacity of the environment.
The **Forestry Sector** includes the production of round wood for forest-based manufacturing industries as well as the extraction and gathering of wild-growing

non-wood forest products, also in this sector also includes the processing of firewood, charcoal, and wood chips. Production and conservation of forestlands are the main activities of the sector, where: Silviculture is the growing of standing timber that includes other activities such as planting, replanting, transplanting, thinning, and conserving of forests and timber tracts; and, Logging is the process of production of roundwood for forest-based manufacturing industries.

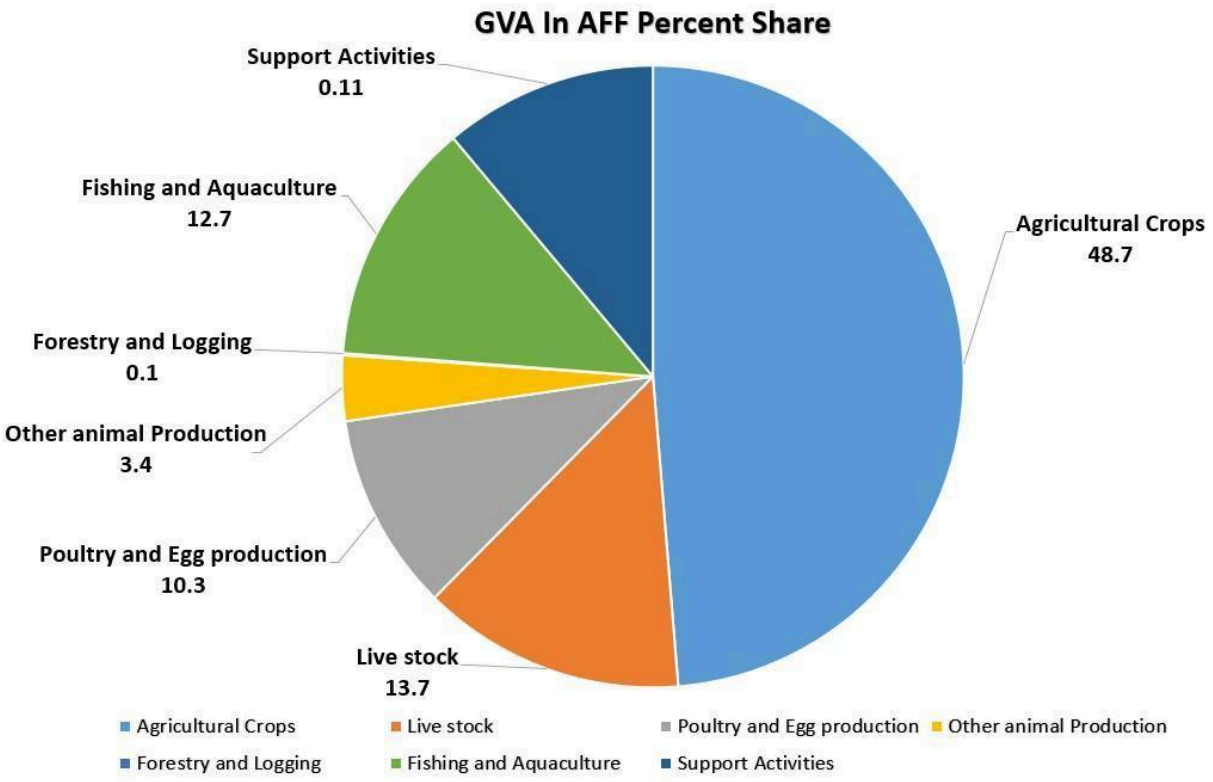
The **Agriculture Sector** comprises several aspects, generally there are: (1) Crop production where all types of crops are grown to be used for consumption or raw materials for manufacturing industries; and, (2) Animal production where all animals, except aquatic animals, are raised and bred for commercial markets.

Crop productions can be also subdivided into what type of crop farmers produce, either perennial or non-perennial; perennials are crops that last for more than two growing seasons while non-perennial crops don't last more than two growing seasons.

Economic Indicators

Industry Share

Figure 2. GVA in AFF by industry, Philippines, 2021 (Share to AFF, at Constant 2018 Prices)



Source: PSA, 2021

Figure 3. (GVA) Percent Share in Agriculture , Forestry and Fishing by Industry, Philippines 2017 -2021 (Current Prices)

Industry	**2017**	**2018**	**2019**	**2020**	**2021**
	Current Prices				
Agricultural Crops	52.2	52.2	48.9	50.5	**48.7**
Livestock	12.2	13.3	13.9	13.1	**13.7**
Poultry and Egg production	10.2	9.6	10.4	10.3	**10.3**
Other Animal Production	2.8	3.1	3.1	3.1	**3.4**
Forestry and Logging	0.2	0.2	0.2	0.1	**0.1**
Fishing and Aquaculture	13.0	12.5	13.5	12.3	**12.7**
Support Activities to the AFF	9.3	10.0	10.6	11.1	**11.1**
Gross Value Added in AFF	100.0				

Source: PSA 2021

As shown in Figure 3, the AFF's industry share for 2021, crops dominate with **48.7** percent at current prices where palay maintained the most significant share among the crops followed by banana, corn, and other crops. Livestock, fishing, and aquaculture placed 2nd and 3rd, respectively. Also, Table 3 shows from 2017 to 2021; agricultural produce consistently had the highest industry share among the industries in the AFF.

Establishments and Employment Growth

An establishment is defined as an economic unit that engages, under a single ownership or control, i.e., under a single legal entity, in one or predominantly one kind of economic activity at a fixed physical location.

In 2018, the PSA published the 2018 Census of the Philippine Business and Industry: Agriculture, Forestry, and Fishing. The document categorizes the AFF sector in terms of the 2009 PSIC Code and analyzes the revenue, expenses, establishment, and employment. Establishments, as an indicator, provide a more insightful look regarding the overall growth of the industries under the sector as it shows that within the sector, there is demand for a particular product or service, thus increasing supply (provided by establishments).

From 2012 to 2018, the AFF sector's establishments have increased by **33.5** percent, with agricultural production and propagation providing the highest combined share with

a **43.5** percent increase. Both forestry and fishing (fisheries) yielded negative growth rates of **-56.3** and **-15.5** percent, respectively, but aquaculture saw a rise of **3.4** percent from 2012.

The increase in the number of establishments did not correlate with the number of employment; to be exact, employment posted a growth rate of **-5.9** percent, and there was a significant decrease in employment growth rate across the AFF except for plant propagation, animal production, and aquaculture who posted **622.4** percent, **57.8** percent, and **10.7** percent increase respectively. This negative rate might be a result of various factors, one of which is the government's push for modernization and mechanization.

Government Support

2009 PSIC Code		Industry Description	Number of Establishment			Employment		
			2018	2012	Growth Rate (%)	2018	2012	Growth Rate (%)
A		Agriculture, Forestry and Fishing (AFF)	3,285	2,461	33.5	154,910	164,706	-5.9
Agriculture	A011	Growing of non-perennial crops	500	421	19	25,351	38,066	-33.4
	A012	Growing of perennial crops	341	282	20.9	59,644	65,860	-9.4
	A013	Plant Propagation	18	8	125.0	484	67	622.4
	A014	Animal Production	1,593	944	68.8	37,618	23,836	57.8
	A015	Support activities to agriculture and post harvest crop activities	413	340	21.5	10,600	13,102	-19.1
Forestry	A021	Silviculture and other forestry activities	7	16	-56.3	246	520	-52.7
	A022	Logging	s	3		s	187	
	A024	Support Services to foirestry	s	6		s	328	
Fishing	A031	Fishing	223	264	-15.5	15,644	18,008	-13.1
	A032	Aquaculture	183	177	3.4	5,236	4,732	10.7

Source: CPBI

Figure 4. Establishment and Employment Statistics of Agriculture, Forestry and Fishing (AFF) by Industry Group Philippines, 2018 and 2012 CPBI

Stated in the Philippine Development Plan 2017-2022, the Agriculture, Forestry and Fisheries (AFF) is an important sector to achieve the country's developmental and social goals. The AFF sector is the main source of raw materials used in manufacturing and servicing sectors, which is also a key for generating jobs, reducing poverty and inequality. Thus, the expansion of the AFF sector has been included in the thrust of PDP (2017-2022), through adopting a holistic value chain approach, guided by science-based decision support tools.

The 2017-2022 Philippine Development Plan aims to increase and maintain the AFF gross value added (GVA) within 2.5 percent 3.5 percent from the baseline of -1.2 percent in 2016. Likewise, a reversal of the negative growth for the value of production in fisheries, A&f exports, and labor productivity is targeted for the remaining period.

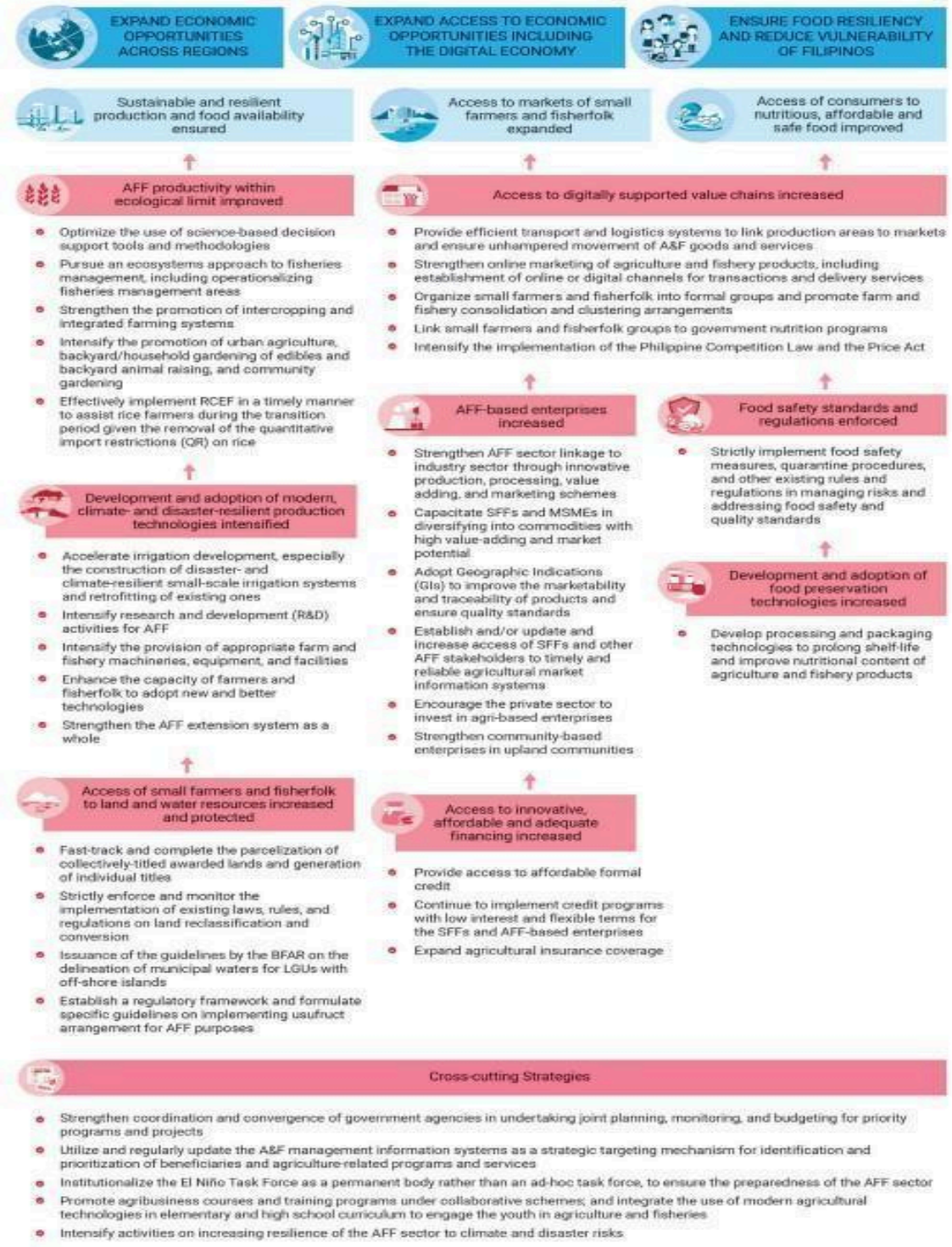


Figure 5: Strategic Framework to Expand Economic Opportunities in Agriculture, Forestry and Fisheries (2017-2022) (Source: Updated Philippine Development Plan 2017-2022)

To achieve the Plan's targets, some outcome-specific and crosscutting strategies were developed; one is "Ensuring sustainable and resilient production and food availability" which focuses on: (a) improving AFF productivity, (b) intensify development and adoption of modern technologies, and (c) Increasing and protecting of SFF's.

Preceding to the Updated PDP (2017-2022), the Philippine government has enacted laws and policies to address the needs of the agricultural sector i.e. R.A. 8435 or the "Agriculture and Fisheries Modernization Act", R.A. 1060 or the "Agricultural and Fisheries Mechanization Law", and R.A 11203 or the "Rice Tariffication Law". The Department of Agriculture has also implemented rules, guidelines and coordinated programs that ensure farmers and producers are provided with monetary assistance incentives.The use of modern technologies or "science based decision support tools have promoted by the DA like the National Color-Coded Agricultural Guide (NCCAG), Rice Crop Manager (RCM) and other farm management tools (e.g. AgriDoc App, MOET App, etc.).

In 2020, the Department of Agriculture Secretary William Dar, said "The agri-fishery sector, for the longest time, has been a 'sleeping giant' of the national economy, whose vast potentials remain largely untapped to achieve higher and sustainable growth" he further added " While the agriculture sector contributes about 10 percent (%) to the country's gross domestic product (GDP), it gets a measly share of total national appropriations, at three to five percent in the last 10 years". This underscores the crucial contribution of the agri-fishery sector in the Philippines economic recovery and national development efforts. For 2021, the DA aims to further increase production of major commodities with respective proposed budgets for:

- Rice
- Fisheries
- High-value Crops
- Livestock and Poultry
- Corn

This sentiment was later echoed again in 2021 for the internal budget hearing for 2022. Secretary Dar wanted the DA to continue to pursue efforts to achieve a 2.5 percent growth for the agriculture and fisheries sector for 2021 and start laying the groundwork for 2022. Further, he said they must continue efforts to attain food security for major commodities like rice, pork, chicken, fish, fruits, and vegetables to stabilize supply and prices. These include consolidating and mobilizing farm and fishery products from surplus provinces to major consumption areas like Metro Manila.

The Department of Agriculture (DA) implemented nationwide the Duterte administration's "Plant, Plant, Plant Program " or "Ahon Lahat, Pagkaing Sapat (ALPAS) Laban sa Covid-19" program to benefit farmers, fishers and consumers. The program seeks to increase national agi-fishery output through intensified levels of productivity across all commodities and thus ensure food productivity, availability, accessibility and affordability the threat of Covid 19 pandemic.

The Technical Education Skills and Development Authority (TESDA) released the The National Technical Education and Skills Development Plan (NTESDP) 2018-2022 that aims to strengthen the Technical Vocational Education and Training

(TVET). The NTESDP cited improving productivity as the main driver in achieving inclusive growth and targets to substantially increase the growth of the gross value added (GVA) in the sector. It also Identified **41** priority Occupations in the Agriculture (AFF) Industry.

Top Priority Occupations in Agri Fishery, (2018-2022)	
Agri-crop Producers/Processors	Foor Chemist
Agriculture Crop Production Workers	Forester
Agricultural Engineers	Horticulturist
Agriculturist	Landscape Installer and Maintenance Worker
Animal Producers (Ruminants)	Landscap Installer and Maintenance Personnel
Aquaculturalists	Machine Operator
Banana Growing Worker	Mechanic
Bangus Caretaker	Mechanic for Farm Implements or Machineries
Butcher	Packer
Craftsman	Plastic Machine Operator
Crop/Fruit Picker	Poultry Raisers
Diary Farm Worker	Poultry Worker
Driver	Rice Machinery Operators
Eviscration Crew (Fish)	Seafarer/Seaman
Farm Machinery Operator/Technician	Seaweed Farmer
Farm Managers	Slaughterer
Farmer	Soil Technologist
Fish Cage Caretaker	Steamer Operator
Fish Processor	Taxonomist
Fisherfolk (Fish Capture)	Weaver
Food Processor	

Figure 6. Top Priority Occupations in the Agri-fishery Sector from the NTESDP 2018-2022

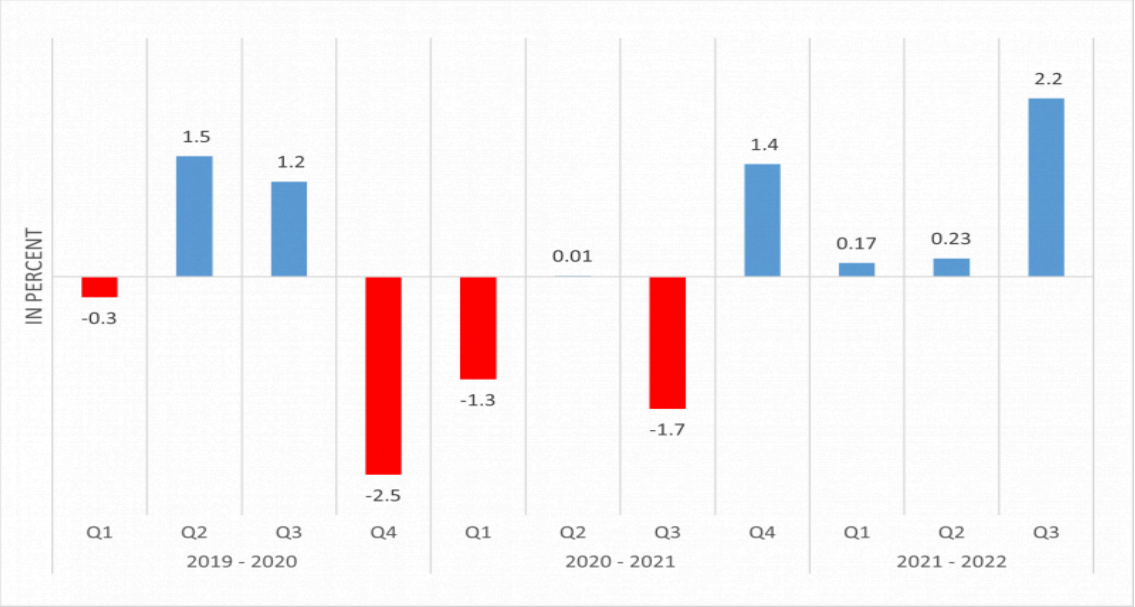
In 2020, with the pressing demand to boost food production, the department of Agriculture (DA) together with the Technical Education Skills and Development Authority (TESDA) promised to conduct more training to further enhance the skills and know-how of farmers and farmworkers under the “new normal” era in agricultural production, and food value chain. A crafted training design that will specifically address the emerging needs of the farmers in terms of skill development to cope with the current national state of emergency and Luzon-wide enhanced community quarantine.

In relation to the government's thrust, the Technical Education and Skills Development Authority (TESDA) has been performing its mandate of providing relevant skills training, certification, and accreditation. TESDA developed TRs related to machinery in addition to other existing TRs in the AFF sector. Efforts to provide relevant training programs are continuously conducted, whereas this study will be part of the process for the program and policy-making of TESDA as well as complement and continue the government's framework for the development of the AFF sector.

Gross National Income and Gross Domestic Product

Based on the data released by the Philippine Statistics Authority for the 3rd Quarter of 2022, Agriculture, forestry, and fishing (AFF) rose by 2.2 percent in the third quarter of 2022. This was a turnaround from a -1.7 percent decline in the same quarter of 2021. (As shown in the figure beloww

Figure 7. Agriculture, forestry and fishing, Q1 2019 to Q3 2021 Growth Rates, At constant 2018 prices



Poultry and egg production, which grew by 6.4 percent this period, had been the main driver of AFF growth since the first quarter of 2022.

This was followed by Livestock, 4.8 percent; Support activities to agriculture, forestry and fishing, 4.0 percent; Other animal production, 5.0 percent; Corn, 2.5 percent; and Palay, 1.0 percent.

Other industries that contributed to the increase were: Sugarcane including muscovado sugar-making in the farm, 69.3 percent; Pineapple, 4.2 percent; Coconut including copra, 1.1 percent; Other agricultural crops, 1.1 percent; Banana, 0.2 percent; Abaca, 17.5 percent; Cacao, 8.2 percent; Rubber, 1.1 percent; Cassava, 0.3 percent; and Tobacco, 1.8 percent.

