PROCESSED FRUITS AND NUTS INDUSTRY ROADMAP

Final Report

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I. Introduction[1]

The study is tasked with formulating a roadmap for the processed fruits and nuts (PFN) industry. Specifically, the objectives include: a) the conduct of value chain analysis (backward and forward linkages, including global production network in which the Philippines could play a role; (c) provide a profile of industry players and associations; b) assess the industry's internal (strengths & weaknesses) and external (opportunities & threats) environment impacting its growth and development potential; c) identify prospects for the industry in the short-, medium-, and long-term, where Philippines has a comparative advantage; and d) provide directions to the processed fruits and nuts industry in order to develop the competitiveness of the industry in domestic and international markets.

This PFN roadmap is based on the analysis of secondary data and extensive consultations with relevant stakeholders from the government and the private sector. As required, the paper carried out a review of relevant documents which included the DTI's manufacturing resurgence program (MRP), the Manufacturing Industry Roadmap and the localized value chain analysis of selected fruits (many have been commissioned by the Department of agriculture under it Participatory Rural Development Program (PRDP). Informant interviews and focus group discussions were conducted for key stakeholders from the government, industry, and other relevant sectors, including local government units in order to contextualize the formulation of the industry roadmap and ensure its consistency with the DTI-BOI's plans, policy directions and strategies (Annex 1).

This PFN industry roadmap contains: (1) the state of the industry; (2) the policy environment for industry development; (3) SWOT analyses; and (4) proposed recommendations. The state of the industry covers: (a) the structure of the industry, (b) its economic performance, currently and in historical perspective, and (c) outlook and challenges.

The Industry Structure includes: (i) the sectoral coverage of the industry (based on the Philippine Standard for Industry Classification); (ii) value chain analysis (backward and forward; global and domestic; identification of activities where PH has a comparative advantage); (iii) profile of industry players and associations.

The Economic Performance covers: (i) manufacturing output, value added, and share to GDP; (ii) trade (exports and imports); (iii) investment (domestic and foreign); (iv) employment (direct and indirect); and (v) multiplier effect (output, income, employment). And the Outlook and Challenges section discusses the prospects for the industry in the short-, medium-, and long-term, including identification of segments of the value chain or the global production network in which the Philippines could play a role. In addition, it should discuss the binding constraints to the growth and development of the industry.

The policy environment for industry development section covers the policy environment of the industry, including a concise history of government support programs, current policies and programs, and the concerned regulatory agencies. While the SWOT analyses present the

[1] This study is commissioned by the Board of Investments (BOI), Department of Trade and Industry (DTI).

industry's internal (strengths & weaknesses) and external (opportunities & threats) environment affecting its growth and development potential.

The paper ends with some recommendations to address the binding constraints to the industry's growth and development and enhance its competitiveness (such as how to address supply chain gaps, innovation measures to develop the industry, green policy measures, human resource development, maximize trade opportunities). These should include proposed strategies to effectively implement the recommendations within specific timelines (short-, medium-, and long-term) taking into consideration the vision/mission and goals/targets that would be formulated.

Business Case Development. Based on the industry roadmap, business cases for dragon fruit and pili nuts are prepared – taking into account the current state of the industry, technological developments affecting the industry, and competition in the regional and global markets – that can guide the BOI's industry development programs.

This report is divided into eight parts. Part II presents the state of the manufacturing industry while Part III discusses the trends in domestic and global production, area, yield, and trade of selected fruits and nuts. Part IV looks at the industry policy environment. Part V analyzes the potential areas for growth and identifies the binding constraints to growth and development of the sector. Part VI gives the SWOT results, and key issues and concerns. Part VII presents the Processed Fruits and Nuts Roadmap. Part VIII provides two sample business plans for pili nut and dragon fruit processing.

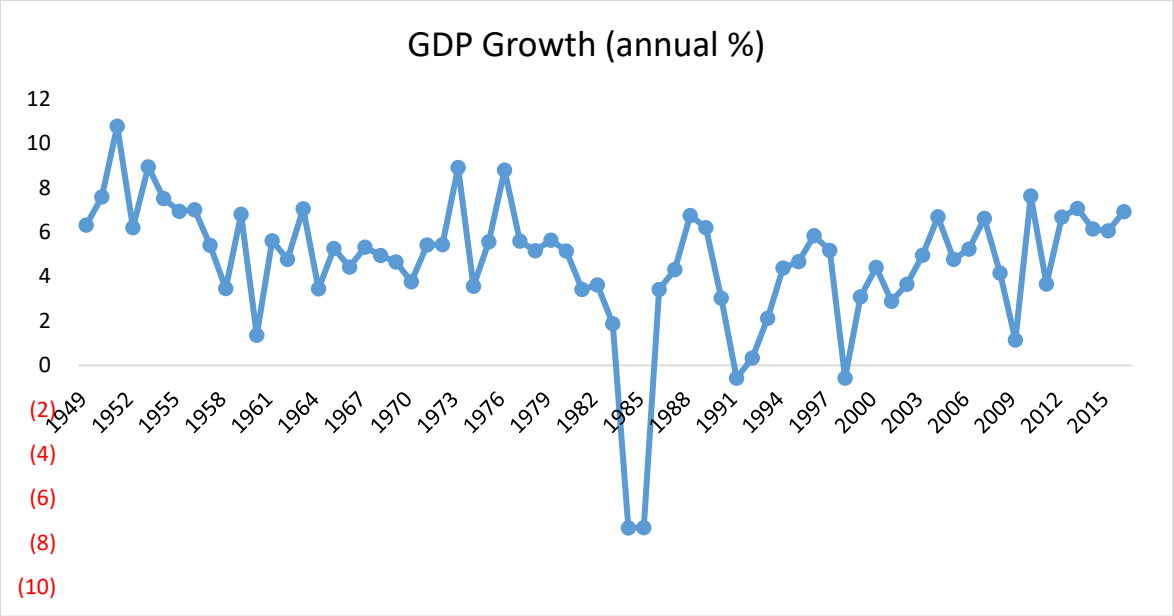
II. State of the Manufacturing Industry

This chapter presents the industry structure and performance as a context for the processed fruits and nuts (PFN) sub-sector. This section is followed by a discussion of the PFN structure and economic performance and trade.

Industry Structure and Economic Performance

The Philippine economy has been on performing well in the last six years with annual growth in the gross domestic product (GDP) above 5% and peaking in 2010 at 7.6% (Figure 1). The significant declines in the economic performance coincide with national, international or global crisis which occurred in 1986 (EDSA revolution), 1991 (power crisis), 1997 (Asian financial crisis), 2008/9 (high global oil and food prices; global financial crisis).

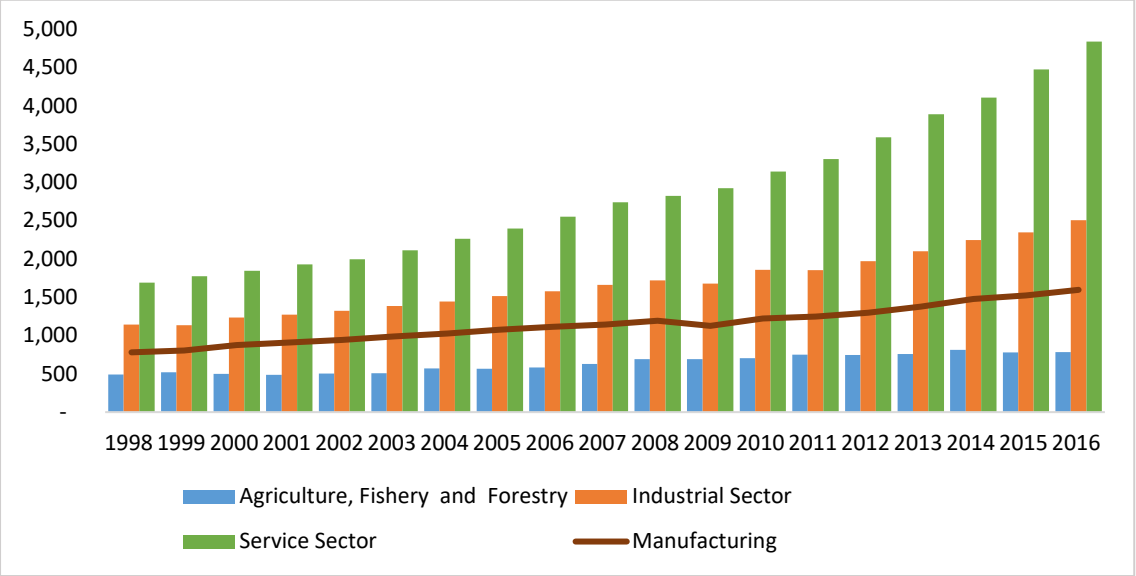
Figure 1. Annual Gross Domestic Product Growth, 1949 - 2016 (2000 Prices)



Source: PSA (2017).

In terms of sectoral performance, growth in GDP in the last two decades can be largely attributed to the growth in the service sector. The industry and manufacturing sector showed consistent although modest increases over the same period.

Figure 2. Gross Domestic Product by Industrial Origin, in Bn pesos, 1998-2016 (2000 Prices)



Source: PSA (2017).

As shown in Table 1, the manufacturing sector's share is decreasing because of the rising share of services. Despite this, it is worth noting that the manufacturing sector has shown increasing growths in the last three decades and a half with growth hitting an average of 4.6% in 2011 to 2016.

Table 1. Philippine Value Added, 1981 to 2016

	Value Added							
	Average Growth				Average Share			
	1981-1990	1991-2000	2001-2010	2011-2016	1981-1990	1991-2000	2001-2010	2011-2016
GDP	**1.7**	**3.0**	**4.8**	**6.1**	**100**	**100**	**100**	**100**
Agriculture	**1.1**	**1.8**	**3.5**	**1.9**	**23.90**	**20.80**	**12.9**	**11.2**
Industry	**0.3**	**3.0**	**4.2**	**5.2**	**38.00**	**34.10**	**33.5**	**31.1**
Manufacturing	0.9	2.5	3.4	4.6	26.30	24.30	23.4	20.4
Services	**3.3**	**3.6**	**5.5**	**7.5**	**40.40**	**42.40**	**53.7**	**57.7**

Sources: Aldaba (2014), PSA (2017).

Figure 3. Presents the trend in manufacturing value added from 2008 to 2017. By end of 2016, food manufactures reached Php663 Bn while beverage increased to Php79 Bn at 2000 prices.

Figure 3. Manufacturing Value Added, 2008-2017 (Bn pesos at 2000 Prices)

Source: PSA (2017).
Note: *As of 3rd quarter of 2017.

The contribution of processed fruits and nuts (PFN) subsector would be captured in food and beverage industries share in total manufacturing sector. In Table 2, the structure and growth of the manufacturing value added shows the significant share of food manufacturing at initially 44% but declines to 40% in 2000s. Beverage however remained at 4% for the same period. These two sub-sectors however, have been showing increasing average growth rates at 5.9 and 3.8% in 2000 to 2009, respectively.

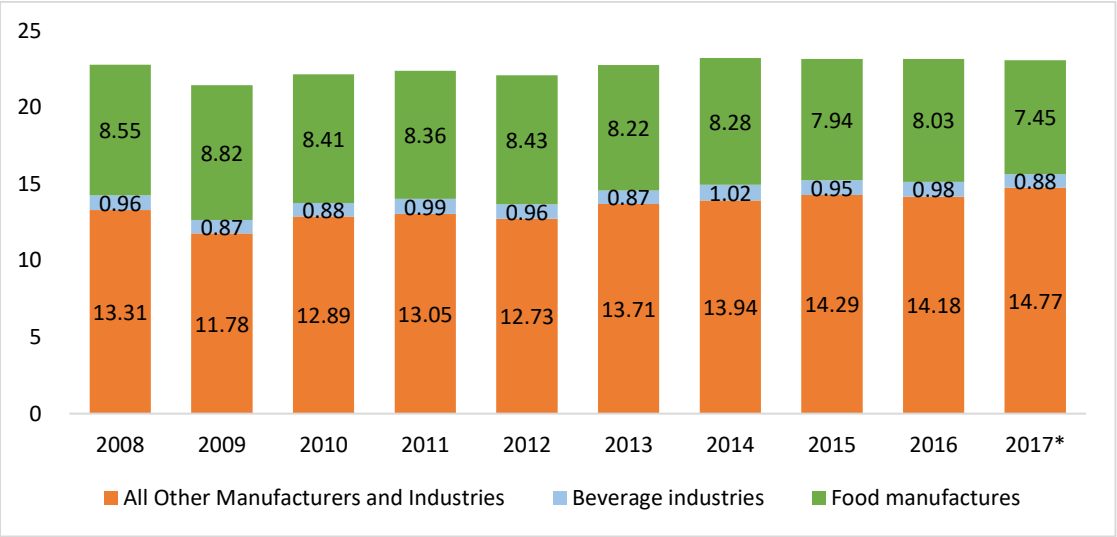
Table 2. Structure and growth of manufacturing value added, 1980-2009

	Average Share (%)			Average Growth Rate (%)		
	1980-89	1990-99	2000-09	1980-89	1990-99	2000-09
Consumer Goods	57	50	51	0.2	1.8	4.6
Food manufacturing	***44***	***36***	***40***	***-0.7***	***1.8***	***5.9***
Beverage industries	***4***	***4***	***4***	***7.1***	***2.3***	***3.8***
Intermediate Goods	31	35	27	1.7	1.6	2.4
Capital Goods	10	13	19	1.9	6.2	5.5
Miscellaneous manufactures	2	2	3	8.0	4.9	7.9
Total Manufacturing	**100**	**100**	**100**	**0.9**	**2.3**	**4.1**

Source: Aldaba (2014).

Relative to the rest of the economy, the shares of the two sub-sectors to the GDP have slightly declined in the last decade from 9.51% in 2008 to 9.01% in 2016 (Figure 4).

Figure 4. Food and Beverage Shares in Manufacturing Value Added (% of GDP), 2008-2017



Source: PSA (2017).
Note: *As of 3rd quarter of 2017.

In terms of share of employment, the manufacturing sector shows declining shares over time, like in the agriculture sector and in contrast to the trend in the service sector. Given the decreasing shares of the food and beverage sub-sectors, it likely that the same trend in employment holds.

Table 3. Share of Employment by Sector, 1981 to 2016

	Average Share			
	1981-1990	**1991-2000**	**2001-2010**	**2011-2016**
Agriculture	49.6	43.2	35.1	30.5
Industry	14.5	16	15.3	15.9
Manufacturing	9.9	10	9.1	8.3
Services	35.9	40.9	49.5	53.6

Sources: Aldaba (2014), PSA (2017).

Processed Fruits and Nuts Structure and Economic Performance

Data on structure and economic performance for the eight (8) processed fruits and nut are not readily available. There two possible sources of official data: the Census of Philippine Business and Industry (CPBI) and the Annual Survey of Philippine Business and Industry (ASPBI). For this section, we present the ASPBI data. In the official statistics, there are six industries which are closest to the processed fruits and nuts: C10301, C10303, C10304, C10306, C10307, C10309. The descriptions are given in the table below. All these six sectors contribute to less than two percent of the manufacturing sector outputs from 2010 to 2015. The contribution was highest at 1.34 percent in 2010 and has declined to 0.98 percent in 2015.

Table 4. PFN Share of Value of Output to Total Manufacturing, 2010 - 2015

2009 PSIC Code	Industry Description	Share of Output to total manufacturing output (%)			
		2010	2013	2014	2015
	Manufacturing	**100**	**100**	**100**	**100**
C10301	Canning/packing and preserving of fruits and fruit juices	0.97	0.64	0.49	0.59
C10303	Manufacture of fruit and vegetable sauces (e.g. tomato sauce and paste)	0.35	0.36	0.32	0.32
C10304	Quick-freezing of fruits and vegetables	0.00			
C10306	Roasting of nut or manufacture of nut foods and pastes	0.02	0.03	0.04	0.05
C10307	Manufacture of perishable prepared foods of fruit and vegetables, such as: salad, peeled or cut vegetables, tofu (bean curd)		0.00	0.00	0.00
C10309	Processing and preserving of fruits and vegetables, n.e.c.		0.02	0.02	0.02

Sources: ASPBI 2010 to 2015.

Despite the relatively small contribution to manufacturing, except for C10303, all the other five sectors show positive growths of two digits or higher for value of outputs and value added for the same period.

Table 5. PFN Annual Growth rates of Value of Output and Value Added (%), 2010 - 2015

2009 PSIC Code	Industry Description	2010-2013		2013-2014		2014-2015	
		Value of Output	Value Added	Value of Output	Value Added	Value of Output	Value Added
	Manufacturing sector	**4.88**	**0.14**	**3.97**	**12.11**	**1.56**	**1.14**
C10301	Canning/packing and preserving of fruits and fruit juices	-5.35	0.83	-20.80	12.58	22.61	17.10
C10303	Manufacture of fruit and vegetable sauces (e.g. tomato sauce and paste)	5.47	2.77	-6.78	-17.31	-0.23	-4.61
C10304	Quick-freezing of fruits and vegetables						
C10306	Roasting of nut or manufacture of nut foods and pastes	21.01	8.05	22.00	14.15	21.81	13.44
C10307	Manufacture of perishable prepared foods of fruit and vegetables, such as: salad, peeled or cut vegetables, tofu (bean curd)			258.16	166.12	24.04	162.65
C10309	Processing and preserving of fruits and vegetables, n.e.c.			29.28	4.12	-13.91	1.64

Sources: ASPBI 2010 to 2015.

In terms of the number of establishments, the PFN related industries account for less than one percent (0.65 to 0.69 percent) of the manufacturing establishments in the 2010 to 2015 ASPBI. Among the PFN establishments, the greatest number is in canning/packing and preserving fruits and fruit juices while roasting of nut or manufacture of nut foods and pastes industries are second. The manufacture of perishable prepared foods of fruits and vegetables are third in terms of number of firms.

Table 6. PFN Number of Establishments, 2010 – 2015

2009 PSIC Code	Industry Description	2010	2013	2014	2015
	Manufacturing	**16,269**	**25,149**	**25,197**	**24,496**
C10301	Canning/packing and preserving of fruits and fruit juices	54	72	72	66
C10303	Manufacture of fruit and vegetable sauces (e.g. tomato sauce and paste)	26	30	30	27
C10304	Quick-freezing of fruits and vegetables	3	*S*	*S*	*S*
C10306	Roasting of nut or manufacture of nut foods and pastes	23	33	33	33
C10307	Manufacture of perishable prepared foods of fruit and vegetables, such as: salad, peeled or cut vegetables, tofu (bean curd)	*S*	18	19	22
C10309	Processing and preserving of fruits and vegetables, n.e.c.	*S*	20	20	15

Sources: ASPBI 2010 to 2015.

On employed workers, canning/packaging and preserving of fruits and fruit juices are the largest employers among the PFN industries employing 13,500 in 2015. Relative to the entire manufacturing sector, this accounts for about one percent of total as shown in the next table.

Table 7. PFN Total employment, 2010 – 2015

2009 PSIC Code	Industry Description	2010	2013	2014	2015
	Manufacturing	**978,027**	**1,219,330**	**1,223,577**	**1,293,811**
C10301	Canning/packing and preserving of fruits and fruit juices	14,547	12,656	13,413	13,512
C10303	Manufacture of fruit and vegetable sauces (e.g. tomato sauce and paste)	1,560	2585	2,432	1,731
C10304	Quick-freezing of fruits and vegetables	103	*S*	*S*	*S*
C10306	Roasting of nut or manufacture of nut foods and pastes	1,063	1,418	1,340	1,350
C10307	Manufacture of perishable prepared foods of fruit and vegetables, such as: salad, peeled or cut vegetables, tofu (bean curd)	*S*	158	223	340

2009 PSIC Code	Industry Description	2010	2013	2014	2015
C10309	Processing and preserving of fruits and vegetables, n.e.c.	*S*	594	548	498

Source: ASPBI.

Table 8. PFN Share of Employment (%), 2010 – 2015

2009 PSIC Code	Industry Description	Share of employment to total Manufacturing sector (%)			
		2010	2013	2014	2015
	Manufacturing	**100**	**100**	**100**	**100**
C10301	Canning/packing and preserving of fruits and fruit juices	1.49	1.04	1.10	1.04
C10303	Manufacture of fruit and vegetable sauces (e.g. tomato sauce and paste)	0.16	0.21	0.20	0.13
C10304	Quick-freezing of fruits and vegetables	0.01			
C10306	Roasting of nut or manufacture of nut foods and pastes	0.11	0.12	0.11	0.10
C10307	Manufacture of perishable prepared foods of fruit and vegetables, such as: salad, peeled or cut vegetables, tofu (bean curd)		0.01	0.02	0.03
C10309	Processing and preserving of fruits and vegetables, n.e.c.		0.05	0.04	0.04

Source: ASPBI.

Looking at the growth of PFN related establishments and employment, the table below shows that there is nominal growth at less than one percent in employment for canning/packing and preserving although the number of establishments declined in 2014-2015. The manufacture of perishable prepared foods of fruit and vegetables industries shows consistent and significant increases in both the number of establishments and employees for 2013-14 and 2014-15.

Table 9. PFN Annual Growth rates of No. of establishments and Employment (%), 2010 – 2015

2009 PSIC Code	Industry Description	2010-2013			2013-2014			2014-2015		
		Number of Establish-ments	Employment as of November 15		Number of Establish-ments	Employment as of November 15		Number of Establish-ments	Employment as of November 15	
			Total	Paid Employees		Total	Paid Employees		Total	Paid Employees
	Manufacturing sector	**11.50**	**5.67**	**5.60**	**0.19**	**0.35**	**0.14**	**-2.78**	**5.74**	**5.54**
C10301	Canning/packing and preserving of fruits and fruit juices	7.46	-3.42	-3.43	0.00	5.98	6.59	-8.33	0.74	0.54

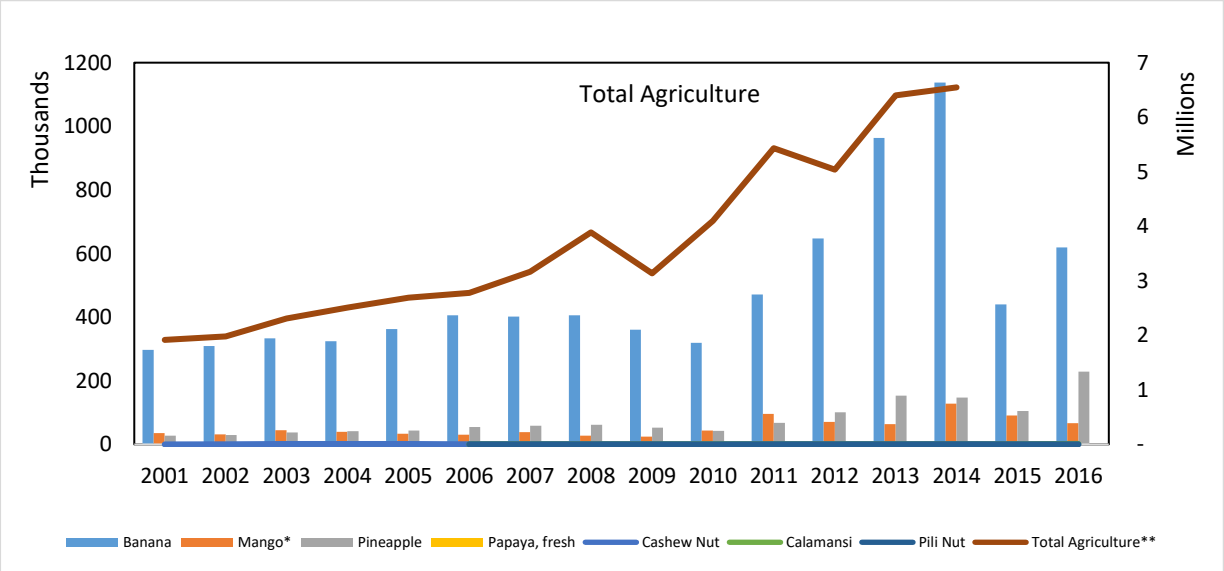
2009 PSIC Code	Industry Description	2010-2013			2013-2014			2014-2015		
		Number of Establish-ments	Employment as of November 15		Number of Establish-ments	Employment as of November 15		Number of Establish-ments	Employment as of November 15	
			Total	Paid Employees		Total	Paid Employees		Total	Paid Employees
C10303	Manufacture of fruit and vegetable sauces (e.g. tomato sauce and paste)	3.64	13.46	13.30	0.00	-5.92	-5.30	-10.00	-28.82	-29.45
C10304	Quick-freezing of fruits and vegetables									
C10306	Roasting of nut or manufacture of nut foods and pastes	9.45	7.47	7.06	0.00	-5.50	-3.56	0.00	0.75	-1.35
C10307	Manufacture of perishable prepared foods of fruit and vegetables, such as: salad, peeled or cut vegetables, tofu (bean curd)				5.56	41.14	140.45	15.79	52.47	23.36
C10309	Processing and preserving of fruits and vegetables, n.e.c.				0.00	-7.74	-5.80	-25.00	-9.12	-8.27

Source: ASPBI.

Exports and Imports of Processed Fruits and Nuts

The Philippine export of fruits and nuts generally exhibited an upward trend.

Figure 5. Exports of fruits, nuts and total agriculture, 2001 - 2016 ($US'000)



*Sources: ITC Trade Map (2017) & PSA CountryStat (2017); ** basic data is PSA CountryStat (2017) for basic data.*

Note: * Mango includes guava and mangosteen.

Table 10 shows the annual average growth rates of Philippine versus world exports on fruits and nuts captured in three product classifications: fresh/dried fruits and nuts, fruit preserved/preparations, and fruit and vegetable juices.

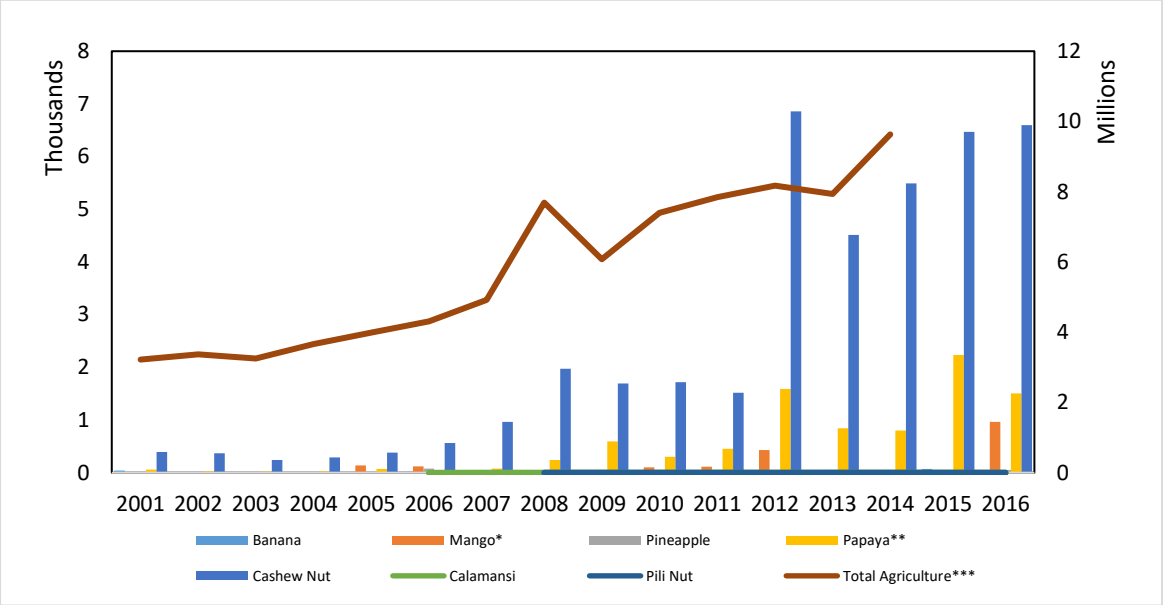
Table 10. Real Export Growth of Fruit and Nuts Exports, 1996-2016

Year	Global Total Export	Philippine Total Export	Fruits and nuts (excluding oil nuts), fresh or dried		Fruit, preserved, and fruit preparations (no juice)		Fruit and vegetable juices, unfermented, no spirit	
			World Export	Philippine Export	World Export	Philippine Export	World Export	Philippine Export
1996	1.59	14.39	5.07	3.76	3.46	11.49	11.89	6.17
1997	1.63	20.00	0.61	-5.73	-6.72	-5.89	-14.37	-0.65
1998	-3.41	15.13	-4.06	-6.52	-1.00	-11.82	7.15	2.94
1999	1.24	16.24	-1.44	6.51	-1.94	-3.03	3.83	-18.38
2000	9.19	5.13	-10.96	6.97	-10.44	-1.12	-9.91	25.23
2001	-6.45	-17.89	-0.68	-3.51	3.77	4.25	-9.62	20.99
2002	3.24	7.80	7.18	7.87	6.51	1.38	8.00	-19.18
2003	13.89	0.62	16.25	7.07	16.81	3.88	16.37	8.17
2004	19.26	6.66	11.75	-3.17	11.43	7.56	2.04	1.78
2005	10.19	0.56	12.64	8.03	7.89	9.91	8.95	6.63
2006	12.23	11.33	2.90	7.60	9.57	2.85	17.61	13.86
2007	12.38	3.49	12.56	1.69	17.81	10.85	26.53	1.74
2008	10.99	-6.35	10.79	7.19	12.38	2.98	4.03	-15.50
2009	-22.17	-21.40	-3.32	-20.33	-13.04	-2.85	-18.38	26.79
2010	19.86	31.82	9.46	-5.95	7.03	-5.03	5.62	-7.85
2011	16.51	-9.56	10.75	60.69	19.41	29.01	22.31	16.35
2012	-1.32	6.03	0.30	8.07	1.96	25.56	-3.82	6.50
2013	1.36	7.47	8.07	33.67	4.44	-6.26	-1.15	2.27
2014	-1.70	7.28	5.30	18.73	2.12	2.03	-7.08	10.38
2015	-13.36	-5.23	-0.84	-52.84	2.06	28.28	-6.31	8.78
2016	-4.31	-5.18	3.34	38.51	-2.79	-7.79	0.96	-1.26

Source: UNCTAD (2017).

The total agricultural imports are increasing. Among the major fruits and nuts imports, cashew nut is the biggest imported commodity for over a decade now. The second biggest is papaya (the data include dried peaches, pears, tamarinds and other edible fruits), followed by mango.

Figure 6. Imports of fruits, nuts and total agriculture, 2001 - 2016 ($US'000)



*Sources: ITC Trade Map (2017) & PSA CountryStat (2017); *** PSA CountryStat (2017) for basic data.*
Notes: * Mango includes guava and mangosteen.
**Include imports in dried peaches, pears, tamarinds and other edible fruits (excl. nuts, bananas, dates, figs, pineapples, avocadoes, guavas, mangoes, mangosteens, citrus fruits, grapes apricots, prunes and apples, unmixed).

The largest commodity exported among the major fruit and nut exports in the Philippines is the banana, which averaged at 70% from 2001 to 2016. Export of banana peaked in 2014 but significantly dropped in 2015 and 2016. One of its major causes was the El Niño phenomenon (PBGEA, 2017). The second largest export is pineapple, averaging at 13% followed by mango with an average of 9%.

The Philippines is among the top 10 banana exporters in the world occupying the number 6 spot as of 2016 in terms of export value as shown in Table 11.

Table 11. Top 10 Banana Exporters, 2016

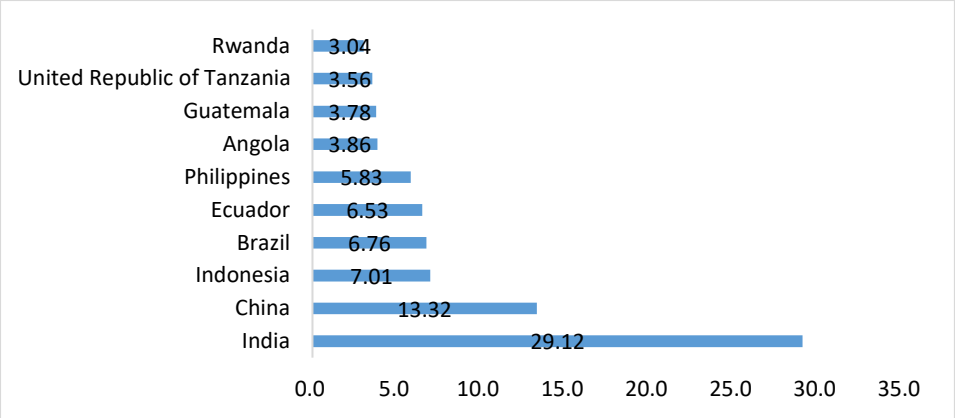
Exporters	Value (US$'000)
Ecuador	2,742,005
Costa Rica	996,815
Belgium	940,884
Colombia	914,937
Guatemala	789,908
Philippines	618,830
Netherlands	451,406
Dominican Republic	444,740
USA	431,228
Côte d'Ivoire	369,969

Source: ITC Trade Map (2017).

Figure 7 shows the leading countries in banana production in 2016. India towered over other countries in the production of banana at 29 million metric tons (MMT). China followed with

about 13 MMT while the Philippines rested at the sixth place behind Indonesia, Brazil and Ecuador producing about 6 MMT, as shown in the figure below.

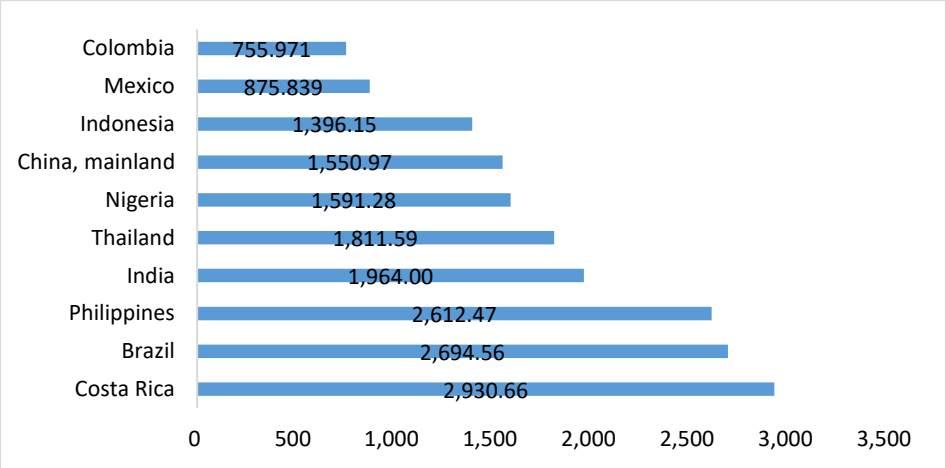
Figure 7. Leading Countries in Banana Production Worldwide in 2016 (MMT)



Source: FAOSTAT (2017).

In the case of pineapple production, in 2016, the top three leading countries in decreasing order were Costa Rica, Brazil and the Philippines with over two thousand metric tons (TMT) of production.

Figure 8. Leading Countries in Pineapple Production Worldwide in 2016 (in TMT)



Source: FAOSTAT (2017).

As for mango, in 2016, the Philippines occupies the 8th place in terms of export value (including guava and mangosteen) worldwide. The mango industry has significant contribution to the economy as it comes third in terms of GVA share, next to banana and pineapple.

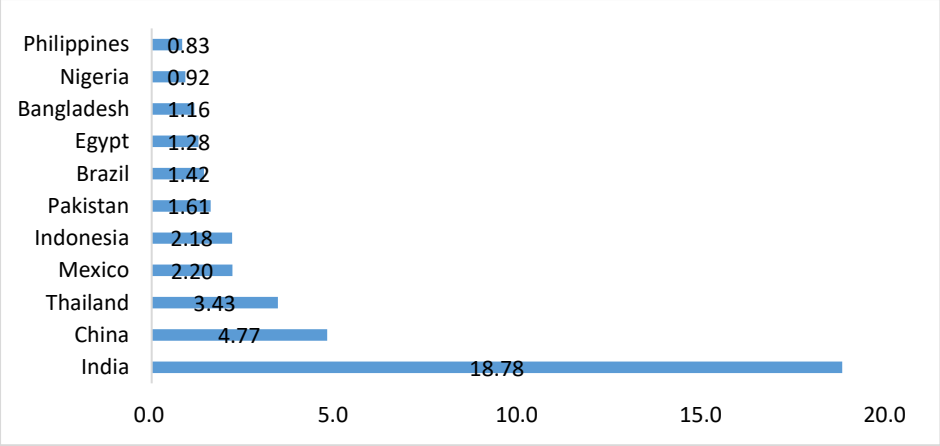
Table 12. Top 10 Mango, Guava and Mangosteen Exporters, 2016

Exporters	Value (US$'000)
Mexico	402,078
Netherlands	285,052
India	202,565
Peru	197,740
Brazil	180,331
Thailand	166,367
Spain	68,161
Philippines	66,865
Pakistan	65,835
Côte d'Ivoire	61,334

Source: ITC Trade Map (2017).

India dominated the other countries in mango production in 2016 with about 19 million metric tons (MMT). China followed behind with about 5 MMT and then Thailand with about 3 MMT. The Philippines fall far back at 11th place with about 0.8 MMT of production.

Figure 9. Leading Countries in Mango (including mangosteen and guava) Production Worldwide in 2016(in MMT)



Source: FAOSTAT (2017).

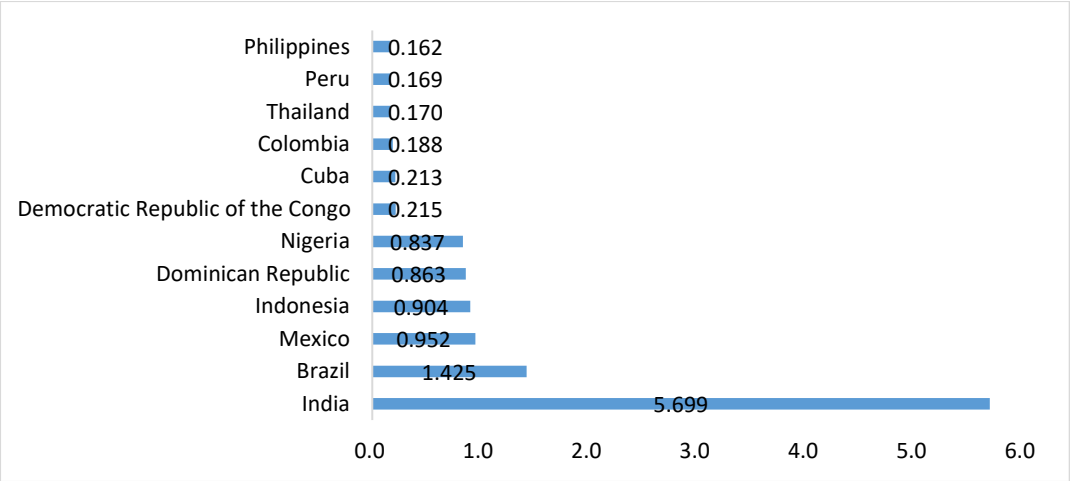
In the same year, 2016, papaya production was also largely dominated by India with about 6 million metric tons (MMT). Brazil came in second with about 1.4 MMT and then Mexico with about 1 MMT of production. The Philippines occupied the twelfth place with about 0.16 MMT of production.

Table 13. Top 10 Papaya Exporters, 2016

Exporters	Value (US$'000)	Rank
Mexico	92,834	1
Brazil	43,089	2
USA	22,383	3
Guatemala	22,308	4
Netherlands	22,201	5
China	13,998	6
Malaysia	9,128	7
India	8,048	8
Spain	4,800	9
Jamaica	4,439	10
Philippines	1,840	18

Source: ITC Trade Map (2017).

Figure 10. Leading Countries in Papaya Production Worldwide in 2016 (in MMT)



Source: FAOSTAT (2017).

In cashew, the Philippines rank 5th in worldwide production of cashew nut but fall far back at 24th in terms of export value as shown in Table 14 and Figure 11 below.

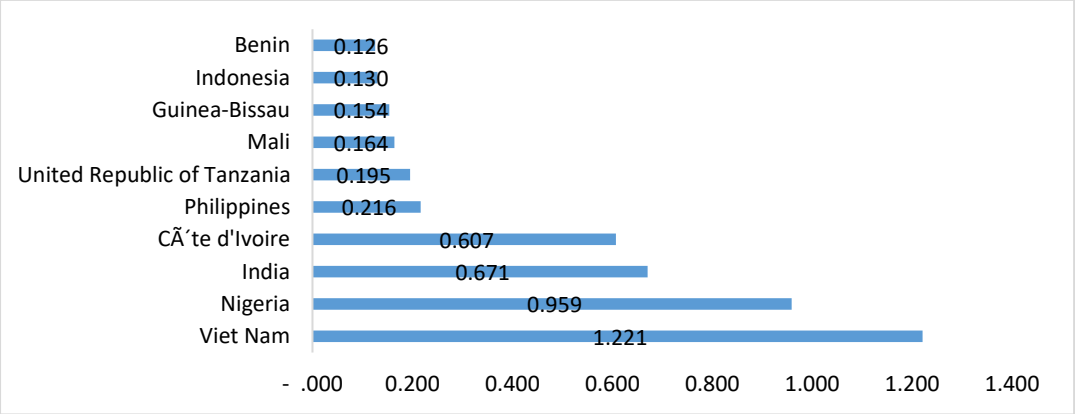
In 2016, Vietnam leads in cashew nut production with 1.22 million metric tons (MMT) of production. Nigeria followed at about 1 MMT. The Philippines is next to India and Cote d'Ivoire at fifth place with 0.216 MMT of production.

Table 14. Top 10 Cashew Nut* Exporters, 2016

Exporters	Value (US$'000)	Rank
Ghana	981,158	1
Côte d'Ivoire	340,737	2
Tanzania, United Republic of	318,011	3
Guinea-Bissau	209,390	4
Burkina Faso	105,619	5
Indonesia	100,261	6
Benin	38,079	7
Guinea	30,033	8
Nigeria	29,039	9
Mozambique	15,781	10
Philippines	489	24

Source: ITC Trade Map (2017).
Note: Refers to fresh or dried in shell.

Figure 11. Leading Countries in Cashew Nut with Shell Worldwide in 2016 (in MMT)



Source: FAOSTAT (2017).

III. Evolution the Philippine Industrial Policies

This chapter presents the evolution of the country's industrial policies from inward to outward looking, and the new industrial policy, aimed to prepare the manufacturing sector for the fourth industrial revolution. It lays out the framework for government programs and actions through these policies.

Inward Looking Industrial Development, Import Substitution Policy

The 1950s to 1970s was characterized by import substitution policy as the country's vehicle to industrialization. Protective tariffs, non-tariff barriers, foreign exchange controls were high, and quantitative restrictions supported inward-looking import-substitution policy. While this policy appeared to have initially worked given the resulting high level of capital per worker, and GDP annual growth of 6.4 percent in the 1960s-70s (Canlas, et al. 2009), it was not sustainable. The economy was facing balance of payments crisis, large external debt, inefficient manufacturing industries, and an export industry with weak backward linkages (Aldaba, 1994; Austria, 2002).

The import substitution incentives led to misallocation of resources and high capital intensity in production processes, which failed to make full use of the country's abundant labor resource. The share of labor-intensive manufactured goods to total exports remained small in the 1950s and 1960s. The manufacturing sector did not have the incentive to modernize and innovate because of lack of competition and assured access to a domestic market, even if essentially small. The protective tariff and non-tariff barriers to trade led to the rise of highly inefficient and uncompetitive manufacturing sector serving the domestic market. According to Yap (2002), the protectionist policies channeled resources to sectors where the economy did not have comparative advantage whereas our neighboring countries were already embracing export-led industrialization strategy. As pointed out by Llanto (2012), during this period, domestic firms were not able to develop the export capacity that would have expanded the market for tradable goods and created job opportunities for a growing domestic labor force.

The Export Incentives Act of 1970 (Republic Act No. 6135) was passed as a way out of the heavy import substitution of the 1950s and 1960s. This was government's first initiative to move away from import-substitution policy. In addition, the Export Processing Zone Authority (EPZA) was created in 1972 but remained relatively small without linkages to the rest of the economy.

Outward Looking Industrial Development, Export Orientation Policy

The 1980s and 1990s were characterized by an export promotion strategy with trade liberalization and major revisions in the investment incentive system. The overall policy however, remained biased against a more outward looking policy, and was still largely inward-oriented as indicated by the support given to 11 major industrial projects deemed "winners" by the Marcos administration technocrats (Llanto 2012). In the early part of the 1980s, a Latin American debt crisis occurred which led to severe liquidity crunch in developing countries and contraction of global trade. The country's economy was brought to a halt, when it suffered a

balance of payments crisis in 1983-1985, exacerbated by domestic political turmoil in 1983 and a foreign exchange crisis. The manufacturing activities declined with factories closing and labor being laid off.

There were attempts to liberalize trade in the early 1980s but it only took off in the late 1980s under the administration of Corazon Aquino. Correspondingly, trade and industrial policies were geared toward trade liberalization, privatization, and deregulation (Medalla, Tecson, Bautista and John Power and Associates, 1996; Medalla, 1998; Llanto, 2014). The economic and regulatory reforms in the post-Marcos period were aimed at recovery and stability after years of patchy economic performance in the martial rule period.

The Ramos administration unilaterally put in place a profound tariff reduction and import liberalization program geared for long-term industrial restructuring (Canlas, 1996). The Philippines continued to liberalize the economy in the 2000s by entering into various trade agreements such as ASEAN+1, the Japanese Philippines Economic Partnership Agreement (JPEPA), and free trade agreements (FTAs) such as ASEAN-EU, ASEAN-Hong Kong, China, Philippines European Free Trade Association, Regional Comprehensive Economic Partnership (RCEP), ASEAN Free Trade Area, ASEAN-Australia and New Zealand, ASEAN-India, ASEAN-Japan Comprehensive Economic Partnership, and ASEAN-PRC Comprehensive Economic Cooperation Agreement, and JPEPA.

Despite all the reforms, incentives and initiatives, manufacturing failed to recover in both value addition and employment. Limited resources flowed into the sector. Aldaba (2013) points to the need for a strong and modern industrial sector. From this perspective, a "new industrial policy" has been crafted by the present administration to reinvigorate the manufacturing sector and make it a major growth and employment driver. The new industrial policy looks at the most binding constraints affecting firm growth and productivity and focuses state intervention to such constraints.

Canlas et al. (2009) identified the lack of infrastructure, weak investor confidence arising from governance issues, and weaknesses in the regulatory environment and investment climate as the most binding constraints affecting industry growth, entry of new firms, and their movement to a higher technology scale. These findings prompted government to: 1) improve the competitiveness of industries, which requires improvement of the investment climate and efficient use of existing capacity expansion and expansion of productive capacity through technological catch-up, structural transformation; and 2) create and implement effective government policies to accelerate the growth and development of the private sector, through strengthened public and private sector (industry) collaboration for industrial and technological upgrading (Aldaba, 2013). Investments in hard infrastructure need to complement the proposed market-enhancing policies.

New Industrial Policy

Aldaba (2013) presents the framework for the country's new industrial policy. This framework defines the horizontal and vertical measures to achieve value added and employment growth targets as well as the coordination mechanism. Presently, the government is collaborating with the private sector in producing industry roadmaps, which identify measures to address

constraints to firm growth and productivity, and coordination mechanisms for consistent policies and interventions.

The **horizontal measures** focus on human resource development, technology upgrading and innovation, measures to address power, logistics and infrastructure costs, smuggling, and measures to promote investments and competitive exchange rate policy. The **vertical measures** are those that will close the supply-chain gaps in food, furniture and garments; integrate mechanisms that would link together different segments of iron and steel, copper, and chemicals industries; and expand domestic market and exports, i.e. automotive and shipping industries. The **coordination mechanism** serves as the venue for discussion, problem solving, and monitoring of horizontal and vertical measures (CPBRD 2013).

Manufacturing Resurgence Program (MRP)

In pursuit of the Philippine government's goal of achieving inclusive growth, the Department of Trade and Industry is implementing the Manufacturing Resurgence Program (MRP). The MRP aims to rebuild the existing capacity of industries, strengthen new ones, and maintain the competitiveness of industries with comparative advantage. It also seeks to build-up agriculture-based manufacturing industries that generate employment and support **small-holder farmers** and **agri-cooperatives** through product development, value-adding, and integration to big enterprises for marketing and financing purposes.

The DTI implements the MRP in coordination with key government agencies, including the Board of Investments, Department of Labor and Employment, Department of Science and Technology, Department of Energy, Department of Agriculture, Commission on Higher Education, Technical Education and Skills Development Authority, National Electrification Administration, National Power Corporation, and the Philippine Coconut Authority.

Under the Philippine Development Plan (PDP) 2017-2022, the target is to reduce poverty incidence from 21.6 percent in 2015 to 14.0 percent by 2022, specifically in agriculture, and in lagging regions with high poverty incidence and inequality. Achieving this target requires strategies that will expand opportunities and enhance competition in agriculture for growth of output and income. One way is to promote linkages with the industry and service (I&S) sectors for more efficient value-adding processes and more effective commercialization. This approach was identified as a major strategy in the PDP 2011-2016, and is being expanded in the current administration, considering that the I&S sector continues to be the major source of growth in the country.

As stated in Chapter 9 "Expanding Economic Opportunities in Industry and Services through *Trabaho at Negosyo"* of PDP 2017-2022, the government will develop a globally-competitive and innovative I&S with strong forward and backward linkages, especially for micro, small and medium enterprises (MSMEs) in regional and global production networks and global value chains. Aligned with this, the Department of Industry (DTI) formulated a new Comprehensive National Industrial Strategy (CNIS) "Trabaho at Negosyo" (Employment and Entrepreneurship).

The CNIS is aimed at upgrading the manufacturing, agriculture, and services sectors, while strengthening their linkages into domestic and global value chains. The goal is to develop globally competitive industries with strong forward and backward linkages, characterized by deep participation, particularly by MSMEs, in regional and global production networks and global value chains. Strategic actions include human resource development; SME development; innovation and R&D activities; green industries; aggressive promotion and marketing programs; infrastructure investments to address the high cost of power, logistics and shipping; and streamlining and automation of government procedures and regulations affecting business operations (DTI BOI, 2017). These actions are expected to generate more income opportunities, build an entrepreneurial culture, provide policy program support to develop competitive MSMEs, and promote more inclusive business models and social enterprises to link MSMEs into the value chain of big businesses.

Five industries are prioritized under the CNIS: manufacturing, infrastructure and logistics, agribusiness, IT-BPM/KPO, particularly knowledge process outsourcing and tourism. According to Aldaba (2017), "agribusiness is the driver for regional economic transformation. Modern agribusiness entails improving agricultural productivity that paves the way to the development of a vibrant manufacturing sector. Priorities in agribusiness include rubber, coconut, ***mangoes***, coffee, ***banana***, palm oil, and other high value crops. Huge investments in infrastructure and logistics would boost the competitiveness of industries and improve connectivity within the country.

At the heart of the Philippines Industrial Strategy is innovation. It is the crucial ingredient for the long-term growth amidst globalization, ASEAN integration and Industry 4.0, which further elevates competition. DTI is deploying the **Inclusive Innovation Industrial Strategy i^{3}S**, which integrates Philippine industries and close value/supply chain gaps.

It is in "innovation that entrepreneurs can create their unique selling proposition and business models with added value leading to higher income propensity" (Lopez 2017). The **i^{3}S** is global value chain-focused, innovation & entrepreneurship-centered, and industry clustered-based.

The five major pillars of i^{3}S. The first pillar is "Building new industries, clusters agglomeration". This is carried out by the following strategies: address supply/value chain gaps; expand domestic markets; attain economies of scale; exports hubs; investment promotions; incentives; and domestic ecozones. The second pillar is "Capacity building, HRD" with the following strategic actions: HRD, training programs to improve skills; tie-ups with universities and training institutions. Third is "Innovation, Entrepreneurship", which is put into effect through the following: link government, academe, and industry; strengthen collaboration towards market-oriented research; R&D incentives; and shared facilities. The fourth pillar is "MSME Growth and Development" put into action through the 7Ms strategies (mindset, mastery, mentoring, money, machine, market, models); SSFs; access to finance and technology; and linking with large enterprises. The fifth major pillar is the "Ease of doing business, investment environment", which has the following strategic actions: address corruption, smuggling, bureaucratic practices, streamlining, automation, single mechanism for coordinating registrations, permits.

The implementation of the manufacturing resurgence program (MRP) is guided by the analysis and recommendations of industry roadmaps. Under the Industry Development

Program's (IDP) Industry Roadmapping Project (IRP), the DTI-BOI works in partnership with the industry and the academe in the formulation and implementation of roadmaps for the development of the country's manufacturing industries. This involves defining the industry's objectives, assessing its state and economic performance, identifying binding constraints to its growth, and recommending strategies for upgrading. Currently, there are 44 industry roadmaps submitted to the BOI, of which 36 are being implemented, which are the bases of the CNIS.

The processed fruits and nuts (PF&N) cluster has been identified as a key industry. Given the diversity and volume of fruits and nuts in the Philippines, the PF&N Cluster under the leadership of DTI Region 10 Director, carried out a prioritization of commodities in the cluster taking into account five considerations: 1) growth potential, 2) poverty reduction potential, 3) prospects for success, 4) outreach and 5) program related aspects. The Cluster also considered the significance of the commodity to the PF&N industry as a whole. The following PFN commodities have been identified as top priorities: ***banana, pineapple, papaya, dragon fruit, mango, calamansi, cashew nut, and pili nut***.

IV. Domestic and Global Trends for the Eight Selected Fruits and Nuts

This chapter provides the situationer and performance by commodity (for banana, pineapple, mango, calamansi, papaya, dragon fruit, pili nut and cashew nut) in terms of production, area, yield, trade, supply, utilization and domestic consumption per capita, domestic price trends, value chain and industry players.

Banana

Among the fruit crops, banana has the largest area harvested as of 2016. It accounts for 3.42% of the total crop harvested area (Table 15). The commonly grown banana varieties in the country are cavendish, bungulan, lacatan, latundan, and saba or cardaba. Cavendish is grown for export in plantation scale in southern Mindanao. The other varieties are small bananas mostly grown in smallholder farms and planted as an intercrop. Lakatan and latundan are also grown commercially for consumers in Luzon and Visayas urban centers. Cardaba is grown mainly for banana chips processing.[2]

Table 15. Philippine Area Harvested/Planted, 2016

Crops	Area (ha.)	Percentage
Palay	4,556,043	35.15
Coconut	3,565,059	27.51
Corn	2,484,465	19.17
Banana	442,865	3.42
Other Fruits	344,900	2.66
Other Crops	1,567,833	12.10
Total	12,961,165	100.00

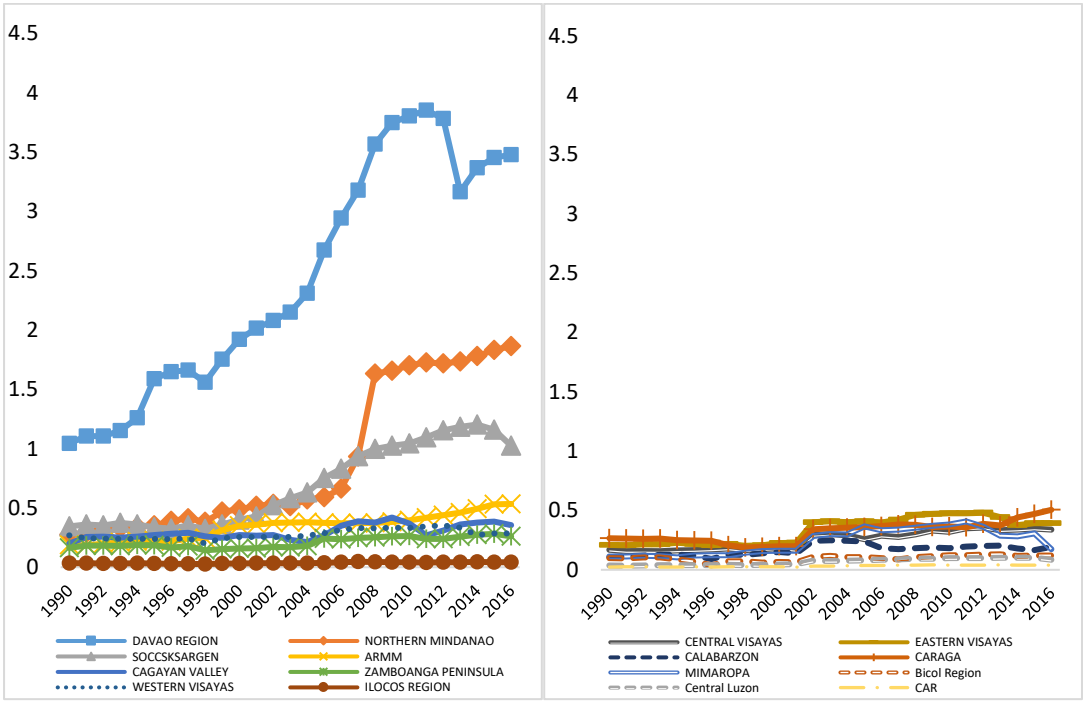
Source: PSA CountryStat (2017).

Production

From 2009 onwards, Davao, Northern Mindanao and SOCCSKSARGEN produced the bulk of the banana in the country with annual production of over one million metric tons (MMT). Banana production in Davao Region dwarfed those in other regions with average production of 3.5 MMT in the past decade. Northern Mindanao trailed behind with 1.6 MMT while SOCCSKSARGEN, at 1.1 MMT. All the other regions had average productions significantly below one MMT.

[2] Philippine Agribusiness Competitiveness and Benchmarking Study (2017).

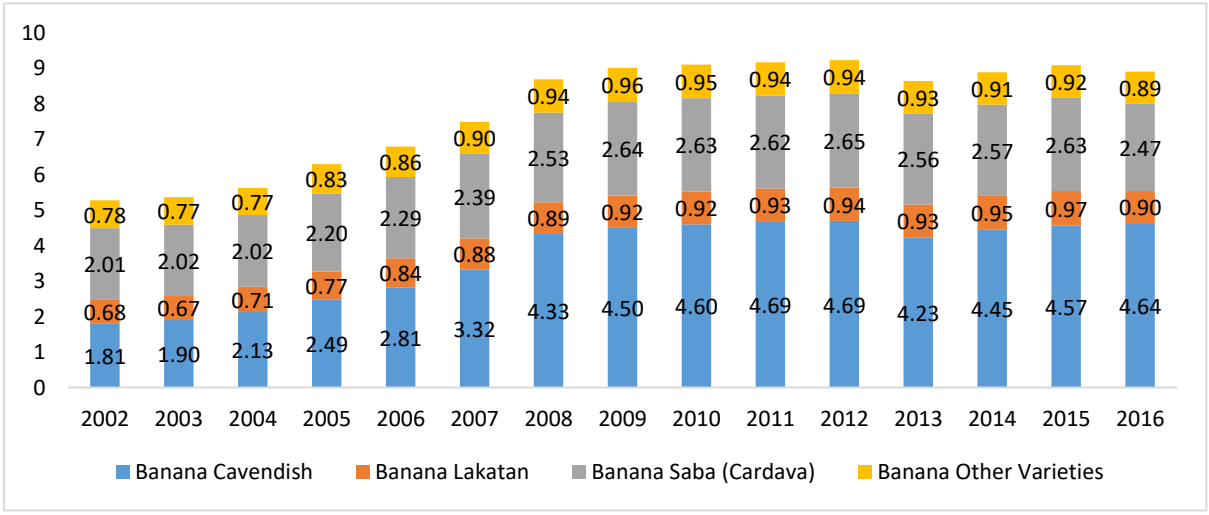
Figure 12. Banana Production (including Cavendesh, Lakatan & Saba), MMT, 1990 - 2016



Source: PSA CountryStat (2017).

Cavendish is the largest variety of banana grown in the country, essentially for export. The second largest is Saba or cardava banana, which accounts for about one third of the banana production. This variety is usually used as ingredient in food preparation and processing. The rest is taken up by lacatan and other varieties.

Figure 13. Production of Banana by Variety, 2002 - 2016, in MMT



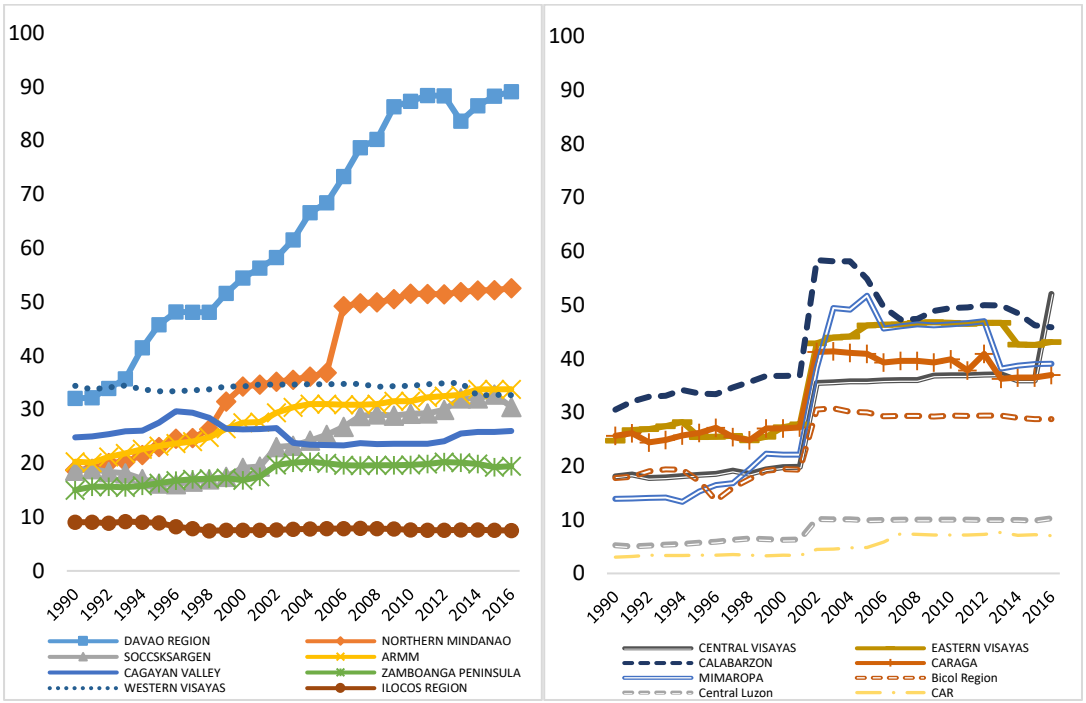
Source: PSA CountryStat (2017).

Area

In the last 3 years, Davao Region has the largest average area of about 88 thousand hectares followed by Northern Mindanao with an average area of 52 thousand hectares. The rest of

the region has areas ranging from an average of 5 thousand to 34 thousand hectares. After 2002, the growth in area planted of all regions except for Davao Region, Northern Mindanao, SOCCSKSARGEN and ARMM plateaued if not showing a declining trend. In Davao Region, the growth in area is much steeper between 1998 and 2012. However, it dropped in 2013 because of typhoon Pablo, which hit the country in December 2012. In Northern Mindanao, a sharp increase was experienced in 2006, followed by a slow steady growth.

Figure 14. Banana Area Planted/Harvested (including Cavendesh, Lakatan & Saba), '000 ha., 1990 - 2016

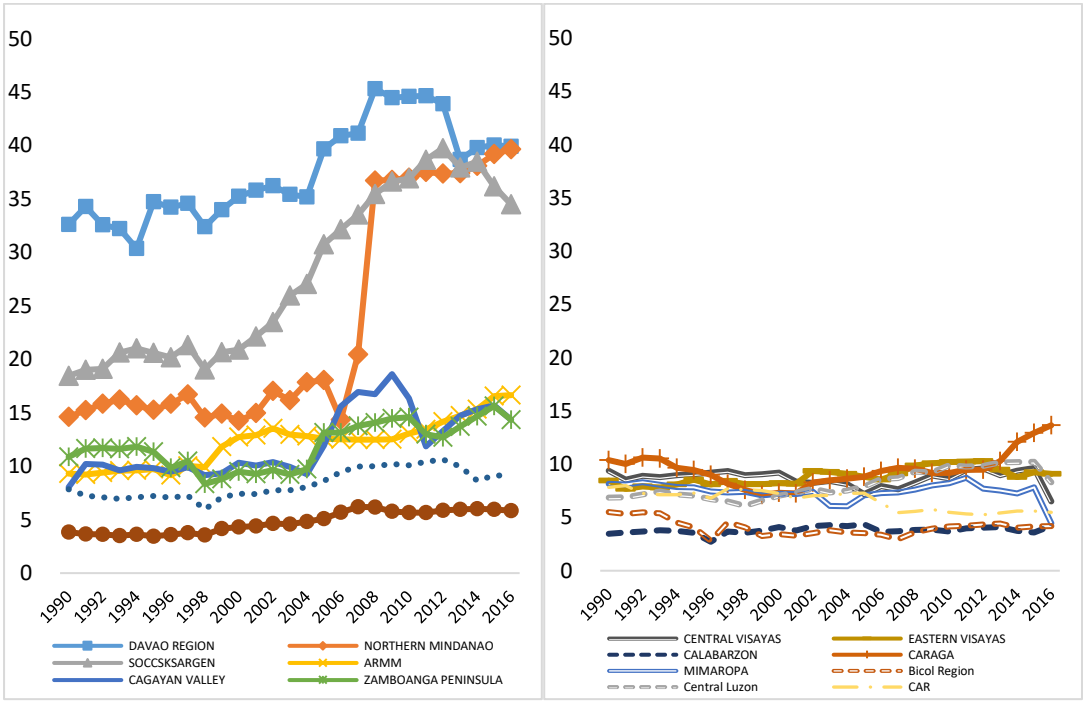


Source: PSA CountryStat (2017).

Yield

Across the years, Davao Region, Northern Mindanao and SOCCSKSARGEN have the highest average yields of over 20 tons per hectare. All other regions fall below 15 tons per hectare.

Figure 15. Banana Yield (including Cavendesh, Lakatan & Saba), T/ha., 1990 - 2016

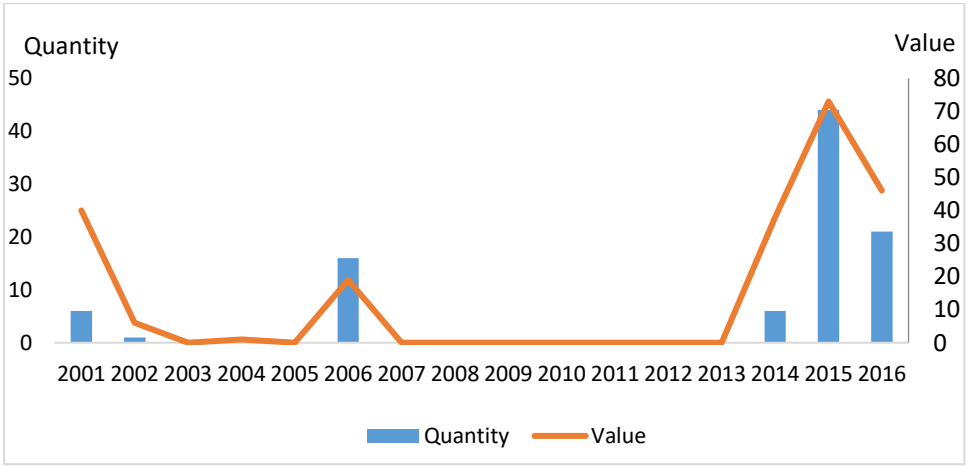


Source: PSA CountryStat (2017).

