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LABOR MARKET INTELLIGENCE REPORT

Revitalizing the Philippines Coconut Industry:

Improving Productivity and Competitiveness through Skills Training

Executive Summary

The Philippines is a powerhouse in producing and trading coconut products among our ASEAN neighbors and the rest of the international markets. This is why the coconut remains an essential crop in the Philippine Agriculture Sector. The Philippine Coconut Authority (PCA), created in 1973 and tasked to develop the industry to its full competitive potential, symbolizes the Philippine government's total commitment to supporting the Industry.

Today, there are two main coconut product categories: Traditional and Non-traditional, where traditional coconut products make up a majority of export in the markets. In contrast, non-traditional coconut products (NTCPs) take up a small portion of global trade. Both being a source of employment opportunities for traditional products, specifically Coconut Oil (CNO) and Desiccated Coconut (DCN), they have extensive processing facilities such as mills and refineries, thus needing more technically component employees.

In recent years, the market trend has shifted to a more “health and organic” mindset, thus paving the way for the growth of non-traditional products. These non-traditional products, such as virgin coconut oil (VCO), coco coir, coco sugar, coconut water, and shells, present a chance to further develop into a top economic contributor.

With the development of the Philippine Coconut Industry Roadmap and the enactment of the Coconut Farmer and Industry Fund Act, there is a renewed sense of vitality in reform and a possibility of investment in the industry. Skills and workforce training must be a priority of the industry as it leans on the quality of its products to be competitive in the markets. It might pose a challenge, but several recommendations have been made to improve skills and competencies in the workforce.

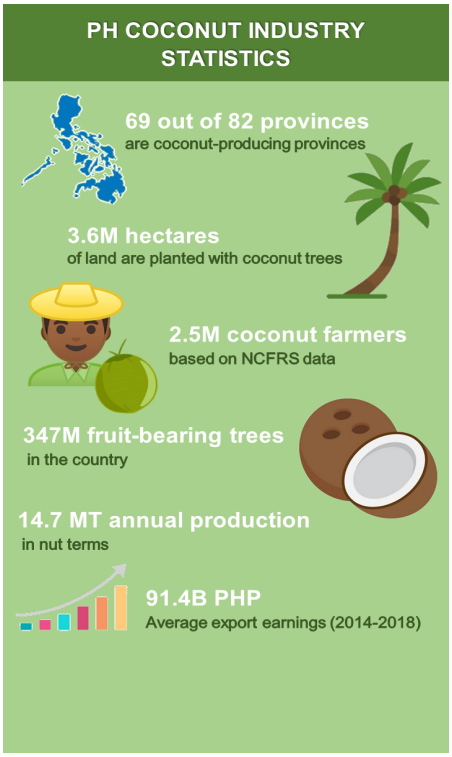
I. Background

A. The Philippine Coconut Industry

Many countries call the coconut tree the “Tree of Life.” Undoubtedly true in the Philippines, where the coconut is described as “ one the major pillars of the agriculture industry”(Tacio, 2019). As early as the 1840s, coconut products were traded in small quantities with Chinese/Malay traders; products such as coconut fibers and oils were likewise used by the Spaniards in rigging the galleon and as food for sailors in the Manila-Acapulco Galleon Trade (PCA, n.d.).

Currently, the Philippines is one of the largest producers of coconut, second to Indonesia. The coconut industry has boomed in trade, specifically in international markets, supplying various coconut products to countries in the west, such as the United States of America and Europe. The industry has also established a foothold in the Asian coconut market, specifically China, where the Philippines is the second largest coconut supplier, cornering 27% of the total market share (PCA, n.d).

Figure 1. Coconut Statistics 2018



Source: Philippine Coconut Authority Statistics

Based on the Philippine Coconut Authority Statistics 2018, there are 69 provinces producing coconut; 3.6 million hectares of land planted with coconut trees; 2.5 million farmers based on the National Coconut Farmers Registry System (NCFRS); 347 million

fruit-bearing trees in the country; and an average 91.4 billion pesos worth of average export earning from 2014 to 2018.

The Philippine Government has continued its research and development strategies and collaborations with various international organizations to prepare better and modernize the coconut industry. Major traditional coconut products include copra, copra meal, coconut oil, desiccated coconut, coconut shell charcoal, activated carbon, and oleochemicals; and non-traditional coconut products like coco chemicals, coconut food, and non-food products (PCG Vancouver, 2022). Among traditional coconut products, coconut oil has a competitive potential in the global markets, proven by the PSA preliminary data, which shows coconut oil recorded the highest annual increase of 95% out of the ten major commodity groups in export value. The data also reported that the country accounts for 60% of the USA coconut oil imports and 73% of USA crude oil imports. The Philippines' 2020 export of coco oil and desiccated coconut accounted for 52.48% and 35.91% of the global market share, respectively (DTI, 2021).

In recent years, global market trends have shifted their demands, impacting the domestic coconut industry. These shifts have transformed the primary export from coconut oil to a multi-product industry, with non-traditional coconut products gaining popularity. Virgin Coconut Oil is an example of a non-traditional coconut product showing potential, whose global demand is projected to reach USD 780 million in 2025.

Traditional coconut products include copra, copra meal, coconut oil, desiccated coconut, coconut shell charcoal, activated carbon, and oleochemical. In contrast, non-traditional coconut products include coco chemicals, coconut food, and non-food products (PCG Vancouver, 2022).

With the economy moving to a post-pandemic state where restrictions are being lifted in other countries and the markets moving to a more “health and wellness” mindset, the Philippine Coconut industry must be ready to meet the additional global demand.

B. The Philippine Coconut Authority

The Philippine Coconut Authority is the government agency tasked to develop the industry to its full potential in line with the new vision of a united, globally competitive, and efficient coconut industry. The agency became an independent public corporation in 1976, reporting directly to the Office of the President. In 1987, the PCA was officially declared as an attached Agency of the Department of Agriculture (DA) until 2014. Then along with other agencies, PCA was transferred back to the Office of the President. In 2018, the PCA was transferred back to the Department of Agriculture as an attached agency.

The PCA is mandated “to promote the rapid integrated development and growth of the coconut and other palm oil industry in all its aspects and to ensure that the coconut

farmers become direct participants in, and beneficiaries of, such development and growth" (PCA, n.d.).

As the sole governing body for the coconut industry, the agency has several functions, such as:

- Formulate and promoting a strategic and comprehensive development program for the coconut and other palm oil industry in all its aspects;
- Implementing and sustaining a nationwide coconut planting and replanting, fertilization and rehabilitation, and other farm productivity programs;
- Conduct research and extension work on farm productivity and process development for product quality and diversification;
- Establishment quality standards for coconut and palm products and by-products; and, develop and expand the domestic and foreign markets.
- Enhance the capabilities and ensure the socio-economic welfare of coconut and palm farmers and farm workers.

II. Relevant Laws, Policies, and Orders

1. Agriculture and Fisheries Modernization Act of 1997

Republic Act 8435, otherwise known as the "Agriculture and Fisheries Modernization Act of 1997", provides measures to sustain the development in the sectors of agriculture and fisheries. The stated objective of this Act is to transform these sectors from resource-based into technology-based industries and to enhance profits in these sectors, especially for small farmers and fishermen. Additional objectives include: measures in the field of production and marketing; identified strategic agricultural and fisheries development zones and establishment of model farms; the Department of Agriculture, in consultation with various Government institutions and NGOs, will develop a modernization plan; and development of national and minor irrigation systems and research and development in the field of irrigation (Republic Act 8435, 1997).

The said law, likewise, mandates TESDA to formulate Post-Secondary Education Programs for Agriculture and Fisheries under the NAFES, in coordination with the appropriate government agencies and private sectors. Further, the TESDA is also tasked to (1) formulate and develop a National and Integrated Continuing Agriculture and Fisheries Education Program and (2) develop a national scholarship program that provides opportunities for academic staff to pursue advanced degrees in agriculture and fisheries.

Other measures concern the granting of credit, structural development, consumer safety and standards for production, etc. Other titles deal with the development of human resources, research development and extension, rural non-farm development, and trade and fiscal incentives.

2. Coconut Farmers and Industry Fund Act

Republic Act 11524, also known as the “Coconut Farmers and Industry Fund Act,” the law declares that “ the policy of the State to consolidate the benefits due to coconut farmers, especially the poor and marginalized, under various statutes and to expedite the delivery thereof to attain increase incomes for coconut farmers, alleviate poverty, and achieve social equality.”

The law sets in motion reforms in the coconut industry and provides efficient utilization of the trust fund by the Coconut Farmers and Industry Development Plan for the benefit of 2.5 million coconut farmers and their families and the coconut industry in general. (treasury.gov, n.d)

Under RA No. 11524, TESDA and ATI will have an equal share of eight percent of the annual allocation from the trust fund for the training on coconut production and processing technologies, value addition of coconut products, diversification, and sustainable farming methods, including organic farming, financial literacy, and farm business schools programs for farmers and their families.

The Philippine Coconut Industry is also tasked with entering a memorandum of understanding (MOU) with TESDA to “ensure a coordinated implementation of the programs under the Development Plan, proper utilization of the allocations provided in this section, and submission of periodic accomplishment report of these implementing agencies to the PCA Board” (RA 11524, 2021).

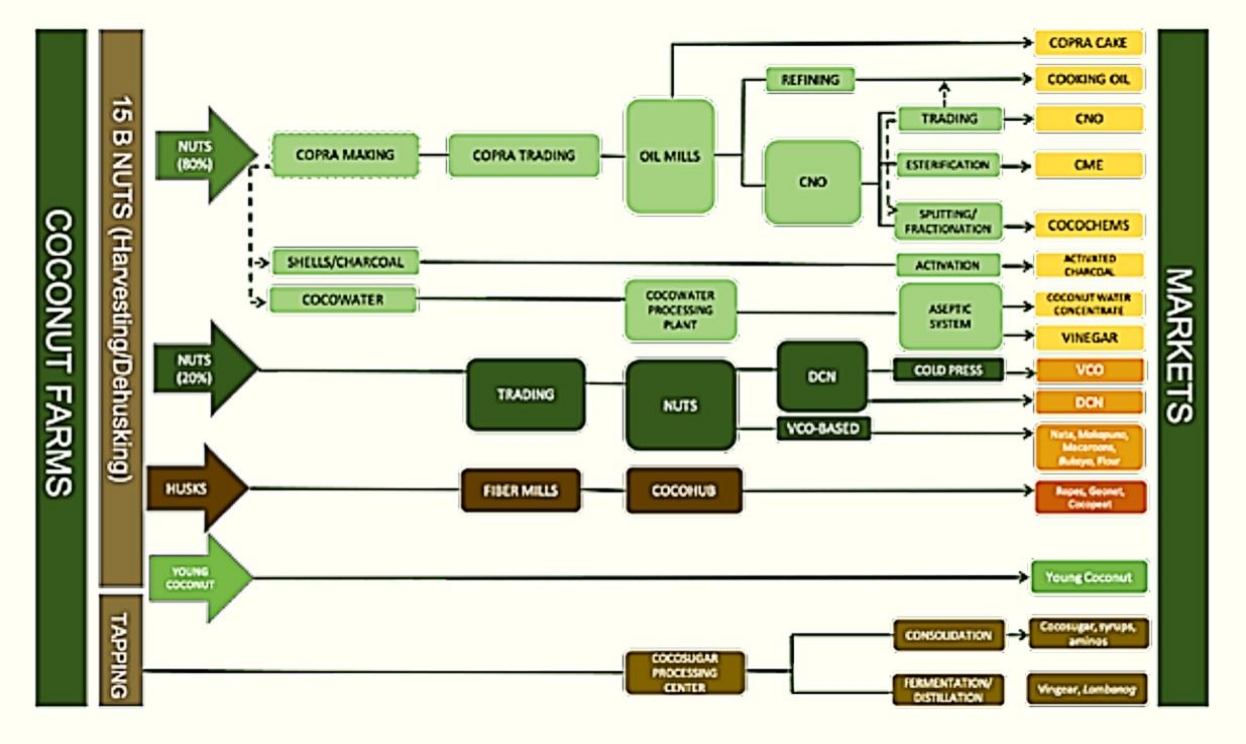
3. Executive Order No. 172

Otherwise known as “ Approving the coconut farmers and industry development plan,” this order approved the CFIDP aimed at boosting the competitiveness of the coconut farmers. The EO mandates the Philippine Coconut Authority (PCA) and other concerned government agencies to implement the CFIDP. It also enjoins local government units to help the PCA and other implementing agencies of the CFIDP (Executive Order 172, 2022).