On the other hand, the remaining industries under AFF declined during the period. These were Fishing and aquaculture, -2.2 percent; Mango, -3.8 percent; Coffee, -1.0 percent; and Forestry and logging, -0.01 percent.

With 8.5 percent share to the total GDP, AFF recorded the least contribution among the three major economic sectors in the third quarter of 2022.

CHAPTER 3
METHODOLOGY

3.1 Research Methodology

The SNA-WSS Survey on Agriculture aims to provide information to Technical-Vocational Education and Training (TVET) stakeholders on the existing and in-demand skills in the Agriculture, Forestry and Fishery industry, particularly in the Agriculture Sector, which can help in the projection of potential future skills needs. This study can also be used as a supplement for policy revisions and strategy changes. The specific objectives of the study are:

- Identify qualification standards and skills certification needed to be designed for new and emerging skills/No Training Regulations (prioritization of Machinery TRs);
- Provide quantitative measures on skills (e.g., skills gaps, skills shortages, skills utilization in the workplace); and,
- Assess factors that are likely to impact skills utilization.

3.2 Questionnaire

The research instrument used in this study was developed based on the Skills Needs Anticipation (SNA) Manual developed by TESDA with the technical assistance provided by the International Labor Organization. The survey questionnaire was used in the first three sectors of the SNA-WSS Survey on Construction. For the first two conducted SNA-WSS Survey, the Construction and IT-BPM Sectors served as the basis for this questionnaire. However, modifications were made based on the nature and characteristics of the Agriculture and Forestry Sector and the conducted industry scoping to cover the industry's context better.

The questionnaire was divided into 12 sections, as listed below, to achieve the survey objectives. The descriptions from the technical report on the SNA WSS for Agriculture.

1. Profile of the Company - this gathers information such as the respondent's position, the establishment's name, location, areas of operation, and the primary crop being produced, processed, and/or marketed.

2. Basic Organizational Background – This section asks for information on the organizational structure, highlighting the human resource and the concerned unit/division in the agriculture sector (production and manufacturing). Affiliation to other organizations/institutions information will be further gathered.

3. Critical Human Resources – this section asks for information on the number of workers/members and distribution of the company's workers from 2021 to 2022 by the following categories:

- Gender
- Age group
- Primary and commodity crop specialization (i.e., perennial/non-perennial crops and timber/non-timber forest products),
- Occupational type
- Employment status (i.e., full-time and casual/seasonal workers),
- Educational attainment from highest to lowest, and
- Gross monthly salary (PHP).

Expected changes in employee size for the succeeding years, unfilled positions in the last six (**6**) months, and the difficult-to-fill and retain occupational types were also included in the survey. Likewise, it inquires about the approximate percentage of employees who would be difficult to replace within three (**3**) months, as well as the jobs that would be difficult to replace, the percentage of decrease in employment in the agricultural sector, and factors affecting the employment, i.e., retirement, decreasing workforce participation, as well as resignation and contract termination, etc.

4. Skills in the Business - for this section, respondents, are asked on the percentage of members according to their performance (able to perform the job, unable to perform the job, and have the potential to perform with more demanding duties), reasons behind poor performance and corresponding actions applied, whether actions were done for those with more potential and whenever applicable, the reason why no action was done.

The positions that require a college degree, two (**2**) to three (**3**) weeks of induction training, continuous learning or developmental activities, at least three (**3**) years of industry-relevant experience, and a technical vocational certificate or National Certificate. The number of additional employees needed for the succeeding years, identify the jobs or skills that either may have a shortage, no change, surplus, or will be hard to fill in the next five (**5**) years. A TVET Program may address occupations/skills needs/requirements.

5. Emerging Skills Associated with Industry Developments - this section contains questions on the emerging skills in line with the fourth industrial revolution, provisions of the Philippine Development Plan 2017-2022, Agricultural and Fisheries Mechanization Law (AfMEch), and other related laws in line with the modernization of the agricultural sector. Identify how these skills will impact skills demand in the next 1-5 years. Self-evaluation of the companies in their readiness for implementing actions and preparations for the human resource relative to the emerging skills. For capable companies, elaborate on the actions undertaken.

6. Green Jobs and the Agriculture Sector - questions under this section include the extent of implementation of each agriculture company on various aspects of green jobs and provisions for any aspects of green jobs. The identified list of emerging skills relative to green jobs and the relevance of the green industry developments to the current and near-future business needs in terms of knowledge, skills, and attitude.

7. Learning and Development - this section seeks information such as the percentage of payroll expenditure/funds allotted for training. Identify the company's

list of capacity-building services, i.e., training and business planning. It also supports the service company's rating of various training-related statements using a 5-point scale where five means "strongly agree," and one means "strongly disagree."

8. Work and Employment Practice - for this section, questions are about the company's policies covering various documents (i.e., business, training, and staff development plans, training budget, and development for high potential staff). Company information is shared with their employees concerning the percentage entitled to various rewards or opportunities.

9. Business Strategy -under this section, companies are asked to rate various statements regarding the approach to business and the extent of implementation of actions for different areas of business development.

10. Work Processes and Technology - this section primarily focuses on gathering information on how up-to-date are company's core equipment is being used in producing goods and services compared to the best commonly available technology in the country and overseas.

11. Organizational Performance - this particular section asks about the outcomes such as profitability, total sales or revenue, and market share for 2021 to 2022. Moreover, it seeks information on the percentage of members exhibiting various behaviors at work.

12. Workforce Matters - the last section of the questionnaire gathers information on the percentage of members/employees that are TVET graduates. Likewise, respondents are asked to give evaluations on the work and performance of TVET graduates and certified.

The questionnaire was converted into an online survey, utilizing JotForm, an online and code-free application used to create custom online forms. Due to time constraints, the team could not conduct a pretest with the characteristics of the actual participants. Instead, TESDA staff assigned to complete another SNA WSS Survey for the Agriculture Sector served as pretests for the jotform survey.

Necessary modifications were made to the JotForm survey after pretesting. Moreover, the online survey was used regardless of the survey method (researcher-administered or self-administered).

Due to the challenges in the technology to some target respondents. A phone interview was also conducted to gather data, the responses were encoded by the interviewer in the jotform, likewise, the same set of questions was used during the survey.

3.3 Sampling and Sampling Techniques

A total of 127 respondents were provided by the various agricultural establishment associations and cooperatives. Each respondent was either a member of an association or a cooperative; these respondents were classified in only one type of agricultural establishment. Agricultural Establishments were first grouped into two groups (perennial and non-perennial) and then further subdivided in each

establishment group's respective commodity crop produced in their farm/holdings. Multiple association memberships were disregarded.

Stratified random sampling was used to identify the sample size per agricultural establishment, and systematic circular sampling was used to select the actual respondents who will participate in the study. The unit of analysis used in this study is “farm/holding”. Thus,

Table 1. *Distribution of the Establishment Groups by Agricultural Establishment*

Establishment Group	Number of Agricultural Establishment
Perennial	79
Non-Perennial	48
Total	127

A substitution replacement was used for some of the sampled farm/holdings where the enumerators had difficulty contacting or obtaining cooperation, That is, the enumerator was unable to locate/identify the sampled facility such that there are no responses from email, SMS, or phone calls. For this survey, a majority was conducted through phone calls due to the general profile of the respondents. Contacting the respondents either through email or call may not necessarily be done on consecutive days.

Substitutions were not applied for respondents who have non-commitment reasons such as important scheduled activity, prior commitments, and some other business or operation-related reasons. In this case, establishments falling under non-response error were not considered. Taking these into account, alongside a 5% margin of error and 95% confidence level, the survey yields a sample size of 112.

Table 2. *Distribution of the Final Sample Size by Establishment Group per Agricultural Establishment*

Establishment Group	Agricultural Establishment	Number of Agricultural Establishment	% Distribution
Perennial	Banana	10	8.93
	Pineapple	4	3.57
	Mango	8	7.14
	Rubber	16	14.29
	Coffee	8	7.14

	Sugarcane	15	13.39
	Cacao	8	7.14
Non -Perennial	Rice	10	8.93
	Corn	33	29.46
	Total	**112**	**100**

3.4 Preparation of the Study

To ensure proper implementation and standardization of the survey, an interviewer manual was developed based on the previous SNA-WSS Survey conducted (IT-BPM, Construction, and Logistics), likewise, modifications were made based on the result of the industry scoping conducted. A survey guide was developed and disseminated to the respondents for the structured and self-administered survey. Also, the survey questionnaire was encoded to the Jotform, an online survey tool, which will be disseminated to the respondents during data collection. In addition, a database was developed for the proper monitoring of the development of the survey.

3.5 Data Collection Strategies and Process

For Agriculture, the majority of the respondents are located in the provinces mostly in Visayas and Mindanao regions. Face-to-face interviews are not the best option since there is a limited number of survey enumerators, time, resources, and challenges in technologies to some of the respondents are the limitations of the study. However, to attain the reliability and validity of the data gathered, a survey guide was disseminated to the respondents that served as their guide in accomplishing the survey.

Online /structured interviews and self-administered interviews through Jotform were considered in data collection. However, due to the challenges faced by some respondents in terms of technology, phone interviews were also considered in data gathering. The data gathered through phone interviews were encoded by the enumerators after.

The team conducted the data collection from 1st week of September to the last week of October and followed the process below:

1. An invitation letter was sent via email to identified associations, government agencies, and government-owned and controlled corporations inviting their members to be one of the respondents of the survey.

2. The database provided by associations, government agencies, and government-owned and controlled corporations provided a database of their members/member associations to be considered as respondents of the study.

3. The target respondents were sent an email containing the following information:
    a. Invitation letter signed by the Deputy Director General
    b. Survey Guide
    c. Consent Form
    d. Jotform Link and password

4. Follow-up emails and calls were made to the respondents depending on the response to the initial email made.

5. The data collection was administered on the following process:
    a. For the self-administered survey, a Jotform link and password were given to the respondents.
    b. For online/structured interviews, the survey team scheduled an interview via zoom, the Zoom link was given to the respondents prior to the schedule.
    c. For phone interviews, an invitation was sent through SMS. Before the enumerator proceeds with the interview proper, the Consent Form is read to the respondent and they have to agree to the content of the Consent Form before proceeding with the interview proper. The enumerator will be responsible for encoding the data gathered to the respondents in the jotform.

6. There were a series of follow-ups conducted by email, calls, and SMS.

3.6 Editing, Encoding, and Analysis

The enumerator checked the accomplished questionnaires for possible errors or inconsistencies before encoding them to the jotform. The database was cleaned based on the result of the validated responses from the respondents.

CHAPTER 4
RESULTS AND DISCUSSION

This chapter contains the survey findings in the form of summary statistics and tabulations, which are organized by section following the format of the questionnaire.

Issues arose during the survey operations, which affected the survey's response rate. Incomplete and incorrect contact information made contacting respondents difficult. Also, recent tropical storms hit the country, adding to the difficulty of the operation. As a result, replacements were generated, and the survey team had to contact (via email and call) all agricultural establishments in the sampling frame.

29 out of the 109 computed sample participants responded to the survey, thus yielding an overall response rate of 25.66 %. This response rate can be further broken down with Banana, Mango, and Cacao having a 50% response rate, rubber, and coffee with a 37.5 % response rate, rice with a 20% response rate, corn and sugarcane having

12.12% and 6.67% response rates respectively. Three out of the 29 respondents were surveyed via zoom.

There were no responses from the Pineapple respondents; thus, the following tables will not include this agricultural establishment.

Table 3A.
Distribution of Participating Agricultural Establishment and the Response Rate by Establishment Group

Establishment Group	**Number of Agricultural Establishment**	% **Response Rate**
Perennial	23	33.33
Non-Perennial	6	13.95

Table 3B.
Distribution of Participating Agricultural Establishment and the Response Rate by Farm/holding

Establishment Group	**Agricultural Establishments**	**Number of Agricultural Establishment**	% **Response Rate**
Perennial	Banana	5	50
	Pineapple	0	0
	Mango	4	50
	Rubber	6	37.5
	Coffee	3	37.5
	Sugarcane	1	6.67
	Cacao	4	50
Non-Perennial	Rice	2	20
	Corn	4	12.12

4.1 Basic Organization Background

Based on the Philippine Standard Occupational Classification (PSOC), employees were classified into nine occupational categories: (1) Manager, (2) Professional, (3) Technical and Associate Professionals, (4) Clerical Supports, (5) Service and Sales Workers, (6) Skilled Agricultural Workers,(7) Craft and Related Trade Workers, (8) Plant and Machine Operators, (9) and, Elementary Occupations.

As seen in table 4, most employees are classified as skilled agricultural workers. Furthermore, table 5 shows the breakdown of each employee classification per Commodity crop-specific establishment; skilled agricultural employees were highlighted throughout each establishment except Sugarcane establishments.

While Sugarcane establishments had no skilled agricultural employees, they had a high Plant and Machine Operators and Assemblers employee percentage (88.15%). The high rate may be because the respondent's establishment is focused on sugarcane processing, where harvested sugarcane is bought from the farmers and converted into raw granulated sugar.

TESDA's aim is to develop policies and programs that improve the country's workforce's technical and vocational skills; this includes the Agriculture sector. As such, the agency may consider employees identified as (1) Technicians and Associate Professionals,(2) Clerical Support, (3) Service and Sales Workers, (4) Skilled Agricultural Workers,(5) Craft and Related Trade Workers, (6) Plant and Machine Operators, and Assemblers, and (7) Elementary Occupations, in the Agriculture sector as the size of the labor market who will benefit from the program.

Table 4.
Distribution of Employees by Occupational Type

Occupational Type Based on PSOC	Distribution %	
	Female %	Total
Manager	17.74	7.78
Professionals	1.70	5.75
Technicians and Associate Professionals	2.33	3.74
Clerical Support	4.68	3.14
Service and Sales Workers	6.35	5.54
Skilled Agricultural Worker	37.49	53.33
Craft and Related Trade Worker	0.63	3.53
Plant and Machine Operators, and Assemblers	7.08	4.87
Elementary Occupation	22.01	12.32
Total	*100.00*	*100.00*

Table 5.
Distribution of Employees by Occupational Type per Agricultural Establishment

Agricultural Establishments	Occupational Type (%)									
	Managers	Professionals	Technicians and Associate Professionals	Clerical Support	Service and Sales Workers	Skilled Agriculture Worker	Crafts and Related Trade Worker	Plant and Machine Operators, and Assemblers	Elementary Occupation	*Total (%)*
Banana	1.87	16.82	2.01	5.43	0.34	42.94	1.56	3.83	25.20	*100*
Mango	0	0	0	0	0	71.43	0	4.76	23.81	*100*
Rubber	0	0	0	0	0	100.0	0	0	0	*100*
Coffee	36.67	13.33	25.0	8.33	0	16.67	0	0	0	*100*
Sugarcane	3.15	0	5.9	0.8	2.00	0	0	88.15	0	*100*
Cacao	12.0	5.0	0	5.00	25.0	28.0	15.0	0	10.0	*100*
Rice	0	0	0	0	0	83.0	0	17.0	0	*100*
Corn	0	0	0	0	0	65.95	0	9.45	24.60	*100*

Table 6 shows that in terms of employment status, the majority of employees are either full-time/permanent or seasonal workers. As seen in table 7, Sugarcane is the only exception of having 100% of its employees full-time. The reason is the sugarcane industry is a processing-focused establishment rather than a production-focused one.

Table 6.
Distribution of the Employees by Employment Status

Employment Status	Distribution %	
	Female %	% Total
Full-Time/Permanent Employees	29.52	43.48
Part-Time	6.84	13.04
Seasonal	63.64	43.48
Total	*100.00*	*100.00*

Table 7.
Distribution of the Employees by Agricultural Establishment and Employment Status

Agricultural Establishments	Employment Status			
	Full-Time / Permanent (%)	Part-time (%)	Seasonal (%)	Total
Banana	62.5	12.50	25.0	100.0
Mango	28.57	14.29	57.14	100.0
Rubber	62.50	0	37.50	100.0
Coffee	50.0	33.33	16.67	100.0
Sugarcane	100.0	0	0	100.0
Cacao	40.0	20.00	40.0	100.0
Rice	0	0	100.0	100.0
Corn	0	0	100.0	100.0

Table 8 shows the sex distribution of employees across the participating Establishments in which only corn enterprises have a majority of women employed. Most female employees are from corn establishments with 50.52%. Other establishments had a lower percentage, rice establishments placed 2nd having 34.43% while mango establishments did not employ any female employees.

Table 8.
Percentage of Female Employees by Agricultural Establishments

Agricultural Establishments	Female (%)
Banana	24.66
Mango	0
Rubber	14.44
Coffee	24.37
Sugarcane	11.78

Cacao	33.64
Rice	34.43
Corn	50.52

Table 9 shows the distribution of employees by the highest educational attainment. The highest percentage are employees who attended primary education (32.28%), followed by lower secondary education old curriculum graduates (24.65%).

In Table 10, most agricultural establishments employ a majority of primarily educated workers and lower secondary education old curriculum graduates, except for Coffee and sugarcane establishments, although there was only one respondent for the sugarcane establishment.

Table 9.
Distribution of the Employees by Highest Educational Attainment

Educational Qualification	**(%)**
No Level Completed	0.18
Primary Education (Grade 1-6)	32.28
Lower Secondary Education Old Curriculum Undergraduate	17.33
Lower Secondary Education Old Curriculum Graduate	24.65
Lower Secondary Education K-12 Undergraduate	0.44
Lower Secondary Education K-12 Graduate	7.39
Upper Secondary Education Undergraduate	0.52
Upper Secondary Education Graduate	0.27
TechVoc Course Undergraduate	0.19
TechVoc Course Graduate	2.13
College Undergraduate	2.29
College Graduate	11.92
Master's Degree	0.40
Doctoral Degree	0.0
Total	*100.0*

Table 10.
Distribution of the Employees by Highest Educational Attainment and Agricultural Establishments

Highest Educational Attainment	Agricultural Establishments							
	Banana	**Mango**	**Rubber**	**Coffee**	**Sugarcane**	**Cacao**	**Rice**	**Corn**
No Level Completed	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Primary Education (Grade 1-6)	10.78	33.33	41.67	0.00	0.00	25.00	50.00	66.66
Lower Secondary Education Old Curriculum Undergraduate	16.35	26.10	0.00	16.67	0.00	21.88	50.00	15.43
Lower Secondary Education Old Curriculum Graduate	37.36	15.58	40.00	5.57	0.00	35.00	0.00	11.11
Lower Secondary Education K-12 Undergraduate	2.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lower Secondary Education K-12 Graduate	1.36	25.00	16.67	0.00	0.00	0.00	0.00	0.00
Upper Secondary Education Undergraduate	0.92	0.00	1.67	0.00	0.00	0.00	0.00	0.00
Upper Secondary Education Graduate	1.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TechVoc Course Undergraduate	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TechVoc Course Graduate	2.94	0.00	0.00	0.00	50.00	10.00	0.00	1.25
College Undergraduate	8.40	0.00	0.00	0.00	0.00	0.00	0.00	5.56
College Graduate	15.61	0.00	0.00	74.43	50.00	8.13	0.00	0.00
Master's Degree	0.22	0.00	0.00	3.33	0.00	0.00	0.00	0.00
Doctoral Degree	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

As Table 11 shows that the largest share of employees belong to the 18 to 34 age group. This is true with five out of the eight establishments, the remaining establishments for coffee and corn both have a higher percentage of employees belonging to the 35 to 44-year age group, and sugarcane has a high share of employees belonging to the 45 and above group.

Table 11.
Distribution of the Employees by Age Group

Age Group	%
18 to 34	46.24
35 to 44	31.91
45 and above	21.85
Total	*100.00*

Table 12.
Distribution of the Employees by Agricultural Establishments and Age Group

Agricultural Establishments	Age Group (Year)			
	18 to 34 (%)	35 to 44 (%)	45 and above (%)	Total (%)
Banana	45.81	35.23	18.96	*100.00*
Mango	52.38	28.57	19.05	*100.00*
Rubber	46.25	25.00	28.75	*100.00*
Coffee	30.00	56.00	14.00	*100.00*
Sugarcane	16.00	26.00	58.00	*100.00*
Cacao	51.20	24.19	24.61	*100.00*
Rice	85.00	12.50	2.50	*100.00*
Corn	35.98	40.43	23.60	*100.00*

According to Table 13, across the age groups women were mostly employees seasonally for all agricultural establishments. A reason, is a need for additional labor.

One respondent from the rice establishment said that they only need extra workers when it is time to plant and harvest rice. The period between the sowing and harvesting, (crop growing) does not need many workers.