Imports and Exports

Importation of banana in the Philippines is minimal. It only peaked in 2015 with 44 tons but it dropped in the following year to 21 tons.

Figure 16. Import of Banana in Value ($'000) and Quantity (tons), 2001-2016



Source: ITC Trade Map (2017).
Note: Refers to bananas, including plantains, fresh or dried (product code: 080300).

Banana imports by product type and major suppliers are shown in the table below. Banana imports mainly consisted of banana ketchup (90%) and banana preserved by sugar (9%). For a more detailed table refer to Appendix 1.

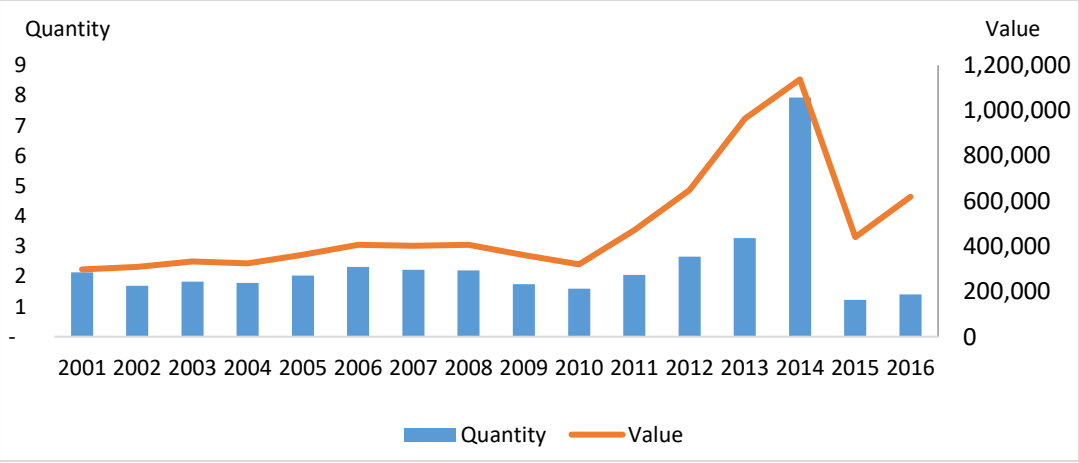
Table 16. Average Banana Import by Product Type, Quantity, Value & % Share, 2003 - 2016

Product Type	Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Suppliers
Banana, fresh	0803000001	8	1	0.29	Thailand, Japan
Banana, dried	0803000001	5	1	1	China
Banana, chips/crackers	2008994006	1	0.4	0.21	Thailand
Banana, flour, meal and powder	1106300002	0.03	0.07	0.03	Japan
Banana, ketchup	2103909001	2,412	182	90	Japan, Vietnam, Hong Kong, China, USA, Australia, UK Great Britain & N. Ireland, Italy, Singapore
Banana, preserved by sugar		45	18	9	Thailand, USA, Singapore

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Over the years, banana exports have been growing until 2015 when it significantly dropped from its peak of about 8 MMT to its lowest at 1.2 MMT. The ”El Nino” phenomenon, which hit the country in 2015 and lingered up to 2016, was the main culprit for this sudden decrease in export volume. A substantial part of these exports were banana chips or crackers, with an export value of $67.8 M in 2016 (DTI, 2017).

Figure 17. Export of Banana in Value ($'000) and Quantity (MMT), 2001-2016



Source: ITC Trade Map (2017).
Note: Refers to bananas, including plantains, fresh or dried (product code: 080300).

As in table 11, the ratio of Processing (Utilization) to gross supply ranges from 15% to 20%. There was a steady increase from 17% to 21% in 2001 to 2010, before declining to 15% in 2014 followed by a sharp increase to 20% 2015 and slowly increasing again.

Table 17. Banana Supply and Utilization, 2001 -2016

Year	Supply		Utilization				Consumption	
	Production (MT)	Gross Supply (MT)	Exports (MT)	Feeds and Waste (MT)	Processing (MT)	Total Net Food Disposable (MT)	UT Per Capita (kg/yr)	Consumption (MT/yr)
2001	5,059,360	5,059,360	1,600,707	207,519	864,663	2,386,471	30.62	2,411,888
2002	5,274,826	5,274,826	1,684,986	215,390	897,460	2,476,990	31.16	2,506,805
2003	5,368,977	5,368,977	1,829,384	212,376	884,898	2,442,319	30.12	2,473,848
2004	5,631,250	5,631,250	1,785,458	230,748	961,448	2,653,596	32.1	2,689,466
2005	6,298,225	6,298,225	2,024,321	256,434	1,068,476	2,948,994	34.6	2,953,761
2006	6,794,564	6,794,564	2,311,540	268,981	1,120,756	3,093,287	35.57	3,089,864
2007	7,484,073	7,484,073	2,217,741	315,980	1,316,583	3,633,769	41.02	3,621,213
2008	8,687,624	8,687,624	2,192,553	389,704	1,623,768	4,481,599	49.54	4,440,335
2009	9,013,186	9,013,186	1,664,055	440,948	1,837,283	5,070,900	55.71	5,067,911
2010	9,101,341	9,101,341	1,590,066	450,677	1,877,819	5,182,779	55.65	5,138,743
2011	9,165,046	9,165,046	2,055,510	426,572	1,777,384	4,905,580	51.73	4,850,726
2012	9,226,768	9,226,768	2,646,118	394,839	1,645,163	4,540,648	47.05	4,481,949
2013	8,646,417	8,646,417	3,266,548	322,792	1,344,967	3,712,110	37.8	3,658,832
2014	8,884,857	8,884,858	3,630,976	315,233	1,313,471	3,625,178	36.3	3,570,293
2015	9,083,929	9,083,929	1,795,219	437,323	1,822,178	5,029,209	49.52	4,947,991
2016	8,903,684	8,903,698	1,733,836	430,192	1,792,466	4,947,204	47.92	4,863,821

Source: PSA CountryStat (2017).

The breakdown of banana exports by product type is presented in Table 18. Fresh banana with major markets in Japan, China, Iran and Korea comprise the bulk of the export, with 89% share in value. Banana chips/crackers took up at 7% of the export from 2003 to 2016 while the remaining 4% is taken up by other product types. A more detailed table is given in Appendix 2.

Table 18. Banana Export by Product Type, Quantity, Value & % Share, 2003 - 2016

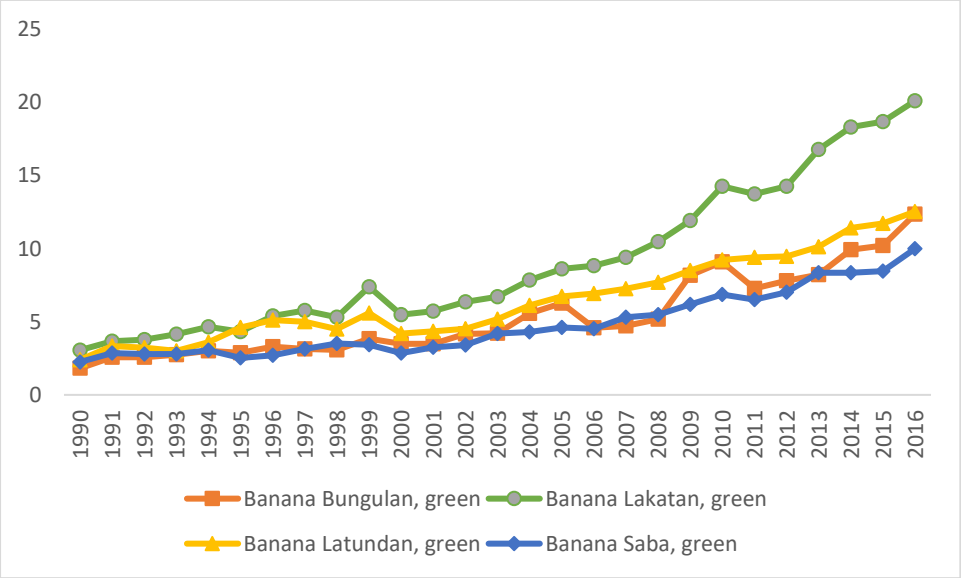
Product Type/ Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Markets
Banana, fresh (0803000001)	2,172,020	31,415	89.60	Japan, China, Iran, Korea
Banana, flour, meal and powder (1106300002)	436	9	0.03	Korea, Germany, Singapore, Hong Kong, Thailand, UAE, Saudi Arabia, China, Taiwan
Banana, dried (0803000001)	326	911	2.60	Thailand, USA, Japan, Vietnam, UAE, China, Korea
Banana, preserved by sugar	2,045	287	0.82	USA, Vietnam, Germany, Canada
Banana chips/crackers (2008994006)	33,910	2,162	6.17	USA, China, Germany, Vietnam, Singapore, Malaysia,
Banana Ketchup (2103909001)	5,462	280	0.75	USA, Saudi Arabia, Canada, UAE, Italy

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Price Trends

Farmgate prices of banana were generally increasing. The lakatan variety has the highest price and showed a steeper increase compared with the other varieties. This is followed by latundan, which showed steady increase after a drop in 2000. Farmgate prices of bungulan variety had sharp fluctuations over time but generally trended upward. The saba variety has the lowest price among the four varieties but also showed an upward trend.

Figure 18. Farmgate Prices of Banana by Variety, 1990 to 2016 (peso per kg)



Source: PSA CountryStat (2017).

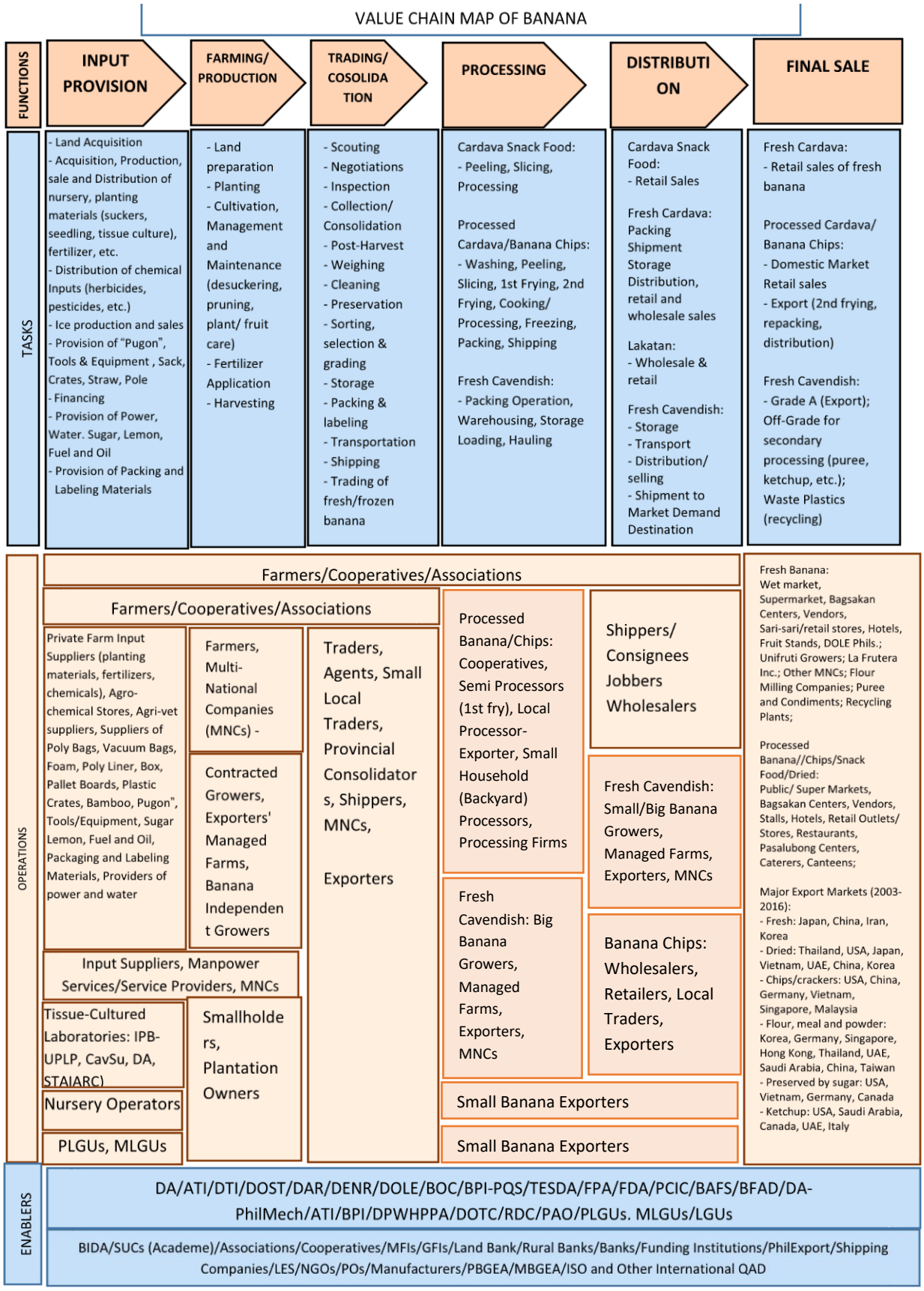
Value Chain Analysis and Industry Players

The value chain map for banana in Figure 19 shows the various functions involved from input provision to farming, trading, processing, distribution, up to final sale. At each stage, the tasks are specified and the corresponding operations that involved different industry players. At the bottom are the government and private agencies identified as the enablers.

Banana has many small and big players selling in established domestic and international markets both for fresh and processed fruit. Among the major export markets for 2003-2016 are the following: (1) Japan, China, Iran, Korea for fresh fruit; (2) Thailand, USA, Japan, Vietnam, UAE, China, Korea for dried fruit; (3) USA, China, Germany, Vietnam, Singapore, Malaysia for chips/crackers; (4) Korea, Germany, Singapore, Hong Kong, Thailand, UAE, Saudi Arabia, China, Taiwan for flour, meal and powder; (5) USA, Vietnam, Germany, Canada for preserved by sugar; and (6) USA, Saudi Arabia, Canada, UAE, Italy for banana ketchup.

Table 19 gives the distribution of banana processors by region. The March 2019 inventory of PFN Cluster indicates a relatively spread distribution across all regions. However, most of the processors are in Region 6, with 18% of the 575 total. The next highest concentration of banana processors is in Region 2 at 16%. Region 8 and CAR are third and fourth.

Figure 19. Value Chain Analysis of Fresh and Processed Banana



Sources: DA (Mindanao Cluster, Luzon B Cluster, CARAGA), RDC 11, and PSA (2018).
Note: This is a consolidated value chain analysis for Cavendish, Cardava, Lakatan, Processed Banana/Snackfood.

Table 19. Distribution of Industry Processors for Banana

Region	BANANA Processors	% to Philippines
CAR	66	11%
1		0%
2	90	16%
3	28	5%
4A	18	3%
4B	6	1%
5		0%
6	105	18%
7	16	3%
8	72	13%
9	25	4%
10	41	7%
11	50	9%
12	38	7%
CARAGA	20	3%
Total	575	100%

Source: PFN Regional Inventories of Industry Players (2019).
Note: The list of Banana Processors may overlap with the lists of processors for other commodities since it is common for a company to be processing more than one commodity.

Pineapple

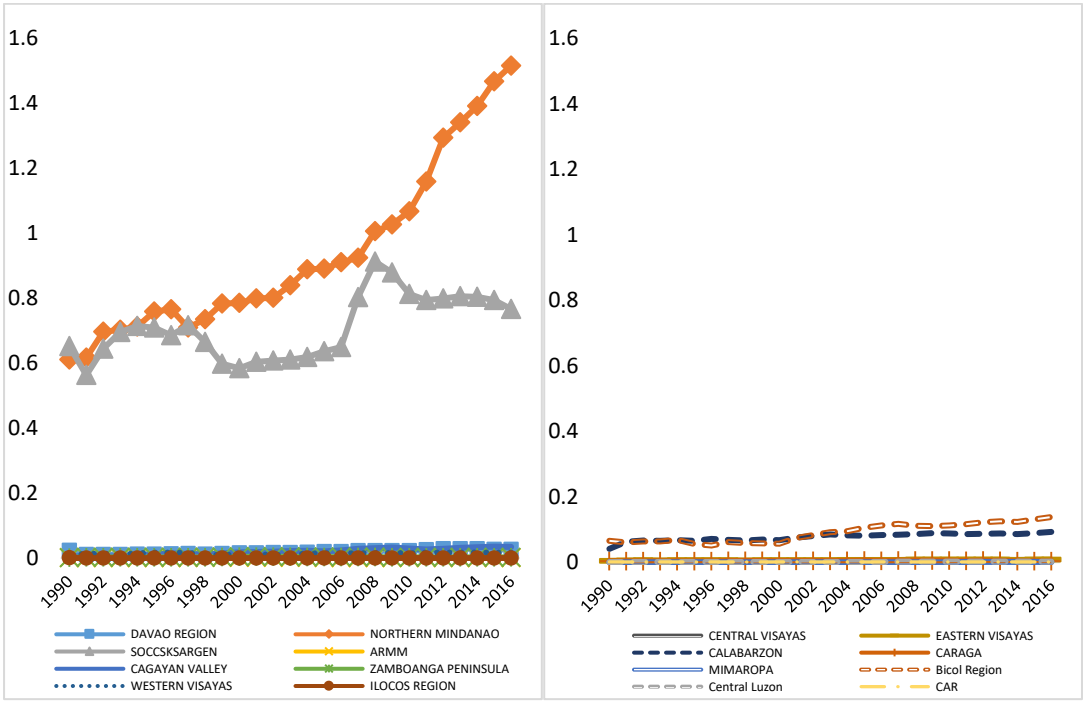
Pineapple is second to banana among the fruit crops with the largest share of GVA and export in the country. Large pineapple plantations in Northern Mindanao and SOCCSKSARGEN placed the Philippines as the third ranking country in pineapple export worldwide as of 2016. This is made possible by the large multi-national companies like Dole, Del Monte and other processors/exporters, which exported fresh, canned and fruit cup products, and complemented by farmers' cooperative export of fresh pineapple.

In addition to consumption, the pineapple's leaves are the source of fine grade textile fibers which can be used in the manufacture of the luxurious and famous piña cloth, twines and cordage, and employed as a component of wall paper and furnishings, amongst other uses. Its leaf juices and the unripe fruit are a source of medicine for anthelmintic, diuretic and digestive refrigerant. The by-products from fruit processing can be used in making wine, vinegar and 'nata' or gel. Other waste from canning can be pulped and dried for livestock feeds.

Production

Pineapple production in the Philippines is located largely in Northern Mindanao and SOCCSKSARGEN where large plantation of giant companies like Del Monte and Dole are also located. Annual productions in all other regions are below 0.2 MMT. In Northern Mindanao, the increase in production has a much steeper compared to that of SOCCSKSARGEN.

Figure 20. Pineapple Production, MMT, 1990 - 2016

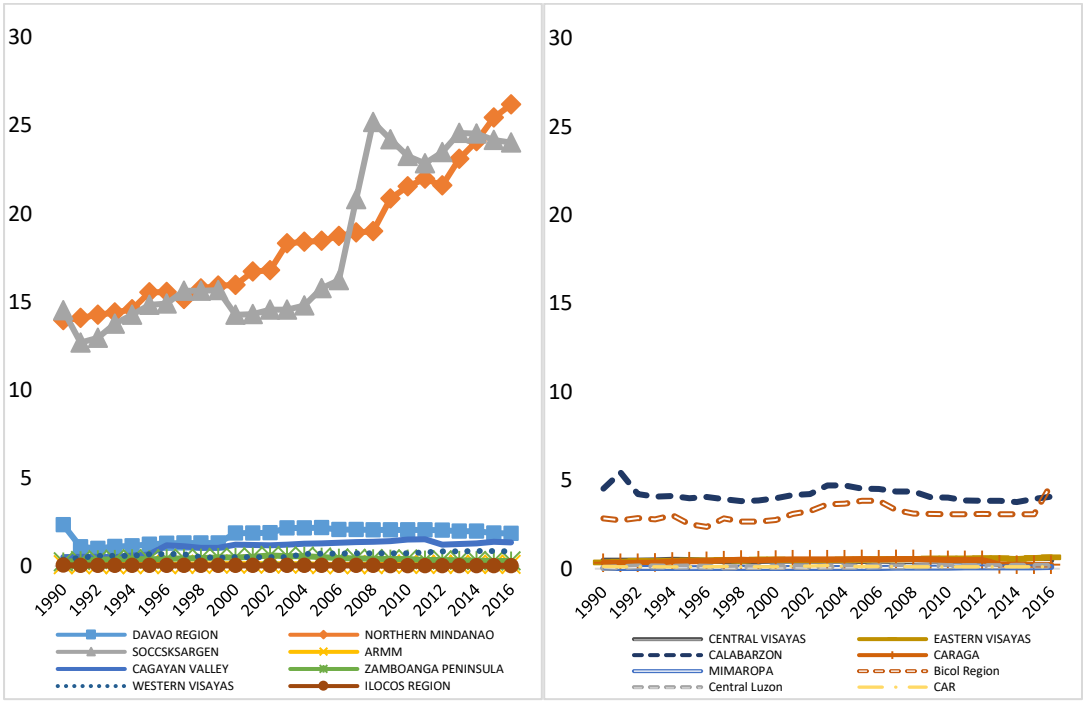


Source: PSA CountryStat (2017).

Area

In the last two decades, over 70% of the pineapple area planted/harvested are in Northern Mindanao and SOCCSKSARGEN. Northern Mindanao has the largest average area of 19.4 thousand hectares while SOCCSKSARGEN closely followed at 19.2 thousand hectares. The rest of the regions only had less than 5 thousand hectares.

Figure 21. Pineapple Area Planted/Harvested, '000 ha., 1990 - 2016

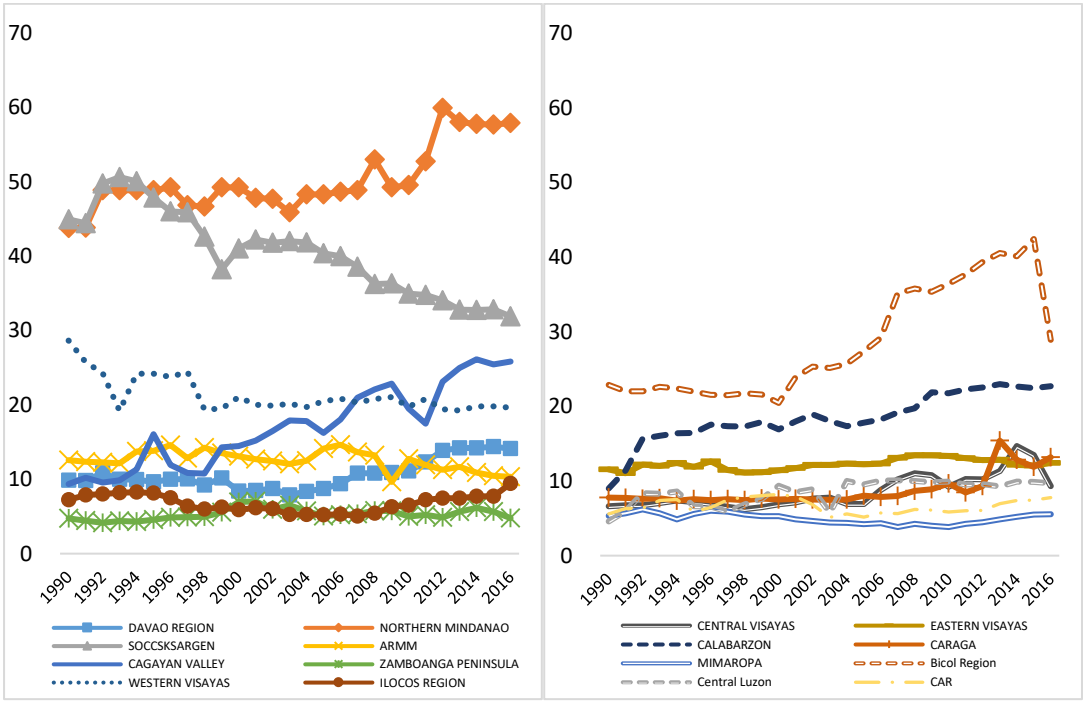


Source: PSA CountryStat (2017).

Yield

Northern Mindanao has the highest yield averaging at 50 T/ha. It exhibits an upward trend over time. This is followed by SOCCSKSARGEN with average of 41 T/ha. However, the yield of SOCCSKSARGEN declined from 45 T/ha. in 1990 to 32 T/ha. in 2016. Other regions exhibiting a sharper increase in yield are Cagayan Valley, Calabarzon and Bicol Region. But, in the case of Bicol Region, the sharp increase was thwarted by a sudden drop in 2016.

Figure 22. Pineapple Yield , T/ha., 1990 - 2016

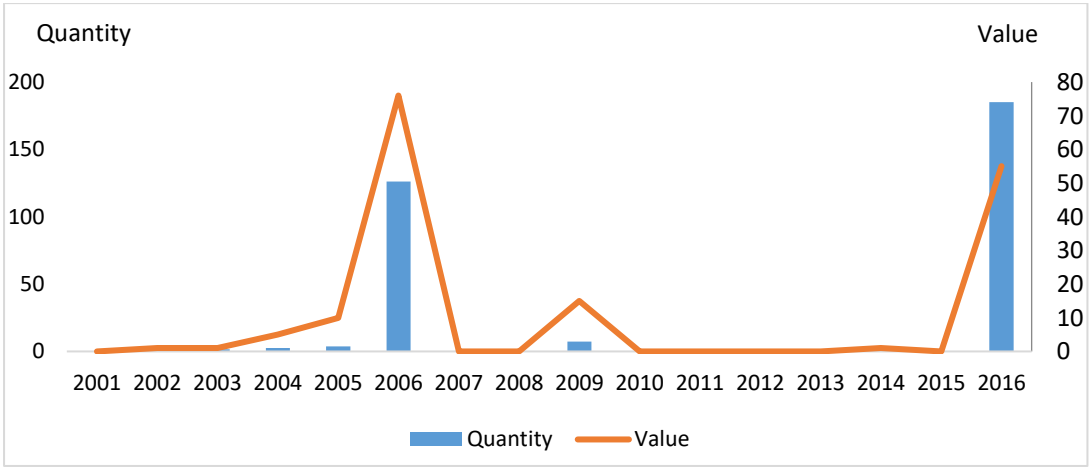


Source: PSA CountryStat (2017).

Imports and Exports

Over more than a decade, imports of pineapple to the country has been minimal in almost all years except in 2006 and 2016 when 126 tons and 185 tons were respectively imported. However, when compared to the country's exports, which are measured in million metric tons, these quantities are considered small.

Figure 23. Import of Pineapple in Value ($'000) and Quantity (tons), 2001-2016



Source: ITC Trade Map (2017).
Note: Refers to fresh and/or dried pineapple with product code 08043000.

Most of the pineapple imports, or 86%, are in the form of juices and concentrates from Thailand, USA, Spain, China, Denmark, Korea, Vietnam, Indonesia, Singapore, Turkey, and Brazil, followed by prepared and preserved pineapple at 6.59%.

Table 20. Average Pineapple Import by Product Type, Quantity, Value & % Share, 2003 - 2016

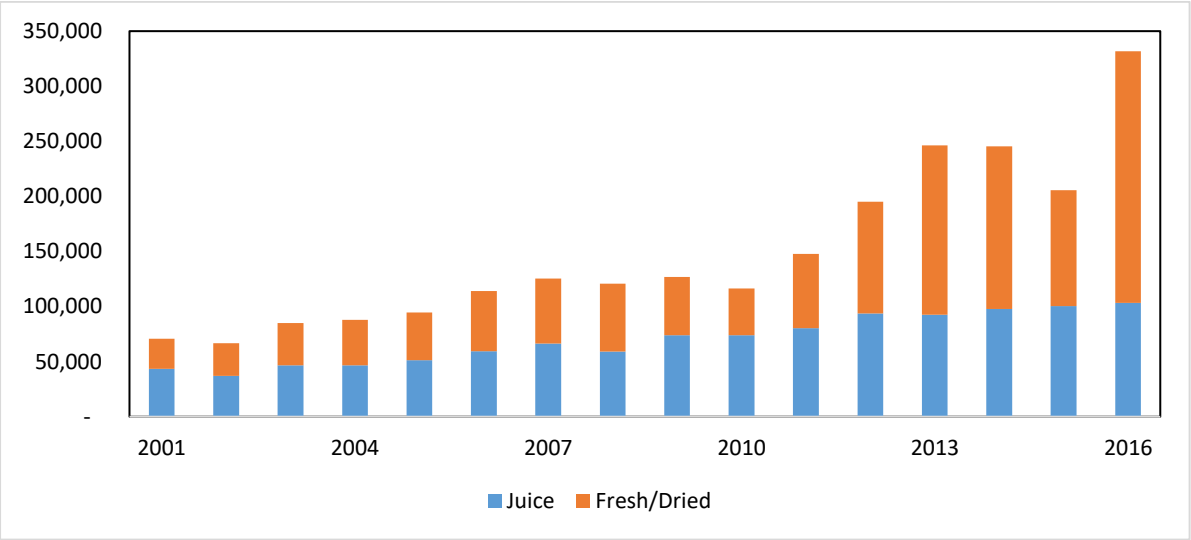
Product Type	Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Suppliers
Pineapple, fresh	0804300001	24	1	1.35	Belgium, Thailand, Korea, Taiwan,
Pineapple, preserved by sugar		9	2	2	Thailand
Pineapple, prepared/ preserved		120	5	6.59	USA, Korea, Singapore, China, Thailand
Pineapple, otherwise prepared/ preserved		40	2	3.14	Honduras, Thailand
Pineapple, juice/ juice concentrates/ other than concentrates	200940, 200941, 200949	2,116	65	86	Thailand, USA, Spain, China, Denmark, Korea, Vietnam, Indonesia, Singapore, Turkey, Brazil
Pineapple, dried	0804300001	2	0	0	Thailand, USA
Pineapple, vinegar	2209000002	2	0	0	Australia, Italy

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Export of fresh pineapple only ranged from 7.6 % to 23% of national production. However, a large volume of processing ends up as exports as well as shown in the figure below.

The export of fresh or dried pineapple has been erratic but generally showed an upward trend. It peaked in 2016 with about $228 million value of export. Pineapple juice export, on the other hand, has a modest but steady increase overtime.

Figure 24. Value of Pineapple exports by product type, 2001-2016 ($'000)



Source: ITC Trade Map (2017).
Note: Product code of fresh or dried pineapple is 08043000; product codes of pineapple juice are 20094000, 20094100, and 20094900.

The ratio of UT processing to gross supply has steadily dropped from 40% in 2001 to 38% in 2006. It then sharply rose to 41% in 2010 before sharply dropping to 35% in 2013, before it suddenly rose to 39% in 2015 and dropped to 34% in 2016.

Table 21. Pineapple Supply and Utilization, 2001 -2016

Year	Supply		Utilization				Consumption	
	Production (MT)	Gross Supply (MT)	UT Exports (MT)	UT Feeds and Waste (MT)	UT Process-ing (MT)	UT Total Net Food Disposa-ble (MT)	UT Per Capita kg/yr	Consumption (MT/yr)
2001	1,617,906	1,617,906	153,149	87,885	644,493	732,379	9.4	740,423
2002	1,639,161	1,639,161	178,639	87,631	642,630	730,261	9.19	739,331
2003	1,697,952	1,697,953	194,595	90,201	661,478	751,679	9.27	761,373
2004	1,759,813	1,759,816	204,072	93,345	684,527	777,872	9.41	788,407
2005	1,788,218	1,788,218	210,754	94,648	694,084	788,732	9.25	789,662
2006	1,833,908	1,833,908	262,133	94,307	691,581	785,887	9.04	785,279
2007	2,016,462	2,016,462	276,400	104,404	765,627	870,031	9.82	866,902
2008	2,209,336	2,209,336	291,676	115,060	843,770	958,830	10.6	950,092
2009	2,198,497	2,198,499	204,505	119,640	877,357	996,997	10.95	996,116
2010	2,169,233	2,169,233	164,553	120,281	882,059	1,002,340	10.76	993,583
2011	2,246,806	2,246,806	263,272	119,012	872,755	991,767	10.46	980,835
2012	2,397,745	2,397,745	397,018	120,044	880,320	1,000,363	10.37	987,839
2013	2,458,528	2,458,528	489,743	118,127	866,265	984,393	10.02	969,881
2014	2,507,098	2,507,098	487,492	121,176	888,627	1,009,803	10.11	994,371
2015	2,582,699	2,582,699	315,829	136,012	997,423	1,133,435	11.16	1,115,097
2016	2,612,474	2,612,542	599,343	120,792	885,808	1,006,599	9.75	989,613

Source: PSA CountryStat (2017).

Table 22 gives the breakdown of pineapple exports by product type. Prepared/preserved pineapple with major markets in USA, South Korea, Singapore and Japan comprise the bulk of the export, with 53.93% share in value. Fresh pineapple took up 25% of the export from 2003 to 2016 while the remaining 21.07% is taken up by other products types. For more detailed table, refer to Appendix 3.

Table 22. Average Pineapple Export by Product Type, Quantity, Value & % Share, 2003 - 2016

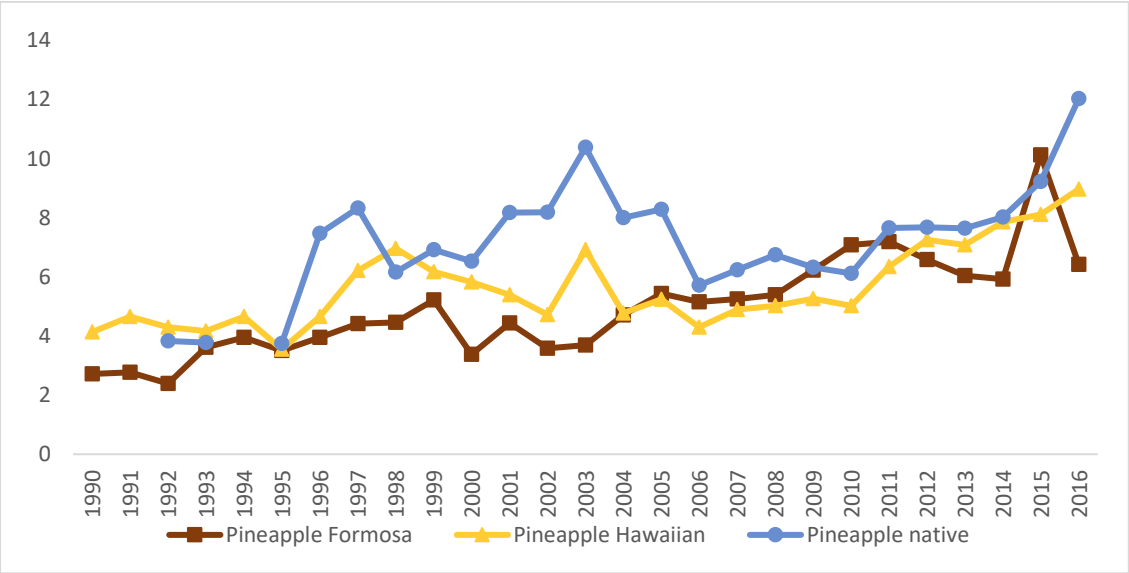
Product Type	Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Markets
Pineapple, fresh	0804300001	314,715	4,301	25	Japan, Korea, China
Pineapple, dried (0804300002)		169	37	0.21	Germany Japan, USA, Singapore, Australia, Malaysia, Netherlands, Hong Kong, Guam, Hawaii, Poland
Pineapple, juice/ juice concentrate and other than concentrates	200940, 200941, 200949	109,174	3,595	21	USA, Netherlands
Pineapple, prepared/preserved		211,893	9,294	54	USA, Korea, Singapore, Japan
Pineapple, nata de pina	2106909911	41	3	0.02	Canada, USA, Hong Kong, Italy
Pineapple, fibers, raw	5311001003	157	2	0.01	Japan
Pineapple, vinegar	2209000002	11	0.3	0.002	USA, UAE, Japan, Saudi Arabia, Canada
Pineapple, processed but not spun		0.10	0.01	0.00004	Japan

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Price Trends

Farmgate prices of pineapple fluctuated over time but generally moving upward. In the past decade, the formosa variety showed the sharpest fluctuations peaking at over Php 10 per kg in 2015, then dropping back to over Php 6 per kg the following year. In contrast, the hawaiian variety showed a steady increase over time. The native variety has undergone rapid price growth of 50% in the last two years after nearly flat prices between 2011 and 2014.

Figure 25. Farmgate Prices of Pineapple by Variety, 1990 to 2016 (peso per kg)



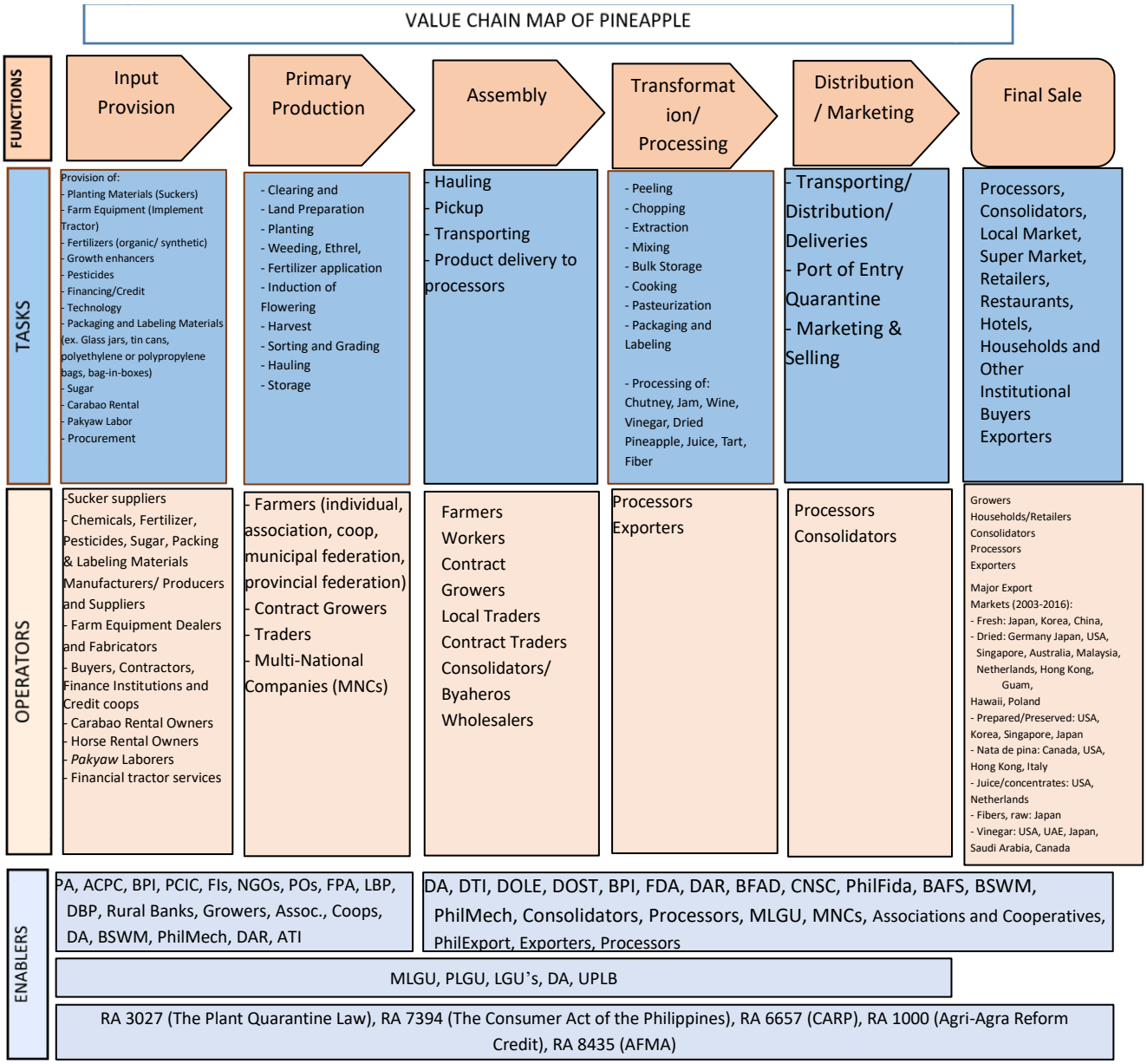
Source: PSA CountryStat (2017).

Value Chain Analysis and Industry Players

The value chain map for pineapple in Figure 26 shows the various functions involved from input provision to farming, trading, processing, distribution, up to final sale. At each stage, the tasks are specified and the corresponding operations that involved different industry players. At the bottom are the government and private agencies identified as the enablers. The figure shows that the country has already established international markets for our pineapple products since 2003: (1) Japan, Korea, China for fresh fruits; (2) Germany Japan, USA, Singapore, Australia, Malaysia, Netherlands, Hong Kong, Guam, Hawaii, Poland for dried fruits; (3) USA, Korea, Singapore, Japan for prepared/preserved fruits; (4) Canada, USA, Hong Kong, Italy for nata de pina; (5) USA, Netherlands for juice/concentrates; (6) Japan for raw fiber; and (7) USA, UAE, Japan, Saudi Arabia, Canada for vinegar.

Table 23 gives the distribution of pineapple processors. Out of the total 148 pineapple processors, majority are located in CAR at 30% of total. CAR is followed by Regions 8, 2, 7 and 10 with 14%, 13%, 9% and 9%, respectively. There are fewer processors in Regions 11, 12, 6, 3, 4A and 9.

Figure 26. Value Chain Analysis of Fresh and Processed Pineapple



Sources: DA, CALABARZON (2016), Camarines Norte (2016), and PSA (2018).
*Note: *Includes fresh, dried, juice, concentrates, fibers, vinegar, processed pineapple.*

Table 23. Distribution of Industry Processors for Pineapple

Region	PINEAPPLE Processors	% to Philippines
CAR	45	30%
1		0%
2	19	13%
3	8	5%
4A	5	3%
4B		0%
5		0%
6	7	5%
7	13	9%
8	20	14%
9	3	2%
10	13	9%
11	7	5%
12	8	5%
CARAGA		0%
Total	148	100%

Source: PFN Regional Inventories of Industry Players (2019).
Note: The list of Pineapple Processors may overlap with the lists of processors for other commodities since it is common for a company to be processing more than one commodity.

Mango

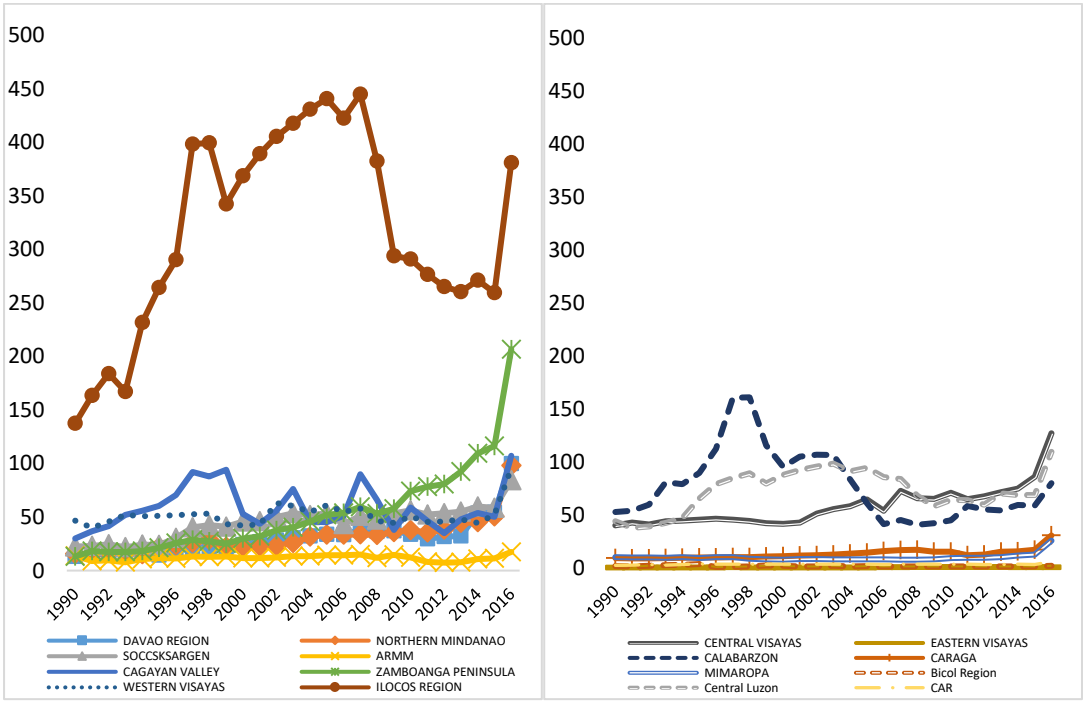
Mango is one the top three fruit crops in the Philippines in terms of production and export. Philippine mango, specifically the Carabao variety, has been known internationally for its sweetness and exotic taste securing a premium spot in international market.[3]

Production

Production of mango in the country varied over the years owing to adverse weather conditions. Output ranged from 0.45 million metric tons to 1.4 million metric tons. In the last decade, Ilocos is the largest mango producer in the country averaging at 317,000 metric tons per year. This is followed by Zamboanga Peninsula at 78,000 metric tons and then by Central Visayas and Central Luzon both averaging 69,000 metric tons. All regions showed an upward trend in the last 3 years.

[3]Delmo, G (2010)

Figure 27. Mango Production, TMT, 1990 - 2016

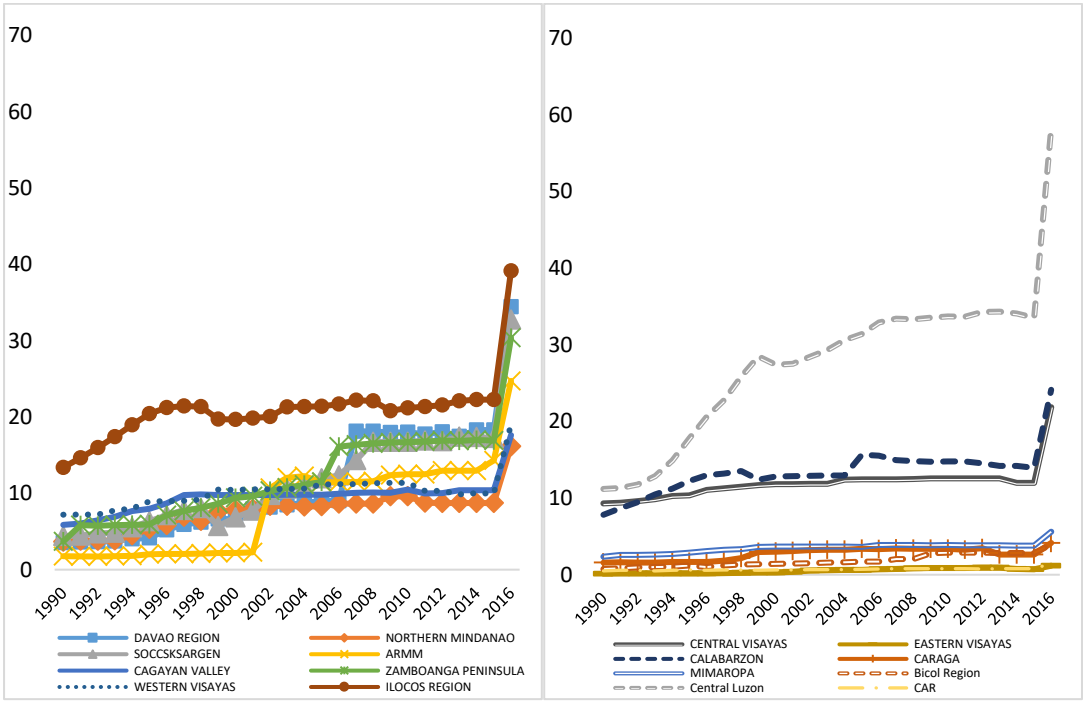


Source: PSA CountryStat (2017).

Area

Central Luzon has the largest area planted to mango averaging at 27,000 hectares over the years. Ilocos region tailed behind at an average of 20,000 hectares. All other regions ranged from 500 hectares to 13 hectares over time. Areas for mango in all regions generally showed an increasing trend. In 2016, the growth in area is almost 78% more than the 2015 level.

Figure 28. Mango Area Planted/Harvested, thousand ha. 1990 - 2016

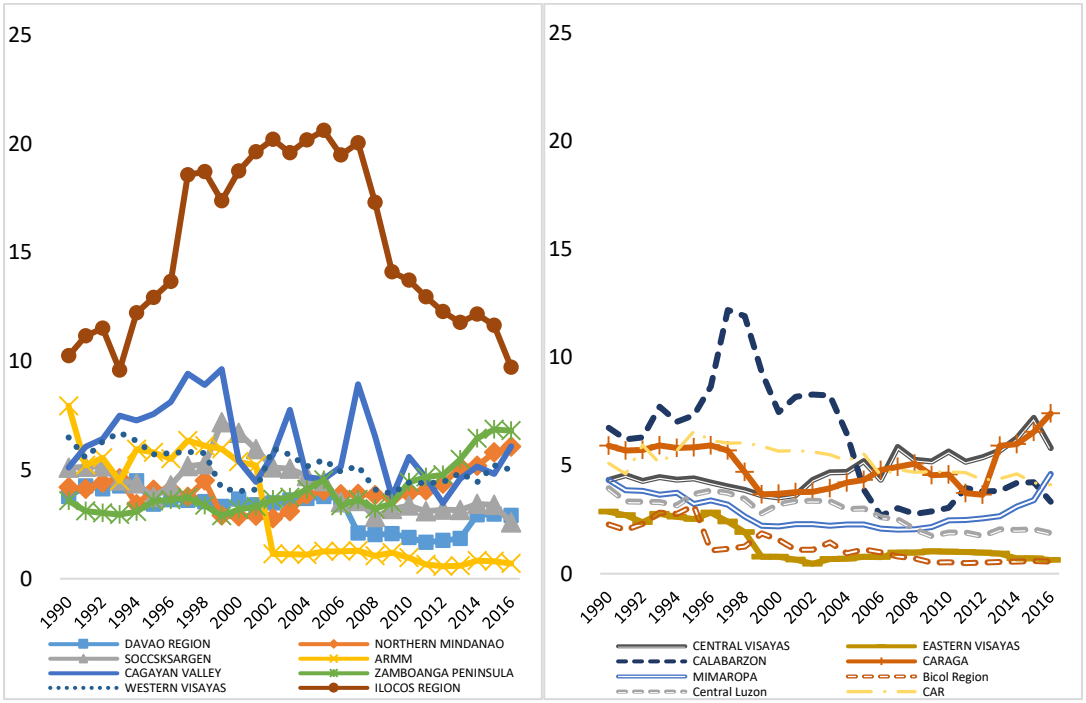


Source: PSA CountryStat (2017).

Yield

In the past decade, Ilocos Region had the highest yield among the regions averaging at 15 tons per hectare. Central Visayas lagged at an average of 6 tons per hectare while regions Cagayan Valley, Zamboanga Peninsula, Western Visayas, Caraga and CAR averaged at 5 tons per hectare. The remaining regions only have yields ranging from 1 to 4 tons per hectare. Half of the regions, namely, Northern Mindanao, Cagayan Valley, Zamboanga Peninsula, Western Visayas, Central Visayas, CALABARZON, CARAGA and MIMAROPA showed upward trends in yield while the other half exhibited downward trends.

Figure 29. Mango Yield, T/ha., 1990 - 2016



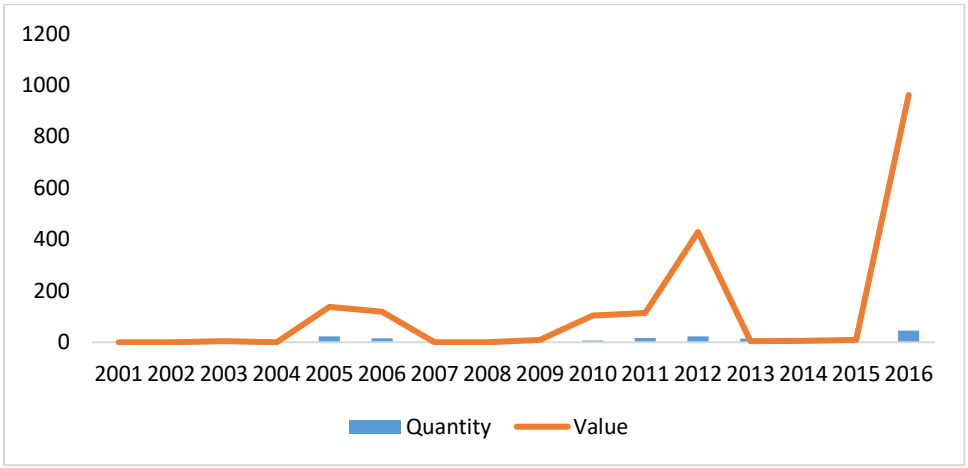
Source: PSA CountryStat (2017).

Imports and Exports

While the interest in this study is really just mango, there is no trade data for mango only. So, we use what is available which is for mango, guava and mangosteen.

Imports of fresh or dried mango, guava and mangosteen, for more than a decade had been very little. It only peaked in 2016 with an import of about 25 tons. Of the kinds imported, 46% are mangoes prepared with sugar from Thailand, followed by 21% steamed or boiled mangoes from USA and Indonesia.

Figure 30. Import of Mango, Guava and Mangosteen in Value ($'000) and Quantity (tons), 2001-2016



Source: ITC Trade Map (2017).
Note: Import refer to fresh and/or dried.

Table 24. Average Mango Import by Product Type, Quantity, Value & % Share, 2003 - 2016

Product Type	Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Suppliers
Mango, dried	0804500004	4	0	0.42	Singapore, USA, Korea
Mango, other than cooked/uncooked by steaming or boiling in water	0811900001	41	5	21	USA, Indonesia
Mango, cooked/uncooked		0	0	0.12	Australia
Mango, juice/ juice concentrates/other than concentrates	2009899901 , 2009899911	118	3	15.00	Taiwan, Hong Kong, Australia, UAE, China, USA, Singapore, Thailand, India, Iran
Mango, puree	2007999003	29	1	6	China, Singapore, USA, India, Malaysia, Hong Kong
Mango, prepared by sugar		32	10	46	Thailand
Mango, prepared/preserved	2008994102	66	3	12	Hong Kong, Pakistan, Australia, Singapore, Malaysia, Japan, Germany, USA, China

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Exports of mango account for only 1% to 4% of the national output. Quantities exported have been erratic over the years. In 2013, it drastically decreased to 7.9 metric tons. This drop was attributed to some production problems leading to the decrease in fruit quality of fresh mango export.

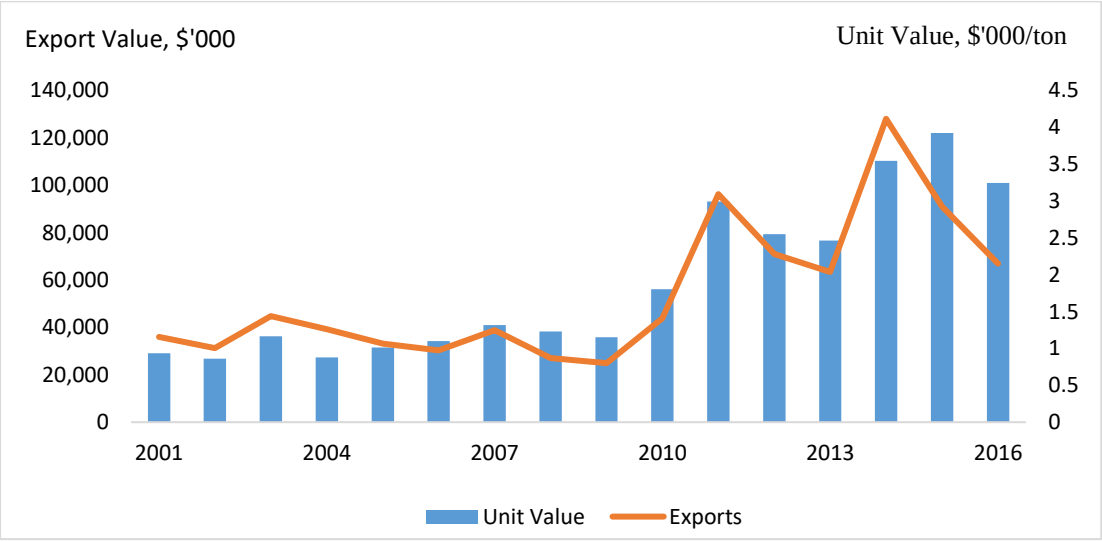
Table 25. Mango Supply and Utilization, 2001 -2016

Year	Supply		Utilization				Consumption	
	Production (MT)	Gross Supply (MT)	UT Exports (MT)	UT Feeds and Waste (MT)	UT Processing (MT)	UT Total Net Food Disposable (MT)	UT Per Capita kg/yr	Consumption (MT/yr)
2001	881,710	881,710	37,131	50,675	0	793,904	10.19	802,650
2002	956,033	956,033	35,515	55,231	0	865,287	10.88	875,290
2003	1,006,191	1,006,191	35,779	58,225	0	912,187	11.25	923,997
2004	967,473	967,473	33,663	56,029	0	877,781	10.62	889,786
2005	984,342	984,342	31,269	57,184	0	895,889	10.51	897,226
2006	919,030	919,030	26,170	53,572	0	839,288	9.65	838,268
2007	1,023,907	1,023,907	26,338	59,854	0	937,715	10.59	934,877
2008	884,011	884,011	20,845	51,790	0	811,376	8.97	803,993
2009	771,441	771,441	20,381	45,064	0	705,996	7.76	705,923
2010	825,676	825,676	20,115	48,334	0	757,227	8.13	750,727
2011	788,074	788,074	21,151	46,015	0	720,908	7.6	712,653
2012	768,410	768,410	18,440	44,998	0	704,972	7.3	695,393
2013	816,378	816,378	7,886	48,510	0	759,982	7.74	749,189
2014	885,038	885,038	21,112	51,836	0	812,090	8.13	799,628
2015	902,739	902,739	12,981	53,385	0	836,373	8.24	823,333
2016	814,055	814,055	14,343	47,983	0	751,729	7.28	738,911

Source: PSA CountryStat (2017).

By unit value, exports more than tripled in 2016 at $3,243/ton from 2001 level of $935/ton. From 2007 up to 2014, exports have been shadowing the unit values; bear in mind though that unit values are capturing both increase in world prices and product upgrading.

Figure 31. Export and Unit Values for Mango, Guava and Mangosteen, 2001-2016



Source: ITC Trade Map (2017).
Note: Export refers to fresh and/or dried.

Table 26 presents the breakdown of mango exports by product type. Dried mango with major markets in USA, Singapore, China, Hong Kong, Canada and Japan comprise the bulk of the export, with 46.25% share in value. Fresh mango took up 26.8% of the export from 2003 to 2016 while the remaining 26.05% is taken up by other products types. For a more detailed table, refer to Appendix 4.

Table 26. Average Mango Export by Product Type, Quantity, Value & % Share, 2003 - 2016

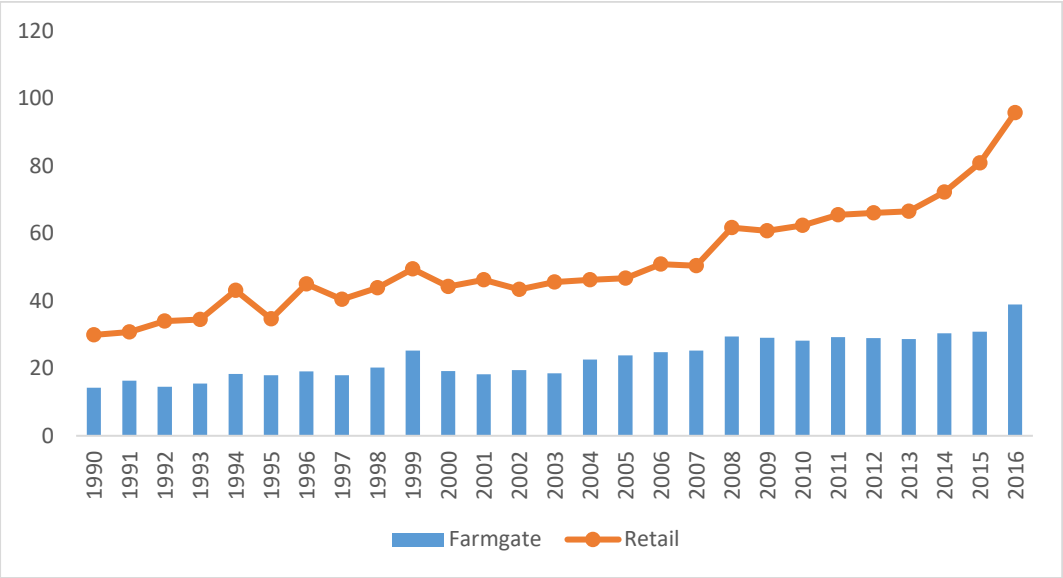
Product Type	Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Markets
Mango, fresh	0804500003	21,811	980	26	Hong Kong, Japan, China, Korea
Mango, dried	0804500004	4,279	1,690	45.3	USA, Singapore, China, Japan, Hong Kong, Canada
Mango, other than cooked/uncooked by steaming or boiling in water	0811900001	2,636	257	7	USA, Hong Kong, Korea, Japan
Mango, cooked/uncooked, prepared/preserved	0811900001, 2008994102	635	76	2	USA, Germany, Japan, Hong Kong, France, Canada, Korea, Italy, Netherlands, China
Mango, puree	2007999003	4,997	357	10	Korea, Japan, USA, Hong Kong, New Zealand, China
Mango, juice/juice concentrates		5,960	293	8	USA, Japan, Canada, China
Mango, prepared/preserved		11,135	79	2	China

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Price Trends

Over the years, farmgate and retail prices generally moved in an upward direction. In the past decade, farmgate prices exhibit an average growth of about 5% per year while retail prices have a higher growth rate of about 7% per year.

Figure 32. Farmgate and Retail Prices of Mango by Variety, 1990 to 2016 (peso per kg)



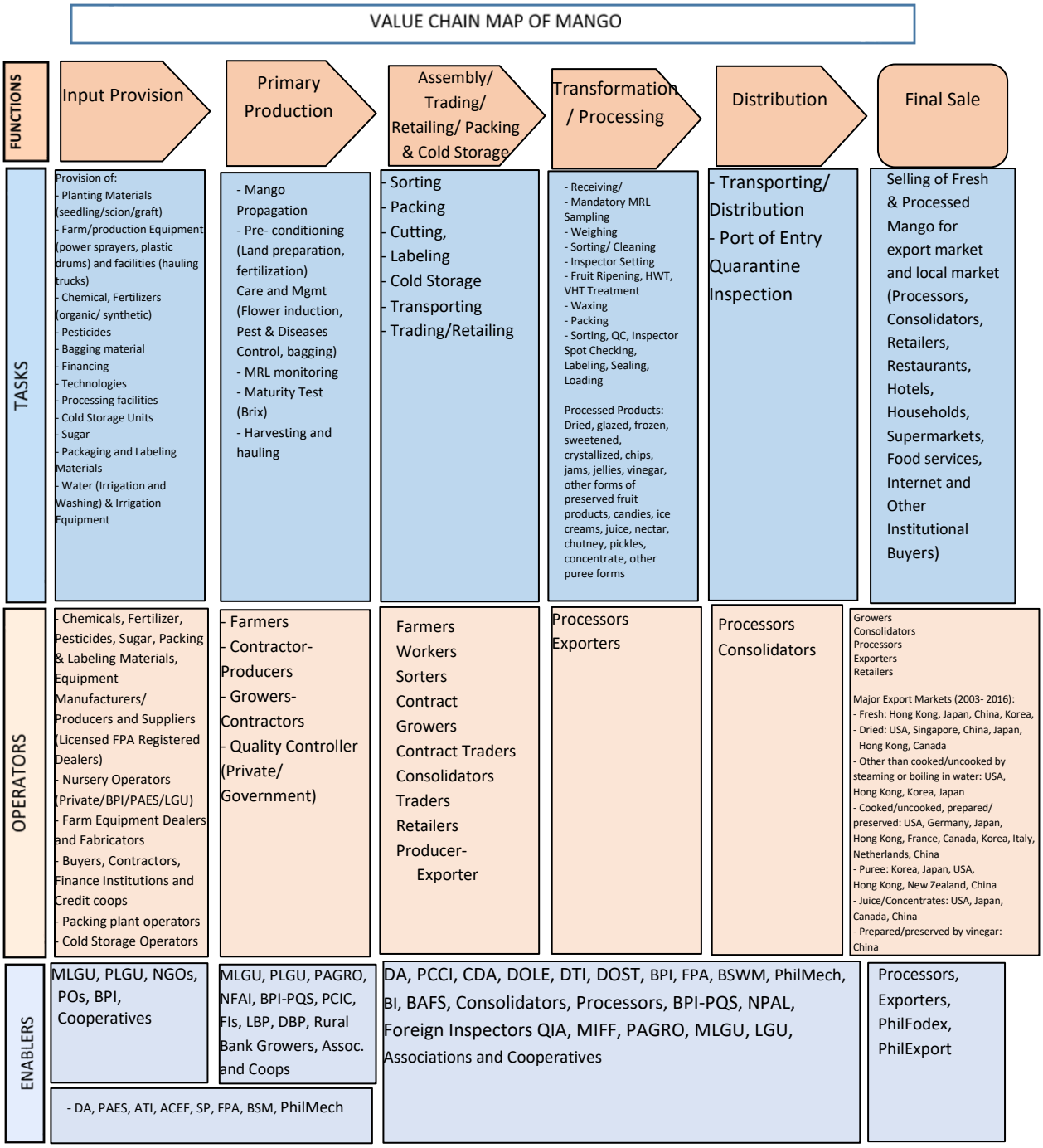
Source: PSA CountryStat (2017).

Value Chain Analysis and Industry Players

The value chain map for mango in Figure 33 shows the various functions involved from input provision to farming, trading, processing, distribution, up to final sale. At each stage, the tasks are specified and the corresponding operations that involved different industry players. At the bottom are the government and private agencies identified as the enablers

Table 27 on the other hand, gives the distribution of the mango processors. These processors are spread across the three island groups. In Luzon area, Region 2 leads the list, accounting for 32% of the 192 processors nationwide. This region is followed by CAR, Regions 1, 3 and 4A at 18%, 17%, 17% and 10%, respectively. Most of the processors in Visayas are found in Regions 6 (16%) and 7 (11%). For Mindanao, Region 10 comprises 6% of total, followed by Regions 9, 12 and 11 with 5%, 5%, and 4%, respectively.