III. Relevant Government Programs and Projects

The Philippine Coconut Authority “ has undertaken a thorough review and rationalization of existing programs and projects, in line with the corporate priorities the strategic direction being pursued by PCA, and as it adopts an institutional transformation with the end-view of effectively delivering the support needed to ensure the success of a market-driven coconut industry” (PCA, n.d.).

Figure 2. Unified Coconut Product Value Chain



Source: COCOFIRM

A “program-based” system in implementing interventions is a “ more effective and holistic approach in ensuring the alignment to the goals, the achievements of outcomes, and the achievement of targets” (PCA, n.d.). There are assigned “Program Directors” in each respective program/project and tasked to lead the management in strategic and operational planning, target setting, implementation management, close monitoring, and program evaluation.

A. PCA Programs

Productivity Management Program

This program aims to have sectoral/industry outcomes of increased Agri-fishery Production and well managed coconut production and provide a holistic approach to the delivery of interventions at the farm level. This program focuses on “contributing to the desired state of a well-managed production responsive to the industry for both coconut and oil palm”(PCA, n.d.)

Agricultural Research Program

The program aims to have a sectoral/industry outcome of increased Agri-fishery Production and well-managed Coconut Productivity and also provide a farm-driven and farmer-focused research output that addresses the challenges, as well as supports the interventions under the Productivity Enhancement Program.

Community Enterprise Development Program

The program aims to have a sectoral/industry outcome of poverty alleviation among coconut farmers and also provide a “holistic approach” in delivering interventions to provide access to additional income sources for the coconut farmers. This system can also provide a venue for the transition of coconut farmers from subsistence farming to agribusiness for primary processing.

Cocohub Enterprise Development Program

The program intends to have a sectoral/industry outcome of an increased gross-value added (GVA) expanded market and also provide a “holistic approach” in delivering interventions to provide coconut farmer organization (CFO’s) a more commercial enterprise undertaking, also this system provides a formal business set up structured to domestically utilize coconut for final processing for the market.

Product Development Program

The program intends to have a sectoral/industry outcome of an increased gross-value added (GVA) expanded market reach and also provide a “market-driven” processor and consumer-focused research that addresses challenges, as well as support interventions under Enterprise Development Programs.

B. PCA High Impact Projects

Accelerated Coconut Planting and Replanting Projects (ACPRP)

The project involves the planting and replanting of good quality coconut seedlings of either draft or tall Open-Pollinated Varieties (OPV) to replace senile coconut trees or those that were totally destroyed by typhoons or other natural calamities

Based on the C.Y. 2019 PCA Report, ACPRP allocation, 70% of the 68,824.12 hectares annual target was accomplished where 99.8% was under the incentive-based components. Around 48,245 ha. were planted, with 6,626,370 coconut seedlings benefiting 38,525 coconut farmers. Additional 4,504,904 seedlings were planted,

covering an area of 36,262 hectares, benefiting 36,401 coconut farmers under the ACPRP C.Y. 2018 and prior years.

Additionally, the PCA Governing Board has passed a policy to increase the monetary incentive for participation in planting activities to encourage widespread and strategic planting.

Coconut Fertilization Project

The Coconut Fertilizer Project (CFP) is described as “a quick turnaround measure of increasing coconut production to address the increasing demand for new and emerging coconut products such as coco water and virgin coconut oil (VCO) aside from the traditional products such as coconut oil and desiccated coconut (DCN), among others” (PCA, n.d)

Only 20% of 7,326,050 targeted trees were fertilized due to some procurement concerns and benefited 7, 691 farmer recipients based on the 2019 allocation report.

The report also added that “ the project's goal is the application of the Agricultural Grade Salt Fertilizer (AGSF)”; also, it was observed that since the implantation in 2008, the fertilization program was able to fertilize 69,433.1 ha. which is 4.62% of the total population of bearing trees. The PCA also plans to implement the use of other fertilizers to increase production in 2020.

Kaanib Coconut Hub Project

The Kaanib Coconut Hub Project (KCHP) is essentially a partnership and productive alliance between the PCA and partner organizations to “ increase the income of the participating coconut farmer and to generate more on-farm and off-farm jobs (PCA, n.d). These objectives are reflected in the components of the program that educates the farmer on other aspects of the industry; these components include; (1) Provision of Coconut Processing Facility and Equipment; Logistics Support, Provision of Appropriate Technology, and Management Capacity Enhancement which include Management Training and Advisory Services, Marketing and Financing, Technical Skills and Quality Standards are also offered to project beneficiaries (PCA, n.d).

There are five operational hubs in the Philippines, divided into; (1) two hubs focused on Coco Sugar Production, (2) two hubs focused on Coir Processing and/or CNO, and (3) one hub as a Training Center. These hubs generate employment in their local communities for 116 full-time employees and 141 seasonal workers and earn annual net sales “ ranging from PHP 280,365.00 - PHP 10,092,265.00” (PCA, n.d).

Kaanib Enterprise Development Project

The Kaanib Enterprise Development Project (KEDP) aims to “promote and institutionalize coconut-based enterprises to address food security, increase income and generate jobs in the small coconut farming communities” (PCA, n.d). The way this project achieves its target is by properly implementing its sub-component programs that are catered to different types of coconut farms; these are

- Coconut -Coffee Based Enterprise Development (COCOBED) and Coconut-Cacao Enterprise Development Project (CCDP) both involve the production of coffee and cacao with coconut crops.
- Coconut Intercropping Project (CIP) involves the planting and the production of high-value crops (HVC), i.e., bananas, corn, pineapple, and vegetables, and the raising of livestock to add income and nutrition.
- Community/Household-Level Coconut Processing Project (CHLCP), where farmers identify coconut-based enterprises to engage in Virgin Coconut Oil Product (VCO), Coir Processing, and Food Confectioneries, among others.

From 2010-2019, it has grown to have 1,055 KAANIB sites that benefit 77.461 farmers; the project has also completed planting various commercial crops covering 1,203.37 hectares of coconut farm. With regards to 76 food and non-food-based enterprises adopted by organizations that range from coco coir/ coco peat-based organic fertilizer production, they can be broken down into the following: (9) VCO; (28) Coco Sugar; (33) other coconut-based enterprises.

Seed Farm Development Project

The project, in collaboration with various Local Government Units (LGUs), State Universities and Colleges (SUCs), and the Coconut Farmers Organizations (CFOs) or Agrarian Reform Beneficiaries (ARBs) or private individuals through Memorandum of Agreement/Contract of Lease, aims to establish “small village” based facility that provides good quality seedlings and is available for future planting and replanting activities of the PCA.

Now a total of 14 seed farms have been identified, totaling an area of about 238.0 hectares. The PCA plans to have seed farms in all coconut-producing provinces, thus supporting “ the quality planting materials of the entire province raising its competitive edge” (PCA, n.d).

Smallholders Oil Palm Development Program

With the focus on the promotion of oil palm plantation development by assisting “ small growers with production inputs provision of seedlings and fertilizers” (PCA, n.d).

The implementation yielded 1,905 hectares of planted land with 243,850 hybrid oil palms seedling benefiting “1,267 farmers in Region IVB, IX, XII, XIII, and BARMM” (PCA, n.d)

IV. Current Industry Profile

The current coconut industry profile, can be broken down into three sectors: (1) the Farm Sector, which focuses on the growth, and maintenance of nuts as well as current conditions of coconut farmers; (2) the Processing Sector, which is where the harvested parts of the coconut tree are converted, through different techniques, into a product ready for selling; (3) Trading Sector, finally this where the processed product is traded.

Industry trends and global market changes also affect each sector in terms of supply and demand. Based on a study by the International Labour Organization in 2020, non-traditional coconut products (NTCP) accounted for about 30% of total exports but have the potential for significant growth in market expansion. The report further elaborated that traditional coconut products have been facing “tough competition” from other types of vegetables, particularly palm oil; additionally, copra and coconut prices sharply dropped.

Three NTCPs were highlighted by the report, Virgin Coconut Oil, Coco Sugar, and Coco peat/coir, because of their growth potential, generation of employment, and creation of decent jobs. The three NTCPs represent a large share of the total volume and value of the NTCP export accounting for a total of 61% in volume and 91 % in value in 2017 (ILO, 2020)

A. Farm Production Sector

In terms of volume produced; the Philippines ranks 2nd with 14.77 MMT (Million Metric Tonnes) and a global percent share of 23.6% of all coconut produced (Table 1). Together with Indonesia (1st) and India (3rd), they account for 74.6% of the world's coconut production, totaling 62.46 MMT in 2019.

Table 1. World Coconut Production and area by major producing country

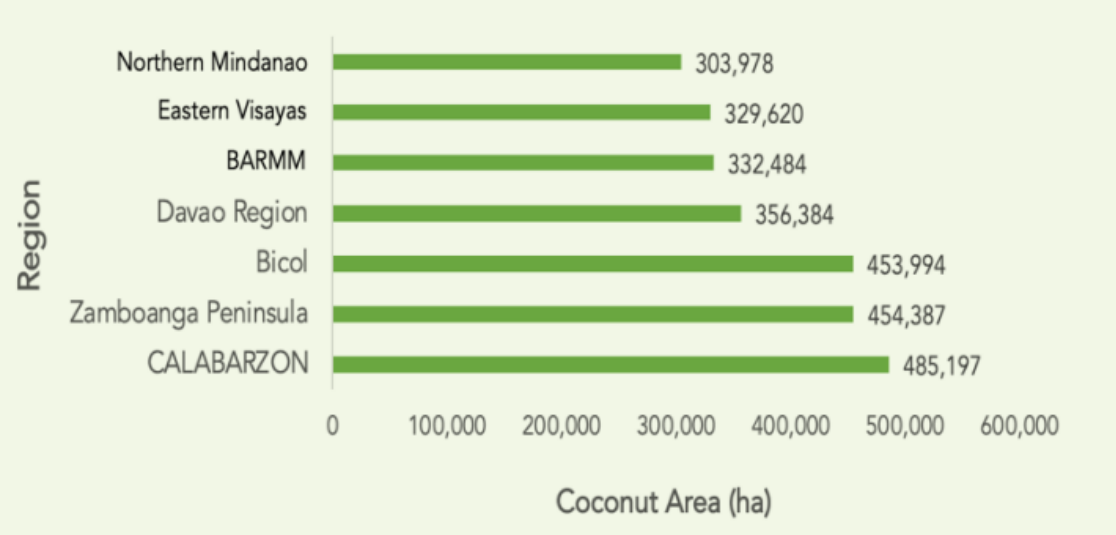
Coconut Production			Coconut Area	
Country	Volume MMT	% Share	M ha	% Share
Indonesia	17.13	27.4	3.50	29.7
Philippines	14.77	23.6	3.65	30.9
India	14.68	23.5	2.15	18.2
World	62.46		11.80	

Source: COCOFIRM

With 62 out of 89 provinces producing coconuts, the crop occupies about 27% arable land and a total of 347 Million bearing palm in 2019 (COCOFIRM, n.d.). Among these provinces, CALABARZON came out on top with regards to coconut hectarage (485,197 ha with 13.3% share).