Table 13.
Distribution of the Female Employees by Employment Status, by Age Group

Age Group	Employment Status			
	Full-Time / Permanent (%)	Part-time (%)	Seasonal (%)	Total
Age 18 to 34	17.85	0.00	82.15	100.0
Age 35 to 44	41.84	11.27	46.89	100.0
Age 45 and above	15.39	18.49	66.13	100.0

The farm/holdings in the majority of agricultural establishments are not part of a multinational organization as shown in table 14, except for Banana and Coffee. This means that 3 out of 29 respondents participating have main offices located in the Philippines and one in Saudi Arabia, Table 15 shows this distribution.

Table 14.
Percentage of Multinational Farm/holdings per Agricultural Establishment

Agricultural Establishment	(%)
Banana	60.0
Mango	0.00
Rubber	0.00
Coffee	33.33
Sugarcane	0.00
Cacao	0.00
Rice	0.00
Corn	0.00

Table 15.
Distribution of the Multinational Agricultural Establishment by Location of Main Office

Location	(%)
Philippines	75.00
Saudi Arabia	25.00
Total	*100.00*

Table 16 shows that the majority of employees, about 83.25%, earn a gross monthly salary that ranges from minimum wage or below, except for sugarcane enterprises whose majority of employees (96.00%) earns a gross monthly income that ranges from Above minimum wage to less than Php 26,000 (Table 17), although only one respondent came from the sugarcane establishment.

Table 16.
Distribution of the Employees by Gross Monthly Salary

Gross Monthly Salary (Php)	(%)
Minimum wage or below	83.25
Above minimum wage to less than 26,000	11.83
26,000 to less than 50,000	2.81
50,000 to less than 70,000	0.19
70,000 or more	1.92
Total	*100.00*

Table 17.
Distribution of the Employees by Agricultural Establishments and by Gross Monthly Salary

Agricultural Establishments	Gross Monthly Salary (PHP)					
	Min. Wage or below (%)	Above Min. Wage to 26K (%)	26K to 50k (%)	50K to 70K (%)	70K to more (%)	Total
Banana	60.46	32.79	5.15	1.04	0.57	*100.00*
Mango	100.00	0.00	0.00	0.00	0.00	*100.00*
Rubber	100.00	0.00	0.00	0.00	0.00	*100.00*
Coffee	50.00	0.00	25.00	0.00	25.00	*100.00*
Sugarcane	0.00	96.00	3.00	0.00	1.00	*100.00*

Cacao	82.15	17.85	0.00	0.00	0.00	*100.00*
Rice	100.00	0.00	0.00	0.00	0.00	*100.00*
Corn	100.00	0.00	0.00	0.00	0.00	*100.00*

4.2 Critical Human Resources

Based on table 18, most vacancies are college-level requirements (25.15%), followed by Lower Secondary Education Old Curriculum (24.70%) and Primary Education (23.33) requirements, respectively. Also, banana, coffee, and sugarcane were the establishments that had a high distribution of college graduate vacancies (Table 19) in 2021, although only one respondent answered from the sugarcane establishment.

It is important to note that respondents from mango, cacao, rice, and corn have no vacancies in 2021.

Table 18.
Distribution of the Vacancies in the Agricultural Establishment by Required Educational Qualification, 2021 to 2022

Educational Qualification	(%)
No Level Completed	6.67
Primary Education (Grade 1-6)	23.33
Lower Secondary Education Old Curriculum Undergraduate	6.53
Lower Secondary Education Old Curriculum Graduate	24.70
Lower Secondary Education K-12 Undergraduate	0.00
Lower Secondary Education K-12 Graduate	6.67
Upper Secondary Education Undergraduate	0.67
Upper Secondary Education Graduate	0.00
TechVoc Course Undergraduate	0.00
TechVoc Course Graduate	2.73
College Undergraduate	2.89
College Graduate	25.15
Master's Degree	0.33

Doctoral Degree	0.33
Total	*100.0*

Table 19.
Distribution of the Vacancies in the Agriculture Sector by Primary Crop Produced and Required Educational Qualification, 2021 to 2022

Highest Educational Attainment	Agricultural Establishment							
	Banana	**Mango**	**Rubber**	**Coffee**	**Sugarcane**	**Cacao**	**Rice**	**Corn**
No Level Completed	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00
Primary Education (Grade 1-6)	0.00	0.00	41.67	0.00	0.00	50.00	0.00	0.00
Lower Secondary Education Old Curriculum Undergraduate	19.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lower Secondary Education Old Curriculum Graduate	26.10	0.00	40.00	0.00	0.00	0.00	0.00	0.00
Lower Secondary Education K-12 Undergraduate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lower Secondary Education K-12 Graduate	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00
Upper Secondary Education Undergraduate	0.00	0.00	1.67	0.00	0.00	0.00	0.00	0.00
Upper Secondary Education Graduate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TechVoc Course Undergraduate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TechVoc Course Graduate	2.78	0.00	0.00	0.00	27.00	0.00	0.00	0.00
College Undergraduate	8.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00
College Graduate	40.85	0.00	0.00	100.00	73.00	0.00	0.00	0.00
Master's Degree	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Doctoral Degree	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	*100.0*	*0.0*	*100.0*	*100.0*	*100.0*	*100.0*	*0.0*	*0.0*

Table 20 shows about 68.97% of the respondent's establishments have retained their employee size from 2021 to 2022. Respondents from Mango, Rubber, Coffee, Rice, and Corn are included in this group (Table 21). Only the respondent from the Sugarcane establishment had a decrease in their employment, although only one respondent answered for the sugarcane establishment.

The remaining establishments, Banana and Cacao, had an increase in employee size.

Table 20.
Distribution of the Agricultural Establishment by Status of Employee Size, 2021 to 2022

Gross Monthly Salary (Php)	(%)
Decreased	13.79
Stayed the same	68.97
Increased	17.24
Total	*100.00*

Table 21.
Distribution of the Agricultural Establishment by Agricultural Establishment and Status of Employee Size, 2021 to 2022

Agricultural Establishment	Status of Employee Size			
	Decreased (%)	Stayed the Same (%)	Increased (%)	Total (%)
Banana	0.00	40.00	60.00	*100.00*
Mango	0.00	100.00	0.00	*100.00*
Rubber	16.67	83.33	0.00	*100.00*
Coffee	0.00	100.00	0.00	*100.00*
Sugarcane	100.00	0.00	0.00	*100.00*
Cacao	25.00	25.00	50.00	*100.00*

Rice	0.00	100.00	0.00	*100.00*
Corn	25.00	75.00	0.00	*100.00*

As shown in Table 22, the majority (72.53%) of employees left the farm/holding due to end of contact and only 20.85% of employees left due to resignation. According to Table 23, five out of the eight farm/holdings identified the end of the contract as the reason why their employees left (mango, rubber, coffee, rice, and corn) while the remaining establishment say that resignations were their primary reason for leaving.

Table 22.
Distribution of Separated Employees from the Agricultural Establishments by Reason for Leaving

Occupational Type Based on PSOC	%
Resignation	20.85
End of Contract	72.53
Termination of Contract	4.13
Retirement	2.49
Total	*100.00*

Table 23.
Distribution of Separated Employees by Agricultural Establishment and Reason for Leaving

Agricultural Establishment	Reason for Leaving				
	Resignation (%)	End of Contact (%)	Termination of Contract (%)	Retirement (%)	*Total (%)*
Banana	43.86	38.72	12.02	5.40	*100.00*
Mango	0.00	100.00	0.00	0.00	*100.00*
Rubber	0.00	100.00	0.00	0.00	*100.00*
Coffee	0.00	66.70	33.30	0.00	*100.00*
Sugarcane	40.00	0.00	20.00	40.00	*100.00*

Cacao	75.00	25.00	0.00	0.00	*100.00*
Rice	0.00	100.00	0.00	0.00	*100.00*
Corn	0.00	100.00	0.00	0.00	*100.00*

In Table 24, only Banana and Rubber establishments have farm/holdings with fast turnover, which means that employees are difficult to retain for more than six months. A more thorough summary is reflected in Tables 25 and 26, and the reasons for difficulty retaining the employees are in Table 27.

Table 24.
Percentage of Agricultural Establishments with Fast Turnover per Agricultural Establishment

Agricultural Establishment	%
Banana	40.00
Mango	0.00
Rubber	83.33
Coffee	0.00
Sugarcane	0.00
Cacao	0.00
Rice	0.00
Corn,	0.00

Employees with fast turnover are mostly skilled agricultural workers (Table 25). However, only two establishments have farm/holdings with fast turnovers (Table 25). Rubber farm/holdings have a fast turnover of skilled agricultural workers (100%). In contrast, banana farms/holdings have a fast turnover of managers, plant and machine operators, and assemblers, elementary occupation workers, with 25% together with skilled agriculture workers.

Table 25.
Distribution of the Occupational Types with Fast Turnover

Occupational Type Based on PSOC	%
Manager	14.29
Professionals	0.00

Technicians and Associate Professionals	0.00
Clerical Support	0.00
Service and Sales Workers	0.00
Skilled Agricultural Worker	85.71
Craft and Related Trade Worker	0.00
Plant and Machine Operators, and Assemblers	14.29
Elementary Occupation	14.29

Table 26.
Distribution of the Agricultural Establishment by Occupational Types with Fast Turnover

	Occupational Type (%)									
Agricultural Establishment	**Managers**	**Professionals**	**Technicians and Associate Professionals**	**Clerical Support**	**Service and Sales Workers**	**Skilled Agriculture Worker**	**Crafts and Related Trade Worker**	**Plant and Machine Operators, and Assemblers**	**Elementary Occupation**	***Total (%)***
Banana	25.00	0.00	0.00	0.00	0.00	25.00	0.00	25.00	25.00	*100.00*
Mango	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	*0.00*
Rubber	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	*100.00*
Coffee	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	*0.00*
Sugarcane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	*0.00*
Cacao	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	*0.00*
Rice	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	*0.00*
Corn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	*0.00*

Each farm/holding identifies several reasons for fast turnover, as shown in Table 27 precisely the worker's unattractive conditions of employment, long working hours, not enough people who are interested in the type of work and shift to other employment opportunities locally or abroad, all of them having a 100 % rate. No other reasons from the participants were listed.

Table 27.
Percentage of farm/holdings with Fast Turnover per Reason for the Difficulty in Retaining Employees

Reasons	%
Low wage offered compared to other companies	0.00
Geographical location of the firm	0.00
Unattractive conditions of employment (e.g., risky job, etc.)	100.00
Lack of career prospects	0.00
Long working hours	100.00
Unsocial hours (night shift)	0.00
Not enough people who are interested in this type of work	100.00
Staff are not interested in long-term commitment	100.00
Poaching	0.00
Lack of access to training	0.00
Shift to other employment opportunities locally or abroad (e.g., farm hand, agriculturist, and technicians)	100.00

Note: Multiple responses were allowed.

The percentage of current employees who would be difficult to replace within three months if they resigned varies across all participating establishments.

Rubber, rice, and corn farms/holdings have no problem replacing the employees who resign for three months. In contrast, banana, sugarcane, and cacao farm/holdings say that less than 10% of their current employees are difficult to replace. Only coffee farm/holdings say that more than 50% of current employees are difficult to replace (Table 28).

Table 28.
Percentage Distribution of Current Employees who would be Difficult to Replace Within Three Months from Resignation

Agricultural Establishment	Occupational Type (%)				
	None	**Less than 10%**	**10%-50%**	**More than 50%**	***Total (%)***
Banana	20.00	80.00	0.00	0.00	*100.00*
Mango	25.00	0.00	25.00	50.00	*100.00*
Rubber	100.00	0.00	0.00	0.00	*100.00*
Coffee	33.33	0.00	0.00	66.67	*100.00*
Sugarcane	0.00	100.00	0.00	0.00	*100.00*
Cacao	0.00	50.00	25.00	25.00	*100.00*
Rice	50.00	0.00	50.00	0.00	*100.00*
Corn	50.00	0.00	25.00	25.00	*100.00*

With regards to the farm/holdings that have a percentage of their current employees being difficult to replace in case of recognition, specific occupations were identified in Table 29. Some notable jobs include farmers, farm laborers, machine operators, and managers. However, it is essential to note that jobs vary across the different establishments based on what type of crop they mainly handle and the size of their operations. For example, respondents cited registered nurses; this may be attributed to the establishment's larger farm/holding an expanded operation. A more extensive farm/holding and expanded operations mean more workers, which has a possibility of incidents and accidents; thus, a registered nurse is needed in the farm/holding.

Table 29.
Identified Jobs that will be Difficult to Replace in Case of Resignation

Commodity Crops	Jobs
Banana	- Registered Nurse - Chemist Backhoe Operator - Farm Manager - Heavy Equipment Operator - Machine Operator

	- Finance Manager - Assistant Manager for Shipping and Logistics - Branch Manager - Stacker Operator - Biotech and Research Services - Graphic Artist
Mango	- Laborer Mango - Farmer - Farm Worker/Caretaker - Farm helper - Chemical Sprayer (Team Lead)
Rubber	
Coffee	- CEO - Skilled Worker - Farm Managers
Sugarcane	- Maintenance Planner - Cane Supply Manager - Heavy Equipment Operator
Cacao	- Nursery Worker/ maintenance - Nursery Worker - Labor workers - Chocolate Maker - Quality Controller - Machine Operator
Rice	- Farmer (Rice)
Corn	- Farmer (Corn) - Chemical/Fertilizer Sprayer - Laborer

Note: Gray cells indicate that no farm/holdings in the establishment answered given that there are no positions that would be difficult to a replacement within three months if they resign

Table 30 lays out the reasons for employees to resign from the farm/holdings. Each farm/holdings vary across the participating farm/holding; notable reasons are new employment opportunities either locally or overseas. Most establishments say that they resigned due to new job opportunities such as overseas work, other local employment, and government agencies. Other reasons were the lack of pathways for promotion, and other works having better compensations.

Table 30.
Identified Reasons for Resignation by Agricultural Establishment

Agricultural Establishments	Reasons
Banana	- Health Condition - Personal/Family Matter (Manage Own Business, pursue studies, look after family member) - For other work opportunities (abroad, etc.) - Personal reason - Applied to government agencies - Greener pasture - New Job - Change of Residency - Continuation of Education - To take care of children - Accepted a new job - Move to another city - Family matters - Local Employment - Overseas employment
Sugarcane	- Work in government - Focus in the family - Other compensation
Cacao	- No way to be promoted - Found Better opportunities - Was offered with a better job in another farm with all the benefits included - A better opportunity to work at LGU

In terms of career growth, Table 31 and 32 show the percentage of employees promoted to managerial and supervisory positions.

Overall, a majority of perennial and non-perennial enterprises did not promote any employees to managers and supervisors from 2021 - 2022. Most of the farm/holdings, had no employees being promoted to managers and supervisors, only banana and sugarcane farm/holdings, said that they promoted less than 10% of their employees to managerial and supervisory positions.

Table 31.
Distribution of the Employees Promoted to Managerial and Supervisory Positions per Establishment Group

Establishment Group	Percentage Distribution				
	None	Less than 10%	10%-50%	More than 50%	*Total (%)*
Perennials	78.26	21.74	0.00	0.00	*100.00*
Non-Perennials	100.00	0.00	0.00	0.00	*100.00*

Table 32.
Distribution of the Employees Promoted to Managerial and Supervisory Positions per Agriculture Establishments

Agriculture Establishments	Percentage Distribution				
	None	Less than 10%	10%-50%	More than 50%	*Total (%)*
Banana	20.00	80.00	0.00	0.00	*100.00*
Mango	100.00	0.00	0.00	0.00	*100.00*
Rubber	100.00	0.00	0.00	0.00	*100.00*
Coffee	100.00	0.00	0.00	0.00	*100.00*
Sugarcane	0.00	100.00	0.00	0.00	*100.00*
Cacao	100.00	0.00	0.00	0.00	*100.00*
Rice	100.00	0.00	0.00	0.00	*100.00*
Corn	100.00	0.00	0.00	0.00	*100.00*

Table 33 shows that 62.07 % of the respondents say that their employees are not supported by any career/ structured succession planning policy/ practices for current and future development. It can be noted that banana, sugarcane, and cacao have a

percentage of their employees under a career/ structures succession planning policy/ practice (Table 34), also, 50.00% of rice establishment respondents say that more than 50% of their employees are also under a structures succession plan.

Table 35, 37.93% of respondents say that they have no employees contributing to outstanding performances in their respective farms. Mango, rubber, rice, and corn were the establishments that are in the majority who say they have no employees contributing outstanding performances (Table 36). A reason for the lack of outstanding employees may be a result of the type of task assigned to them, for example; in non-perennial establishments, the work given to the laborers is non-technical or manual jobs, such as planting, harvesting, and utility works.

According to Table 37, only bananas, coffee, and sugarcane have any structured plan for managing high-potential employees. Banana has three programs, which are, Training and promotion, Training and Development, and HRBP (Human Resources Business Partner) Engagement Program; while Coffee and Sugarcane farm/holding specified Talent management and Succession planning (Table 38).

Table 33.
Percentage Distribution of Employees Supported by Career/Structured Succession Planning Policy/Practices for Current and Future Development

Percentage	%
None	62.07
Less than 10%	13.79
10-50%	10.34
More than 50%	13.79
Total	100.00

Table 34.
Percentage Distribution of Employees Supported by Career/Structured Succession Planning Policy/Practices for Current and Future Development per Agricultural Establishment

Agriculture Establishments	Percentage Distribution				
	None	Less than 10%	10%-50%	More than 50%	*Total (%)*
Banana	0.00	40.00	40.00	20.00	*100.00*
Mango	100.00	0.00	0.00	0.00	*100.00*
Rubber	100.00	0.00	0.00	0.00	*100.00*
Coffee	33.33	0.00	0.00	66.67	*100.00*
Sugarcane	0.00	100.00	0.00	0.00	*100.00*
Cacao	50.00	25.00	25.00	0.00	*100.00*
Rice	50.00	0.00	0.00	50.00	*100.00*
Corn	100.00	0.00	0.00	0.00	*100.00*

Table 35.
Percentage Distribution of Employees Contributing Outstanding Performance to the Farm/holdings

Percentage	%
None	37.93
Less than 10%	13.79
10-50%	13.79
More than 50%	34.48
Total	100.00

Table 36.
Percentage Distribution of Employees Contributing Outstanding Performance to the Farm/holdings per Agriculture Establishments

Agriculture Establishments	Percentage Distribution				
	None	Less than 10%	10%-50%	More than 50%	*Total (%)*
Banana	0.00	20.00	40.00	40.00	*100.00*
Mango	75.00	0.00	0.00	25.00	*100.00*
Rubber	50.00	16.67	0.00	33.33	*100.00*
Coffee	0.00	0.00	0.00	100.00	*100.00*
Sugarcane	0.00	100.00	0.00	0.00	*100.00*
Cacao	25.00	25.00	50.00	0.00	*100.00*
Rice	50.00	0.00	0.00	50.00	*100.00*
Corn	75.00	0.00	0.00	25.00	*100.00*

Table 37.
Percentage of Farm/holdings with Structured Program for Managing High Potential Employees by Agriculture Establishments

Agriculture Establishments	Percentage Distribution
Banana	60.00
Mango	0.00
Rubber	0.00
Coffee	33.33
Sugarcane	100.00
Cacao	0.00
Rice	0.00

Corn	0.00

Table 38.
List of Structured Programs for Managing High Potential Employees by Establishment

Agriculture Establishments	Structured Program
Banana	Training and promotion Training and Development HRBP Engagement Program
Mango	None Specified
Rubber	None Specified
Coffee	Talent Management
Sugarcane	Succession Planning
Cacao	*None Specified*
Rice	*None Specified*
Corn	*None Specified*

4.3 Skills in your Business

This section lays out the information gathered about the performance evaluation, the farm/holdings actions and interventions regarding low-performance employees and related questions on skills requirements and policies.

Table 39 shows that a majority (65.32%) of the farm/holdings employees can perform the job but not beyond. This majority holds for most enterprises except for coffee and cacao, whose employees have the potential to perform more demanding duties than they currently have. It is also important to note that farm/holdings from rice establishment's performance evaluation were evenly distributed (50%) between being able to perform the job but not beyond and having the potential to perform more demanding duties (Table 40).

On the other hand, only 0.38% of farms/holdings say that their employees are unable to perform the job. These are from the banana and sugarcane farm/holdings. Together with the results in Table 41, it can be linked to the reasons for employee underperformance; all farms/holdings cited the lack of soft skills, socio-emotional skills, language skills, management, and leadership skills.