Figure 33. Value Chain Analysis of Fresh and Processed Mango



Sources: DA Mindanao Cluster, RDC 11, Lantican (2010), Palawan (2015), Duke (2017) and PSA (2018).
Note: This is a consolidated VCAs of fresh, dried and processed mango.

Table 27. Distribution of Industry Processors for Mango

Region	MANGO Processors	% to Philippines
CAR	18	9%
1	17	9%
2	32	17%
3	17	9%
4A	10	5%
4B		0%
5		0%
6	30	16%
7	22	11%
8	4	2%
9	10	5%
10	12	6%
11	7	4%
12	9	5%
CARAGA	4	2%
Total	192	100%

Source: PFN Regional Inventories of Industry Players (2019).
Note: The list of Mango Processors may overlap with the lists of processors for other commodities since it is common for a company to be processing more than one commodity.

Calamansi

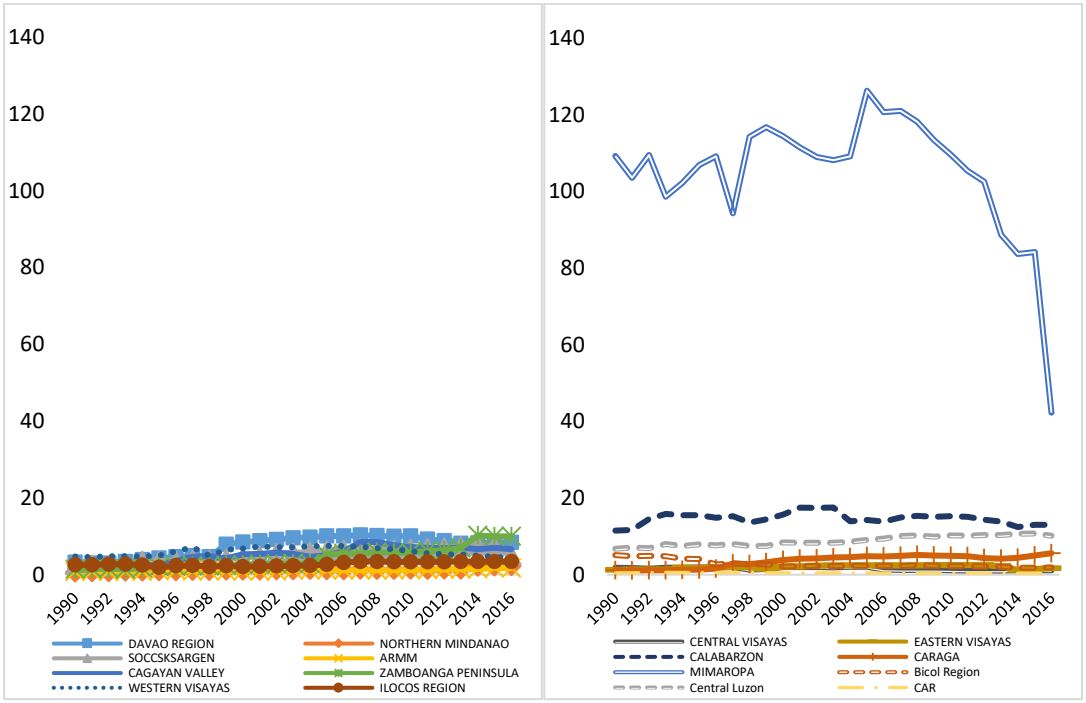
In the Philippines, MIMAROPA is the top producer as the region supplies over 60% of the average production in the past two decades (see figure below). However, production in the region has been declining sharply because of aging trees, poor farming practices, and rampant farm conversions[4].

Production

Production of calamansi in MIMAROPA leads over other regions, averaging at 107 thousand metric tons per year. However, in 2016 the production in MIMAROPA dove to about half of the 2015 level. This decline could be attributed to the effects of the typhoon Nona in Oriental Mindoro. All other regions have annual productions of less than 20 thousand metric tons.

[4] DA PRDP VCA for Fresh Calamansi (Oriental Mindoro)

Figure 34. Calamansi Production, TMT, 1990 - 2016

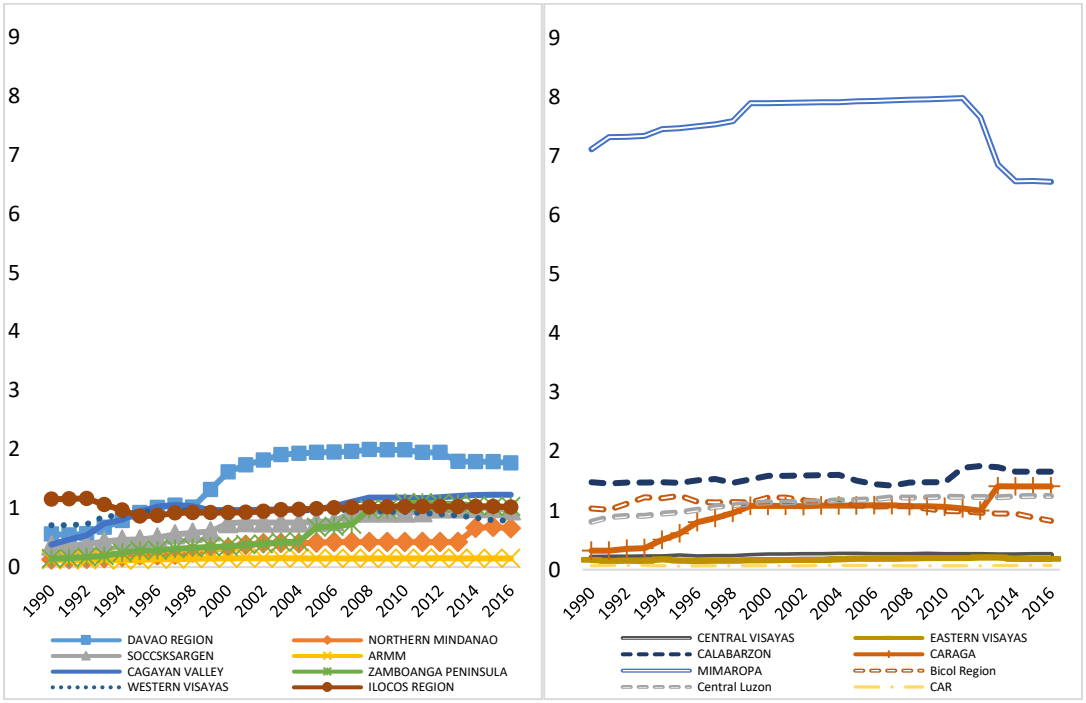


Source: PSA CountryStat (2017).

Area

MIMAROPA has the largest area planted/harvested at an average of 7,600 has. over the years. All other regions have less than two thousand hectares. The area planted of almost all regions hardly changed.

Figure 35. Calamansi Area Planted/Harvested, '000 ha., 1990 - 2016

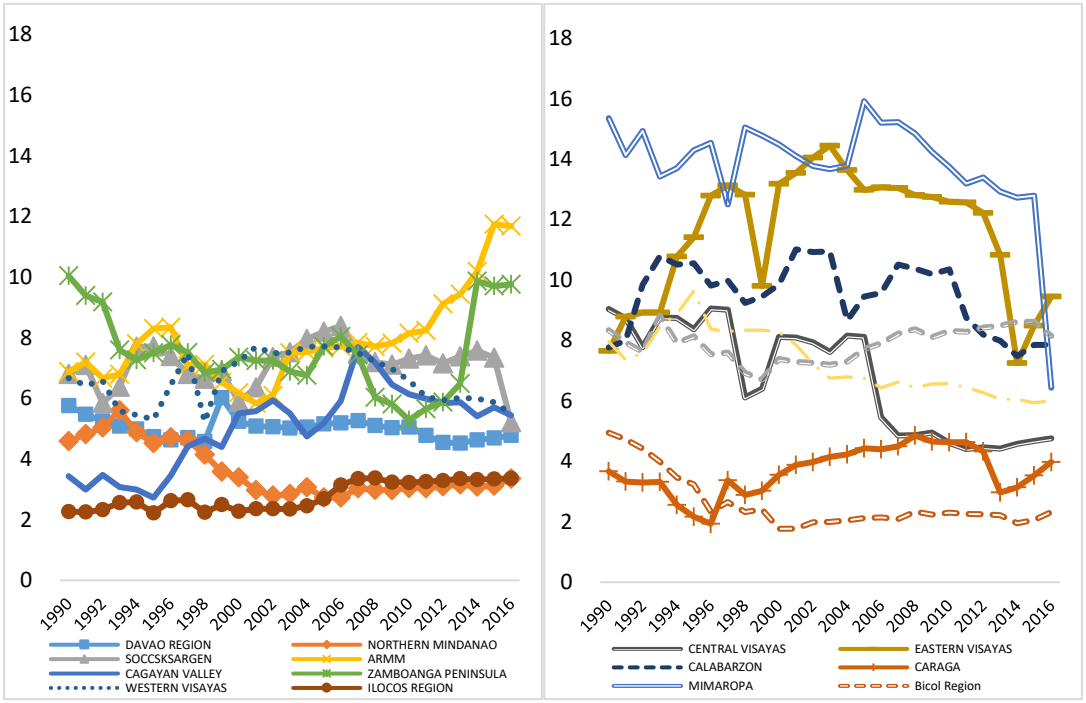


Source: PSA CountryStat (2017).

Yield

MIMAROPA, Eastern Visayas and CALABARZON are the regions with the highest average yields of over 10 tons per hectare from 1990 to 2016. The rest of the regions ranged from 3 to 8 tons per hectare average yield. ARMM however, has breached the 10 tons per hectare mark in the last couple of years. At least 10 regions are producing way below 10 tons/ha.

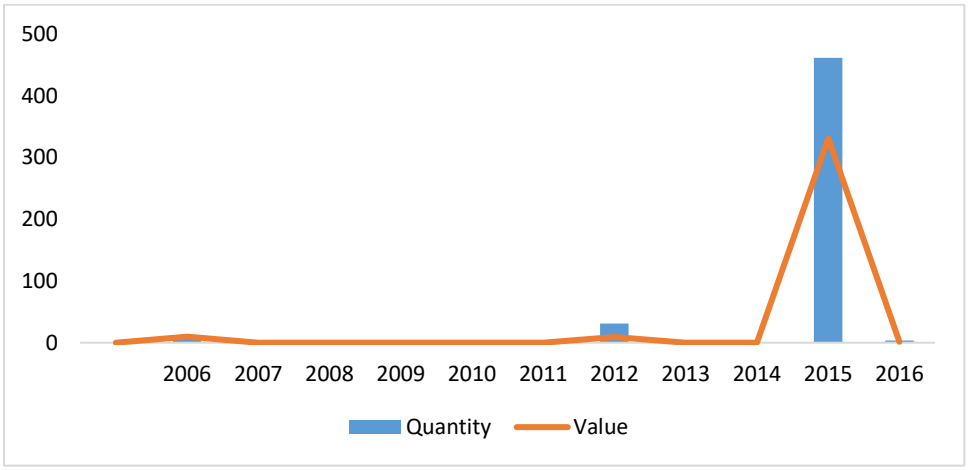
Figure 36. Calamansi Yield, T/ha., 1990 - 2016



Source: PSA CountryStat (2017).

Imports and Exports

Figure 37. Import of Calamansi in Value ($'000) and Quantity (tons), 2006-2016



Source: EMB, DTI (2017).

Table 28. Average Calamansi Import by Product Type, Quantity, Value & % Share, 2003 - 2016

Product Type / Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Suppliers
Calamansi, juice/juice concentrates/other than concentrates (2009310001, 200939001, 2009390011, 2009310011)	6	0 .29	100.00	Hong Kong, Korea

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Table 29 below shows that export of calamansi is minuscule relative to production. It ranged only from 0.001% to 0.046% of domestic output. Additionally, there is no processing of calamansi.

Table 29. Calamansi Supply and Utilization, 2001 -2016

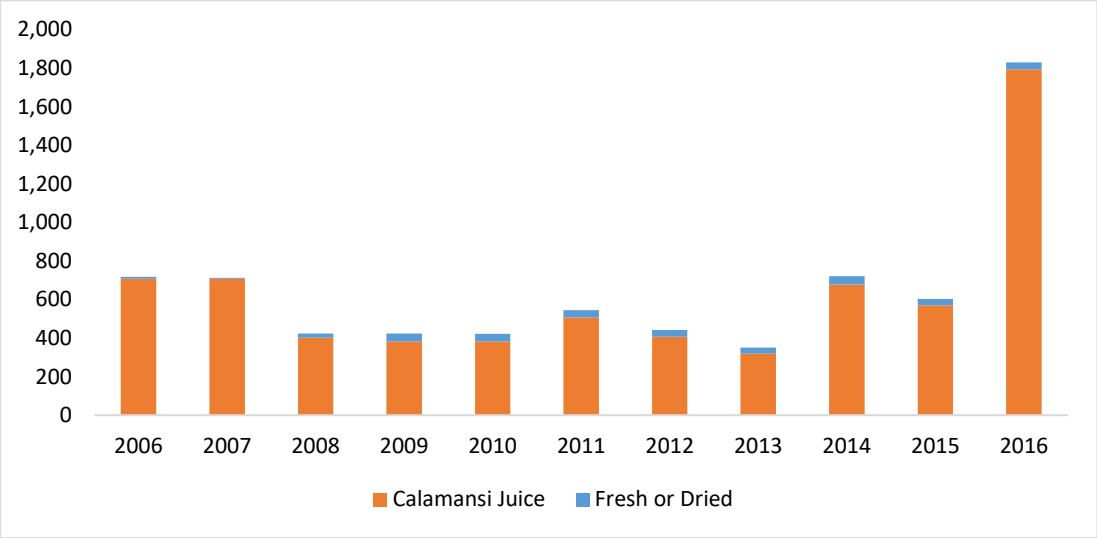
Year	Supply		Utilization				Consumption	
	Production (MT)	Gross Supply (MT)	UT Exports (MT)	UT Feeds and Waste (MT)	UT Processing (MT)	UT Total Net Food Disposable (MT)	UT Per Capita kg/yr	Consumption (MT/yr)
2001	181,747	181,747	2	10,905	0	170,840	2.19	172,503
2002	180,999	180,999	4	10,860	0	170,135	2.14	172,162
2003	180,923	180,923	5	10,855	0	170,063	2.1	172,479
2004	179,020	179,020	7	10,741	0	168,272	2.04	170,919
2005	200,808	200,808	3	12,048	0	188,757	2.21	188,665
2006	196,595	196,595	9	11,795	0	184,791	2.12	184,158
2007	201,619	201,619	8	12,097	0	189,514	2.14	188,917
2008	199,675	199,675	20	11,979	0	187,676	2.07	185,537
2009	192,187	192,187	34	11,529	0	180,624	1.98	180,120
2010	188,340	188,340	31	11,299	0	177,010	1.9	175,447
2011	182,550	182,550	28	10,951	0	171,571	1.81	169,724
2012	178,549	178,549	35	10,711	0	167,803	1.74	165,751
2013	164,091	164,091	29	9,844	0	154,218	1.57	151,967
2014	160,740	160,740	45	9,642	0	151,053	1.51	148,516
2015	162,676	162,676	43	9,758	0	152,875	1.51	150,878
2016	118,248	118,248	54	7,092	0	111,102	1.08	109,619

Source: PSA CountryStat (2017).

In the past decade, the country has only imported processed calamansi four times. The largest import was on 2015 with about 462 tons amounting to $331,055. The product type imported is in the form of calamansi juice.

Calamansi exports can be classified into two types, namely, calamansi juice and fresh or dried calamansi. Of the two, calamansi juice takes up the bulk of the export averaging at 95% of the export value. Exports fluctuated over time. It peaked in 2016 with export value approaching $2 million.

Figure 38. Export of Calamansi by Product Type in Value ($'000), 2006-2016



Sources: EMB, DTI (2017).

Table 30 gives the breakdown of calamansi exports by product type. Calamansi juice/concentrates/others with major markets in USA, Korea, UAE, China, Australia, Canada and Japan comprise the bulk of the export, with 95.67% share in value. Fresh calamansi took up 4.3% of the export from 2003 to 2016.

Table 30. Calamansi Export by Product Type, Quantity, Value & % Share, 2003 - 2016

Year	Parameter	Product Type/Product Code	
		Calamansi, fresh (0805900002)	Calamansi, juice/ juice concentrates/other than concentrates (2009310001, 200939001, 2009390011, 2009310011)
2006	Quantity (MT)	9.02	655.73
	Value (P million)	0.51	36.26
	Major Markets	Hong Kong (34.9%), Canada (32.2%), Saudi Arabia (15.4%)	Japan (47.7%), USA (29.9%)
2007	Quantity (MT)	7.53	700.2
	Value (P million)	0.25	32.65
	Major Markets	Hong Kong (30.4%), UAE (26.3%), Canada (19.8%)	USA (44.4%), Japan (17.8%), Canada (8.3%)
2009	Quantity (MT)	34.47	421.27
	Value (P million)	2	18.32
	Major Markets	Canada (33.1%), UAE (28.9%), Hong Kong (15.3%)	USA (43.4%), Japan (29.3%), China (28.1%)
2010	Quantity (MT)	30.82	356.05

Year	Parameter	Product Type/Product Code	
		Calamansi, fresh (0805900002)	Calamansi, juice/ juice concentrates/other than concentrates (2009310001, 200939001, 2009390011, 2009310011)
	Value (P million)	1.81	17.2
	Major Markets	Canada (36.8%), UAE (24.4%), Hong Kong (16.3%)	USA (53.9%), Japan (21.5%), Canada (4.7%)
2011	Quantity (MT)	27.86	502.52
	Value (P million)	1.66	21.92
	Major Markets	UAE (39.7%), Hong Kong (20.9%), Saudi Arabia (13.5%)	USA (30.1%), Japan (15.9%), Australia (12.2%)
2013	Quantity (MT)	29.36	270.71
	Value (P million)	1.29	13.55
	Major Markets	UAE (34.6%), Saudi Arabia (29.5%)	Korea (25.0%), USA (24.1%), UAE (18.4%)
2014	Quantity (MT)	44.84	469.02
	Value (P million)	1.93	30.08
	Major Markets	UAE (34.8%), Kuwait (31.1%), Saudi Arabia (17.2%)	China (40.1%), Korea (18.4%)
2015	Quantity (MT)	43.02	400.37
	Value (P million)	1.5	25.9
	Major Markets	UAE (36.2%), Hong Kong (30.4%), Saudi Arabia (16.0%)	China (34.8%), Korea (28.8%)
2016	Quantity (MT)	53.63	974.02
	Value (P million)	1.76	85.14
	Major Markets	UAE (38.3%), Hong Kong (35.7%), Saudi Arabia (15.3%)	Korea (76.6%)
Average	Quantity (MT)	31.17	527.77
	Value (P million)	1.41	31.22
	Value (% Share)	4.3%	95.67%

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Table 31. Average Calamansi Export by Product Type, Quantity, Value & % Share, 2003 - 2016

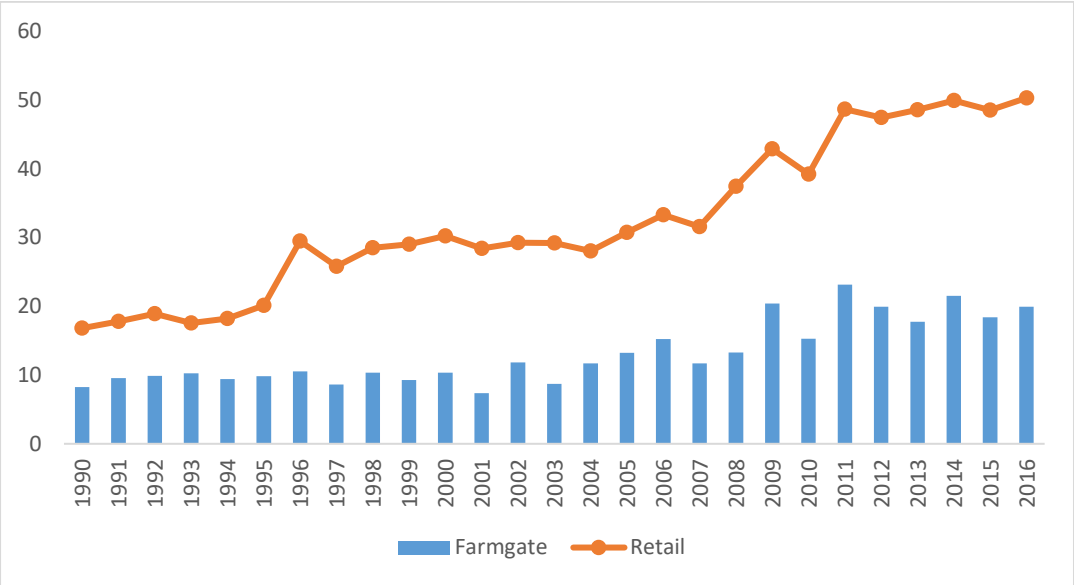
Product Type	Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Markets
Calamansi, fresh	0805900002	31	1	4	Hong Kong, Canada, Saudi Arabia, UAE, Kuwait
Calamansi, juice/ juice concentrates/ other than concentrates	2009310001, 200939001, 2009390011, 2009310011	528	31	96	Japan, USA, Canada, China, Australia, Korea, UAE

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Price Trends

Both farmgate and retail prices fluctuated over time especially during the period between 2006 and 2012, but generally trended upward. Between 2007 and 2016, farmgate prices enjoyed a rapid growth of over 6% per year while retail prices experienced growth of about 5%.

Figure 39. Farmgate and Retail Prices of Calamansi, 1990 to 2016 (peso per kg)



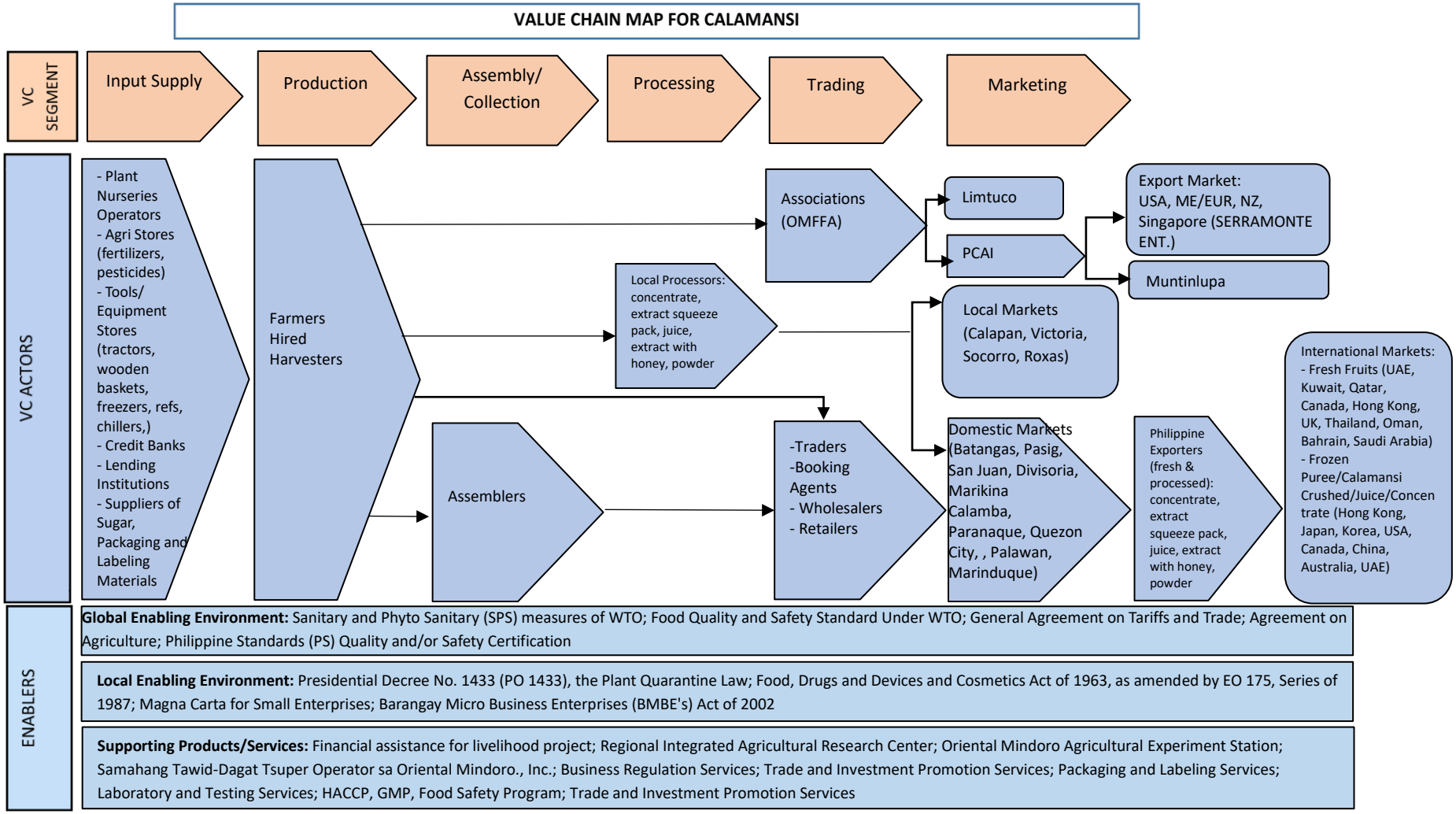
Source: PSA CountryStat (2017).

Value Chain Analysis and Industry Players

The value chain map for calamansi in Figure 40 shows the various functions involved from input provision to farming, trading, processing, distribution, up to final sale. At each stage, the tasks are specified and the corresponding operations that involved different industry players. At the bottom are the government and private agencies identified as the enablers.

Table 32 shows the distribution of calamansi processors. Most of the processors are concentrated at the top five regions: Regions 6, 12, CARAGA, 2 and 9 accounting for 24%, 11%, 11%, 10% and 10%, respectively. Some processors are also operating in Region 8 with 5%, Region 4B at 7% and Region 10 at 9% of total processors.

Figure 40. Value Chain Analysis of Fresh and Processed Calamansi



Sources: DA, Oriental Mindoro; DTI EMB (2018).
Note: This is a consolidation of VCAs of Fresh and Processed Calamansi.

Table 32. Distribution of Industry Processors for Calamansi

Region	CALAMANSI Processors	% to Philippines
CAR	3	2%
1	4	3%
2	15	10%
3	5	3%
4A	2	1%
4B	10	7%
5		0%
6	36	24%
7	4	3%
8	8	5%
9	15	10%
10	14	9%
11	2	1%
12	17	11%
CARAGA	16	11%
Total	151	100%

Source: PFN Regional Inventories of Industry Players (2019).
Note: The list of Calamansi Processors may overlap with the lists of processors for other commodities since it is common for a company to be processing more than one commodity.

Papaya

Papaya is among the top 10 fruits cultivated in the Philippines in terms of area as shown in Table 33. It is at 9th place as of 2016 next to Mandarin. Papaya production is concentrated mainly in Mindanao, particularly in the regions of SOCCSKSARGEN, Northern Mindanao and Davao. The Philippines, however, fall far back at 18th place in terms of papaya export value in the international market as of 2016. The bulk of the papaya produced are domestically consumed (93%) and only about 1% is exported (PSA CountryStat, 2017).

Table 33. Area Harvested of Top 10 Fruits, 2016

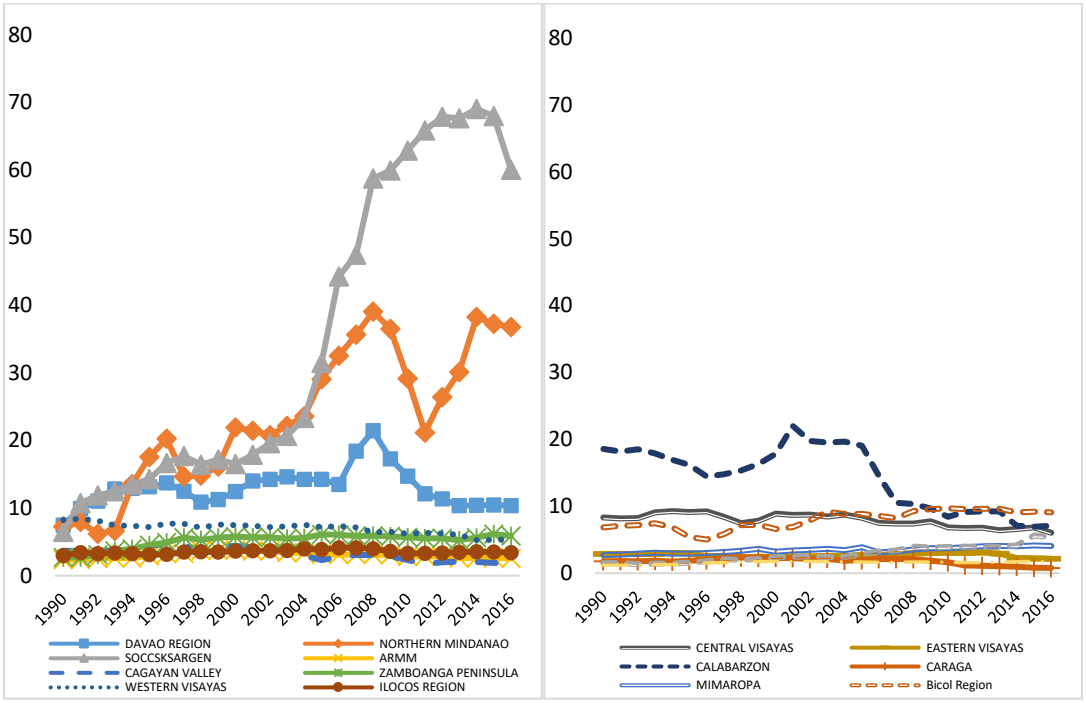
Crops	Area (ha,)
Banana	442,865
Mango	187,834
Pineapple	65,224
Lanzones	20,144
Calamansi	19,824
Durian	16,619
Tomato	16,197
Mandarin	8,747
Papaya	7,835
Watermelon	7,082

Source: PSA CountryStat (2017).

Production

In the past decade, over 60% of papaya produced was grown in SOCCSKSARGEN (36%), Northern Mindanao (19%) and Davao Region (8%). Production averaged 108,000 metric tons per year in these three regions. Some substantial increases have been seen in 2008 but it has been generally declining after that.

Figure 41. Papaya Production, TMT, 1990 – 2016

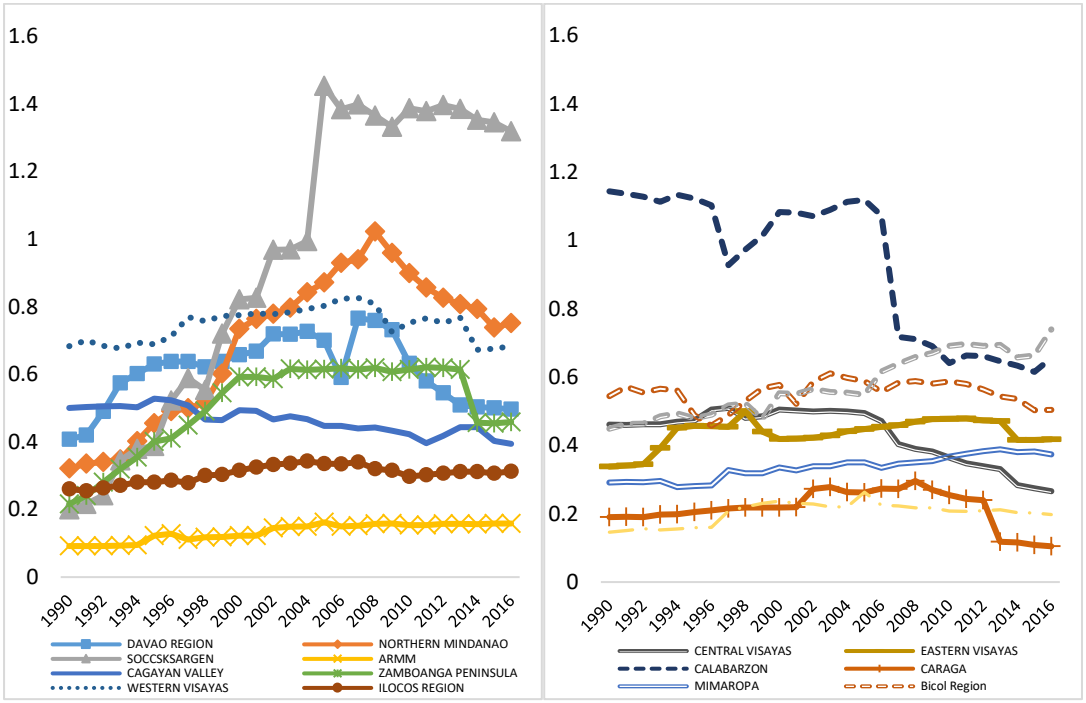


Source: PSA CountryStat (2017).

Area

Areas planted to papaya appear to be generally declining since mid-2000 except for Ilocos, Central Luzon, MIMAROPA and ARMM. In the last 10 years, SOCCSKSARGEN has the largest average area of 1,372 hectares followed by Northern Mindanao with 877 hectares and then by Western Visayas at 757 hectares.

Figure 42. Papaya Area Planted/Harvested, thousand ha., 1990 – 2016

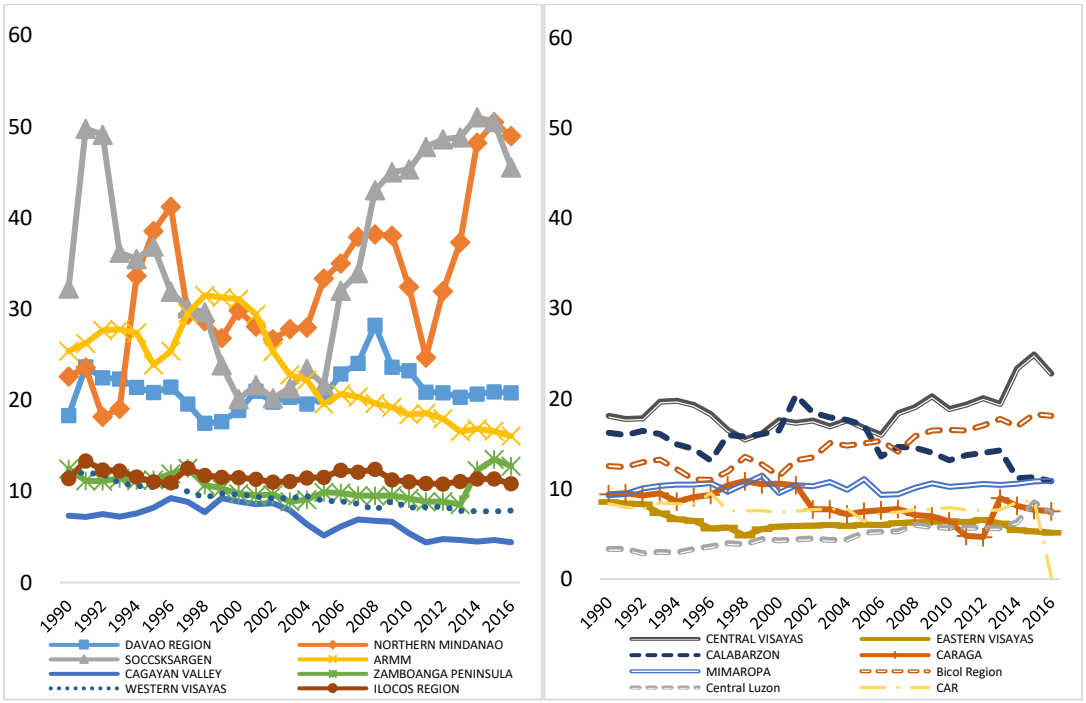


Source: PSA CountryStat (2017).

Yield

Among the regions, SOCCSKSARGEN, Northern Mindanao, ARMM and Davao Region have average annual yield of over 20 metric tons per hectare. The rest of the regions have less than 20 tons per hectare.

Figure 43. Papaya Yield, T/ha., 1990 – 2016

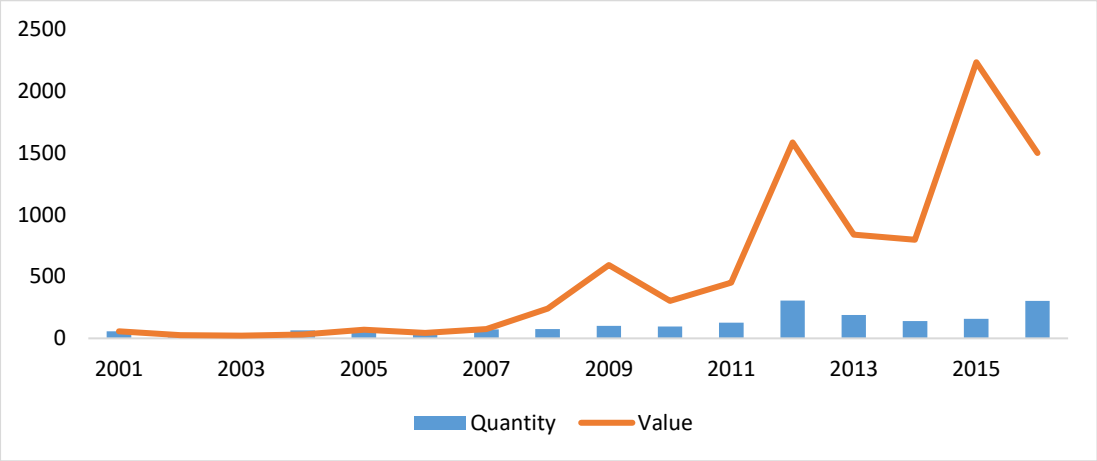


Source: PSA CountryStat (2017).

Imports and Exports

Imports of fresh papayas (including dried peaches, pears, tamarinds and other edible fruits) has been generally increasing although it dipped in 2010, 2014 and 2016. It peaked in 2015 with the import value of $2,236.

Figure 44. Import of Papaya* in Value ($'000) and Quantity (tons), 2001-2016



Source: ITC Trade Map (2017).

*Note: *Include imports in dried peaches, pears, tamarinds and other edible fruits (excl. nuts, bananas, dates, figs, pineapples, avocadoes, guavas, mangoes, mangosteens, citrus fruit, grapes apricots, prunes and apples, unmixed).*

Table 34. Average Papaya Import by Product Type, Quantity, Value & % Share, 2003 – 2016

Product Type / Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Suppliers
Papaya, dried	2	0.48	100.0	Thailand

Sources: PSA Commodity Fact Sheet, various years

Note: No data for 2005, 2008 and 2012

Exports of papaya only ranged from 1% to 4% of the national production. Quantities exported have been fluctuating over the years. Exports dropped in 2003, 2010, 2015 and 2016 with export quantities of less than 2,000 metric tons. It peaked in 2013 with almost 6,000 metric tons of exports.

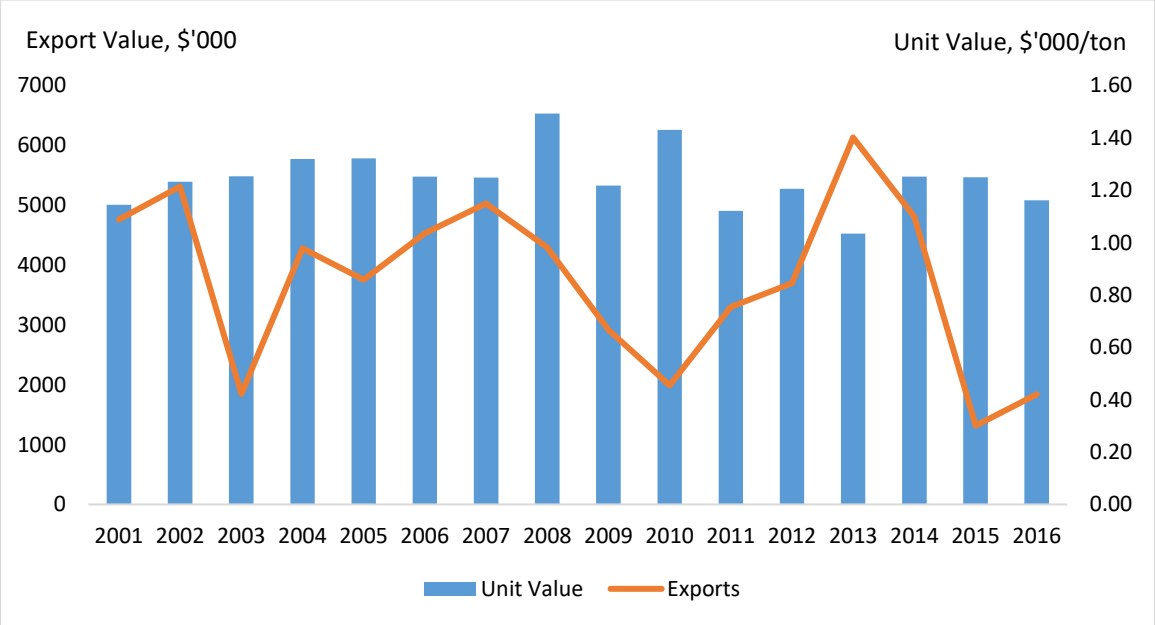
Table 35. Papaya Supply and Utilization, MT, 2001 -2016

Year	Supply		Utilization				Consumption	
	Production (MT)	Gross Supply (MT)	UT Exports (MT)	UT Feeds and Waste (MT)	UT Processing (MT)	UT Total Net Food Disposable (MT)	UT Per Capita kg/yr	Consumption (MT/yr)
2001	127,787	127,787	4,163	7,417	0	116,207	1.49	117,365
2002	127,680	127,680	4,311	7,402	0	115,967	1.46	117,456
2003	130,764	130,764	1,467	7,758	0	121,539	1.5	123,200
2004	133,876	133,876	3,324	7,833	0	122,719	1.48	124,000
2005	146,628	146,628	2,842	8,627	0	135,159	1.59	135,736
2006	157,120	157,120	3,620	9,210	0	144,290	1.66	144,199
2007	164,234	164,234	4,060	9,610	0	150,564	1.7	150,075
2008	182,907	182,907	2,878	10,802	0	169,227	1.87	167,611
2009	176,656	176,656	2,305	10,461	0	163,890	1.8	163,745
2010	165,981	165,981	1,391	9,875	0	154,715	1.66	153,285
2011	157,907	157,907	2,951	9,297	0	145,659	1.54	144,406
2012	164,913	164,913	3,065	9,711	0	152,137	1.58	150,510
2013	166,336	166,336	5,925	9,625	0	150,786	1.54	149,064
2014	172,628	172,628	5,108	10,051	0	157,469	1.58	155,401
2015	172,650	172,650	1,834	10,249	0	160,567	1.58	157,872
2016	162,481	162,481	1,588	9,654	0	151,239	1.46	148,188

Source: PSA CountryStat (2017).

In terms of value, minimal change is observed in exports except in 2008, 2010 and 2013. It peaked to a high of $1,493 per ton in 2008 and dropped to a low of $1,035 per ton in 2013. On the other hand, export values had been very erratic reaching peaks of over $6 million in 2013 and then falling to just over $1 million in 2015.

Figure 45. Export and Unit Values for Papaya, 2001-2016



Source: ITC Trade Map (2017).
Note: Export refers to fresh papaya.

Table 36 presents the breakdown of papaya exports by product type. Prepared/preserved papaya with major markets in USA, New Zealand, Australia, Hong Kong, Canada and UAE comprise the bulk of the export, with 54.04% share in value. Dried papaya took up 45.86% of the export from 2003 to 2016. For more detailed table, refer to Appendix 5.

Table 36. Average Papaya Export by Product Type, Quantity, Value & % Share, 2003 – 2016

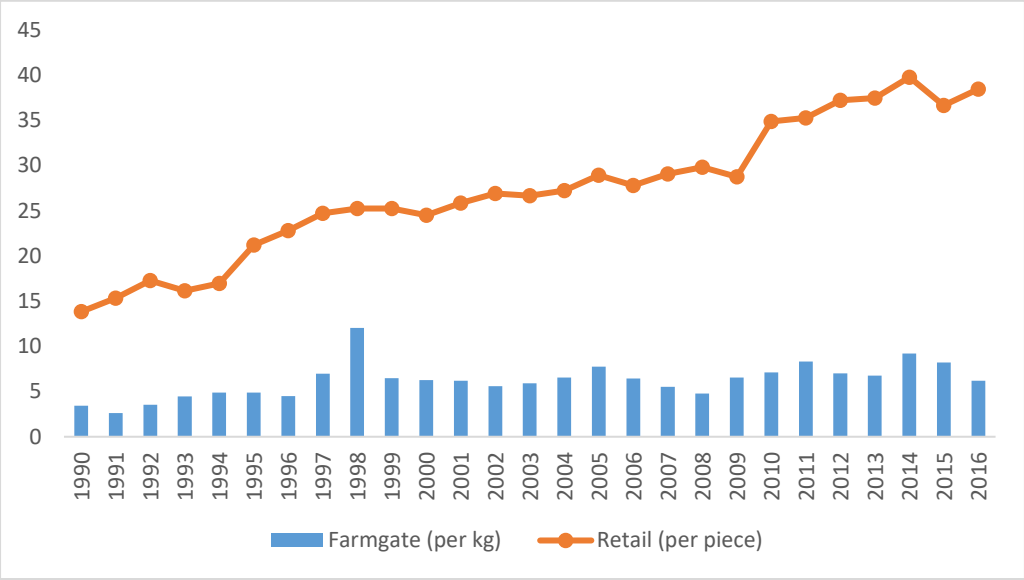
Product Type	Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Markets
Papaya, fresh	0807200000	3,052	166	0	Korea, New Zealand, Japan, Singapore, China
Papaya, prepared/ preserved	2001909003	24	96,106	54.04	USA, UAE, Australia, Hong Kong, Canada, New Zealand
Papaya, dried		953	81,557	46	Hong Kong, Australia, New Zealand, USA
Papaya, other than fresh and dried	0813400001	577	12	0	Australia, Hong Kong, New Zealand, Pakistan, Canada, Korea

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Price Trends

Between 1999 and 2016, farmgate prices of papaya seemed to level off at around 7 pesos per kg despite spikes in several years. Retail prices of papaya, on the other hand, generally veered upward with over 4% annual growth.

Figure 46. Farmgate and Retail Prices of Papaya, 1990 to 2016



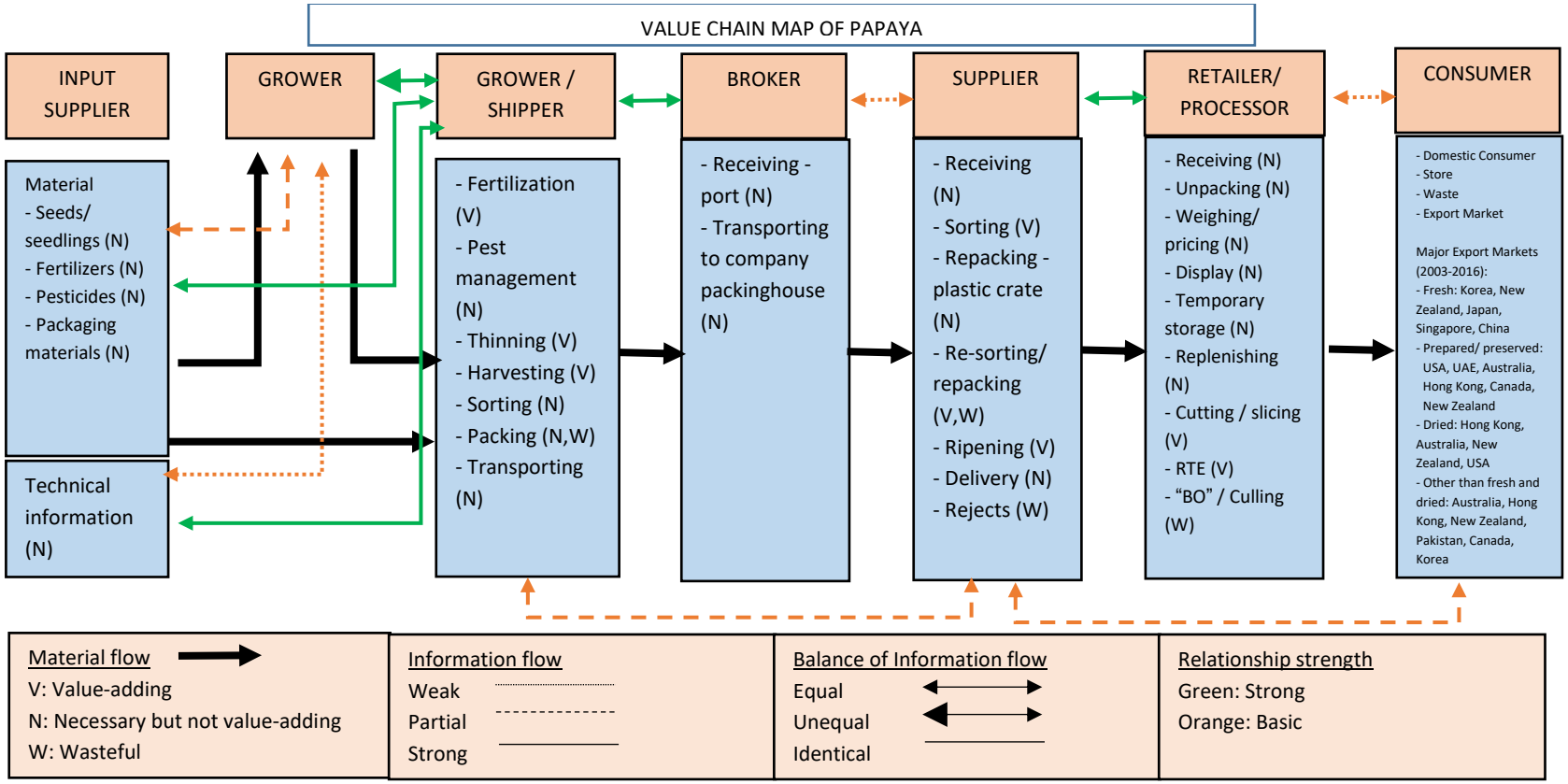
Source: PSA CountryStat (2017).

Value Chain Analysis and Industry Players

The value chain map for papaya in Figure 47 shows the various functions involved from input provision to farming, trading, processing, distribution, up to final sale. At each stage, the tasks are specified and the corresponding operations that involved different industry players. At the bottom are the government and private agencies identified as the enablers. For this commodity, for 2003 to 2016, we have already established export markets for fresh, prepared/preserved, dried and other than fresh/dried. Specifically, our major export markets include the following countries: (1) fresh: Korea, New Zealand, Japan, Singapore, China; (2) prepared/ preserved: USA, UAE, Australia, Hong Kong, Canada, New Zealand; (3) dried: Hong Kong, Australia, New Zealand, USA; and (4) other than fresh and dried: Australia, Hong Kong, New Zealand, Pakistan, Canada, and Korea.

Table 37 reveals that more than half of the papaya processors of the 90 total processors nationwide are in Regions 8, CAR, 6 and 12. Regions 8 and CAR topped the list comprising 18% each of total while Regions 6 and 12 are at 16% and 13%, respectively. The other processors are located in Region 11 at 7% and Region 2 at 6%.

Figure 47. Value Chain Analysis of Fresh and Processed Papaya



Sources: ACIAR (2012), PSA (2018).

Table 37. Distribution of Industry Processors for Papaya.

Region	PAPAYA Processors	% to Philippines
CAR	16	18%
1		0%
2	5	6%
3	9	10%
4A	4	4%
4B		0%
5		0%
6	14	16%
7	3	3%
8	16	18%
9	3	3%
10	2	2%
11	6	7%
12	12	13%
CARAGA		0%
Total	90	100%

Source: PFN Regional Inventories of Industry Players (2019).
Note: The list of Papaya Processors may overlap with the lists of processors for other commodities since it is common for a company to be processing more than one commodity.

Dragon Fruit

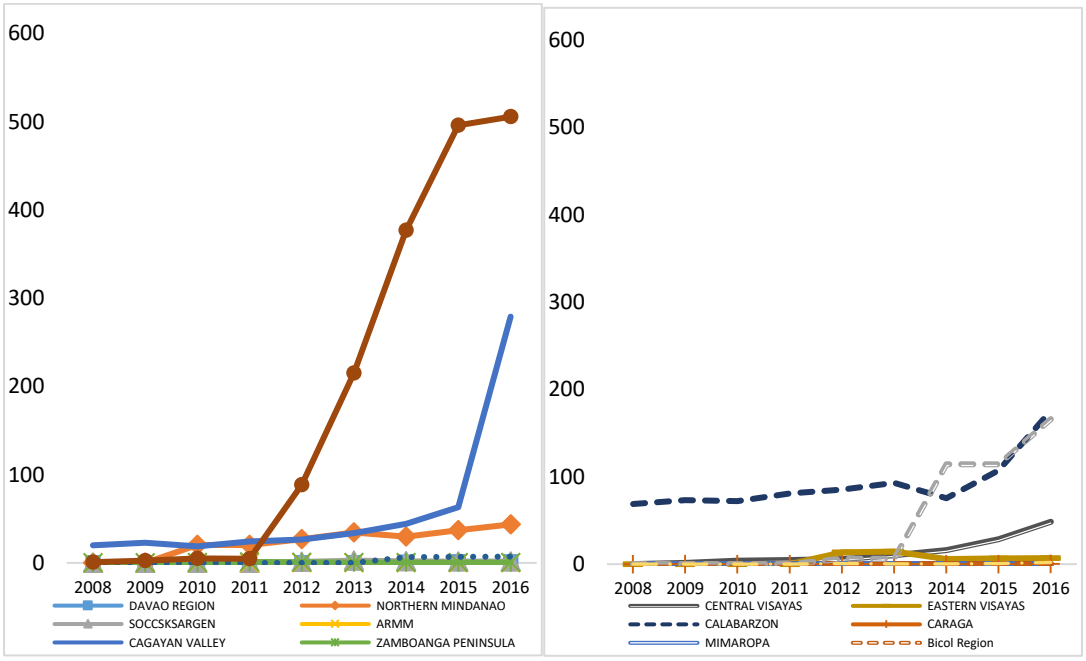
The Dragon Fruit, also called "Pitaya or Pitahaya" in other parts of the world, is a native plant in Central and South America that was reportedly introduced by the French in Vietnam where it was first cultivated in Asia. It is a vine-like specie of cactus that prefers hot climate but requires a lot of rain. It has gained popularity due to its economic viability and medicinal value that fueled its propagation in Thailand, Malaysia, Taiwan, Southeast of China, and the Philippines. It is considered one of the regional priority commodities of Philippine Rural Development Project (PRDP).[5]

Production

From 2008 to 2011, production of dragon fruit in the Philippines was largely dominated by CALABARZON with annual production ranging from 69 tons to 81 tons. However, from 2012 to 2016, Ilocos Region overshadowed all other regions with annual production ranging from 89 to 506 tons. In 2016, Cagayan Valley overtook Calabarzon with production reaching up to 279 tons.

[5] DA PRDP VCA for Dragon Fruit (Ilocos Region).

Figure 48. Dragon Fruit Production, MT, 2008 – 2016

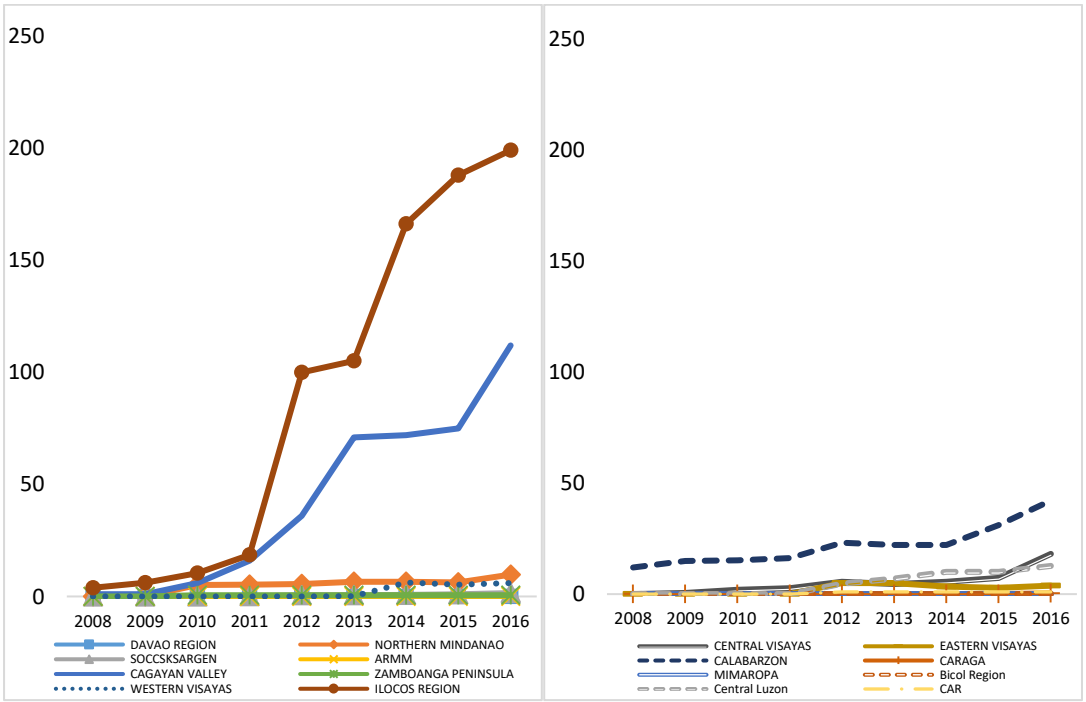


Source: PSA CountryStat (2017).

Area

In the last three years, Ilocos had the largest area planted for dragon fruit averaging at 184 hectares followed by Cagayan Valley with an average area of 86 hectares. All other regions only have areas below 50 hectares. In regions that produced dragon fruits, planted/harvested areas are increasing every year.

Figure 49. Dragon Fruit Area Planted/Harvested, ha., 2008 – 2016

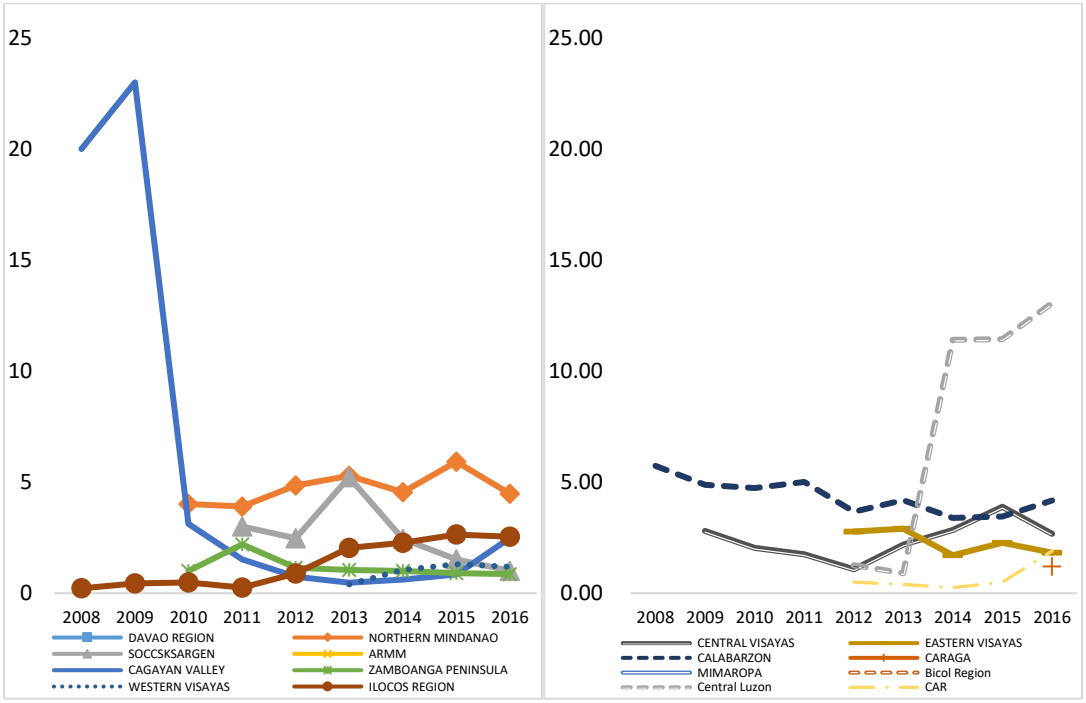


Source: PSA CountryStat (2017).

Yield

From 2008 to 2016, both Central Luzon and ARMM had the highest yield of 6 tons per hectare with Davao Region trailing at 5 tons per hectare. However, in the last three years, the yield of Central Luzon doubled to 12 tons per hectare while in Cagayan Valley the yield dropped to 1 ton per hectare.

Figure 50. Dragon Fruit Yield, T/ha, 2008 – 2016



Source: PSA CountryStat (2017).

Exports

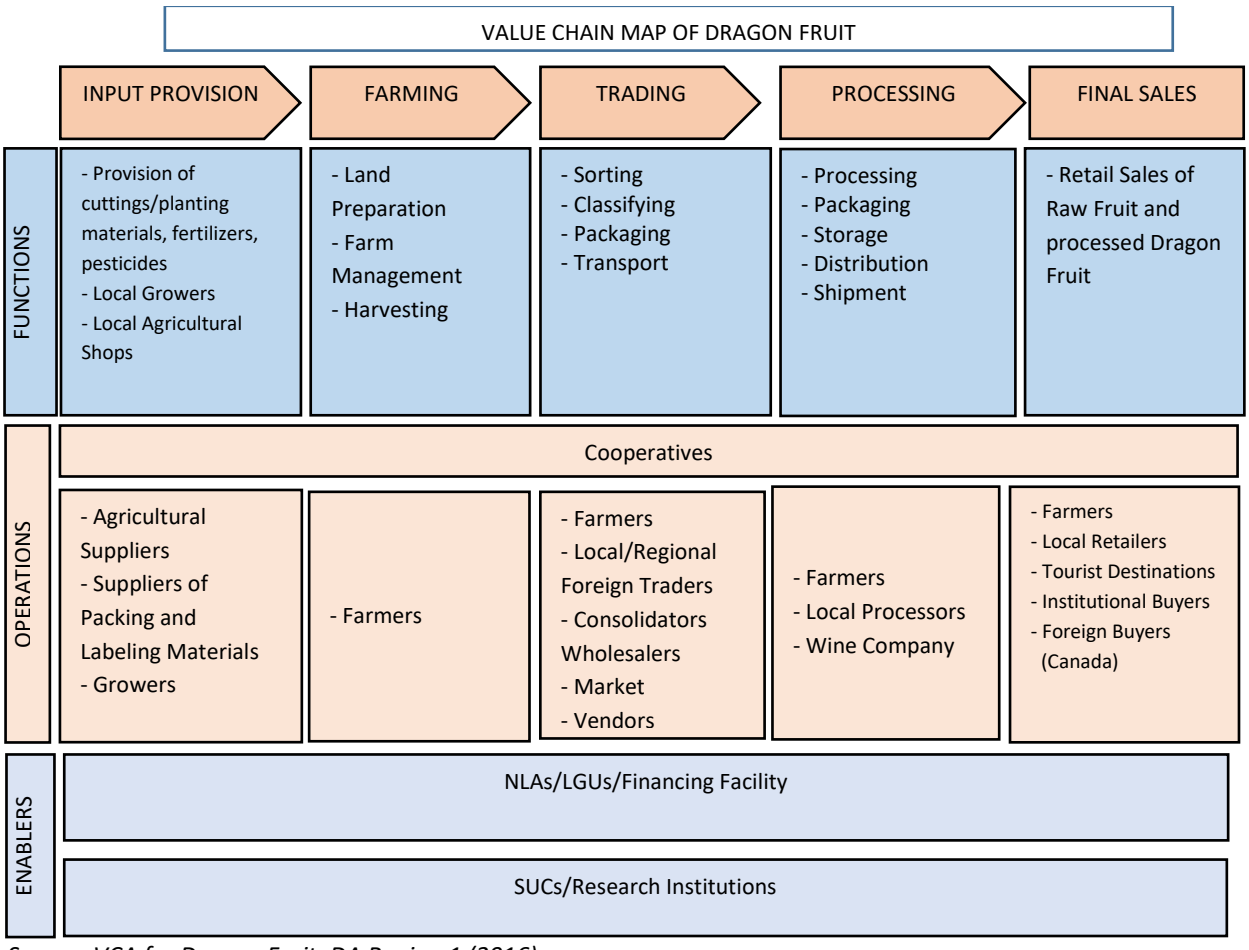
In the Philippines, as far as the current data is concerned, only REFMAD Farms from Burgos, Ilocos Norte had exported outside the country. Last August 2016, the first shipment of more than 600 kilos of REFMAD dragon fruits landed in Richmond City, British Columbia, Canada, through a fruit and vegetable importer, Pahoa Produce Ltd (SunStar, Pangasinan 2016). The total estimated quantity exported to Canada was 2 tons as of September 2016. Data of other exports from the Philippines are yet to be gathered. Aside from this, there are no officially recorded exports by the other producers in the country (DA PRDP Region 1 VCA, 2017).

Value Chain Analysis and Industry Players

The value chain map for dragon fruit in Figure 51 shows the various functions involved from input provision to farming, trading, processing, distribution, up to final sale. At each stage, the tasks are specified and the corresponding operations that involved different industry players. At the bottom are the government and private agencies identified as the enablers. This value chain diagram is generic and needs fleshing out as more information becomes available.

Table 38 highlights the distribution of dragon fruit processors. Significantly, the processors are concentrated in Region 1, which takes the lead at about 32% out of the total 94 processors. This is followed by CARAGA at 16%, while Region 2 and CAR are both at 11%. Some processors are located in Regions 3 and 12, at 7% each, and Region 11 at 6%.

Figure 51. Value Chain Analysis of Fresh and Processed Dragon Fruit



Source: VCA for Dragon Fruit, DA Region 1 (2016).

Table 38. Distribution of Industry Processors for Dragon Fruit.

Region	DRAGON FRUIT Processors	% to Philippines
CAR	10	11%
1	30	32%
2	10	11%
3	7	7%
4A	2	2%
4B		0%
5		0%
6	1	1%
7	1	1%
8	2	2%
9	3	3%
10		0%
11	6	6%
12	7	7%
CARAGA	15	16%
Total	94	100%

Source: PFN Regional Inventories of Industry Players (2019).
Note: The list of Dragon Fruit Processors may overlap with the lists of processors for other commodities since it is common for a company to be processing more than one commodity.