In terms of individual nuts produced, the Davao region takes the top spot posting 1.93 MMT (13.08% share) in 2019. Northern Mindanao placed second, followed by Zamboanga Peninsula, CALABARZON, BARMM, Bicol Region, SOCCSKSARGEN, and Eastern Visayas.

Figure 3. The volume of Coconut Production in the Regions in the Philippines



Souce: COCOFIRM

The high yield in Mindanao's coconut production could be attributed to the region's "highly sustainable rainfall, younger tree population, and optimal tree spacing" (COCOFIRM,n.d.). If broken down into individual administrative regions, nine out of the 16 administrative regions posted yields above the national average. Mindanao's highest average coconut yield of 50 nuts per tree in 2019, but accounting for individual regions in

Mindanao, SOCCSKSARGEN registered 66 nuts per tree, higher than Mindanao, Luzon (34 nuts per tree), and Visayas (36 nuts per tree). This shows Mindanao's potential to be a high coconut volume production island.

The highest production achieved was 15.8 Billion coconuts in 2012. A subsequent decline followed this production rate until 2017; then, it slowly picked up, with 2018 having a growth rate of 5% or 14.7 Billion nuts produced (Figure 3). When calculated from 2009-2019 is 1.37% (Figure 4). Mindanao has consistently been the island that produces the most volume of coconut, about 60%, with the Davao region being the highest-producing region in Mindanao. Other regional production trends were: Zamboanga Peninsula maintained its steady production and remained 3rd in rank, while Northern Mindanao placed 2nd in 2019; BARMM placed 5th in 2019; CALABARZON improved to 4th in ranking while Eastern Visayas dropped to 8th in 2019.

Figure 4. Annual Nut Production and Growth Rate in the Philippines, 2009 - 2019

Source: COCOFIRM

Figure 5. Percent Contribution of Major in the Philippines, 2009 - 2019

Source: COCOFIRM

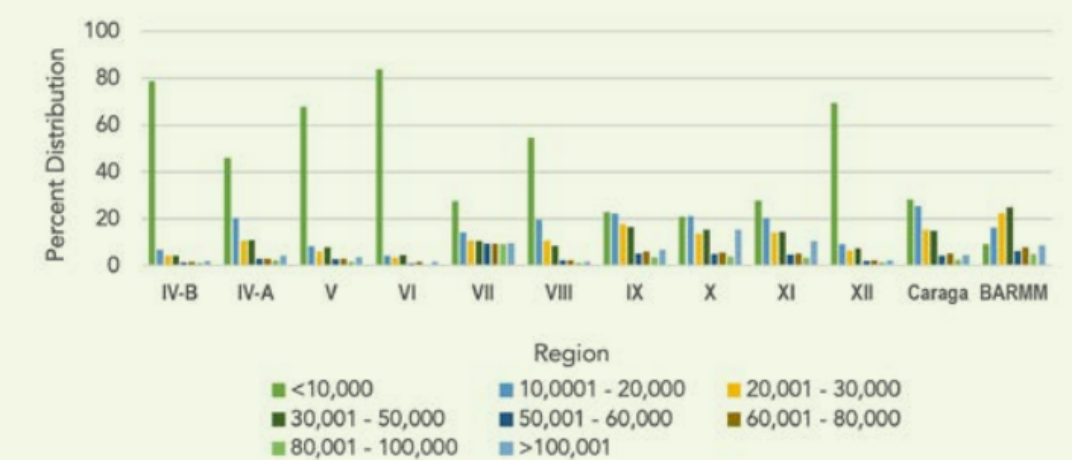
The Philippine Coconut Authority, through its program, the National Coconut Farmer's Registry System in 2018, posted that the coconut industry employs 2.54 Million farmers. These numbers can further be broken down as per the type of tenure: (1) Farm Workers comprise the majority with 36.5%; (2) Absentee Owners share 25.1%; (3) Owner-Operators with 24.2%; and (4) tenants with 14.1%. Concerning the farmer distribution among the three major islands, it is spread across the Philippines, with: (1) Mindanao having 1,158,984 farmers; (2) Visayas having 875,745.

Figure 6 shows that most of the 2.54 million coconut farmers earn less than Php 10,000 per year. Approximately 26% of the coconut farmers in the country have low annual incomes ranging from Php 10,001 to Php 30,000; only 5.6% of the coconut farmers earn more than Php 100,000 per year.

Figure 6. Percent Distribution of Coconut Farmers According to Income Range in the Philippines, 2018

Source: COCOFIRM

Figure 7. Percent Distribution of Coconut Farmers According to Income Range in the Philippines, 2018



Source: COCO FIRM

Figure 7 shows the comparison of income distribution among the three primary island groups shows Luzon has the highest proportion of 73% of coconut farmers who earn less than Php 10,000 per year, followed by Visayas with 51.3%, and Mindanao posting the least proportion with 31.4% ” (COCOFIRM, n.d.). These proportions may be attributed to the higher number of coconut farm workers and tenants in Luzon and Visayas than in Mindanao; conversely, Mindanao has a higher proportion of farm owners who can freely make decisions regarding the practice of intercropping, livestock integration, processing, and easily access credit support from formal institutions. It shows that Mindanao's high proportion of the coconut farmer population (7.5%) reported an annual income of Php 100,000 compared to Visayas with 4.3% and Luzon with 2.7%.

The roadmap stressed the importance of associations and cooperatives as they “ play a major role in ‘agribusiness sizing’ the coconut sector (COCOFIRM,n.d). Based on COCOFIRM data, as shown in Table 2 shows about 10,505 small coconut farmer’s organizations (SCFOs), 1,306 coconut farmer’s cooperatives, and 70 coconut farmer’s federations covering 11,405 municipalities.

Table 2. The number of Coconut Farmers’ Cooperative, SCFO and Federation of coconut farmers Organizations, 2019

Region	No. of Coconut Farmers Cooperatives	No. of Small Coconut Farmers Organizations	No. of Federations of Coconut Farmers Organizations
CAR	1	-	-
Region I (Ilocos Region)	48	120	-
Region II (Cagayan Valley)	23	97	-
Region III (Central Luzon)	7	132	-
Region IV-A (CALABARZON)	39	336	8
Region IV-B (MIMAROPA)	63	183	-
Region V (Bicol Region)	57	758	4
Region VI (Western Visayas)	66	1,000	5
Region VII (Central Visayas)	486	1,747	3
Region VIII (Eastern Visayas)	128	1,902	2
Region IX (Zamboanga Peninsula)	40	1,023	-
Region X (Northern Mindanao)	141	559	13
Region XI (Davao Region)	42	778	3
Region XII (SOCCSKSARGEN)	51	713	1
Region XIII (Caraga)	57	952	30
BARMM	57	206	-
PHILIPPINES	1,306	10,506	69

Source: COCOFIRM

Table 2 shows that Central Visayas has the highest number of cooperatives with 486, followed by Northern Mindanao with 141, while Eastern Visayas has the highest number of SCFO's with 1,902. PCA databases also indicate that landowners comprise a majority of members in the Associations; other members include tenants and farm workers.

B. Processing Sector

The roadmap specifies that 80% of the total coconut production of the Philippines from 2009-2019 passes through the copra stage. Village-level processing of other coconut products is undertaken by SCFOs or Cooperatives and coconut farming households, while small- to large-scale coconut processing operations are generally done by Coconut Oil Mills.

Regarding Coconut Oil Mills, the roadmap shows that there were 60 mills nationwide with an annual aggregate capacity of 3,420,554 metric tonnes, operating in 10 regions (Table 3).

Table 3. Number of Coconut Oil Mills by Region, 2018

Region	Number of Plants	Percent Share
Region IV-A (CALABARZON)	20	33.3
Region V (Bicol Region)	3	5.0
Region VI (Western Visayas)	1	1.7
Region VII (Central Visayas)	2	3.3
Region VIII (Eastern Visayas)	5	8.3
Region IX (Zamboanga Peninsula)	4	6.7
Region X (Northern Mindanao)	8	13.3
Region XI (Davao Region)	13	21.7
Region XII (SOCCKSSARGEN)	3	5.0
Region XIII (Caraga)	1	1.7
Total	60	100.0

Source: COCOFIRM

CALABARZON has the highest percentage share of mills with 33%, followed by the Davao Region having 22% share. CALABARZON and Davao Region also has the top crushing capacity (MT/Year) share of 17.7% and 20.6%, respectively; others can be seen in Table 4.

Table 4. Copra Crushing Capacities of Coconut Oil Mills by Region, 2018

Region	Crushing Capacity (MT/Year)	Percent Share
Region IV-A (CALABARZON)	606,250	17.7
Region V (Bicol Region)	222,000	6.5
Region VI (Western Visayas)	15,840	0.5
Region VII (Central Visayas)	81,000	2.4
Region VIII (Eastern Visayas)	333,600	9.8
Region IX (Zamboanga Peninsula)	504,300	14.7
Region X (Northern Mindanao)	476,364	13.9
Region XI (Davao Region)	705,600	20.6
Region XII (SOCCSKSARGEN)	444,000	13.0
Region XIII (Caraga)	31,600	0.9
Total	3,420,554	100.0

Source: COCOFIRM

There are 39 Oil Refineries operating in the Philippines. Coconut Oil Refineries essentially remove undesired components to improve coconut quality and make the product more marketable.

Table 5. Number of Coconut Oil Refineries by Region, 2018

Region	Number of Plants	Percent Share
Region IV-A (CALABARZON)	6	15.4
Region V (Bicol Region)	1	2.6
Region VII (Central Visayas)	3	7.7
Region VIII (Eastern Visayas)	1	2.6
Region IX (Zamboanga Peninsula)	2	5.1
Region X (Northern Mindanao)	9	23.0
Region XI (Davao Region)	9	23.0
Region XII (SOCCSKSARGEN)	1	2.6
Region XIII (Caraga)	1	2.6
Total	39	100.0

Source: COCOFIRM

These oil refineries are “spread” across ten regions, with CALABARZON, Northern Mindanao, and Davao Region having the top 3 shares with 15.4%, 23.0%, and 23.0%

respectively. Northern Mindanao has the highest refining capacity, with 463,500 MT/Year in the Philippines, Table 5.

Coco Shell Processing, which produces coconut shell charcoal products, has 15 plants in the Philippines. Davao Region has the most plants with 7 and 20% share. Eight of the 15 Coco Shell Processing Plants have integrated top active carbon processing; these eight are being added to the 14 coco shell-based activated carbon in the Philippines, Table 6.

Table 6. Number of Activated Carbon Plants by Region, 2020

Region	Number of Plants	Percent Share
Region IV-A (CALABARZON)	2	14.3
Region VII (Central Visayas)	1	7.1
Region VIII (Eastern Visayas)	1	7.1
Region IX (Zamboanga Peninsula)	1	7.1
Region X (Northern Mindanao)	3	21.4
Region XI (Davao Region)	6	42.9
Total	14	100.0

Source: COCOFIRM

Table 7. Number of Operating Coconut Water Processing Plants by Region, 2018

Region	Number of Plants	Percent Share
Region IV-A (CALABARZON)	6	42.9
Region VII (Central Visayas)	2	14.3
Region VIII (Eastern Visayas)	1	7.1
Region X (Northern Mindanao)	1	7.1
Region XI (Davao Region)	3	21.4
Region XII (SOCCSKSARGEN)	1	7.1
Total	14	100.0

Source: COCOFIRM

There are 14 coconut water processing plants primarily concentrated in the CALABARZON and DAVAO Region, Table 7. Among the 14 companies, there are seven sizeable desiccated coconut processing companies that produce coconut water, coconut water concentrate, and other coconut products for the export market.

