

Benefit Diffusion and Linkage Development in the Philippine Tropical Fruits Sector¹

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1.0. Introduction

The linkage of multinational companies particularly with small and medium domestic companies in the Philippines is perceived to be underdeveloped. In November 2003, the Philippine government -- through the Center for Industrial Competitiveness of the Department of Trade and Industry -- requested FIAS assistance in assessing the country's policy options to foster benefit diffusion and linkages between multinational corporations (MNCs) and domestic firms, with special reference to small and medium enterprises.

Three sectors have been identified, namely: electronics, agribusiness (tropical fruits) and IT-enabled services. This paper focuses on the agribusiness industry (tropical fruits) and aims to: (1) determine the extent and type of linkages and knock-on effects of foreign investment; (2) examine how these linkages and impacts are constrained by the policy environment; and (3) explore some specific policies to address issues identified.

Global demand for both fresh and processed fruits has been expanding over time not only because of increasing population, higher income, and technology breakthroughs that improve quality and lower prices, but also because of the increasing preference for healthy food.

This increasing demand has brought in investments and, at the same time, triggered changes in the production and marketing systems. One of the key global trends is the increasing concentration of large multinational firms controlling the supply chain. This is particularly true for banana and pineapple -- the country's top two fruit industries in terms of exports, area and production -- but not for mango which ranks third.

Clearly, there are opportunities to improve and develop linkage of multinational firms with domestic firms so that participants in the supply chain of tropical fruits may be able to tap the higher value chains and substantially improve quality, production capacity and ultimately enhance competitiveness.

This paper focuses on the tropical fruit sector, particularly banana, pineapple and mango. Both fresh and processed fruits are covered for two reasons. First, large multinational companies such as Dole and Del Monte are key players in these two industries. Second, they are the major export fruit products that have high growth potentials.

To analyze benefit diffusion and linkages in the three fruit industries (banana, pineapple and mango), value chain analysis was employed to examine various aspects of the agribusiness

¹Paper presented during the conference entitled "Closing the Productivity Gap" sponsored by the World Bank and the National Economic and Development Authority", June 27, 2005, Asian Institute of Management Policy Center

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system. Interviews were conducted with stakeholders in the industry, including firms in the upstream and downstream industries as well as representatives from the government and non-government organizations. Analyses of secondary data and review of literature were also done.

This paper is organized as follows. Analysis of the banana, pineapple and mango industries is presented in sections 2, 3 and 4, respectively. In each case, key trends, industry structure and value chain analysis are discussed in order to understand benefit diffusion and linkage development and extract potential areas for investments and issues that need to be addressed. Finally, a summary of key findings and recommendations is presented in section 5.

2.0 Banana

2.1 Production and export trends

The largest producer of banana in the world is India, accounting for 24% of the world's total production in 2004. It is followed by Brazil with 9%. The Philippines' share of world production was approximately 8% in the same year (Table II.1).

Growth of Philippine banana production was faster than the global rate. Between 1992-97, production expanded by 26% and increased faster in more recent years, growing by 83% from 1997 to 2004.

Table II.1 World Banana Production, 1992-2004

Banana Production	World Production (metric tons)			% Change	
	1992	1997	2004	1992-97	1997-04
Total World Production	50,677,595	60,518,480	70,629,047	19.42	39.37
Largest producer –India	8,523,000	13,340,000	16,820,000	56.52	97.35
2nd largest Producer -Brazil	5,848,523	5,412,360	6,593,110	-7.46	12.73
Philippines	3,005,209	3,773,800	5,500,000	25.58	83.02
Philippines as % of World (%)	5.93	6.24	7.79	--	--

Source: FAOSTAT 2005

Ecuador is the largest exporter of banana in the world. Its share to total world production in 2003 was 23%, almost double the share of Costa Rica, the second largest exporter. The Philippines accounted for 7% of the world exports in 2003.

Total world exports of banana declined by 5% from 1997 to 2003. Similarly, the largest and 2nd largest exporters experienced a decrease of 17% and 6%, respectively. Philippine exports, on the other hand, increased by 54% during this period (Table II.2).

While these top four banana exporters supply more than 60% of the world's total banana exports, they only contributed less than 20% of the total area for banana production. The Philippines accounts for 8.6% of the total area for banana production which is higher than any of the top three banana exporters. However, this does not imply higher exports of fresh bananas compared to the top three banana exporters as there are other varieties of bananas that are consumed locally or processed into banana chips for exports.

It is interesting to note, however, that of the top four banana exporters, the fastest expansion in production in the last five years occurred in the Philippines. All the top three exporters registered a negative growth rate although increase in production area was almost the same as the Philippines. While production of the top exporter (Ecuador) posted an average annual increase of 3% from 1992 to 2003, its production declined annually by 4% from 1998 to 2003. Costa Rica and Colombia showed declining production from 1992 to 2003 and also in the past five years.

In sum, the Philippines is gaining competitive advantage as shown by the improvement in its ranking in terms of share of exports and production growth.