Pili Nut

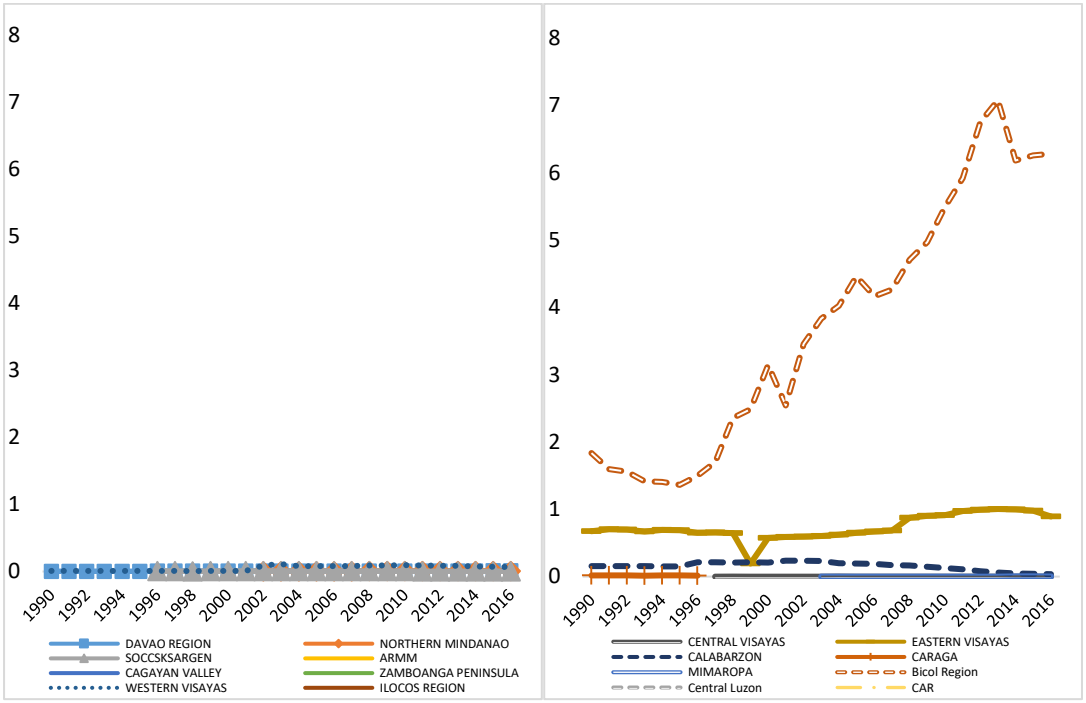
Although Pili trees are grown as ornamental trees in many areas of the old world tropics in Indonesia, Malaysia and the Philippines, only the Philippines produces and processes pili nuts commercially.[6] The following are the product forms of pili: fresh pili, dried form or shelled pili, pili kernel, processed pili products such as pili candies and pili oil, and pili handicrafts (VCA of Pili PRDP, Bicol Region).

Production

In the last 10 years, about 97% of the pili nut produce came from Bicol (83.4%) and Eastern Visayas (13.4%). Production in other regions is less than 2 metric tons per year. The increase in annual production in Bicol is steeper compared to that of Eastern Visayas.

[6] Imperial (2017)

Figure 52. Pili Nut Production, TMT, 1990 - 2016

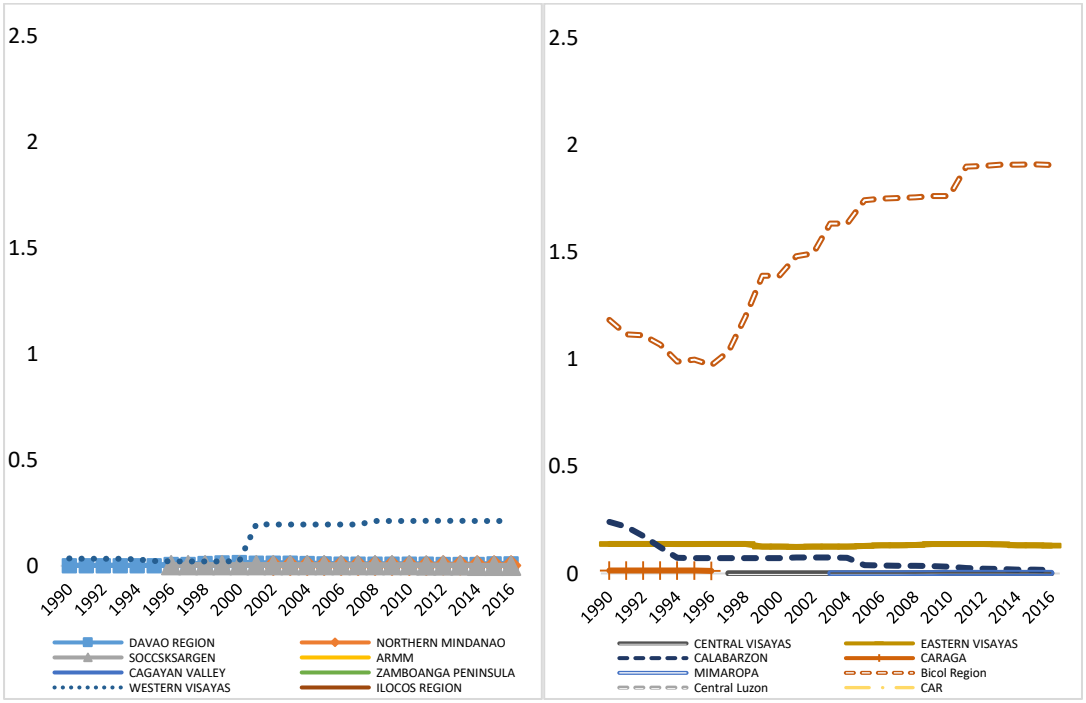


Source: PSA CountryStat (2017).

Area

Bicol has the largest area planted to pili nuts averaging at over 1,800 hectares in the last decade. All other regions have average areas of less than 300 hectares.

Figure 53. Pili Nut Area Planted/Harvested, thousand ha., 1990 - 2016

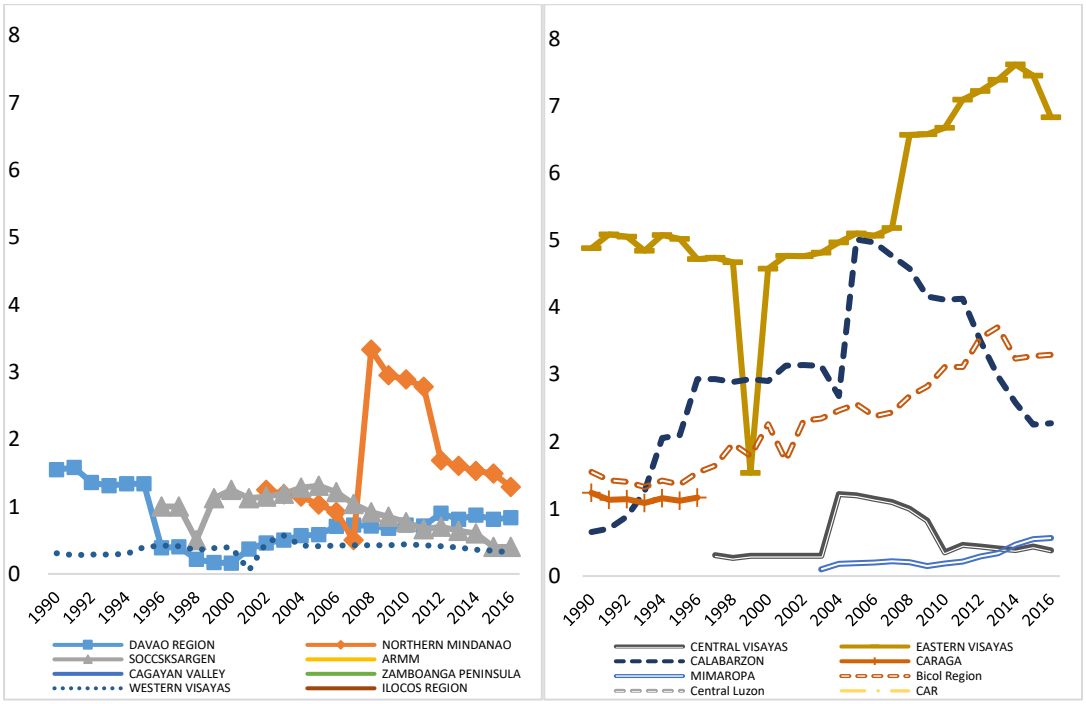


Source: PSA CountryStat (2017).

Yield

Over the years, Eastern Visayas ranked first in terms of yield, averaging at 5 tons per hectare per year. This is followed by CALABARZON at 3 tons per hectare and then by Northern Mindanao and Bicol, each with 2 tons per hectare.

Figure 54. Pili Yield, T/ha., 1990 - 2016



Source: PSA CountryStat (2017).

Imports and Exports

Imports of pili nuts were limited to preserved and unshelled fresh and dried pili nuts, with the former comprising of 80% of the total share, both imported from the USA. There have only been two times when pili nuts were imported between 2001 and 2016.

Table 39. Average Pili Nut Import by Product Type, Quantity, Value & % Share, 2003 - 2016

Product Type	Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Suppliers
Pili Nut, fresh/ dried with/not shelled/peeled	0802909001	1	0	20.0	USA
Pili, prepared/ preserved	2008199003	11	0	80.0	USA

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

From 2006 to 2011, quantity of exports of pili nuts have been minimal ranging from $19,827 to $50,883. The same is true with quantities processed. Starting 2012, exports picked up with

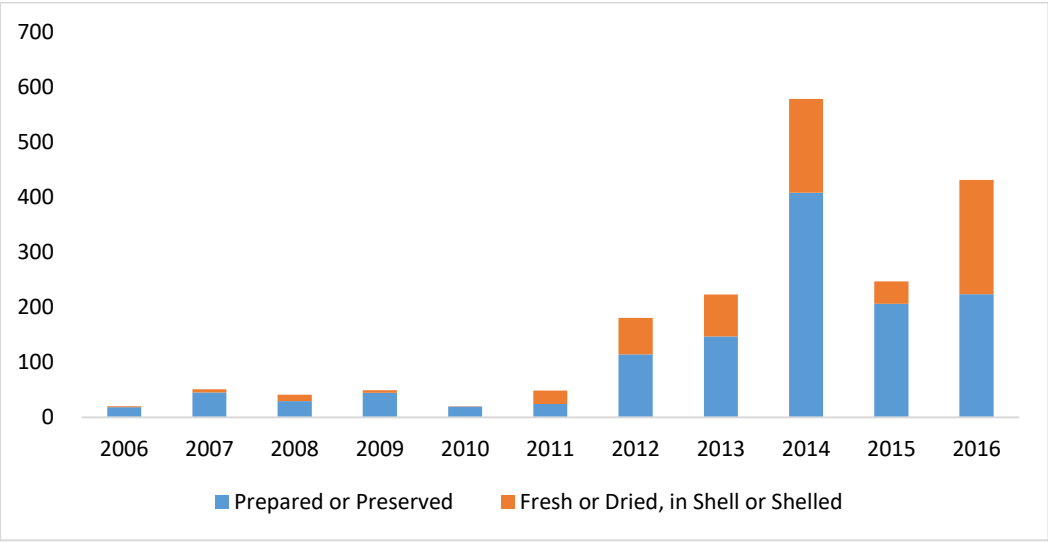
value quadrupling that of the 2011 level. It hit its highest in 2014 with over $500,000 in export value. Fresh or dried pili nut whether in shell or shelled also increased overtime with exports reaching $208,000 in 2016.

Table 40. Pili Supply and Utilization, MT, 2001 -2016

Year	Supply			Utilization					Consumption	
	Production (MT)	Imports (MT)	Gross Supply (MT)	Exports (MT)	Seeds (MT)	Feeds and Waste (MT)	Processing (MT)	Total Net Food Disposable (MT)	UT Per Capita kg/yr	Consumption (MT/yr)
2001	3,392	0	3,392	0	8	17	8	3,359	0.04	3,151
2002	4,391	0	4,391	0	8	22	11	4,350	0.05	4,022
2003	4,794	0	4,794	0	8	24	12	4,750	0.06	4,928
2004	4,939	0	4,939	0	8	25	12	4,894	0.06	5,027
2005	5,402	0	5,402	b/	8	27	14	5,353	0.06	5,122
2006	5,116	0	5,116	b/	9	26	13	5,068	0.06	5,212
2007	5,217	0	5,217	2	9	26	13	5,167	0.06	5,297
2008	5,853	0	5,853	3	9	29	15	5,797	0.06	5,378
2009	6,122	1	6,123	2	9	31	15	6,066	0.07	6,368
2010	6,637	0	6,637	b/	9	33	17	6,578	0.07	6,464
2011	7,105	1	7,106	4	9	36	18	7,039	0.07	6,564
2012	7,933	0	7,933	8	9	40	20	7,856	0.08	7,621
2013	8,243	0	8,243	23	9	41	21	8,149	0.08	7,744
2014	7,316	0	7,316	25	9	37	18	7,227	0.07	6,885
2015	7,362	0	7,362	18	9	37	18	7,280	0.07	6,994
2016	7,291	0	7,291	30	9	36	18	7,198	0.07	7,105

Source: PSA CountryStat (2017).

Figure 55. Export of Pili Nut by Product Type in Value ($'000), 2006-2016



Sources: EMB, DTI (2017).

The breakdown of pili nut exports by product type is presented in Table 41. Fresh/dried with/not shelled/peeled Pili nut with major markets in USA, Japan, France, Saudi Arabia, China, Hong Kong, Canada, Germany, Israel, and Korea comprise the bulk of the export, with 72.5% share in value. Prepared/preserved pili nut took up 27.51% of the export from 2003 to 2016. For a more detailed table on exports, refer to Appendix 6.

Table 41. Average Pili Nut Export by Product Type, Quantity, Value & % Share, 2003 - 2016

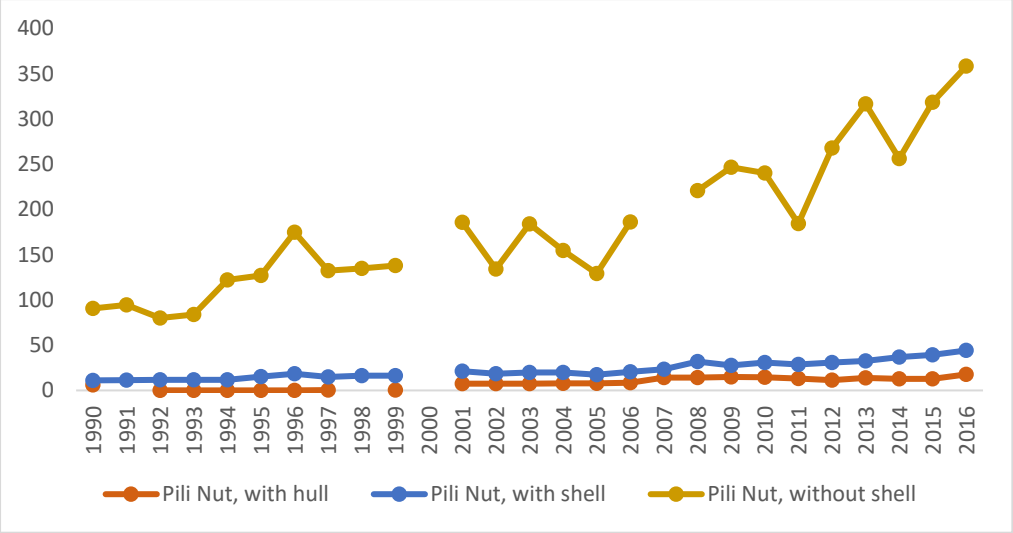
Product Type	Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Markets
Pili Nut, fresh/dried with/not shelled/peeled	0802909001	12	12	72	USA, Japan, France, Saudi Arabia, China, Hong Kong, Canada, Germany, Israel, Korea
Pili Nut, prepared/ preserved	2008199003	9	4	28	USA, Japan, Canada, UAE, Italy, Macau, China, Korea

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Price Trends

Farmgate prices of pili nut with hull and with shell showed a modest increase over time. In contrast, pili nut without shell exhibited sharp fluctuations, but with a much rapid growth of 7% per year.

Figure 56. Farmgate of Pili Nut, 1990 to 2016 (peso per kg)



Source: PSA CountryStat (2017).

Value Chain Analysis and Industry Players

The value chain map for pili nuts in Figure 57 shows the various functions involved from input provision to farming, trading, processing, distribution, up to final sale. At each stage, the tasks are specified and the corresponding operations that involved different industry players. At the bottom are the government and private agencies identified as the enablers. It is interesting to note that despite the relatively limited volume and operations, we seem to have established our export market from 2003 to 2016. For fresh and dried, we have USA, Japan, France, Saudi Arabia, China, Hong Kong, Canada, Germany, Israel and Korea. For prepared/ preserved pili nuts, we have USA, Japan, Canada, UAE, Italy, Macau, China and Korea markets.

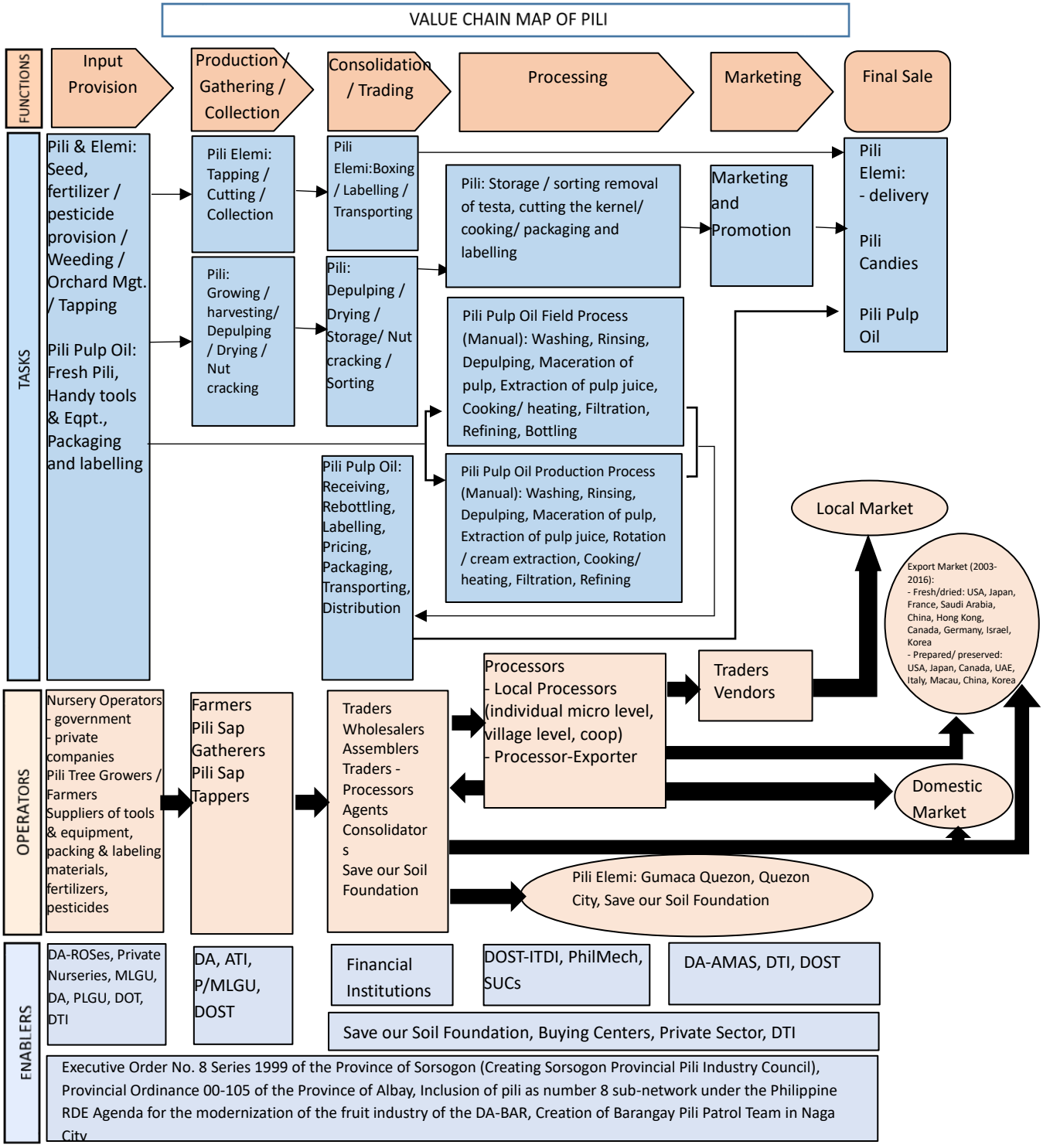
Table 42 presents the distribution of pili processors. It is clear that they are concentrated in practically one region. Region 5 accounts for 86% of the total processors nationwide. A far second is Region 8 with 9%. Regions 1, 3, 4A and 7 each contribute 1% or 2% only.

Table 42. Distribution of Industry Processors for Pili.

Region	PILI Processors	% to Philippines
CAR	1	0%
1	6	2%
2		0%
3	2	1%
4A	5	1%
4B	1	0%
5	299	86%
6	1	0%
7	2	1%
8	32	9%
9		0%
10		0%
11		0%
12		0%
CARAGA		0%
Total	349	100%

Source: PFN Regional Inventories of Industry Players (2019).
Note: The list of Pili Processors may overlap with the lists of processors for other commodities since it is common for a company to be processing more than one commodity.

Figure 57. Value Chain Analysis of Fresh, Shelled, Kernel, Candies, Elemi and Pulp Oil of Pili



Sources: DA, Region 5 (2016) and PSA (2018).

Note: This is a consolidation of VCAs of Fresh Fruit, Shelled and Kernel for Pili Candies, Pili Elemi and Pipi Pulp Oil.

Cashew Nut

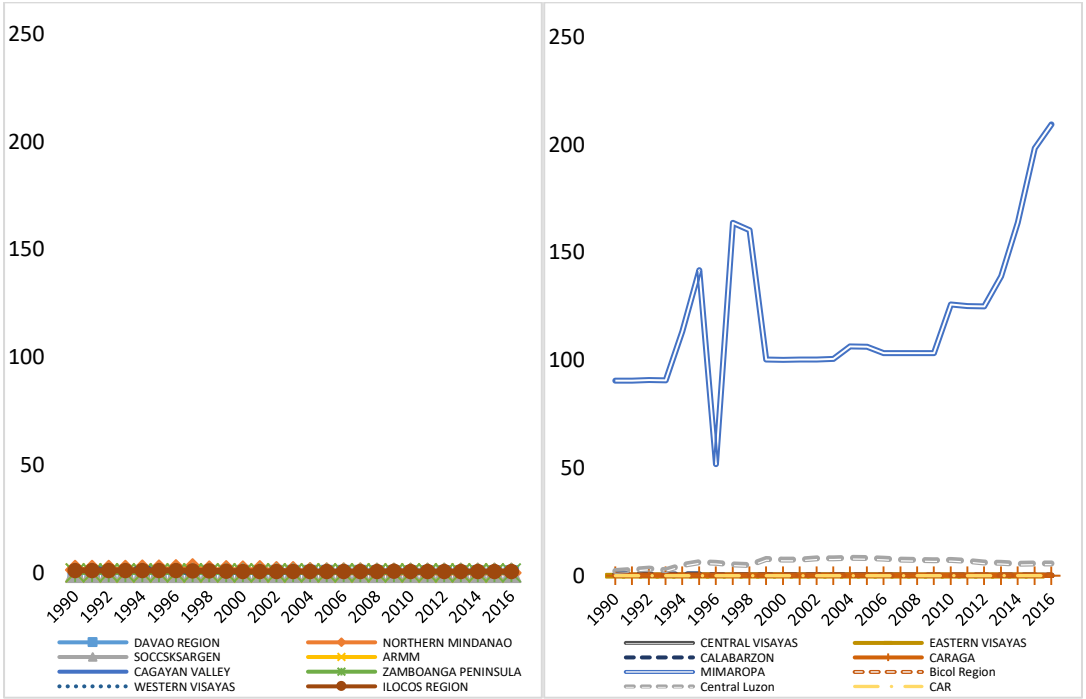
Cashew, a native of Brazil, was introduced in other parts of the world starting from the 16th century mainly with the intention of afforestation and soil conservation. However, it is now one of the most important nut crops in the Philippines. It is a versatile crop with many uses in the food industry. At present, only the nut is given attention by cashew growers as it commands a good demand in the market among domestic consumers. Cashew nuts are processed into different forms - dried, roasted, salted, fried, brittle, caramelized, and chocolate-coated. Cashew apples are also processed as prunes, wine, vinegar and juice.[7]

Cashew nut production in the Philippines is largely located in MIMAROPA, specifically in Palawan.

Production

About 93% of the production of cashew nuts in the Philippines came from MIMAROPA with annual average production of 115 thousand metric tons. All other regions had production of less than 10 thousand metric tons.

Figure 58. Cashew Production, TMT, 1990 - 2016



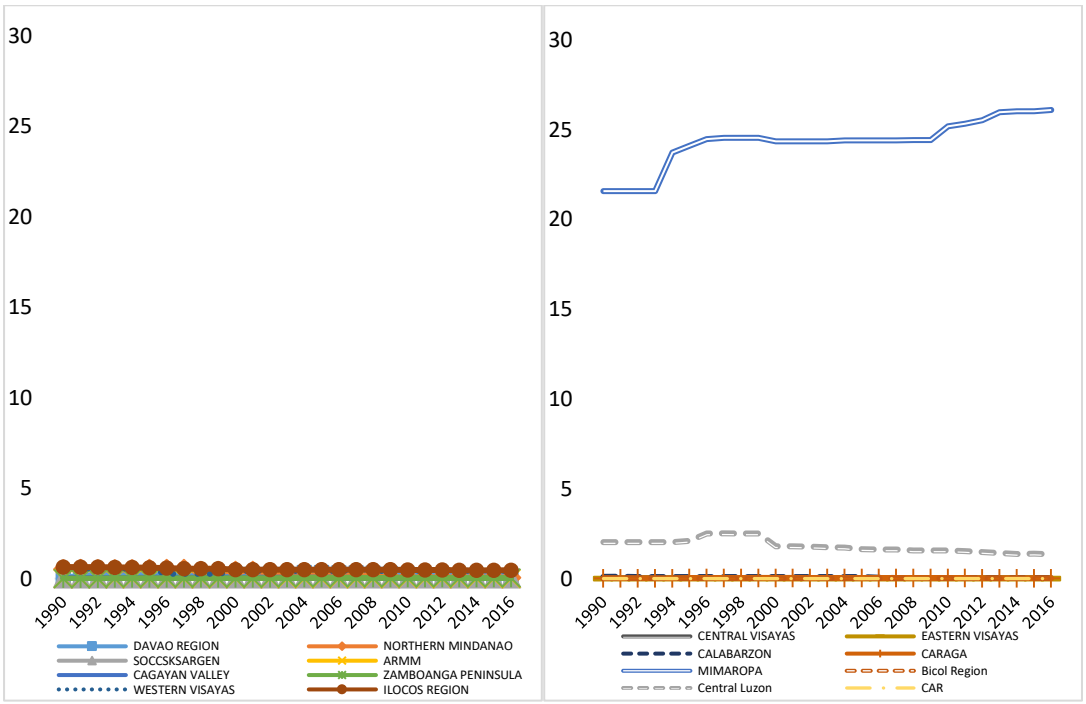
Source: PSA CountryStat (2017).

[7] DA, South Luzon Cluster (2017)

Area

Over the years, MIMAROPA has the largest cashew area planted/harvested compared to the other regions. From 1990 to 2016, the average area is over 24,000 hectares. All other regions have average areas of less than 3000 hectares.

Figure 59. Cashew Area Planted/Harvested, thousand ha., 1990 - 2016

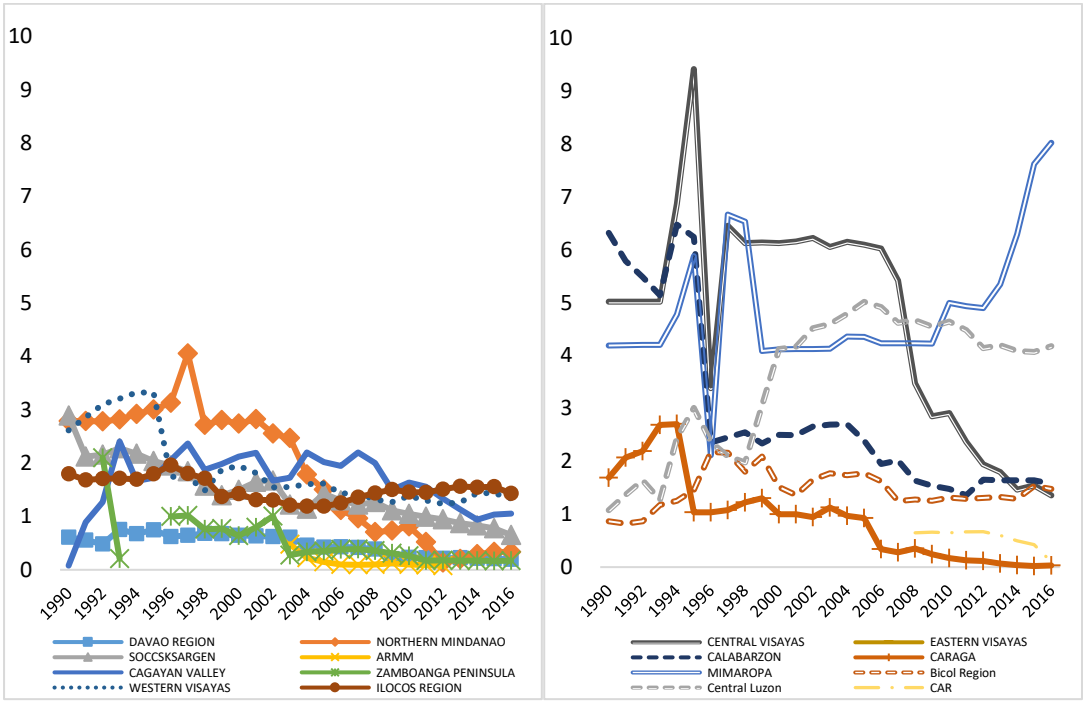


Source: PSA CountryStat (2017).

Yield

From 1990 to 2016, Central Visayas and MIMAROPA had the highest annual average yields of 5 tons per hectare. This is followed by Central Luzon at 4 tons per hectare and then by CALABARZON at 3 tons per hectare. The rest of the regions have yields averaging from 0.2 to 2 tons per hectare.

Figure 60. Cashew Yield, T/ha, 1990 - 2016

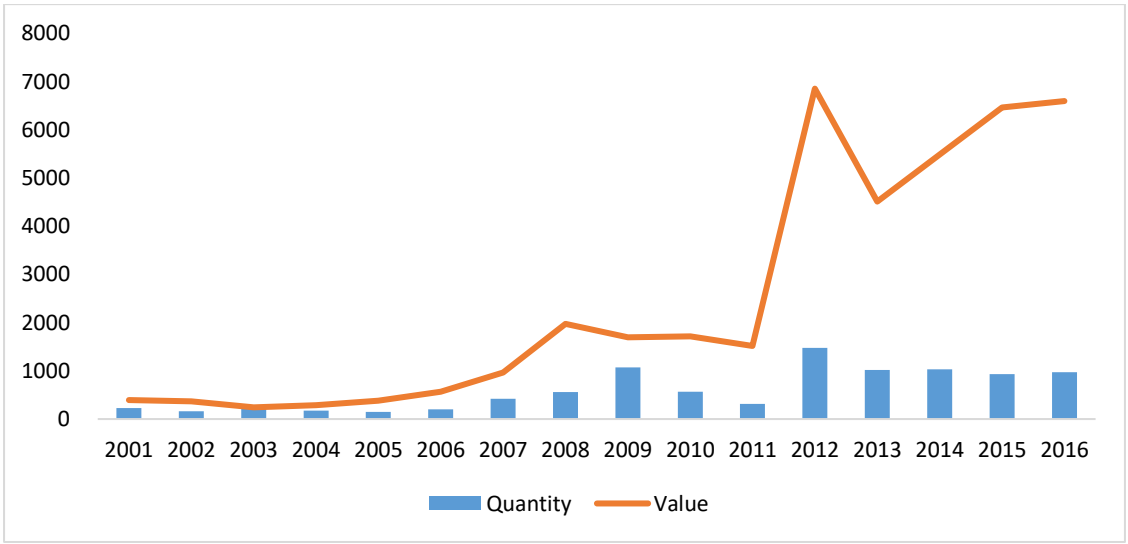


Source: PSA CountryStat (2017).

Imports and Exports

The country's import of cashew nut in terms of value has been rising since late 2000. The quantity, on the other hand, seemed to stabilize around 1000 tons after 2012.

Figure 61. Import of Cashew Nut in Value ($'000) and Quantity (tons), 2001-2016



Source: ITC Trade Map (2017).
Note: Refers to fresh and/or dried.

Table 43. Average Cashew Nut Import by Product Type, Quantity, Value & % Share, 2003 - 2016

Product Type	Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Suppliers
Cashew, fresh/ dried nut, shelled	0801320000	566	133	77	Vietnam, Germany, Brazil, Singapore, China
Cashew, fresh/ dried nut, in shell	0801310000	225	23	14	Australia, Indonesia, Vietnam, Brazil,
Cashew, prepared/ preserved	2008191000	59	15.8	9	India, Brazil, Vietnam, UK Great Britain & N. Ireland, China, USA, Thailand, Malaysia, Argentina

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

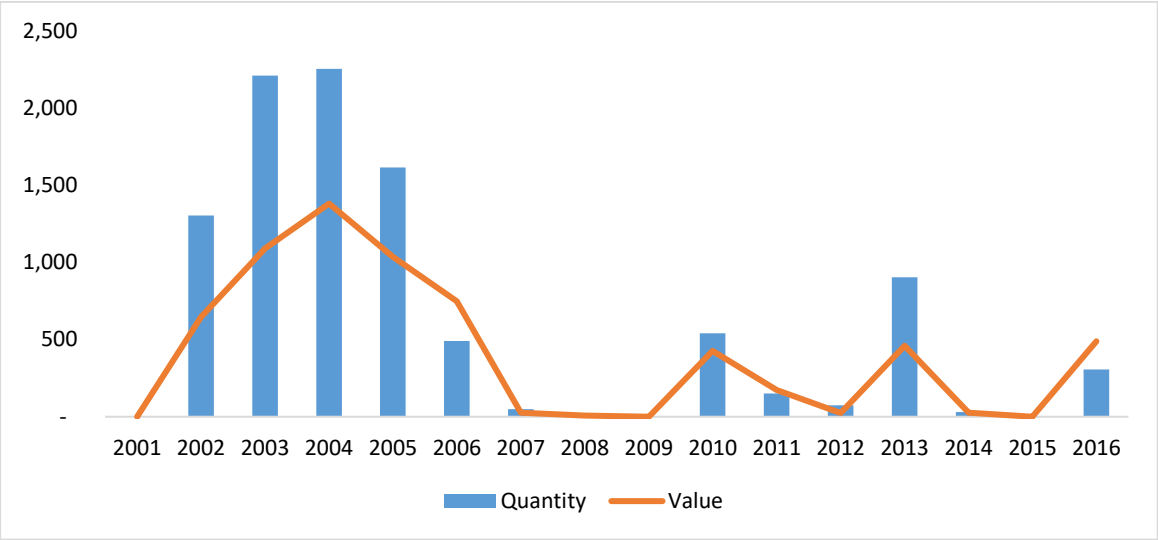
Most of the exports of cashew nuts progressed between 2002 and 2005 with over a thousand tons exported annually. Exports in succeeding years has been sporadic and in lower quantities. Additionally, the ratio of the processed to the gross supply remained at below one percent.

Table 44. Cashew Supply and Utilization, MT, 2001 -2016

Year	Supply				Utilization				Consumption	
	Production (MT)	Imports (MT)	Gross Supply (MT)	Exports (MT)	Seeds (MT)	Feeds and Waste (MT)	Processing (MT)	Total Net Food Disposable (MT)	UT Per Capita kg/yr	Consumption (MT/yr)
2001	11,115	210	11,325	0	112	57	28	11,128	0.14	11,028
2002	11,122	148	11,270	1,220	111	50	25	9,863	0.12	9,654
2003	11,129	240	11,369	2,176	111	46	23	9,013	0.11	9,035
2004	11,691	167	11,858	2,223	111	48	24	9,452	0.11	9,216
2005	11,653	144	11,797	1,589	111	51	26	10,020	0.12	10,244
2006	11,307	160	11,467	473	110	55	27	10,802	0.12	10,424
2007	11,256	55	11,311	48	110	56	28	11,069	0.12	10,594
2008	11,233	100	11,333	15	110	57	28	11,123	0.12	10,756
2009	11,199	577	11,776	0	110	59	29	11,578	0.13	11,826
2010	13,468	209	13,677	541	112	66	33	12,925	0.14	12,928
2011	13,339	60	13,399	150	113	66	33	13,037	0.14	13,128
2012	13,254	196	13,450	6	113	67	34	13,230	0.14	13,336
2013	14,629	28	14,657	814	115	69	35	13,624	0.14	13,551
2014	17,085	0	17,085	24	114	85	43	16,819	0.17	16,720
2015	20,553	0	20,553	0	115	103	51	20,284	0.2	19,984
2016	21,640	0	21,640	275	115	107	53	21,090	0.2	20,300

Source: PSA CountryStat (2017).

Figure 62. Export of Cashew Nut in Unit Value ($'000) and Quantity (tons), 2001-2016



Source: ITC Trade Map (2017).
Note: Refers to fresh and/or dried.

The breakdown of cashew nut exports by product type is presented in the table below. Fresh/chilled cashew nut with major markets in Vietnam and India comprise the bulk of the export, with 70.33% share in value. Fresh/dried cashew nut in shell took up 27.83% of the export from 2003 to 2016 while the remaining 1.82% is taken up by other products types. For a more detailed table, refer to Appendix 7.

Table 45. Average Cashew Nut Export by Product Type, Quantity, Value & % Share, 2003 - 2016

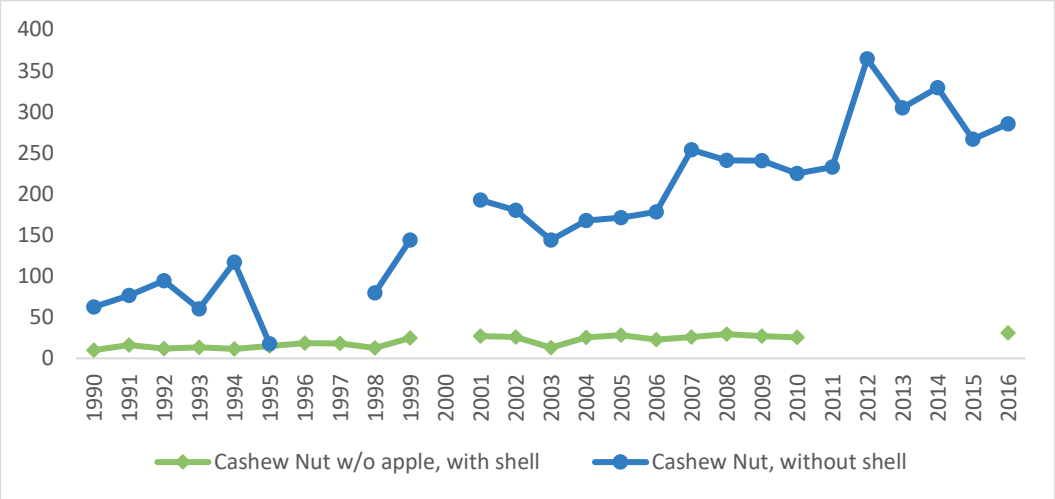
Product Type	Product Code	Quantity (MT)	Value (P million)	Value (% Share)	Major Markets
Cashew, fresh/dried nut, shelled	080132000	3	1	1	Vietnam
Cashew, fresh/dried nut, in shell	0801310000	569	23	28	Vietnam, India
Cashew, fresh/chilled nut, in shell		2,176	59	70	Vietnam, India
Cashew, prepared/preserved nut	2008191000	3	1	1	USA, Japan, Thailand, Italy, Canada, Guam, Papua New Guinea, Korea

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Price Trends

The farmgate prices of cashew nut in shell seemed to flat line between 1999 and 2010 while prices of cashew nut without shell experienced fast growth at over 9% per year in the past two decades despite fluctuations.

Figure 63. Farmgate of Cashew Nut, 1990 to 2016 (peso per kg)



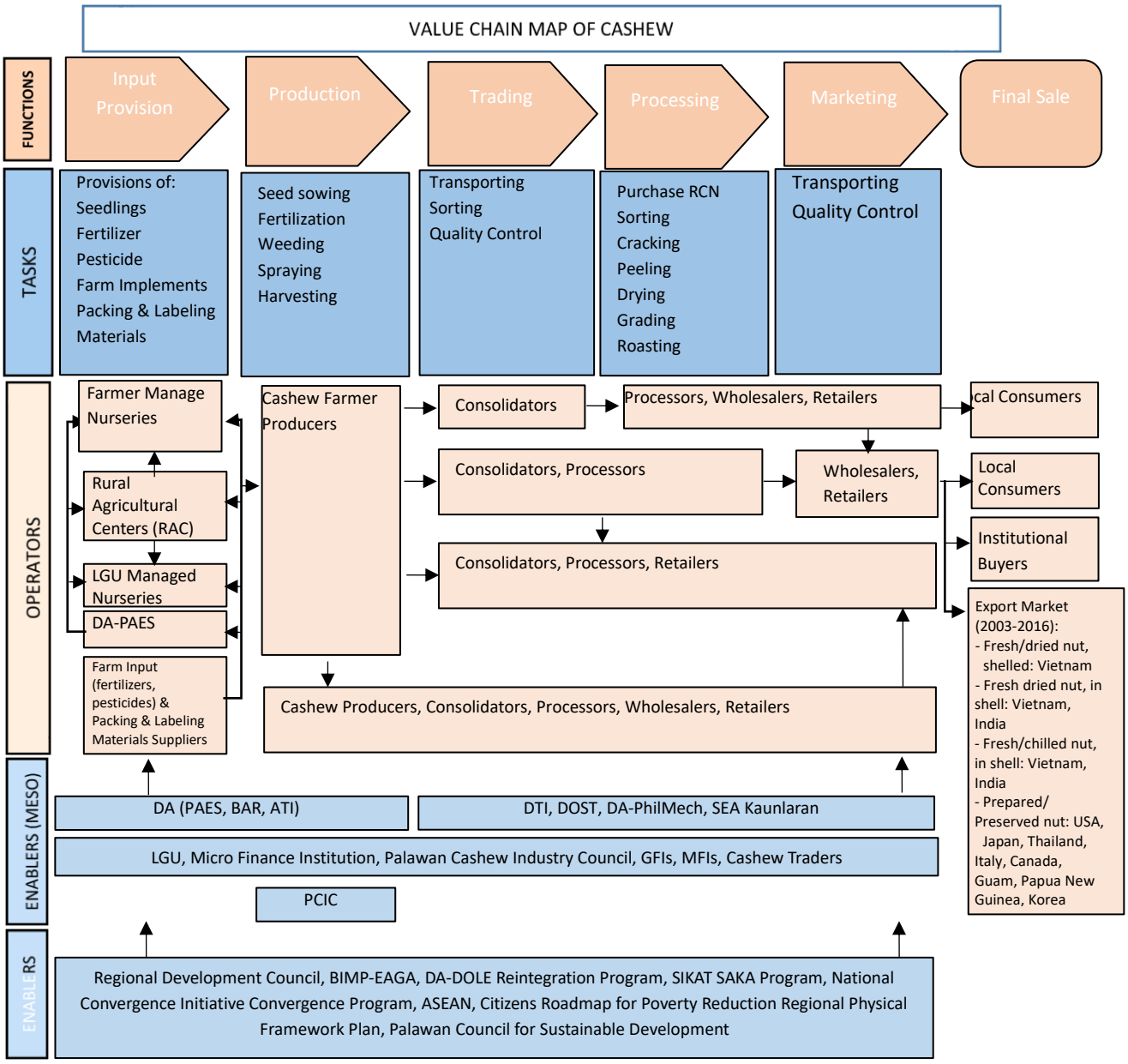
Source: PSA CountryStat (2017).

Value Chain Analysis and Industry Players

The value chain map for cashew nut in Figure 64 shows the various functions involved from input provision to farming, trading, processing, distribution, up to final sale. At each stage, the tasks are specified and the corresponding operations that involved different industry players. At the bottom are the government and private agencies identified as the enablers. Interestingly, despite the relatively small volume, we have established export markets from 2003 to 2016 for fresh/dried nut, shelled (Vietnam) and in shell (Vietnam, India), fresh/chilled nut, in shell (Vietnam, India), prepared/preserved nut (Guinea, Korea, USA, Japan, Thailand, Italy, Canada, Guam, Papua New).

Table 46 presents the distribution of cashew processors across the regions. More than half of the 80 processors nationwide are located in Regions 6 and 3, at 35% and 29%, respectively. Region 4A accounts for 13% and Regions 1 and 10, 8% each.

Figure 64. Value Chain Analysis of Roasted Cashew Nut



Sources: DA, South Luzon Cluster (2017) and PSA (2018).

Table 46. Distribution of Industry Processors for Cashew.

Region	CASHEW Processors	% to Philippines
CAR	1	1%
1	6	8%
2		0%
3	23	29%
4A	10	13%
4B		0%
5		0%
6	28	35%
7	2	3%
8	2	3%
9		0%
10	6	8%
11		0%
12		0%
CARAGA	2	3%
Total	80	100%

Source: PFN Regional Inventories of Industry Players (2019).
Note: The list of Cashew Processors may overlap with the lists of processors for other commodities since it is common for a company to be processing more than one commodity.

V. Potential Areas of Growth and Binding Constraints

This chapter provides the analyses on potential for growth and viability in the global market by looking at the competitive and comparative advantage across the eight selected commodities and specific processed fruits and nuts, with available data.

Revealed Comparative Advantage

Measures of RCA[8] have been used to help assess a country's export potential. The RCA indicates whether a country is in the process of extending the products in which it has a trade potential, as opposed to situations in which the number of products that can be competitively exported is static.[9]

A ratio of greater than 1 indicates that a country has a comparative advantage in that product while a ratio of less than 1 indicates the opposite. Products with RCA greater than 1 are considered as the country's export product niches.

The products can be classified into four (4) categories depending on their competitiveness using the criteria below:

1. **Competitive** – if RCA is: (a) greater than 1 from 2001-2015; or (b) is greater than 1 for most – but not all – years provided that RCA does not fall below 1 for more than four years (consecutive or non-consecutive) and that RCA did not fall below 1 within 2014-2015;
2. **Emerging Products** – if RCA is: (a) less than 1 in the initial years, but is consistently greater than 1 in the recent years (2013-2015); or (b) greater than 1 in the initial years but fell below 1 for more than 4 consecutive years before regaining competitiveness in the more recent years (2013-2015);
3. **Declining Products** – if RCA is: (a) greater than 1 in the initial years (2001-2003) but has lost competitiveness in the recent years (2013-2015); or (b) greater than 1 for most years but exhibits a downward trend in the recent years before losing competitiveness as of 2015; and
4. **Uncompetitive Products –** if RCA: (a) is less than 1 for most years; or (b) does not satisfy any of the aforementioned criteria.

Table 47 shows trade figures of major fruits and nuts covered in this study. The country's major imports are cashew nut, papaya and mango while the major exports are bananas, pineapples, and mangoes. The exports for papaya and calamansi are less than $2 million.

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[8]The Revealed Comparative Advantage or RCA index of country *i* for product *j* is often measured by the product's share in the country's exports in relation to its share in world trade:

$$RCA_{ij} = (x_{ij}/X_{it}) / (x_{wj}/X_{wt})$$

where x_{ij} and x_{wj} refer to the values of country i's exports of product j and world exports of product *j*, X_{it} and X_{wt}, the country's total exports and world total exports, respectively. A value of less than unity implies that the country has a revealed comparative disadvantage in the product. Similarly, if the index exceeds unity, the country is said to have a revealed comparative advantage in the product.

[9] World Bank (2010)

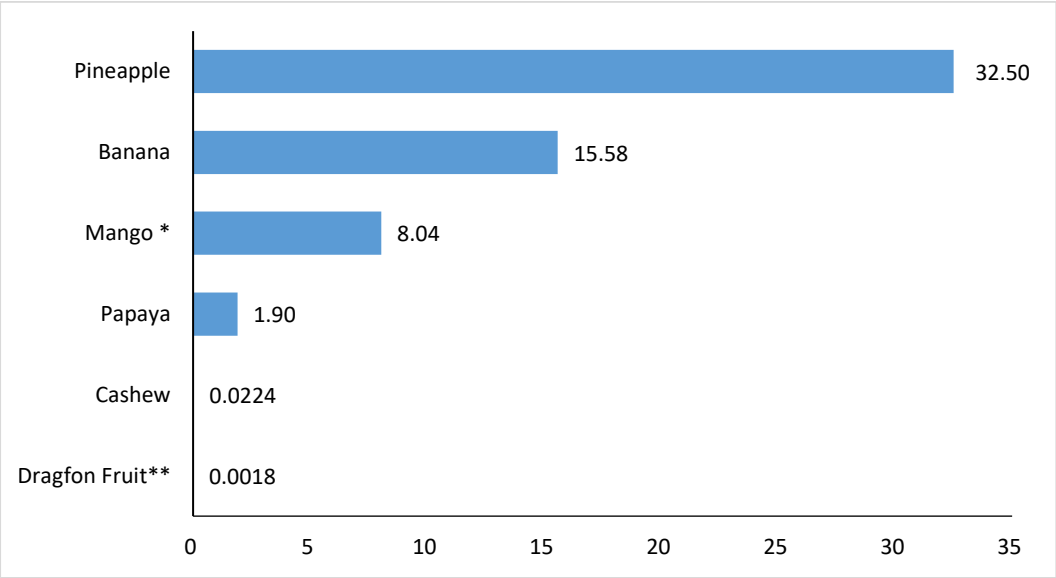
Table 47. Imports and Exports of Major Fruits and Nuts, 2016, in $US'000

Commodity	Imports	Exports
Banana	46	618,830
Mango*	961	66,865
Pineapple	55	228,412
Papaya	1,502	1,840
Cashew Nut	6,598	489
Calamansi	5	1,830
Pili Nut	-	431
Dragon Fruit	-	5.73

Sources: ITC Trade Map (2017), DA Region 1 VCA for Dragon Fruit.
*Note: * Mango includes guava and mangosteen.*

The Revealed Comparative Advantage (RCA) measures of the above commodities with available data are shown in the figure below. In 2016, the country has comparative advantage in pineapple, banana, mango and papaya, with pineapple having the highest RCA. We have comparative disadvantage for cashew nut and dragon fruit.

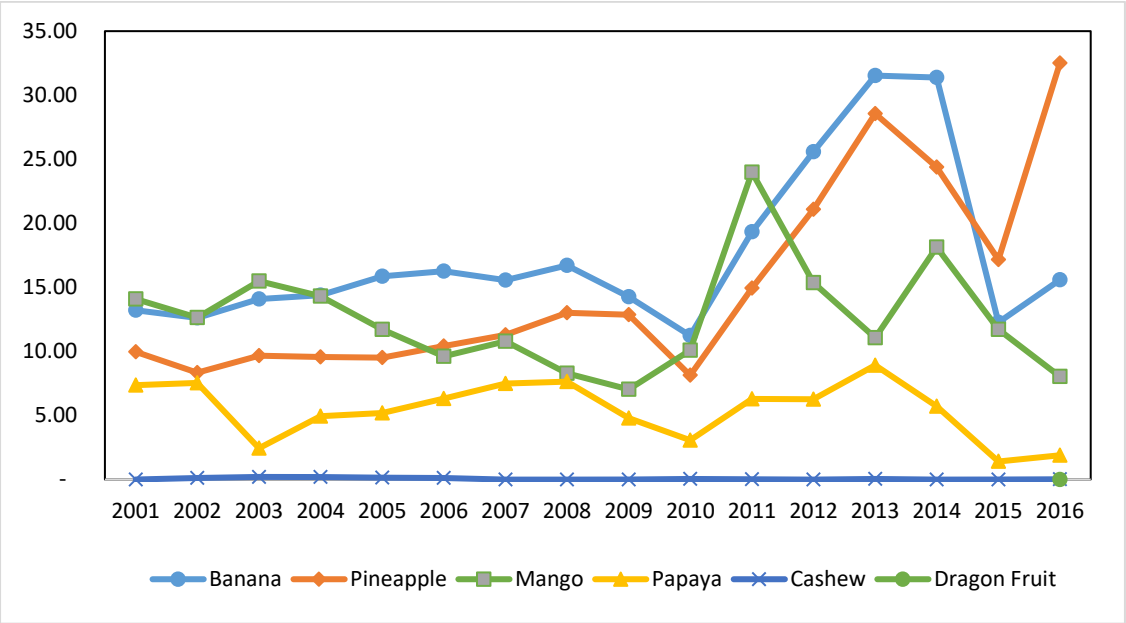
Figure 65. Revealed Comparative Advantage for Selected Fruits and Nuts, 2016



Sources of Basic Data: ITC Trade Map (2017), DA Region 1 (2016), http://en.vietnamplus.vn.
*Note: * Mango includes guava and mangosteen*
***data for world export of dragon fruit is http://en.vietnamplus.vn.*

Figure 66 below shows the calculated RCA overtime for the six commodities covered in this study. In terms of average RCA overtime, banana ranked first, followed by pineapple, and then by mango and papaya. Mango and papaya RCAs are however declining while those for banana and pineapple, peaked in 2013, declined until 2015 and recovered in 2016.

Figure 66. Revealed Comparative Advantage for Selected Fruits and Nuts, 2001 -2016



Sources of Basic Data: ITC Trade Map (2017), DA Region 1 (2016); http://en.vietnamplus.vn.
*Note: * Mango includes guava and mangosteen*
*** data for world export of dragon fruit is http://en.vietnamplus.vn.*

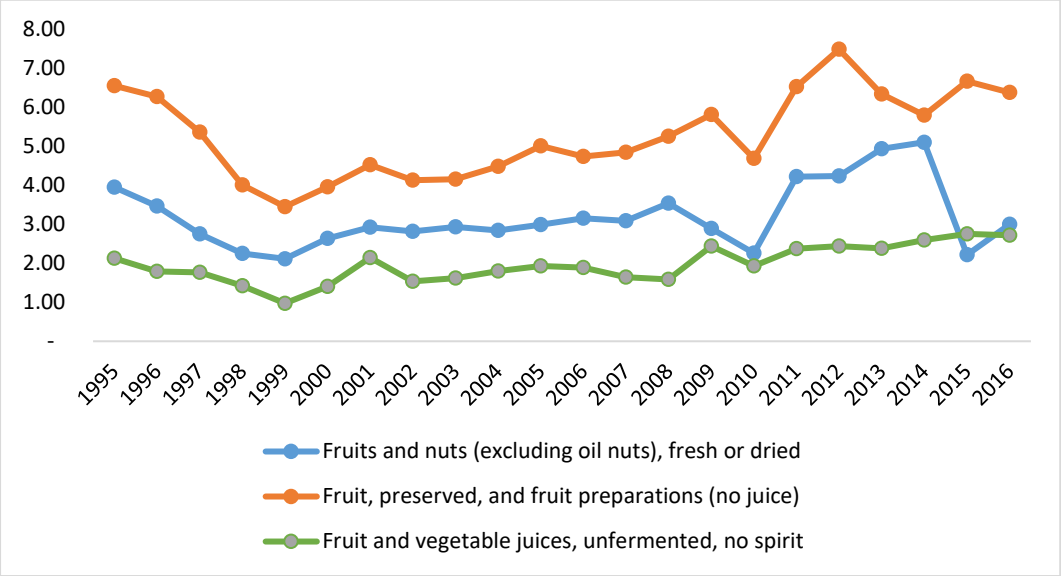
Measuring the RCA at the 6-digit Harmonized System (HS) product categories, we can establish if there is product specialization within the country and vis-à-vis the country's top competitors. Table 48 below shows that it is clear that we have revealed comparative advantages in processed banana, pineapple and mango. We are yet to establish volume and presence in processing of cashew, pili, calamansi, papaya and dragon fruit.

Table 48. Revealed Comparative Advantage for Selected Fruits and Nuts, 2001 -2016

Commodity	Code	2001	2002	2003	2004	2005	2006	2007	2008	2010	2011	2012	2013	2014	2015	2016
Banana including plantains , fresh or dried	080300	13.21	12.61	14.09	14.39	15.86	16.27	15.55	16.70	11.23	19.34	25.58	31.53	31.37	12.26	15.58
Pineapple, fresh or dried	080430	9.96	8.34	9.67	9.58	9.51	10.42	11.28	13.01	8.13	14.95	21.09	28.57	24.37	17.15	32.50
Pineapple, juice	200940	34.98	23.85	23.83	25.12	30.50	31.65	36.78	31.00	29.33	36.47	45.52	44.79	43.81	33.29	30.77
Mango, fresh or dried (with guava & mangosteen)	080450	14.10	12.63	15.48	14.32	11.73	9.60	10.78	8.30	10.09	23.99	15.35	11.05	18.15	11.71	8.04
Papaya, fresh	080720	7.37	7.53	2.45	4.93	5.19	6.31	7.49	7.64	3.07	6.30	6.25	8.92	5.73	1.41	1.90
Cashew Nuts, in shell & shelled	080131/ 080132	-	0.12	0.20	0.20	0.14	0.11	0.00	0.00	0.04	0.01	0.00	0.03	0.00	-	0.02
Dragon Fruit																0.002

Sources of Basic Data: ITC Trade Map (2017), DA Region 1 (2016); http://en.vietnamplus.vn.

Figure 67. Revealed Comparative Advantage for Fruits, Nuts and Vegetables, 1995 -2016



Source of Basic Data: UNCTAD (2017).

Competitive and Comparative Advantage

The advantage of using RCA is that it is easy to calculate and understand. However, it does not consider government policies/interventions such as taxes, subsidies, or regulations (e.g. import restrictions). The revealed patterns of trade may be simply the distorted outcome of these policies/interventions. The domestic resource cost ratio (DRCR) takes the ratio of returns to non-tradable domestic factors (namely land, labor, and capital) to tradable value (measured as outputs less tradable inputs). The DRCR is an indicator of competitive (financial) and comparative (economic) advantage (Briones 2014). A DRCR which is below one (1) implies a country's comparative advantage in producing the commodity.

Banana

Banana has a high financial profitability of about Php128,000 per ha and even higher economic profitability of about Php131,000 per ha. The difference is due only to taxes as shown in the breakdown of cost items in terms of tradable and non-tradable input costs. Even though banana is the largest exported commodity among the fruits and nuts exports in the country, the DRCR is only at 0.25 (economic) to 0.26 (financial).

Table 49. Policy Analysis Matrix for Cardava Banana, 2013, in pesos per ha (unless in ratios)

	Revenue	Tradable inputs	Domestic resources	Net	DRCR	DRC/SER
Financial	200,000	28,000	44,127	127,873	0.26	0.21
Economic	200,000	24,701	43,812	131,487	0.25	0.20
Divergence	-	3,299	315	-3,614		

Source of basic data: DA VCA Cardava Banana (Mindanao), 2013.

Pineapple

The financial profitability of pineapple is much higher than that of banana, reaching almost Php280,000 per hectare. This is due to the high yield for pineapple of over 40 tons per hectare compared to the latter. However, the DRCR is much lower than that of banana with only 0.12 as shown in the table below.

Table 50. Policy Analysis Matrix for pineapple, 2016, in pesos per ha (unless in ratios)

	Revenue	Tradable inputs	Domestic resources	Net	DRCR	DRC/SER
Financial	359,284	41,039	38,683	279,562	0.12	0.10
Economic	359,284	40,496	38,356	280,432	0.12	0.10
Divergence	0	543	327	-870		

Source of basic data: PSA CountryStat (2017).

Mango

The matrix below shows financial profitability of over Php 69,000 per hectare. This is lower than both banana and mango. Nonetheless, the financial DRCR measure of mango is the highest by far at 0.44. The economic DRCR is close at 0.43 since the difference between financial and economic value is small as shown in the details of the cost items below.

Table 51. Policy Analysis Matrix for Mango, 2016, in pesos per ha (unless in ratios)

	Revenue	Tradable inputs	Domestic resources	Net	DRCR	DRC/SER
Financial	**146,923**	**23,088**	**54,558**	**69,277**	**0.44**	**0.35**
Economic	**146,923**	**22,020**	**53,727**	**71,176**	**0.43**	**0.34**
Divergence	**0**	**1,068**	**831**	**-1,899**		

Source of basic data: PSA CountryStat (2017).

Calamansi

The policy matrix below indicates a net income of around 56,000 pesos per ha, which is the lowest by far, but it has the highest DRCR of 0.50 in comparison with the previous crops. The divergence between financial and economic prices are very small, thus the economic and financial DRCR have the same value.

Table 52. Policy Analysis Matrix for Calamansi, 2016, in pesos per ha (unless in ratios)

	Revenue	Tradable inputs	Domestic resources	Net	DRCR	DRC/SER
Financial	118,942	7,264	55,912	55,766	0.50	0.40
Economic	118,942	6,999	55,474	56,469	0.50	0.40
Divergence	0	265	438	-703		

Source of basic data: PSA CountryStat (2017).

Papaya

The financial profitability of papaya production is quite low at around Php 26,000 per ha. owing to the high cost of production. The DRCR (financial), however, is higher than that of calamansi at 0.79. Due to taxes, the economic DRCR is 0.77.

Table 53. Policy Analysis Matrix for Papaya, 2016, in pesos per ha (unless in ratios)

	Revenue	Tradable inputs	Domestic resources	Net	DRCR	DRC/SER
Financial	173,992	49,522	98,107	26,363	0.79	0.63
Economic	173,992	46,723	97,792	29,477	0.77	0.61
Divergence	0	2,799	315	-3,114		

Source of basic data: PSA CountryStat (2017).

Pili nut

The policy analysis matrix below indicated a high financial profitability of over Php 111,000 per ha. This is much higher than that for mango. The DRCR (financial), however, is far from unity at 0.21 and lower than that for mango. The economic DRCR is close at 0.20 since the divergence is almost negligible.

Table 54. Policy Analysis Matrix for Pili Nut, 2016, in pesos per ha (unless in ratios)

	Revenue	Tradable inputs	Domestic resources	Net	DRCR	DRC/SER
Financial	140,895	107	29,212	111,576	0.21	0.17
Economic	140,895	92	28,653	112,150	0.20	0.16
Divergence	0	15	559	-574		

Source of basic data: PSA CountryStat (2017).

Cashew Nut

The profitability of cashew nut production is the lowest among the crops covered in this study at around Php 16,000 per hectare. The financial and economic DRCR measures are, however, higher than that of banana, pineapple and pili nut at 0.30 and 0.29, respectively.

Table 55. Policy Analysis Matrix for Cashew Nut, 2016, in pesos per ha (unless in ratios)

	Revenue	Tradable inputs	Domestic resources	Net	DRCR	DRC/SER
Financial	23,382	2	6,923	16,457	0.30	0.24
Economic	23,382	2	6,684	16,696	0.29	0.23
Divergence	0	0	239	-239		

Source of basic data: PSA CountryStat (2017).

VI. PFN SWOT Analyses

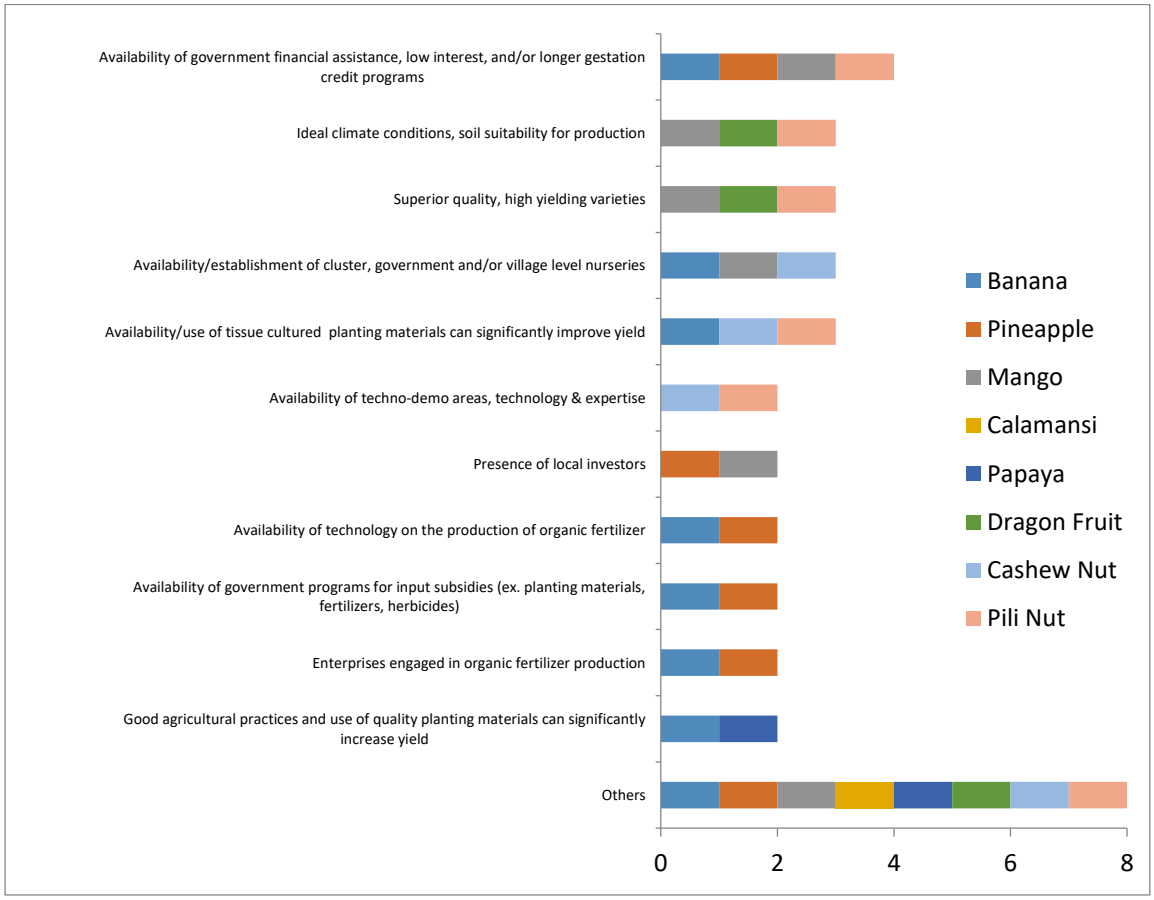
This chapter presents the results of the focus group discussions/strategic planning exercise with the stakeholders of the eight commodities from Luzon to Mindanao. The participants were asked to define their goals and set some targets, followed by proposed strategies after establishing the strengths, weaknesses, opportunities and threats faced by the processed fruits and nuts cluster. The results of this process led to the formulation of PFN strategies articulated in the PFN Roadmap.