For Desiccated Coconut Processing Companies, in 2019, the PCA database showed that there were 21 medium-scale processing plants operated by 19 companies

(COCOFIRM, n.d.). CALABARZON and Davao Region have the highest percentage share of desiccated coconut plants, with both having 28.6% (Table 8). Desiccated Coconut processing plants were established initially for desiccated coconut only (COCOFIRM, n.d.). In more recent times, companies found that integrating these plants into multi-product plants produces more profits since they utilize their coconut waste, such as coconut water, coconut cream, and coco shells, to produce value-added products and avoid wastage. Many firms that utilize integrated multi-product plants are among the large producers and exporters of coconut water, virgin coconut oil, and coco sugar.

Table 8. Number of Desiccated Coconut Plants by Region, 2019

Region	Number of Desiccated Coconut Plants	Percent Share
Region IV-A (CALABARZON)	6	28.6
Region V (Bicol Region)	2	9.5
Region VII (Central Visayas)	1	4.8
Region VIII (Eastern Visayas)	1	4.8
Region X (Northern Mindanao)	3	14.3
Region XI (Davao Region)	6	28.6
Region XII (SOCCSKSARGEN)	1	4.8
Region XIII (Caraga)	1	4.8
Total	21	100.0

Source: *COCOFIRM*

Based on the Coconut Industry Roadmap, all three identified NTCPs, VCO, coco sugar, and coco coir, as well as other non-traditional coconut products, are commonly produced to a limited extent by SFO's and Cooperatives.

Virgin Coconut Oil (VCO) processing plants operated in 9 regions in 2018, where 40.5% of operations are in Region IV-A. Furthermore, desiccated coconut processing plants have the flexibility to produce VCO and are the primary producers of VCO (COCOFIRM,n.d.). This is represented by 80% of the country's 2018 export volume of VCOs coming from desiccated coconut processing companies (Table 9).

Table 9. The number of VCO Processing Plants By Region, 2018

Region	Number of Plants	Percent Share
Region IV-A (CALABARZON)	17	40.5
Region V (Bicol Region)	2	4.8
Region VII (Central Visayas)	7	16.7
Region VIII (Eastern Visayas)	2	4.8
Region IX (Zamboanga Peninsula)	2	4.8
Region X (Northern Mindanao)	3	7.1
Region XI (Davao Region)	6	14.3
Region XIII (Caraga)	1	2.4
BARMM	2	4.8
Total	42	100.0

Sources: COCOFIRM

Table 10. Number of Decorticating/Coir Processing Plants by Region in the Philippines, 2018

Region	Number of Plants	Percent Share
Region IV-A (CALABARZON)	10	6.1
Region IV-B (MIMAROPA)	7	4.2
Region V (Bicol Region)	7	4.2
Region VI (Western Visayas)	4	2.4
Region VII (Central Visayas)	14	8.5
Region VIII (Eastern Visayas)	6	3.6
Region IX (Zamboanga Peninsula)	5	3.0
Region X (Northern Mindanao)	20	12.1
Region XI (Davao Region)	27	16.4
Region XII (SOCCSKSARGEN)	13	7.9
Region XIII (Caraga)	51	30.9
BARMM	1	0.6
Total	165	100.0

Source: COCOFIRM

As shown in Table 10, Mindanao has the largest share of Coco Coir processing companies that are primarily located in Mindanao specifically in CARAGA, Northern Mindanao, and Davao Region. Micro, small and medium enterprises (MSMEs) make up about the majority of the coco coir/peat processors. These enterprises are generally characterized by a relatively small scale and low technology skill; also, they produce basic coco coir with some commercializing coco peat as a by-product. Twine, geonets, and bio-logs have been other products of these MSMEs.

Table 11. Number of Operating Coconut Sugar Processing Plants by Region in the Philippines, 2018

Region	Number of Plants	Percent Share
Region IV-A (CALABARZON)	5	15.2
Region IV-B (MIMAROPA)	1	3.0
Region VII (Central Visayas)	2	6.1
Region X (Northern Mindanao)	6	18.2
Region XI (Davao Region)	1	3.0
Region XII (SOCCSKSARGEN)	13	39.4
Region XIII (Caraga)	4	12.1
BARMM	1	3.0
Total	33	100.0

Source: COCOFIRM

In 2018, there were 33 coconut sugar processing plants operating in eight regions. Mindanao has the most number of companies, about 75.7% (Table 11), concentrated. Generally, most MSMEs still follow traditional methods of coco sugar processing, and few processors have converted them into mechanized processing.

Trading Sector

The Philippine Coconut Industry is complex; raw coconut materials pass through several marketing channels before reaching the processing plants. An example of this is " copra passes through at least two to three market intermediaries (i.e., barangay/village trader - municipal/secondary trader - lead/big trade-trucker) before reaching the oil mill (COCOFIRM, n.d.).

These coconut processors often have a network of traders and trade assemblers to produce their raw materials; these local traders have contact with local traders with an established relationship (COCOFIRM,n.d.). The trader-assemblers meanwhile consolidate the supply of raw materials from local traders. In Table 12, there are 2,285 Philippine Coconut Authority - registered domestic traders engaged in buying and selling copra only and 94 domestic traders of copra and other coconut products. Other traders consist of: 706 whole nuts/mature nut traders; 178 fresh young nut traders; 55 coconut shell traders; and four coco husk and coir traders. It also includes 15 traders and exporters of fresh young nuts.

Table 12. Number of PCA registered domestic coconut traders, processors, and exporters, 2019

Types of Traders	Number
Domestic copra traders	2,285
Domestic traders of copra and multi-coconut products	94
Domestic traders of coconut shells	55
Domestic traders of whole nuts/mature nuts	706
Domestic traders of coconut fiber, husk, coir, and peat	4
Domestic traders of fresh young nuts	178
Domestic traders & exporters of fresh young nuts	15

Source: PCA

The Philippine Coconut Authority also reports that there are 365 processors of food and non-food coconut products locally and/ or export their products directly to international markets, with some small processors who directly export their coconut products through brokers (COCOFIRM, n.d.).

Coconut product exports put out an average aggregate value of about US$ 1.83 billion per year from 2015-2019, noting that exports are a combination of traditional and non-traditional coconut products. The road map also highlighted non-traditional coconut products like virgin coconut oil, coco peat/baled coir, coco sugar, and others.

The largest contribution to the country's export earnings from coconut products came from traditional coconut products, with an average of US$ 1.53 billion (2.4%) per year during the period 2015-2019. Revenues from exports of traditional coconut products improved from 2015 to 2019 by an average of 5.1%. Among the non-traditional products, virgin coconut oil (VCO) had higher export prices, while coco sugar showed a decline at -10.5 %/year. This could be attributed to repacking mixed imported coco sugar with organically produced coco sugar and then exporting it at a lower price to other countries. Coco coir products, specifically coco baled coir rose to an average growth rate of 7.3% in 2019.

V. Philippine Coconut Industry Road Map 2021-2040

According to the Philippine Information Agency, the former Sec. Dar instructed the DA officials to update the existing commodity industry roadmap (CIR), which included one of the eight paradigms under the DA's " new thinking in agriculture."

The development and creation of industry road maps provide a window into the current situation of the industry and lays out detailed plans for modernization, industrialization, and global competitiveness. Thus, serving as a basis for policies and implementing programs that help the development and growth of the industry.

The Philippine Coconut Authority initiated the secretary's instruction by seeking the expertise of a team from the University of Los-Baños (UPLB) to help craft an industry roadmap. The PCA Administration Madrigal said about the process, "it was a product of painstaking consultations with various coconut farmers' organizations, industry players, civil society, academe, concerned government agencies, local government units, and other stakeholders nationwide" (Philippine Information Agency, 2021).

PCA administrator Madrigal said that the roadmap has seven thematic areas, namely:

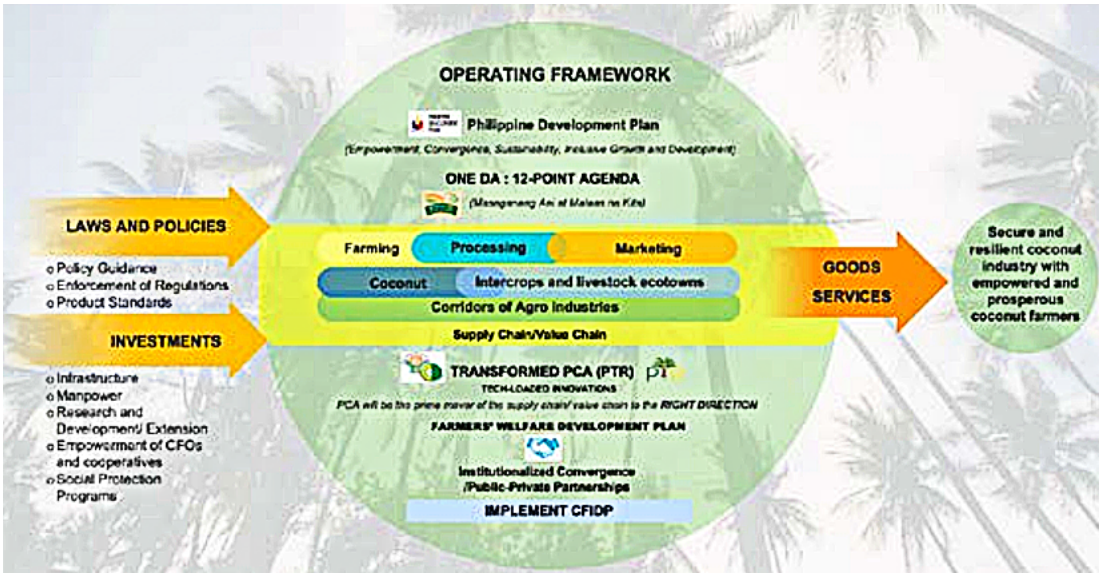
The Philippine Coconut Roadmap consists of seven thematic areas, namely:

- Promotion of coconut farmers' welfare and social protection;
- Strengthening and empowerment of coconut farmers' organizations and associations;
- Increasing and sustaining coconut production programs;
- Establishment of coconut farming systems such as agri-hub for coco products;
- Enhancing global competitiveness of traditional and non-traditional coco products;
- Expanding trade and marketing, and conduct of innovative research and development, and
- Strengthening of institutional policies.

Further, Secretary Dar commended the PCA for its efforts to update the National Coconut Farmers Registry System (NCFRS), which forms part of the "mother" Registry System for Basic Sectors in Agriculture (RSBSA) (Philippine Information Agency, 2021).

The actual roadmap, **Philippine Coconut Industry Roadmap 2021-2040,** otherwise known as the **Coconut Farmers and Industry Roadmap** or **(COCOFIRM)**, states it aims to provide direction and recommendations towards the sustainable development of the coconut industry**.** It stresses focus on: (1) Inclusive growth; and (2) improving competitiveness and expanding the market potential.

Figure 8. Operational Framework of COCOFIRM



Source: COCOFIRM

The roadmap cites seven value chain clusters and product streams, notably highlighting both traditional and non-traditional coconut products, which are: (1) Coconut Oil (CNO); (2) Desiccated Coconut; (3) Coconut Charcoal; (4) Coco Water; (5) *Virgin Coconut Oil*; (6) *Coco Sugar;* and, (7) *Coco Coir*, these were used as bases for recommending improvements for a more efficient supply and value chain. The document adopted the DA's 12 paradigms towards a ONE DA: Holistic approach to agriculture & Fisheries Transforming focusing on "Masaganang Ani at Mataas na Kita" for the small-scale coconut farmers. Existing practices of small - and medium-sized enterprises (MSMEs) and large-scale processing companies were benchmarked with best practices and new technologies (COCOFIRM, n.d.). Value chain analysis across the seven clusters is implemented with additional analysis of each value chain player as well.