Table II.2 World Banana Exports, 1992-2003

Banana Exports	Exports (000 US \$)			% Change	
	1992	1997	2003	1990-97	1997-03
Total World Exports	3,298,709	5,048,553	4,786,246	53.05	-5.20
Largest exporter -Ecuador	667,917	1,311,639	1,084,169	96.38	-17.34
2nd largest exporter – Costa Rica	485,300	588,029	554,250	21.17	-5.74
Philippines	157,734	216,556	333,000	37.29	53.77
Philippines as % of World (%)	4.78	4.29	6.96	--	--

Source: FAOSTAT 2005

2.2 *Industry Value Chain*

The structure of the supply chain varies across banana-producing countries. The presence of small independent growers is higher in the Caribbean banana producing countries and Ecuador. In Colombia and Ecuador, national banana companies are major producers while multinational companies are dominant in Central America, Asia and increasingly in Africa. However, as mentioned earlier, multinational companies -- as a whole -- dominate the banana global market such as in the case of the Philippines.

After cleaning, packing and quality control, bananas are transported through independent reefer carriers or by fleet owned by multinational companies. At the importing country, they may pass through wholesalers or importers for ripening before they are brought to the different retail outlets or institutional buyers (Figure II.1).

Because of the perishable nature of bananas, control of these various activities in the supply chain is critical. Thus, multinational companies tend to vertically integrate and own specialized refrigerated shipping and ripening facilities, and distribution networks. Traditionally, these multinational companies set the rules of the game in the supply chain. However, during the last decades, downstream agents -- particularly the retailers -- have increased concentration particularly in the EU and the USA. In fact, recent trends show that the banana industry is heading for a shift from a producer-driven chain to a market-driven or retailer-driven chain. These multinational firms no longer set the rules of the game. The shift has led to increasing vertical coordination, through improved supply chain management practices used by retailers and building long-term relationships with preferred suppliers to guarantee continuous supply at required levels of quality. As a response, Dole and Chiquita shifted their management attention

from supply to the market side of the business, strengthening its distribution network and partnerships with the retailers. Moreover, Lapanday Development Corp. has also established a strategic partnership with Carrefour, a large multinational retailer in Japan.

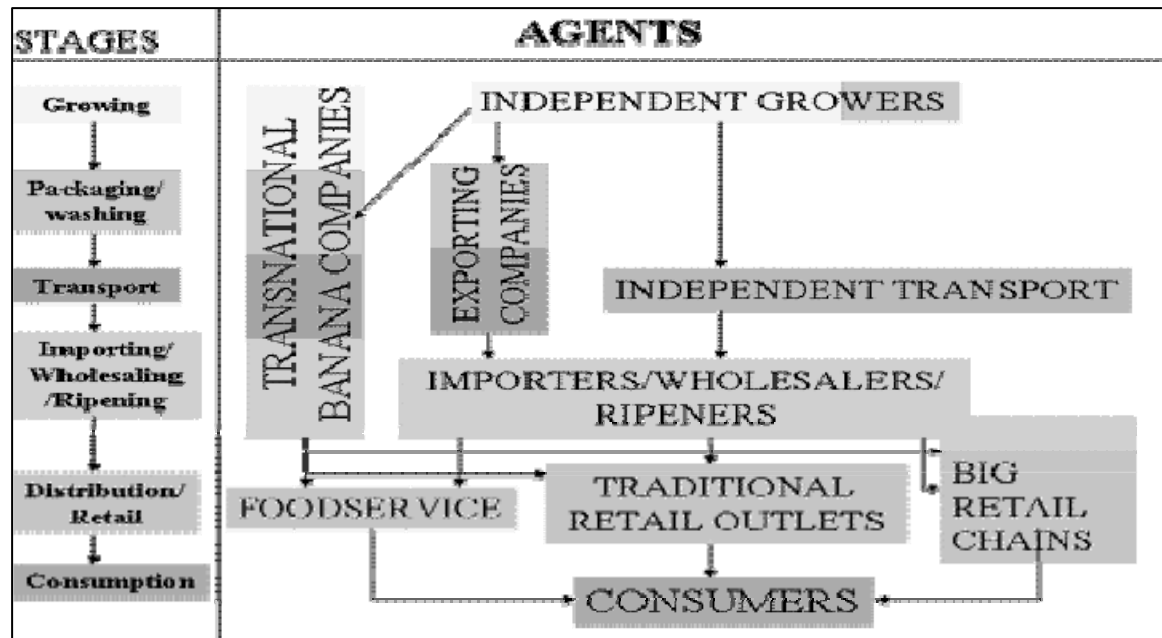


Figure II.1. Supply Chain Linkages in the Banana Industry (Source: FAO 2001)

Examining the level of prices in the value chain provides a picture of the cost structure and the distribution of margins in the different levels of the chain.