Strengths/Opportunities

Input Provision

The figure below summarizes the strengths and opportunities under input provision of the PFN sector. Commonly identified strengths and/or opportunities among the eight (8) commodities are the following: availability of government financial assistance, low interest, and/or longer gestation credit programs; ideal climate conditions, soil suitability for production; superior quality, high yielding varieties; availability/establishment of cluster, government and/or village level nurseries; and availability/use of tissue cultured planting materials can significantly improve yield.

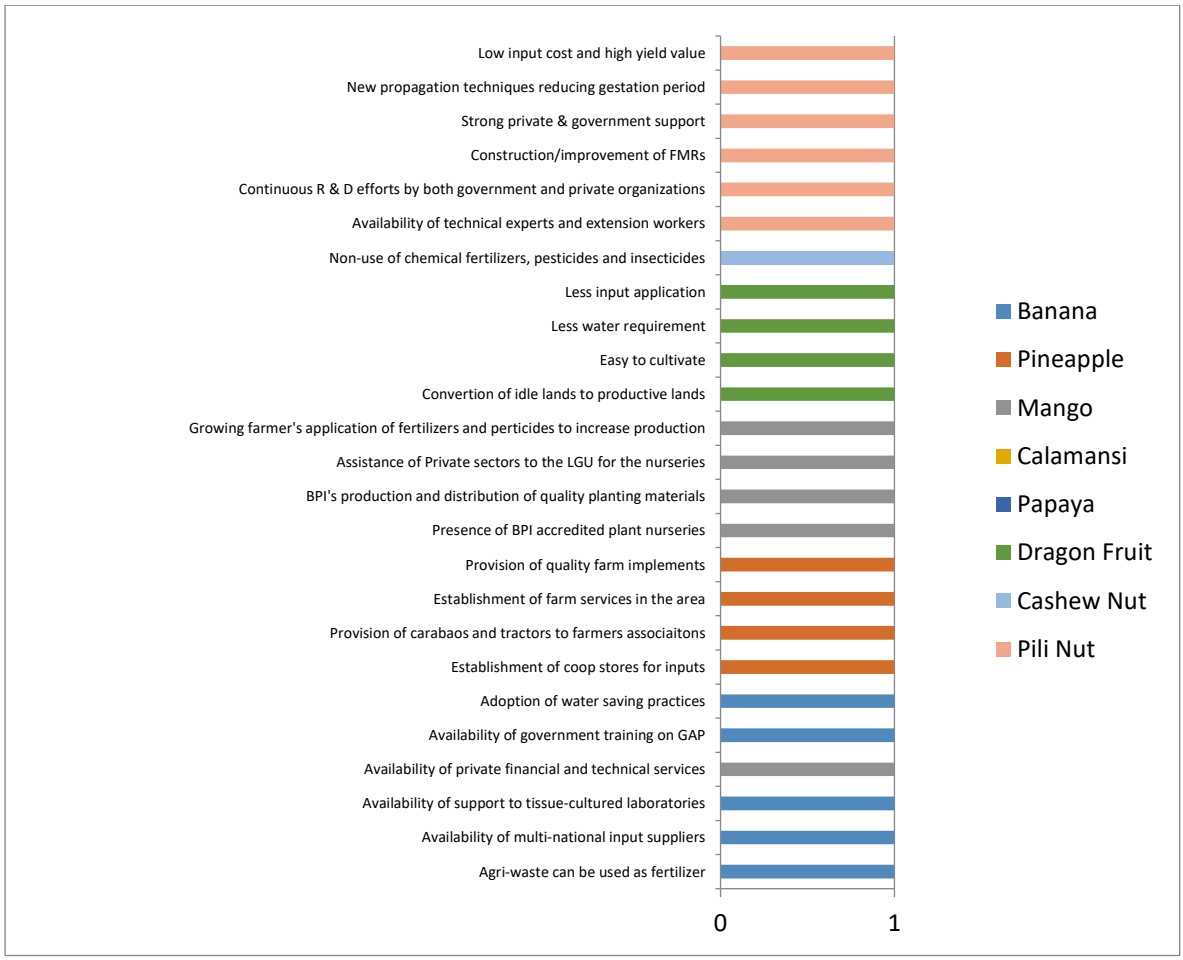
Figure 68. Strengths and Opportunities in Input Provision



Sources: Various VCAs various years, FGD 2018.

Just to show the variety of answers, the figure below shows the “other” identified strengths and opportunities.

Figure 69. Others in Strengths and Opportunities in Input Provision

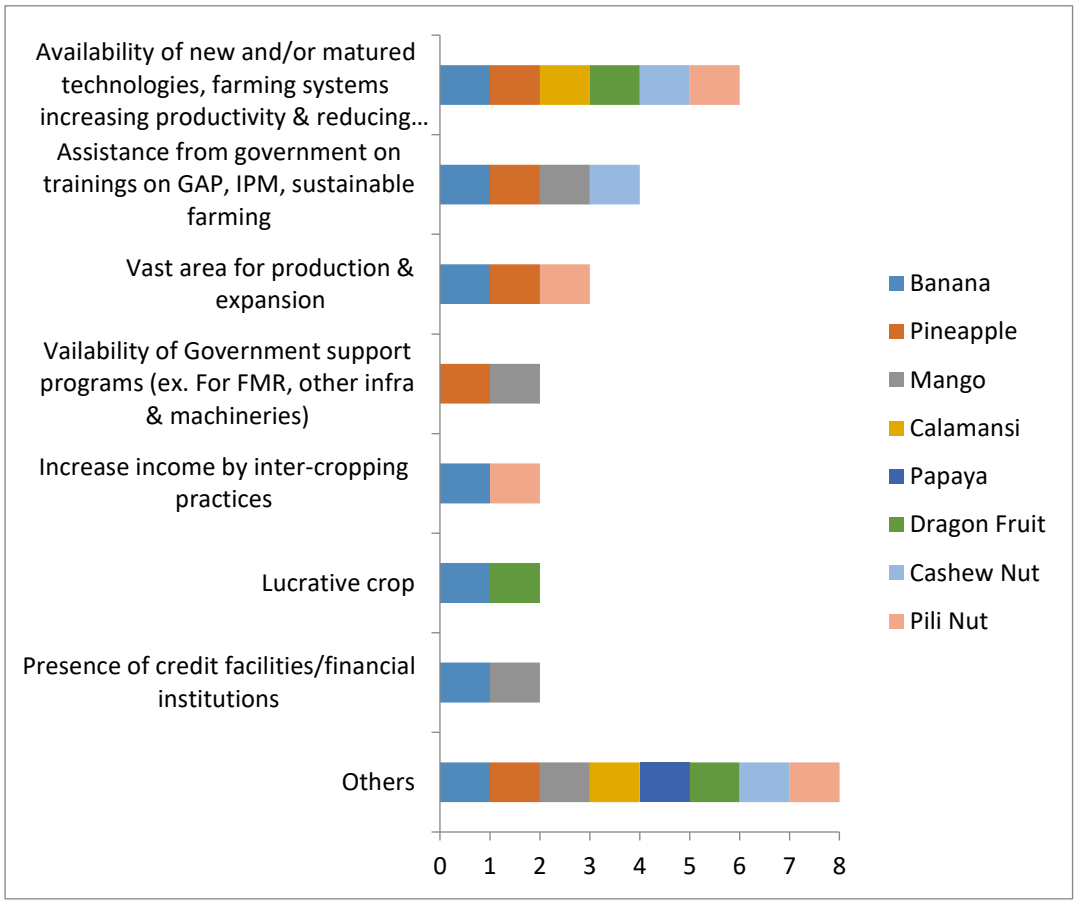


Sources: Various VCAs various years, FGD 2018.

Farming/Production

In farming, the following strengths and opportunities were identified by stakeholders of more than four commodities: availability of new and/or matured technologies, farming systems increasing productivity & reducing pest and diseases; and assistance from government on trainings on GAP, IPM, sustainable farming.

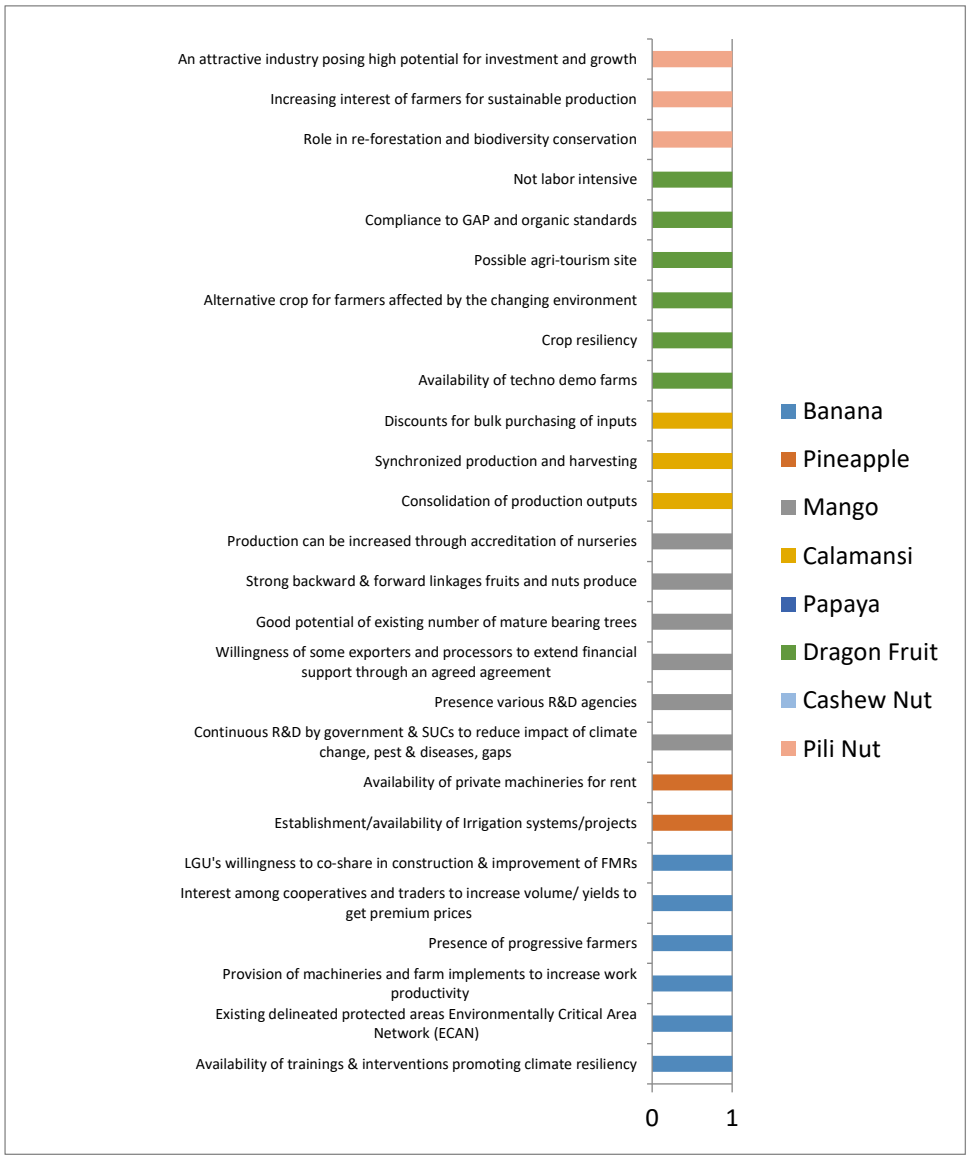
Figure 70. Strengths and Opportunities in Farming/Production



Sources: Various VCAs various years, FGD 2018.

The figure below shows the breakdown of those categorized under “Others”.

Figure 71. Others in Strengths and Opportunities in Farming/Production

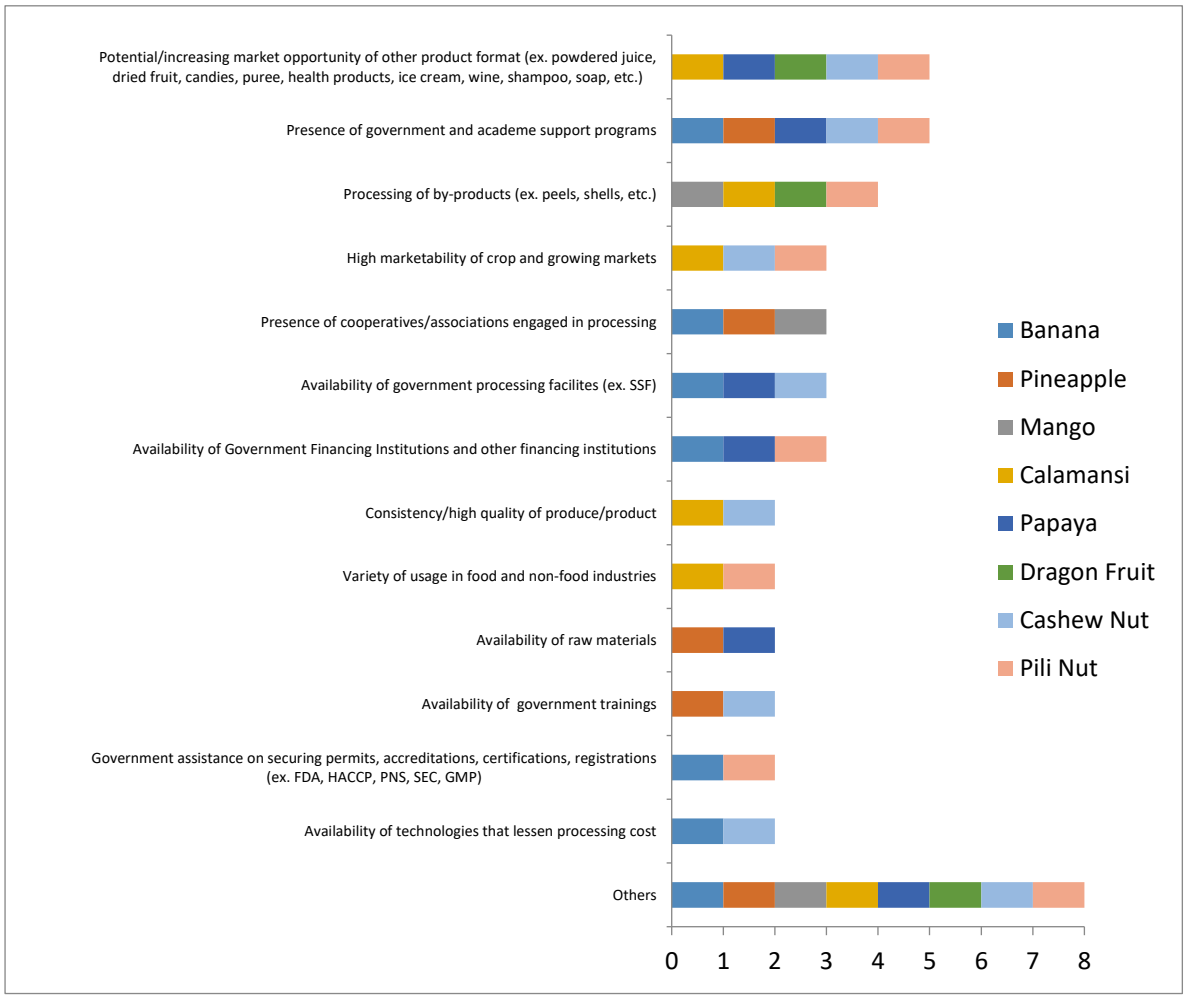


Sources: Various VCAs various years, FGD 2018.

Processing

The top 3 commonly identified strengths and opportunities by processors are as follows: potential/increasing market opportunity of other product format (ex. powdered juice, dried fruit, candies, puree, health products, ice cream, wine, shampoo, soap, etc.); presence of government and academe support programs; and processing of by-products (ex. peels, shells, etc.).

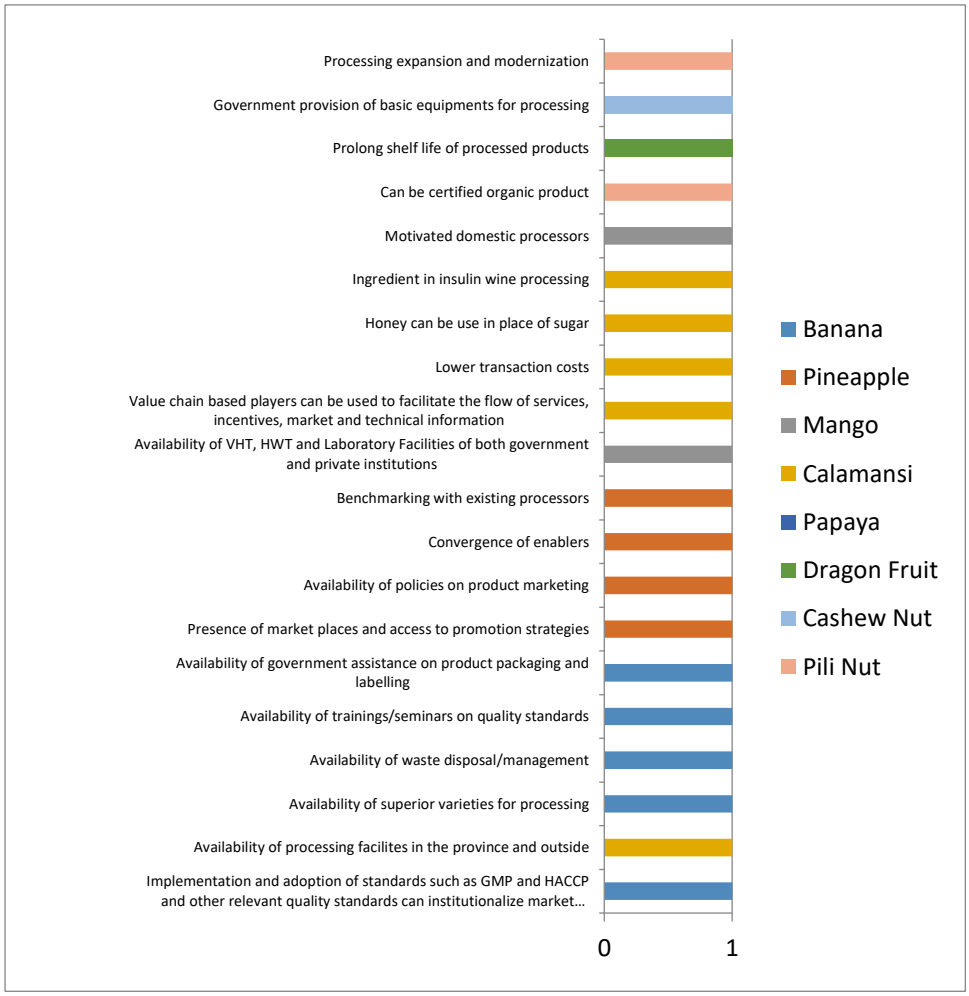
Figure 72. Strengths and Opportunities in Processing



Sources: Various VCAs various years, FGD 2018.

For strengths/opportunities placed under “Others”, the figure below shows how the answers varied across the commodities.

Figure 73. Others in Strengths and Opportunities in Processing

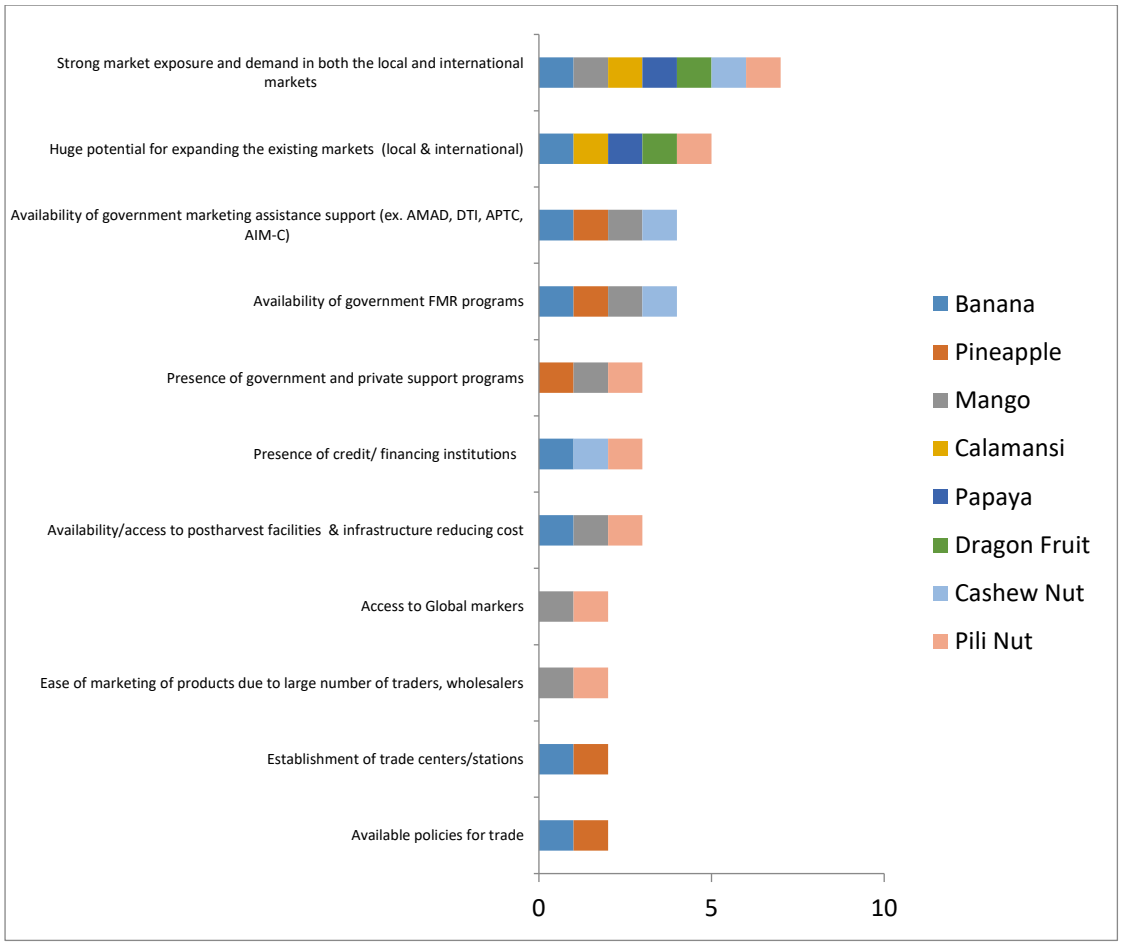


Sources: Various VCAs various years, FGD 2018.

Consolidation/Packing/Marketing/Distribution/Post-Harvest/Logistics/ Assembly/Trading/ Final Sale

Under these activities, the following are identified as strengths and opportunities by stakeholders of more than four (4) commodities: strong market exposure and demand in both the local and international markets; huge potential for expanding the existing markets (local & international); availability of government marketing assistance support (ex. AMAD, DTI, APTC, AIM-C); and availability of government FMR programs.

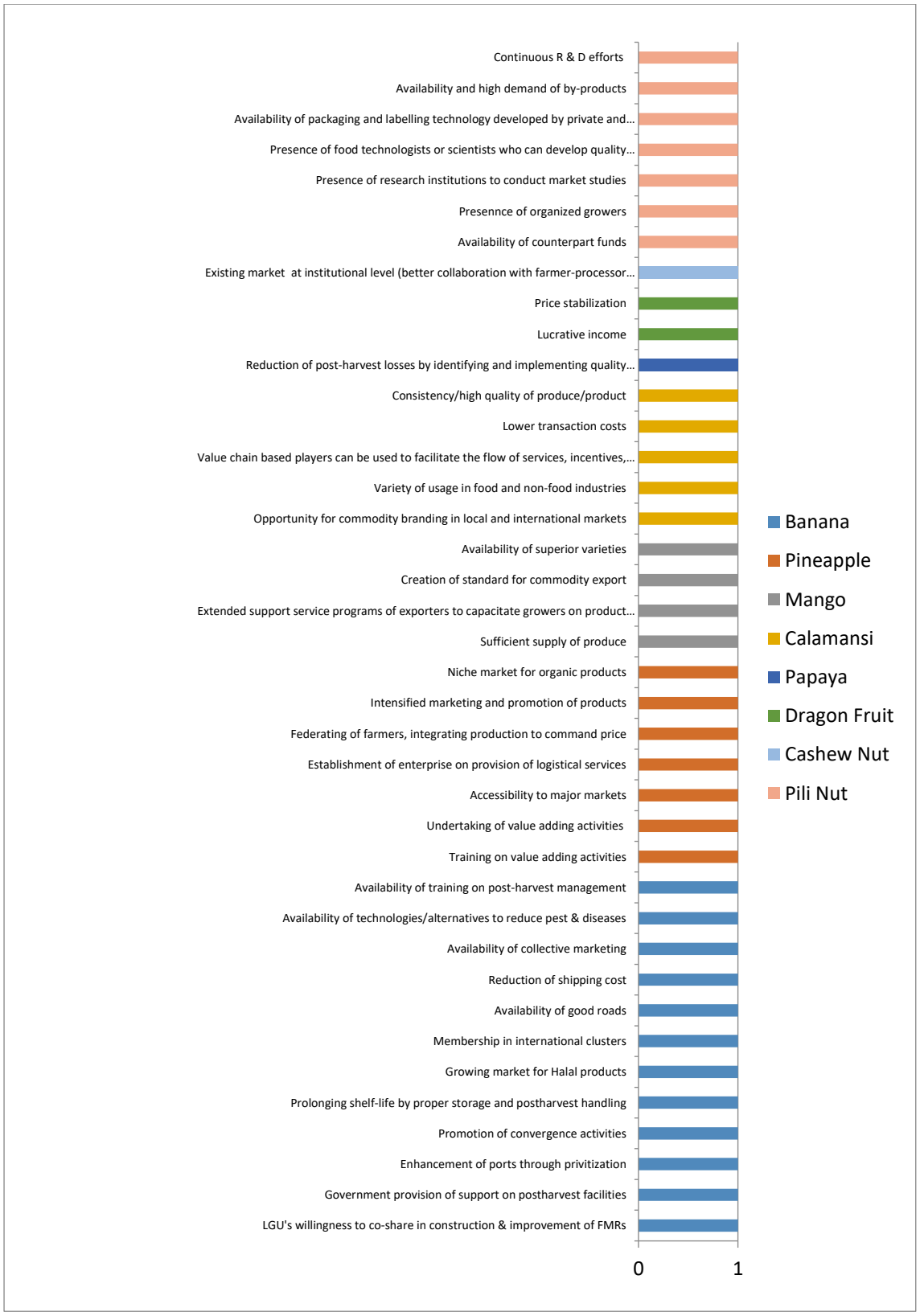
Figure 74. Strengths and Opportunities in Consolidation/Packing/Marketing/Distribution/Post-Harvest/Logistics/Assembly/Trading/ Final Sale



Sources: Various VCAs various years, FGD 2018.

The variety of answers across the commodities is shown in the figure below.

Figure 75. Others in Strengths and Opportunities in Consolidation/Packing/Marketing/Distribution/Post-Harvest/Logistics/Assembly/Trading/ Final Sale

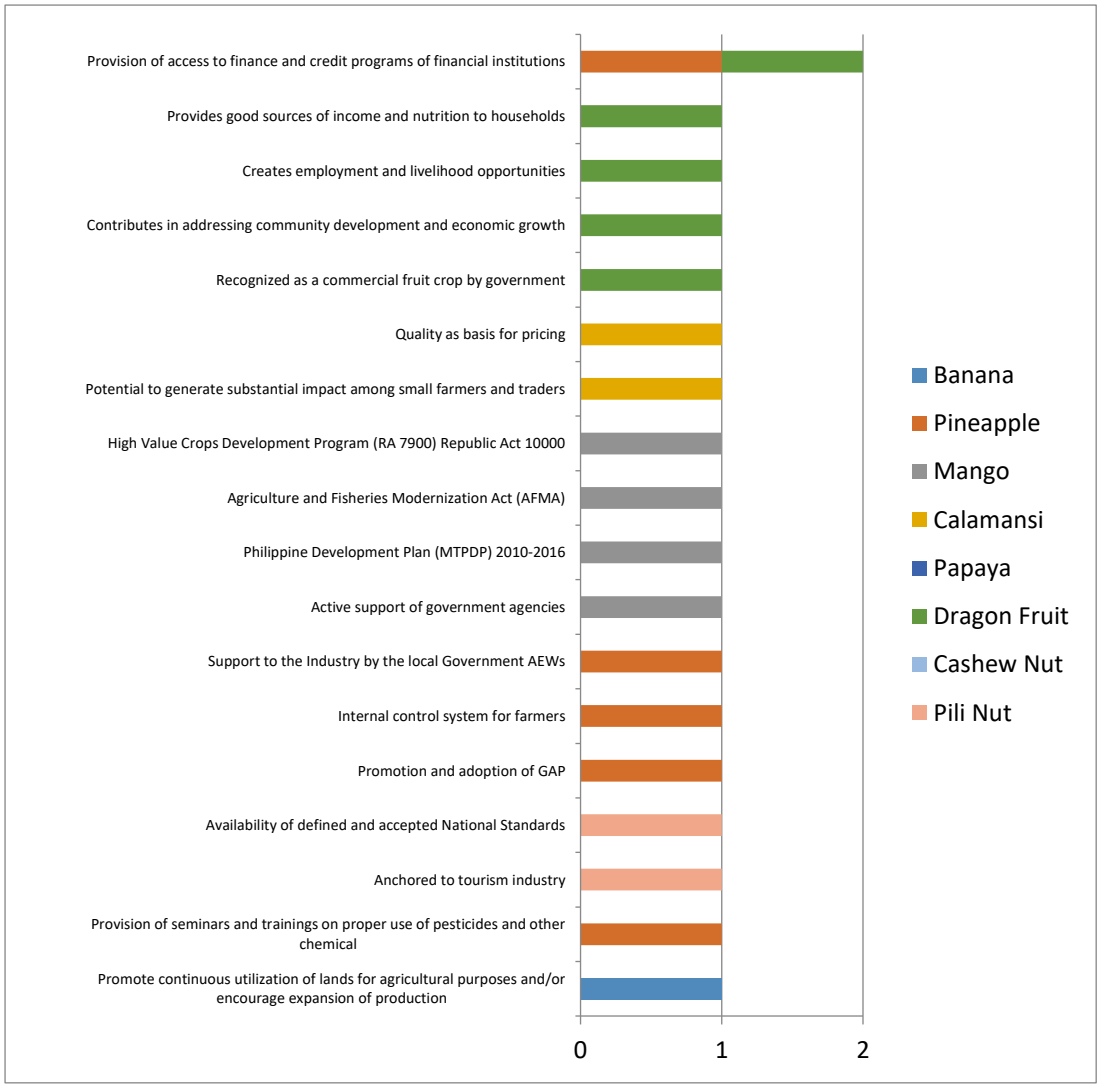


Sources: Various VCAs various years, FGD 2018.

Enabling Environment

The figure below shows the strengths and opportunities under enabling environment given by the stakeholders.

Figure 76. Strengths and Opportunities in Enabling Environment

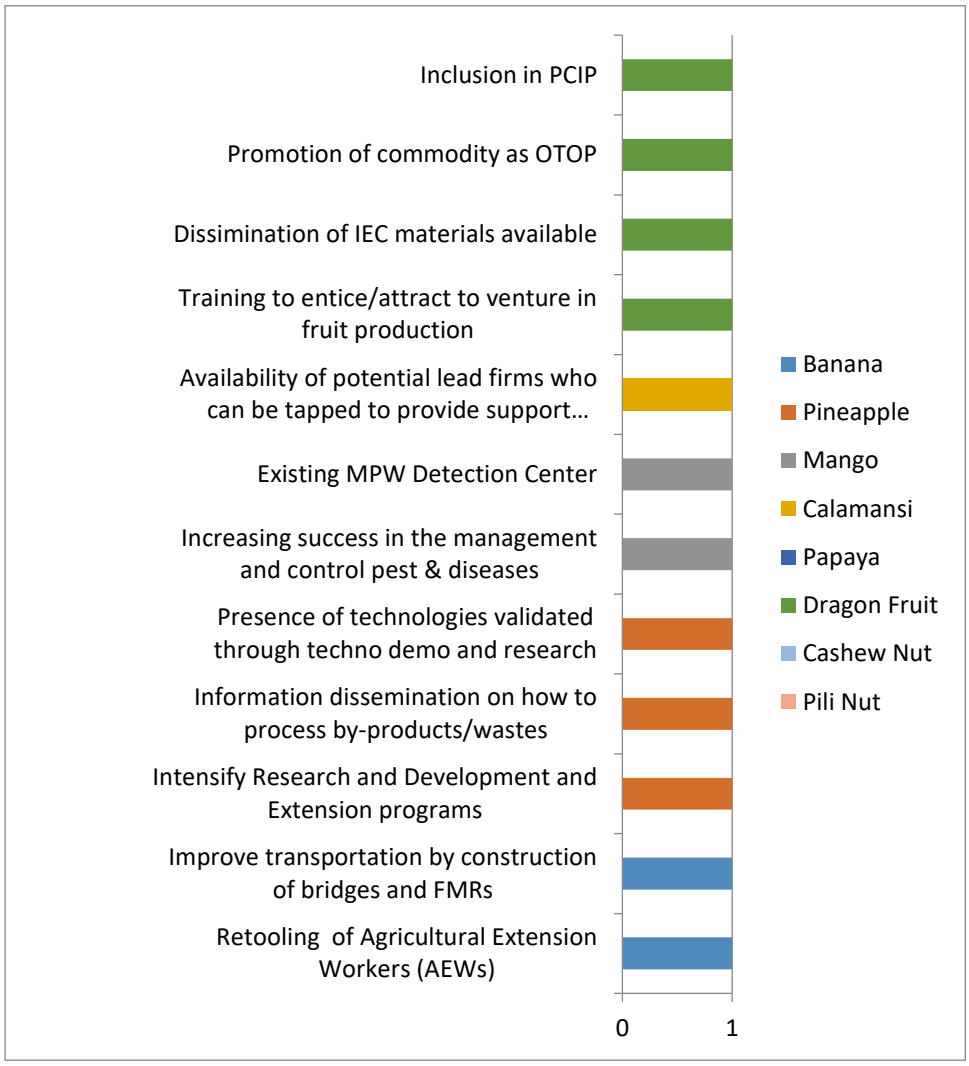


Sources: Various VCAs various years, FGD 2018.

Support Services

The figure below shows the identified strengths and opportunities under support services.

Figure 77. Strengths and Opportunities in Support Services



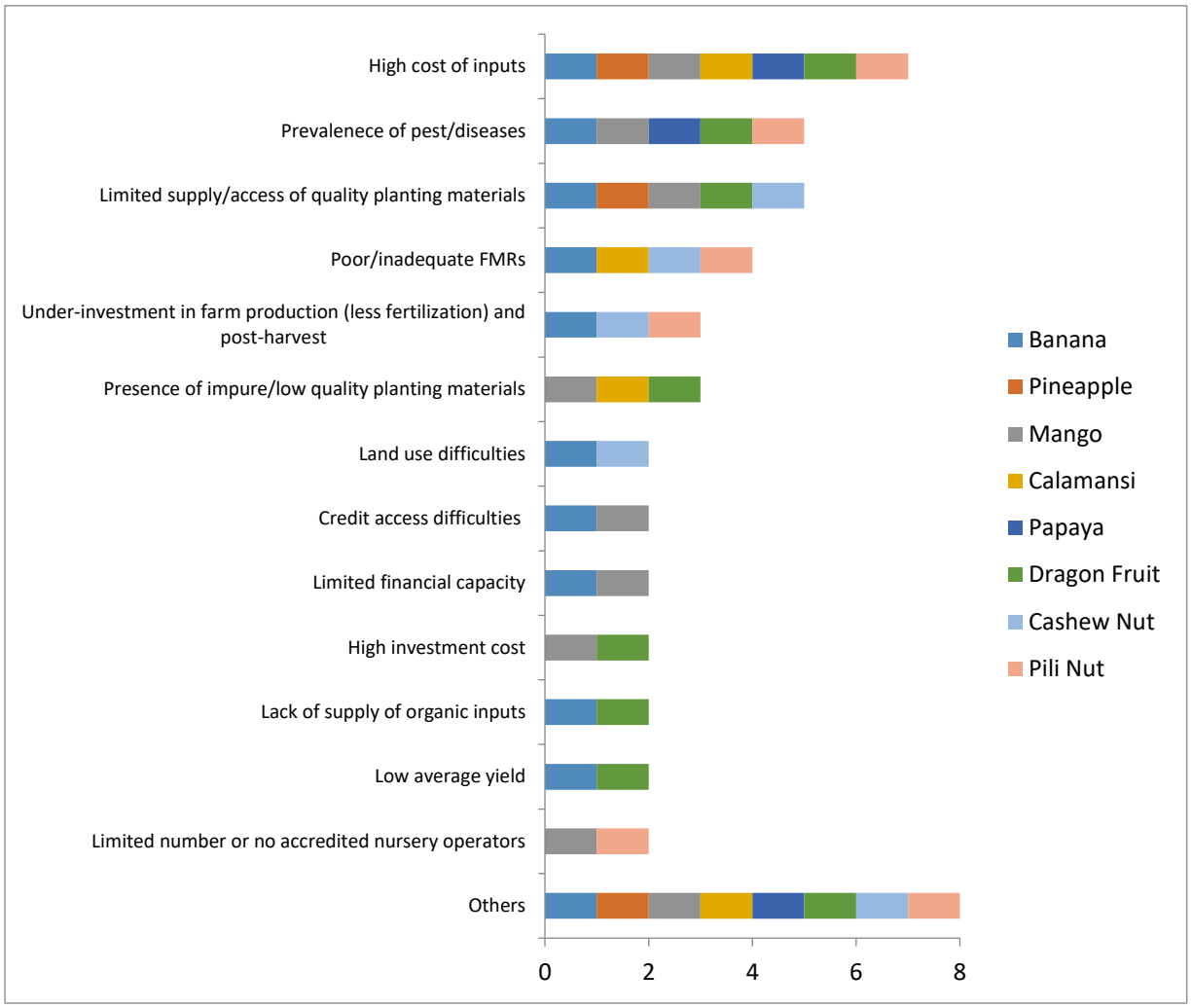
Sources: Various VCAs various years, FGD 2018.

Weaknesses/Threats

Input Provision

Under input provision, the top four weaknesses/threats identified by stakeholders are the following: high input cost, prevalence of pest/diseases, limited supply/access of quality planting materials, and poor or inadequate farm to market roads.

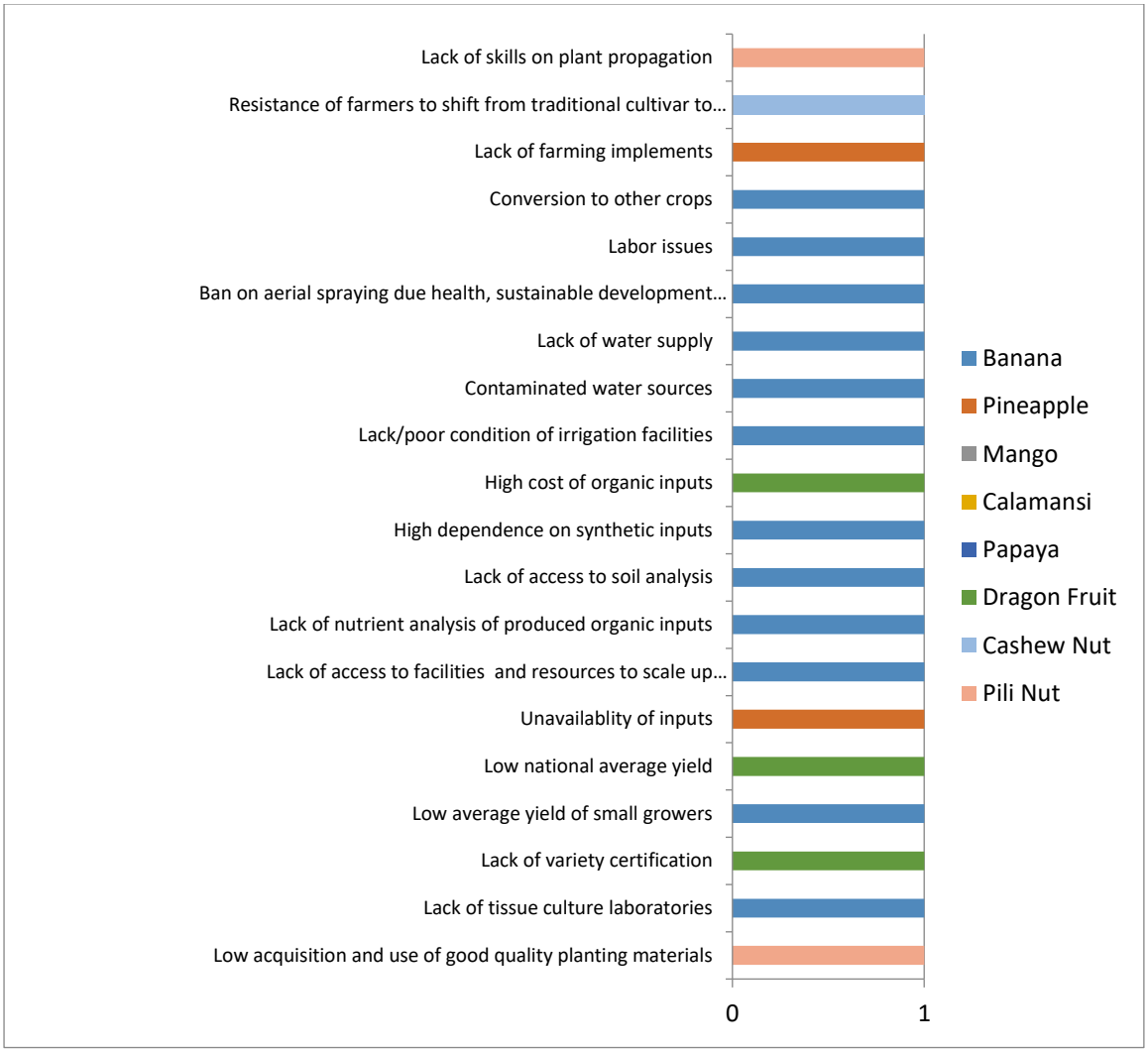
Figure 78. Threats and Weaknesses for Inputs



Sources: Various VCAs various years, FGD 2018.

Below is the breakdown of weakness and/or threats categorized under “Others”.

Figure 79. Others in Threats and Weaknesses for Inputs

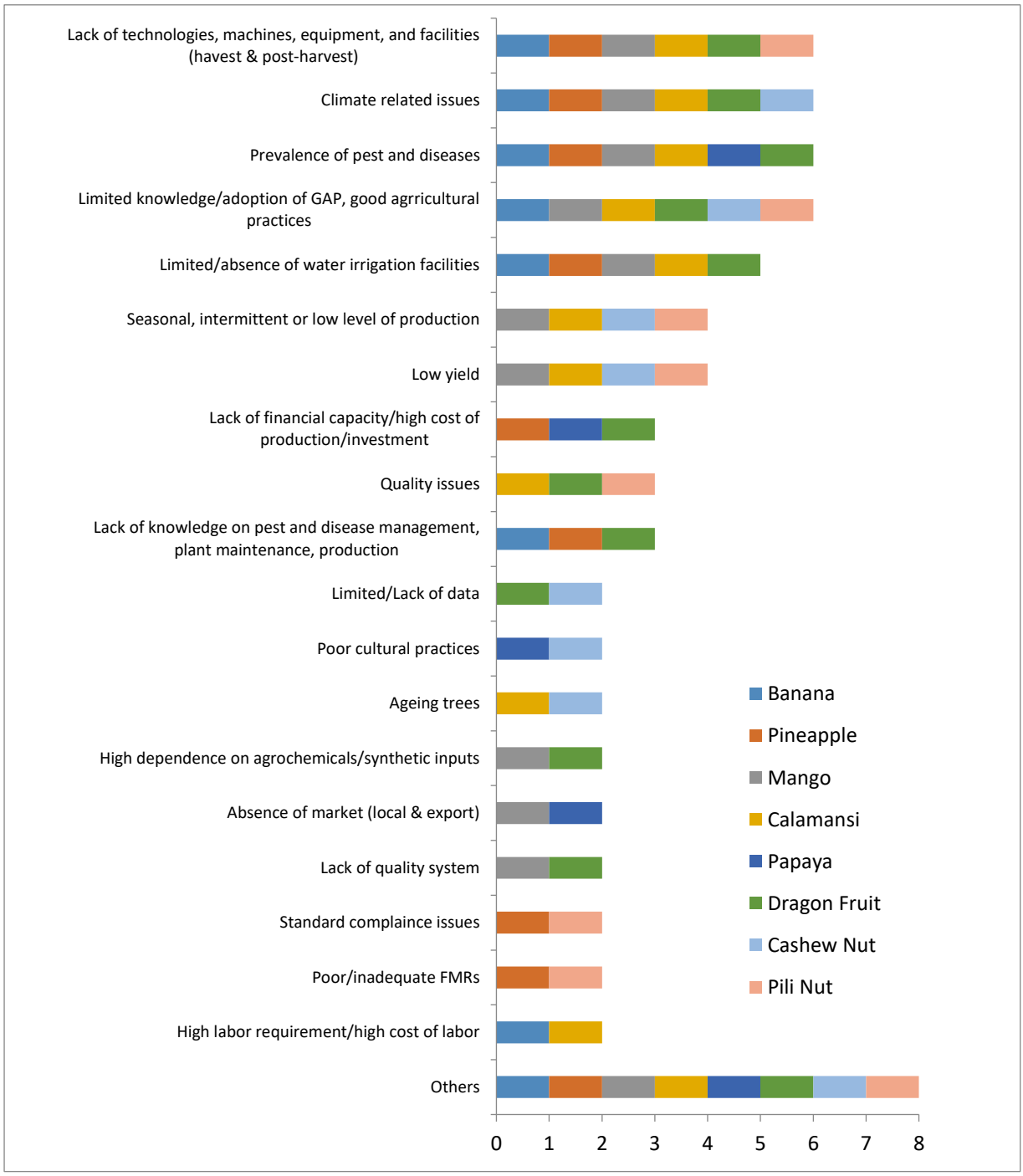


Sources: Various VCAs various years, FGD 2018.

Farming/Production

The top four weaknesses/threats that are common across commodities are the following: lack of technologies, machines, equipment, and facilities (harvest & post-harvest); climate related issues; prevalence of pest and diseases; and limited knowledge/adoption of GAP, good agricultural practices.

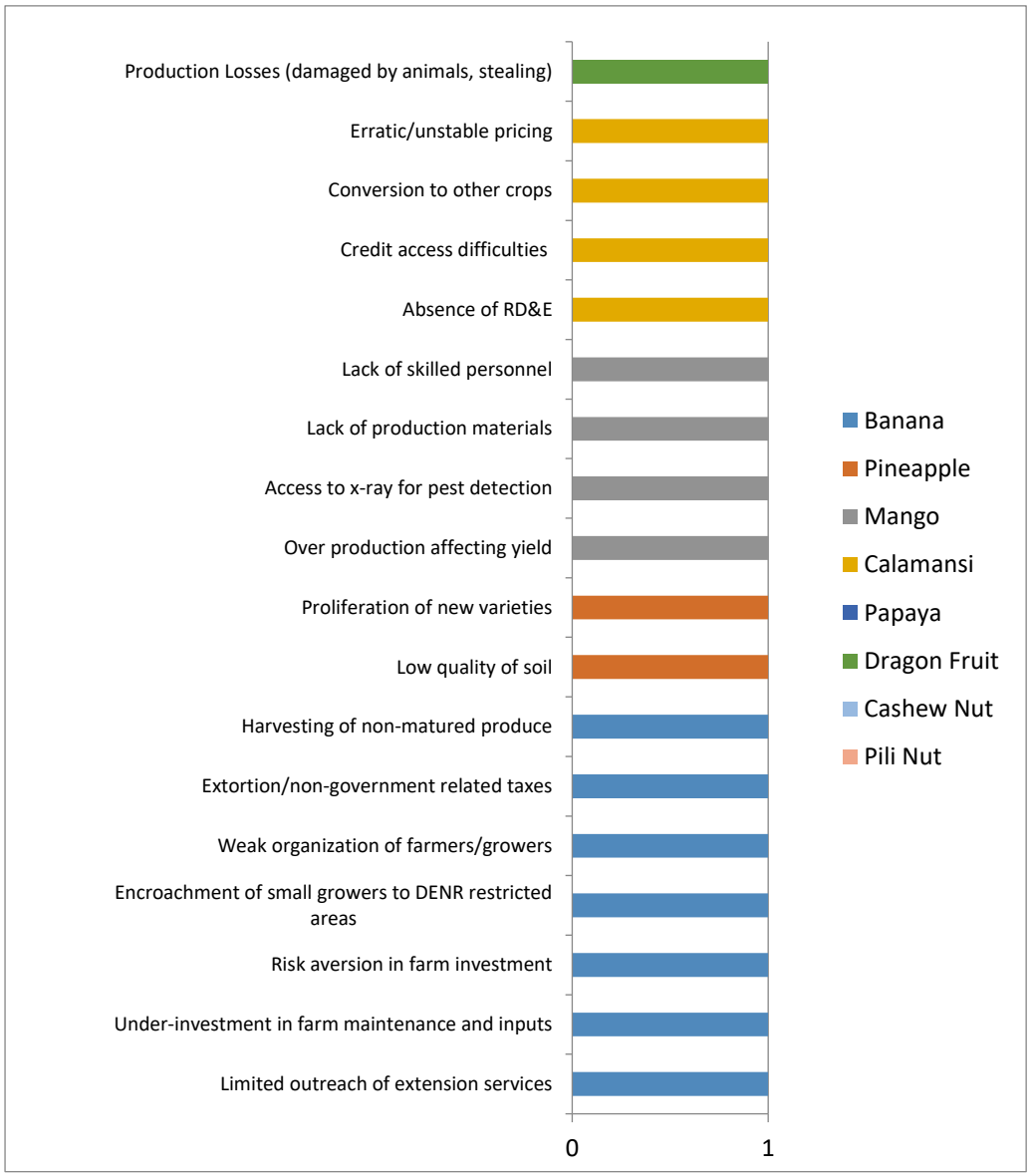
Figure 80. Threats and Weaknesses for Farming/Production



Sources: Various VCAs various years, FGD 2018.

The figure below shows the breakdown of “Others”.

Figure 81. Others in Threats and Weaknesses for Farming/Production

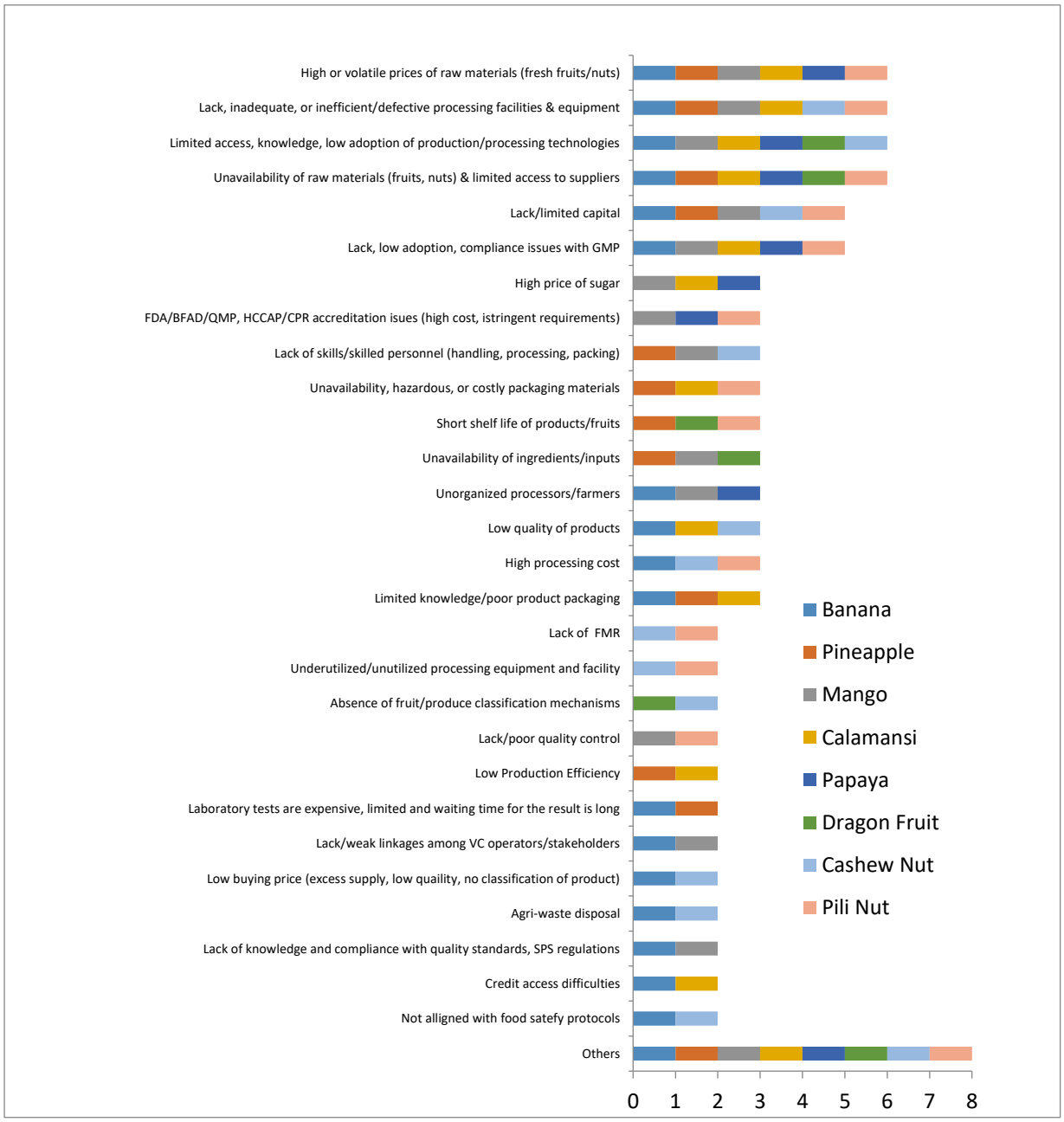


Sources: Various VCAs various years, FGD 2018.

Processing

The prevalent weakness/threats pointed out by most processors are the following: high or volatile prices of raw materials (fresh fruits/nuts); lack, inadequate, or inefficient/defective processing facilities & equipment; limited access, knowledge, low adoption of production/processing technologies; and unavailability of raw materials (fruits, nuts) & limited access to suppliers.

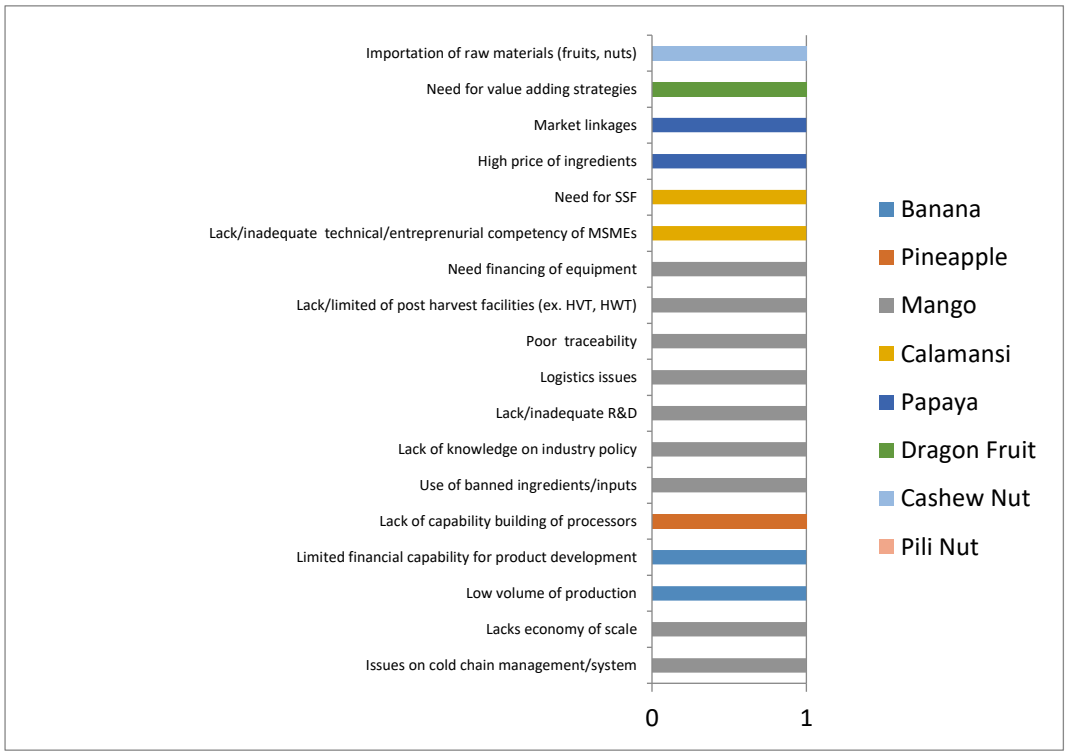
Figure 82. Threats and Weaknesses for Processing



Sources: Various VCAs various years, FGD 2018.

The details for “Others” are shown below

Figure 83. Others in Threats and Weaknesses for Processing

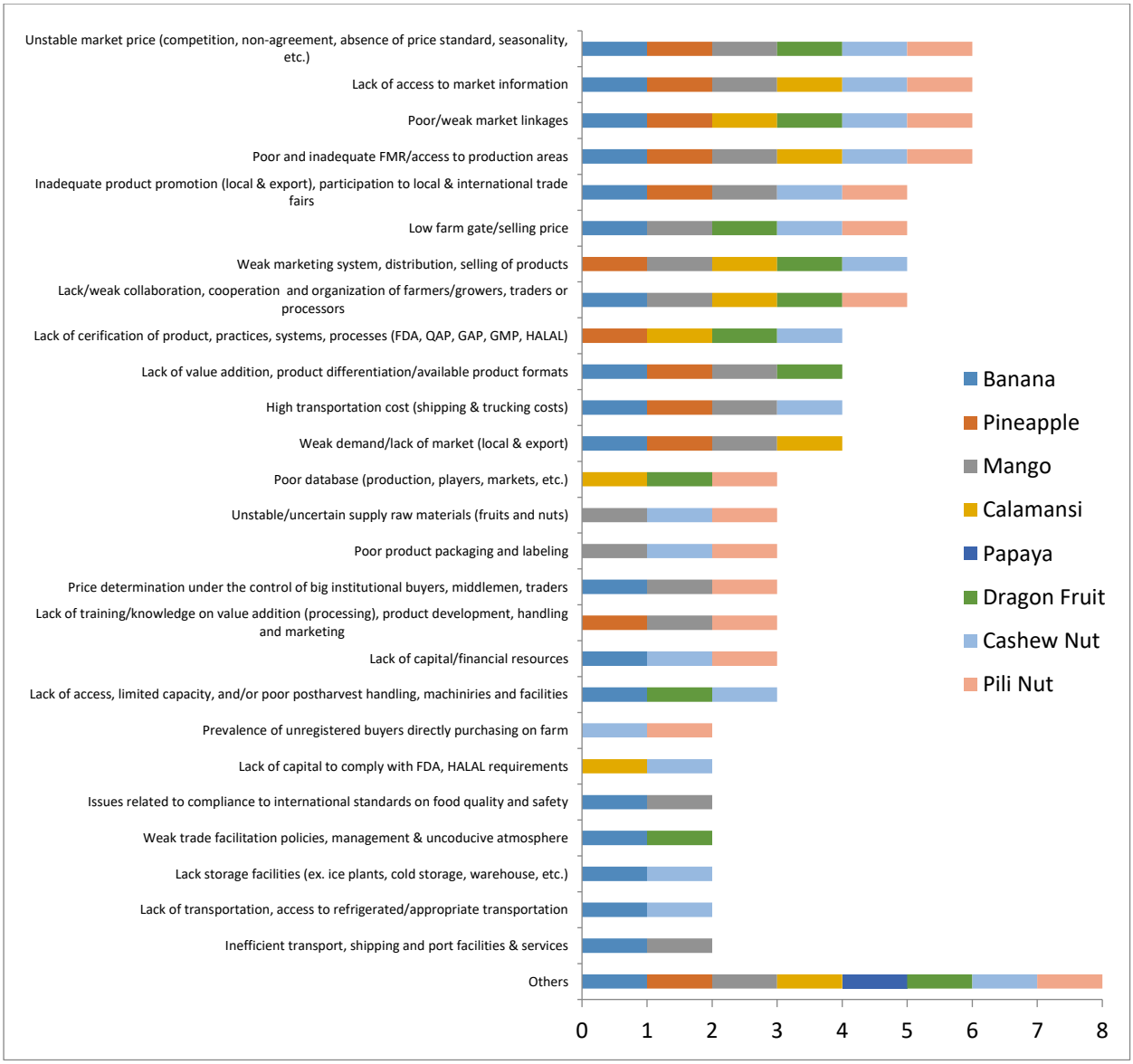


Sources: Various VCAs various years, FGD 2018.

Consolidation/Packing/Marketing/Distribution/Post-Harvest/Logistics/ Assembly/ Trading / Final Sale

Weakness and threats common across most commodities are the following: unstable market price; lack of access to market information; poor/weak market linkages; and poor and inadequate FMR/access to production areas.

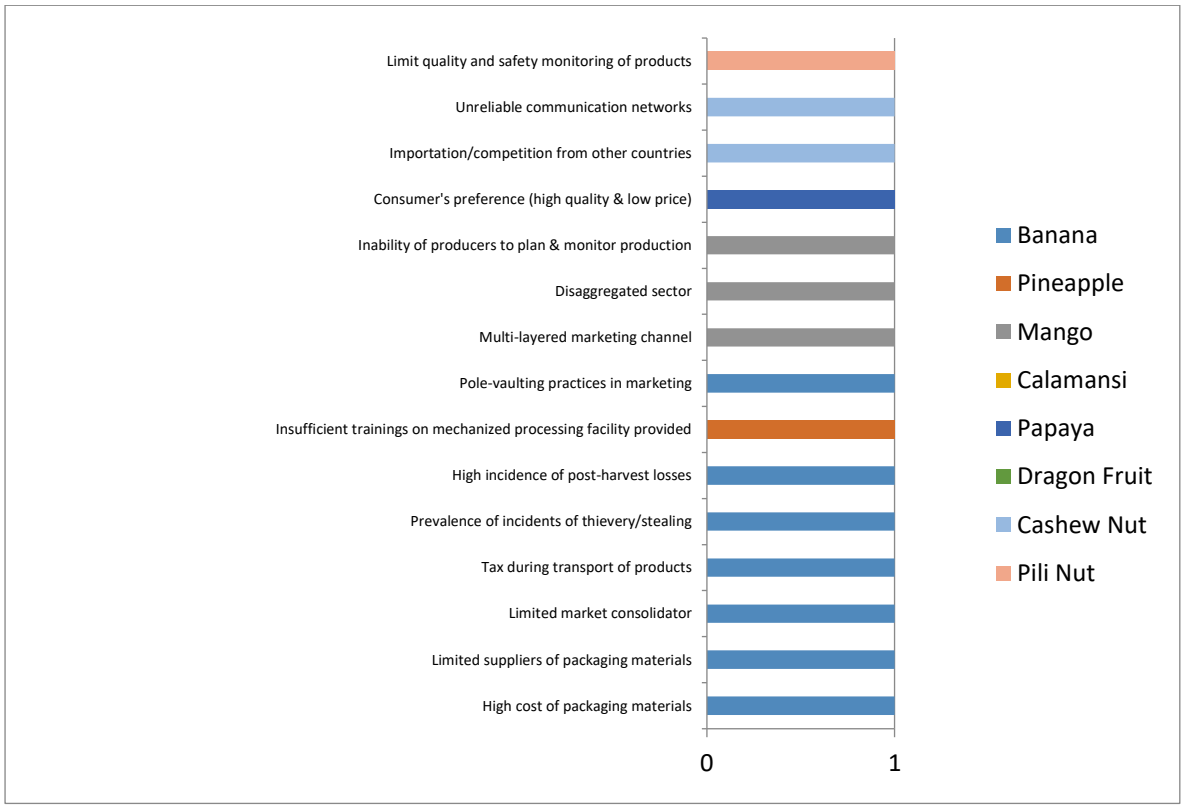
Figure 84. Threats and Weaknesses in Consolidation/Packing/Marketing/Distribution/Post-Harvest/Logistics/Assembly/ Trading / Final Sale



Sources: Various VCAs various years, FGD 2018.

The figure below shows the breakdown of weaknesses/threats listed under “Others”.

Figure 85. Others in Threats and Weaknesses in Consolidation/Packing/Marketing/Distribution/Post-Harvest/Logistics/Assembly/ Trading / Final Sale

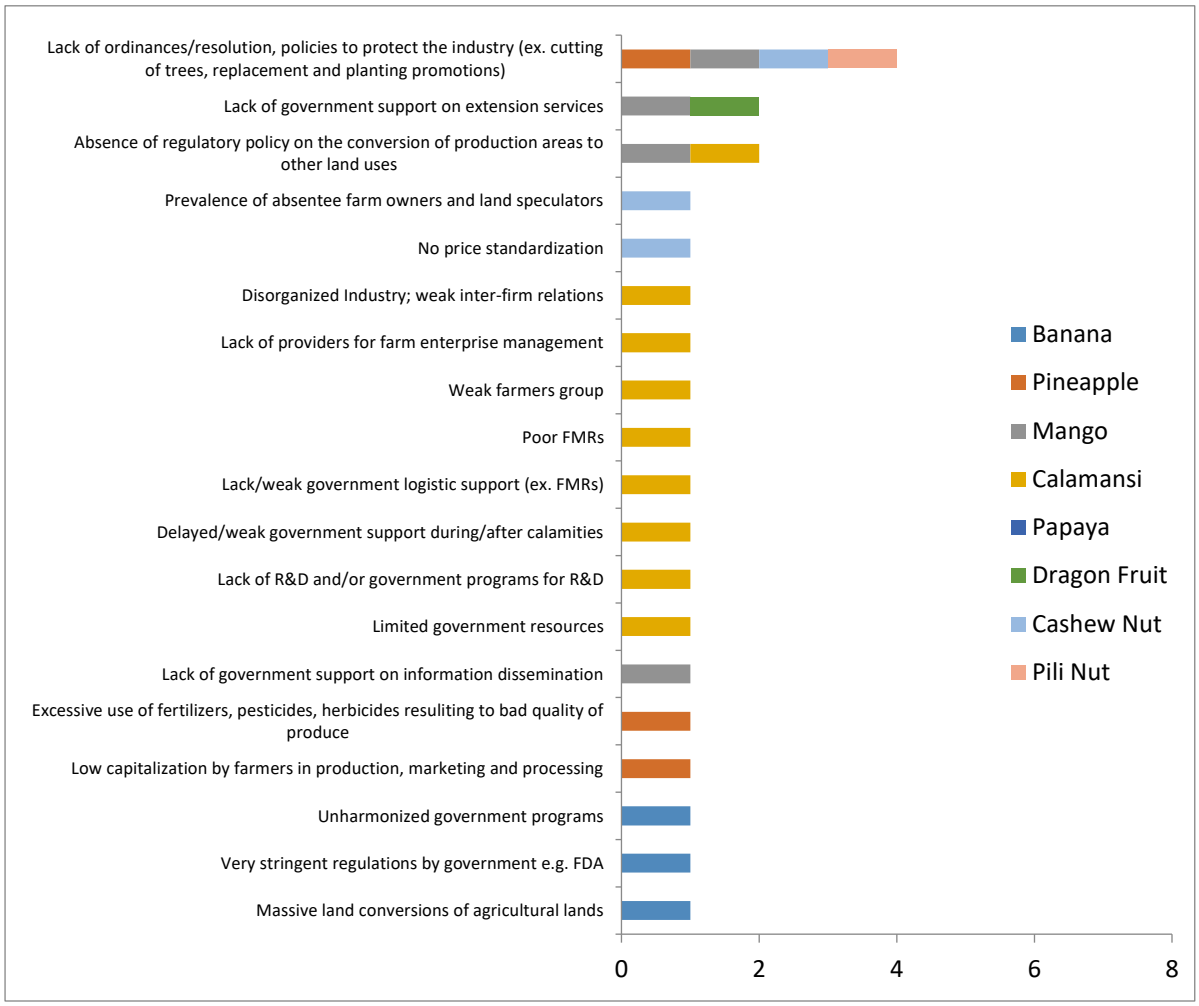


Sources: Various VCAs various years, FGD 2018.