It also stressed the importance of a transformed PCA (PTR) in the overall development and operation of the coconut industry; COCOFIRM also added that the approval of the RA 11524 creating the Coconut Farmers and Industry Trust Fund that will jump-start and sustain the transformation of the coconut industry and provide other various help to farmers.

VI. Issues and Challenges

A. Production Sector

Based on the unified value chains of the various coconut products (Figure 2), the production sector supplies all parts needed by each product. Unfortunately, the primary challenge is that there has been a decline in coconut productivity; this is clearly shown in the 2019 data as reported by the COCOFIRM, which states that while some 15B nuts are harvested annually from 345 M bearing palms, coconut productivity in 2019 was only at 44 nuts per tree", which only represents half of the potential yield native tall variety and a third of potential yield of local hybrids. In terms of productivity, the Philippines remains the lowest among the top ten producers in the world, having 4.0 MT/ha nuts versus the world's best at 12.5 MT/ha. This low productivity may be due to the coconut population being made up of 98% native tall variety having an average of 10% senility, and about 50% of coconut areas are nutrient deficient; also poor farm management may also be considered.

Climate Change plays a significant role in affecting the industry's production sector as more storms pass the Philippines, compounded by prolonged El Niño and La Niña seasons. In 2021, the country was ranked 4th in the long-term climate risk index. From experiencing strong and super typhoons, severe droughts, and the spread of exotic cocolisap pests that has devastated the regions, reducing bearing trees and decreasing tree productivity for several years. The road map advises on the "recalibration of targets and prioritization for rehabilitation, planting and replanting of coconuts, particularly of hybrids and the choice of intercrops and other enterprises should consider this recurring extreme weather risks"(COCOFIRM, n.d.). Another way is adopting and integrating resilient coconut-based farming systems in agribusiness and continuing innovating science and research-based recommendation to national back-up programs.

B. Processing Sector

The road map has assessed that 80% of coconuts produced in the country are processed into copra - the feedstock for coco oil mills. With oil mills having highly efficient processing technology, low-quality copra supply negatively impacts the overall process of the mills, thus reducing the overall mill processing. An example of this is the by-product of crude coconut oil, polycyclic aromatic hydrocarbons, and aflatoxin, which makes crude oil unmarketable in export markets. The road map estimates that the Philippines stands to lose the export markets if the country cannot comply with stricter standards on aflatoxin and PAH allowable limits in coconut oil and copra cake. In this regard, the COCOFIRM proposes the establishment of " agroindustrial corridors for a white copra central (WCC) owned and operated by coconut farmers that will market directly to coco oils" (COCOFIRM, n.d.).

Another finding also includes the importance of farm workers, specifically *tappers, nut harvesters, dehusker, splitters, and various machine and equipment operators*; additionally, the significance of service crews was also highlighted as an important support system to modernize the coconut industry. The roadmap urges "professionalizing this sector" through certificate training and continuing education.

VII. Coconut Product Value Chain Maps

The Unified Value chain consists of different parts and functions performed for their respective coconut products (traditional and non-traditional). Based on the Philippine Coconut Industry Map, each value chain map is "made of the three inter-linked components: (1) the different players (i.e., input suppliers, inbound and outbound logistics service providers, coconut farmers, traders, and processors); (2) the business enabling environment (e.g., laws, regulations, and policies); and (3) support services.

Focusing on the Industry player can provide the task per step in the value chain, then it can be deduced what "generally" the traditional and non-traditional coconut products have in common and also their differences. Take note that the End Market Phase was excluded from the tables.

Coconut Oil

Table 13. Coconut Oil (CNO) Value Chain Map

Functions	Operators / Players	Task
Inputs	● Input Store Owner ● Philippine Coconut Authority ● Seedling/Nursery Operator	● Supplies ○ Seedlings ○ Fertilizers ○ Pesticide
Inbound and Outbound Logistics/ Distribution	● Logistics Service Providers ○ Trucking Companies ○ Warehouse Service Providers ○ Roro/Ship Operators ○ Other Logistics Services Providers ● Distributors ○ Local Distributor ○ Exporter ○ Domestic and International Shipping ○ Broker Exporter	● Buying Of Inputs/ raw materials, storage, and distribution ● Selling of coconut oil products ● Transporting ● Repacking ● Distribution

	○ Forwarding Companies	
Production	● Coconut Farmers ○ Farm Owner ○ Tenants ○ Farm Laborer	● Land Preparation ● Planting ● Fertilizer Application ● Weeding ● Pesticide Application ● Harvesting ● Husking ● Copra Making
Trading/ Marketing	● Trader ○ Consolidators ○ Barangay Traders ○ Municipal/City Traders ○ Provincial Traders ○ Buying Station	● Selling Copra ● Collection ● Drying ● Storage ● Procurement ● Transporting
CNO Processing	● Oil Miller	● Crushing ● Expelling ● Extracting
RDB Oil Processing	● Oil Refineries ○ RDB Coconut Oil ○ Manufactured Oil	● Refining ● Bleaching ● Deodorizing ● Packing

Desiccated Coconut

Table 14. Coconut Oil (CNO) Value Chain Map

Functions	Operators / Players	Task
Inputs	● Input Store Owner ● Philippine Coconut Authority ● Seedling/Nursery Operator	● Supplies ○ Seedlings ○ Fertilizers ○ Pesticide
Inbound and Outbound Logistics/ Distribution	● Logistics Service Providers ○ Trucking Companies ○ Warehouse Service Providers ○ Roro/Ship Operators ○ Other Logistics Services Providers ● Distributors ○ Local Distributor ○ Exporter ○ Domestic and International Shipping	● Buying Of Inputs/ raw materials, storage, and distribution ● Selling of DCN ● Transporting ● Repacking ● Distribution

	○ Broker Exporter ○ Forwarding Companies	
Production	● Coconut Farmers ○ Farm Owner ○ Tenants ○ Farm Laborer	● Land Preparation ● Planting ● Fertilizer Application ● Weeding ● Pesticide Application ● Harvesting ● Husking
Trading/ Marketing	● Trader ○ Consolidators ○ Barangay Traders ○ Municipal/City Traders ○ Provincial Traders ○ Buying Station	● Selling Husked Nuts ● Transporting
Coconut Processing	● DCN Processors ○ Integrated Coconut Processor Exporters	● DCN Processing ○ Marketing ○ Promotion ○ Standardizing ○ Packaging and Labeling

Coconut Charcoal/Activated Charcoal

Table 15. Coconut Charcoal/ Activated Charcoal Value Chain Map

Functions	Operators / Players	Task
Inputs	● Input Store Owner ● Philippine Coconut Authority ● Seedling/Nursery Operator	● Supplies ○ Seedlings ○ Fertilizers ○ Pesticide
Inbound and Outbound Logistics/ Distribution	● Logistics Service Providers ○ Trucking Companies ○ Warehouse Service Providers ○ Roro/Ship Operators ○ Other Logistics Services Providers ● Distributors ○ Local Distributor	● Buying Of Inputs/ raw materials, storage, and distribution ● Selling of Activated Carbon products ● Transporting ● Repacking ● Distribution

	○ Exporter ○ Domestic and International Shipping ○ Broker Exporter ○ Forwarding Companies	
Production	● Coconut Farmers ○ Farm Owner ○ Tenants ○ Farm Laborer	● Land Preparation ● Planting ● Fertilizer Application ● Weeding ● Pesticide Application ● Harvesting ● Husking ● Shelling ● Charcoal Making
Trading/ Marketing	● Trader ○ Consolidators ○ Barangay Traders ○ Municipal/City Traders ○ Provincial Traders ○ Buying Station	● Selling Coconut Shells/ Charcoal ● Transporting
Coconut Processing	● Activated Carbon Processing	● Activated Carbon Processing ○ Coconut Shell Processing ○ Marketing ○ Promotion ○ Standardization ○ Packaging and Labeling

Virgin Coconut Oil

Table 16. Virgin Coconut Oil (VCO) Value Chain Map

Functions	Operators / Players	Task
Inputs	● Input Store Owner ● Philippine Coconut Authority ● Seedling/Nursery Operator	● Supplies ○ Seedlings ○ Fertilizers ○ Pesticide
Inbound and Outbound Logistics/ Distribution	● Logistics Service Providers ○ Trucking Companies ○ Warehouse Service Providers	● Buying Of Inputs/ raw materials, storage, and distribution ● Selling of VCO

	○ Roro/Ship Operators ○ Other Logistics Services Providers ● Distributors ○ Local Distributor ○ Exporter ○ Domestic and International Shipping ○ Broker Exporter ○ Forwarding Companies	● Transporting ● Repacking ● Distribution
Production	● Coconut Farmers ○ Farm Owner ○ Tenants ○ Farm Laborer	● Land Preparation ● Planting ● Fertilizer Application ● Weeding ● Pesticide Application ● Harvesting ● Husking
Trading/ Marketing	● Trader ○ Consolidators ○ Barangay Traders ○ Municipal/City Traders ○ Provincial Traders ○ Buying Station	● Selling husked nuts ● Transporting
Coconut Processing	● VCO Processors ○ Integrated Coconut Processor Exporters ○ Cooperatives/Associate Processors ○ MSME Processors	● VCO Processing ○ Marketing ○ Promotion ○ Standardizing ○ Packaging and Labeling

Coconut Water

Table 17. Coconut Water Value Chain Map

Functions	Operators / Players	Task
Inputs	● Input Store Owner ● Philippine Coconut Authority ● Seedling/Nursery Operator	● Supplies ○ Seedlings ○ Fertilizers ○ Pesticide
Inbound and Outbound Logistics/ Distribution	● Logistics Service Providers ○ Trucking Companies ○ Warehouse Service Providers	● Buying Of Inputs/ raw materials, storage, and distribution ● Selling of Coconut Water

	○ Roro/Ship Operators ○ Other Logistics Services Providers ● Distributors ○ Local Distributor ○ Exporter ○ Domestic and International Shipping ○ Broker Exporter ○ Forwarding Companies	● Transporting ● Repacking ● Distribution
Production	● Coconut Farmers ○ Farm Owner ○ Tenants ○ Farm Laborer	● Land Preparation ● Planting ● Fertilizer Application ● Weeding ● Pesticide Application ● Harvesting ● Husking
Trading/ Marketing	● Trader ○ Consolidators ○ Barangay Traders ○ Municipal/City Traders ○ Provincial Traders ○ Buying Station	● Selling of fresh young nuts and coconut husked nuts ● Transporting
Coconut Processing	● Coconut Water Processors ○ Pasteurized Coconut Water ○ DCN Processing Company	● Coconut Water Processors ○ Marketing ○ Promotion ○ Standardizing ○ Packaging and Labeling

Coconut Coir

Table 18. Coconut Coir Value Chain Map

Functions	Operators / Players	Task
Inputs	● Input Store Owner ● Philippine Coconut Authority ● Seedling/Nursery Operator	● Supplies ○ Seedlings ○ Fertilizers ○ Pesticide
Inbound and Outbound Logistics/ Distribution	● Logistics Service Providers ○ Trucking Companies ○ Warehouse Service Providers	● Buying Of Inputs/ raw materials, storage, and distribution ● Selling of coconut coir