On the other hand, 34.30% of the employees have the capacity to perform more demanding duties than they currently have. As mentioned in the previous Logistics and IT-BPM SNA: WSS reports, these employees are referred to as "over-skilled

workers or employees whose skills are underutilized in their current job" (TESDA & PSTRI, 2020). Despite the pool of potential employees in the farm/holdings, only less than 10% of them are being promoted to managerial and supervisory positions and only coming from perennial establishments (Tables 31 and 32).

Table 39.
Distribution of the Employees by Performance Evaluation

Performance Evaluation	(%)
Able to perform the job but not beyond	65.32
Unable to perform the job	0.38
Have the potential to perform more demanding duties than they currently have	34.30
Are providing infrastructure support to the employees	0.00
Total	100.00

Table 40.
Distribution of the employees by Agricultural Establishment and Performance Evaluation

Agricultural Establishment	Percentage Distribution				***Total (%)***
	Able to perform the job but not beyond (%)	Unable to perform the job (%)	Have the potential to perform more demanding duties than they currently have (%)	Are providing infrastructure Support to the Employees (%)	
Banana	54.60	2.00	43.40	0.00	*100.00*
Mango	75.00	0.00	25.00	0.00	*100.00*
Rubber	96.67	0.00	3.33	0.00	*100.00*
Coffee	*23.33*	0.00	76.67	0.00	*100.00*
Sugarcane	98.00	1.00	1.00	0.00	*100.00*
Cacao	43.33	0.00	56.68	0.00	*100.00*
Rice	50.00	0.00	50.00	0.00	*100.00*
Corn	75.00	0.00	25.00	0.00	*100.00*

All respondents (perennial) having underperforming employees cited the reasons are the lack of soft skills (100%), socio-emotional (100%), language skills (100%),

management and leadership skills (100%) as shown in Table 40. It can be noted from Table 41 that only Banana and Sugarcane farm/holding cited of underperforming employees, both under perennial establishments.

The lack of underperforming employees from all non-perennial establishments may be due to the nature of work in the farm/holdings. As per interviewed Rice respondents, most of their workers perform varying tasks like crop planting, field maintenance, and harvesting; additionally, they also do post-harvest work such as milling operator.

Table 41.
Percentage of Agricultural Establishments Underperforming Employees by Reason

Reason	Percentage Distribution		Total %
	Perennial (%)	Non-Perennial (%)	
Lack of basic agriculture skills (e.g., good agriculture practice, etc.)	0.00	0.00	*0.00*
Lack of specialized technical skills for Agriculture Sector	0.00	0.00	*0.00*
Lack of advanced agriculture skills:	0.00	0.00	*0.00*
Lack of soft skills (e.g., communication, collaboration and teamwork, etc.)	100.00	0.00	*100.00*
Lack of socio-emotional skills (e.g., extraversion, emotional stability, agreeableness, grit, consciousness, decision-making, openness, etc.)	100.00	0.00	*100.00*
Lack of language skills (including listening, speaking, reading, and writing skills)	100.00	0.00	*100.00*
Lack of management and leadership skills	100.00	0.00	*100.00*
Lack of office and admin skills	0.00	0.00	*0.00*
Lack of digital skills	100.00	0.00	*100.00*
Lack of industry-specific STEM-related skills/competencies (i.e Operate Basic Hand Tools & Equipment, Plant Breeding Techniques, Soil Science, etc.)	0.00	0.00	*0.00*
Others:	0.00	0.00	*0.00*

Note: Multiple responses were allowed. Also, these answers only came from all farm/farm holdings of Banana and Sugarcane Establishments.

As indicated in tables 39 and 40, 0.38 % of the employees in the participating farm/holdings are unable to perform the job; these employees come from the banana and sugarcane farm/holdings. Since there are a number of underperforming employees, Table 42 presents what actions/interventions were done by the establishments and the employees.

It is notable that only establishments belonging to the perennial group have actions and interventions for underperforming employees (Table 42). Increase training activity / spend or increase/expand trainee programs (100%), Review of appraisals/performance (100%), Conduct mentoring (100%), and Intensify supervision of staff (100%) were top actions/interventions that the farm/holdings are implementing always/regular; In comparison, conduct of retraining (50%) and apply corresponding disciplinary procedure of the company (50%) was second in the ranking.

Table 42.
Distribution of Agricultural Establishment by Frequency of Implementation of Various Actions or Interventions for Underperforming Employees per Establishment Group

Actions/Interventions	Percentage Distribution			
	Never (%)	Sometimes or when necessary (%)	Always or regularly (%)	*Total (%)*
Perennial				
Increase training activity / spend or increase/expand trainee programs	0.00	0.00	100.00	*100.00*
Conduct of re-training	0.00	50.00	50.00	*100.00*
Reallocating work	50.00	50.00	0.00	*100.00*
Review of appraisals/performance	0.00	0.00	100.00	*100.00*
Conduct mentoring	0.00	0.00	100.00	*100.00*
Intensify supervision of staff	0.00	0.00	100.00	*100.00*
Apply corresponding disciplinary procedures of the company	0.00	50.00	50.00	*100.00*
Add people to complement the work	0.00	100.00	0.00	*100.00*
Change work practices	0.00	100.00	0.00	*100.00*
Non-Perennial				
Increase training activity / spend or increase/expand trainee programs	0.00	0.00	0.00	*0.00*
Conduct of re-training	0.00	0.00	0.00	*0.00*
Reallocating work	0.00	0.00	0.00	*0.00*
Review of appraisals/performance	0.00	0.00	0.00	*0.00*

Conduct mentoring	0.00	0.00	0.00	*0.00*
Intensify supervision of staff	0.00	0.00	0.00	*0.00*
Apply corresponding disciplinary procedures of the company	0.00	0.00	0.00	*0.00*
Add people to complement the work	0.00	0.00	0.00	*0.00*
Change work practices	0.00	0.00	0.00	*0.00*

Regarding the employees that can perform more demanding duties, Table 43, shows the percentage of the establishments that have undertaken actions and intervention. The majority of perennial establishments (85.71%) have taken action while in non-perennial establishments only half (50.00) have done interventions. All perennial and non-perennial establishments are included in this majority, except for mango and corn respectively (Table 44).

Table 43.
Percentage of Farm/holdings that have Undertaken Actions or Interventions to Employees with the Potential to Perform More Demanding Duties per Establishment Group

Establishment Group	(%)
Perennial	85.71
Non-Perennial	50.00

Table 44.
Percentage of Agricultural Establishments that have Undertaken Actions or Interventions to Employees with the Potential to Perform More Demanding Duties

Agricultural Establishment	(%)
Banana	100.00
Mango	0.00
Rubber	100.00
Coffee	100.00
Sugarcane	100.00
Cacao	66.67
Rice	100.00
Corn	0.00

Actions undertaken by farm/holdings in these establishments are listed below with learning and development (e.g, training, mentoring, etc.) being the most common type of intervention followed by a salary increase.

a. Learning and Development (e.g., training, mentoring, etc.)
b. Salary Increase
c. Job Reassignments (e.g., job rotation, deployment, etc)
d. Promotion
e. Other incentives (e.g., travel, etc.)
f. Additional allowances
g. Additional responsibilities
h. Additional food/snacks in the field

For farm/holdings in Mango, cacao, and corn that have not taken any action to utilize the potential of employees who have the potential to perform more demanding duties, there are different reasons selected, including

a. The current organizational structure and work practices do not allow changes.
b. The management is aware of the potential, but there are no definite plans yet.

Table 45 shows the distribution of positions in each farm/holding per specific policy requirement, with the results indicating that the farm/holdings differ in the distribution of positions that require specific requirements. As seen, positions that require no level completed (39.89 %) and basic educational graduates (39.72 %) are at the top requirements. This reflects the findings in Table 18, which shows that 67.9 % of the vacancies are under basic education graduates (HS Grad Old Curriculum or SHS Graduate K-12 Curriculum), though only 6.67 % are under no level completed requirements.

Table 46 shows that only farm/holdings from coffee establishments have a majority of positions that require higher education graduates (baccalaureate and above) (56.67%). Meanwhile, farm/holdings from Rice (100%) and Corn (100%) have positions that don't need any completed level of education. The only sugarcane respondent said that 100% of their vacancies require tech-voc course graduates.

In terms of policy requirements, most farm/holdings (62.84 %) have continuous learning/development activities (Table 47). This holds true for most except for mango, all (100%) farms/holdings require at least 3 years of industry-relevant experience to do the job. Additionally, non-perennial farm/holdings don't have any requirements thus both rice and corn have no percentages across the board (Table 48).

Table 45.
Distribution of the Positions in each Farmholding per Specific Educational Requirements

Requirements by Policy	Percentage Distribution
No level Completed	39.89
Basic Education Graduate (HS Grad Old Curriculum or SHS Graduate K-12 Curriculum)	39.72
Tech Voc Course Graduate	6.67
Higher Education Graduate (Baccalaureate and Above)	13.73
Total	*100.00*

Table 46.
Distribution of the Positions in each Farmholding per Agricultural Establishments and Specific Educational Requirements

Requirement by Policy	Agricultural Establishments							
	Perennial						Non-Perennial	
	Banana	Mango	Rubber	Coffee	Sugarcane	Cacao	Rice	Corn
No level Completed	11.35	50.00	16.67	0.00	0.00	50.00	100.00	100.00
Basic Education Graduate (HS Grad Old Curriculum or SHS Graduate K-12 Curriculum)	41.96	46.50	81.67	33.33	0.00	41.50	0.00	0.00
Tech Voc Course Graduate	7.88	3.50	1.676	10.00	100.00	0.00	0.00	0.00
Higher Education Graduate (Baccalaureate and Above)	38.82	0.00	0.00	56.67	0.00	8.50	0.00	0.00
Total	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*	*100.00*

Table 47.

Distribution of the Positions Specific Policy Requirements

Requirements by Policy	%
Induction training of more than two week before the post-holder can perform assigned work	25.61
Continuous learning/developmental activities	62.84
At least 3 years of industry-relevant experience to do the job	11.54

Table 48.

Distribution of the Positions in each Farmholding per Agricultural Establishments and Specific Educational Requirements

Requirement by Policy	Agricultural Establishments							
	Perennial						Non-Perennial	
	Banana	Mango	Rubber	Coffee	Sugarcane	Cacao	Rice	Corn
Induction training of more than two week before the post-holder can perform assigned work	31.82	0.00	0.00	25.00	0.00	33.33	0.00	0.00
Continuous learning/developmental activities	58.18	0.00	100.00	50.00	0.00	66.67	0.00	0.00
At least 3 years of industry-relevant experience to do the job	10.00	100.00	0.00	25.00	0.00	0.00	0.00	0.00

The participants were given a list of relevant skills/jobs in the Agriculture Sector. This was used to determine which skills are relevant to the farm/holding's establishment over the next five years. It projects trends such as shortages, no changes, surplus, hard-to-fill, and or not. For any applicable skills/jobs, it can be identified whether the skill/jobs could be addressed by the TVET program.

Table 49 shows the projected distribution of the skills supply for the next five years. The majority of skills of the listed skills/jobs do not change in the next five years.

Upon further analysis, agricultural extension workers is the job projected to highest shortage at 18.52%, followed by agricultural technician, laborer, farmer, pest manager/control technician, chemical sprayer, post-harvest worker, farm manager overseer, agricultural specialist, plant breeder, machine and equipment operators and

tractor operator (and other agricultural vehicles) that ranged from 17.86% to 10.71% shortage. There was only a 3.45% to 7.14% surplus of all farm/holdings.

Table 49.
Projected Distribution of the Skills Supply for the next 5 years

Value Chain	Skills/Jobs	Distribution %				
		Shortage (%)	No Change (%)	Surplus (%)	Not Applicable (%)	*Total (%)*
Input	Agricultural Engineer	7.14	25.00	*0.00*	*67.86*	*100.00*
	Agricultural extension Worker	18.52	29.63	*0.00*	*51.85*	*100.00*
	Agricultural Specialist	11.11	18.52	*0.00*	*70.37*	*100.00*
	Agriculture Clerk	3.70	14.81	*0.00*	*81.49*	*100.00*
	Administrative Clerk	3.70	22.22	*0.00*	*74.07*	*100.00*
	Agriculture Technician	17.86	39.29	*0.00*	*42.86*	*100.00*
	Agronomist	3.70	29.63	*0.00*	*66.67*	*100.00*
	Agronomy Technicians	3.70	14.81	*0.00*	*81.48*	*100.00*
	Purchasing Officer	3.70	14.81	*0.00*	*81.48*	*100.00*
	Chemical Sprayer (Pesticide, fungicide, etc.)	14.81	37.04	*0.00*	*48.15*	*100.00*
	Irrigation Technician	3.70	22.22	*0.00*	*74.07*	*100.00*
	Machinery and Equipment Mechanic	3.70	25.93	*0.00*	*70.37*	*100.00*
	Pest Management/ Control Technician	15.38	23.08	*0.00*	*61.54*	*100.00*
Production	Tractor Operator (and Other Agricultural Vehicles)	10.71	25.00	*0.00*	*64.29*	*100.00*
	Farm Manager and Overseer	14.29	42.86	*0.00*	*42.86*	*100.00*
	Farm Supervisor	7.14	25.00	*0.00*	*67.86*	*100.00*
	Crop Grower	3.70	22.22	*0.00*	*74.07*	*100.00*
	Machine and Equipment Operators	10.71	21.43	*0.00*	*67.86*	*100.00*
	Farmer	17.24	48.28	*3.45*	*31.03*	*100.00*
	Field Clerk	3.57	10.71	*0.00*	*85.71*	*100.00*
	Labourer	17.86	50.00	*3.57*	*28.57*	*100.00*
	Nursery Manager	7.41	22.22	*0.00*	*70.37*	*100.00*

Value Chain	Skills/Jobs	Distribution %				
		Shortage (%)	No Change (%)	Surplus (%)	Not Applicable (%)	*Total (%)*
	Nursery Worker	7.14	25.00	*7.14*	*60.71*	*100.00*
	Plant Breeder	10.71	10.71	*0.00*	*78.57*	*100.00*
	Post-Harvest Workers	14.29	17.86	*0.00*	*67.86*	*100.00*
	Crop Grader	50	50	0	0	*100.00*
	Crop Sorter	20.00	80.00	0.00	0.00	*100.00*
	Production Operation Manager	28.57	71.43	0.00	0.00	*100.00*
	Production Supervisor	14.29	85.71	0.00	0.00	*100.00*
	Tappers	50.00	50.00	0.00	0.00	*100.00*
Processing	Processing Operation Manager	7.14	10.71	*0.00*	*82.14*	*100.00*
	Processing Operation Supervisor	0.00	10.71	*0.00*	*89.29*	*100.00*
	Processing Specialist	0.00	3.57	*0.00*	*96.43*	*100.00*
	Processing Staff/Worker	3.57	17.86	*0.00*	*78.57*	*100.00*
	Packagers	3.57	17.86	*0.00*	*78.57*	*100.00*
	Sorter	0.00	21.43	*0.00*	*78.57*	*100.00*
	Storage Clerk	0.00	7.14	*0.00*	*92.86*	*100.00*
	Storage/ Warehouse Manager	0.00	7.14	*0.00*	*92.86*	*100.00*
	Storage/ Warehouse Supervisor	0.00	17.86	*0.00*	*82.14*	*100.00*
	Storage Workers	0.00	17.86	*0.00*	*82.14*	*100.00*
Marketing	Marketing Manager	3.57	14.29	*0.00*	*82.14*	*100.00*
	Promoter	0.00	7.14	*0.00*	*92.86*	*100.00*
	National/Regional/Provincial Sales Managers	0.00	10.71	*0.00*	*89.29*	*100.00*
	Sales Worker	0.00	14.29	*0.00*	*85.71*	*100.00*
	Product Development Specialist	0.00	14.81	*0.00*	*85.19*	*100.00*

Table 50 shows that the most common hard -to-fill skills across multiple sub sectors are agricultural extension workers, chemical sprayers (pesticide, fungicide, etc.), pest

management/control technician, tractor operator (and other agricultural vehicles), farm manager and overseer, and farmer which are all under the production value chain.

Other skills that can be noted are crop graders, post-harvest workers, nursery managers, laborers, agricultural specialists, and machinery and equipment mechanics.

Table 50.
Hard-to-Fill Skills under each Agricultural Establishment for the next 5 Years

Value Chain	***Areas of Skills/Jobs***	***Agricultural Establishment***							
		Banana	***Mango***	***Rubber***	***Coffee***	***Sugarcane***	***Cacao***	***Rice***	***Corn***
Input	*Agricultural Engineer*	■					■		
	Agricultural extension Worker	■			■		■	■	
	Agricultural Specialist				■		■	■	
	Agriculture Clerk						■	■	
	Administrative Clerk							■	
	Agriculture Technician						■	■	
	Agronomist						■		
	Agronomy Technicians				■		■		
	Purchasing Officer								
	Chemical Sprayer (Pesticide, fungicide, etc.)	■	■				■	■	
	Irrigation Technician						■		
	Machinery and Equipment Mechanic	■					■		■
	Pest Management/ Control Technician	■	■	■			■		
Production	*Tractor Operator (and Other Agricultural Vehicles)*	■					■	■	■
	Farm Manager and Overseer	■		■	■		■		
	Farm Supervisor						■		
	Crop Grower						■		
	Machine and equipment Operators						■	■	
	Farmer		■	■	■				■
	Field Clerk								
	Laborer		■		■				■
	Nursery Manager			■			■	■	
	Nursery Worker				■		■		
	Plant Breeder				■		■		
	Post-Harvest Workers		■		■		■		

Value Chain	Areas of Skills/Jobs	Agricultural Establishment							
		Banana	Mango	Rubber	Coffee	Sugarcane	Cacao	Rice	Corn
	Crop Grader								
	Crop Sorter								
	Production Operation Manager								
	Production Supervisor								
Processing	Processing Operation Manager								
	Processing Operation Supervisor								
	Processing Specialist								
	Processing Staff/Worker								
	Packagers								
	Sorter								
	Storage Clerk								
	Storage/ Warehouse Manager								
	Storage/ Warehouse Supervisor								
	Storage Workers								
Marketing	Marketing Manager								
	Promoter								
	National/Regional/Provincial Sales Managers								
	Sales Worker								
	Product Development Specialist								

According of Table 51, tractor operator, machine and equipment operator and machinery and equipment mechanic had are the top skills/jobs that needed a TVET graduate for the job, this is in relation to tables 49 and 50 where the mentioned skills/jobs are also in shortage and hard-to fill. Additionally, there were other skills/jobs identified in Tables 49 and 50 but were said to be positions that need a basic education graduate such as farmer, laborer, chemical sprayer, and nursery worker; and higher education graduate such as farm manager and overseer.

Table 52 shows the distribution of farms/holdings by skills/jobs that a Technical Vocational Certificate/ National Certificate can address. It shows that processing specialists, irrigation technicians, tractor operators, machinery and equipment mechanic and operator, and agricultural clerks are the top skills said to be addressed with a national certificate. Only Respondents who answered Technical Vocational Graduate in the questionnaire for the specific skill/job were able to choose whether that skill/job needed a national certificate or not.