Enabling Environment

Critical weaknesses/threats identified by stakeholders common across commodities that hampers enabling environment of the PFN sector are the following: lack of ordinances/resolution, policies to protect the industry (ex. cutting of trees, replacement and planting promotions); lack of government support on extension services; and absence of regulatory policy on the conversion of production areas to other land uses.

Figure 86. Threats and Weaknesses in Enabling Environment

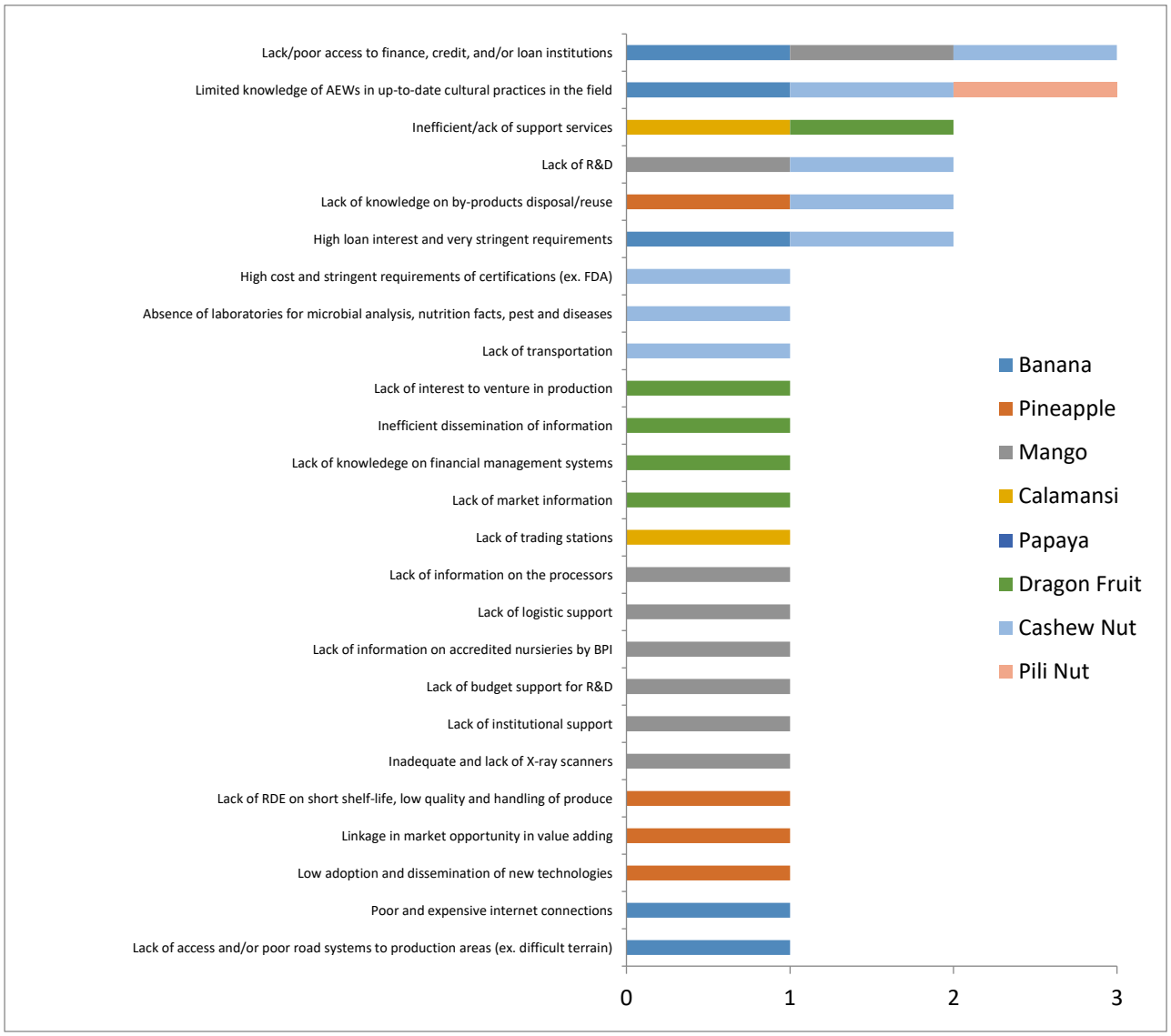


Sources: Various VCAs various years, FGD 2018.

Support Services

Under support services, the most common weaknesses and threats identified across commodities are the following: (1) lack/poor access to finance, credit, and/or loan institutions; and (2) limited knowledge of AEWs in up-to-date cultural practices in the field.

Figure 87. Threats and Weaknesses in Support Services

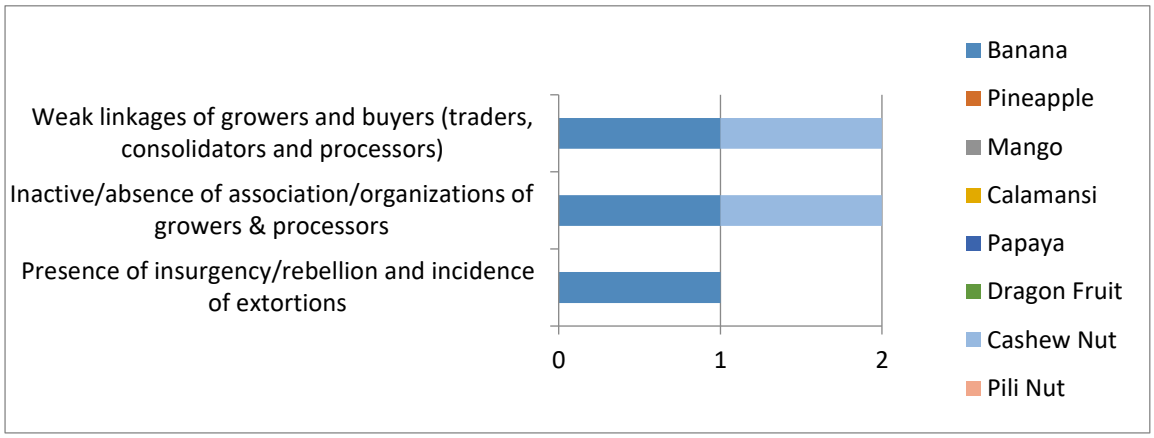


Sources: Various VCAs various years, FGD 2018.

Inter-firm relations/supply chain governance

There are three issues raised by stakeholders under inter-firm relations/supply chain governance of the PFN sector as shown in the figure below.

Figure 88. Threats and Weaknesses in Inter-firm Relations/Supply Chain Governance



Sources: Various VCAs various years, FGD 2018.

VII. The Processed Fruits and Nuts Roadmap

This chapter presents the proposed PFN Roadmap which takes into account the insights from earlier chapters. Here, we repeat the PFN Cluster formulated vision and objectives. We then propose the short, medium and long-term milestones with the corresponding strategies. Seven strategies are identified for the short and medium terms: (1) strengthening the PFN Cluster; (2) raw materials development; (3) development and promotion of domestic and export markets; (4) intensification of investment promotions and facilitation; (5) establishment of productivity improvement program; (6) institutionalization of product development program; and (7) continuation of improvement of business environment.

This PFN Roadmap for 2019-2029 should serve as a general guide for the sector in formulating programs, activities and projects for each of the strategies. While comprehensive and extensive, this roadmap has been constrained by limited data specific to the PFN commodities covered including the profiles of industry players (which should have included not only the micro, small and medium enterprises or MSMEs but also the big processors, the sources of raw materials/farmers/producers), and less-specific trade data (i.e., none for mango, dragon fruit).

Nonetheless, this study has provided a more systematic generation of the roadmap using insights from available secondary data and inputs from more stakeholders from the eight commodities, various government agencies, private sector representatives, and thereby validating and refining the initial roadmap drafted by the PFN Cluster.

Preliminaries

As indicated above, data have been among the limitations in drafting this roadmap. Needless to say, an improved data will sharpen analysis and focus better the strategies. In this roadmap, it is important that the PFN sector is clear on who are the targets for the strategies and interventions. Clearly, while this Roadmap is meant for the micro, small and medium enterprises (MSMEs), there must be a role for the large players which have generally paved the way for the export markets. Also, it may be better to distinguish MSMEs into those which are meant for domestic market (***domestic market players***) and those which are ready for the export market (***export-ready players***). And also those which are yet to be developed for domestic market (possible ***domestic micro players***). The interventions can then be tailor-fit to each type of player. In addition, depending on how fast or slow these players can grow and develop, the domestic players can eventually graduate to become exporters.

For each type of player, “exit strategies” must be defined. There has to be a timeline for the handholding. For instance for the export-market players, the assistance needed will just be expanding export market reach which may not take too long. Domestic *micro players* may need several stages of development to become ready even for the domestic market. The domestic-ready players may just need support in getting certifications and facilitations of entrance to formal and broader domestic markets.

The Roadmap

The Philippines has revealed comparative advantage in fruits such as pineapple, banana, mango and papaya, both fresh and processed products. There are three nodes in the value chain of fruits, namely, raw materials, semi-processed, and final product. The raw materials include fresh fruit and sometimes dried; the semi-processed fruit includes cooked fruit, provisionally preserved fruit, mixtures of dried fruit, and peel of fruit; while the final products comprises of jams, jellies, preserved/prepared/canned fruit, juice, and wine. In all of these forms of fruit products (and more of processed products), the Philippines is the second largest net-exporter in ASEAN market. These fruits also indicated economic and financial comparative advantage in its production. On the other hand, dragon fruit and cashew nuts have comparative disadvantage in the export market. However, there is competitive (financial) and comparative (economic) advantage (measured by the domestic resource cost ratio) in producing cashew nuts and dragon fruit. Similarly, for other crops covered in this study, calamansi and pili nuts also indicated high financial profitability.

The roadmap of processed fruits and nuts presented below defines the vision and mission of the PFN industry over a 10-year period (2019-2029), and identifies the strategies toward achieving the vision.

The Vision:

"A Globally Competitive Quality-Driven and Reliable Supply of Processed Fruits and Nuts Industry that generates Sustainable Inclusive Economic Growth"

Objectives:

1. To increase investments and sales of PFN in both domestic and export markets;
2. To provide employment opportunities to the members of the society and increase their income, especially those who have less opportunity to be employed in the formal sector of the economy; and
3. To enhance the growth of MSMEs engaged in PFN, including upstream and downstream industries and services allied with PFN industry.

What does the Vision mean?

Globally Competitive. The processed fruits and nuts industry are able to compete in the international market. Processed fruits and nuts from the Philippines are more preferred in the export market compared to other countries.

Quality-Driven. The PFN industry invests on R&D to improve quality and stimulate innovation, and regulatory environment by streamlining processes and data harmonization of the various participating agencies.

Reliable Supply. The PFN industry is cluster-based and is physically linked to production areas through improvement in transport and communication infrastructure and services; reducing

both shipping-time and shipping-cost can significantly enhance supply chain connectivity and facilitate movement of goods, services, and people to domestic and global markets.

Sustainable. The PFN industry is capable of meeting the needs of future generations by observing standards and practices that preserve and protect the environment and society, such as zero waste processing.

Inclusive. The PFN industry contributes to economic growth of the country thru the development of strong forward and backward linkages for micro, small and medium enterprises MSMEs in regional and global value chains.

Economic Growth. The PFN industry strengthens, driven by increasing export sales, rising incomes, increasing urbanization, and growing demand for natural food products, convenience and food safety, growing access to supermarkets, and the proliferation of more sophisticated foodservice and retail formats.

The Milestones:

The milestones for this paper will cover selected processed fruits and nuts set over a period of ten years, from 2019 to 2029. Following the value chain analysis, the milestones will be a sequence of upgrading the fruits and nuts segments of the value chain, starting from production of fruits and nuts to processing and final sale.

Short-term (2019 – 2020):

The fruits and nuts processors are linked directly to farmers/producers, increasing supply of raw materials. The processors act as contractors producing products based on consumers' specification, FDA accredited for the domestic market, HACCP/GMP certified for the export market.

Medium – term (2021 – 2023)

Philippine PFN products have Good Manufacturing Practices (GMP)- certification, and have met international food safety standards. There will be faster flow of goods and ease of doing business because of efficient logistics and clearance procedures, reduced corruption or irregular payments, and improved infrastructure (i.e., ICT and transport services). This will make the Philippines competitive from its neighboring countries (ASEAN), under an improved regulatory environment and efficient supply chain connectivity.

Long – term (2024 – 2029)

Philippine fruits and nuts processors have established their global networks of suppliers and distribution channels, both in the domestic and export markets. They have gained the trust of consumers, both local and international. With an expanding market share in the region, trade facilitation environment will be at par with neighboring countries and competitors.

Strategies

Short (2019-2020) to Medium – term (2021 – 2023)

1. **Strengthen the PFN Industry Cluster**

1.1 Develop Mechanism for National Cooperation to Strengthen the Current PFN Cluster

1.1.1 Organize **Regional PFN Cluster** Associations and **PFN Industry Council**

1.1.2 **Profile the industry and Players**

1.1.2.1 Institutionalize the industry cluster approach by establishing institutional platforms for convergence of fruits and nuts value chains, with representation from key producing and processing provinces for "relevant" region; Regional representatives can comprise the PFN National Industry Council;

1.1.2.2 Continue to improve the inventory of industry players, for growers to processors to wholesalers and retailers, starting with members of PFN Cluster Associations, such as the Banana Council, Pili Board and Federation of Pili-based Producers and Processors, Philippine Dragon Fruit Stakeholders Association, Pineapple Processors, National Mango Research and Development Council;

1.1.2.3 Establish profile of industry players or members of associations to include and strengthen data on outputs (volumes and sales), employment contributions; investments, and domestic and export markets. With better information, segment the firms into *domestic*, *export* and *micro* players to better design and target interventions; and

1.1.2.4 Develop ICT/e-platform to facilitate linkage between producers/growers, processors, exporter, individual/institutional buyers.

1.2 Organize **National Technical Working Group** (TWG) composed of members from DTI ROG/Bureaus/Attached Agencies/Lead Regions, DOST, DA, FDA, Private Sector Representatives by sub-sector. The TWG will craft the EO for the creation of PFN Council.

1.3 Following the value chain analysis, DTI to collaborate with DOST and DA in upgrading the fruits and nuts segments of the value chain, starting from production of fruits and nuts to processing, to distribution and final sale.[10]

1.4 Organize National Congress to be held in different regions in Luzon, Visayas and Mindanao, so that **every other year**, each island will host the event to bring together all stakeholders from all over the Philippines.

1.5 Establish a **results-based monitoring and evaluation** system (RBME) to track PFN industry performance and progress relative to the Cluster goals and targets.

2. **Develop Stable Sources of Raw Materials and Strengthen Backward Linkages**

[10] DA Comments during the PFN Roadmap Presentation on March 12,2020 in Makati City

2.1 Deliberately and purposefully coordinate with DA on the production of raw materials for processing. Specifically,

2.1.1 Massively propagate and plant pili nut and cashew nut trees

2.1.2 Promote massive rehabilitation of mango trees

2.1.3 Facilitate/Coordinate with the appropriate DA unit the supply of quality seedlings and planting materials (tissue cultured, disease resistant) by establishing village-level seedling orchards and nurseries, and conduct of trainings on nursery management at the barangay/village. For instance, in the case of banana, improve current capacity of existing tissue culture laboratories and be able to cater to other banana varieties, and establishment of banana mother gardens as alternative source of quality planting materials;

2.1.4 Mitigate/control serious pests and diseases affecting PFN industry especially banana and mango, and provide technical assistance on production technology to achieve good quality production.

2.1.5. Facilitate improvement of post-harvest facilities for fruits and nuts, such as storage warehouse, buying stations, de-pulper (in the case of pili), multipurpose drying pavement, mechanical dryer, weighing scale, and processing equipment facilities.

2.2 Facilitate the linkage of growers and processors –providing dates for the supply of raw materials (timing of needs), and volume needed for processing. The Inventory of Industry players can be used as a tool to realize this.]; DA can facilitate the consolidation of raw materials; PFN industry can provide the raw material/commodity specifications that fit processing needs;

2.3 Develop a strong backward linkage. Part of the needs of the sector is a strong backward linkage to support the needs of the processors. Examples of this would be appropriately designed “pugon” for banana chips making; driers for dried mangoes; bottles for wines; molds for soap making, etc.

2.4 In terms of priority support per cluster, focus assistance on areas with high advantage and volume of production. Prepare target according to the profile of the area and then make sure that the target is doable based on the PDP[11]

3. Develop and Promote Domestic and Export Markets

3.1 Promote PFN products through participation in domestic and international trade fairs and food fairs to expand to international markets or develop new additional markets considering that the Philippines has deepened its revealed comparative advantage in both fresh and processed fruits (e.g., SIAL- ASEAN, MAFBEX, BIMP-EAGA, Asian Fruit Market, Winter Fancy Food Show, Taipei International Food Show, CAEXPO);

3.2 Intensify dissemination of market information on PFN in both domestic and international markets, especially on emerging processed fruits and nuts such as dragon fruit and pili;

3.3 Provision of trainings on quality assurance to meet international standards and maintain efficient product certifications;

3.4 Conduct market research to explore the potential markets of PFN products especially within Southeast Asia (SEA) and the Asia-Pacific regions, and to identify potential

[11] DA Comments during the PFN Roadmap Presentation on March 12,2020 in Makati City

buyers and strategic partners that can provide value added services, through provision of financial and capital assistance;

3.5 Strengthen product marketing and promotion in the international market;

4. Intensify Investment Promotions and Facilitation

4.1 Define clearly the areas for domestic or foreign investment, and also foreign investors since the government is proposing a reduction of corporate income tax (currently at 30%) by one percentage point per year from 2020 until it reaches 20% in 2029. To finance the corporate rate tax reduction, sectoral incentives (such as income tax holiday) will be reduced. Food manufacturing is one of the beneficiary sectors of incentives (at 1.8%). The 20% corporate tax rate is expected to improve the country's competitiveness as an investment destination. It will be growth-promoting, employment-generating, and poverty-reducing;

4.2 Prepare project briefs/profiles

4.3 Increase product awareness and health benefits of fruits and nuts (e.g., dragon fruit, pineapple, calamansi, banana)

4.4 Monitor and evaluate projects and programs for MSMEs such as product innovation, technology upgrading,

5. Establish Productivity and Efficiency Improvement Programs

5.1 Invest in research and development on product innovation and packaging (food-based fabrication labs, Business Incubation Centers, automation of production process, and product preservation, including backward linkages, e.g., improved planting materials/use of tissue culture, resistance to pest and diseases, reduction of use of chemicals); Develop technologies to improve processing and reduce costs;

5.2 Promote strategic partnerships among the academia, research institutions and the private sector towards developing capabilities and creating an effective channel for technology transfer and commercialization.

5.3 Do research and development (R&D) on fruits and nuts for medicine and wellness, and for health and well-being (e.g., dragon fruit, pineapple, calamansi, banana) to meet the increasing demand for healthy food[12]

5.4 Provide cold storage facilities and other post-harvest facilities to improve shelf-life of harvested fruits to make sure that the product is always available in the market; supervise and/or regulate sales by NGAs; market matching and trade fair promotions; and development of IEC material;

5.5 Build capacity through conduct of trainings for MSMEs producers and processors on productivity and efficiency, and for SME counselors on post-harvest mechanisms, food safety and quality assurance, and cGMP and FDA-LTO requirements to meet SPS standards and certification; Take note to do "thinning" of participants/beneficiaries (avoid inviting the same participants over time) and to scale up and include new players;[13]

[12] DA Comments during the PFN Roadmap Presentation on March 12,2020 in Makati City

5.6 Profiling of farmers that are assisted by DTI to be matched by the farmers assisted by DA. DA and DTI to harmonize list of farmers to avoid duplication of beneficiaries. This sharing of list can also be utilized for the budgeting and planning of programs.[14]

5.7 Develop the capacities for support industries to PFN processing;

5.8 Streamline documentary requirements for application of GMP certification, DTI-BPS Product Certification Scheme, and strengthen regulatory services –through provision of facilities for certification system, pest risk analysis, pesticide residue analysis, and food safety;

5.9 Streamline processes and data harmonization on product quality of the various participating agencies to enhance quality of PFN products and improve regulatory environment;

5.10 Facilitate Food Certification (dispatch of experts on food safety & certification);

5.11 Adopt standardization of product and quality ingredients at firm level, OHILGAP, HACCP, HALAL, GTP and other good practices in production and GMP in processing[15]

5.12 Determine bottlenecks in the flow of processed products and raw materials; Commission studies in improving logistic requirements of industry players.

5.13 Determine products that may need research in certain regions through Registry System for Basic Sectors in Agriculture (RSBSA). Focus on research that would give commercial value and would have ready implementors. DA has funds for R&D for innovative products and products with commercial value.[16]

6. Continue and Strengthen Product Development

6.1 Institutionalize product development that responds to PFN requirements; Draw in DOST and the academe;

6.2 Coordinate with DOST-FIC on product innovation (both forward and backward linkages), product packaging and labeling, and technology upgrade;

6.3 Promote strategic partnerships among the academia, research institutions and the private sector towards developing capabilities and creating an effective channel for product development, technology transfer and commercialization.

6.4 Promote product specialization to allow PFN industry to lower cost of production and achieve economies of scale, such as value-added products from pili nuts (elemi oil), dragon fruit (wine, anti-stress balm), calamansi (essential oil, powdered calamansi juice), and mango (gluten-free mango flour);

7. Improve Business Environment

7.1 Facilitate registration with FDA-LTO-CPR and simplify procedures and streamline documentary requirements for application of GAP certification, DTI-BPS Product Certification Scheme, and strengthen regulatory services –through provision of facilities for certification system, pest risk analysis, pesticide residue analysis, and food safety; [17]

[13-17] DA Comments during the PFN Roadmap Presentation on March 12,2020 in Makati City

7.2 DOST and DTI to link up with universities and private companies in establishing food testing laboratories for assessment and certification of GAP and GMP, and agricultural management systems to ensure production of safe food;[18]

7.3 Investment in infrastructure for greater connectivity between regions and more seamless trade facilitation. Government support is immediate for efficient logistics and infrastructure for whole value chain, and improved regulatory environment for faster flow of PFN goods within the domestic and international markets. The Philippines must strive harder in order to be at par with ASEAN countries like Malaysia, Thailand, Vietnam, and Indonesia in terms of logistic performance and trade facilitation environment;

7.4 Organize regional food safety teams and provide trainings to MSMEs on quality assurance to meet international standards and maintain efficient product certifications;

7.5 Through DTI's One-Town, One Product (OTOP) program, government should provide enabling environment for business opportunities on product consolidation (operation of product consolidation enterprise where origin of raw materials for processing can be traced but one OTOP), organizational support for cooperatives and corporate farming;

7.6 Facilitate financing and credit access thru strong linkages of cooperatives and farmers association with banks and other financial institutions (DA currently has available loan programs for farmers thru Land Bank) [19]

7.7 Develop ICT/e-commerce platform for easy access to service providers, online payments, and cashless transactions.

7.8 DA and DTI to collaborate across the value chain functions. The convergence should focus on the value adding of products in the key clusters.

[18-19] DA Comments during the PFN Roadmap Presentation on March 12,2020 in Makati City

Long – term (2024 – 2029)

1. Increase intensity of public-private partnership on R&D, including development of incubators, information sharing and networking with universities, research institutions, and industries;
2. DTI and FDA to accredit food testing laboratories and assessment institutions to be included in the ASEAN Reference Food Testing Laboratory Network;
3. Continue investments in adequate testing laboratories to ensure sustainable production of safe and good quality PFN products;
4. Intensify product specialization to allow PFN industry to lower cost of production and achieve economies of scale;
5. DOST and DTI to intensify investment on green technologies that are environmentally sustainable (e.g., organic farming and zero waste management) to modify the production processes and/or the equipment making them more energy efficient, generating less waste and/or less pollution (particularly GHG emissions), and to adjust production processes on low cost operations and maintenance processes or introduction of affordable equipment.
6. Enhance transparency of non-tariff measures (NTMs) to optimize supply chain connectivity of PFN in the ASEAN and the rest of the world. Data information on the new non-tariff regulations need to be widely accessible to the public both at home and abroad when they are promulgated and preferably before they are implemented;
7. Intensify promotion on harmonizing national standards with international standards to enhance quality and competency of PFN products in the international market;
8. Strengthen regulatory services and international regulatory cooperation, and Good Regulatory Practice (GRP).

VIII. Sample Business Plans for Processed Pili Nut and Dragon Fruit

This chapter presents sample business plans for two of the eight commodities: pili nut and dragon fruit. These business plans can serve as templates for scaling up and the other commodities.

Pili Nuts Business Plan

This business plan is put together using the VCA study for Pili obtained from DTI Region 5. This plan provides ideas to the pili processors on the potential in scaling up.

Figure 89. Processed Pili Nut Business Plan

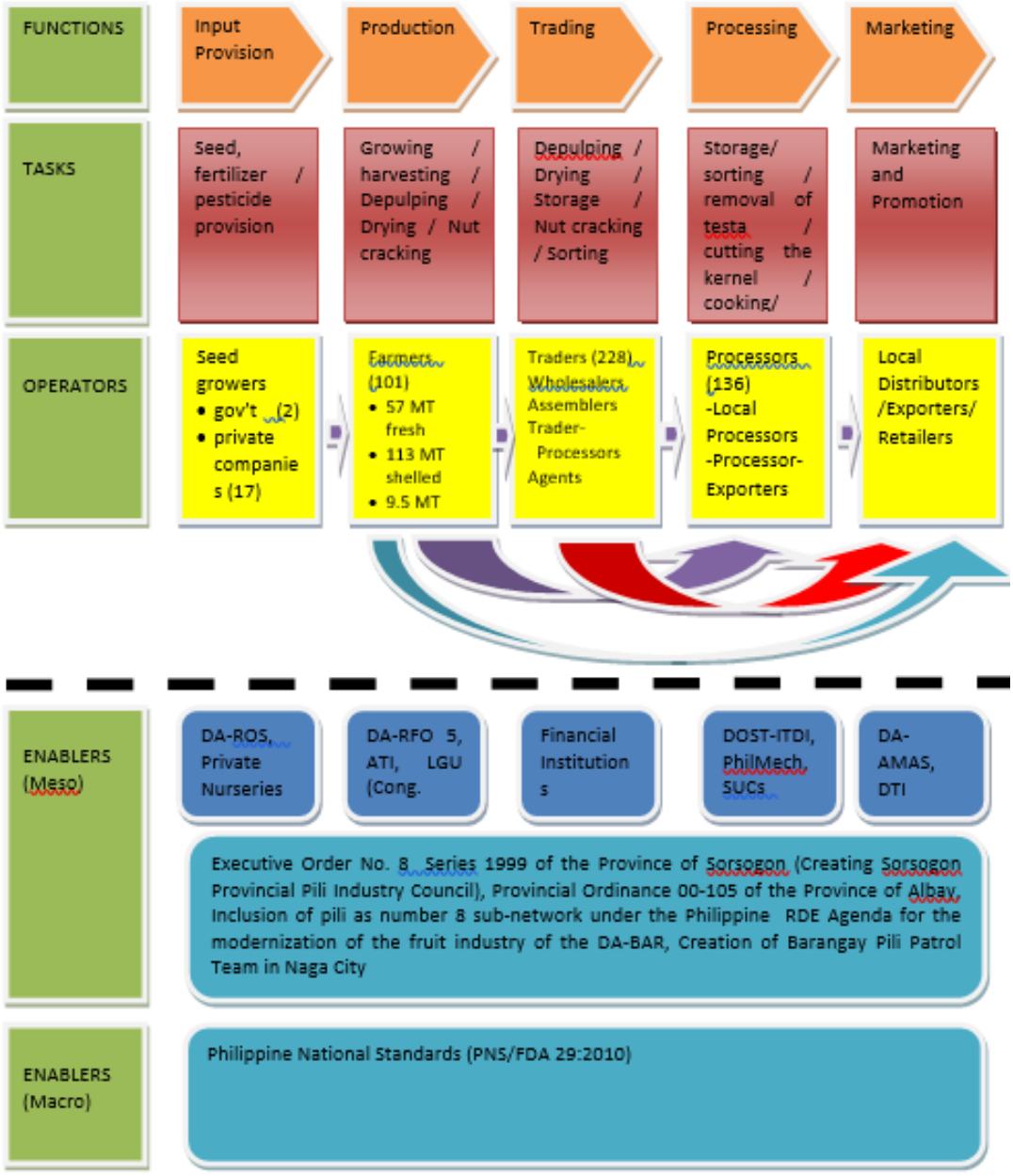
J. EMMANUEL PASTRIES-THE HOUSE OF PILI (PROCESSED PILI NUT)	
Key Partners	Department of Trade and Industry, Department of Agriculture, Department of Science and Technology, Department of Labor and Employment and Department of Environment and Natural Resources
Key Activities	The House of Pili had added more products like crispy pili nuts with garlic, honey glazed pili nuts, and roasted pili nuts. Later, JEP-The House of Pili started producing and selling roasted pili nuts with testa, pili nuts barbecue, pili nuts with Himalayan salt, pili nuts with sea salt, chili pili, pili nuts Au Naturel, pili mazapan, pili bar, suspiros de pili, galletas dobles, and other variations of the processed pili nut. The House of Pili also added in their line-up of pili processed by-products accessories made from pili nut shell, and pili massage oil. To protect their brand and keep up with the level of excellence, Research and Development (R&D) is conducted in-house with the help of various government agencies and private entities to ensure continuous quality as well as reliability in the process involved. To meet the increasing market demand, JEP-The House of Pili launched the PILIpinas Movement. This is a Bicol socio-economic development project to establish pili nut plantations in the Bicol Region starting in Camarines Sur through the partnership with landowners, farmers, tenants, local government units, government and non-government agencies, private corporations and religious-socio-civic organizations. The project provided more job opportunities in the rural areas by actively advocating for the establishment of more pili nut nurseries, farms, orchards and commercial plantations, increasing the pili nut supply base, enhancing the value chain, and maximizing business opportunities. JEP-The House of Pili assures the pili tree planters and farmers (contract growers) involved in the PILIpinas Movement of wholesale purchase of their harvest at fair farm gate (market price). They also supply the pili seedlings and gives technical trainings on the proper growing of pili trees. JEP-The House of Pili conducts research and development in collaboration with various government agencies and private entities to ensure quality and affordability of their products.

	JEP-The House of Pili engages in greening practices in their production process such as efficient use of energy using pili shells as fuel for the blanching process of their operations, and the outer peels of nuts are composted and used as organic fertilizer. Also participated in MIHAS 2017 in Malaysia, the Natural and Organic Products Asia (NOPA) Hong Kong, Orgulyo kan Bicol (OKB) Trade and Tourism Fair in SM Mega Mall and FABEX Kansai in Osaka. Always maintain the outbound Business Matching Mission.
Value Proposition	**Product Excellence** and the Runaway Leader in Pili Nut Processing (certified by DTI) J. Emmanuel Pastries-The House of Pili is a **people oriented and self-sustaining industry committed to provide jobs to Filipinos**, especially those marginalized and from rural areas. JEP-The House of Pili **considers food safety and compliance of its products and strives to comply with the standards set by the Food and Drugs Administration (FDA) as one of its registered Food Establishment. Their products are not only Philippine FDA License to Manufacture/Export Own Products certified, but also US FDA FFRS registered, Halal certified, GMP-compliant, and HACCP-aligned**. The country's **biggest pili nut processor** with the tagline "The House of Pili" is a rightful claim. The owner, Ms. Lydia Perez Lomibao received the inspiring Filipina Entrepreneur Award from President Duterte in Malacañang in 2017.
Customer Relationship	In line with its aim to improve and uplift from poverty the lives of our marginalized sector through sustainable livelihood options and Eco enterprises such as organic farming, it maintains an advocacy and fair trade network through a regular participation in National and World Food Fairs like Salon International de l'Agroalimentaire (SIAL Paris 2016).
Customer Segments	Pasalubong Centers and stores Hotels and Restaurants Local public Markets Wholesalers (Divisoria) Processors (Manila, Quezon, Laguna and Baguio) Supermarkets (SM, Market-Market, Duty-free shops, supermarkets located Ilocos Sur and Pampanga)
Key Resources	Strong linkage with support agencies for Full Vertical Integration Designated as an Official Destination for Metro Naga Cultural Heritage Tours
Cost Structure	Cost of raw materials, packaging materials, tools and equipment Marketing, Trade shows and Exhibit expenses Business permits and licenses, and Food safety certification Utilities (electricity, water, fuel, etc.) Salaries and wages of employees/workers Transportation

Channels	Local and Foreign Trade fairs and exhibits Pasalubong Stores Grocery Stores and Malls Direct sales to customers, both local and foreign
Revenue Streams	Sales from crispy pili nuts with garlic, honey glazed pili nuts, roasted pili nuts, pili mazapan, pili bar, suspiros de pili, and other variations of the processed pili nut, and pili massage oil.

Sources: Various VCAs various years, FGD & KII 2018.

Figure 90. Value Chain Map for Processing of Pili Nuts and Candies



Source: Pili VCA Report 2015.

Costs and Returns on Pili Candies (10 packs of 80 grams)

Particulars	COST (Php)
Gross Revenue	**850.00**
Pili Candies (80grams/pack)	10
Price (Php/pack)	85.00
Production Cost	
Raw Material	279.59
Packaging and Labeling	91.60
Labor	
Pre-processing, Processing and Post-processing	32.00
Marketing/Transportation	2.31
Utilities	12.35
Permits/License/Taxes	10.00
Stall Rental	11.54
Depreciation	0.27
Total Production Costs (Php)	**439.65**
Net Returns (Php)	**410.35**

Source: Pili VCA Report (2015).

Dragon Fruit Sample Business Plan

the other commodities and can be used for This sample business plan is put together using the VCA for this commodity provided by DTI Region 1 (from DA Region 1) and from the inputs of E. Dacuycuy (2019). This plan serves as a template to the dragon fruit processors in scaling up.

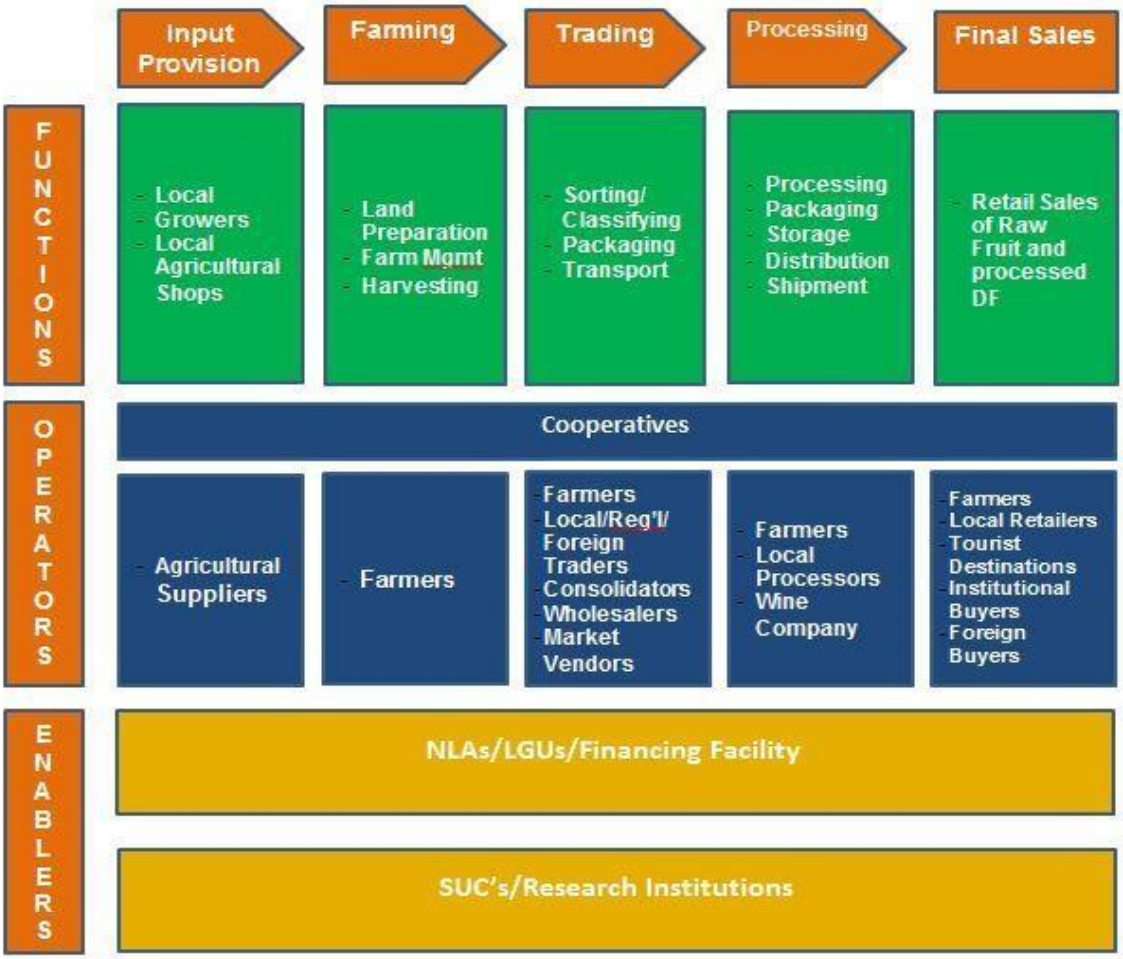
Figure 91. Processed Dragon Fruit Wine Business Plan

REFMAD Farms (Processed Dragon Fruit WINE) - REFMAD (Rare Eagles Forest Marine and Agricultural Development) Dragon Fruit growers is in Burgos, Ilocos Norte. It is the oldest farm established in 2005 with 20 has. Majority of the growers under this firm own their farms, Mrs. Dacuycuy owns about 8 has., while one farm is owned by a local government unit. Most of these farms are purely planted with dragon fruit while a few are intercropped with vegetables.	
Key Partners	Department of Trade and Industry, Dragon Fruit Philippines, Kailokuan Saniata Producers Cooperative (KASACOOP), Department of Agriculture, Department of Agrarian Reform and the Ilocos Region Agriculture Resources Research and Development Council (ILARRDEC), Sarah Balorio in Dumanjug, Cebu, Felipe Uygongco in Guimaras, Jose Fortunato Uy in General Santos City, Raffi Catalan of Bacolod, Department of Science and Technology and Ilocos Norte Trade and Investment Promotion Center

Key Activities	• REFMAD and farm owners exchange planting materials, other input s, and together join trade fairs and market competition. • Exchanges of inputs are extended to other provinces outside the region such as in Cagayan, Pampanga, and Cavite. • They also search for prospective buyers of their processed crop. • REFMAD offer their service as consultants or technical resource persons to other growers or farmers in other aspects of fruit cultivation. • There is a general trend of "fragmented" growers' community in the region. • The fruit and planting materials (cuttings), other services are offered outside the region. • REFMAD Farms offer training and consultancy for dragon fruit establishment and cultivation to other provinces such as Cebu and Iloilo.
Value Proposition	Ms Edita A. Dacuycuy, a multi-awarded farmer scientist and woman entrepreneur of REFMAD Farms (the pioneering dragon fruit plantation in Ilocos region) leads both the National Council and the "Kailokuan Saniata Dragon Fruit Producers Cooperative" in the Ilocos Region. The dragon fruit players are inclusive as the market is big and there are not enough players yet. Ms Dacuycuy has been very open in extending a helping hand from providing technical advice and inputs, to providing planting materials, and sharing her time.
Customer Relationship	REFMAD Farms and KASACOOP who both supplied dragon fruits to La Tondeña, while the former (REFMAD Farms) have already exported their produce to Canada. Although dragon fruit products of the whole region in general reaches the rest of Luzon, in the Visayas, and Mindanao. Furthermore, REFMAD also had partnership[20] with Dragon Fruit Philippines to establish a 100-hectare farm in Pampanga
Customer Segments	• Local public markets and larger markets such as La Tondeña Inc. • Cooperatives • Establishments where there's plenty of customers • Walk in customers • International foreign countries such as British Columbia, Canada and China
Key Resources	• Strong linkage with support agencies • Full Horizontal and Vertical Integration
Cost Structure	• Business permits and licenses, and Food safety certification • Utilities (electricity, water, fuel, etc.) • Salaries, Labor and wages of employees/workers • Transport • Cost of raw materials, packaging materials, tools and equipment • Marketing expenses
Channels	• Direct Sales to customers • Traders and Growers • Trade fairs and exhibits • Grocery Stores and Malls
Revenue Streams	Sale from dragon fruit cutting materials and fresh dragon fruits Sale on processed products like wines etc.

Sources: VCA for Dragon Fruit, DA Region 1; KII 2019.

Figure 92. Value Chain Map for Dragon Fruit Wine Processing



Source: PRDP VCA Dragon Fruit (2016).

PROJECT TITLE: PROCESSED DRAGON FRUIT WINE PRODUCTION COST AND RETURN

END PRODUCT: Per mixture with a harvest of 36 bottles @ 750 ml. wine

INGREDIENTS: 5 kls fresh dragonfruit
5 kls white sugar
5 grams wine yeast

PROCESSING PROCEDURE: Dissolve sugar in lukewarm water.
Put into 20 liter fermenter and add 5kls. Sugar.
Let it cool.
Add yeast.
Cover for 2 weeks and repeat steering daily.
Rock for at least once a month and do this for 3 months.
Filter and ready for bottling.

COST OF INGREDIENTS	**:**	Dragon Fruit	Php 500
		5kls sugar	Php 300
		Yeast	Php 190
		H_2O	Php 35
MATERIAL COST	**:**	Packaging bottle Php 120 per set	
		Bottles with cork bottle (36 x Php 120)	Php 4,320
		Labels	Php 200
LABOR COST	**:**	Labor per fermenter	Php 600
TOTAL PRODUCTION COST:			Php 6,145

NET PROFIT:	Cost production per bottle	Php 300
	Sales of production with (36 bottles x Php 300)	Php 10,800
	Net Sales (Php 10,800 – Php 6,145)	Php 4,655
	Less Handling cost percentage (10% of Php 4,655)	Php 465.50
	Less Wholesale cost (10% of P4,655)	Php 465.50
	Net profit	Php 3,724

Source: KII REFMAD 2019.

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APPENDICES

Appendix 1. Banana Import Quantity, Value, % Share and Major Markets by Product Type, 2003-2016

Year	Commodity	Quantity (MT)	Value (P million)	% Share	Major Suppliers
2003	**Banana, fresh**			**0.0**	
	Banana, dried			0.0	
	Banana, chips/crackers			0.0	
	Banana, flour, meal and powder			0.0	
	Banana, ketchup	0.24	0.2	100.0	Japan (100.0%)
	Banana, preserved by sugar			0.0	
2004	Banana, fresh			0.0	
	Banana, dried			0.0	
	Banana, chips/crackers			0.0	
	Banana, flour, meal and powder			0.0	
	Banana, ketchup			0.0	
	Banana, preserved by sugar			0.0	
2006	Banana, fresh			0.0	
	Banana, dried			0.0	
	Banana, chips/crackers			0.0	
	Banana, flour, meal and powder			0.0	
	Banana, ketchup	56.42	3.63	100.0	Vietnam (85.1%)
	Banana, preserved by sugar			0.0	
2007	Banana, fresh			0.0	
	Banana, dried			0.0	
	Banana, chips/crackers			0.0	
	Banana, flour, meal and powder			0.0	
	Banana, ketchup	1.21	0.66	100.0	Hong Kong (100%)
	Banana, preserved by sugar			0.0	
2009	Banana, fresh			0.0	
	Banana, dried			0.0	
	Banana, chips/crackers			0.0	
	Banana, flour, meal and powder			0.0	
	Banana, ketchup	27.48	1.06	100.0	China (96.1%), USA (3.9%)
	Banana, preserved by sugar			0.0	
2010	Banana, fresh			0.0	
	Banana, dried			0.0	
	Banana, chips/crackers			0.0	
	Banana, flour, meal and powder			0.0	
	Banana, ketchup	0.095	0.03	54.5	Australia (100%)
	Banana, preserved by sugar	0.08	0.03	45.5	Thailand (100%)
2011	Banana, fresh			0.0	
	Banana, dried			0.0	
	Banana, chips/crackers			0.0	
	Banana, flour, meal and powder			0.0	

Year	Commodity	Quantity (MT)	Value (P million)	% Share	Major Suppliers
2003	**Banana, fresh**			**0.0**	
	Banana, dried			0.0	
	Banana, chips/crackers			0.0	
	Banana, flour, meal and powder			0.0	
	Banana, ketchup	0.24	0.2	100.0	Japan (100.0%)
	Banana, preserved by sugar			0.0	
	Banana, ketchup	34.56	1.25	100.0	USA (83.8%)
	Banana, preserved by sugar			0.0	
2013	Banana, fresh			0.0	
	Banana, dried			0.0	
	Banana, chips/crackers			0.0	
	Banana, flour, meal and powder			0.0	
	Banana, ketchup	56.26	8.81	100.0	China (49.9%), Vietnam (17.7%), UK Great Britain & N. Ireland (16.5%)
	Banana, preserved by sugar			0.0	
2014	Banana, fresh	0.87	0.43	8.9	Thailand (100%)
	Banana, dried	4.74	1.27	26.3	China (100%)
	Banana, chips/crackers			0.0	
	Banana, flour, meal and powder			0.0	
	Banana, ketchup	54.13	3.13	64.8	USA (60.3%), Italy (30.1%)
	Banana, preserved by sugar			0.0	
2015	Banana, fresh			0.0	
	Banana, dried	3.3	1.01	0.1	China (100.0%)
	Banana, chips/crackers	0.90774	0.4223765	0.0	Thailand (100.0%)
	Banana, flour, meal and powder	0.031	0.069888	0.0	Japan (100.0%)
	Banana, ketchup	23,378.75	1,769.15	97.9	China (77.9%)
	Banana, preserved by sugar	89.85	36.23	2.0	Thailand (44.4%), Singapore (19.8%), USA (15.9%)
2016	Banana, fresh	14.26	0.75	1.9	Japan (100.0%)
	Banana, dried	7.38	1.61	4.1	China (100.0%)
	Banana, chips/crackers			0.0	
	Banana, flour, meal and powder			0.0	
	Banana, ketchup	513.86	36.98	94.0	China (68.4%), Singapore (10.4%)
	Banana, preserved by sugar			0.0	
Average	Banana, fresh	8	1	0.29	Thailand, Japan
	Banana, dried	5	1	1	China
	Banana, chips/crackers	1	0	0.21	Thailand
	Banana, flour, meal and powder	0	0	0.03	Japan
	Banana, ketchup	2,412	182	90	Japan, Vietnam, Hong Kong, China, USA, Australia, UK Great Britain & N. Ireland, Italy, Singapore
	Banana, preserved by sugar	45	18	9	Thailand, USA, Singapore

Appendix 2. Banana Export Quantity, Value, % Share and Major Markets by Product Type, 2003-2016

Year	Commodity	Quantity (MT)	Value (P million)	% Share	Major Markets
2003	Banana, fresh	1,829,384	81049.7	98.3	Japan (48.3%), China (14.2%)
	Banana, flour, meal and powder			0.0	
	Banana, dried			0.0	
	Banana, preserved by sugar			0.0	
	Banana chips/crackers	25,998	1319.8	1.6	USA (15.4%)
	Banana Ketchup	2	81.94	0.1	USA (54.1%)
2004	Banana, fresh	1,797,342	18,292.73	89.6	Japan (50.9%), China (9.6%), Iran (9.5%)
	Banana, flour, meal and powder			0.0	
	Banana, dried	2	0.14	0.0	Thailand (96.7%)
	Banana, preserved by sugar			0.0	
	Banana chips/crackers	36,422	2,052.94	10.1	USA (17.0%), China (18.9%), Germany (10.0%)
	Banana Ketchup	2,051	73.63	0.4	USA (57.8%), Saudi Arabia (8.9%), Canada (7.2%)
2006	Banana, fresh	2,311,540	20,803.35	91.3	Japan (39.4%), Iran (16.1%), Korea (11.5%)
	Banana, flour, meal and powder	23	0.42	0.0	Korea (100%)
	Banana, dried			0.0	
	Banana, preserved by sugar			0.0	
	Banana chips/crackers	37,961	1,885.79	8.3	China (19.8%), USA (17.4%), Germany (11.7%)
	Banana Ketchup	2,466	86.65	0.4	USA (39.7%), UAE (13.6%), Saudi Arabia (9.6%)
2007	Banana, fresh	2,217,741	18,498.34	90.6	Japan (41.2%), Iran (19.3%), Korea (12.4%)
	Banana, flour, meal and powder	83	2.35	0.0	Korea (51.8%), Germany (36.3%), Singapore (11.9%)
	Banana, dried	310	27.59	0.1	USA (86.6%)
	Banana, preserved by sugar			0.0	
	Banana chips/crackers	32,993	1,879.36	9.2	Vietnam (16.8%), USA (15.7%), Germany (14.0%)
	Banana Ketchup			0.0	
2009	Banana, fresh	1,664,055	16,408.85	89.3	Japan (54.9%), Iran (15.1%), Korea (7.9%)
	Banana, flour, meal and powder	321	4.81	0.0	Hong Kong (28.6%), Germany (24.8%), Singapore (17.8%)
	Banana, dried	143	3.23	0.0	Japan (49.4%), Vietnam (16.7%), USA (11.8%)
	Banana, preserved by sugar			0.0	
	Banana chips/crackers	30,437	1,827.03	9.9	Vietnam (22.1%), USA (12.5%), China (10.5%)
	Banana Ketchup	4,032	127.73	0.7	USA (40.5%), Saudi Arabia (14.7%), UAE (11.7%)
2010	Banana, fresh	1,590,066	14,403.42	59.0	Japan (49.8%), Iran (13.8%), China (10.4%)
	Banana, flour, meal and powder	534	6.62	0.0	Korea (36.4%), Germany (30.4%), Thailand (19.7%)
	Banana, dried	102	8,029.58	32.9	UAE (100%)
	Banana, preserved by sugar			0.0	
	Banana chips/crackers	28,085	1,816.76	7.4	Vietnam (20.5%), USA (15.5%), China (15.0%)
	Banana Ketchup	4,838	147.62	0.6	USA (36.5%), Saudi Arabia (16.4%), UAE (11.4%)

Year	Commodity	Quantity (MT)	Value (P million)	% Share	Major Markets
2011	Banana, fresh	2,055,510	20,458.66	89.6	Japan (47.8%), China (19.6%), Korea (9.6%)
	Banana, flour, meal and powder	243	2.71	0.0	Korea (51.8%), UAE (16.3%), Saudi Arabia (10.1%)
	Banana, dried	369	8.4	0.0	Vietnam (50.9%), Japan (46.1%)
	Banana, preserved by sugar			0.0	
	Banana chips/crackers	30,142	2,190.42	9.6	Vietnam (19.2%), China (18.5%), USA (12.3%)
	Banana Ketchup	5,763	169.96	0.7	USA (34.0%), UAE (16.3%), Saudi Arabia (10.1%)
2013	Banana, fresh	3,266,548	40,861.32	93.6	Japan (33.1%), China (15.3%)
	Banana, flour, meal and powder	877	24.98	0.1	Singapore (47.7%), China (37.9%)
	Banana, dried	1,015	35.51	0.1	China (65.9%), Japan (28.1%)
	Banana, preserved by sugar	3,193	658.63	1.5	USA (31.7%), Vietnam (26.6%), Germany (14.5%)
	Banana chips/crackers	22,122	1,498.57	3.4	Singapore (32.9%), China (19.5%), Malaysia (11.0%)
	Banana Ketchup	11,462	594.91	1.4	USA (37.4%), UAE (12.5%)
2014	Banana, fresh	3,630,976	50,167.16	91.6	Japan (29.0%), China (26.9%), Korea (12.5%)
	Banana, flour, meal and powder	719	19.44	0.0	Taiwan (44.5%), Hong Kong (31.1%)
	Banana, dried	280	17.62	0.0	Japan (73.4%), UAE (18.0%)
	Banana, preserved by sugar	3,235	322.19	0.6	USA (49.1%), Vietnam (10.7%), Germany (10.4%)
	Banana chips/crackers	41,955	3,545.53	6.5	China (18.9%), USA (10.9%), Vietnam (10.1%)
	Banana Ketchup	9,879	709.05	1.3	USA (43.0%), UAE (13.2%)
2015	Banana, fresh	1,795,219	29,933.09	90.3	Japan (33.7%), China (24.9%), Iran (12.3%)
	Banana, flour, meal and powder	284	7.85	0.0	Korea (38.7%), Hong Kong (24.9%), Taiwan (23.3%)
	Banana, dried	645	69.85	0.2	Japan (61.2%), USA (12.2%)
	Banana, preserved by sugar	1,658	158.74	0.5	USA (64.8%), Canada (11.5%)
	Banana chips/crackers	50,263	2,513.64	7.6	USA (46.1%), Vietnam (8.4%), China (10.7%)
	Banana Ketchup	7,430	451.09	1.4	USA (45.5%), Saudi Arabia (13.0%), Canada (12.5%)
2016	Banana, fresh	1,733,836	34,684.96	90.5	Japan (31.0%), China (25.7%), Korea (15.5%)
	Banana, flour, meal and powder	845	15.22	0.0	Korea (60.1%), North Korea (20.4%)
	Banana, dried	72	4.58	0.0	Japan (63.7%), Korea (14.9%)
	Banana, preserved by sugar	95	6.94	0.0	USA (58.0%), Germany (25.3%)
	Banana chips/crackers	36,634	3,252.62	8.5	USA (22.9%), China (17.8%), Germany (10.4%)
	Banana Ketchup	6,697	361.22	0.9	USA (36.4%), UAE (21.9%), Saudi Arabia (14.8%)
Average	Banana, fresh	2,172,020	31,415	90	Japan, China, Iran, Korea
	Banana, flour, meal and powder	436	9	0.03	Korea, Germany, Singapore, Hong Kong, Thailand, UAE, Saudi Arabia, China, Taiwan
	Banana, dried	326	911	3	Thailand,, USA, Japan, Vietnam, UAE, China, Korea
	Banana, preserved by sugar	2,045	287	1	USA, Vietnam, Germany, Canada
	Banana chips/crackers	33,910	2,162	6	USA, China, Germany, Vietnam, Singapore, Malaysia,
	Banana Ketchup	5,462	280	1	USA, Saudi Arabia, Canada, UAE, Italy

Sources: PSA Commodity Fact Sheet, various years.

Appendix 3. Pineapple Export by Product Type, Quantity, Value & % Share, 2003 - 2016

Year	Parameters	Product Type / Product Code							
		Pineapple, fresh (08043000001)	Pineapple, dried (08043000002)	Pineapple, juice/ juice concentrate and other than concentrates (200940, 200941, 200949)	Pineapple, prepared/ preserved	Pineapple, nata de pina (2106909911)	Pineapple, fibers, raw (5311001003)	Pineapple, vinegar (2209000002)	Pineapple, processed but not spun
2003	Quantity (MT)	194,595.01	88.01	109.21	196,638.15				
	Value (P million)	2,043.10	21.82	2,537.20	4,568.18				
	Major Markets	Japan (75.2%), Korea (12.1%)	Germany (39.5%), USA (13.2%)	USA (74.2%), Netherland (21.2%)	USA (31.8%), South Korea (5.2%)				
2004	Quantity (MT)	203,997.99	89.05	115,437.83				4.42	
	Value (P million)	2,289.27	15.84	2,621.87				0.3	
	Major Markets	Japan (78.8%)	USA (35.8%), Singapore (26.7%)	USA (69.0%), Netherlands (11.2%)				USA (51.6%), UAE (40.8%)	
2006	Quantity (MT)	262,133.44	82.14	118,612.05	185,529.76				
	Value (P million)	2,799.07	12.34	3,043.66	5,518.26				
	Major Markets	Japan (61.6%), Korea (20.7%)	Australia (56.8%), Malaysia (13.1%), Netherlands (11.1%)	USA (66.7%), Netherlands (10.0%)	USA (65.5%)				
2007	Quantity (MT)	276,399.91	530.78	115,895.98	196,379.78				
	Value (P million)	2,662.83	52.93	3,070.10	5,649.56				
	Major Markets	Japan (62.1%), Korea (23.6%)	USA (58.8%), Hong Kong (26.7%)	USA (66.8%), Netherlands (10.1%)	USA (62.2%), Korea (6.0%)				
2009	Quantity (MT)	204,505.02	126.51	114,383.15	168,682.52			0.824	0.1
	Value (P million)	2,450.97	25.11	3,520.50	6,545.42			0.03	0.01
	Major Markets	Japan (68.4%), Korea (15.5%)	USA (55.5%), Hong Kong (20.6%), Australia (18.2%)	USA (75.0%)	USA (60.6%), Singapore (10.3%)			USA (100.0%)	Japan (100.0%
2010	Quantity (MT)	164,552.64	97	100,434.88	140,918.83	82.49			
	Value (P million)	1,884.54	26.26	3,338.87	5,693.23	6.39			

Year	Parameters	Product Type / Product Code							
		Pineapple, fresh (08043000 01)	Pineapple, dried (08043000 02)	Pineapple, juice/ juice concentrate and other than concentrates (200940, 200941, 200949)	Pineapple, prepared/ preserved	Pineapple, nata de pina (21069099 11)	Pineapple, fibers, raw (53110010 03)	Pineapple, vinegar (22090000 02)	Pineapple, processed but not spun
	Major Markets	Japan (63.7%), Korea (19.4%)	Japan (42.9%), Guam (14.3%), USA (10.6%)	USA (74.3%)	USA (65.5%)	Canada (53.4%), USA (20.7%)			
2011	Quantity (MT)	263,271.83	329.29	111,881.84	207,187.04	36.18		5.44	
	Value (P million)	2,851.73	77.1	3,578.44	8,462.10	2.54		0.16	
	Major Markets	Japan (54.1%), Korea (20.7%)	USA (32.4%), Japan (26.1%)	USA (74.1%)	USA (44.8%), Singapore (28.2%)	USA (39.8%), Canada (26.8%)		USA (78.8%), Japan (21.2%)	
2013	Quantity (MT)	489,742.86	162.74	126,842.19	199,696.72	5.05	157.26	33.4	
	Value (P million)	6,473.45	50.6	3,935.91	15,197.65	0.23	1.89	0.82	
	Major Markets	Japan (45.4%), Korea (26.5%)	Japan (62.6%), Hawaii (7.8%), USA (6.9%)	USA (75.9%), Netherlands (7.1%)	USA (59.7%), Japan (5.4%)	Hong Kong (69.3%), Italy (17.3%)	Japan (100.0%)	Saudi Arabia (69.2%), Canada (12.5%)	
2014	Quantity (MT)	487,492.38	125.22	119,131.29	176,582.14				
	Value (P million)	6,833.50	34.88	4,355.85	8,089.41				
	Major Markets	Japan (40.6%), Korea (23.9%)	Japan (48.7%), Hawaii (11.2%), Guam (8.3%)	USA (76.7%)	USA (59.0%)				
2015	Quantity (MT)	315,828.95	87.4	114,190.41	283,830.72				
	Value (P million)	5,740.76	33.02	4,664.45	15,689.63				
	Major Markets	Japan (41.6%), Korea (23.0%), China (11.6%)	Japan (58.5%), Poland (12.2%), USA (10.2%)	USA (83.0%)	USA (57.3%)				
2016	Quantity (MT)	599,343.05	137.98	163,991.26	363,488.86				
	Value (P million)	11,285.18	54.86	4,880.72	17,528.67				
	Major Markets	Japan (34.4%), Korea (30.4%),	Japan (50.7%), USA (18.4%)	USA (84.8%)	USA (65.9%)				

Year	Parameters	Product Type / Product Code							
		Pineapple, fresh (08043000 01)	Pineapple, dried (08043000 02)	Pineapple, juice/ juice concentrate and other than concentrates (200940, 200941, 200949)	Pineapple, prepared/ preserved	Pineapple, nata de pina (21069099 11)	Pineapple, fibers, raw (53110010 03)	Pineapple, vinegar (22090000 02)	Pineapple, processed but not spun
		China (16.4%)							
Average	Quantity (MT)	314,714.83	168.74	109,173.64	211,893.45	41.24	157.26	11.02	0.10
	Value (P million)	4,301.31	36.80	3,595.23	9,294.21	3.05	1.89	0.33	0.01
	Value (% Share)	25.0%	0.21%	20.86%	53.93%	0.02%	0.01%	0.00%	0.00%

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Appendix 4. Mango Export by Product Type, Quantity, Value & % Share, 2003-2016

Year	Parameter	Product Type / Product Code						
		Mango, fresh (08450000 3)	Mango, dried (08045000 04)	Mango, other than cooked/uncooked by steaming or boiling in water (0811900001)	Mango, cooked/uncooked, prepared/preserved (0811900001, 2008994102)	Mango, puree (20079990 03)	Mango, juice/juice concentrates (2009809001, 200809011)	Mango, prepared/preserved (2008994102)
2003	Quantity (MT)	35,779.01			914.01			
	Value (P million)	1,681.03			73.07			
	Major Markets	Hong Kong (65.0%), Japan (24.3%)			USA (21.7%), Germany (11.3%)			
2004	Quantity (MT)	33,662.91	1,912.19		599.81	9.29	4,580.16	
	Value (P million)	1,610.32	455.12		83.92	516.74	194.31	
	Major Markets	Hong Kong (60.6%), Japan (29.6%)	USA (40.7%), Singapore (12.1%)		Germany (26.6%), USA (20.4%), Japan (20.0%)	South Korea (47.4%), Japan (18.7%)	USA (32.8%), Japan (26.4%)	
2006	Quantity (MT)	26,169.62	1,187.15		530.57	7,618.86	3,752.32	11.46
	Value (P million)	1,233.83	322.07		70.78	461.21	184.5	0.84
	Major Markets	Hong Kong (53.9%), Japan (24.9%), China (13.4%)	USA (24.9%), Singapore (13.6%), China (12.0%)		Japan (46.5%), Germany (17.8%), Hong Kong (14.4%)	Japan (35.9%), USA (28.4%), Hong Kong (14.2%)	USA (27.0%), Japan (25.3%), Canada (10.2%)	Japan (83.8%)
2007	Quantity (MT)	26,337.82	2,591.32		946.48	7,898.27	5,046.18	110.4
	Value (P million)	1,074.54	704.53		120.15	415.83	191.99	10.25
	Major Markets	Hong Kong (68.7%), Japan (19.7%)	USA (49.6%), Japan (14.3%)		Japan (33.1%), France (15.2%), Hong Kong (14.1%)	Japan (35.8%), USA (22.6%), Hong Kong (16.0%)	USA (43.5%), Canada (17.1%)	USA (91.7%)
2009	Quantity (MT)	20,380.86	1,049.92		667.62	4,986.71	5,910.62	490.86
	Value (P million)	761.47	420.39		106.12	270.68	200.51	37.06
	Major Markets	Hong Kong (68.5%), Japan (21.2%)	USA (43.8%), Canada (12.1%), Hong Kong (10.1%)		Japan (39.4%), USA (17.4%), Hong Kong (12.6%)	USA (31.0%), Hong Kong (19.5%), Japan (16.6%)	USA (44.0%), Canada (13.8%), Japan (9.8%)	Canada (55.6%), USA (21.0%), Korea (10.6%)
2010	Quantity (MT)	20,114.96	3,619.96	744.73		5,160.57	4,175.42	52.36
	Value (P million)	685.12	1,290.93	106.17		251.53	183.04	4.28
	Major Markets	Hong Kong (76.3%), Japan (18.7%)	USA (41.6%), Japan (13.5%), Canada (13.3%)	Japan (41.9%), USA (18.3%), Korea (10.1%)		USA (28.6%), Hong Kong (21.2%), New Zealand (15.8%)	USA (19.8%), Japan (13.9%), Canada (10.5%)	France (45.5%), Italy (40.8%)
2011	Quantity (MT)	21,150.89	9,463.64	860.05		6,090.36	5,676.12	147.47