	○ Roro/Ship Operators ○ Other Logistics Services Providers ● Distributors ○ Local Distributor ○ Exporter ○ Domestic and International Shipping ○ Broker Exporter ○ Forwarding Companies	products ● Transporting ● Repacking ● Distribution
Production	● Coconut Farmers ○ Farm Owner ○ Tenants ○ Farm Laborer	● Land Preparation ● Planting ● Fertilizer Application ● Weeding ● Pesticide Application ● Harvesting ● Husking ● Copra Making
Trading/ Marketing	● Trader ○ Consolidators ○ Barangay Traders ○ Municipal/City Traders ○ Provincial Traders ○ Buying Station	● Selling of coconut coir products ● Transporting
Basic Processing	● Decorticators/ Bailed and Raw Coir Processor	
Secondary Processing	● Coconut Coir Processors ○ Twines ○ Geonet/Fascines ○ Coco peat / Growbags ○ Coir based mats	

Coco Sap Sugar

Table 19. Coco Sap Sugar Value Chain Map

Functions	Operators / Players	Task
Inputs	● Input Store Owner ● Philippine Coconut Authority ● Seedling/Nursery Operator	● Supplies ○ Seedlings ○ Fertilizers ○ Pesticide
Inbound and Outbound	● Logistics Service Providers ○ Trucking Companies	● Buying Of Inputs/ raw materials, storage, and

Logistics/ Distribution	○ Warehouse Service Providers ○ Roro/Ship Operators ○ Other Logistics Services Providers ● Distributors ○ Local Distributor ○ Exporter ○ Domestic and International Shipping ○ Broker Exporter ○ Forwarding Companies	distribution ● Selling of Coconut Sugar ● Transporting ● Repacking ● Distribution
Production	● Coconut Farmers ○ Farm Owner ○ Tenants ○ Farm Laborer	● Land Preparation ● Planting ● Fertilizer Application ● Weeding ● Pesticide Application ● Harvesting ● Tapping ● Sap Collection
Trading/ Marketing		
Coconut Processing	● Cooperative/ Association-based processors ○ LGU-led Processors ○ Integrated Coconut Processing Companies ○ Village-level Processors	● Coconut Sugar Processing ○ Boiling ○ Granulation ○ Drying ○ Packaging ○ Marketing ○ Promotion ○ Standardizing ○ Labeling

From the seven value chain maps provided we can see the similarities in the Input; Inbound and Outbound Logistics/ Distribution; Production; and Trading/Marketing. There are some differences in each of the mentioned functions, notably in their respective ways of processing the raw materials (Table 20).

Table 20. Similarities in Tasks not including Processing Function

Function	**Coconut Products**		
	Virgin Coconut Oil	**Coconut Coir**	**Coco Sap Sugar**

Input	Supplies of Seedlings Fertilizers Pesticide
Inbound Logistics	Buying Of Inputs/ raw materials, storage, and distribution
Production	Land Preparation Planting Fertilizer Application Weeding Pesticide Application Harvesting
Trading/ Marketing	Transporting
Outbound Logistics/ Distribution	

Table 21. The difference in Task not including Processing Function

Function	**Coconut Products**						
	Coconut Oil	**Desiccated Coconut**	**Coconut Charcoal**	**Virgin Coconut Oil**	**Coconut Water**	**Coconut Coir**	**Coco Sap Sugar**
Input							
Inbound Logistics							
Production	Husking						Tapping & Sap Collecting
	Copra Making		Shelling &			Copra Making	

			Charcoal Making				
Trading/ Marketing	Selling Copra Collection Drying Storage Procurement Transporting	Selling of Husked Nuts	Selling Coconut Shells/ Charcoal	Selling Husked Nuts	Selling of fresh young husked nuts	Selling of Husked Nuts	
Outbound Logistics/ Distribution	Selling of coconut oil Repacking Distributing	Selling of DCN	Selling of Coconut Shell/ Charcoal	Selling of VCO	Selling of Coconut Water	Selling of coconut coir Repacking Distributing	

Table 21 shows that husking is done by all coconut products except coco sap sugar; another common task that two out of the seven performs is copra making. On trading/marketing, only selling of husked nuts is done by 3 out of the seven products, while in the processing phase of each product, they have different players and tasks.

VIII. Employment and Skills Needs

With the Philippine Coconut Industry being the top exporter subsector of the agriculture sector, with millions of farmers and millions of hectares of farmland, the International Labour Organization (ILO), through consultation with the Philippine Coconut Administration (PCA), was chosen for the organization's project.

The ILO identified 3 NTCPs, Virgin Coconut Oil (VCO), Coconut Sugar, and Coco Coir, as the focus, adding that "according to the 2018 Coconut Industry Value Chain study of the Bureau of Agricultural Research (BAR) among the 3 NTCPs generation of full-time employment (FTE) is highest in coco sugar value chain, followed by VCO and coco coir/peat" (ILO, 2020). For traditional coconut products, it can be inferred, based on Table 21, that are opportunities in the production and post-harvest (pre-processing) activities as well as technical jobs in the processing facilities.

The ILO project on Strengthening the Impact of Trade on Employment (STRENGTHEN) provides support for the Philippines to improve the export value chain's competitiveness through Trade and Value Chain in Employment Rich Activities (TRAVERA). Essentially, it assists in developing a business model aimed at MSME's export-oriented enterprises, which will result in higher employment and increasing levels of productivity and income for workers (ILO, 2020).

A. Employment in the Virgin Coconut Oil (VCO) Chain

The project found that in the VCO value chain process, farm production of coconut and the process of cocomeat into VCO. Full-time employment increases if there is an intermediate VCO processing at the village level. Intermediate processing workers perform activities such as sorting, breaking nuts, grating, pressing, harvesting fermented VCO, filtering, packaging, and packing.

Coconut production, harvesting, and post-harvest activities generate about the same full-time employment level as processing. Major cultural activities that need more workers are fertilizing, spraying, weeding, harvesting, collecting/piling, and dehusking (ILO, 2020).

Based on the TRAVERA project report, in 2018, there were about 998 workers employed in VCO processing with employment statuses summarized below:

- More than half were male workers and 42% were female workers
- 55% were regular employees; 17% were probationary workers; 11% seasonal workers; and 9% were contractual.

Standardization of the finished products, quality control, compliance with food safety, GMP Protocols and sustainability rules and regulations, and product development were seen as important skills in processing. Workers with these skills are needed to " ensure the consistency of product quality, conformance to food safety rules and regulations, and traceability " (ILO, 2020).

It is important to note that the dominant value chain of virgin coconut oil (VCO) is the DCN-VCO value chain; Desiccated Coconut (DCN) processors represent about 80% of the export of VCO (ILO, 2020).

Figure 8. DCN route of VCO Processing

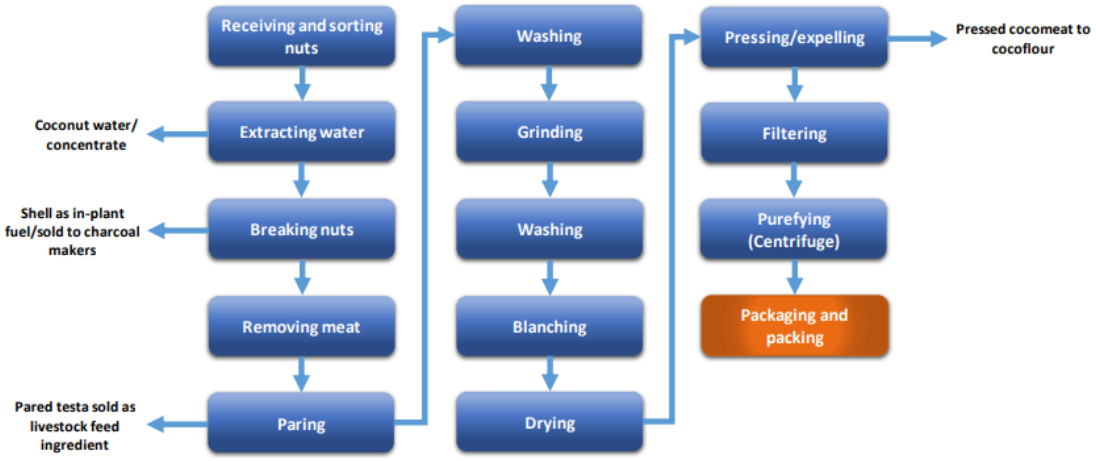


Figure 8 shows the processing phase of VCO produced from the desiccated coconut (DCN) using a cold, dry process (cold press expeller) (ILO, 2020). The figure also shows that process produces Coconut water, Shells that can be used for charcoal making/activated charcoal, and coco flour.

B. Employment in the Coco Sugar (Sap) Chain

According to the ILO TREVERA project, most full-time employees are in the processing and production phase, specifically tapping. As seen in VCO, intermediate processing produces more full-time employees (ILO, 2020). Based on the TRAVERA project document, in 2018, there were about 414 workers employed in coco sugar chain processing with employment statuses summarized below:

- More than half are male workers and 47% are female workers
- 57% are regular employees, 19% are casual workers, seasonal workers are 13%, probationary and contractual workers are both at 1%.

Sap harvesting and drying, at the farm level, are simple manual skills that can easily be required by workers. For mechanically operated dryers, skills needed from the workers are on operating and troubleshooting the equipment; additional skills in maintaining and operating the equipment, and implementation of protocols that comply with the process and product certifications. Other skilled workers coco sugar companies hire include sales agents, engineers, and operation managers (ILO, 2020).

C. Employment in the Coco Coir Chain

Dehusking and processing level coir processing are highlighted as areas of generating employment. Making twine, weaving geonets, making geologs, making tufted mats and other rubberized coco coir products, and producing coco peat-based fertilizers and compressed coco peats are tasks that generated additional employment, as stated in the TRAVERA project report.

The report also stated that in 2018, there were about 498 workers employed in the coco coir and peat processing with the following statuses:

- More than half are male workers and only 18% are female workers
- 36% are regular employees, 30% are contractual employees, 21% are probationary workers, 10% casual workers and 3% seasonal workers
- A high number of male workers compared to women is due to the heavy workload in the coco coir/ peat industry.

Compared to VCO and coco sugar, the level of skills in the coco coir/ peat value chain. Skilled workers are needed in twining, weaving, operating, and maintaining machinery and equipment and quality control (ILO, 2020). Additional skills are needed if twining and weaving are mechanized, which is done in large-scale operations.

D. Skills Needs in Coconut Product Value Chains

Based on tables 10 to 13, information regarding the employment and skills needed, and focusing on the *input, inbound* and *outbound logistics*, *production, trade/marketing*, *processing,* and *end-market* phases of the value chain where there is a high generation of employment, the specific training regulations associated with the jobs needed for each coconut product were determined. Roles such as managers were not included in Table 22 as these roles include higher education training and certifications. Also included in the end market phase are the sales workers needed for each of the NTCPs. This was not included in the previous table as it is the only common occupation that the coconut products share.