Table 51.
Percentage of Farm/holdings by Skills Needs/Requirement Addressable by Technical Vocational Certificate/ National Certificate

		Highest Educational Qualification			
Value Chain	***Areas of Skills/Jobs***	Basic Education Graduate	Technical Vocational Education	Higher Education Graduate	Total
Input	Agricultural Engineer	0.00	22.22	77.78	*100.00*
	Agricultural extension Worker	33.33	33.33	33.33	*100.00*
	Agricultural Specialist	12.50	12.50	75.00	*100.00*
	Agriculture Clerk	20.00	60.00	20.00	*100.00*
	Administrative Clerk	42.86	14.29	42.86	*100.00*
	Agriculture Technician	0.00	18.75	81.25	*100.00*
	Agronomist	11.11	11.11	77.78	*100.00*
	Agronomy Technicians	0.00	20.00	80.00	*100.00*
	Purchasing Officer	40.00	20.00	40.00	*100.00*
	Chemical Sprayer (Pesticide, fungicide, etc.)	69.23	23.08	7.69	*100.00*
	Irrigation Technician	16.67	83.33	0.00	*100.00*
	Machinery and Equipment Mechanic	25.00	62.50	12.50	*100.00*
	Pest Management/ Control Technician	33.33	33.33	33.33	*100.00*
	Tractor Operator (and Other Agricultural Vehicles)	33.33	66.67	0.00	*100.00*
Production	Farm Manager and Overseer	23.53	5.88	70.59	*100.00*
	Farm Supervisor	0.00	10.00	90.00	*100.00*
	Crop Grower	42.86	14.29	42.86	*100.00*
	Machine and equipment Operators	37.50	62.50	0.00	*100.00*
	Farmer	57.89	21.05	21.05	*100.00*
	Field Clerk	50.00	0.00	50.00	*100.00*
	Labourer	68.42	10.53	21.05	*100.00*
	Nursery Manager	25.00	12.50	62.50	*100.00*
	Nursery Worker	72.73	18.18	9.09	*100.00*
	Plant Breeder	33.33	33.33	33.33	*100.00*
	Post-Harvest Workers	37.50	37.50	25.00	*100.00*

		Highest Educational Qualification			
Value Chain	***Areas of Skills/Jobs***	Basic Education Graduate	Technical Vocational Education	Higher Education Graduate	Total
Processing	Crop Grader	33.33	33.33	33.33	*100.00*
	Crop Sorter	60.00	20.00	20.00	*100.00*
	Production Operation Manager	14.29	0.00	85.71	*100.00*
	Production Supervisor	0.00	0.00	100.00	*100.00*
	Processing Operation Manager	50.00	50.00	0.00	*100.00*
	Processing Operation Supervisor	0.00	20.00	80.00	*100.00*
	Processing Specialist	0.00	0.00	100.00	*100.00*
	Processing Staff/Worker	0.00	100.00	0.00	*100.00*
	Packagers	80.00	20.00	0.00	*100.00*
	Sorter	100.00	0.00	0.00	*100.00*
	Storage Clerk	60.00	40.00	0.00	*100.00*
	Storage/ Warehouse Manager	0.00	50.00	50.00	*100.00*
	Storage/ Warehouse Supervisor	0.00	0.00	100.00	*100.00*
	Storage Workers	0.00	0.00	100.00	*100.00*
Marketing	Promoter	0.00	25.00	75.00	*100.00*
	National/Regional/Provincial Sales Managers	0.00	0.00	100.00	*100.00*
	Sales Worker	0.00	22.22	77.78	*100.00*
	Product Development Specialist	33.33	33.33	33.33	*100.00*

Table 52.
Percentage of Farm/holdings by Skills/jobs by Technical Vocational Certificate/National Certificate Requirement

Value Chain	***Areas of Skills/Jobs***	%
Input	Agricultural Engineer	22.22
	Agricultural extension Worker	33.33
	Agricultural Specialist	12.50
	Agriculture Clerk	60.00
	Administrative Clerk	14.29

Production	Agriculture Technician	18.75
	Agronomist	11.11
	Agronomy Technicians	20.00
	Purchasing Officer	20.00
	Chemical Sprayer (Pesticide, fungicide, etc.)	23.08
	Irrigation Technician	83.33
	Machinery and Equipment Mechanic	62.50
	Pest Management/ Control Technician	33.33
	Tractor Operator (and Other Agricultural Vehicles)	66.67
	Farm Manager and Overseer	5.88
	Farm Supervisor	10.00
	Crop Grower	14.29
	Machine and equipment Operators	62.50
	Farmer	21.05
	Field Clerk	0.00
	Labourer	10.53
	Nursery Manager	12.50
	Nursery Worker	18.18
	Plant Breeder	33.33
	Post-Harvest Workers	37.50
Processing	Crop Grader	33.33
	Crop Sorter	20.00
	Production Operation Manager	0.00
	Production Supervisor	0.00
	Processing Operation Manager	50.00
	Processing Operation Supervisor	20.00
	Processing Specialist	0.00
	Processing Staff/Worker	100.00
	Packagers	20.00
	Sorter	0.00
	Storage Clerk	40.00
	Storage/ Warehouse Manager	50.00
	Storage/ Warehouse Supervisor	0.00
	Storage Workers	0.00
Marketing	Promoter	0.00
	National/Regional/Provincial Sales Managers	0.00
	Sales Worker	0.00
	Product Development Specialist	0.00

Regarding the identification of particular talents, the survey also inquired about the number of women employed in STEM-related occupations at the company. Table 52.A. reveals that, all participating agricultural establishments have less than 25% of women workers hold STEM-related positions.

Table 52A.
Percentage of Women in STEM-related Occupations by Agriculural Establishments

Establishments	*Action Undertaken*		
	Less than 25%	*25% or More*	*Total*
Banana	100.00	0.00	*100.00*
Mango	100.00	0.00	*100.00*
Rubber	100.00	0.00	*100.00*
Coffee	66.67	33.33	*100.00*
Sugarcane	100.00	0.00	*100.00*
Cacao	75.00	25.00	*100.00*
Rice	100.00	0.00	*100.00*
Corn	100.00	0.00	*100.00*

4.4 Emerging Skills Associated with Industry Development

This section discusses the relationship between emerging skills and industry developments. Specifically, respondents were asked to assess the impact of various industry developments associated with 4th Industrial Revolutions, New Normal and STEM related Courses. In Addition, they were also asked about their readiness for the emerging skills, as well as the actions that were undertaken by those who were ready. Finally, questions were raised about the Human Resource (HR) preparations made regarding the emerging skills.

Table 53 shows industry developments, new advanced technologies and new modern practices as well as adjustments to the new normal, will impact the skills demand in the given emerging skills over the next 1-5. Most 4IR emerging skills in the list were not applicable to most of the farm/holdings. In the cases that did, the highest percentage accounts for more skills demanded as an impact.

While New normal skills list were all not applicable to all the farmholdings same with STEM related courses. This can be attributed to the profile of most of the participating establishments where they do manual tasks with little to no technical skills needed.

Table 53.
Percentage Distribution on the Impact of Skills Demand in Emerging Skills Associated with the Industry Developments over the Next 1-5 Years

Emerging Skills	Impact on Skill Demand				
	More Skills demanded (%)	Staying the same (%)	Fewer skills demanded (%)	*Not Applicable (%)*	*Total (%)*
Fourth Industrial Revolution					
Drone Technology Operation	34.48	10.34	3.45	51.72	*100.00*
Soil Scanning Device Operation and Analysis	48.28	13.79	0.00	37.93	*100.00*
Value Added Agriculture Techniques	51.72	6.90	3.45	37.93	*100.00*
Hydroponic Technology Techniques	3.45	0.00	0.00	96.55	*100.00*
Geo Tagging Operation	41.38	0.00	0.00	58.62	*100.00*
Geo Mapping Operation	37.93	3.45	0.00	58.62	*100.00*
Technical Skills for equipment/Tools	51.72	10.34	3.45	34.48	*100.00*
New Normal					
Internet of Things (IoT)	34.48	10.34	0.00	55.17	*100.00*
Data Analytics	31.03	10.34	0.00	58.62	*100.00*
Distributed Ledger Technologies (DLT's) Operation	24.14	10.34	0.00	65.52	*100.00*
Geographic Information Systems (GIS) Operation	31.03	3.45	0.00	65.52	*100.00*
Contact Tracing	13.79	13.79	0.00	72.41	*100.00*
STEM Related Courses					
Digital Literacy	20.69	13.79	3.45	62.07	*100.00*
Engineering Design Thinking	17.24	6.90	6.90	68.97	*100.00*

Table 54.
Percentage Distribution on the Impact of Skills Demand in Emerging Skills (Others) Associated with the Industry Developments over the Next 1-5 Years

Emerging Skills	Impact on Skill Demand				
	More Skills demanded (%)	Staying the same (%)	Fewer skills demanded (%)	*Not Applicable (%)*	*Total (%)*
Fourth Industrial Revolution					
Bean Quality Control/Bean Grade	100.00	0.00	0.00	0.00	100.00
Financial Literacy	100.00	0.00	0.00	0.00	100.00
Chocolate Process/Making	100.00	0.00	0.00	0.00	100.00
Marketing and Sales	100.00	0.00	0.00	0.00	*100.00*
New Normal					
Nursery production of quality seedlings (grafted)	100.00	0.00	0.00	0.00	*100.00*
Maintaining physical distancing	100.00	0.00	0.00	0.00	*100.00*
Plant Propagation	100.00	0.00	0.00	0.00	*100.00*
Managing the cooperative	100.00	0.00	0.00	0.00	*100.00*
STEM Related Courses					
Fermentation procedure of cacao	0.00	0.00	100.00	0.00	*100.00*
Climate Change Initiatives	100.00	0.00	0.00	0.00	*100.00*
Packaging of cacao by-product	0.00	0.00	100.00	0.00	*100.00*
Machine operation	0.00	0.00	100.00	0.00	*100.00*

A Skills Content Index was generated based on the responses to the mentioned requirement in Tables 45, 46, 47 and 48. Based on the Philippine TVET SNA Manual (TESDA, 2021), this index provides various aspects of a company's skill content based on the job demand such as

- Qualifications required for doing the job rather than what the job holder possesses

- Initial induction training to do the job
- Need for continuous learning and development
- Needed for industry-relevant experience

The scores of each facet were added to compute for the Skills Content Index of a facility. The implications are as follows:

- Skilled Jobs, which correspond to more complex jobs, tend to score high in the above mentioned job demand categories. In this sense, a workplace with a greater number of jobs with high scores is also a “high skilled location”.
- The skill index assessment also identifies the skills that are applicable or important to workplace performance. These skills are defined primarily by the way work is structured, but they also define the skill complexity or degree required by the entire industry.

In this study, there are four skill content index scores computed based on the qualification requirement, which are no level completed, basic education graduate, Tech Voc course graduate and higher education graduate policy requirement. (Table 45).

In terms of skills content index score generated by using the responses on the tech voc course graduate completed policy requirement, Table 55 shows that coffee establishments garnered the highest while rubber had the lowest score. It is also important to note that coffee garnered the highest scores among the other skill content index scores. Cacao establishment came in second with rubber and banana coming in third.

It is important to note that rubber also scores the lowest across all scores.

Table 55.

Skills Content Index Score by Agricultural Establishment

Respondent Code	Agricultural Establishment	Percentage Distribution			
		In relation to No Level Completed	In relation to Basic Education Graduate	In relation to TechVoc Course Graduate	In relation to Higher Education Graduate (Baccalaureate and Above)
BNN_008	Banana	130	155	135	200
BNN_009	Banana	100	160	100	140
PLY_005	Rice	100	0	0	0
CFF_003	Coffee	300	300	330	370
BNN_003	Banana	100	150	120	130

Respondent Code	Agricultural Establishment	Percentage Distribution			
		In relation to No Level Completed	In relation to Basic Education Graduate	In relation to TechVoc Course Graduate	In relation to Higher Education Graduate (Baccalaureate and Above)
MNG_001	Mango	14	100	28	14
PLY_003	Rice	100	0	0	0
CFF_008	Coffee	0	100	0	0
CFF_007	Coffee	100	100	100	200
BNN_007	Banana	120	193	127	140
COC_005	Cacao	200	266	200	234
CRN_014	Corn	100	0	0	0
CRN_021	Corn	100	0	0	0
CRN_002	Corn	100	0	0	0
COC_006	Cacao	100	200	100	100
CRN_009	Corn	100	0	0	0
MNG_007	Mango	100	0	0	0
MNG_010	Mango	100	0	0	0
COC_007	Cacao	100	0	0	0
COC_008	Cacao	100	0	0	0
MNG_005	Mango	0	100	0	0
BNN_002	Banana	156.74	101.78	107.38	134.1
SGR_011	Sugarcane	0	0	100	0
RBB_015	Rubber	100	200	100	100
RBB_006	Rubber	0	100	0	0
RBB_018	Rubber	0	100	0	0
RBB_010	Rubber	0	100	0	0

Respondent Code	Agricultural Establishment	Percentage Distribution			
		In relation to No Level Completed	In relation to Basic Education Graduate	In relation to TechVoc Course Graduate	In relation to Higher Education Graduate (Baccalaureate and Above)
RBB_019	Rubber	200	100	100	100
RBB_007	Rubber	0	90	10	0

On average, As seen in Table 56, banana had the highest skill index score in relation to Techvoc graduates, coffee being second. Also across all the skill index scores, banana had the highest average followed by coffee and cacao. Rice and corn are tied with the lowest average skill content index.

Upon further analysis, the Skills content index for the required qualifications shows that the farm/holdings that have high skills scores are from coffee, cacao and banana while the lowest scoring establishments are rice and corn.

The lowest mentioned establishments have little to no jobs demanding Techvoc or college diplomas, as most jobs are labor intensive and seasonal in nature. Furthermore it was found that in this study, the skills content concerning the policy requirement on TechVoc course graduate is moderately positive (0.45) with the employee participation. Highly skilled employees are informed about the situation of the farm/holding.

Table 56.
Average Skills Content Index Score by Agricultural Establishment

Agricultural Establishment	Percentage Distribution			
	In relation to No Level Completed	In relation to Basic Education Graduate	In relation to TechVoc Course Graduate	In relation to Higher Education Graduate (Baccalaureate and Above)
Banana	151.685	189.945	147.345	186.025
Mango	53.5	50	7	3.5
Rubber	50	115	35	33.33
Coffee	133.33	166.67	143.33	190

Sugarcane	0	0	100	0
Cacao	125	116.5	75	83.5
Rice	100	0	0	0
Corn	100	0	0	0

Since the respondents identified at least one emerging skill in any of the industry development areas, several follow-up questions were posed. First, they were asked if they were prepared concerning the identified emerging skills in the farm/holding establishments. According to Table 57, the majority of the non are ready for the emerging skills, except for Rubber (0%), Sugarcane (0%), and Cacao (25%) establishments.

Table 57.
Percentage of Agricultural Establishments that is Aware of and Ready for the Emerging Skills Associated with the Industry Developments, by Agricultural Establishment

Establishment	**(%)**
Banana	50.00
Mango	50.00
Rubber	0.00
Coffee	66.67
Sugarcane	0.00
Cacao	25.00
Rice	50.00
Corn	75.00

Although some establishments are aware and ready for the emerging skills most of them have not taken action as seen in Table 57; only some banana, coffee and rice have taken action.

All rice establishments have establishment plans to address the requirements while 50% of coffee establishments have either established plans or have started initiatives and programs in terms of training and development of human resources. While some banana establishments have started initiatives and programs for the acquisition of equipment and materials relevant to the requirements.

Table 58.

Percentage of Agricultural Establishments that have taken action given the identified emerging skill, by Agricultural Establishment

Establishment	(%)
Banana	40.00
Mango	0.00
Rubber	0.00
Coffee	50.00
Sugarcane	0.00
Cacao	0.00
Rice	50.00
Corn	0.00

Table 59.
Percentage of Agricultural Establishments that are Aware of the Emerging Skills Associated with the Industry Developments by Relative Actions Undertaken and by Agricultural Establishment

Type of Crop	Actions Undertaken		
	Established plans to address the requirements (%)	Started some initiatives/programs in terms of training and development of the human resource (%)	Started some initiatives/programs for the acquisition of equipment and materials relevant for the requirements (%)
Banana	40.00	20.00	40.00
Mango	0.00	0.00	0.00
Rubber	0.00	0.00	0.00

Type of Crop	Actions Undertaken		
	Established plans to address the requirements (%)	Started some initiatives/programs in terms of training and development of the human resource (%)	Started some initiatives/programs for the acquisition of equipment and materials relevant for the requirements (%)
Coffee	50.00	50.00	0.00
Sugarcane	0.00	0.00	0.00
Cacao	0.00	0.00	0.00
Rice	100.00	0.00	0.00
Corn	0.00	0.00	0.00

For the establishments that have taken action given the identified emerging skills and started some initiatives/programs in terms of preparing their human resources, Table 60 shows that the establishments mostly chose to reskill and upskill existing employees to acquire the required competencies.

Table 60.
Percentage of farm/holdings that are Aware of and Ready for the Emerging Skills Associated with the Fourth Industrial Revolution by Preparations on Human Resource

Preparations	(%)
Hire new employee/s who have the required skills	20.00
Reskill existing employee/s to acquire the required competencies	40.00
Upskill existing employee/s to acquire the required competencies	40.00

Most farm/holdings who have not taken action given the emerging skills say that they have no budget to conduct the training/learning and development initiatives (Table 61). Also no physical infrastructure to conduct training/learning and development initiatives was a close second response with 35.56%.

Most respondents are from sole proprietor establishments thus having difficulty funding these training and learning development initiatives. Most rely on government sponsored training such as training provided by the Department of Agriculture and the Technical Education and Skills Development Authority.

Table 61.
Percentage of farm/holdings that are not Aware of and Ready for the Emerging Skills Associated with the Fourth Industrial Revolution by Responses

Preparations	(%)
No budget to conduct the training/learning and development initiatives	40.00
No physical infrastructure to conduct training/learning and development initiatives	35.56
No Digital infrastructure to conduct training/learning and development initiatives	24.44

4.5 Green Jobs and the Agriculture Sector

As seen in Table 62, majority of farm/holdings had taken no action so far and no plan in the near future when it comes to continuing to decarbonization (58.62%); protecting ecosystem and biodiversity (51.72%); reducing energy, materials and water consumption (55.17%); and minimizing waste and pollution (44.83%). This holds true for all establishments except for bananas.

It can be highlighted in the table that 41.38% of farms/holdings have created/changed some jobs to contribute to minimizing waste and pollution only. While there were few farm/holdings that had taken no action but planning on all green aspects.

Table 62.
Distribution of Agricultural Establishments by Extent of Implementation on the Different Aspects of Green Jobs

Aspect of Green Jobs	Actions Undertaken			
	No action so far and no plan in the near future (%)	No action so far but planning to act (%)	Have created/changed some jobs as described (%)	Total (%)
Contribute to ‘decarbonization’	58.62	17.24	24.14	*100.00*
Contribute to ‘protecting the ecosystem and biodiversity’	51.72	17.24	31.03	*100.00*
Contribute to ‘reducing energy, materials and water consumption’	55.17	10.34	34.48	*100.00*
Contribute to ‘minimizing waste and pollution	44.83	13.79	41.38	*100.00*

Table 63, shows the organizational provisions of the farm/holdings of the farm/holdings who have taken actions or plans to contribute to the various aspects of green jobs. Provisions on solid waste management and waste segregation are the most common implementations in various establishments such as Banana, Mango, and Cacao.

Additionally, coffee and cacao identified the application of organic practices, organic farming, and fertilizer. This might be considered, as modern commercial agriculture is produced using mechanized equipment that output fumes harmful to the environment as well the use of chemical fertilizers that can contribute to reducing soil nutrition.

Other farm/holding's more notable provisions include specific green jobs which are pollution control officers and farm supervisors, these supervisors may be specialized in greening processes.

Table 63.
Examples of Organizational Provisions from any Aspects of Green Jobs, by Agricultural Establishment

Agricultural Establishment	(%)
Banana	- Solid Waste Management - Pollution Control Officers - Farm Supervisors - Earned licenses to various government agencies that regulate pollution and did have employees trained certified PCO, CPA and ARCO - Carbon print reduction program
Mango	- Waste Segregation - Collecting and proper disposal of chemical containers
Rubber	- Decomposition
Coffee	- We reuse in-process waste material into other processes - Use the dry method process instead of the wet method in coffee processing. - Practicing natural farming/organic farming - Organization of Environmental cleanup jobs (Oceans, Rivers, Beaches, etc)
Sugarcane	
Cacao	- Segregation of Waste / Waste segregator - Use of organic fertilizer
Rice	- Composting
Corn	

Only the respondents from sugarcane farm/holdings (100) with plans and actions on green jobs have taken advantage of tax incentives/import duty exemption programs in Table 64. The Department of Agriculture (DA) and the Department of Environment and Natural Resources (DENR) are the most common governments that the farm/holding have received or sought assistance (Table 65).

Table 64.
Percentage of Agricultural Establishment with Plans and Acts on Aspects of Green Jobs that Have Received Support or are Seeking Support from any Government Agency

Agricultural Establishment	(%)
Banana	20.00
Mango	0.00
Rubber	0.00
Coffee	33.33
Sugarcane	100.00
Cacao	33.33
Rice	0.00
Corn	0.00

Table 65.
Percentage of Agricultural Establishment s with Plans and Acts on Aspects of Green Jobs that Have Received Support or are Seeking Support from any Government Agency by Primary Crop Produced

Agricultural Establishment	Government Agencies
Banana	- Department of Agriculture (DA) - Department of Environment and Natural Resources (DENR) - Department of Labor and Employment (DOLE) - Department of Trade and Industry (DTI)
Mango	
Rubber	
Coffee	- Department of Agriculture (DA) - Department of Environment and Natural Resources (DENR) - Technical Education and Skills Development Authority (TESDA)
Sugarcane	- Department of Environment and Natural Resources (DENR) - Department of Labor and Employment (DOLE)
Cacao	- Department of Agriculture (DA) - Department of Trade and Industry (DTI)
Rice	
Corn	

Technical assistance and/ or import duties exemption program, and program registration, assessment; and certification including greening green goods and services are the top support from the government received (Table 66). About half of the establishments are aware of emerging skills resulting from green jobs (Table 67). Keep in mind that sugarcane establishments had only one farm/holding participating thus the 100% rating, also all farm/holdings that are aware account for only 13.79% of establishments surveyed.