Year	Parameter	Product Type / Product Code						
		Mango, fresh (08450000 3)	Mango, dried (08045000 04)	Mango, other than cooked/uncooked by steaming or boiling in water (0811900001)	Mango, cooked/uncooked, prepared/preserved (0811900001, 2008994102)	Mango, puree (20079990 03)	Mango, juice/juice concentrates (2009809001, 200809011)	Mango, prepared/preserved (2008994102)
	Value (P million)	724.2	3,443.39	119.23		327.44	277.72	16.98
	Major Markets	Hong Kong (74.2%), Japan (17.5%)	USA (44.2%), Japan (13.2%), Hong Kong (10.8%)	USA (31.5%), Japan (23.8%), Korea (14.7%)		Hong Kong (21.1%), USA (18.3%), Japan (16.7%)	Canada (26.2%), USA (18.8%)	Canada (65.2%), USA (22.5%)
2013	Quantity (MT)	7,886.00	2,937.04	3,963.18	152.16	2,687.30	14,365.82	4,300.13
	Value (P million)	564.45	1,305.82	323.03	3.84	142.56	736.08	292.15
	Major Markets	Hong Kong (39.7%), Korea (25.0%), Japan (19.0%)	USA (19.1%), China (16.2%), Japan (12.1%)	USA (47.1%), Japan (21.4%)	China (90.9%)	USA (23.5%), Hong Kong (18.3%), China (16.3%)	USA (57.75), Canada (10.5%)	USA (59.0%)
2014	Quantity (MT)	21,111.53	6,745.56	3,793.48		4,502.71	7,037.66	94,516.01
	Value (P million)	1,083.81	3,114.05	396.62		275.17	428.11	309.27
	Major Markets	Hong Kong (60.9%), Korea (25.0%)	USA (24.3%), China (14.0%), Japan (12.9%)	Korea (19.5%), Japan (15.8%)		Hong Kong (27.3%), USA (19.7%), China (18.8%)	USA (31.5%), China (10.1%), Japan (10.3%)	Netherlands (95.3%)
2015	Quantity (MT)	12,981.27	7,078.56	5,721.11		4,320.55	6,484.61	573.54
	Value (P million)	731.9	3,190.70	503.53		359.94	401.99	39.72
	Major Markets	Hong Kong (58.5%), Korea (25.4%)	USA (34.3%), Japan (12.3%), Hong Kong (11.0%)	USA (60.4%)		China (23.6%), Hong Kong (22.1%), Korea (19.2%)	USA (47.4%), Canada (9.7%), China (9.3%)	USA (62.2
2016	Quantity (MT)	14,342.97	6,203.38	733.43		6,692.18	2,569.44	10.79
	Value (P million)	632.52	2,654.20	95.21		549.63	133.41	1.37
	Major Markets	Hong Kong (75.7%), Korea (14.5%)	USA (46.2%), Japan (17.0%), Hong Kong (11.4%)	Hong Kong (27.6%), Korea (16.8%), Japan (16.7%)		Hong Kong (29.6%), China (18.9%), Korea (18.9%)	USA (30%), Canada (29.9%)	China (86.8%)
Average	Quantity (MT)	21,810.71	4,278.87	2,636.00	635.11	4,996.68	5,959.84	11,134.78
	Value (P million)	980.29	1,690.12	257.30	76.31	357.07	293.17	79.10
	Value (% Share)	26.8%	46.25%	7.04%	2.09%	9.77%	8.02%	2.16%

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Appendix 5. Papaya Export by Product Type, Quantity, Value and % Share, 2003-2016

Year	Parameter	Product Type/Product Code			
		Papaya, fresh (0807200000)	Papaya, prepared/preserved (2001909003)	Papaya, dried	Papaya, other than fresh and dried (0813400001)
2003	Quantity (MT)	1,466.02		919.51	
	Value (P million)	99.91		58.91	
	Major Markets	Japan (75.2%), South Korea (12.3%)		Hong Kong (48.3%), Australia (22.2%)	
2004	Quantity (MT)	3,324.02		1,329.44	
	Value (P million)	234.35		70.38	
	Major Markets	Japan (89.6%)		Hong Kong (67.3%), Australia (29.7%)	
2006	Quantity (MT)	3,620.18		1,119.93	
	Value (P million)	232.5		60.17	
	Major Markets	Japan (76.8%), New Zealand (14.9%)		Hong Kong (53.2%), Australia (30.6%), New Zealand (12.1%)	
2007	Quantity (MT)	4,059.90	10.18	1,390.88	
	Value (P million)	232.14	0.75	84.11	
	Major Markets	Japan (69.0%), New Zealand (11.8%)	USA (40.3%), UAE (37.4%)	Hong Kong (59.0%), Australia (27.7%)	
2009	Quantity (MT)	2,304.68	38.2		246.49
	Value (P million)	132.64	3.26		18.58
	Major Markets	Japan (85.2%)	USA (42.3%), Hong Kong (14.4%), Canada (12.0%)		Australia (52.9%), Hong Kong (41.5%)
2010	Quantity (MT)	1,390.55	29.63		121.67
	Value (P million)	89.77	2.53		11.84
	Major Markets	Japan (71.8%), New Zealand (16.0%)	USA (66.6%)		Australia (46.1%), Hong Kong (27.1%), New Zealand (13.9%)
2011	Quantity (MT)	2,950.76	47.26		87.91
	Value (P million)	143.25	4.3		13.21
	Major Markets	Japan (80.1%), New Zealand (12.8%)	USA (75.2%)		Australia (59.6%), Hong Kong (21.1%)
2013	Quantity (MT)	5,924.83	11.42		3,002.75
	Value (P million)	260.32	1.02		28.59
	Major Markets	Japan (46.9%), Singapore (17.2%), New Zealand (13.3%)	Australia (60.9%), USA (37.9%)		Pakistan (98.7%)
2014	Quantity (MT)	5,108.43			5.09
	Value (P million)	212.99			1.55
	Major Markets	Korea (33.6%), Japan (32.8%), China (13.2%)			Canada (85.7%)
2015	Quantity (MT)	1,834.37			0.03
	Value (P million)	101.48			0.0088725
	Major Markets	Japan (46.2%), New Zealand (21.9%), Singapore (17.6%)			Korea (100.0%)

2016	Quantity (MT)	1,587.98	4.95	3.52	
	Value (P million)	87.77	576,623.58	407,511.69	
	Major Markets	New Zealand (29.1%), Japan (25.1%), China (24.5%)	Australia (55.1%), New Zealand (43.2%)	USA (99.5%)	
Average	Quantity (MT)	3,051.97	23.61	952.66	577.32
	Value (P million)	166.10	96,105.91	81,557.05	12.30
	Value (% Share)	0.1%	54.04%	45.86%	0.01%

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Appendix 6. Pili Nut Export by Product Type, Quantity, Value and % Share, 2003-2016

Year	Parameter	Product Type / Product Code	
		Pili Nut, fresh/dried with/not shelled/peeled (0802909001)	Pili Nut, prepared/preserved (2008199003)
2003	Quantity (MT)		0.37
	Value (P million)		0.12
	Major Markets		USA (97.9%)
2004	Quantity (MT)		3.08
	Value (P million)		0.58
	Major Markets		USA (94.3%)
2006	Quantity (MT)	0.21	3.69
	Value (P million)	78.9	0.96
	Major Markets	USA (100%)	USA (80.7%)
2007	Quantity (MT)	2.38	6.94
	Value (P million)	0.26	2.09
	Major Markets	France (100.0%)	Japan (72.8%), USA (22.5%)
2009	Quantity (MT)	1.7	8.72
	Value (P million)	0.23	2.12
	Major Markets	Japan (50.4%), France (30.2%)	Canada (73.0%), USA (19.3%)
2010	Quantity (MT)	0.092	4.08
	Value (P million)	0.0081198	0.89
	Major Markets	Saudi Arabia (100.0%)	UAE (37.8%), USA (17.5%), Italy (14.6%)
2011	Quantity (MT)	3.78	2.52
	Value (P million)	1.04	1.06
	Major Markets	China (66.@%), USA (25.3%)	Macau (63.6%0, Japan (15.9%)
2013	Quantity (MT)	23.39	8.86
	Value (P million)	6.23	3.23
	Major Markets	Hong Kong (33.9%), USA (31.2%)	Macau (51.1%), Canada (22.3%)
2014	Quantity (MT)	25.45	13.85
	Value (P million)	7.56	18.1
	Major Markets	Canada (51.5%), Hong Kong (37.2%)	Macau (54.8%), China (31.4%)
2015	Quantity (MT)	17.83	26.81
	Value (P million)	1.85	9.38
	Major Markets	USA (69.3%), Korea (13.8%), Hong Kong (12.3%)	Korea (43.0%), Canada (33.3%)
2016	Quantity (MT)	30.49	15.75
	Value (P million)	9.87	10.61
	Major Markets	Germany (42.9%), Israel (21.0%), Korea (15.3%)	Japan (52.6%), Canada (18.2%)
Average	Quantity (MT)	11.70	8.61
	Value (P million)	11.77	4.47
	Value (% Share)	72.5%	27.51%

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Appendix 7. Cashew Nut Export by Product Type, Quantity, Value and % Share, 2003-2016

Year	Parameter	Product Type/Product Code			
		Cashew, fresh/dried nut, shelled (0801320000)	Cashew, fresh/dried nut, in shell (0801310000)	Cashew, fresh/chilled nut, in shell	Cashew, prepared/preserved nut (2008191000)
2003	Quantity (MT)			2,175.60	2.06
	Value (P million)			59.06	0.65
	Major Markets			Vietnam (52.9%0, India (47.1%)	USA (76.2%), Japan (10.2%)
2004	Quantity (MT)		2,223.43		3.18
	Value (P million)		77.43		0.82
	Major Markets		Singapore (45.5%), India (27.9%)		USA (81.0%)
2006	Quantity (MT)		472.8		4.46
	Value (P million)		38.45		1.43
	Major Markets		UAE (52.9%), Vietnam (35.7%)		USA (57.5%), Thailand (13.1%), Italy (12.9%)
2007	Quantity (MT)		47.5		2.48
	Value (P million)		1.23		0.66
	Major Markets		Vietnam (98.9%)		USA (27.3%), Canada (22.7%), Guam (17.8%)
2009	Quantity (MT)				1.72
	Value (P million)				0.3
	Major Markets				USA (74.9%), Guam (15.0%), Canada (8.4%)
2010	Quantity (MT)		540.65		6.66
	Value (P million)		19.28		2.04
	Major Markets		Vietnam (100.0%)		Thailand (42.9%), USA (25.8%), Italy (19.5%)
2011	Quantity (MT)		150.23		0.66
	Value (P million)		7.49		0.11
	Major Markets		Vietnam (99.9%)		USA (41.6%), Papua New Guinea (27.0%), Guam (23.1%)
2013	Quantity (MT)		813.95		1.04
	Value (P million)		19.5		0.12
	Major Markets		Indonesia (73.4%), Vietnam (20.9%)		Korea (100.0%)
2014	Quantity (MT)	3.28	24.2		
	Value (P million)	0.77	0.38		
	Major Markets	Vietnam (100.0%)	Malaysia (55.8%), Turkey (44.2%)		
2015	Quantity (MT)				8.55
	Value (P million)				1.5
	Major Markets				Korea (100.0%)
2016	Quantity (MT)		275.4		0.315
	Value (P million)		23.22		0.10
	Major Markets		Vietnam (100.0%)		Canada (98.4%)
Average	Quantity (MT)	3.28	568.52	2,175.60	3.11
	Value (P million)	0.77	23.37	59.06	0.77
	Value (% Share)	0.9%	27.83%	70.33%	0.92%

Sources: PSA Commodity Fact Sheet, various years.
Note: No data for 2005, 2008 and 2012.

Appendix 8. Detailed SWOT by Commodity

(1) Banana

Input Provision

Banana Input Provision

Weaknesses/Threats	*Strength/Opportunities*
Limited supply and/or access to good quality disease free planting materials	Use of tissue cultured planting materials can significantly improve yield of farmers
Limited supply of tissue cultured banana seedlings	Village level nurseries can potentially reduce cost of tissue cultured planting materials and provide additional income to farmers
Lack of tissue culture laboratories	Proper application and management of fertilizer and pesticides together with use of quality planting materials and good agronomic practices can potentially result to yield of 50 to 80 kilos per bunch
Low willingness among farmers to invest in good quality planting materials resulting to low quality of banana produced/ Presence of seeded fruits	Agri-waste can be used in the production of organic fertilizer
Average yields and productivity of small producers are low	There are also existing enterprises engaged in production of organic fertilizer but not specifically for banana
High cost of chemical inputs	Inputs are widely available from the multi-national companies
Limited/lack of local supply and commercial distribution of organic fertilizer and inputs	Support to existing tissue-cultured laboratories
Lack of understanding among farmers on cost benefits of proper and efficient use of fertilizer/Only very few farmers apply fertilizer	Establishment of municipal or cluster nurseries
Low level of purchasing power among smallholders	Availability of government programs that distribute inputs such as fertilizers and herbicides for banana
High input price/cost	Existing technology on propagation/ production of tissue cultured planting materials
High increase of production cost	Availability of financial assistance on agri-based industry development
Increasing cost of tissue cultured planting materials	Availability of assistance from DA & ATI on farmers' capability training on Good Agronomic Practices (GAP)
Limited capacity for pre- and post-harvest investments	Availability of matured technology on the production of organic fertilizer
Land use and credit access difficulties brought about by CARP	Presence of small scale production of organic fertilizers but not intended for banana
Conflict with land use policy	Sufficiency of agri-waste including banana peels which can be used in the production of organic fertilizer
Inadequate access to banana production areas	Use of organic inputs can reduce incidence of pests and diseases as well as improve soil and environmental health
High dependence on synthetic inputs is costly and can have negative impacts on human health and the environment	Proper irrigation can help improve productivity and reduce resource/water use
Poor utilization of biodegradable waste/Lack of access to facilities and resources to scale up and/or mechanize production of organic inputs	
Lack of access to soil analysis	
Lack of nutrient analysis of homemade/ on-farm produced organic inputs	
Lack of irrigation facilities	
Poor condition of some of the drainage/canals/irrigation facilities	

Weaknesses/Threats	*Strength/Opportunities*
Contaminated water sources	
Unstable and/or decreasing water supply	
Under-investment in farm production and post-harvest	
Ban on aerial spraying due issues of health, sustainable development and environmental effects in the areas where there are banana plantations	
Widespread of banana disease (e.g. fusarium wilt of banana)	
Labor rights violations	
Poor farm-to-market roads	
Hiring of plantation supervisors who are not known to the workers often resulted to insubordination	
Lack of understanding among farmers on cost benefits of proper and efficient use of fertilizer/only few farmers apply fertilizer	
Conversion of Banana to other varieties/crops	

Sources: Various VCAs various years, FGD 2018.

Farming

Banana Farming

Weaknesses/Threats	*Strength/Opportunities*
Limited outreach of existing extension services	Vast area suitable for banana plantation/area for expansion
Cardava traditionally grown with minimal investments on farm maintenance and inputs	Availability of matured technologies that have good potentials for improving banana production & farm productivity including the reduction of incidence of pest & disease infestation
Limited knowledge on Good Agricultural Practices (GAP)	Assistance from the DA & ATI through: conduct of trainings on GAP
Low uptake and adoption of Good Agricultural Practices	Presence of credit facilities
Lack of knowledge/ignorance of farmers on proper planting and other agricultural practices	Availability of trainings & interventions promoting climate resiliency
Lack of know-how to control and manage spread of pests and diseases resulting to low yield	Existing delineated protected areas Environmentally Critical Area Network (ECAN)
Risk aversion among farmers to reinvest in Lakatan farming	Availability of new technologies and farming systems: 1)Use of new technologies to prevent/manage banana diseases and insect pests; 2)Information Dissemination and Training on pests and diseases management
Banana diseases and insect pests especially Banana Bunchy Top, Bugtok, and Sigatoka	Provision of machineries and farm implements to increase work productivity
Changing agro-climatic conditions and typhoon destructions	Upgrading of low cost indigenous technologies that have good potentials of improving farm productivity and reduce incidence of pest and disease infestation
High labor requirement	There are progressive farmers in Lanao del Norte, North Cotabato, and Davao Region especially Davao del Sur who have been trained in GAP and are willing to share best practices with peers Interest among cooperatives and traders to increase volume/ yields to get premium prices (traders pay higher prices if farmers/groups deliver significant volume)
Mismatch of postharvest facilities	Interest among cooperatives and traders to increase volume/ yields to get premium prices (traders pay higher prices if farmers/groups deliver significant volume)
Encroachment of banana small holdings and plantations to DENR restricted areas	Vast land in the ARMM is ideal for Cavendish cultivation
Limited water irrigation facilities	Technology to preventing and managing diseases are available

Weaknesses/Threats	*Strength/Opportunities*
Weak organization of farmers/growers	LGU is willing to co-share in the construction and/or improvement of farm-to-market roads
Extortion/non-government related taxes	Lakatan farming can be a lucrative business if BBTV incidence can be eliminated/reduced
Harvesting of non-matured bananas	Inter-cropping practices on cardaba banana (Cacao/coconut)

Sources: Various VCAs various years, FGD 2018.

Consolidation/Packing

Banana Consolidation/Packing

Weaknesses/Threats	*Strength/Opportunities*
Limited capacity of postharvest facilities caused by underinvestment	Improved postharvest facilities reduces costs related to consolidation/ packing and marketing and distribution
Lack of Postharvest Facilities (PHF) for handling resulting to high levels of losses	PLGU is willing to share in the construction and/or upgrading of farm-to-market roads
Lack of capital and facilities for small farmers to engage in consolidation	Presence of credit/ financing institutions
Poor farm-to-market road	DA, LGUs and other GO/NGO providing support on PHF
Weak demand for banana chips & other byproducts in the local market	Marketing/Distribution
High cost of packaging materials	ARMM is easily accessible to major PPA ports (Davao and General Santos City) for transshipment of goods that are also due for privatization to enhance its services
Limited suppliers of packaging materials	PPA's ports in Sasa, Davao City and in Makar, General Santos City are being proposed for privatization to enhance its operation
Limited market consolidator	There is a huge potential for expanding the existing markets of Cavendish banana producers of Maguindanao in countries of Asia and Middle-East
Tax during transport of banana product	House Bill No. 4994: Bangsamoro Basic Law provides mechanism on trade and commerce with autonomy from Central Government of the Philippines and mechanism on peace development program in the ARMM
Criminal practices / stealing of transport fuels	Peace building program can address peace and order and poverty problems through productive agriculture
	Establishment of *bagsakan*/trading hub per identified farmers' clustered group
	Organizing of activities like Industry Stakeholders' Convergence and Investment
	The shelf-life of bananas can be prolonged by proper storage and postharvest handling
	The very large population in the Philippines and increasing consciousness for healthy snack food provides opportunities to develop the local market for other processed Cardava based products
	Growing market for Halal products
	LGU willing to cost share in the construction and maintenance of farm to market roads
	Good roads can reduce cost of transactions, delays in delivery, and postharvest losses
	PRDP Program and DA-Regular FMR-Program
	Existence of DA-AMAD
	Inclusion of Palawan in the BIMP-EAGA

Sources: Various VCAs various years, FGD 2018.

Processing

Banana Processing

Weaknesses/Threats	*Strength/Opportunities*
Lack of access to skills and resources to comply with GMP (especially micro enterprises)	Implementation and adoption of standards such as GMP and HACCP and other relevant quality standards can play a positive role in providing the catalyst and incentives for the modernization of the banana chips industry and the adoption of safer and more sustainable production and processing activities which can be differentiation factors that can institutionalize market competitiveness
Low adoption of GMP particularly for micro firms due to limited resources	Availability of Government Financing Institutions and other financing institutions to aide in financial constraints
Street food preparation not aligned with food safety protocols	Presence of DTI, DOST and academe support programs and projects on banana processing
Low volume of production	Availability of technology on the implementation and adoption of standards such as GMP for the modernization of banana chips industry and adoption of safer and more sustainable production and processing towards market competitiveness
Limited access to suppliers of raw materials	Support mechanism of DA, DOST and DTI on processing facilities
Limited access to production technologies	Availability of seedless variety for processing
Low technology adaptation	Availability of technologies that help lessen cost of processing
Low uptake and adoption of good agronomic practices with emerging effects of climate change	Waste disposal/management
Limited/lack of production/processing capital	Facilitate trainings/seminars on quality standards
Limited consolidation since most credit facility provide assistance to cooperatives and/or groups, while there is no existing active cooperatives or farmers association on banana industry	Assistance in securing of sanitary permits and accreditation requirements, i.e., PNS, FDA accreditation, HACCP certification, DOC permits, SEC registration
Effect of climate change	Availability of technical assistance from DTI to improve packaging and label and thereby helping in upgrading and penetrating new markets
Limited technical know-how on agri-quality standards in production and processing	
Limited knowledge and capacity to improve packaging for product development	
Limited financial capability to finance product development	
Limited knowledge on processing technologies	
Lack of processing facilities and cost of processing is high particularly processing that requires electricity (cost of electricity in the province is high)	
Low quality of processed products due to the low quality of bananas (with seeds)	
High processing cost	
Agri-waste of banana	
Abundant supply of Saba banana resulting to low farm gate price	
Unpredictable/volatile prices of raw materials	
Weak institutional linkages among VC operators	
Unorganized processors	
Laboratory tests are expensive, limited and waiting time for the result is long	

Sources: Various VCAs various years, FGD 2018.

Marketing/Distribution/Post-Harvest/Logistics

Banana Marketing/Distribution/Post-Harvest/Logistics

Weaknesses/Threats	***Strength/Opportunities***
Inefficient logistics	Good roads can reduce cost of transportation, travel time, and postharvest losses
Inefficient shipping and port facilities	Reduction in shipping cost can improve profitability of players in the chain and help cushion effects of BBTV in yield
Weak collaboration among farmers	Collective marketing can improve bargaining position of smallholders and lower marketing costs
Lack of access to refrigerated / appropriate transportation and storage facilities	Use of ice as alternative to sliced trunks to reduce risks of BBTV infection
Lack of access to postharvest facilities	Access to banana post-harvest-related infrastructures
Lack of financial resources to undertake and/or scale up collective marketing	Training on post-harvest management i.e. use of ethylene adsorbents, proper handling to prolong shelf-life for a longer storability, and use of wooden crates lined with banana bracts in transport
Lack of ice plants	
High incidence of post-harvest losses	
Lack of post-harvest machineries/facilities	
Limited access to direct market	
Poor Market linkage	
Poor postharvest handling and facilities especially among buying stations resulting to high levels of losses	
Weak demand for banana chips in local market	
Lack of product differentiation/available product formats	
Lack of value addition in ARMM provinces	
Poor farm to market roads	
Inefficient port (PPA controlled) services	
Inefficient logistics	
Weak trade facilitation policies and management	
Price determination of bananas for export has remained under the control of big institutional buyers	
Issues related to compliance to international standards on food quality and safety	
Low farm gate price	
Several access roads to main highways are not all-weather roads that contribute to increased logistical costs and result to poor product quality (marketability problem)	
Inadequate access to banana production areas and poor road condition	
Limited access to market information (supply and demand including in-demand banana products)	
Limited access to potential markets	
Non-participation to international trade fairs	
Expensive logistics cost on shipping (e.g. The cost per container from Davao to Manila is Php 50,000 while the cost from Davao to Japan is only Php 10,000.)	
Banana farmers not committed to price agreements	
Pole-vaulting practices in marketing	
Prevalence incidents of thievery	
Non-contracted manila buyers bought banana in higher prices	

Sources: Various VCAs various years, FGD 2018.

Enabling Environment

Banana Enabling Environment

Weaknesses/Threats	*Strength/Opportunities*
Massive land conversions of agricultural lands	Promote continuous utilization of lands for agricultural purposes and/or encourage expansion of production
Very stringent regulations by government e.g. FDA	
Various plans of Government agencies assisting banana industry are not harmonized	

Sources: Various VCAs various years, FGD 2018.

Support Services

Banana Support Services

Weaknesses/Threats	*Strength/Opportunities*
Limited knowledge of AEWs in up-to-date cultural practices in the field	Retooling and/or Update Training on cultural management for Agricultural Extension Workers (AEWs)
Lack of passage over bodies of water or problematic terrains	Support to better transport of products and services through construction/improvement of public infrastructures like: 1) Single-lane bridge; 2) Farm-to-market roads
Poor road networks in production areas	
Poor yet expensive internet connection	
Poor access to finance or financial support and high loan interest with very stringent requirements	

Sources: Various VCAs various years, FGD 2018.

Inter-firm relations/supply chain governance

Banana Inter-firm relations/supply chain governance

Weaknesses/Threats	*Strength/Opportunities*
Presence of insurgency/rebellion and incidence of extortions	House Bill No. 4994: Bangsamoro Basic Law provides mechanism to resolve the peace and order problem in Mindanao
Inactive banana growers association or organized group at the farmer level	Presence of Cooperative Development Offices and Institutional Support Services Division in the LGUs (Provincial & Municipal)
Farmers have no formal ties or coordination with end buyers (traders, consolidators and processors)	
Banana stakeholders (growers and processors) must have nationwide convergence at least twice a year	

Sources: Various VCAs various years, FGD 2018.

(2) Pineapple

Input Provision

Pineapple Input Provision

Weaknesses/Threats	*Strengths/Opportunities*
High cost of agricultural inputs including planting materials, fertilizers, flower inducers, herbicides in production	Presence of local investor: increase of economic stability of the province encourage the local investor to invest in the province especially in the growing opportunity of pineapple.
High cost of carabaos and tractors service	Existing processor of organic fertilizer is the additional/alternative source of fertilizer during production.
Lack of farming implements (patik, kawit, araro, lubid, bolo, lubid)	Availability of low interest credit program
Non availability of some inputs in the market/high cost if available. Because not all municipality of the province are having a solid area for pineapple production, markets do not supply all kind of inputs for specific commodity.	Availability of technology to produce natural fertilizers
	Provision of good quality suckers, fertilizers, flower inducers and herbicides through MLGUs
	Establishment of cooperative stores for fertilizers, flower inducers, herbicide in production
	Provision of carabaos and tractors to associations, which will be used through proper scheduling
	Establishment of farm service providers (carabao, tractor service) in the area
	Provision of good quality farming implements

Sources: Various VCAs various years, FGD 2018.

Production

Pineapple Production

Weaknesses/Threats	*Strengths/Opportunities*
Presence of "kalamatso" or black spots on the fibers of pineapple due to constant changing of weather and presence of worms, Rats and other pests	Training on Integrated Pest Management
Burning of Pineapple leaves due to extremely hot weather	Provision of seminar on pineapple production and diseases
Insufficient water supply in pineapple farms	Establishment of Irrigation system on pineapple farms
Lack of capital. Pineapple is grown all year round that needs a capital that can sustain the needs of the crops and the family of the farmer during production.	Presence of Government support program such as PAMANA and etc. in pineapple industry and provide funding for FMR and other related infrastructure and machinery.
Inadequate technology, machines, equipment and irrigation facilities resulting to poor production output	Availability of support institutions/programs that can provide trainings
Farm to Market Roads (FMR) are not enough. Some areas of the province do not have access road for the commodity of the province.	Availability of technology (e.g. balance fertilization) that provide the different agency like DA, PLGU and MLGU.
Absence of cropping calendar (fragmented production base)	Custom rental of farm machineries for land preparation that are given by different agency/private association
Most of the farmer do not apply mechanize farming because of insufficient equipment for land preparation and during production.	Availability of areas for expansion
Low quality of soil, lack of supply of good quality of planting materials and lack of water supply affects the quality of fruits of pineapple farmer	Availability of projects and program in irrigation
Required specification/standard of buyers are not yet met	

Weaknesses/Threats	*Strengths/Opportunities*
Proliferation of new varieties of pineapple. In the province there are some farmer used the other variety of pineapple such as Hawaiian variety	

Sources: Various VCAs various years, FGD 2018.

Post-Harvest Operations

Pineapple Post-Harvest Operations

Weaknesses/Threats	*Strengths/Opportunities*
Insufficient training on value adding activities on pineapple specifically processing	Conduct training on value adding activities that can be done to pineapples
Farmers are limited to their role as supplier of fresh pineapples	Establishment of village type pineapple processing facility (Pineapple chutney, jam, wine, juice, candy, etc.) to pineapple farmers
Insufficient trainings on mechanized processing facility provided	Rehabilitation of processing facilities
	Undertake value adding activities Creation of processed pineapple enterprise
	Provision of trainings and demonstration to farmers about the mechanized processing facility

Sources: Various VCAs various years, FGD 2018.

Assembly/Logistics

Pineapple Assembly/Logistics

Weaknesses/Threats	*Strengths/Opportunities*
Lack of trainings for proper handling and marketing of product. Some farmers and processor do not have proper training in handling, proper processing and marketing. Farmers are not trained to market their product in their own in which possibly adds to the income from their product	With number of *viajeros*/ wholesalers, marketing of products is easy to those who have no linkages in buyers.
Lack of access to production area. Most of the production areas in the province are located to the remote areas. Since FMR are not enough, farmers are cannot transport their product to the market and to the processing area which affects the price of the commodity	Ease of transporting products due to accessibility to major markets outside the province. Since the province of Camarines Norte is near to large marketing area in the country which is manila, it is an opportunity to deliver the product easily

Sources: Various VCAs various years, FGD 2018.

Processing

Pineapple Processing

Weaknesses/Threats	*Strengths/Opportunities*
Inadequate processing facility, equipment and trained personnel.	Enabling government support (DTI, DOLE and etc.)
Facilities of the existing processor are small enough to sustain the large demand. Most of them are relying on the order basis from the small buyer that is why their processing is irregular.	With existing NGOs engage in processing.
Short shelf life of pineapple processed products because the facilities needed to prolong its life are not available in the processor.	Presence of Cooperative/association involved in processing
Poor packaging/design.	Presence of market places and access to promotion strategies in the province
Inadequate network in materials/inputs needed during processing.	Policy basis of the farmers, traders and buyer in marketing of pineapple products
Some ingredients of food products are not available in the local market	Convergence of enablers
Lack of raw materials, capital for processing and capability building for processor	Availability of trainings through livelihood programs and etc. Nowadays, Government agencies have support in trainings and capability building activities in different cooperative, association and private individuals
High price of raw materials	Availability of raw materials (pineapple)
Access to better packaging materials	Benchmarking with existing processors
Availability of packaging materials	
Expensive laboratory analysis	
Improvement of product texture or quality (consistency of the finished products)	

Sources: Various VCAs various years, FGD 2018.

Marketing

Pineapple Marketing

Weaknesses/Threats	*Strengths/Opportunities*
High transportation and trucking cost	Establishment of enterprise on provision of logistical services
Bad state of Farm to Market Roads	Provision of Farm to Market Roads
Price competition among farmers	Federating of farmers, integrating production to command price
Lack of stable and consistent market	Federating of farmers to solidify production and marketing system and unify the farmers. These may lead to consolidate harvest, which will be a merit to contract negotiation
Weak marketing system, distribution, selling of products	Establishment of a "*tindahangbayan*" or "*pasalubong* center" to increase marketability of products
Weak linkages to market institutions, processors, exporters, commercial establishment (restaurants, department stores)	Intensified marketing and promotion of pineapple products (fresh and processed) and entering into contract pricing
Lack of market information	Presence of supports from other government institutions like DTI, DOST, DAR, LGUs, SUC, NGO and other private institutions
Inadequate product promotion for processed products	Presence of APTC and Agrarian Information and Marketing Center (AIM-C).
Limited market presence due to lack of product certification	APTC will be one of the marketing areas of fresh fruits and AIM-C will be additional place in which marketing transaction and linkages will be done.

Weaknesses/Threats	*Strengths/Opportunities*
	Presence of Radio programs, TV network and social media in the province that can cater the promotion aspect in marketing
	Niche market for organically grown pineapple
	Emerging demand from niche market for other products forms and usage
	Presence of market places and access to promotion strategies in the province
	Policy basis of the farmers, traders and buyer in marketing of pineapple products

Sources: Various VCAs various years, FGD 2018.

Enabling Environment

Pineapple Enabling Environment

Weaknesses/Threats	*Strengths/Opportunities*
Low capitalization by farmers in production, marketing and processing	Provision of seminars and trainings on proper use of pesticides and other chemical
Excessive use of fertilizers, pesticides, herbicides in Pineapple Production which lead to bad quality	Promotion and adoption of GAP
Lack of Ordinances/Resolution to protect the industry	Internal control system for farmers
	Provision of access to finance and credit programs of financial institutions
	Support to the Industry by the local Government AEWs

Sources: Various VCAs various years, FGD 2018.

Research and Development and Extension

Pineapple Research and Development and Extension

Weaknesses/Threats	*Strengths/Opportunities*
Low adoption and dissemination of new technologies	Intensify Research and Development and Extension programs on pineapple to reach the farmer
Linkage of market opportunity in value adding	Information Dissemination on processes on pineapple by-products/waste
Lack of knowledge on by-products disposal of pineapple	Presence of technology that needs to validate the result through techno demo and support of Local Government and other agencies to conduct research
Short shelf-life, small sizes of pineapple fruit and improper handling of product	

Sources: Various VCAs various years, FGD 2018.

(3) Mango

Mango General SWOT

Strengths	*Threats*
Superior quality variety	Climate change
Philippines has Ideal climate conditions for mango growing	Competitors are increasing production & exports, and upgrading
Strong drive among domestic processors	Major export destinations are implementing more stringent SPS & quality standards
	Cecid fly disease is critical since it threatens the mango industry and has no treatment yet

Sources: Various VCAs various years, FGD 2018.

Input Provisions

Mango Input Provisions

Weaknesses	*Opportunities*
High cost of production inputs needed for better production	Farmers have expressed desires to increase production with aid of fertilizers and pesticides
Limited access and supplies of good quality planting materials	Bureau of Plant and Industry accreditation for private and government plant nursery operators with good quality planting materials. At present, Five (5) nursery operators in Mindanao are accredited by BPI; 2 in Bukidnon, 1 in Davao City, 2 in Kidapawan City
Presence of impure planting materials	BPI's production and distribution of planting materials. BPI's commitment to ensure plant quarantine, seed quality control, and crop production and protection among others
BPI accredited nursery operators are present in 3 provinces only which includes Davao, Northern Mindanao and South Cotabato, others do not have BPI accredited nursery thus quality of planting materials cannot be guaranteed. Some of the growers has to conduct variety check to ensure the variety of mango are the supposed variety.	Local Government Units and DA Regional Offices establishment of nurseries
Lack of Financial capacity to finance input materials	Assistance of Private sectors to the LGU for the nurseries
Mango production entails high investment cost. It takes 4-5 years, before a farmer earns profit. Productivity of bearing trees as well is very much dependent on input provision such as fertilizers, pesticides and maintenance	Private nurseries located in the provinces
Producers access borrowing from informal borrowers(e.g. "Bombay", "5:6") with very high interest rate from 15-20 % since government financing services are mostly available to cooperatives only and/or needs a stringent process	Financing services that may be accessed from various banks and government agencies by farmers associations, cooperatives and individuals
	Issuance of BSP Circular No 217, Series 1999 prescribing the Implementing Guidelines for the Setting of Variable Grace period for Long-Gestating Agriculture and Fisheries Projects, such as for mango, having a long gestational maximum grace period of seven years
	Availability of finance and technical services extended by processors and exporters to farmers
	Presence of mango contractors who are willing to finance input materials in an agreed contract

Weaknesses	*Opportunities*
	Farmers have expressed desires to increase production with aid of fertilizers and pesticides

Sources: Various VCAs various years, FGD 2018.

Primary Production

Mango Primary Production

Weaknesses	*Opportunities*
Unpredictable weather conditions; Mango trees productivity is at its best if climate is dry during flowering and fruit development period, since continuous raining and exposure to moisture develops fungal diseases that causes flower and fruit drop	PAGASA, DOST, UPLP and other institutions' continued research and investment on weather forecasting. on Adaptation of climate-smart agriculture technologies to mitigate and reduce impact of climate changes
Pest and diseases incidences Mango are very susceptible to pest and diseases	Presence of various agencies such as BPI-National Mango Research and Development Council
High Density Farming: Although existing farms with high density farming were not identified during the study, but, this have been identified by several growers-per experience- as one of the major causes of low yield. 40 From almost zero yield to around 10 mt yield per hectare by improving farm density from 5x10 to 10x10	Research and development activities on evolving pests and diseases are given priority by various government agencies such as BPI-National and Satellite Pesticide Analytical Laboratories (CDO and Davao PAL Satellite)
Poor farm management and adoption of mango growers to good agricultural practices due to the following reasons: 1) Limited knowledge on available technologies and other good agricultural practices; 2) Lack of financing to practice good agricultural practices	DA-HVCDP provides technical assistance to farmers on sustainable farming and/or good agricultural practices
Contractors' tendency to maximize contract term by doing two production cycles in one year. After the contract, the farmers bear the impact to mango trees which is low productivity	Availability of trainings and manuals for Good Agricultural Practices
Lack of water supply in upland areas	DA-HVCDP provides technical assistance on sustainable farming and/or good agricultural practices
	PCAARRD and DOST Mango Industry Strategic S & T Plan (ISP) to address gaps through Science and Technology interventions from production, postharvest, processing, trade to marketing aspect on the export cultivar "Carabao"
	Presence of financial institutions such as DBP, Land Bank and Rural banks who offers low interest financing scheme for mango growers
	Willingness of some exporters and processors to extend financial support through an agreed agreement
	I-Build Infrastructure Development Component of the PRDP include but not limited to Farm to Market Road, bridges, Communal irrigation System, and Potable Water Supply System programs

Sources: Various VCAs various years, FGD 2018.

Production/Farming

Mango Production/Farming

Weaknesses	*Opportunities*
Difficulty in transporting fresh produce from harvesting farms to the MPW detection facility (for the required x-ray scanning process) before entry into the local market	Good potential of existing number of mature bearing mango trees (117,344 bearing) to produce more than enough volume of production for local consumers. Eighty-two percent (82%) of production is on the Carabao variety
Low mango yield	Strong backward & forward linkages Fruits and Nuts produce are strategically positioned in each region
Lack of production equipment (power sprayer, plastic drums) and facilities (hauling trucks) among growers/ farmers)	Production can be increased through accreditation of nurseries to be able to plant more
High costs of production inputs (fertilizers, pesticides, mango inducer, etcetera)	Mango peels can be transformed to mango powder
Quality Control	
Inadequacy and lack of strategically placed x-ray scanners in key locations, i. e., top producing areas	
Oversupply in the local market during peak seasons due to absence of an export market	
Prevalence of pest and diseases especially cecid flies	
Lack farming handling materials such as paper bags used to wrap after flowering stage	
Lack of GAP	
Seasonal yield due to the rainy months	
Long-term overreliance on agrochemicals	
Over-spraying and application of banned chemicals by contractors with short-term interest in orchards productivity	
Need for trained/skilled personnel in disaggregation or sorting to be able to directly export	

Sources: Various VCAs various years, FGD 2018.

Support Services

Mango Support Services

Weaknesses	*Opportunities*
Lack of research support	Increasing success in the management and control of MPW through interventions introduced by the Office of the City Agriculturist in coordination with the Department of Agriculture. As per recent data of OCA, detection of MPW in X-ray scanned fresh carabao mangoes has significantly declined to 1%
Inadequacy and lack of strategically placed X-ray scanners in top-producing areas	Existing MPW Detection Center
Lack of institutional support services resulting to weak organization of farmers	
Lack of budget support for the R & D	
Lack of institutional support services resulting to weak organization of farmers	
Lack information with accredited nurseries certified by BPI	
Lack of access to credit, loans etc.	
Lack of logistics support/information with the processors	

Sources: Various VCAs various years, FGD 2018.

Processing

Mango Processing

Weaknesses	*Opportunities*
Insufficient processing facilities and processors in the industry	Existence of one (1) processor in Palawan
Small-scale farmers struggle to obtain the right inputs and apply banned inputs	Establishment of Vapor Heat Treatment and Laboratory Facilities in the Island of Samal as provided in the City Ordinance 2010-168
Lack of modern production techniques	Existing VHT and HWT in private plantation in Mindanao such as in Nakashin, SPPFC, Dole and Lapanday Agro-Industrial Development Corporation
Lack handling and packing skills	Mango producers and processors face a complex system of standards
Poor post-harvest control, cold chain management, and traceability	
Poor post-harvest control, cold chain management, and traceability	
Lack of compliance with SPS regulations & quality global standards.	
Absence of coordination amongst farmers	
Lack of coordination regarding industry policy	
Fragmented R&D activities, lacking continuity	
Lack of qualified human capital with specialized knowledge on the mango industry	
Large distances between farms and pack-houses, processors and distribution hubs	
Shortcomings in the cold chain system	
Poor SPS management	
No Vapor Heat Treatment (VHT), Hot Water Treatment (HWT) Facilities and other Post Harvest Facilities in most areas. VHT and HWT facilities are mostly located in Davao and Metro Manila	
Lack of scale economies at the production level	
Lack of modern production and harvesting techniques	
Lack of coordination between industry stakeholders and high levels of bureaucracy	
Lack of coordination between industry stakeholders & high levels of bureaucracy	
Limited capital for processing venture	
Inadequate processing equipment	
Inadequate machines, equipment, facilities and new processing technologies for the product development	
Lack of GMP	
Need financing for equipment	
Difficulty in accreditation due to requirements	
High cost of raw mango due to low production	
For dried mango: high cost of sugar (There a need for revision of SRA regulations)	
For dried mango: need for drying equipment/technology	

Sources: Various VCAs various years, FGD 2018.

Marketing

Mango Marketing

Weaknesses	*Opportunities*
Marketing	**Marketing**
Absence of an export market can lead to oversupply in the local market, thereby reducing the price of the fresh fruits	Over supply of fresh mangoes is experienced during on-season harvests
Some farmers' prevailing perception on the absence of any potential export market for fresh fruits from Puerto Princesa City and other areas of the Province leads to some mango farming areas not being prepared for flowering	Emerging demands for mango products due to increased economic growth of Palawan and Puerto Princesa City as brought primarily by increasing tourist influx
Lack of collaboration and cooperation among farmers	Global demand for mangos is increasing
Farmers lack on marketing information and continuous business sector seminars	Few countries have been able to penetrate the global market
Farmers remain at lower level in the value chain	Trade in fresh mangos is more regional in scope, while dried mango trade is more globally oriented
Poor product packaging and labeling	The global mango sector operates as a buyer-driven value chain
Absence of an export market can lead to oversupply in the local market, thereby reducing the price of the fresh fruits	World's trend towards consumption of more nutritious food/snack items. Good prospects both domestic & export Increasing demand. Export opportunities to ASEAN and EU
Lack of buying stations for the fresh mangoes to be supplied to the local market	
Lack of information with the farmers for the product development	
Farmers suffer a low selling price due to the middleman	
Traders and Middleman are controlling the price in the market	
Lack of product promotion to export	

Sources: Various VCAs various years, FGD 2018.

Final Sale

Mango Final Sale

Weaknesses	*Opportunities*
Inadequate supply of export quality which compels processors to turn down purchase orders from foreign buyers (sizes, maturity, MRL restrictions)	Extended support service programs of exporters to capacitate growers on permissible size range, acceptable MRL and other product specifications of importing countries
Disaggregate sector and multi layered marketing channel. "Too many "middlemen"	Creation of Codex Standard for Mango as guide on standards of commodity export
Unstable market price due to unstable supply and demand, and inability of producers to plan and monitor production	DAs program to promote Good Agricultural Practices. The agency also formulated a code of practices entitled The Good Agricultural Practices for Fruits and vegetable Farming (GAP-VF) which was formulated based on concept of Hazard Analysis of Critical Control Points (HACCP)
Mango's market prices are very unstable. The profitability of mango production is very dependent to current buying price during the time of harvest	I-Reap/Enterprise Development program includes infra on production and marketing
Low buying Price due to limited buyers	Increasing demand for local and foreign market, specifically for Japan and Korea
	Declaration of the US Department of Agriculture (USDA) for the whole Philippines except Palawan Province as weevil free, this will open expanding market for Philippine Mango
	Sweet taste of Philippine Mango Varieties
	Presence of organizations and associations to improve marketing of mango

	Registered PEZA Zones and Infra support facilities in identified priority areas (General Santos City, Zamboanga City, Cagayan de Oro)

Sources: Various VCAs various years, FGD 2018.

Distribution

Mango Distribution

Weaknesses	***Opportunities***
Poor farm to market roads in some areas	PRDP's I-Build and other national government agencies programs include Farm to Market Road (FMR) interventions
High transportation cost Limited and inefficient transport services	RO-RO Connectivity for Bitung, Gensan and Davao will increase accessibility of the commodity to existing and potential markets from ASEAN countries

Sources: Various VCAs various years, FGD 2018.

Business Enabling Environment

Mango Enabling Environment

Weaknesses	***Opportunities***
Absence of regulatory policy on the conversion of mango production areas to other land uses	Active support from the Office of City/Provincial Agriculture and other related agencies for enhancing production performance of the existing mango industry
Absence of policy on cutting of mango trees and its replacement, as well as encouraging farmers to plant mango trees	Philippine Development Plan (MTPDP) 2010-2016 – government assistance through international promotional events, inbound business matching and addressing the market access issues resulting from new requirements of growth markets; strengthening the certification system for Good Manufacturing Practices (GMP), Hazard Analysis Critical Control Point (HACCP) and ISO 22000.
Absence of regulatory policy on the conversion of mango production areas to other land uses	Agriculture and Fisheries Modernization Act (AFMA) –duty - free importation of all types of agricultural and fisheries inputs, equipment and machinery
Absence of policy on cutting of mango trees and its replacement, as well as encouraging farmers to plant mango trees	High Value Crops Development Program (RA 7900) Republic Act 10000 – otherwise known as Agri-Agra Reform Credit Act of 2009 Law in1970s requiring all banking institutions, whether government of private to have at least 25% of loan portfolio devoted to agriculture and fisheries
Lack of government support such as personnel to monitor or assist with the farming problems of the individual farmers per commodity	
Lack of government information support (DA, PhilMech, DOST and other government agencies are lack in disseminating information to farmers)	

Sources: Various VCAs various years, FGD 2018.

(4) Calamansi

Input support

Calamansi Input Support

Weaknesses/Threats	*Strengths/Opportunities*
Inferior quality planting materials	Potential market opportunity for powdered calamansi; wide range of application and long shelf - life
High cost of inputs	174,000 liters of calamansi extract would require 185MT of fresh calamansi
Inadequate farm to market road/ poor road conditions resulting to high transport cost and overall production cost	

Sources: Various VCAs various years, FGD 2018.

Production

Calamansi Production

Weaknesses/Threats	*Strengths/Opportunities*
Typhoon damage to existing trees	Available technology for off season production
Ageing calamansi trees	Consolidation of production outputs
Occurrence of pests and diseases	Synchronized production and harvesting
Seasonal / Intermittent production	Easy to disseminate best practices and new technology
Low yield of calamansi planted in lowland compared with the upland	Discounts for bulk purchasing of inputs
Low yield on upland due to no irrigation availability and depends only on rivers and pond from rainwater	Technology for spray drying is already available and mature
High cost of labor during harvest	
Lack of postharvest equipment such as cold storage to cater all crops	
Lack of harvest mechanization	
Absence of RD & E for calamansi	
Poor access to credit due to high interest rates and stringent requirements	
Crop conversion from calamansi to other crops like rice, rambutan, lanzones, banana, coconut and other income generating crops	
Declining production of fresh calamansi in the province	
Limited access to GAP	
Erratic/unstable pricing	
Quality of calamansi fruit is declining	

Sources: Various VCAs various years, FGD 2018.

Assembly/Processing

Calamansi Assembly/Processing

Weaknesses/Threats	*Strengths/Opportunities*
Seasonal Availability of raw materials/ unstable price of fresh calamansi	Presence of calamansi processing facilities in the province and outside
Low Production Efficiency	Marketing
Inadequate technical competency of MSMEs	Target markets recognize the competitive advantage of Oriental Mindoro calamansi products
Limited access to cGMP-compliant processing facilities	Huge potential for export

Weaknesses/Threats	*Strengths/Opportunities*
Low Market Competitiveness of Value added products due to poor packaging/product quality	Opportunity to promote calamansi as a brand in the local and international markets; ensuring quality and better prices
Low entrepreneurial competency of MSMEs	Varied used of calamansi on food and non-food industries
Existing processors do not know where and how to access appropriate financing for upgrading their processing lines	Growing markets for fresh calamansi
Access to capital or financing to invest on a spray drying facility	Value chain based players can be used to facilitate the flow of services, incentives, market and technical information
Inefficient or defective processing equipment	Lowers transaction costs
Lack of organized and centralized automated processing machine to cater all small farmers	Consistency in quality of fresh calamansi from farm to end markets
High cost of sugar	Honey can be use in place of sugar
Need for Shared Service Facilities (SSF)	Insulin wine processing
PET packaging is an environmental hazard, costly and in limited supply	Calamansi peels can be converted into essential oils

Sources: Various VCAs various years, FGD 2018.

Marketing

Calamansi Marketing

Weaknesses/Threats	*Strengths/Opportunities*
Limited access to market information	
Poor road conditions	
Weak Marketing system	
The 6 existing processors do not have marketing plan for their produce; the processors do not have regular markets for their produce; the calamansi RTM are sold within Oriental Mindoro or as ordered by buyers in Metro Manila	
Solid track record for the proponent is needed to ensure the success of this new venture	
Lack of access to service providers to facilitate compliance with FDA requirements	
Additional capital or financing is needed to comply with FDA requirements and recommendations	
Documentation process and financing for registration can be a burden for small calamansi farmers group.	
Poor database on calamansi	
Industry stakeholders do not see any incentives for establishing mutually beneficial buyer – supplier relations	
Industry stakeholders do not see any incentives in organizing themselves into a farmers/traders/ or processors' organization	

Sources: Various VCAs various years, FGD 2018.

Support Markets

Calamansi Support Markets

Weaknesses/Threats	*Strengths/Opportunities*
Support Markets	**Support Markets**
Lack of viable schemes to design and sustainably deliver the required support services	There are potential lead firms who can be tapped to provide support services needed by the value chain
Lack of *bagsakan* centers, trading stations	

Sources: Various VCAs various years, FGD 2018.

Enabling Environment

Calamansi Enabling Environment

Weaknesses/Threats	*Strengths/Opportunities*
Limited government resources	Potential to generate substantial impact among small farmers and traders
Lack of appropriate development program that focus on calamansi R & DE	Quality of Mindoro calamansi is basis for pricing at Divisoria
Lack of government program support for the calamansi R & D	
Lack of program support such as R & D from the SUCs, states, universities and colleges	
Weak government program supports such as provision of free seedling after typhoons are delayed in two years	
Lack of government support in promoting the calamansi products abroad	
Weak government logistic support in terms of fresh calamansi delivery from farm to local markets	
Lack of regulation on farm conversion	
Lack of providers for farm enterprise management	
Poor road condition resulting to high transport cost	
Weak farmers group	
Disorganized Industry; weak inter-firm relations	

Sources: Various VCAs various years, FGD 2018.

(5) Papaya

Input Provision

Papaya Input Provision

Weaknesses/Threats	*Strengths/Opportunities*
High input cost of seedlings and organic fertilizers	Sustainable nutrient management strategies are available such as application of nitrogen at a rate of 450 kg N/ha for a 24-month cycle of papaya to optimize fruit production and yield of commercial papaya growers
The spider mite Tetranychus kanzawai is the most common and damaging phytophagous mite	Use of fungicides such as propineb, cupric hydroxide, azoxystrobin, tebuconazole and crothalonil for control of Corynespora cassiicola (causes brown spots in papaya

Sources: Various VCAs various years, FGD 2018.

Production

Papaya Production

Weaknesses/Threats	*Strengths/Opportunities*
High cost incurred due to thorough land preparation	
Occurrences of various diseases	
Problematic diseases identified with no current treatment are the bacterial crown rot and the papaya crown yellow	
No buyers for the surplus output	
Poor cultural practices of most papaya farmers promote the spread of diseases to other farms	

Sources: Various VCAs various years, FGD 2018.

Processing

Papaya Processing

Weaknesses/Threats	*Strengths/Opportunities*
High price of fruits to be processed	Increase demand for dried fruits of hotel clients
High price of ingredients/supplies such as sugar brought about by TRAIN Law, vinegar, salt	For atchara production, ample production of papaya (can use any variety as long as it is green/not ripe)
Uncertainty of other ingredients supplies e.g. pineapple, peppers, onion, ginger, carrots	Availability of assistance from Government agencies
Market linkages	DTI assisted machineries (SSF)
FDA accreditation	Financial assistance from DTI, DA, DOST
Training on new technology on processing	Papaya can be used as raw material for beauty soap and other health products
Lack of access to skills and resources to comply with GMP	
There is no existing active cooperatives or farmers association on papaya industry	
Source of fruit of small processors are from backyard farms of association members	

Sources: Various VCAs various years, FGD 2018.

Marketing

Papaya Marketing

Weaknesses/Threats	*Strengths/Opportunities*
Marketing:	**Marketing**
Consumers preferred the absence of decay/damage, sweetness, maturity, and low price	Increased export profitability and competitiveness of Philippine 'Solo' papaya in the Singapore market

Sources: Various VCAs various years, FGD 2018

Final Sales

Papaya Final Sales

Weaknesses/Threats	*Strengths/Opportunities*
Final Sales	**Final Sales**
	Reduction of post-harvest losses by identifying and implementing quality improvements which include the following: capacity building of stakeholders in the chain, handling guides through adaptive and participatory action research, regulation of ripening (1 Methylclopropene treatment), and disease control with hot water treatment

Sources: Various VCAs various years, FGD 2018.

(6) Dragon Fruit

Input Provision

Dragon Fruit Input Provision

Weaknesses/Threats	*Strengths/Opportunities*
Low national average yield	There are 12 coastal municipalities that are located in Northern Cagayan
Lack of variety certification	Provides an opportunity for the underutilized and idle areas to be converted into productive lands
Varieties available from Vietnam and Thailand are probably inferior to the commercial varieties grown in other countries	Use of high yielding varieties
Cultural management used were with only few revisions and localized package of technology	Efficient utilization of cuttings from the mother plant
Prevalence of insect pest and diseases (cancer)	Suitable to wide array of soil types
Need for better accessibility of healthy planting materials	Less input (pesticides and insecticides)
Need for more reliable source of planting materials	Less water requirement
Need for better accessibility of good quality and wide variety of seeds	Easy to cultivate
Need for better accessibility of organic fertilizers	
High cost of establishment (ex. cost of posts)	
High cost of organic fertilizers (10 kg of organic fertilizer per stem for higher yield	
Disease-free and quality planting materials (nodal cuttings)	
Planting in July one can harvest by February	
Planting materials should come from older plants (3 year-old)	

Sources: Various VCAs various years, FGD 2018.

Farming/Production

Dragon Fruit Farming/Production

Weaknesses/Threats	*Strengths/Opportunities*
The intensive cultivation by applying inorganic fertilizers and pesticides to the crop that contributes to the environmental degradation	Dragon fruit as new money crop for favorable upland areas and marginal adverse ecosystem
High cost of initial investment and problems on credit to develop available areas for expansion	Profitability with the widely available production technologies that have been developed, and dragon fruit has been experiencing wide promotions
Occurrence/prevalence of pest (fruit fly, rats/rodents infestations, which causes about 30% damage of harvest, ants & other insects), weed and diseases (cancer, stem rot and worm inside fruit)	Various Techno Demo on Dragon Fruit Production were established in 2011 under the supervision of Northern Cagayan Experiment Station
Lack of water supply during dry months	Resilience to drought, erratic rainfall and typhoons brought by climate change which the country is now experiencing
Lack or limited knowledge on plant maintenance	Provides available alternative crop for farmers affected by the changing environment
Need of quality improvement of produce	Erratic/unstable pricing
Need of good and sufficient water supply	Possible agri-tourism site
Presence of animals like goats and snails that damages the seedlings	Compliance to GAP and organic standards
Loss of fruits on farms without fences	Not labor intensive
Need for better knowledge on fertilizer application	

Weaknesses/Threats	*Strengths/Opportunities*
Difficulty in complying to GAP standards	
Limited data available with regards to the dragon fruit production or of the industry in general	
Summer season also has an adverse effect, specifically to dragon fruit farmers in the uplands of Ilocos Sur where it was reported to impact their water supply and negatively affects the growth of dragon fruit plants during the said season	
Unavailability of postharvest facilities and technologies	
Lack of Post-Harvest Quality Management (PQM)	

Sources: Various VCAs various years, FGD 2018.

Processing

Dragon Fruit Processing

Weaknesses/Threats	*Strengths/Opportunities*
Need for value adding strategies	Dragon fruit processed as ice cream, shampoo bar from dragon fruit, dragon fruit sweet & dry wine, dragon fruit "anti-stress" balm, concentrated juice (1 month shelf life) and regular juice, dragon fruit jam
Absence of fruit/produce classification mechanisms	Need for Share Service Facilities (SSF)
Need for postharvest, handling, processing and branding technologies	Prolong shelf life of processed products
Low shelf-life of harvested fruits	Utilization of by-products
Lack of fruit supply	
Suppliers for wine bottles, soap molds and other tools/containers needed for processing of dragon fruit	

Sources: Various VCAs various years, FGD 2018.

Trading

Dragon Fruit Trading

Weaknesses/Threats	*Strengths/Opportunities*
Good relationship among growers with regards to price of produce	Great demand among local consumers and a possibility for export in the near future
Backyard growers are pulling down the prices of produce	Lucrative income to farmers and its export potential
"Unconducive" local trade atmosphere (i.e. players are not in good terms)	
Lack or absence of Inter-linkage among traders	
No existing uniform price / No definite price standard	
Hesitance to form an organization to acquire support [programs and facilities]	
"Disunity of farmers"	
Limited access to big companies	
Problems in handling fruits which cause damages	
Need for growers to form a group to cater for institutionalized buyers	
Lack of inventory of existing growers	

Sources: Various VCAs various years, FGD 2018.

Marketing

Dragon Fruit Marketing

Weaknesses/Threats	*Strengths/Opportunities*
Most of the farmers are not yet certified with Quality Assurance Protocol (QAP) and Good Agricultural Practices (GAP)	Fruit farm had increased the agri-entrepreneurs in Cagayan because of its good market potential and relatively short growing period
Supply and value chain analyses were not yet studied	There is an export market for frozen dragon fruit
Value adding on food, pharmaceutical and beauty products	Growing market for other processed products
Lack or weak marketing capabilities	Awareness of health benefits of dragon fruit
"Monopoly of sales" by some farmers	High local and foreign demand
Non-established price regulation or pricing scheme in trade and marketing	Price stabilization
Over ripeness will cause fruit cracking leading to a lower price	

Sources: Various VCAs various years, FGD 2018.

Support Markets

Dragon Fruit Support Markets

Weaknesses/Threats	*Strengths/Opportunities*
Dragon fruit's competitiveness to other fruit commodities is not yet clear since preferences of market buyers and end-consumers are not yet determined	Training for possible growers to entice/attract them on venturing to dragon fruit production
Book keeping and accounting, or financial systems in general are not formally practiced that is also limiting to stakeholders, especially at the level of individual farms	Dissemination of IEC materials available for dragon fruit (i.e. production guide, etc.)
Inability to get some information from reliable sources due to slow and inefficient dissemination of information	Promotion of dragon fruit as OTOP
Few farmers are interested to venture in Dragon Fruit production	Inclusion of dragon fruit in PCIP
There are existing interventions or opportunities of support services, but (regional) commodity profile is not developed/determined	

Sources: Various VCAs various years, FGD 2018.

Enabling Environment

Dragon Fruit Enabling Environment

Weaknesses/Threats	*Strengths/Opportunities*
Minimal presence of concerned agencies to facilitate the grower's needs (e.g. lack of visits by agencies, or absence of focal persons in the MLGU level, etc.)	Philippines' Department of Agriculture, Regional Field Office 02 (DA-RFO 02) recognizes dragon fruit as a commercial fruit crop grown in the coastal municipalities of Cagayan
	Contributes in addressing community development and economic growth
	Creates employment and livelihood opportunities
	Brings/strengthens partnerships among GOs, NGOs, and private sectors together for development
	Provides good sources of income and nutrition to households
	Available government agencies for loan such as DA

Sources: Various VCAs various years, FGD 2018.

(7) Cashew Nuts

Input Provision/Supply

Cashew Nut Input Provision/Supply

Weaknesses/Threats	*Strengths/Opportunities*
Input Provision/Supply	**Input Provision/Supply**
Difficult access of farmers to improved varieties of planting materials and other inputs due to lack or absence of farm to market roads (FMR) and logistical support	Existence of DA-PAES and LGU nurseries as source of quality planting materials for bud-wood gardens
Farmers have limited access to improved varieties (planting material)	Presence of technology demonstration areas at the farmer level showcasing cashew promising technology
Resistance of farmers to shift from traditional cultivar to improved varieties	Cashew farmers do not use chemical fertilizers, pesticides and insecticides
Cashew farmers do not subscribe to fertilization	In Bataan, planting materials is not a problem
Expansion area for production/limited land for cashew production or land conversion	
Lack of supply of raw nuts	

Sources: Various VCAs various years, FGD 2018.

Production

Cashew Nut Production

Weaknesses/Threats	*Strengths/Opportunities*
Sharp decrease in yield	Cashew-based farming system has been well-developed and piloted
Low cashew production due to poor cultural practices, seasonality of the crops, aging of cashew trees, effect of climate change resulting in low income	Presence of Agriculture SUCs as learning centers and ATI funds for training
Majority of cashew trees are above 30 years old. Vulnerable to pests (e.g. termite)	CNSL as having anti-termite properties
Insufficient updated data on cashew	Sharp decrease in yield is really not a problem since yield depends on age of tree
Small growers do not practicing GAP	

Sources: Various VCAs various years, FGD 2018.

Consolidation/Packing

Cashew Nut Consolidation/Packing

Weaknesses/Threats	*Strengths/Opportunities*
Limited purchasing capital to buy in bulk and increase volume purchase	Availability of low interest financial assistance from Government Financing Institutions (GFIs)
Uncertain supply of cashew nuts due to lack of warehouse facility, limited purchasing capital to buy in bulk and increase volume purchased	
Lack of transportation for hauling of cashew raw materials	
Uncertain supply of raw materials	
Prevalence of unregistered buyers directly purchasing on farm	
Difficult access to remote areas	
Lack of warehouse facility is not applicable	

Prevalence of unregistered buyers/middle man is a number 1 problem	
Seasonality/variability of prices	

Sources: Various VCAs various years, FGD 2018.

Processing

Cashew Nut Processing

Weaknesses/Threats	***Strengths/Opportunities***
For every 1 kilo cashew nut, there are 3 kilos shell waste without proper disposal (56.6 metric ton)	There is existing technology to process cashew nut shell to industrial products
Unutilized cashew shell for other economic uses	Presence of Western Philippine University to teach on how to process cashew shells and DOST for support facility
Importation of processed cashew nuts (e.g. from Vietnam)	Unsaturated domestic market for cashew nuts due to growing hotels, *pasalubong* centers and restaurants
Lack of skilled workers in the use of decorticators and poor processing system	Basic equipment are already downloaded to community-level processors
Underutilized/unutilized processing equipment and facility (e.g. manual sheller for whole nuts; coal-fueled dryer)	Tap PAES and WPU for proper trial production runs (e.g. Time & Motion runs) for downloaded equipment to improve usage skills
Lack / absence of crucial processing equipment (e.g. mechanical dryer)	Availability of improved processing technology than can bring down cost. Buying price from farmer may also improve
High processing cost (labor, packaging, raw materials, electricity)	Presence of post-harvest processing technology from the PHILMECH and WPU
Quality of cashew nut not at par with outputs from mechanized nuts (e.g. high moisture content; lower % whole nuts; low shelf-life)	DOST also set-up village level processing facility
Feedback from consumers/clients of a Puerto Princesa-based processor : Cashew from West Coast are better in quality and taste	Quality taste of Bataan cashew nuts
Lack of sustainable financial support for long period stocking of products	Cashew can be processed as puree, jelly, jam, wine
Low buying price of cashew product at the market because of low quality/no classification of product/ DTI standardization of product	
No new technology and better machineries for processing/ Purchases of competitive and upgraded equipment/machineries	
Lack of transportation/ FMR	
Safety measures (internal & external health) during cashew processing/ Knowledge enhancement	
No Bodega & drying pavement	
No electricity in the area or barangay/ Access to electricity	
Accumulation of agricultural waste due to unutilized cashew shell	
Lack of quality control for processors to determine what variety to use for processing	
Low quality of cashews and no good sanitation practices are sold in the public market and were used for processing	
No common processing plant to be supplied by the government for poor farmers to avail	
Insufficient supply of cashew nuts so some processors import cashew nuts	
Increasing prices due to high quality, high demand and lack of supply	

Weaknesses/Threats	*Strengths/Opportunities*
Not practicing Good Manufacturing Practice - hair, broken glass, stones found in cashew nuts	
Wine making was ceased since most growers don't anymore climb their trees to harvest raw fruit used in wine making	
High cost of FDA certification since the building should conform to FDA specifications	

Sources: Various VCAs various years, FGD 2018.

Marketing

Cashew Nut Marketing

Weaknesses/Threats	*Strengths/Opportunities*
Generally low farmgate price of cashew/ no price standardization	Existing market at institutional level (better collaboration with farmer-processor groups)
Most processors are not FDA and Halal registered due expensive and stringent requirements	PRDP Program and DA-Regular FMR Program
Insufficient market information/inadequate linkages/weak networking with other business sectors to compete in the national/global market	Presence of DTI to provide updated price information and DA-AMAD for market matching
Inappropriate packaging and labelling materials	Cashew nut is in demand in both local and international markets
No established common brand for Palawan cashew	
No established markets for potential new products (cashew oil)	
Importation of cashew nut from Vietnam	
Main bridge to Taradungan damaged and unpassable (only motorcycles)	
Several access roads to main highways are not all-weather roads contribute to increased logistical costs	
Unreliable network signals for fast communication from buyers to cashew production areas (affects efficiency of product delivery)	
Japan who imports from Thailand/Vietnam is their first competition	

Sources: Various VCAs various years, FGD 2018.

Enabling Environment

Cashew Nut Enabling Environment

Weaknesses/Threats	*Strengths/Opportunities*
No price standardization/ representation of cashew processors group to MDC	
Absence of policy pertaining to replacement of cut cashew trees	
Prevalence of absentee farm owners and land speculators	

Sources: Various VCAs various years, FGD 2018.

Support Services

Cashew Nut Support Services

Weaknesses/Threats	*Strengths/Opportunities*
Poor access to credit institutions due to stringent requirements	
Extension workers have inadequate information on updated technology on cashew production, post-harvest, marketing and management	
Lack of transportation for hauling of cashew raw materials	
Limited research and development for cashew and by-products	
Absence of laboratory for microbial analysis and nutrition facts	
Absence of pest and disease clinic for cashew	
Small processors are lack of initial investments for the FDA certifications	
Small processors only avail loans through microfinancing and not with the government banks to due stringent requirements	

Sources: Various VCAs various years, FGD 2018.

Inter-firm Relationships/Supply Chain Governance

Cashew Nut Inter-firm Relationships/Supply Chain Governance

Weaknesses/Threats	*Strengths/Opportunities*
Inter-firm Relationships/Supply Chain Governance	**Inter-firm Relationships/Supply Chain Governance**
There is no existing cashew related association or organized group at the farmers level	Various organizations can provide organizational development support
Farmers have no formal ties or coordination with end buyers (consolidators / processors)	Presence of DA-AMAD regular market matching program
There is a localized but minimal coordination among Processors & Manufacturers through RPMA (Roxas Processors & Manufacturers Association)	
There is no current association of processors since most of processors like to impose their own pricing system.	

Sources: Various VCAs various years, FGD 2018.