Table 22. Training Regulations in the Coconut Industry

Coconut Product Value Chain	**Coconut Products**	**Jobs Needed**	**Training Regulations**
	CNO	Nursery Operators/Worker Horticulture Workers	Agricultural Crops Production NC II
	DCN		
	Coco Charcoal/ Activated		

Input	Charcoal		
	VCO	Horticulture Workers	Horticulture NC III
	Coconut Water		
	Coconut Coir		
	Coco Sap Sugar		
Production	CNO	Coconut Farmer	Agricultural Crops Production NC III
	DCN		
	Coco Charcoal/ Activated Charcoal		
	VCO	Farm Laborer	Agricultural Crops Production NC I
	Coconut Water		
	Coconut Coir		
	Coco Sap Sugar		
Post-Harvest	CNO	Dehusker	
		Copra Maker	
	DCN	Dehusker	
	Coco Charcoal/ Activated Charcoal	Coconut Sheller	
		Dehusker	
		Shell Crusher	
	VCO	Dehusker	
	Coconut Water		
	Coconut Coir		
	Coco Sap Sugar		
	CNO	Truck Driver	Driving (Passenger Bus/Straight Truck) NC III
	DCN		
	Coco Charcoal/	Warehouse person	Warehousing Services NC II

Inbound and Outbound Logistics/ Distribution	Activated Charcoal		
	VCO	Warehouse Processing Clerk	Warehousing Services NC III
	Coconut Water	Logistics Admin Officer	
	Coconut Coir	Logistics Supervisor	Warehousing Services NC IV
	Coco Sap Sugar	Distribution Supervisor	
		Inbound and Outbound Supervisor	
Trading / Marketing	CNO	Trader (Specified Coconut Product)	
	DCN		
	Coco Charcoal/ Activated Charcoal		
	VCO	Consolidator	
	Coconut Water		
	Coconut Coir		
	Coco Sap Sugar		
Processing	CNO	Oil Millers	
		Oil Refiners	
		Cooker Machine Operator	
		Filter Press Operator	
		Centrifuge Operator	
		Processing Plant Worker	
		Machine and Equipment Technician (CNO Processing Plant)	
		Oil filling Machine Operator	
		Packing and Sealing	

		Machine Operator	
		Packers	
		Food and Safety Professionals	
		Quality Control Professionals	
		Milling Technician	Drying and Milling Plant Servicing NC III
		Processing Plant Professionals	
	DCN	Desiccated Coconut Cutter and Grinder Operator	
		Blanching Machine Operator	
		Multipurpose Dryer Operator	
		Coconut Meat Slicing Machines Operator	
		Disintegrator Operator	
		Grader machine Operator	
		Sorting Machine Operators	
		Packing and Sealing Machine Operator	
		Packers	
		Food and Safety Professionals	
		Quality Control Professionals	
		Machine and Equipment Technician (DCN Processing Plant)	

		Process Plant Workers	
		Processing Plant Professionals	
	Coconut Charcoal/ Activated Carbon	Charcoal Maker	
		Gasifier Machine Operator	
		Pulverizing Machine Operator	
		Furnace/Kiln Operators (Carbonization and Activation Process)	
		Machine and Equipment Technician (Activated Charcoal Processing Plant)	
		Plant Cooling and Heating System Technician (Activated Carbon Plant)	
		Quality Control Professionals	
		Safety Professionals	
		Process Plant Workers	
		Processing Plant Professionals	
	VCO	Coconut Meat Slicing Machines Operator	
		Milling Technician	Drying and Milling Plant Servicing NC III
		Disintegrator Operator	
		Screw or Hydraulic Press Operator	
		Blanching Machine Operator	

		Centrifuge Machine Operator	
		Virgin Coconut Expeller Operator	
		Packing and Sealing Machine Operator	
		Packers	
		Food and Safety Professionals	
		Quality Control Professionals	
		Machine and Equipment Technician (VCO Processing Plant)	
		Process Plant Workers	
		Processing Plant Professionals	
	Coconut Water	Pasteurization Machine Operator	
		Degasser Machine Operator	
		Homogenizer Machine Operator	
		UHT Sterilization Machine Operator	
		Filling and Sealing Machine Operator (coconut water)	
		Food and Safety Professionals	
		Quality Control Professionals	
		Machine and Equipment Technician (VCO Processing Plant)	
		Process Plant Workers	

		Processing Plant Professionals	
		Coconut Water Processor	
	Coco Coir	Coco Coir Processor	
		Decorticator Machine Operator	
		Weaver/Twiner	Handloom Weaving (Upright) NC II
		Coco Peat Workers	
		Geonet/ Fascines Workers	
	Coco Sap Sugar	Coco Sugar Processor	
		Food and Safety Worker	
		Packager	

Legend: Greyscale means no corresponding TR's for that skill/occupation

Take note that the ILO TRAVERA project identified that " the level of skills needed in the 3 NTCP VC is generally low" (ILO, 2020). Additionally, the ILO Skills for Trade and Economic Diversification (STED) in the non-traditional coconut export sectors of the Philippines, whose one objective was to incorporate results and findings of the TRAVERA (value chain) enterprise survey to identify and map out the skills needs, gaps and issues from the demand side perspective, said that "the availability of skilled manpower and/or worker who have the necessary aptitude to be trained in performing the various processing enterprises. Moreover, skills needed for managers to sustain a village-level coconut processing enterprise are entrepreneurial/ business management skills, specifically business planning, plant/production operation, and market identification skills. In contrast, skills needed for workers/laborers are basic operation, repair, and maintenance while skills needed for workers/laborers are basic operation, repair, and maintenance of plant/processing equipment, machinery, and facilities" (ILO, 2020).

IX. TVET Capacity

The following TVET Capacity is all data on the qualifications based on WTR and WTR-cluster as TR status.

Table 24 below shows the total number of enrolled and graduated by the qualification that relates to the identified skills/occupation required in the non-traditional coconut product subsector. Some training regulations (Warehousing Service NC II, Warehousing Services NC III, Warehousing NC IV) have enrollees but no graduates. Handloom Weaving (Upright) NC II has no enrolled and no graduates.

Based On the table, the TRs with the most number of enrollees and graduates for the year 2022 are Agricultural Crop Production NC I, Agricultural Crop Production NC II, and Agricultural Crop Production NC III.

Table 23. Total Number of Enrolled, Graduated by Qualification by Sex, As of September 2022

Qualifications	Enrolled			Graduated		
	Male	Female	Total	Male	Female	Total
Agricultural Crops Production NC I	635	1363	1998	917	1764	2681
Agricultural Crops Production NC II	107	131	238	96	79	175
Agricultural Crops Production NC III	599	1127	1726	948	1487	2435
Horticulture NC III	72	130	202	60	117	177
Driving (Passenger Bus/Straight Truck) NC III	491	19	510	560	22	582
Warehousing Services NC II	0	69	69	0	0	0
Warehousing Services NC III	0	0	0	0	0	0
Warehousing Services NC IV	0	0	0	0	0	0
Drying and Milling Plant Servicing NC III	38	12	50	62	65	127
Handloom Weaving (Upright) NC II	0	0	0	0	0	0

Source: 2022 Consolidated Data of Enrolled and Graduated Output from TESDA

Meanwhile, Table 23 lists the following No Training Regulation (NTRs) programs for skills/occupations needed for non-traditional coconut production subsectors. Note that

NTRs have no National Certifications, thus not having Assessment and Certification requirements.

Table 24. Total Number of Enrolled, Graduated by No Training Regulation (NTR) Program by Sex, As of September 2022,

No Training Regulation (NTR) Programs/Qualification	Enrolled			Graduated		
	Male	Female	Total	Male	Female	Total
Virgin Coconut Oil Processing	20	28	48	10	16	26
Coco Sugar Processing	19	10	29	18	9	27
Coco Coir Processing	7	4	11	7	3	10

Source: 2022 Consolidated Data of Enrolled and Graduated Output from TESDA

The NTRs listed are all qualifications for the three identified NTCPs (VCO, Coco Sugar, and Coco Coir).

From Table 25, it can be concluded that there is a comparable difference between the number of male and female enrollees, graduates, certified, and assessed. Agricultural production qualifications, specifically Agricultural Crops Production NC I, Agricultural Crops Production NC II, Agricultural Crops Production NC III, and Horticulture NC III, have a higher number of female trainees while other Driving (Passenger Bus/Straight Truck) NC III and Drying and Milling Plant Servicing NC III have higher male trainees.

Table 25. Total Number of Enrolled, Graduates, Assessed and Certified by Quialification by Sex, As of September 2022

Qualifications (TR)	Enrolled			Graduated			Assessed			Certified		
	(M)	(F)	(T)	(M)	(F)	(T)	(M)	(F)	(T)	(M)	(F)	(T)
Agricultural Crops Production NC I	635	1363	1998	917	1764	2681	849	1180	2029	813	1152	1965
Agricultural Crops Production NC II	107	131	238	96	79	175	5393	5547	10940	5168	5352	10520
Agricultural Crops Production NC III	599	1127	1726	948	1487	2435	1065	1233	2298	1002	1178	2180
Horticulture NC III	72	130	202	60	117	177	235	108	343	220	108	328

Driving (Passenger Bus/Straight Truck) NC III	491	19	510	560	22	582	4189	73	4262	3968	63	4031
Warehousing Services NC II	0	69	69	0	0	0	0	0	0	0	0	0
Warehousing Services NC III	0	0	0	0	0	0	0	0	0	0	0	0
Warehousing Services NC IV	0	0	0	0	0	0	0	0	0	0	0	0
Drying and Milling Plant Servicing NC III	38	12	50	62	65	127	10	3	13	10	3	13
Handloom Weaving (Upright) NC II	0	0	0	0	0	0	2	13	15	2	13	15

Legend: (M) - Male; (F) - Female; and (T) - Total
Source: 2022 Consolidated Data of EGAC Output from TESDA

X. TESDA Initiatives

A. Memorandum of Agreement (MOA) between The Technical Education and Skills Development Authority (TESDA), Philippine Coconut Authority (PCA) and Agricultural Training Institute (ATI)

In 2022, TESDA together with PCA and ATI signed a memorandum of agreement (MOA), where all parties take part in collaboration and coordination with regards to the successful implementation of programs/projects in using allocations provided in RA 1154. The agreement's purpose is the facilitation of programs and services that professionalize, empower, and develop coconut farmers and their families to become productive, hence improving farmers' income and generating livelihood.

TESDA's duties and responsibilities include

1. Facilitate the development of Training Regulations (TRs), Competency Standards(CS), and Competency Assessment Tools (CATs) on coconut-related qualifications/programs;
2. Assist PCA in the dissemination and orientation of training programs;
3. Facilitate the conduct of skills training and assessment of training programs;
4. Make TESDA's scholarship program available to PCA beneficiaries subject to the availability of funds and existing guidelines and regulations;
5. Provide free Trainers Training Methodology and accreditation of coconut industry trainers;

6. Provide proposal plans and guidelines for setting up equipment/machinery service center;
7. Utilize the funds from the Coconut Farmers and Industry Trust Fund Allocation and facilitate the procurement of necessary eligible expenditure items to be used for the implementation of initiatives identified in the approval Annual Program Work, annual Procurement Plan, and the approval project Proposals.
8. Issue TESDA's National Certificate or Certificate of Competency to beneficiaries who have completed the requirements for the Training Programs.

B. Area-Based Demand-Driven TVET Implementation

In 2021, the National Technical Skills and Development Authority implemented the Area -Based Demand Driven TVET; this was in support of the operationalization of the National Technical Education and Skills Development Plan (NTESDP) 2018-2022 address the recommendations in the TVET Sector Study. In Organizational Development, most notably the skills demand of the industries and employers for increased productivity.

Based on the initial skills map submissions of the Provincial and Regional TESDA offices, Table 26 shows the regions and their respective provinces that identified in-demand coconut-related skills/jobs in their respective locations. These submissions will then be further enhanced based on the comments and recommendations provided by the TESDA Central Planning Office; this enhanced skills map will form part of the Provincial Priority Skill requirement and Regional Priority Skills requirement reports. These are all necessary steps for TESDA to develop related programs and their implementation.