Table 66.
Percentage of the support from the Government received by the Agricultural Establishment

Support from the Government	(%)
Tax incentives and/ or import duties exemption program	0.00
Technical assistance to ensure labor law compliance to green jobs	75.00
Data/Information request as reference in the formulation of strategies and potential green jobs development	50.00
Farm/holding, curriculum, and instructional materials development	0.00
Program registration, assessment, and certification including green goods and services	75.00
Skills development relating to Green Jobs/Skills	50.00
Special business facilitation program for business enterprises creating green jobs	0.00
Business development support (e.g. prototyping/modeling of technologies, clean technology development)	25.00
Environmentally friendly modes of transport	25.00
Sustainable tourism planning	0.00
Green building practices	25.00

Table 67.
Percentage of Agricultural Establishments that are Aware of Emerging Skills Resulting from Green Jobs

Agricultural Establishment	(%)
Banana	20.00
Mango	0.00
Rubber	0.00
Coffee	33.33
Sugarcane	0.00
Cacao	0.00

Rice	50.00
Corn	0.00

Table 68 summarizes the emerging skills as a result of green jobs identified by the farm/holdings that have stated that they are aware of this in their establishments. It can be evident that most of the skills listed such as segregation, composting, regenerative agriculture, net zero emissions and e-waste recycling, are related to the list of provisions in Table 59.

Additionally, most non perennial farm/holding have a little to no known knowledge of any aspect of green skills. One rice farm/holding said that they do not know much “green skill” other than decomposition of the plant matters in the farm, additionally it can be said that the size of the farm/holding may affect how extensive the provisions of green skills these establishments can implement.

Table 68.
Identified Emerging Skills as a Result of Green Jobs by Agricultural Establishment

Agricultural Establishment	Emerging Skill as a result of Green Jobs
Banana	- E-waste recycling
Mango	
Rubber	
Coffee	- Regenerative Agriculture - Net zero gas emissions
Sugarcane	
Cacao	
Rice	- Segregation - Decomposting
Corn	

In all listed green industry advancements described in Table 69, the majority of the farm/holdings said most are not applicable in their establishment. This holds true for all green industry advancements except for organic agriculture. Most of the farm holdings said that they have knowledge (58.62%) on organic farming, meanwhile in terms of skills and competencies, farm/holdings had a sizable percent share, 44.83% and 48.28% respectively.

One corn farm/holding representative said in a phone call interview, they do not have any knowledge with regards to any green industry development. This lack of knowledge may be due to lack of information distribution to the local farmers. Also some farmers are small farm holders who may not have an interest in green development. The Department of Agriculture and other government agencies should

look into this to assist in dissemination so that all farmers can be better informed and assisted.

Table 69.
Distribution of Agricultural Establishment by 'green' industry developments relevant to (current and near future) business needs

"Green" Industry Development	Areas with Business Needs			
	Knowledge (Critical understanding, theories and principles) (%)	Skills (Skills mastery and innovation for solving complex problems) (%)	Competencies (Managing activities and tasks) (%)	Not Applicable (%)
Biomass Energy	17.24	24.14	10.34	72.41
Genetically Modified Organism (GMO)	13.79	13.79	6.90	82.76
Organic Farming	58.62	44.83	48.28	31.03
Cleaner Fuels	20.69	17.24	24.14	75.86

Note: Multiple responses were allowed.

4.6 Learning and Development

Table 70, shows that a majority of establishments have no allocation of their payroll expenditure for learning and training programs in terms of training conducted by the company, training conducted by external providers, and training needs assessment conducted by the establishment.

Also it must be noted that only one farm/holding from sugarcane establishments participated in the survey thus having the 100 % share in the expenditure choices per learning and training program.

None the less there are farm/holdings that had varying allotments in the payroll expenditure. For instance, a majority of farm/holdings from the coffee establishments said that they have less than 10% (66.67%) allotment of their payroll expenditure to learning and training programs developed and conducted by the company.

Table 70.
Distribution of Payroll Expenditure Allocated for Learning and Development Programs Conducted by the Establishment and External Providers, by Agricultural Establishment

Agricultural Establishment	Payroll Expenditure				
	None (%)	Less than 10% (%)	10-50% (%)	*More than 50% (%)*	*Total (%)*
Learning and training programs developed and conducted by the establishment					
Banana	0.00	20.00	40.00	40.00	*100.00*
Mango	100.00	0.00	0.00	0.00	*100.00*
Rubber	100.00	0.00	0.00	0.00	*100.00*
Coffee	100.00	0.00	0.00	0.00	*100.00*
Sugarcane	0.00	0.00	0.00	100.00	*100.00*
Cacao	50.00	25.00	25.00	0.00	*100.00*
Rice	100.00	0.00	0.00	0.00	*100.00*
Corn	100.00	0.00	0.00	0.00	*100.00*
Learning and training programs developed and conducted by external providers (public and private training providers)					
Banana	0.00	40.00	40.00	20.00	*100.00*
Mango	100.00	0.00	0.00	0.00	*100.00*
Rubber	83.33	16.67	0.00	0.00	*100.00*
Coffee	33.33	66.67	0.00	0.00	*100.00*
Sugarcane	0.00	0.00	100.00	0.00	*100.00*
Cacao	50.00	25.00	25.00	0.00	*100.00*
Rice	100.00	0.00	0.00	0.00	*100.00*
Corn	100.00	0.00	0.00	0.00	*100.00*
Training needs assessment conducted by the establishment for their employees					
Banana	0.00	0.00	60.00	40.00	*100.00*
Mango	100.00	0.00	0.00	0.00	*100.00*
Rubber	100.00	0.00	0.00	0.00	*100.00*

Agricultural Establishment	Payroll Expenditure				
	None (%)	Less than 10% (%)	10-50% (%)	*More than 50% (%)*	*Total (%)*
Coffee	33.33	66.67	0.00	0.00	*100.00*
Sugarcane	0.00	0.00	0.00	100.00	*100.00*
Cacao	50.00	25.00	0.00	25.00	*100.00*
Rice	100.00	0.00	0.00	0.00	*100.00*
Corn	100.00	0.00	0.00	0.00	*100.00*

According to Table 71, a majority of banana and coffee establishments strongly agree that they provide in-house learning and training programs. In terms of providing support for learning and training programs conducted by private and public training providers, banana,coffee and sugarcane establishments all strongly agree though only one respondent came from the sugarcane establishment.

When asked whether the establishments provide or support learning and training programs that are required by the job (includes both in-house and external programs) only mango, cacao and rice are generally agreed. Most establishments agreed that employees have a say in their own learning and training needs; most establishments also said that their learning and training programs covert future skills needs. Only Banana and mango establishments agreed that their learning and training programs cover STEM skills and competencies.

Table 71.
Distribution of Agricultural Establishment by Rating Scale Various Statements related to Learning and Development, by Primary Crop Grown

Agricultural Establishment	Rating Scale (%)					
	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree *(%)*	*Total (%)*
We provide in-house learning and training programs						
Banana	0.00	0.00	20.00	0.00	80.00	*100.00*
Mango	0.00	25.00	0.00	50.00	25.00	*100.00*
Rubber	33.33	33.33	33.33	0.00	0.00	*100.00*
Coffee	0.00	0.00	0.00	33.33	66.67	*100.00*
Sugarcane	0.00	0.00	0.00	0.00	100.00	*100.00*
Cacao	0.00	25.00	0.00	50.00	25.00	*100.00*
Rice	0.00	50.00	0.00	0.00	50.00	*100.00*
Corn	0.00	25.00	0.00	50.00	25.00	*100.00*
We support learning and training programs conducted by private and public training providers						
Banana	0.00	0.00	0.00	0.00	100.00	*100.00*
Mango	0.00	0.00	0.00	50.00	50.00	*100.00*
Rubber	33.33	33.33	33.33	0.00	0.00	*100.00*
Coffee	0.00	0.00	0.00	0.00	100.00	*100.00*
Sugarcane	0.00	0.00	0.00	0.00	100.00	*100.00*
Cacao	0.00	25.00	0.00	50.00	25.00	*100.00*
Rice	0.00	0.00	0.00	50.00	50.00	*100.00*
Corn	0.00	25.00	0.00	50.00	25.00	*100.00*
We only provide or support learning and training programs that are required by the job (includes both in-house and external programs)						
Banana	0.00	40.00	20.00	0.00	40.00	*100.00*
Mango	0.00	0.00	0.00	100.00	0.00	*100.00*
Rubber	33.33	50.00	16.67	0.00	0.00	*100.00*

Agricultural Establishment	Rating Scale (%)					
	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree *(%)*	*Total (%)*
Coffee	0.00	33.33	33.33	33.33	0.00	*100.00*
Sugarcane	100.00	0.00	0.00	0.00	0.00	*100.00*
Cacao	0.00	25.00	0.00	50.00	25.00	*100.00*
Rice	0.00	0.00	0.00	50.00	50.00	*100.00*
Corn	25.00	25.00	25.00	25.00	0.00	*100.00*
Employees have a say in their own learning and training needs						
Banana	20.00	0.00	0.00	60.00	20.00	*100.00*
Mango	0.00	25.00	0.00	75.00	0.00	*100.00*
Rubber	33.33	33.33	33.33	0.00	0.00	*100.00*
Coffee	0.00	0.00	0.00	66.67	33.33	*100.00*
Sugarcane	0.00	0.00	0.00	0.00	100.00	*100.00*
Cacao	0.00	0.00	0.00	100.00	0.00	*100.00*
Rice	0.00	0.00	0.00	50.00	50.00	*100.00*
Corn	25.00	25.00	25.00	25.00	0.00	*100.00*
Our learning and training programs cover future skills needs.						
Banana	0.00	0.00	0.00	40.00	60.00	*100.00*
Mango	0.00	0.00	0.00	100.00	0.00	*100.00*
Rubber	33.33	50.00	16.67	0.00	0.00	*100.00*
Coffee	0.00	0.00	0.00	33.33	66.67	*100.00*
Sugarcane	0.00	0.00	0.00	0.00	100.00	*100.00*
Cacao	0.00	25.00	0.00	50.00	25.00	*100.00*
Rice	0.00	50.00	0.00	0.00	50.00	*100.00*

Agricultural Establishment	Rating Scale (%)					
	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree *(%)*	*Total (%)*
Corn	25.00	25.00	25.00	25.00	0.00	*100.00*
Our learning and training programs cover STEM skills and competencies						
Banana	0.00	0.00	40.00	60.00	0.00	*100.00*
Mango	0.00	25.00	0.00	75.00	0.00	*100.00*
Rubber	33.33	50.00	16.67	0.00	0.00	*100.00*
Coffee	0.00	0.00	66.67	33.33	0.00	*100.00*
Sugarcane	0.00	0.00	0.00	0.00	100.00	*100.00*
Cacao	0.00	25.00	0.00	50.00	25.00	*100.00*
Rice	0.00	50.00	0.00	0.00	50.00	*100.00*
Corn	0.00	50.00	0.00	50.00	0.00	*100.00*

Analyzing the responses of the participants on the various statements from the preceding tables (Table 70 and Table 71) in this section, the People Focus Index Score was generated (Table 72). The said index reflects the extent to which a farm/holding is paying attention to its human resources.

In this survey, people focus have a moderate correlation with value added index (0.52). The relationship may indicate that Establishments who are greatly reliant on innovative, and competitive products and services also tend to leverage on developing and utilizing their workers' skills and competencies. With this, employees working in Establishments that have a high score for People Focus (Table 75) and Value Add (Table 85) may also have higher skills demanded for creativity (e.g. innovativeness).

The facility with the highest index score is a Sugarcane farmholding, though the remaining establishments have evenly distributed shares of high scoring farm/holding. In contrast, the lowest scorers are mostly Rubber farm/holdings.

Table 72.
People Focus Index by Farmholdings

Respondent Code	Agricultural Establishment	People Focus Index
SGR_011	Sugarcane	30
CFF_007	Coffee	26
BNN_002	Banana	26
RBB_019	Rubber	26
BNN_009	Banana	25
CFF_003	Coffee	25
PLY_003	Rice	25
COC_005	Cacao	25
BNN_003	Banana	24
CFF_008	Coffee	24
MNG_010	Mango	24
BNN_008	Banana	23
MNG_001	Mango	22
BNN_007	Banana	22
CRN_009	Corn	22
COC_007	Cacao	22
COC_008	Cacao	22
CRN_014	Corn	21
MNG_007	Mango	20
CRN_021	Corn	19
MNG_005	Mango	18
RBB_006	Rubber	18
PLY_005	Rice	17
RBB_015	Rubber	17
COC_006	Cacao	16

CRN_002	Corn	14
RBB_018	Rubber	14
RBB_010	Rubber	14
RBB_007	Rubber	10

Table 72 results are somewhat the same as the results in the average people focus index score, where sugarcane also got the highest score with 30 (Table 73). It is important to note that sugarcane only had one respondent. Also, rubber got the lowest score.

Table 73.
Average People Focus Index Score by Primary Crop Grown

Agricultural Establishment	Average People Focus Index
Banana	24
Mango	21
Rubber	16.5
Coffe	25
Sugarcane	30
Cacao	21.25
Rice	21
Corn	19

4.7 Work and Employment Practices

This section discusses the information about the farm/holdings policies, the percentage of full-time employees who are eligible for reward and opportunities, and the extent of information sharing in the farm/holding regarding financial information, business plans, operational challenges and market analysis.

Most farm/holdings only have standard operating procedure policies (89.66%) as shown in Table 74. It is important to note that, among the various documents, only

27.59 % of farm/holdings have policies covering training plan, training budget, staff development plan, and development of high potential employees.

Table 74.
Percentage of with Policies Covering Various Documents

Commodity Crop	%
Business Plan	34.48
Training Plan	27.59
Training Budget	27.59
Staff Development Policy/Plan	27.59
Development for High Potential Staff	27.59
Feasibility Study Preparation	24.14
Standard Operating Procedure Policies	89.66

Note: Multiple responses were allowed.

Table 75 shows that among the various establishments, mango, rubber, and corn farm/holdings had no policies with regards to business plan, training plan, training budget, staff development plan, development of high potential staffs and feasibility study preparation. While rice farm/holdings were evenly split (50.00%) having policies regarding business plan and standard operating procedure.

Table 75.
Percentage of Agricultural Establishments with Policies Covering Various Documents by Establishments

Commodity Crop	Business Plan (%)	Training Plan (%)	Training Budget (%)	Staff Development Policy/Plan (%)	Development for High Potential Staff *(%)*	Feasibility Study Preparation (%)	Standard Operating Procedure Policies
Banana	80.00	100.00	100.00	100.00	100.00	40.00	100.00
Mango	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Rubber	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Coffee	66.67	33.33	33.33	33.33	33.33	100.00	66.67
Sugarcane	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Cacao	50.00	25.00	25.00	25.00	25.00	25.00	75.00
Rice	50.00	0.00	0.00	0.00	0.00	0.00	50.00
Corn	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Table 76.

Percentage of Agricultural Establishments with Policies Covering Various Documents by Establishment Group

Commodity Crop	Business Plan (%)	Training Plan (%)	Training Budget (%)	Staff Development Policy/Plan (%)	Development for High Potential Staff (%)	Feasibility Study Preparation (%)	Standard Operating Procedure Policies
Perennial	40.91	36.36	36.36	36.36	36.36	31.82	95.45
Non-Perennial	16.67	0.00	0.00	0.00	0.00	0.00	83.33

The respondents were also asked about the full-time employees in their facility who were entitled to certain rewards or opportunities to understand how systems work within the business that support performance outcomes and competitiveness.

According to Table 77, most of the respondents that have rewards and opportunities belong to perennial groups of agricultural establishments. For pay-related benefits, overtime pay is available for 71.11% of perennial farm/holding employees and 50.00 % for non-perennial farm/holding employees, bonuses based on overall organizational performances are available for only 52.72 % of perennial farm/holding employees, and individual performance related pay for 77.00 % of perennial farm/holding employees and only 5% of non-perennial farm/holding employees. Additionally, non-pay benefits such as child-care, health insurance, travel allowance, study leave, food subsidies among others, are available to 87.50 % of perennial farm/holding employees only.

Other rewards that are only available for perennial employees are share options for employees (75.00 %), eligible for internal promotion (67.17%) and opportunities for job rotation at other locations, including overseas, (72.50 %).

Table 77.
Percentage of Full-Time Employees in the Establishments Entitled to Various Rewards or Opportunities

Rewards or Opportunities	Percentage (%)	
	Perennial (%)	Non-Perennial (%)
Individual performance related pay	77.00	5.00
Bonuses based on overall organizational performance	52.72	0.00
Share options for employees	75.00	0.00
Eligible for internal promotion	67.17	0.00
Non-pay benefits (such as child-care, health insurance, travel allowance, study leave, food subsidies etc.)	87.50	0.00

Opportunities for job rotation at other locations (including overseas)	72.50	0.00
Overtime pay	71.11	50.00

A Mutual Gains Index has been created based on the responses from the Establishments in Table 69. This index reflects the facility's provisions for pay and non-pay benefits to entice workers to commit. In this survey, mutual gains have a moderate correlation with employee participation (0.19). Employees in Establishments with a high mutual gains index score are informed about their facility's business situation.

Banana, sugarcane, cacao and coffee are the top farm/holdings with the highest Mutual Gains Index score. The majority of Establishments with the lowest Mutual Gains Index score are from rubber, rice, and corn (Table 78). Also, each respective agricultural establishment mentioned have the highest and lowest average Mutual Gains Index Scores (Table 69).

Table 78.
Mutual Gains Index by Farm/holding

Respondent Codes	Agricultural Establishment	Mutual Gains Index
BNN_008	Banana	600
BNN_009	Banana	555
BNN_002	Banana	500
SGR_011	Sugarcane	500
BNN_003	Banana	400
COC_008	Cacao	360
CFF_008	Coffee	350
CRN_021	Corn	100
COC_006	Cacao	100
BNN_007	Banana	70
CFF_007	Coffee	50
COC_007	Cacao	29
MNG_010	Mango	12

MNG_001	Mango	10
RBB_015	Rubber	10
PLY_003	Rice	5
MNG_007	Mango	5
PLY_005	Rice	0
CFF_003	Coffee	0
COC_005	Cacao	0
CRN_014	Corn	0
CRN_002	Corn	0
CRN_009	Corn	0
MNG_005	Mango	0
RBB_006	Rubber	0
RBB_018	Rubber	0
RBB_010	Rubber	0
RBB_019	Rubber	0
RBB_007	Rubber	0

Table 79.
Average Mutual Gains Index by Farm/holdings

Agricultural Establishment	Mutual Gains Index
Banana	425
Mango	6.75
Rubber	1.67
Coffe	133.33
Sugarcane	500

Cacao	122.25
Rice	2.5
Corn	25

In terms of sharing, the results in Table 80 show that most farm/holdings do not generally share financial information, business plans, and market analysis to their employees. Only 48.27% of farm/holdings said that they only share operational challenges with some employees. Majority of respondents (58.62 %) also said that they do not generally share market analysis information. Financial information and business plans were not generally shared also, although it is important to note that both did not reach above 50 %, only 44.83 % and 41.38 % respectively.

None of the respondents said that the stated information was inapplicable.

Table 80.
Distribution of the Agricultural Establishments by Extent of Sharing Various Information

Information	Extent of Sharing				Total
	Not generally shared (%)	Only with some employees (%)	Only with some employees (%)	Not Applicable (%)	
Financial Information	44.83	31.03	24.14	0.00	*100.00*
Business Plans	41.38	31.03	27.59	0.00	*100.00*
Operational Challenges	27.59	24.14	48.27	0.00	*100.00*
Market Analysis	58.62	27.59	13.79	0.00	*100.00*

Based on the responses of the Establishments in Table 80, an Employee Participation Index was calculated. This index analyzes the extent to which a business unit is increasing performance/improvement input from those who are critical to the business's operation. Highly efficient business units are known to make use of their employees' tacit knowledge and participatory energy (TESDA, 2021).