(8) Pili Nut

Pili Nut General SWOT

Strengths	***Threats***
Climate suitability/agronomically viable	Price fluctuations, whereby when prices are high, interest soar, but when prices are down, the tendency is to neglect pili, or even worst, cut the trees.
Pili is produced largely in Bicol accounting for about 83% of total production in 2011 and is continuously increasing to date	Increasing cost of inputs
Availability of agriculturally suitable lands (573,397 hectares potential areas for expansion)	Worsening occurrence of pests & diseases (esp. "*tayangaw*")
Availability of technology, expertise and good germ plasm collection	The "get rich quick euphoria". Investment period of at least 3-4 years discourages small farmers to invest in bigger scale pili production
·has new propagation techniques such as grafting which reduces the gestation period from 7 years to 4 years	Natural calamities/disaster
Pili pastries and candies serve as regional identity "*pasalubong*" items	Emerging substitutes & competitors (better quality/low-priced imported nuts)
Has strong market exposure and demand foothold both in the local and international markets	
It is at present strongly anchored to Bicol Tourism Industry	
Strong private & government support: DTIs OTOP, Locally Funded Development Program, DAs priority crop/commodity, and Tourism-Driven Demand	
With defined and accepted National Standards	
Increasing interest of farmers for sustainable pili production	
Can be certified organic product	
Can be utilized as main ingredient or as component ingredients of food products	
Belongs to the rare breed of "no-waste" crops or maximum-utilization commodities	
Low input cost and high yield value	
Minimal substitutes and competitors thus, occupying large market share & strong market sustainability	
An attractive industry posing high potential for investment and growth	
With strong stakeholders' support (active Commodity Board, aggressive & innovative entrepreneurs etc.)	

Sources: Various VCAs various years, FGD 2018.

Input Provision

Pili Nut Input Provision

Weaknesses	***Opportunities***
Low acquisition and use of good quality planting materials: 1)Low willingness to buy new planting materials because farmers do not consider pili as a major crop; 2)Despite several government programs to increase production of pili (seedlings and inputs distribution, technology training, etc.), farmers are not encouraged to improve their productivity and expand production	Availability of superior and registered varieties (which are high yielding, easy to propagate asexually, bears fruit all year round and resistant to pests and diseases) for propagation and distribution
No accredited nurseries to produce quality planting materials	Technical experts and extension workers are available in these regions (5, 6, and 8)

Lack of skills on propagation (asexual) at the farmer's level.	Continuous R & D efforts by both government and private organizations
Poor access to production areas due to damaged/absence of road network	Construction/improvement of FMRs
	Strong government support to the project
	Availability of counterpart funds

Sources: Various VCAs various years, FGD 2018.

Production

Pili Nut Production

Weaknesses	***Opportunities***
Farmers are still at the backyard level of production and do not appreciate the opportunities in market; Low level of awareness and appreciation of benefits of complying with standards	Farming technologies are available and can easily comply with the requirements of the market through Good Agricultural Practices (GAP)
Low yield due to non-adoption of recommended farm practices (no fertilizer applied, no pruning practice, irregular planting distance, etc.)	Availability of areas for production expansion
Poor access to production areas due to damaged/absence of road network	There are available fertilizers (organic or inorganic), newly developed high yielding varieties, proper pruning techniques and recommended planting distance
Pili resin (manila elemi): 1) No identified production area; 2) No established industry – only raw materials are produced/exported outside the province; 3) No matured technology for extraction of elemi	A potential source of additional income for coconut farmers, agrarian reform communities and farmers in forest base areas; Pili can be intercropped with other crops resulting in high return on investment (ROI)
	Doable technology on pili production and good germplasm collection are available
	Role in re-forestation and biodiversity conservation

Sources: Various VCAs various years, FGD 2018.

Post Production

Pili Nut Post Production

Weaknesses	***Opportunities***
Inadequate post-harvest facilities (pulper, dryer, nutcracker)/technology resulting to low quality of pili for processing	Availability of locally designed post-harvest facilities (pulper, dryer, nutcracker)
Inconsistent quality of pili supply (shelled and kernel)	Availability of financing support to set-up additional postharvest facilities
Improper handling & harvesting practices	There is a local standard which is not adopted by local buyers that will support the premium pricing scheme
No post production laboratory for manila elemi	Availability of site for the construction of post-production laboratory
Poor access to production areas due to damaged/absence of road network	

Sources: Various VCAs various years, FGD 2018.

Consolidation/Packing

Pili Nut Consolidation/Packing

Weaknesses	*Opportunities*
Lack of warehouse facility is not applicable	
Prevalence of unregistered buyers/middle man is a number 1 problem	
Seasonality/variability of prices	

Sources: Various VCAs various years, FGD 2018.

Processing

Pili Nut Processing

Weaknesses	*Opportunities*
Unstable/insufficient supply of pili nuts for processing into high value products	There is a high demand for pili products in the domestic market throughout the year
Some processors cannot comply with GMP/BFAD requirements	There are technical assistance or training on GMP compliance for SMEs
Limited capital to venture into new pili products (pulp and kernel) oil processing	There are available processing technologies and financing support e.g. DOST's SETUP
No processing plant for manila elemi	Processing expansion and modernization
Poor access to production areas due to damages/absence of road network	
Raw materials delivered with young pili fruit at early stage of harvest, generated several rejects due to shrinkage during storage	
Raw materials delivered with over matured pili fruit can't be immediately de-pulped since shell will discolor into black and affects the quality and taste of the kernel	
Short life of ground pili candies	
Distinct taste of Pili Kernel depending on the variety and process	
Insufficient/Lack of processing equipment	
Poor quality control	
High cost of pili kernel and ingredients for processing	
Processors/traders are suffering with high cost of kernel and pili with shell, have less capital to invest with warehouse and frequent price fluctuation with raw material such as the kernel	
Lack of storage facilities	
High investment of packaging materials, machineries and processing equipment	
High investment cost with permits and licenses such as FDA, QMP, HCCAP and CPR requirements	
Farmers have limited capital for inventory and stocks	
Under/unutilized processing equipment happens when there is no more supply	
High processing cost (labor, packaging, raw materials, electricity)	
Not practicing Good Manufacturing Practice	

Sources: Various VCAs various years, FGD 2018.

Marketing

Pili Nut Marketing

Weaknesses	*Opportunities*
Lack of collaboration and cooperation among players to increase access to markets and ensure adherence to quality and food safety standards	Existence of organized pili growers groups at different levels that can be strengthened and clustered in Region 5 (Bicol Pili Board, Pili Growers and Pili Processors Association, Sorsogon City Pili Stakeholders Association, Samahan ng mga Mangangalakal ng Pili sa Sorsogon, Albay Pili Industry Federation, among others)
Lack of timely and reliable market studies that determine the consumers preferences in terms of quantity and quality by type of pili products	Existing research institutions which can be tapped to conduct market and consumer studies (BUCAF, BCAARRD)
Pili is always compared to established nuts produced by other countries (macadamia, almonds, walnuts, etc.) without distinguishing its own quality characteristics	There are established Food Technologists or scientists who can develop quality characteristics using scientific tools (FDC, UPLB-Food Science, DOST)
Unattractive packaging and labelling of pili products	Availability of packaging and labelling technology developed by private and government agencies like DTI, DOST, and SUCs for pili products
Poor access to production areas due to damages/absence of road network	Availability of refined/processed manila elemi
Poor market linkages for manila elemi	High demand for manila elemi as ingredient for perfume, varnish, lacquer, etc.
Substandard packaging and product presentation resulting to short shelf life of the processed products	Access to Global markets
Limited forward (capital intensive & requires specific skill) and backward (land & capital intensive) integration activities	Increasing local/export demand
Limited quality and safety monitoring of pili products & by-products (sp. In the local market)	Continuous R & D Efforts
The farmers are lack of business skills to manage diversified farm enterprise	More venues for market promotion and exposure
Supply chain is non-cohesive and fragmented	
Limited information and data source	
Limited product promotion and exposure	
Seasonality of the product	

Sources: Various VCAs various years, FGD 2018.

Support Services

Pili Nut Support Services

Weaknesses	*Opportunities*
Lack of access to credits, loans and etc. especially with less interest rates	

Sources: Various VCAs various years, FGD 2018.

Enabling Environment

Pili Nut Enabling Environment

Weaknesses	*Opportunities*
Absence of policy on cutting of Pili trees and its replacement, as well as encouraging farmers to plant Pili trees	

Sources: Various VCAs various years, FGD 2018.

Trading

Pili Nut Trading

Weaknesses	***Opportunities***
Poor access to production areas due to damages/absence of road network	Strong government support to the project
Unstable price among traders	Availability of counterpart funds
Unpredictable pricing of raw materials	Presence of organized pili traders
Farmers can't demand a high selling price due to the middleman	

Sources: Various VCAs various years, FGD 2018.

Appendix 9. Commodity Specific Strategies from the SWOTs

(1) Banana

Strategic Goals

Below are the strategic goals for banana in the short-, medium-, and long term:

Banana Strategic Goals

Period	Strategic Goals
Short Term	Establish Institutional platform for convergence of all banana value chain
	Increase production of quality banana through area expansion and productivity improvement
	FDA-LTO certification of banana processors
	Mitigate/control serious pests and diseases affecting banana industry
	Research and development of other processed banana products
Medium Term	Rebuild existing capacities of banana VC operators
	Penetrate other countries for export markets (Iran)
Long Term	Increase market presence in domestic and export market
	Maintain position of the Philippines as top banana exporter (processed) in the world

Sources: SWOTs and Validation Workshops (2017).

Strategies

In order to achieve the strategic goals, below are the proposed strategies:

Banana Strategies

Strategy	Programs, Project, Activities
Develop Mechanism for National Cooperation	Formulate National PFN Roadmap
	Create Banana Council through Executive Order/s
Develop and Promote Domestic and Export Market	Promote business opportunities on product consolidation (preparation of business plan on the operation of product consolidation enterprise)
	Intensify market intelligence & dissemination of market information
	Market linkages
	Trade fairs (local, domestic, international)
	Promote on-line marketing
	Compliance to regulatory requirements (e.g. FDA-LTO, CPR)
Intensify Investment Promotions and Facilitation	Prepare and disseminate business plans covering different strategies of banana VC
	Intensify business opportunity seminars and forums

Strategy	Programs, Project, Activities
	Optimize investment promo services through Negosyo Centers
	Promote farm tourism
Capacitate Banana Processors to be FDA-LTO Certified	Support to obtaining FDA-LTO certification
	Seminars and trainings on food safety and other FDA requirements
Establish Productivity Improvement Program	Install at firm level GAP, OHILGAP, HACCP, HALAL, GTP and other good practices in production and processing
	Strengthen supply of quality seedlings (tissue cultured, disease resistant)
	Capacity building for farmers
	Sharing of Business Models among industry players
	Capacity building on Green Productivity
Product Development Program	Commercialization/intensification of market-driven Research and Development outputs
	Quality Seal Program for Banana products
	Establish/strengthen food-based FABLABs or Business Incubation Centers with FDA registration
	Research and development of Product diversification
	Product quality centralization
Improve Business Environment	Promote adoption of organize production and processing
	Promote cooperatives/corporate farming
	Harmonize/synchronize policies on commodity prioritization and provision of services
	Cascading of national plans/roadmaps to local level (i.e. regional, provincial, municipal/city, barangay level)
	Ensure budget support for roadmap implementation
Access to Finance	Easy access to financing programs for banana stakeholders
	Conduct financial forums for banana players
	Institutional strengthening for banana players
	Low interest financial programs for banana players

Sources: SWOTs and Validation Workshops (2017).

Strategic Interventions

The strategic interventions at each stage/activity of the value chain.

Inputs

To augment the limited supply of quality planting materials and lack of tissue culture laboratories, the following activities can be adopted to improve current capacity of existing tissue culture laboratories and be able to cater to other banana varieties: conduct assessment

of the needs of the existing tissue culture laboratories; develop capacity of existing tissue culture laboratories to address demand; conduct demand assessment and projections considering the seasonality of the demand; conduct of trainings on barangay/village level nursery management for tissue culture; and establishment of banana mother gardens as alternative source of quality planting materials. Also, there is a need to increase awareness on the production and utilization of quality planting materials. Another major concern is the unavailability of resistant varieties to various pests and diseases. To address this, Research and Development (R&D) should be strengthened in order to develop pest resistant banana varieties and effective local farm practices.

Promotion of organic fertilizer and balance fertilizer application strategy are ways in remedying the high cost of using synthetic fertilizers. In this aspect, the following can serve as strategic actions: production and distribution of IEC materials; promote the use of locally available resources to enrich soil fertility; operationalize existing Vermi Composting Facilities; conduct of Techno Demo, Hands-on Training; and Local Policy Reuse of Organic Fertilizers. However, the lack of supply of these organic fertilizers, soil ameliorants and other inputs acts as an obstacle that needs to be resolve. This can be rectified by strengthen local capacities to locally produce natural inputs through the following activities: strengthen capacity of local producers of natural inputs; operationalize and upscale existing Vermi Composting Facilities; market information/promotion of vermi composting and other facilities producing organic fertilizer and other inputs; production and distribution of IEC materials; imposition of existing laws and ordinances on waste management/utilization; facilitate third party certification of organic fertilizer producer; and Local Policy Reuse of Organic Fertilizers/Natural Inputs.

Low level of purchasing power among smallholders prevents them from acquiring the necessary inputs. To improve their access to credit/financing, the following activities are suggested: facilitate access to micro financing, supervised credit facility and other Government-facilitated lending programs; conduct of Financing Forum; capacitate farmers on financial management/literacy and cooperativism (pooling of resources); institute a Farmer Business Schools (FBS); and promote collective procurement of inputs.

There is a need for promotion of cost-effective fertilizer management and application of organic fertilizer/pesticides to address the lack of understanding among farmers on their cost-benefits. The following are strategic actions to resolve this concern: production and dissemination of IEC materials; conduct of research studies on the recommended fertilizer application for banana; conduct of Trainings/Technology Demonstrations/Participatory Research; set-up demo farms to showcase benefits organic fertilizer and as venue for learning; and conduct of soil fertility and mapping.

To improve insufficient irrigation facilities, the following strategies are suggested: assessment and improvement of existing irrigation facility (drip irrigation); and construction/ rehabilitation of other irrigation facilities. Another issue pertaining to water supply is contamination. To address this, waste disposal should be regulated. The following actions can be undertaken: monitoring of sewerage and waste disposal; strict implementation of health and sanitary activities; and establishment of filtration ponds.

Farming

Longer growing period of banana and low productivity affect banana growers. To resolve these issues, the following strategic actions can be adopted: establishment of new areas through provision of planting materials; rehabilitation of existing areas through Integrated Cultural Management; enhancement of tissue culture laboratory; conduct of Techno Demo of new varieties and Integrated Nutrient Pest and Disease Management; conduct of R &D on different varieties; identification of fusarium race affecting banana; and promote of multiple-cropping system.

Banana plants are susceptible to infestation of various diseases, which is exacerbated by poor cultural management practices and lack of knowledge on insect and pest management. To address this, it is necessary to improve the delivery of extension services by capacitating Agricultural Extension Workers (AEWs) and farmer leaders as effective agent of change. Also, adoption of appropriate technologies should also be strengthened. Below are strategic actions in resolving this issue: strengthen monitoring for prevention and early detection; conduct training on integrated pest management (IPM) and production management; provide funds for containment of outbreak especially for small growers; establishment of technology demonstration sites; production and distribution of IEC materials; info campaign on quad media on successful farm practices and major pest and diseases control; development of banana stakeholders' directory; capacitate AEWs on the effective delivery of matured technologies; conduct of forums and trainings (ex. proper post-harvest handling); promotion of biological control agents; promotion and trainings on Good Agricultural Practices (GAP); conduct of location specific research studies; creation and or establishment of a banana research institute; strict implementation of export protocols (ex. China Export Protocol) and improve crop insurance cover.

Farm areas are prone to damages due to occurrence of typhoons/strong winds. One strategy to address this concern is the promotion of climate change adaptation and mitigation measures. This involve the following activities: (1) information dissemination of climate change mitigation and adaptation measures; (2) establishment of windbreaks or shelterbelts; (3) facilitation for crop insurance cover; (4) introduction of dwarf varieties; and (5) conduct of location specific research.

Most of banana farms have no GAP certification and this is coupled with low adoption of GAP practices by growers. Thus, there is a need for massive promotion of GAP through the succeeding activities: information campaign on GAP through quad media; reproduction and distribution of IEC materials; enhance the knowledge and skills of farmers on GAP thru trainings, technology demonstrations, etc.; conduct of proactive pre-assessment for GAP certification; and facilitate GAP certification of farms.

Another concern affecting farming is the limited outreach of existing extension services. Retooling of AEWs and expansion of Barangay Agricultural Workers (BAWs) should be performed to strengthen extension programs and services. Another strategy is to conduct Student of the Air (SOA) program for those hard to reach areas.

There is a need to Increase awareness and access to Pre and Post-harvest technologies. The following strategic actions are suggested: information campaign on the advantages of Pre/

Post harvest technologies through quad media; reproduction and distribution of IEC materials; and conduct of Seminars and Techno Forum.

High cost of labor is a major concern among banana growers. Increasing farm mechanization level to hasten farms operations is one way to lessen labor cost. Below are suggested strategic actions: facilitate access to micro financing, supervised credit packages and other government-facilitated lending programs in the acquisition of quality and appropriate pre and post-harvest machineries and equipment; and provision of counterparting scheme in the acquisition of appropriate pre/post-harvest machineries and equipment.

Processing

The local processors lack quality standards for both fresh and processed products. To address this, there a need to strengthen the dissemination of standards of quality for fresh and processed banana products through the following actions: (1) information campaign on market standards through quad media; (2) reproduction and distribution of IEC materials; conduct of seminars and techno forum; (3) intensify value adding and improvement of packaging and labelling; and (4) promotion of Good Manufacturing Practice (GMP) and Hazard Analysis and Critical Control Points (HACCP).

Logistics

A major concern under logistics is the poor conditions and expensive transport system. Construction/rehabilitation of farm-to-market roads (FMRs) should be performed to improve road networks.

Marketing

Market access for smallholder growers needs to be strengthened. Below are ways to build up market access: strengthen banana associations/cooperatives to access loans at a lower interest rate and simplified requirements to support production; Government support for soft loans accessible for farmers; and Government to facilitate bulk buying and/or counter-trade with ASEAN partners.

There is a weak demand of processed products like banana chips in the local market. The following activities can help improve marketing and promotion strategies: improve the quality of processed products; conduct massive information drive on the advantages and nutritive advantage of processed products; launching/promotion of local brands; adoption of GMP; facilitate product registration with FDA; encourage the conduct of banana festival; integrate banana in the feeding program of school children; and capacitate processors on product packaging and labeling. For international markets, the following will help intensify market promotion: increase market promotion to other emerging export markets; and increase gov't. investment for participation of key players in international trade fairs/exhibits.

The product differentiation/available products formats need to be expanded to improve marketing of processed products. The following strategic activities are suggested: conduct of R& D on product development/value adding of banana; provide information of product demand and supply; and conduct of Techno Forum. Also, marketing systems and network need to be improved through the following actions: conduct of regional trade fairs and seminars on investment opportunities; establishment of Consolidation Centers; market information/seminar for costing and pricing; development of Directory of Suppliers, Traders

and Processors; conduct of outbound business matching missions; capacitate banana coops to engage in collective marketing systems; and establishment of on-line marketing system.

On pricing, there is a need to review existing marketing contracts. DA-AMAD or an established local price information system can provide farmers the needed price information. Furthermore, local ordinance should be crafted that will penalize pole-vaulting. Guidelines for accreditation of exporter, traders, growers and packing facilities for export (BPI MO No.40) and protocol for export of banana (BPI MO No. 41) should be strictly implemented.

Others

The following are strategic activities to strengthen organizations of banana stakeholders: study on the possibility of establishment of an organizational entity that will oversee and address all concerns of the industry; development of quality standards for various banana varieties; and strengthen the existing industry cluster and creation of banana industry council.

(2) Mango

Strategic Goals

Below are the strategic goals for mango in the short-, medium-, and long term:

Mango Strategic Goals

Period	Strategic Goals
Short Term	**Production:**
	Improve access to financing
	Introduce crop insurance from flowering to harvesting
	Accredit nurseries
	Avail tools & equipment
	Introduce organic farming
	Manage pest and diseases and reduce use of chemicals
	Increase mango production
	D funding R&
	Improve access to financing
	Manufacturing:
	Employment of trained/ skilled personnel
	Intensified orientation on GMP
	Stabilize quality
	R&D funding
	Improve access to financing
	Marketing:
	Market linkage
	Establishment of consolidators /buying stations
	Obtain R&D funding
	Export permit and documents
Medium Term	**Production:**
	GAP accreditation
	R&D funding
	Introduce organic farming
	Increase mango production
	Improve access to financing
	Manufacturing:
	Help establish (small/medium-scale) mango processing
	Avail tools & equipment from NGAs
	Employment of trained/skilled personnel
	R&D funding for innovation
	FDA accreditation
	Organic certification
	Improve access to financing
	R&D funding
	Drying facilities
	Obtain VHT- WHT facilities
	Marketing:
	Market linkage
	Organize consolidators/establish buying stations

Period	Strategic Goals
	R&D funding
Long Term	**Production:**
	Export superior quality mango product and by-product
	Increase export market by participation in international trade fairs
	R&D funding
	Improve access to financing
	All farmers should be accredited with GAP
	Introduce organic
	Increase mango production
	Manufacturing:
	Shared service facilities- (e.g. blast freezer)
	Drying facilities
	VHT- WHT facilities
	Marketing:
	Establish market linkage
	Organize consolidators/establish buying stations
	R&D funding

Sources: SWOTs and Validation Workshops (2017).

Strategies

In order to achieve the strategic goals, below are the proposed strategies:

Mango Strategies

Strategy	Programs, Project, Activities
Develop Mechanism for National Cooperation	Government support on strengthening organizations
	Availability of Product Technology
	Technology Enhancement
Develop and Promote Domestic and Export Market	Strengthen OTOP Program from local entities
	Assistance for product development
Intensify Investment Promotions and Facilitation	Low interest for financing assistance for mango growers
	Website for Production Promotion
Establish Productivity Improvement Program	Shared knowledge on technologies on farming, insect infestation control
	Research
	Information dissemination on MRL regulations and other importer regulations
Product Development Program	Seek government support in benchmarking to countries with large mango production
	Continuous training
	Capital for Product Improvement
Improve Business Environment	Promote HACCP/ISO/HALAL/GMP Certifications among facilities
	Regulatory Compliance
Protection of mango growers	Regulated and mandatory written contract between growers and buyers

Sources: SWOTs and Validation Workshops (2017).

Strategic Interventions

The strategic interventions at each stage/activity of the value chain.

Inputs

High cost of inputs like inducers, chemicals, fertilizers, and certified quality planting materials is a prime concern of mango growers. To remedy this, access to inputs with reasonable cost should be improved and organic fertilizers should be promoted together with the balance fertilizer application strategy. Below are the specific actions to implement these strategies: collective procurement/bulk buying by the organization like the coops who will serve as dealers and sell to members; undertake R&D facility to develop locally produced agricultural inputs and product-enhancing agri-technologies; improvement of current R&D facilities; promote the use of alternative/natural soil conditioner, pesticides, bio-control agents/attractants through IEC; promote the use of locally available resources to enrich soil fertility; operationalize existing composting facilities; local policy regarding the use of organic fertilizer; provision of subsidy; and establishment of BPI accredited mango nurseries and establishment of mango scion grove.

Also, most growers lack financing capacity. So, credit access should be facilitated through the following actions: conduct of Financing Forum; and capacitate farmers on the financial management/literacy and cooperativism (pooling of resources).

Farming

There is a high risk of mango production due to climate change, pests and diseases, and transportation cost. To deal with this concern, promotion of Climate Change Adaptation and Mitigation measures and improvement of road access should be implemented. The following activities need to be put into action: information dissemination of Climate Change Adaptation and Mitigation measures; synchronization of farming system; strengthen GAP -application of appropriate farming technologies; facilitation of insurance cover; expansion of FMR Development Program (mapping & validation of production areas that need access road); and construction /rehabilitation of FMRs in strategic locations.

Emergence of new pests and diseases, weak implementation of farming standards, lack of capital to conform to standard farming protocols, low extension services (dissemination of technologies down to the field), and massive cutting of mango trees are among the major concerns facing farmers. As a strategy, extension services in the promotion of package of technologies to increase adoption of proper farm management practices should be strengthened. To do this, the following actions should be deployed: conduct information campaign on new pests and diseases and its control through Quad Media; establishment of pests and diseases emergency hotline system; conduct of regular pest and disease surveillance; development mango pest and disease database; adoption of GAP; promote the use of alternative pesticides, bio-control agents/attractants; enhance capacity of AEW and farmer leaders through retooling program; strengthen dissemination of appropriate technologies; conduct values orientation to farmers through Farmer's Group Forum; provide government subsidies to cushion cropping losses (e.g. crop insurance); contract growers to provide financing support for mango-growing operations; and formulation of national/local Policy that regulates cutting of mango trees.

Also, the quality of local mango variety should be improved due to predominance of Florida types in the world market and stiff competition from other mango producing countries (Mexico, Thailand, Vietnam). The following strategic actions should be performed to address this issue: capacitate mango growers on the proper farm management; participation in trade fairs both local and international; promote GAP Certification of farms to become globally competitive; and promote branding of mango.

Postharvest handling should be improved to minimize high postharvest losses. The following are ways to minimize losses: establish service providers that cater services for harvesting, sorting, classifying and packaging of mango fruits; and conduct of continuous training of workers.

There is a need to regulate contractors particularly those who maintain and harvest the produce of mango growers through accreditation. To realize this the following actions are needed: conduct inventory of all Mango Industry Contractors; meeting with key industry players; and creation of a Mango Code with specific provisions on how to regulate and accredit Mango Contractors/Traders.

Processing

In some areas, there is minimal or no processed products of mango. So, there is a need to promote processing and value adding. To do this, the following activities should be performed: conduct agri-business training related to mango processing; conduct of R & D on mango processed products and by-products; expository tour and technology missions for potential processors; and conduct of Investment Forum.

Marketing

A significant concern under marketing is the lack of price information for domestic and international markets. So, improvement of access to correct and timely price information is necessary. This can be achieved through establishment of price Information system that has wide reach -local and international market (Quad Media) and continuous conduct of price monitoring. Prices of mango are unstable highlighting the need for growers to strengthen their organizations by capacitating mango growers to act as consolidators.

Multi-layered marketing contributes to the high cost of mango. Improvement of market linkages through market matching, trade fairs and forum as well as dissemination of market information for stakeholders are strategic actions to address this issue.

Sale

There is a low export of fresh mangoes due to high pesticide residues, insufficient/unreliable regulatory services (e.g. MRL testing) and low quality. Mango production and quality should be improved through facilitation of GAP certification and strengthen regulatory services through provision of facilities locally for certification system, pest risk analysis, pesticide residue analysis and food safety.

Others

Another concern of growers is weak organization and collaboration among the players. Mango growers organization/association can be strengthened through the following activities: (1) generate a directory of Mango Stakeholders (enablers and players); (2) creation of a

functional Mango Industry Council; (3) registration of the organization as a cooperative; (4) capability building of the members; (4) assessment and strengthening of the organization's PSP (Policies, System and Procedures); and (5) profiling and creating a database of mango growers at barangay level.

(3) Pineapple

Strategic Goals

Below are the strategic goals for pineapple in the short-, medium-, and long term:

Pineapple Strategic Goals

Period	Strategic Goals
Short Term	Acquisition of equipment (drying, packaging, etc.)
	Compliance to certifications – e.g., Halal
	Assistance from LGU thru training on product development
	Government intervention of the SSF
	Access to market through participation to Trade Fairs and exhibits
	Website/online business promotion/marketing
	Enjoin local group of food processors
Medium Term	Partnership / linkages with public sectors
	Access to financing institutions
	Establish bigger processing plant
Long Term	Develop international market linkages
	Develop organic production
	Target HACCP and ISO certification

Sources: SWOTs and Validation Workshops (2017).

Strategies

In order to achieve the strategic goals, below are the proposed strategies:

Pineapple Strategies

Strategy	Programs, Project, Activities
Increase government interventions and partnership (e.g. SSF, NC-training, and seminars)	Create an organization for pineapple processors and growers/producers
	Accreditation of the organization/association
	Prepare project proposals/letter of intent to concerned agencies
	Participation to trainings and seminars provided by government agencies
Compliance to government accreditation and certifications	Apply for FDA-LTO through online registration
	Identification of the basic requirements for HALAL, HCCP and ISO
	Attend GMP and Food Safety Seminars
Market expansion	Participation to local and international trade fairs
	Create company website and use of social media (FB, Instagram)
	Conduct product sampling (free taste)
Improve access to financing	Identify financial windows available
	Choose loan program that suites our need / lower interest rate
Improve product development	Consult DTI and DOST
	Benchmarking through WOFEX, IFEX and other food expo

	Improve labelling and packaging

Sources: SWOTs and Validation Workshops (2017).

Strategic Interventions

The strategic interventions at each stage/activity of the value chain.

Inputs

Improving environmental resources is a necessary strategy to improve climate change resiliency of pineapple production. To do this, the following are strategic interventions: soil protection through soil analysis for nutrient management and appropriate fertilizer utilization; and introduction of organic input produced from farm-sourced ingredients.

Access to production and infrastructure support are essential specially among small farm holders to increase productivity. To improve these, here are specific interventions: improve access to financing and input support for seedlings and fertilizers; establishment of nurseries for production of variation of suckers; and integrate pineapple production in the Convergence Programs and Poverty Reduction Programs reinforcing development of Social Enterprises and Backyard Production.

Farming

To increase productivity of pineapple growers that strategic actions are needed: (1) mechanization for land preparation; (2) improvement of post-harvest activities; (3) increase investment in RD&E for appropriate production technology; (4) building capacities of farmers and producers; (5) institutionalization of Quality Control, GAP Certifications and Compliance Standards; and (6) inclusion of pineapple production in SUC curriculum.

Processing

Product quality can be improved through the following strategic interventions: product quality standardization, certification and quality infrastructure improvement; and HACCP/GMP certification and traceability requirements.

Another strategy as an innovation and productive use of pineapple in industries and services are the following: (1) plan out and increase investment into the industrial use of pineapple; (2) invest in RD&E on pineapple-processing; (3) enhance culinary use of pineapple; and (4) provide pineapple processing plants and common service facilities.

Logistics

Improving rural infrastructure for connectivity is needed to improve logistics. Other support for value-chain utilization are transport and packaging.

Marketing

To expand market access, it is necessary to establish ICT facilities for market linkage, matching and information. Branding and product packaging should be improved and opportunities in regional and global integration should also be maximized.

Others

Agro-enterprise development and institution building and strengthening are strategies to improve business climate. The following are strategic interventions: (1) building capacities of stakeholders in value adding and agro-enterprise development and investment; (2) clustering of pineapple producers, manufacturers and service providers; production and surplus planning; (3) re-vitalization and strengthening of pineapple producers associations; and (4) inventory, permits, registrations, licensing and accreditation of supply-chain players and farm-owners.

Other cross-cutting interventions are the following: include pineapple in the LGU Investment Programs; participation of pineapple producers' organizations in LGU Development Councils; partnership building in value-chain development and management; and pursuing formulation of provincial, municipal and barangay roadmaps/plans.

(4) Calamansi

Strategic Goals

Below are the strategic goals for calamansi in the short-, medium-, and long term:

Calamansi Strategic Goals

Period	Strategic Goals
Short Term	Compliance to FDA accreditation
	Stabilize price of calamansi
	Converting waste materials into other value adding products (e.g. essential oils)
	Database on raw materials and supplies
	Technology innovation and advancement
Medium Term	Improve production yield
	Venture into the export market
	Calamansi should be included in DA PCIP
	Product innovation
Long Term	Continuous improvement of the product
	Participation in international fairs
	Market expansion (local and international market)

Sources: SWOTs and Validation Workshops (2017).

Strategies

In order to achieve the strategic goals, below are the proposed strategies:

Calamansi Strategies

Strategy	Programs, Project, Activities
Develop Mechanism for National Cooperation	Creation of sub-cluster
	RDC endorsement to harmonize plan
Develop and Promote Domestic and Export Market	Online promotion and marketing
	Preparation of fliers/promotion collateral
	Investment on free taste during trade fairs
Intensify Investment Promotions and Facilitation	Conduct of market driven investment forum
	Market matching activities
Establish Productivity Improvement Program	Bench marking activities for successful processor
	Documentation of best practices
Product Development Program	Product development
	Development of spray drying technique to prolong shelf life commodity
	Provision of postharvest facilities
Improve Business Environment	Database of all processors
	Access to financing
Expand production	Profiling
	Collaboration with LGUs and government agencies for financial and technical support
	Price matching
	Technology mission/benchmarking

Strategy	Programs, Project, Activities
Technology innovation and advancement	RDE (shelf-life, nutrient analysis, etc.)
	Coordination with proper agencies
	Capability building (training, food safety, accreditation)
Market expansion	Branding and packaging development
	FDA accreditation
	Compliance with the requirements of international accrediting body
Product innovation	Research and development (other products and by-products of calamansi)

Sources: SWOTs and Validation Workshops (2017).

Strategic Interventions

The strategic interventions at each stage/activity of the value chain.

Inputs

Establishment of calamansi nurseries is crucial. Here strategic actions to realize this: tap existing calamansi nursery operators in setting up nurseries in calamansi production areas: and set up of community-based collective enterprises engaged in calamansi seedling production.

Farming/Assembly

To increase production of fresh calamansi, there a need to adopt the following strategies: rehabilitate existing calamansi farms; replace old calamansi trees; expand calamansi hectarage in the target municipalities; adopt GAP for calamansi farming; and regulate cutting of calamansi trees.

Re-aligning calamansi production towards the lean seasons will help improve off season production. Other constrains are the lack of access to service providers and poor FRMs. To resolve these issues, the following interventions are suggested: development of community-based service providers for calamansi farming; and improvement of FMR conditions in target municipalities.

Under assembly, to help organize the industry the following are strategies are suggested: organize calamansi farmers down to the barangay level for collective marketing activities; improve relations between buyers and suppliers; and conduct organizational development activities for farmers organizations. Also, there a need to develop a collective marketing system by adopting a clustering approach to coordinate production and harvesting activities geared towards collective marketing.

Processing

The following are various gaps under processing: inefficient processing activities; defective processing equipment; and production of calamansi powder. Here are the corresponding strategic actions: optimize the facilities and production system of existing processing enterprises to maximize capacity utilization, production output, and product quality; and establishment of calamansi powder processing facility in the target area.

Marketing

To address the lack of access to service providers, it is important to link processors to service providers like DOST, DTI, private laboratories, food technologists among other who will help complete FDA requirements.

(5) Papaya

Strategic Goals

Below are the strategic goals for papaya in the short-, medium-, and long term:

Papaya Strategic Goals

Period	Strategic Goals
Short Term	**Production:**
	- To produce 192,000 kilos of RED LADY PAPAYA in 6 months
	Processing (Papaya Chutney):
	- To produce 300 bottles of PAPAYA chutney in 6 months
	Processing (Achara Papaya):
	- To be able to produce 3,600 bottles of white achara in 6 months
Medium Term	**Production:**
	- In 2 years, production is expected to be 768,000 kilos
	Processing (Papaya Chutney):
	- To be able to market the product outside of the community
	- To be able to produce 1,500 bottles in 2 years time
	Processing (Achara Papaya):
	- To be able to increase production by 50% and market the product outside the vicinity of the community
Long Term	**Production:**
	- Continuous rotation of papaya planting for sustainability
	Processing (Papaya Chutney):
	- To be able to penetrate market outside the Philippines
	Processing (Achara Papaya):
	- To be able to penetrate more market within and outside the Philippines

Sources: SWOTs and Validation Workshops (2017).

Strategies

In order to achieve the strategic goals, below are the proposed strategies:

Papaya Strategies

Strategy	Programs, Project, Activities
Intensify Investment Promotions and Facilitation	By using Social Media facility we can post our products to gain public attention
	By joining trade fairs and giving taste samples we can promote and gain the buyers testimony, comments and suggestions to improve the product
	By joining trade fairs, we can also distribute calling cards in order for the buyers to know where to contact us for re-orders
Product Development Program	Attendance to skills trainings on new technologies to enhance and improve our product and eventually make use of our by-products into useful and profitable way
Improve Business Environment	Create a link with co-processor by making our by-products the ingredients for soap making and beauty products

Sources: SWOTs and Validation Workshops (2017).

Strategic Interventions

The strategic interventions at each stage/activity of the value chain.

Inputs

A crucial strategy to improve yield and lower input cost is through conducting location specific research. For example, nitrogen application rate of 450 kg/ha for a 24-month cycle of papaya as a sustainable nutrient management strategy to optimize fruit production and yield while decreasing cost of farm input.

Another example is the improvement of marketable yield through research by using effective fungicides against Papaya Brown Spot (PBS) disease, which commonly infect papaya plantings. Among these effective fungicides are the following: propineb, cupric hydroxide, azoxystrobin, tebuconazole and chlorothalonil.

Farming

Below are strategic actions to reduce losses and maintain fruit quality: optimized harvest maturity; regulation of fruit ripening by low temperature storage (10 to 13 ^{o}C) and/or modified atmosphere packing/storage; 1-methylcyclopropene treatment to delay ripening; and postharvest disease control like field treatment, carefully timed pre-harvest fungicide spraying, hot water treatment in combination with fungicide, hot treatment only or a 20-minute dip in 0.1% thiabendazole.

Another strategic intervention is the capability building through training on papaya production and postharvest handling.

(6) Dragon Fruit

Strategic Goals

Below are the strategic goals for dragon fruit in the short-, medium-, and long term:

Dragon Fruit Strategic Goals

Period	Strategic Goals
Short Term	Compliance to FDA accreditation
	Stabilize price of dragon fruit
	Converting waste materials into other value adding products
	GAP certification
	Organic certification
	Increase product awareness and promote health benefits of dragon fruit
	Suitability map for dragon fruit cultivation
	Database on raw materials and supplies
Medium Term	Improve production yield
	Venture into export market
	Dragon fruit should be included in DA PCIP
	Area expansion
	Capability trainings for dragon fruit farmers
	Development of high yielding varieties
	Access to government support in terms of working capital, technologies, and other interventions
Long Term	Continuous improvement of the product
	Participation to international trade fairs
	Agri-tourism spot
	Innovation of new products
	Large and stable supply for processing
	Association for dragon fruit growers

Sources: SWOTs and Validation Workshops (2017).

Strategies

In order to achieve the strategic goals, below are the proposed strategies:

Dragon Fruit Strategies

Strategy	Programs, Project, Activities
Develop Mechanism for National Cooperation	Linkages with different government agencies and other cooperatives for programs and activities, trade fairs which we can be a part of it
	Crafting of dragon fruit roadmap/development plan
	Creation of Philippine Dragon Fruit Stakeholders Association
Develop and Promote Domestic and Export Market	Compliance and acquisition of registration with FDA-LTO-CPR
	Must have enough supply of products/raw materials
	Intensify market intelligence and dissemination of market information on dragon fruit
	Participate in local and foreign trade fairs
	Certification of GAP and Organic Farming
	Establish market linkages

Strategy	Programs, Project, Activities
Intensify Investment Promotions and Facilitation	Linkages with banks, coops. and other financial institutions
	Advertisement through social media
	Transform farm to Agri-tourism site
	Provide food samples during trade fairs
	Increase product awareness and its health benefits
Establish Productivity Improvement Program	Product standardization: procedure, quality ingredients
	Improve procurement process
	Adaption of GAP and GMP
	Capacity building for farmers/growers to venture into business
	Area expansion
Product Development Program	Attends trainings, seminars, for product developments
	Adopt Standardize Operating Procedure (SOP)
	Promote cooperatives/corporate farming
	Ensure budget support for program implementation
Improve Business Environment	Make sure that the product is always available in the market
	Have harmonious relation with customers/buyers
	Promote cooperatives/corporate farming
	Ensure budget support for program implementation

Sources: SWOTs and Validation Workshops (2017).

Strategic Interventions

The strategic interventions at each stage/activity of the value chain.

Inputs

To improve access to reliable, healthy, quality, and wide variety of seeds and other planting materials, the following are possible strategic interventions: improve linkage to supply sources of good quality and sufficient fertilizers, pesticides, etc.); complete dissemination of information with regards to achieving good quality productions; and provide technical assistance on production technology.

Farming

There are various issues pointed out by dragon fruit growers. Among them are the following: occurrence of pest and diseases; limited knowledge on plant maintenance and fertilizer application; need of good and sufficient water supply; presence of animals like goats and snails that damages the seedlings; loss of fruits on farms without fences; and difficulty in complying to GAP standards. To address these issues, below are suggested actions: plant and pest management training (know-how in pesticide application, fruit/farm security, etc.); enhancement on knowledge of fertilizer application; GAP technical assistance; and water resource analysis and management.

Trading

A major hindrance among growers is the lack of price standard. Backyard growers are pulling down the prices coupled with the lack of good relationship among growers regarding the price of the produce. Thus, it is crucial to establish a minimum price level and an entity to administer/regulate prices.

Local trade is afflicted with disunity of farmers, hesitance of growers to form organizations, lack of inter-linkage among traders, and most players are not in good terms. The following are strategic actions to resolve these issues there is a need to facilitate the formation of farmer associations and associations in other industry levels.

Other strategic interventions to improve trade are the following: consolidation of produce; reinvention of produce; LGU to propose FMRs; provision of incentives to growers, traders and other key players; and facilitate links to large private companies as potential trading partners.

Processing

Under processing, the following are possible strategic actions: establishment of classification scheme/system for harvested fruit; provision of post-harvest, handling and processing equipment and facilities; and training on packaging and labelling, branding technology, and product development (e.g. candies, wine, vinegar, etc.).

Final Sales

To improve final sales, here are possible strategic interventions: enhancement of marketing capabilities (e.g. eye-catching slogan, better packaging, or provision of packaging materials, etc.); provision of cold storage facilities and other post-harvest facilities to improve shelf-life of harvested fruits; supervise and/or regulate sales by NGAs; market matching and trade fair promotions; and development of IEC material.

Support Systems/Over-arching Functions

The following are strategic interventions in order to improve support systems: MLGUs to provide agriculture technicians; enterprise support like provision of “set-up program”, financing support (loan of Php 2 million above), financial management training and facilitating financing forum; provision of microbial and nutritional analysis; regularization of stakeholders’ meeting to be initiated by MLGUs; conduct industry survey/study for commodity profile; training on product development and production to post-harvest mechanisms; and development of IEC materials.

(7) Cashew Nut

Strategic Goals

Below are the strategic goals for cashew nut in the short-, medium-, and long term:

Cashew Nut Strategic Goals

Period	Strategic Goals
Short Term	**Raw Materials:**
	Eradicate middlemen by linking farmers to processors
	Identify varieties
	Promote Good Agricultural Practices
	Increase raw material supply (nuts)
	Processing:
	Identify fabricators to automate/customize equipment
	Improve/innovate packaging and labelling
	Marketing:
	Consolidate the needs of MSME's and negotiate with suppliers as a group for minimum order of quantity and price
Medium Term	**Raw Materials:**
	Finalize value chain
	Increase farm hectarage
	Processing:
	Product innovation to nut world-class standards
	Develop common fabricators and customize machineries for processors
	Develop new technologies for processing (drying, automated filling machine)
	Marketing:
	Consolidation of OTOP of cashew, pili and peanut processors
Long Term	**Raw Materials:**
	Certifications
	Sustainability of raw materials
	Resiliency
	Processing:
	Certifications
	Marketing:
	Certifications and service provider
	Export oriented

Sources: SWOTs and Validation Workshops (2017).

Strategies

In order to achieve the strategic goals, below are the proposed strategies:

Cashew Nut Strategies

Strategy	Programs, Project, Activities
Develop Mechanism for National Cooperation	Linkages with different government agencies and other cooperatives for programs and activities, trade fairs which we can be a part of it
	Proper consolidation to all processor, Farm to table
	Formation of an umbrella association for "Nuts" (from P.O. F.A. to National level)
	National Data Base to intensify I.E.C.
Develop and Promote Domestic and Export Market	Acquire registration with FDA/LTO
	Must have enough supply of products/raw materials
	Training on the whole nut value chain
	Intensive Campaign in schools
	Social Media and Online Marketing, fb accounts on nuts (Nuts_PhilPro)
	OTOP
Intensify Investment Promotions and Facilitation	Linkages with banks, coops. and other financial institutions
Establish Productivity Improvement Program	Product standardization: procedure, quality ingredients
	Improve procurement process
	Negotiation with packaging suppliers re volumes and payments
	Provision of seeds and seedlings to farmers
	Social Media
Product Development Program	Attend trainings, seminars, for product developments
	Adopt Standardize Operating Procedure (SOP)
	Collaboration of PhilMec, design Center of the Philippines and academe
Improve Business Environment	Make sure that the product is always available in the market
	Have harmonious relation with customers/buyers

Sources: SWOTs and Validation Workshops (2017).

Strategic Interventions

The strategic interventions at each stage/activity of the value chain.

Inputs

Enterprise approach to establishment of barangay-level seedling nursery managed by farmer/farmer group is a potential intervention strategy to improve farmers' access to improved varieties (planting material).

Farming/Consolidating

Production is plagued by the following constraints: sharp decrease in yield and majority of cashew trees are above 30 years old making them vulnerable to pests (ex. termite). To address these concerns, the following are suggested strategies: integrated farming system technology (modularized to provide the optimum "crop combination" on a per hectare basis); and tap or

outsource chemical engineering technology center for development of Caustic Nut Shell Liquid (CNSL), which has anti-termite properties.

For consolidators, linkage or access to financial facility with friendlier terms for seasonal crop producers is crucial.

Processing

For every kilo of cashew nut, there are 3 kilos of shell waste without proper disposal. So, there is a need to minimize and/or re-use these shells into industrial products through conduct of Feasibility studies, market studies to validate initial findings, and product development programs.

There should a policy environment, which protects the internal cashew processing industry from importation of processed cashew nuts from other counties.

There a need for feasibility studies for facility upgrade to minimize lack/absence of crucial processing equipment and underutilized processing equipment and facilities.

Also, a product standard for cashew should be established to lower processing cost and improve product quality and taste.

Marketing

Productivity of cashew at farm level should be improved through varietal improvement and cultural practices among others to increase cashew supply to reduce the supply-demand gap. Another strategy to reduce importation of cashew nuts is the improvement of cashew nut as a product (eating quality, shelf-life, reliability of supply, competitive pricing, etc.).

Damaged roads and bridges and unreliable network signals increase logistical cost and hinders supplier-buyer communications. To improve these infrastructures, there is a need to link with PRDP I-Build program of the government.

(8) Pili Nut

Strategic Goals

Below are the strategic goals for pili nut the short-, medium-, and long term:

Pili Nut Strategic Goals

Period	Strategic Goals
Short Term	**Raw Materials:**
	Eradicate middlemen by linking farmers to processors
	Identify varieties
	Promote Good Agricultural Practices
	Increase raw material supply (nuts)
	Processing:
	Identify fabricators to automate/customize equipment
	Improve/innovate packaging and labelling
	Marketing:
	Consolidate the needs of MSME's and negotiate with suppliers as a group for minimum order of quantity and price
Medium Term	**Raw Materials:**
	Finalize value chain
	Increase farm hectarage
	Processing:
	Product innovation to nut world-class standards
	Develop common fabricators and customize machineries for processors
	Develop new technologies for processing (drying, automated filling machine)
	Marketing:
	Consolidation of OTOP of cashew, pili and peanut processors
Long Term	**Raw Materials:**
	Certifications
	Sustainability of raw materials
	Resiliency
	Processing:
	Certifications
	Marketing:
	Certifications and service provider
	Export oriented

Sources: SWOTs and Validation Workshops (2017).

Strategies

In order to achieve the strategic goals, below are the proposed strategies:

Pili Nut Strategies

Strategy	Programs, Project, Activities
Develop Mechanism for National Cooperation	Linkages with different government agencies and other cooperatives for programs and activities, trade fairs which we can be a part of it
	Proper consolidation to all processor, Farm to table
	Formation of an umbrella association for "Nuts" (from P.O. F.A. to National level)
	National Data Base to intensify I.E.C.
Develop and Promote Domestic and Export Market	Acquire registration with FDA/LTO
	Must have enough supply of products/raw materials
	Training on the whole nut value chain
	Intensive Campaign in schools
	Social Media and Online Marketing, fb accounts on nuts (Nuts_PhilPro)
	OTOP
Intensify Investment Promotions and Facilitation	Linkages with banks, coops. and other financial institutions
Establish Productivity Improvement Program	Product standardization: procedure, quality ingredients
	Improve procurement process
	Negotiation with packaging suppliers re volumes and payments
	Provision of seeds and seedlings to farmers
	Social Media
Product Development Program	Attend trainings, seminars, for product developments
	Adopt Standardize Operating Procedure (SOP)
	Collaboration of PhilMec, design Center of the Philippines and academe
Improve Business Environment	Make sure that the product is always available in the market
	Have harmonious relation with customers/buyers

Sources: SWOTs and Validation Workshops (2017).

Strategic Interventions

The strategic interventions at each stage/activity of the value chain.

Inputs

Among the key gaps under input provision identified by pili grower are the weak enforcement of nursery accreditation and low acquisition and use of good quality planting materials. Below are potential interventions to address these issues: conduct orientation on nursery accreditation; and establishments of accredited pili seedling orchards ranging from 1 to 4 hectares in target municipalities.

Farming/Assembly

Low pili yield has been pestering pili growers. To improve yield, below are suggested strategic actions: establishments of pili orchards ranging from 1 to 4 hectares in target municipalities; monitoring of mortality of pili trees and replanting specified number of trees to sustain production; boost pili production/yield by introducing organic inputs/fertilizer to existing pili orchards; and training and seminars on GAP for pili.

The limited sharing on farming technologies among farmers is a hindrance in farming. Seminars and trainings should be conducted and readily available through IEC materials to link technologies between farmers.

Other hurdles include re the inadequate postharvest facilities and inefficient postharvest handling. The following are strategic actions to resolve these issues: provision of storage warehouse, buying stations, de-pulper, multipurpose drying pavement, mechanical dryer, and weighing scale; and trainings on proper harvesting and postharvest handling.

Under-assembly, poor and inefficient system of pili assembling, and transport can be addressed through the following interventions: organize and cluster pili farmers; identify proponents group to establish an enterprise; provide buying stations or assembly points complete with postharvest facilities, weighing scale with 100 to 500 kg capacity, trolley, and stroller; and procurement of delivery trucks.

Processing

Unstable supply of pili nuts, limited capital for processing venture and inadequate processing equipment (e.g. processing for pili pulp oil) are major constrains identified by processors. To resolve these constraints, the following actions are suggested: increase production through orchard establishment; agri-credit seminars for farmers; and provision of processing equipment.

Logistics

To improve logistics, construction and/or concreting of farm-to-market roads is necessary.

Marketing

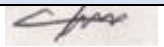
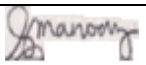
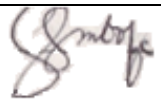
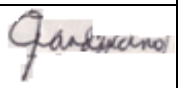
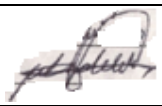
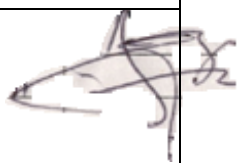
Here are several potential interventions to close the gaps under marketing: creation of Pili Board and Federation of Pili Based Organizations; price monitoring; farmers forum on pili to improve market information; participation in local and international trade fairs; farmers group to conduct business on pili processing; and conduct consultation on packaging designs, labeling.

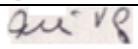
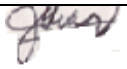
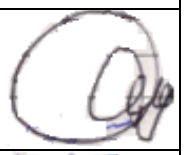
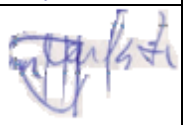
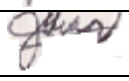
Others

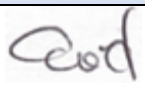
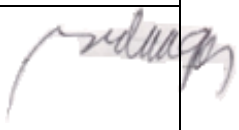
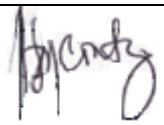
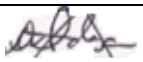
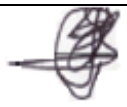
There is a need to conduct market and consumer studies by tapping the existing research institutions.

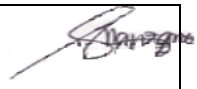
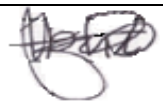
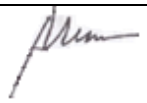
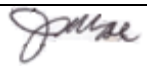
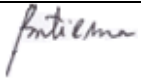
ANNEX

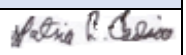
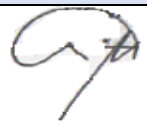
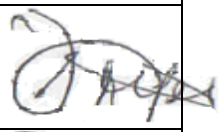
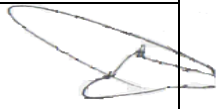
Annex 1. List of Key Informant Interviewees and FGD Participants, Eight Commodities

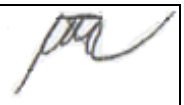
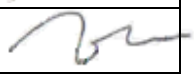
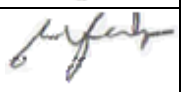
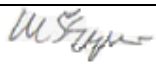
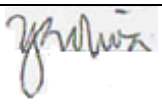
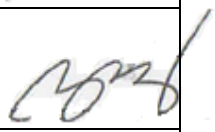
NAME	SEX	ORGANIZATION/COMPANY	ADRESS	POSITION	CELLPHONE/LAND LINE	EMAIL ADDRESS	SIGNATURE
Banana & Pineapple Stakeholders, November 13, 2017							
FRANCIS CARLO REYES	M		Davao City	Student	3214821	Reyesfranciscarlo26@gmail.com	
JESSABELLE MANOAY	F		Guerrero St., Davao City	Student	09103633522	Jmanoay@yahoo.com	
FE R. ACABO	F	YECOY FOOD PRODUCT	Pantukan, Compostela Valley	Owner	09169481592	marifegayacabo@yahoo.com	
EMMAN DELA CRUZ	M	SINAH CONSULTANCY	Pasig City, NCR	Partner	09178358166	Emman.delacruz@gmail.com	
EVA E. ANDRIANO	F	CL FOOD PRODUCTS	San Isidro, Davao Oriental	Partner	09468742203		
ANGELITO B. CARRABLE	M	BARCOCO	Tubod, Lanao	BOD	09105746911		
ANNA GEM C. BAGOL	F	DACKIES FOODS	Malingaw, Tubod, Lanao del Norte	OIC	09177114385	dackiesfoods@gmail.com	
EMIRY F. ESCANO	M	DOUBLE "S" FOODS	Digos City	Owner	09282648453	Double_sbananachips@yahoo.com	
NESTOR MANUEL	M	NM Food Products	Dologon, Maramag, Bukidnon	Owner	09056361954	Eatamor_2000@yahoo.com	
ADOLFO D. TANCO JR.	M	Tboli Fruit Growers Mango & Pineapple Cooperative (TFGMPC)	Tboli, South Cotabato	Manager	09089890644	tfgmpc@yahoo.com	
JOSEPHINE P. LUCAS	F	Tboli Fruit Growers Mango & Pineapple Cooperative (TFGMPC)	Tboli, South Cotabato	BOD	09214161449	tfgmpc@yahoo.com	
DANNY ADULACION	M	Tboli Fruit Growers Mango & Pineapple Cooperative (TFGMPC)	Tboli, South Cotabato	Member			

EMMANUEL E. ZAORO	M	MAGINA	Masher Gr.	General Manager	09209121310	bifzazaoro@yahoo.com.ph	
ARACELI V. ALAGOS	F	SABAMALUPAD	Lupon, Davao Oriental	President	09106054321		
JOSEPHINE RABOR	F	LMR EXIM TRADING	Butuan City	President	09076957437	joyrabor55@gmail.com	
Mango & Dragon Fruit Stakeholders, November 15, 2017							
ROGELIO A. ABALOS	M	ABALUS FARM & AGRI BUSINESS	Nabunturan, Compostela Valley	Owner	09434758457	gel_abalus@yahoo.com	
MARY ANN WATTS	F	SOUTHERN YUI FARM, INC	Bugo, Cagayan de Oro	Production Manager	09263264172		
QUERITESS Q. QUEJA	F	MORMIN VEGGIES MARKETING COOPERATIVE/CMB MANGO INC.	Cagayan de Oro	Marketing Director	09273191468	qqqueja@yahoo.com	
IMELDA C. ACALISDO	F	I AND R AGRI PRODUCTS	Davao City	Marketing	09121648961		
ARNOLD BALICO	M	SMNI	Davao City	Marketing	09359135925	smni.mults@gmail.com	
REYNALDO F. ACALISDO	M	I AND R AGRI PRODUCTS	Davao City	Consultant	09321029433	mtfujigoldenfortune@gmail.com	
Papaya Fruit Stakeholders, November 14, 2017							
BLEZEL BALMOCENA	F	MSME DRAGON FRUIT ORCHARD	Butuan City	Owner	09497732194	zelsdfo@yahoo.com	
REYMAR RUBA	M	CMU	Musuan, Maramag, Bukidnon	Director	09067253852	tootsieruba@gmail.com	
UMA M. BOLANIO	F	MSME FRUIT	Jimenez, Misamis Occidental	Owner	09105455113	Uma143@gmail.com	
JOHANN DAGANDARA	M	JOHSNNS DRAGON FRUIT ICE CREAM	Ozanmis City, Misamis Occidental	Owner	09209459139	johsnnscuisine@yahoo.com	
SHIRLEY DAYANAN	F	SAFEPAC CORPORATION	Toril, Davao City	President	09985785292	safepacbio@gmail.com	
JOSEPHINE RABOR	F	LMR EXIM TRADING	Butuan City	President	09076957437	joyrabor55@gmail.com	

RICHLEY LUCENA	M	DFIPA	Koronadal City	Treasurer	09155810430	richleyl@yahoo.com	
LGUs/NGAs/Processor's KII, November 15 - 17, 2017 (Mango, Pineapple, Durian & Banana)							
ELMER DEGORIO	M	STO TOMAS MUNICIPAL HALL	Sto. Tomas, Davao Del Norte	Municipal Agriculturist	09499218751		
LOI MICULOB	M	D' FARMER'S MARKET FRUITS AND PASTRYCENTER	Davao City	Owner	09985415057		
JULIA D. SAGOLILI	F	OFFICE OF THE PROVICIAL AGRICULTURIST (OPAG)	Digos, Davao Del Sur	Senior Provincial Agriculturist - HVCDP	09287617692		
Dragon Fruit Stakeholders, October 5, 2017							
AGNES M. ASUNCION	F	AGNES DRAGON FRUIT PRODUCTS	Pias Norte, Carrimao, Ilocos Norte	Owner	09212735415	gretchys@yahoo.com	
EFREN G. CRUZ	M	EFREN ORGANIC FARM	Sta. Maria, Apo, La Union	Owner	09072759526		
HONORA CONTEZ	F	RURAL IMPROVEMENT CLUB (RIC)	Urayong, Bauang, La Union	President	09955750069		
DANILO A. PANES	M	DRAGON FRUIT FARMER	Tubao, La Union	Owner	09996979323	dannypanes66@yahoo.com	
DEBRA A. DALISAN	F	DRAGON FRUIT FARMER	Francia West, Tubao, La Union	Owner	09194779676	debradalisan@yahoo.com	
ANGELITA T. WAGAYEN	F	DRAGON FRUIT FARMER	Palacapac Candon City, La Union	Owner	09178510712		
TEDDY NUNEZ	M	DRAGON FRUIT FARMER	San Jacinto, Pangasinan	Owner	09189365745	masuerteconstruction@yahoo.com	
JOVELYN NUNEZ	F	DRAGON FRUIT FARMER	San Jacinto, Pangasinan	Owner	09189365736	masuerteconstruction@yahoo.com	

JOEMELDA MANZANO	F	LOMBOY FARMS	Urayong, Bauang, La Union	Staff	09151358401	lomboyfarms@gmail.com	
CRESTITA Z. ABDON	F	DRAGON FRUITS GROWER	Disso-or, Bauang, La Union	Owner	09484274909		
JOHN BELLO	M	KAILAN MPC	Lidlidda, Ilocos Sur	Manager	09178003248	kailanmpc@yahoo.com.ph	
EDITA A. DACUYCUY	F	REFMAD FARMS	Brgy. Paayas, Burgos, Ilocos Norte	Owner	09395163453	Refmad_venterprise@yahoo.com	
NGA's KII, October 5, 2017 (Dragon Fruit)							
VIOLETA B. LAFORTEZA	F		Pago, Pangasinan	AVCDP Coordinator	09194127103	hvcdppangasinan@gmail.com	
DAVID JOHN RONDAL	M	DA-RFO1	San Fernando City, La Union	HVCDP Staff	09165708565	Reg01prubbet@yahoo.com	
Calamansi Stakeholders, October 13, 2017							
CHRISTIE S. MARASIGAN	F	Matulatual Agrarian Reform Community Cooperative (MARCCO)	Matulatula, Pola, Oriental Mindoro	General Manager	09173295920	marasiganchirstie@yahoo.com	
ALLEN R. RABIDA	M	Matulatual Agrarian Reform Community Cooperative (MARCCO)	Matulatula, Pola, Oriental Mindoro	Production Manager	09072078292		
MAURO A. METRILLO	M	Victoria Kalamansi Farmers Federation (VKFF)	Victoria, Oriental Mindoro	Vice President	09196879402	19maurometrillo75@gmail.com	
RUEL A. SANCHEZ	M	Victoria Kalamansi Farmers Federation (VKFF)	Victoria, Oriental Mindoro	President	09061351931		
JACINTO C. GARROCE	M	Victoria Kalamansi Farmers Federation (VKFF)	Victoria, Oriental Mindoro	Treasurer	09083266994		
GINA G. CUEVAS	F	KAPAKYANAN	Victoria, Oriental Mindoro		09482799924		
VIRGINIA C. DELA CRUZ	F	Victoria Kalamansi Farmers Federation (VKFF)	Victoria, Oriental Mindoro		09563608209	virgeedc@gmail.com	
PRENILLA LIERRA	F	Pinamalayan Agrarian Reform for Indigenous Communities (PARIC)	Victoria, Oriental Mindoro	President	09757324963		

LURYNITH FAJUTAG	F	BcDc Agri (Fajutag AgroFarm Products)	San Teodoro, Oriental Mindoro	Manager	09287414087		
LUCIANO D. SEVEZIAN	M	L. SEVEZIAN AGRI PRODUCTS	Roxas, Oriental Mindoro	Owner	09499352115		
LGUs/NGA's KII, October 13, 2017 (Calamansi)							
PATRICIA L. CADACIO	F	PROVICIAL OFFICE OF ORIENTAL MINDORO	Provincial Capitol Complex, Camilmil, Calapan City, Oriental Mindoro	PEO-IV	2881746	ppdo.monitoring@gmail.com	
ALBERT A. METRA	M	Department of Agrarian Reform (DAR)	Nasipit, Calapan, Oriental Mindoro	APPT	2882162		
CHRISTINE M. PINE	F	Provincial Agricultural Office (PAgO)	Calapan City, Oriental Mindoro	Provincial Agriculturist	09176793714/(043)2882282	opagormindoro@gmail.com	
CHARITO J. MANANGSONG	F	Provincial Agricultural Office (PAgO)	Calapan City, Oriental Mindoro	PA-II	09202553108		
LUCILA ROSELLE L. BALANCIO	F	Provincial Agricultural Office (PAgO)	Calapan City, Oriental Mindoro	AT	09260676814		
Pili Nut Stakeholders, September 19, 2017							
GERRY R. DIMAANDAL	M	COZYTOPS PILINUTS	Daraga, Albay	Manager	09089832534		
JULIET A. AL-KHUREEM	F	MAYON PERFECTION	Naga City, Bicol Region	General Manager	09177700652		
MELINDA A. YEE	F	LESLIE PILI PRODUCTS	Sorsogon City, Bicol Region	Manager	09173335421		
CORAZON NAREDO	F	NAREDO'S PILI NUT PRODUCTS	Camalig, Albay	Owner	09282466989		
MYRA ZANDRA GESTUNA	F	VICKY'S PILI & FOOD PRODUCTS	Irosin, Sorsogon	Owner	09177295848		

MARIA TERESA PALCES	F	BERTON PILINUT CNADIES & PASTRIES	Malilipot, Albay	Owner	09162231618		
EVANGELINE MARINAY	F	PILAUI CANDY STORE	Legaspi City, Albay	Owner	09466777898		
EDWIN PERENIA	M	C.O.P. PILI SWEETS & PASTRIES	Daraga, lbay	Manager	2040038		
EDLYN B. DISCAYA	F	EDGELINES PILI PRODUCTS	Sorsogon City, Bicol Region	Staff	09093506589		
LYD LONUBAO	F	J EMMANUEL PASTRIES	Naga City	General Manager	09989707556		
NONA FLORES	F	RAINS DELICACIES		Owner	09175584983		
MARIBEL F. ERMINO	F	7A'S PASALUBONG SHOP	Sorsogon City	Owner	09997945693		
SALVACION F. EVANGELISTA	F	DING & ADETH EVANGELISTA PASALUBONG	Central, Bulusan, Sorsogon	Owner	09286603655		
MA. LINDA R. ESPENA	F	ESPENA ECO FARMS	Prieto Diaz, Sorsogon	Owner	09257443704		
DOLORES M. ANTES	F	ANTES ENTERPRISES	Sorsogon City	Owner	09109222839	dorisantes@outlook.com	
YOLANDA B. OLIVA	F	XML HEALTH FOOD	Naga City	Owner	09186287310	yollyoliva@yahoo.com	
JEROME GARCIA	M	RPM PILINUTS	Naga City	Employee	09066500745		
Engr. RAUL T. CARRERAS	M	PREMIER HARVEST AGRIVENTURES	Panagan, Tigaon, Camarines Sur	President	09178371059	Inverse32@yahoo.com	
SOL M. AYCOCHO	F	AYCOCHO'S FOOD PRODUCTS	Daraga, Albay	Owner	09778349222		
RICARDO A. BUBAN	M	RICAH'S BIG BITES FOOD PRODUCTS	Castilla, Sorsogon	Owner	09395870481	ricahbuban29@gmail.com	
DOMINGA JUESA G. YU	F	BAHI ENTERPRISES	Gubat, Sorsogon	Owner	09479371945	bahi.enterprises@icloud.com	
ROSEMARIE T. KWAN				Resource Person			
LGUs/NGA's KII, September 19 - 20, 2017 (Pili Nut)							
ARLENE VIBAR	F	DEPARTMENT OF AGRICULTURE REGION 5	Legaspi, Albay	Provincial Director	09194566784		

GRACE A. DEJUMO	F	OFFICE OF THE CITY AGRICULTURIST	Legaspi City, Albay	Executive Assistant	09568659511	dejumograce@gmail.com	
JESUS J. KALLOS	M	OFFICE OF THE CITY AGRICULTURIST	Legaspi City, Albay	Head	(052)7421739		