Table 26. Initial Coconut product related Priority Skills/Occupation Mapping from the Area Based Demand Driven TVET Program

Region	**Province**	**Coconut Related Priority Skills/Occupation** *(Consultation and Other Sources)*
CAR	Apayao	Coconut-based Food Processing
		Coconut-based Handicraft Making
		Coconut-based Accessory Making
		Coconut-based Wire and Fiber Making
Region III	Aurora	Coconut-based Diversified Farming
		Coconut Coco Coir
Region IV-B	Marinduque	Coconut Farmer (Harvester)
	Romblon	Coconut Shell Crafts
Region V	Camarines Sur	Coconut Sap Collector

		Hybrid Coconut Farmer
		Coco Coir Geonet Installation and Maintenance
		Coco Coir Production
		Weaving (Geonet Textile) and Twinning
		Decorticating Machine Operator/Mechanic
		Vinegar Training and Coco Sugar
		Production of White Copra/High Quality Copra
		Copra Making/Processing
Region VI	Aklan	Copra Crusher Operator
		Expeller Operator
	Antique	Coco Coir Processing
Region VII	Bohol	Coconut Toddy Production and Processing
		Coconut Processing (By Products i.e. shell, dust, coir)
		Integrated Coconut and Cash Crops Production
	Siquijor	Agricultural Crop Production (Root Crops, Banana, Coconut, Bamboo, Salago)
Region VIII	Samar	Coconut Farmer
	Biliran	Coconut
		Coconut Coir Production Workers
Region IX	Zamboanga Del Norte	Cacao/Coffee/Coconut/Palm Oil Producer/Propagator
		Coco Coir Producer
	Zamboanga Del Sur	Coconut Production/Processing (Coco Coir/Virgin Coconut Oil)
Region X	Lanao Del Norte	Coconut Production Workers/Coconut Processors
	Misamis Oriental	Coco Coir Processor
	Misamis Occidental	Coconut Products Processor (Coco sugar, liquid and power coco water)
Region XI	Davao Del Norte	Coconut Production
	Davao Occidental	Coconut Production
		Coconut Processing
Region XII	North Cotabato	Coconut Planter
	Sultan Kudarat	Coco-sugar Processing
		Coconut Production
		Charcoal and Briquette Production from Coconut By-product

		Coconut Farm Maintenance
		Coconut Husk Processing for Coir Fiber, GeoNet & Rope Production
		Coconut Nursery Operations and Management
		Coconut Pests and Disease Management
		Coconut Plantation Establishment
		Integrated Coconut Central Processing
		Nata De Coco Production
		Virgin Coconut Oil
CARAGA	Agusan Del Sur	Dehusking Machine Operator (Coconut Industry)
		Coconut Oil Processor (Coconut Industry)
		VCO Processor (Coconut Industry)
		Coco Sugar Processor (Coconut Industry)
		Coco Amino Processor (Coconut Industry)
	Dinagat Island	Coco Sugar Processor (Coconut Industry)
		VCO Processor (Coconut Industry)
	Surigao Del Sur	Virgin Coconut Oil (VCO) Processor (Coconut Industry)
		Coco Coir Processor
		Coco Sugar Processor (Coconut Industry)

Source: *2022 ABDD Skills Mapping Initial Submissions*

C. Industry Consultations

As part of TESDA's continued skills development prioritization process, the agency is currently having industry consultations with Agriculture agencies, such as Agricultural Training Institute (ATI), Bureau of Agricultural and Fisheries Engineering (BAFE), and Philippine Center for Postharvest Development Mechanization (PhilMech). This is discussing is also anchored in the following laws and discussions:

- Republic Act No. 10601 "Agricultural and Fisheries Mechanization (AFMECH) Law";
- "Train to Mechanize Philippine Agriculture and Fisheries" Program dated 18 December 2019;
- BAFE-TESDA Consultation meeting via zoom on February 21, 2022,

The meeting's agenda was to explore the request on the skills requirement needed in response to the government's efforts in modernizing the agricultural sector in the country. Moreover, to determine if the request is in line with the development of the skills training program, focus on the development of the skills program, provision for the budget on

scholarship allocation, and the need to review existing related TRs. Further discussions and consultations will be made following the meeting.

D. Greening TVET System

In 2018, TESDA published LMIR Issue No. 1, “Green Skills for Green Jobs: Preparing the Filipino Workforce for the Green Economy "; about 14,160 to 118,000 green jobs are available in the Agriculture Sector. The document also laid out the challenges with regards to greening of the Agri-Forestry and Fisheries Sector which are:

- Making the Local Chief Executives (LCEs) as green champions
- Impact of using organic products on productivity
- Non-Observance of law
- Lack of relevant technology
- Constraints on material to be used for fishing boats (wood vs fiberglass)
- Why companies need to implement greening
- Cost for training and accreditation
- Political Support
- Lack of Training for farmers and fisherfolk
- Information dissemination
- Provision of grant, incentives
- Need to harmonize training programs

It also proposed ways TESDA can assist in the green shift by: (1) Ensuring training programs are aligned with greening requirements of the sectors; (2) Develop more Training Regulations (TR’s) and update existing TRs to include green skills; (3) Continue to advocate green agenda and green skills development, as well as strengthen its linkages with industries, government agencies and other relevant stakeholders in order to be able fulfill its role in the promotion of Green Jobs Act; and (4) Tesda is recommended to undergo “greening” as an institution, in order to harmonize steps in enabling all stakeholders - leadership, teachers, learners and administration to jointly development a vision and plan to implement Education for Sustainable Development (ESD).

E. Scholarship Program for Coconut Farmers

Through TESDA Circular 059 series of 2022, which observed in providing coconut farmers and their dependents with access to free TVET through TESDA. The implementation covers the training and assessment for the programs/qualifications identified in the approved Coconut Farmers and Industry Development Plan (CFIDP). For the beneficiaries, the implementation targets the coconut farmers and their relatives up to the 4th level of consanguinity with at least 18 years of age upon finishing the program.

XI. Way Forward

The Philippine Coconut Industry has been taking advantage of new global trends and shifts. It has diversified its portfolio of coconut products exports to fill up the demands in the international market. The government, in turn, has provided support to the industry, primarily programs that support the livelihood of coconut farmers. However, the studies of the country's level of coconut-related training and education, as seen in the ILO projects and the Philippine Coconut Industry Roadmap, prove that there is a need to improve training to ensure that the coconut industry workers are skilled and competent.

The following are recommendations for TESDA:

- Consultations with coconut industry stakeholders (Private and Government) should be prioritized. Recent global market shifts have propelled NTPC as an in-demand commodity; thus, TESDA needs to assess and identify the skills requirements needed by the industry. Actions such as this will be the first step in the development of Training Regulations (TRs) and Competency Standards (CS) tailored to both Traditional and Non-traditional Coconut Products (NTCPs).

- Existing Training Regulations (TRs) should be re-evaluated. There are existing TRs related to coconut production and maintenance (i.e., Agricultural Crop Production NC I, Agricultural Crop Production NC II, Agricultural Crop Production NC III, and Horticulture NC III), and further assessment of these TRs must be done.

    - TESDA must analyze whether the existing TRs have the best agricultural practices to maximize the crop; TESDA might also need to check on new modern techniques, such as integrated intercropping, which can improve productivity.
    - TRs specializing in processing must also be enhanced as the end product must meet quality standards set by the market. There are already NTR programs related to coconut processing, as shown in Table 25 of this report, which TESDA can assess for TR development. Overall, TESDA needs to develop TRs and CS that address the lack of professional skills needed in the industry from aspects of farm maintenance, coconut production, and processing.

- Any developed and re-evaluated TRs related to the industry should address issues, and the challenges seen in the industry, particularly farm management practices such as managing extreme weather phenomena (i.e., typhoons, el niño and la niña)
    - Modern methods in processing concerning each of the different products should also be considered; these practices may increase the efficiency of

processing, lessen unusable by-products, and effectively assist in achieving quality standards set by the global market.

- TESDA needs to increase its capacity concerning the identified skills/occupation with corresponding qualifications (registered programs, assessment centers, assessors, and trainers), Table 27.
    - Agriculture Crops Production NC I has no trainers registered compared to Agriculture Crop Production NC II and III, both have 962 and 461 trainers, respectively. Horticulture NC III also has few assessment centers, assessors, and registered programs.
    - As part of the coconut product value chain, logistic qualifications are important to farms/holdings, community growers, and large processing companies. From storage, product handling, and distribution, the coconut industry relies on the inbound/outbound logistics phase to safely store and transport products. With this, the two qualifications (Warehousing Services NC III and Warehousing Services NC III) have no assessment centers, assessors, registered programs, and trainers.
    - There are only two identified qualifications applicable in processing. Handloom Weaving NC II has no assessment centers, assessors, registered programs, and trainers compared to Drying and Milling Plant Servicing NC III, which also has low numbers.

Table 27. Summary of Number of Assessment Centers, Competency Assessors, Registered Programs, and National TVET Trainers Certification Holder by Qualification, as of September 2022

Qualifications	No. of Assessment Centers	No. of Competency Assessors	Registered Programs	Trainers
Agricultural Crops Production NC I	41	62	99	0
Agricultural Crops Production NC II	120	238	263	962
Agricultural Crops Production NC III	39	68	84	461
Horticulture NC III	8	14	16	88
Driving (Passenger Bus/Straight Truck) NC III	75	119	25	195
Warehousing Services NC II	2	2	1	2
Warehousing Services NC III	0	0	0	0

Warehousing Services NC IV	0	0	0	0
Drying and Milling Plant Servicing NC III	4	9	3	19
Handloom Weaving (Upright) NC II	0	0	0	0

Source: 2022 Consolidated Data of EGAC Output from TESDA

- Scholarship Program
    - With the current status of the scholarship programs relative to Coconut related qualifications. TESDA has to strengthen and promote the implementation of the scholarship program specifically for the Program on Accelerating Farm School Establishment (PAFSE) and Tulong Trabaho Scholarship Program (TTSP).
    - The road map identifies TESDA, together with the Commission on Higher Education (CHED), as the authority on setting the criteria for selecting coconut farmers' children beneficiaries for Educational Scholarship Programs. It is recommended that TESDA consider the provision in managing funds allotted for Scholarship programs for this industry.

- Program Registration and Capacity Building Program for the Trainers
    - One of the challenges in the coconut industry is the limited number of Technical Vocational Institutions offering coconut-related programs and a limited number of trainers teaching the program. The table below shows that only CARAGA has three coconut-related programs as of September 2022 and with a total of 2 trainers.

Table 28. Registered Programs related to Coconut and Number of Trainers per Province and Region as of September 2022

Region	Province	No Training Regulation	Number of Trainers
CARAGA	Surigao Del Sur	Virgin Coconut Oil Processing	2
CARAGA	Surigao Del Sur	Coco Sugar Processing	
CARAGA	Surigao Del Sur	Coco Coir Processing	

Source: Compendium as of September 2022

With regards to this, TESDA has to conduct the following interventions to address the above-mentioned challenges:

- Conduct Capacity Building Program for the Regional Lead Trainers for Coconut related programs to further multiply the existing number of trainers.
- ROPOTI to promote the Coconut Farmers Scholarship Program under the Area-Based and Demand-Driven TVET.

- Partnership and Linkages
  - TESDA must maintain partnerships and linkages with government agencies and other industry stakeholders to develop more programs relevant to the Coconut Industry. Also, it will be an avenue to develop labor market information and address the skills and needs requirements of the industry. The roadmap also recommended that TESDA and other agencies assist in establishing shared facilities for processing coconut, intercrops, and livestock. The establishment of farms schools for coconut farmer participants is also included in the recommendation.
  - TESDA should adopt the road maps recommendation on the development of Entrepreneurship training models for farmer's organizations and cooperate with the Agricultural Training Institute (ATI).

- Area-Based and Demand-Driven TVET
  - The implementation of the skills mapping of the ABBDD needs to be enhanced; thorough research and consultation will yield a more actual "picture" of what each specific region has in terms of employment and skills demands.
  - Relative to the Area-Based and Demand Driven TVET, TESDA has to support the following regions with emerging skills requirements related to the Coconut Industry.

- CAR
- Region III
- Region IV-B
- Region V
- Region VI
- Region VII
- Region VIII
- Region IX
- Region X
- Region XI
- Region XII
- CARAGA

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