Employee Participation in this study has a moderately positive correlation with skills content (0.42) in relation to policy requirements on the Technical Vocational Graduate and a weakly positive correlation with mutual gains (0.19). Highly skilled employees turn out to be well-informed about the business situation at their facility, and are somewhat compensated for it.

Coffee and rubber farm/holding had the highest Employee Participation Index (12) followed by another coffee farm/holding with 11 (Table 81).

Table 81
Employee Participation Index by Farm/holdings

Respondent Code	Agricultural Establishment	Employee Participation Index
CFF_003	Coffee	12
RBB_010	Rubber	12
CFF_007	Coffee	11
MNG_007	Mango	10
BNN_002	Banana	10
RBB_006	Rubber	10
BNN_008	Banana	9
BNN_009	Banana	9
BNN_003	Banana	9
BNN_007	Banana	9
COC_005	Cacao	9
CFF_008	Coffee	8
CRN_009	Corn	8
MNG_010	Mango	8
COC_007	Cacao	8
PLY_003	Rice	7
SGR_011	Sugarcane	7
PLY_005	Rice	6
CRN_014	Corn	6
RBB_015	Rubber	6
MNG_001	Mango	5

CRN_021	Corn	5
CRN_002	Corn	5
COC_008	Cacao	5
COC_006	Cacao	4
MNG_005	Mango	4
RBB_018	Rubber	4
RBB_019	Rubber	4
RBB_007	Rubber	4

From the results of Table 81, the Coffee establishment also ranked first on the average employee participation index score in Table 82. The second was banana, which placed third highest in Table 81 with a score of 10. The number of participants may have played a part in the placements.

Table 82

Average Employee Participation by Farm/holdings

Agricultural Establishment	Employee Participation Index
Banana	9.2
Mango	6.75
Rubber	6.67
Coffee	10.33
Sugarcane	7
Cacao	6.5
Rice	6.5
Corn	6

4.8 Business Strategy

In Table 83, the farm/holdings were grouped into perennial and non-perennial. Generally, it is notable that each group has different rating scales for most of the stated approaches to business. For instance, 30.43 % of perennial farm/holdings agree that their product has a ‘more-than-average’ amount of customization in comparison to other establishments in the Agricultural Sector while 66.67 % of non-perennial farm/holdings are neutral.

When asked whether their businesses mostly compete in a market of premium quality products or services, most perennial farms/holdings (43.48 %) agreed while non-perennial farm/holdings said they are neutral. This result was also seen in regards to whether their products and services rely on developing unique or innovative products or services, 39.17 % of perennial farm/holdings agreed while 50.00% of non-perennial farm/holdings said they are neutral.

Both perennial and non-perennial farm/holdings agreed that the competitive success of our products and services is dependent on price in the vast majority of cases, having 52.17% and 83.33% respectively.

Table 83.
Distribution of the farm/holdings by Rating Various Approaches to Business, by Establishment Group

Approach to Business	Rating Scale (%)					Total
	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	
Perennial						
Compared to farm/holdings in the Agriculture Sector, there is a ‘more-than-average’ amount of customization in our products and services	0.00	26.09	26.09	30.43	17.39	*100.00*
Compared to other farm/holding in the Agriculture Sector the competitive success of our products and services is dependent on price in the vast majority of cases	0.00	30.43	8.70	52.17	8.70	*100.00*
Our business mostly competes in a market of premium quality products or services	0.00	30.43	0.00	43.48	26.09	*100.00*
Our products and services rely on developing unique or innovative products or services	0.00	34.78	17.39	39.13	8.70	*100.00*
Non-Perennial						

Compared to farm/holdings in the Agriculture Sector, there is a 'more-than-average' amount of customization in our products and services	0.00	0.00	66.67	16.67	16.67	*100.00*
Compared to other farm/holding in the Agriculture Sector the competitive success of our products and services is dependent on price in the vast majority of cases	0.00	0.00	16.67	83.33	0.00	*100.00*
Our business mostly competes in a market of premium quality products or services	0.00	0.00	66.67	33.33	0.00	*100.00*
Our products and services rely on developing unique or innovative products or services	0.00	0.00	50.00	33.33	16.67	*100.00*

Based on the responses of the participating Establishments in Table 83, a Value-Add (VA) Index has been generated. The VA Index measures where the site is located along a value chain. Hence, the site can be engaging a 'low' VA segment by selling services or products that are cheaper/lower-priced, or the high segment that provides more bespoke/customized/innovative services or products. Relatably, a site with a high VA score requires more skills from its workers.

Based on the results of this study, the VA has a moderately positive correlation with People Focus at 0.52 and a weakly positive correlation with Mutual Gains at 0.30. Establishments with a high VA score are highly skilled, well-informed of their sites' business situation, highly encouraged to contribute their ideas and suggestions, and have good performance so they continue to provide high-value products and services.

Many farm/holdings across different agricultural establishments scored the highest VA index score of 16, two farm/holdings from the banana establishment, three from coffee, two from cacao, and one each from mango and corn establishments (Table 84).

Table 84.
VA Index Score by Farm/holding

Respondent Code	Agricultural Establishment	VA Index Score
BNN_008	Banana	16
CFF_008	Coffee	16
CFF_007	Coffee	16
COC_005	Cacao	16

CRN_009	Corn	16
MNG_007	Mango	16
COC_008	Cacao	16
BNN_002	Banana	16
CFF_003	Coffee	15
PLY_003	Rice	15
BNN_009	Banana	14
PLY_005	Rice	14
BNN_003	Banana	14
MNG_001	Mango	14
BNN_007	Banana	14
MNG_010	Mango	14
RBB_006	Rubber	14
COC_006	Cacao	13
MNG_005	Mango	13
CRN_014	Corn	12
COC_007	Cacao	12
CRN_021	Corn	11
CRN_002	Corn	11
SGR_011	Sugarcane	11
RBB_015	Rubber	10
RBB_018	Rubber	10
RBB_010	Rubber	10
RBB_019	Rubber	10
RBB_007	Rubber	10

Coffee had the highest average VA index score (Table 85) followed by Banana. This is somewhat reflected by the result in Table 84 where coffee and banana establishments achieved the highest score.

Table 85.
Average VA Index Score by Primary Crop

Agricultural Establishment	VA Index
Banana	14.8
Mango	14.25
Rubber	10.67
Coffee	15.67
Sugarcane	11
Cacao	14.25
Rice	14.5
Corn	12.5

As shown in Table 86, farm/holdings have varying extent of implementations regarding any collaboration with the academe and the government education agencies for future skills.

A majority (60.00 %) of banana farm/holdings have no action so far but are planning to act while both coffee and sugarcane farm/holdings (100.00 %) have created/ changed some jobs as described. Most rubber farm/holdings (83.33 %) said that they have no plans in the near future for any collaboration with the academe or any government educational agency.

Both cacao and corn farm/holdings were evenly split between having no plans in the near future and planning to act. While rice farm/holdings were either planning to act or already have created./changed some jobs as described.

Table 86.
Distribution of the Agricultural Establishment by Extent of Implementation on Collaborating with the Academe and the Government Education Agencies for Future Skills Supply

Agricultural Establishment	Extent of implementation (%)			*Total (%)*
	No action so far and no plan in the near future (%)	No action so far but planning to act (%)	Have created/changed some jobs as described (%)	
Banana	0.00	60.00	40.00	*100.00*
Mango	50.00	25.00	25.00	*100.00*
Rubber	83.33	16.67	0.00	*100.00*
Coffee	0.00	0.00	100.00	*100.00*
Sugarcane	0.00	0.00	100.00	*100.00*
Cacao	50.00	50.00	0.00	*100.00*
Rice	0.00	50.00	50.00	*100.00*
Corn	50.00	50.00	0.00	*100.00*

Table 87, shows that most farm/holdings in the majority of agricultural establishments intend to expand into other areas of development. The only respondent for sugarcane said that it has no plans for expansion resulting in a 0.00 % value.

Relating this to expected increases in the number of employees for 2022 (Table 21), it can be recalled that Banana and Cacao establishments were noted to have additional manpower. As seen in Table 86, both banana and cacao establishments indicated plans to expand into some other areas; thus, expansion may lead to the production of new jobs.

Table 87.
Percentage of Agricultural Establishments with Plans to Expand on Other Areas of Development by Agricultural Establishments

Agricultural Establishments	(%)
Banana	60.00
Mango	75.00
Rubber	16.67
Coffee	100.00

Sugarcane	0.00
Cacao	75.00
Rice	100.00
Corn	50.00

For those establishments that are planning on expanding to other areas of development, commonly, the establishments are planning to expand their production operations and processing capabilities (Table 88).

This result indicates that most agricultural establishments primarily place importance on the production and processing side of the value chain, where additional workforce and technology research is heavily invested.

Table 88.
Areas of Development for Expansion by Agricultural Establishments

Agricultural Establishment	(%)
Banana	- Production - Research and Development
Mango	- Processing Mango - Additional Farmland (Production) - Addition Spaying Establishments
Rubber	- Barangay Training
Coffee	- Product diversification, overseas distribution, infrastructure development - Expand operations (production and processing) - Regenerative Agriculture
Sugarcane	
Cacao	- Expanding Nursery area/operation - Processing, Marketing - Training and seminar
Rice	- Planting additional crops such as vegetables - Processing (Milling and Storage)
Corn	- Expand Corn Farm Operation and location (plot) - Aquaculture (Fish ponds)

4.9 Work Processes and Technology

This section discusses how up-to-date the farm/holding equipment (i.e., used in the production and processing of crops) when compared to the best commonly available technologies in the country and overseas. The analysis in this section also aims to highlight how technology impacts other workplace matters. When asked to compare their equipment with those overseas, most perennial and non-perennial establishments say that their equipment is more than five years behind.

Table 89 shows that 43.48% of perennial establishments have up-to-date equipment compared to those in the country, while 50.00% of non-perennial establishments say their equipment is more than five years behind. Based on Table 88, a majority of establishments say that their equipment is fairly up-to-date compared with those in the country; it should be noted that the majority, 50.00 % of mango and cacao chose the “up-to-date” respondents. Also, 100.00% of rubber farm/holdings said that their equipment was more than five years behind compared with those in the country.

Table 89 also shows that a majority of agricultural establishments say their equipment is more than five years behind. Only a majority of banana establishments, 60.00%, said that their equipment is up-to-date comp[ared with those overseas.

It is important to also note that sugarcane had only one participating farm/holding thus having 100.00% in saying that their equipment is 1 to 5 years behind compared with those in the country and compared with those overseas.

Table 89.
Distribution of the Establishment Group by Core Equipment Condition as Compared with the Best Commonly Available Technology

Type of Crop	**How up-to-date is the equipment (%)**			*Total (%)*
	Up to date (%)	1 to 5 years behind (%)	More than five years behind (%)	
Compared with those in the country				
Perennial	43.48	21.74	34.78	*100.00*
Non-Perennial	16.67	33.33	50.00	*100.00*
Compared with those overseas				
Perennial	21.74	30.43	47.83	*100.00*
Non-Perennial	16.67	0.00	83.33	*100.00*

Table 90.
Distribution of the Agricultural Establishment by Core Equipment Condition as Compared with the Best Commonly Available Technology

Agricultural Establishment	How up-to-date is the equipment			
	Up to date (%)	1 to 5 years behind (%)	More than five years behind (%)	Total (%)
Compared with those in the country				
Banana	80.00	20.00	0.00	*100.00*
Mango	50.00	50.00	0.00	*100.00*
Rubber	0.00	0.00	100.00	*100.00*
Coffee	66.67	0.00	33.33	*100.00*
Sugarcane	0.00	100.00	0.00	*100.00*
Cacao	50.00	25.00	25.00	*100.00*
Rice	0.00	50.00	50.00	*100.00*
Corn	25.00	25.00	50.00	*100.00*
Compared with those overseas				
Banana	60.00	40.00	0.00	*100.00*
Mango	0.00	50.00	50.00	*100.00*
Rubber	0.00	0.00	100.00	*100.00*
Coffee	33.33	33.33	33.33	*100.00*
Sugarcane	0.00	100.00	0.00	*100.00*
Cacao	25.00	25.00	50.00	*100.00*
Rice	0.00	0.00	100.00	*100.00*
Corn	25.00	0.00	75.00	*100.00*

4.10 Organizational Performance

This section discusses the information gathered about the distribution of the participating farm/holdings by the status of outcomes for the period of 2021 to 2022, and by the percentages of employees exhibiting various behaviors at work.

According to Table 91, the profitability in perennial establishments have decreased while total sales/revenue and market shares generally stayed the same. This applies to Mango, Coffee, Cacao and Rice establishments (Table 90). Meanwhile, most non-perennial establishments said that their profitability stayed the same (50.00%), even though their total sales/revenue (50.00%) and market share (50.00%). Non-perennial establishments included in these are rice and corn.

It is important to note that these were conducted at the time when Covid-19 restrictions were relaxed, and most businesses were reeling from the effects of the imposed government limitations and price freezes, especially for crops.

Table 91.
Distribution of the Participating Farm/holdings by Rating of Different Outcomes from 2021 to 2022 by Establish

Type of Crop	Rating (%)				*Total (%)*
	Decrease (%)	Stay the same (%)	Increase (%)	Not Applicable (%)	
Profitability					
Perennial	34.78	30.43	17.39	17.39	*100.00*
Non-Perennial	33.33	50.00	16.67	0.00	*100.00*
Total Sales/ Revenue					
Perennial	30.43	39.13	13.04	17.39	*100.00*
Non-Perennial	50.00	16.67	33.33	0.00	*100.00*
Market Share					
Perennial	26.09	43.48	17.39	13.04	*100.00*
Non-Perennial	50.00	16.67	33.33	0.00	*100.00*

Table 92.
Distribution of the Agricultural Establishments by Primary Crop Grown and Rating of Different Outcomes from 2021 to 2022

Agricultural Establishment	Rating Scale (%)				
	Decrease (%)	Stay the same (%)	Increase (%)	Not Applicable (%)	*Total (%)*
Profitability					
Banana	0.00	80.00	0.00	20.00	*100.00*
Mango	50.00	25.00	25.00	0.00	*100.00*
Rubber	33.33	33.33	33.33	0.00	*100.00*
Coffee	66.67	0.00	0.00	33.33	*100.00*
Sugarcane	0.00	0.00	0.00	100.00	*100.00*
Cacao	50.00	0.00	25.00	25.00	*100.00*
Rice	50.00	50.00	0.00	0.00	*100.00*
Corn	25.00	50.00	25.00	0.00	*100.00*
Total Sales/ Revenue					
Banana	0.00	80.00	0.00	20.00	*100.00*
Mango	25.00	75.00	0.00	0.00	*100.00*
Rubber	33.33	33.33	33.33	0.00	*100.00*
Coffee	66.67	0.00	0.00	33.33	*100.00*
Sugarcane	0.00	0.00	0.00	100.00	*100.00*
Cacao	50.00	0.00	25.00	25.00	*100.00*
Rice	100.00	0.00	0.00	0.00	*100.00*
Corn	25.00	25.00	50.00	0.00	*100.00*
Market Share					

Banana	0.00	80.00	20.00	0.00	*100.00*
Mango	25.00	75.00	0.00	0.00	*100.00*
Rubber	33.33	33.33	33.33	0.00	*100.00*
Coffee	33.33	33.33	0.00	33.33	*100.00*
Sugarcane	0.00	0.00	0.00	100.00	*100.00*
Cacao	50.00	0.00	25.00	25.00	*100.00*
Rice	100.00	0.00	0.00	0.00	*100.00*
Corn	25.00	25.00	50.00	0.00	*100.00*

The Organizational Performance Index has been created whose findings from other indices can be related as contributing or inhibiting factors. Based on the results of the correlation, Organizational Performance has a weakly positive correlation (0.15) with Mutual Gains. It can be recalled that the Mutual Gains Index reflects the provision of pay and non-pay benefits to employees to entice them to commit and influence discretionary effort and innovations.

According to Table 93, three farm/holdings from different agricultural establishments scored, coffee, cacao, and sugarcane, attained the highest organizational performance index of 12. A high Organizational Performance Index is a measurement of how well a facility/company/organization achieves both its financial and non-financial objectives.

Table 93.
Organizational Performance Index by Agricultural Establishment

Respondent Code	Agricultural Establishment	Organizational Performance Index
CFF_003	Coffee	12
COC_006	Cacao	12
SGR_011	Sugarcane	12
BNN_009	Banana	11
COC_005	Cacao	9
CRN_009	Corn	9
RBB_006	Rubber	9

RBB_019	Rubber	9
CRN_014	Corn	8
MNG_010	Mango	7
BNN_008	Banana	6
BNN_003	Banana	6
BNN_007	Banana	6
CRN_002	Corn	6
MNG_005	Mango	6
BNN_002	Banana	6
RBB_018	Rubber	6
RBB_010	Rubber	6
MNG_007	Mango	5
PLY_005	Rice	4
CFF_007	Coffee	4
MNG_001	Mango	3
PLY_003	Rice	3
CFF_008	Coffee	3
CRN_021	Corn	3
COC_007	Cacao	3
COC_008	Cacao	3
RBB_015	Rubber	3
RBB_007	Rubber	3

Based on Table 94, sugarcane establishment scored the highest in the average Organizational Performance Index, it is important to note that the number of participants may have affected the results; sugarcane only had one participant. bananas and cacao scored second and third respectively.

Table 94.
Average Organizational Performance Index Score by Agricultural Establishment

Agricultural Establishment	Organizational Performance Index Score
Banana	7
Mango	5.25
Rubber	6
Coffee	6.33
Sugarcane	12
Cacao	6.75
Rice	3.5
Corn	6.5

Furthermore, the organizational performance of the agricultural farm/holdings and the percentages of employees who exhibit various behavior at work was determined as shown in Table 95. According to the results, a high percentage of farm/holdings have none of their employees exhibiting the behaviors, and this is true for all behaviors listed in the table.

This result reflects the results in Table 35, where 65.32% are able to perform the job but not beyond. We can infer that most of the employees across all the establishments are capable of performing the duties but do not exert any additional effort beyond his/her duties.

Table 95.
Distribution of the Agricultural Establishment by Percentage of Employees Exhibiting Various Behavior at Work

	Percentage of Employees (%)
Behavior	

	None (%)	<10% (%)	10%-50% (%)	>50% (%)	Total (%)
Go above and beyond the 'call of duty' without being asked	37.93	10.34	17.24	34.48	*100.00*
Take up the duties of a colleague without being asked	34.48	6.90	31.03	27.59	*100.00*
Regularly put in more hours than contractually expected into their jobs	48.28	3.45	17.24	31.03	*100.00*
Make helpful suggestions for improving the operation within the organization	34.48	6.90	34.48	24.14	*100.00*

4.11 Workforce Matters

This section discusses the workforce in relation to TVET graduates and TVET certified, including the percentage and the satisfaction level of employers. Based on Table 96, only bananas, sugarcane, cacao, and corn have TVET graduate employees. However, the sugarcane establishment had only one representative.

Only banana and sugarcane farm/holdings have tvet-certified employees.

Table 96.
Percentage of TVET Graduate Employees and TVET-Certified Employees by Primary Crop

Agricultural Establishment	(%)
TVET Graduate Employees	
Banana	2.942
Mango	0.00
Rubber	0.00
Coffee	0.00
Sugarcane	50.00
Cacao	10.00
Rice	0.00
Corn	1.25
TVET Certified Employees	
Banana	2.25

Mango	0.00
Rubber	0.00
Coffee	0.00
Sugarcane	15.00
Cacao	0.00
Rice	0.00
Corn	0.00

Those farm/holdings that have employed TVET graduates and TVET certified employees are generally satisfied with their work and performance (Table 97). Among the participating agricultural establishments that have employees who are TVET graduates, 80.00% gave a satisfactory rating, while TVET-certified employees were given a 100.00% satisfactory rating.

Table 97.
Distribution of Agricultural Establishment with TVET-Graduate Employees by Satisfaction Rating on Employees Work Performance

TVET Workforce	Percentage of Employees (%)						
	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Not Applicable (%)	Total (%)
TVET Graduate (%)	20.00	0.00	0.00	80.00	0.00	0.00	*100.00*
TVET Certified (%)	0.00	0.00	0.00	100.00	0.00	0.00	*100.00*

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The survey collected data on different components in the workplace, including employee demographics, skills gaps and demand, employee size projections, as well as site development plans, and satisfaction to existing TVET graduates and TVET certified employees, among others.

In summary, the Agriculture sector workforce is relatively young, considering that the age bracket is aged 18 to 34 or 46.24% of the identified respondents; the majority are

skilled workers, plant and machine operators and assemblers, and managers. Most of the agricultural establishments employed full-time/permanent employees and seasonal workers. In terms of educational attainment, the majority of the workforce completed their Primary education.

In terms of salary, the majority of the workforce earns a gross monthly salary of minimum wage or below. In terms of intervention with the underperforming employees, the majority of the agricultural establishments are always or regularly conducting interventions such as increase in training activity, conduct or re-training, review of performance, conduct mentoring, intensify supervision staff and apply corresponding disciplinary measures. On the other hand, employees who can perform more demanding duties have been receiving interventions such as learning and development and salary increase.

Although there is a low percentage of TVET graduates and certified employees in each of the surveyed agriculutral establishments; those who have say that they are satisfied with the said employees performance.

5.1. Conclusions and Recommendations on the identified issues and policy implication

Anticipating industry skill requirements is critical in developing policies and programs that bridge the gap between training and employment. This WSS survey for the agriculture sector provides important benchmark information on essential agricultural workforce skills.

With the ever-changing demands resulting from economic, environmental, and technical developments, to name a few, it is necessary for industry and government to assess their present programs and regulations. Similarly, create new processes and initiatives to address the skills and abilities required for a future-ready workforce.

Particular recommendations to the industry, TESDA, and other relevant government organizations are provided below.

TESDA

1. **Review the entry trainee requirements of TVET programs to cater to the identified priority requirements of the primary education and higher education graduates in the Agriculture Sector.**
   A. For most of the agricultural establishments surveyed, the majority of the employees attained primary education (i.e elementary graduates). Relative to this, the results of the survey also revealed that the majority of the most in-demand, hard-to-fill, and difficult to replace skills/jobs/occupations in the Agriculture Sector only requires primary education.
   B. The results are consistent with the nature of the industry being mostly composed of manual, labor-intensive occupations that will not usually require high educational attainment. Most of these types of jobs are found under the input,

C. As such, TESDA, together with the industry and concerned government offices, shall review the trainee entry requirements of the TVET programs in consideration of the target program beneficiaries. Many of the current Training Regulations require trainees to complete at least 10 years of basic education or an Alternative Learning System (ALS) Certificate of Completion, specifically the programs for the Agriculture Sector which falls under National Certificate III and above. This may be a critical consideration for workers who aim for career growth/progression.
D. For the identified skills/occupations under higher education, TESDA should in turn collaborate with concerned agencies such as the Commission on Higher Education and the Professional Regulation Commission, as well as the industry, to develop and update curricula and training regulations that will align with emerging skills/occupations.This collaboration can help bridge the gap between theoretical knowledge and practical skills required by the industry.

2. **Developement new Standards and Training Regulations (TRs)/ Competency Standards (CS's) to fit the technical requirements of the Agriculture Sector.**
   A. The priority skills requirements/occupations of the sector had been identified in reference to the three main indicators (addressable by TVET program, urgency, demand) evaluated vis-a-vis the four criteria for prioritization (National Implication, Employment Generation, Industry Requirements, and Standardization and Certification).
   B. The table presents the summary of the priority requirements, which shall be the basis for the qualifications recommended for the development of either Competency Standards or Training Regulations.

Table 98.
Summary of the Priority Requirements for the Agriculture Sector for Program Development per Crop

Crop	**Training Regulation (TR) Development**	
	Priority 01	**Priority 02**
Mango	Chemical Sprayer (Pesticide, fungicide, etc.)	
	Post-Harvest Workers	
	Crop Grader	
	Packagers	

Crop	**Training Regulation (TR) Development**	
	Priority 01	**Priority 02**
Rubber	Plant Breeder	
	Production Operation Manager	
	Agricultural extension Worker	
	Agricultural Specialist	
	Crop Grader	
	Farm Manager and Overseer	
Coffee	Plant Breeder	
	Post-Harvest Workers	
	Processing Operation Manager	
	Agriculture Technician	
Cacao	Field Clerk	
	Plant Breeder	
	Post-Harvest Workers	
	Processing Operation Manager	

Crop	Training Regulation (TR) Development	
	Priority 01	**Priority 02**
	Production Operation Manager	
	Production Supervisor	
	Administrative Clerk	
	Agriculture Technician	
Rice	Post-Harvest Workers	
	Agriculture Technician	

Crop	Competency Standards (CS) Development	
	Priority 01	**Priority 02**
Coffee	Crop Sorter	
Cacao	Marketing Manager	
	National/Regional/Provincial Sales Managers	
	Product Development Specialist	
	Promoter	
	Sorter	

Rice	Agriculture Clerk	

C. During the facilitation of the Qualification and Standards Office (QSO) for the functional analysis, QSO could further determine if whether the programs identified in multiple crops (i.e common or recurring requirements among various crops) will necessitate the development of separate programs or may be combined in one general program. Based on the survey most common skills across the crops are:
    - Agricultural extension Worker
    - Farm Manager and Overseer
    - Farmer
    - Agriculture Technician
    - Tractor Operator
    - Machine and equipment Operators
    - Post-Harvest Workers

D. At the Validation meeting the representatives from the Cacao and Rubber Industry gave inputs on other needed skills such as for cacao, grafters and pruners; and for rubber, rubber wood processing. In the post harvests side, to increase productivity the cacao producers need skills such as fermentation, drying and bean grading.

   The representatives from the Banana industry added that most plantations need the Occupational Safety and Health (OSH) programs for their workers as it is a requirement. Additionally, it was mentioned in the validation that although TESDA includes OSH in its TR, it may not be recognized by the industry and the primary government agency that provides certification on OSH, thus it is recommended that TESDA look into the development of a separate program on OSH in collaboration with the Department of Labor and Employment (DOLE). This alignment with DOLE may assist TESDA in developing OSH program that is industry recognized.

3. **Promote awareness of the 4IR emerging skills and green jobs in the Agriculture Sector.**
   A. TESDA shall collaborate with the Department of Agriculture and other agricultural stakeholders, to strengthen awareness of the Fourth Industrial Revolution and emerging skills among farmers and skilled workers.
   B. TESDA to include emerging skills identified by the agricultural establishments in its update on the skills mapping. The list of emerging skills in Table 99 shall serve as reference in the development and review of the existing programs for possible embedment as part of the basic/common competencies.
   C. In relation to the green jobs the survey shows that most of the participating establishments do not yet have knowledge of green jobs. This is critical as the industry's awareness of the green competencies and occupations will

have an impact on the identification of the industry requirements. TESDA's Green Technology Center may assist in meeting the agriculture sector's emerging green demand of industry workers.

D. It can be inferred that most agricultural establishments surveyed had little to no knowledge of green related jobs in the industry, thus TESDA notify the concerned agencies such as the Department of Trade and Industry; and Department of Agriculture on the need to strengthen the information dissemination to agri-businesses, associations and cooperatives regarding green jobs. TESDA shall also support these mentioned government agencies in any plan and/ or program relative to green job development.

Table 99.
Summary Emerging Skills by Crop

Emerging Skills							
Banana	*Mango*	*Rubber*	*Sugarcane*	*Coffee*	*Cacao*	*Rice*	*Corn*
Soil Scanning Device Operation and Analysis	Soil Scanning Device Operation and Analysis	Soil Scanning Device Operation and Analysis	Financial Literacy	Soil Scanning Device Operation and Analysis	Soil Scanning Device Operation and Analysis	Soil Scanning Device Operation and Analysis	Financial Literacy
Financial Literacy	Value Added Agriculture Techniques	Value Added Agriculture Techniques	Machine operation	Value Added Agriculture Techniques	Value Added Agriculture Techniques	Financial Literacy	Machine operation
Climate Change Initiatives	Nursery production of quality seedlings (grafted)	Nursery production of quality seedlings (grafted)		Bean Quality Control/Bean Grade	Bean Quality Control/Bean Grade	Plant Propagation	
Machine operation		Rubber Wood Processing		Nursery production of quality seedlings (grafted)	Chocolate Process/Making	Climate Change Initiatives	
				Plant Propagation	Marketing and Sales	Machine operation	
				Climate Change Initiatives	Nursery production of quality seedlings (grafted)		
				Grafting and Pruning Activity	Plant Propagation		
					Managing the		

					cooperative		
					Fermentation procedure (Cacao)		
					Climate Change Initiatives		
					Grafting and Pruning Activity		

4. **Endorse the results of the survey to the TESDA Regional and Provincial Offices to Enhance the implementation of the Area-Based Demand Driven TVET program related to Agriculture.**
   A. Relevant to the implementation of the Area-Based and Demand Driven TVET, it is recommended to improve the Provincial and Regional Skills Mapping and the skills priorities report reflecting the identified skills in each respective crops seen below.

Table 100.
Summary of Regions identified Skills related to Crops in the Area-Based Demand Driven TVET Program as of June 2023

Crops	**Regions**
Banana	Region I, Region IV-B, Region V, Region VI, Region VII, Region VIII, Region X, Region XI, Region IX, Region XII
Mango	Region II, CAR, Region IV-B, Region VI, Region XI, Region IX
Rubber	Region VII, Region X, Region XI, Region IX, CARAGA, Region XII, BARMM
Sugarcane	Region I, Region III, Region IV-B, Region VI, Region VII, Region X, CARAGA

Coffee	Region I, Region II, CAR, Region IV-B, Region V, Region VII, Region VIII, Region XII
Cacao	Region I, Region II, CAR, Region IV-A, Region IV-B, Region V, Region VII, Region VIII, CARAGA
Rice	Region II, Region III, CAR, Region IV-B, Region V, Region VII, Region VIII, CARAGA, Region XII
Corn	Region II, Region III, CAR, Region IV-B, Region V, Region VII, Region VIII, CARAGA, Region XII

B. The mentioned regions identified the specific agricultural crop as one of their priority in the agriculture sector for the ABDD. With the results of the ABDD and the identified priority crops for each region, National Training Regulation (TR)/ Competency Standards (CS) must be developed.

C. TESDA shall use the results of this survey in updating the National Skills map to include the skills requirements of the Agriculture Sector.

5. Improve TVET infrastructure for the corresponding Identified existing Training Regulation (TR) to better capacitate the in-demand jobs in the Agriculture Sector

A. In reference to the identified skills requirements with shortage and hard-to-fill that already have corresponding TVET programs, the table below presents the number of competency assessors, assessment centers, registered programs, and TVET trainers, see Table 101.
B. However, there are programs that have a small number of registered programs that might contribute to the availability of the skilled workers needed. Additionally, there are also zero to few number of trainers, assessors and assessment centers with respect to the corresponding Training Regulations (TRs).
C. It is therefore necessary to extend the information to establishments as well as with the DA-ATI to increase the number of providers that will cater possible trainees of the programs.

6. Preparation for the shift to modernization and mechanization of the Agriculture Sector

A. The survey results show that most of the agricultural establishments do not have up-to-date equipment compared to others in the country or internationally, nonetheless it is the government's advocacy, thru such laws as RA No. 10601 otherwise known as the “AFMECH” Law, to modernize the agriculture sector.
B. TESDA can assist this shift by increasing its TVET infrastructure on programs that cater to agriculture machinery focused programs such as Agricultural Machinery Servicing (4-Wheel Tractor) NC III, Agricultural Machinery Operations NC II and Rice Machinery Operations NC II.
C. Mechanical knowledge and maintenance, technical troubleshooting, operational skills, precision technology, and safety awareness are skills needed in Agriculture mechanization. When checking the individual agriculture related TR’s, most of these are already embedded most notably the safety awareness skills. Thus, TESDA must ensure the proper training is done to impart these important skills to the trainees availing them.

7. TESDA to strengthen collaboration with the Department of Agriculture and Other concerned government agencies and private stakeholders in the Agriculture Sector

A. TESDA to collaborate and strengthen linkages with the Department of Agriculture and other crop associations who participated in the study. This was highlighted in the validation meeting where the representative from the Agriculture Training Institute (ATI) noted that through the accreditation of ATI’s learning sites into Farm Schools, accessibility of farmers and laborers to TVET Programs may increase.

   In addition, TESDA should also strengthen existing MOAs with agricultural establishments, such as the Philippine Cacao Industry Council, to better deliver TESDA programs.

B. This strengthened collaboration can help in the dissemination of information on the available TVET and Scholarship Programs related to the agriculture sector.

Table 101.

Summary of TVET Capacity and Infrastructure based on the corresponding TVET Qualifications identified by the Agriculture Sector, as of December 2022

Qualifications	Enrolled	Graduated	Assessed	Certified	No. Assessment Centers	No. Competency Assessors	Registered Programs	Trainers
Training Regulations								
Agricultural Crops Production NC I	2,683	3,206	3,135	3,050	50	62	102	0
Agricultural Crops Production NC II	7,536	8,515	14,500	14,018	118	248	283	1,036
Agricultural Crops Production NC III	1,598	2,012	3,228	3,075	37	43	87	485
Agricultural Machinery Operations NC II	50	75	0	0	4	8	1	0
Agricultural Machinery Servicing (4-Wheel Tractor) NC III	0	0	0	0	0	0	0	0
Food Processing NC II	1,579	1,801	5,675	5,554	66	143	123	434
Grains Production NC II	96	148	454	453	9	29	17	82

Qualifications	Enrolled	Graduated	Assessed	Certified	No. Assessment Centers	No. Competency Assessors	Registered Programs	Trainers
Pest Management (Vegetables) NC II	1,189	1,197	635	630	20	24	34	118
Pressurized Irrigation System Installation and Maintenance NC II	0	0	0	0	0	0	0	0
Rice Machinery Operations NC II	4,870	4,621	4,189	4,047	42	71	74	197
Rubber Processing NC II	0	0	0	0	0	0	0	0
Rubber Production NC II	163	187	445	414	6	12	7	34
Sugarcane Production NC II	0	0	0	0	0	0	0	2
Competency Standards								
Coffee Nursery Operation Level II	0	0	0	0	0	0	1	0
Coffee Production Level II	475	380	0	0	0	0	8	0
Mango Production Level II	528	545	0	0	0	0	3	0

5.2. Recommendations on the Conduct of the Survey

1. Commitment and endorsement of relevant government agencies, such as the Department of Agriculture and the Department of Trade and Industry, as well as other agencies attached to the departments, were crucial to the success of the survey. The Department of Agriculture provided TESDA with a list of associations that were included in the universe; additionally, the Department of Agriculture and the Department of Trade and Industry each designated a focal person to be the focal person for a specific crop, such as cacao. It can be concluded that associations are more likely to respond to a survey when it is mentioned that their organizations have government endorsement. For future WSS Surveys, it is recommended that TESDA obtain the commitment and support of the primary government agency or agencies for each respective sector.

2. The SNA: WSS Survey for the Agriculture Sector was conducted over a twelve-week period, with the duration of the actual survey and weather constraints posing the greatest challenges for the enumerators. Additionally, the majority of respondents indicated that completing the survey required too much time, and some questions, such as those regarding gross monthly salary, were met with reluctance.

   Consequently, it is suggested that the questionnaire's contents be reviewed and evaluated to determine whether or not they can provide the required insights.

3. Another issue that arose from the implementation was that while some businesses said they are interested in participating, there are other factors that prevent them from accomplishing the survey such as scheduling issues, and connectivity issues. With this, it is recommended that a pool of replacements should be considered before the start of the survey proper.

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Annex A

Projected Distribution of Skills Supply, Hard-to-fill Skills, and Highest Educational Qualifications

Note: All Not Applicable (NA) entries/responses in C6.1 were not included in this table.

General Agricultural Value Chain	Skills/Jobs	Skills Supply			Hard-to-fill		Highest Educational Qualification		
		Shortage	No change	Surplus	Hard to fill	Not hard to fill	Basic Education Graduate (HS Grad Old Curriculum or SHS Graduate K-12 Curriculum)	Technical Vocational Education (TVET) Graduate	Higher Education Graduate (College Degree and above)
Input	Agricultural Engineer	22.22	77.78	*0.00*	33.33	66.67	0.00	22.22	77.78
	Agricultural extension Worker	38.46	61.54	*0.00*	38.46	61.54	33.33	33.33	33.33
	Agricultural Specialist	37.50	62.50	*0.00*	50.00	50.00	12.50	12.50	75.00
	Agriculture Clerk	20.00	80.00	*0.00*	40.00	60.00	20.00	60.00	20.00
	Administrative Clerk	14.29	85.71	*0.00*	14.29	85.71	42.86	14.29	42.86
	Agriculture Technician	31.25	68.75	*0.00*	25.00	75.00	0.00	18.75	81.25
	Agronomist	11.11	88.89	*0.00*	22.22	77.78	11.11	11.11	77.78
	Agronomy Technicians	20.00	80.00	*0.00*	20.00	80.00	0.00	20.00	80.00
	Purchasing Officer	20.00	80.00	*0.00*	0.00	100.00	40.00	20.00	40.00
	Chemical Sprayer (Pesticide, fungicide, etc.)	28.57	71.43	*0.00*	42.86	57.14	69.23	23.08	7.69
	Irrigation Technician	14.29	85.71	*0.00*	14.29	85.71	16.67	83.33	0.00
	Machinery and Equipment Mechanic	12.50	87.50	*0.00*	37.50	62.50	25.00	62.50	12.50

	Pest Management/ Control Technician	40.00	60.00	*0.00*	40.00	60.00	33.33	33.33	33.33
Production	Tractor Operator (and Other Agricultural Vehicles)	30.00	70.00	*0.00*	40.00	60.00	33.33	66.67	0.00
	Farm Manager and Overseer	25.00	75.00	*0.00*	37.50	62.50	23.53	5.88	70.59
	Farm Supervisor	22.22	77.78	*0.00*	11.11	88.89	0.00	10.00	90.00
	Crop Grower	14.29	85.71	*0.00*	14.29	85.71	42.86	14.29	42.86
	Machine and equipment Operators	33.33	66.67	*0.00*	22.22	77.78	37.50	62.50	0.00
	Farmer	25.00	70.00	*5.00*	20.00	80.00	57.89	21.05	21.05
	Field Clerk	25.00	75.00	*0.00*	0.00	100.00	50.00	0.00	50.00
	Labourer	25.00	70.00	*5.00*	20.00	80.00	68.42	10.53	21.05
	Nursery Manager	25.00	75.00	*0.00*	50.00	50.00	25.00	12.50	62.50
	Nursery Worker	18.18	63.64	*18.18*	18.18	81.82	72.73	18.18	9.09
	Plant Breeder	50.00	50.00	*0.00*	33.33	66.67	33.33	33.33	33.33
	Post-Harvest Workers	44.44	55.56	*0.00*	33.33	66.67	37.50	37.50	25.00
	Crop Grader	50.00	50.00	*0.00*	50.00	50.00	33.33	33.33	33.33
	Crop Sorter	20.00	80.00	*0.00*	40.00	60.00	60.00	20.00	20.00
	Production Operation Manager	28.57	71.43	*0.00*	28.57	71.43	14.29	0.00	85.71
	Production Supervisor	14.29	85.71	*0.00*	14.29	85.71	0.00	0.00	100.00
Processing	Tappers	50.00	50.00	*0.00*	50.00	50.00	50.00	50.00	0.00
	Processing Operation Manager	40.00	60.00	*0.00*	40.00	60.00	0.00	20.00	80.00
	Processing Operation Supervisor	0.00	100.00	*0.00*	0.00	100.00	0.00	0.00	100.00
	Processing Specialist	0.00	100.00	*0.00*	0.00	100.00	0.00	100.00	0.00
	Processing Staff/Worker	16.67	83.33	*0.00*	16.67	83.33	80.00	20.00	0.00
	Packagers	16.67	83.33	*0.00*	16.67	83.33	100.00	0.00	0.00

	Sorter	0.00	100.00	*0.00*	16.67	83.33	60.00	40.00	0.00
	Storage Clerk	0.00	100.00	*0.00*	0.00	100.00	0.00	50.00	50.00
	Storage/ Warehouse Manager	0.00	100.00	*0.00*	0.00	100.00	0.00	0.00	100.00
	Storage/ Warehouse Supervisor	0.00	100.00	*0.00*	0.00	100.00	0.00	0.00	100.00
	Storage Workers	0.00	100.00	*0.00*	0.00	100.00	75.00	0.00	25.00
Marketing	Marketing Manager	20.00	80.00	*0.00*	33.33	66.67	0.00	0.00	100.00
	Promoter	0.00	100.00	*0.00*	33.33	66.67	0.00	0.00	100.00
	National/Regional/Provincial Sales Managers	0.00	100.00	*0.00*	25.00	75.00	0.00	0.00	100.00
	Sales Worker	0.00	100.00	*0.00*	0.00	100.00	0.00	25.00	75.00
	Product Development Specialist	0.00	100.00	*0.00*	20.00	80.00	0.00	0.00	100.00

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