Table II.3 shows the share farm and export prices to retail price of banana in Japan, the Philippines' main market. The difference between export price and price in Japan would cover transportation, ripening and other distribution costs. Farm price accounts for 32% of the banana price in Japan in 2001. This went down to 28% in 2002 as the price in Japan increased to US\$0.51/kg from US\$0.46/kg in 2001 while farm price decreased to US\$0.14/kg from US\$0.15/kg during the same period. Data for Japan prices were sourced from FAO and were derived by dividing value of banana imports from the Philippines by the volume of banana imports from the same country. Thus, the price in Japan may not include retail costs. Farm prices were derived based on the data of one of the large multinational companies exporting banana (class A). The exports prices (freight on board) were sourced from the Central Bank of the Philippines. These are average prices of different quality levels of banana. The difference between export price and farm price would be the cost paid by banana growers to cover expenses in hauling, stevedoring documentation, facility rentals and other charges and documentation.

Table II.3. Prices of bananas in the value chain.

Market Level	Prices (US\$/kg)*		% to Japan Price	
	2001	2002	2001	2002
Price in Japan	0.46	0.51	100	100
Phil Export (Freight on Board)	0.17	0.17	37.28	32.99
Farm	0.15	0.14	32.06	28.37

*56 pesos to 1 US\$

Source: Bureau of Agricultural Statistics, Central Bank of the Philippines, multinational company

2.3 Key players

2.3.1 Global

The major global players in the banana industry are Dole, Del Monte, Chiquita, Fyffes (European fresh produce distributor), Noboa Corporation (Bonita brand, Ecuador), Banacol, and Uniban-Turbana in Colombia. The first three and first five firms account for 60%-70% and 80%, respectively, of the global market of over 12 million metric tons valued at US\$ 5B per year .

However, Chiquita's share has declined over time due to the EU Banana regime introduced a decade ago while Dole has overtaken Chiquita and established itself as the leading banana company in the world. While Chiquita challenged the EU regime at WTO, other competitors turned this threat into an opportunity. Dole and Del Monte expanded in ACP countries while Fyffes took position in Latin American countries. These companies also reduced their dependence on banana. Del Monte's share of banana sales to total sales, for example, shrunk from 56% in 1998 to 46% in 2001.

Production costs are lower in Asia, South America and Central America compared to the Caribbean. Large plantations in the Philippines, Costa Rica and Colombia benefit from economies of scale. Caribbean producers have higher costs because of small farm size, steepness of the land, low quality of soil, and unfavorable weather conditions. The Philippines has lower production cost than Ecuador albeit the latter has lower labor cost. This is primarily due to large plantations in the Philippines which benefit from the economies of scale.

2.3.2 Philippines

In the Philippines, there are five major exporters in the banana industry (PBGEA 2005). These are the Del Monte Fresh (Philippines) Produce, Stanfilco (a division of Dole Philippines), Sumitomo, Fresh Asia Produce Co. International and Chiquita/Unifrutti. These companies have moved from direct growing to contract growing arrangements primarily due to the implementation of the Comprehensive Agrarian Reform Law. This arrangement also minimizes risks related to environmental and social costs of production. Table II.4 shows the major growers or suppliers of these exporters.

Table II.4 Exporters and growers in the Philippine banana industry, 2004.

Banana Exporter	Grower
Del Monte Fresh (Philippines) Produce	Lapanday Group of Companies, Anflo Group of Companies and Dizon Group of Companies
Stanfilco, A Division of Dole Philippines	Sarangani, Cooperatives, Small Growers, Managed Areas
Sumitomo	Davao Fruits Corporation, AMS Group of Companies
Fresh Asia Produce Company International (FAPCI)	Global Fruits Corporation, Lapanday Hijo Plantations, Small Growers
Chiquita/Unifrutti	Malalag Tortuga Group, Marsman-Drysdale Group of Companies, La Frutera, Incorporated, Ardexcor

As of December 2003, the leading exporter was Dole-Stanfilco, followed by Del Monte, Chiquita/Unifrutti, Fresh Asia Produce Co. International and Sumitomo (Table II.5). Dole leads in Japan while Del Monte is ranked first in Korea. Chiquita/Unifrutti is number one in Middle East while Fresh Asia Produce Co. International is ranked first in China.

Table II.5. Key players in the Philippine Banana Industry

Name	Brand	Share to total 2003 exports	Rank First in
Dole	Dole	27	Japan
Del Monte	Del Monte	26	Korea
Chiquita/Unifrutti	Unifrutti (Middle East), Chiquita (Japan), Chiquita Jr (Korea)	21	Middle East
FAPCI/ Lapanday	Estrella, Aloha, Mabuhay	12	China
Sumitomo	Gracio	9	
Others		7	

Source: Key informant survey, 2004.

Of the 138 million boxes sold in 2003, 44% was sold in Japan, followed by Middle East (22%), China (17%) and Korea (12%) (Table II.6). Performance of each exporter/brand in these markets is presented in Table II.6. The two large multinational companies, Dole and Del Monte account for 53% of the total Philippine banana exports. In terms of specific markets, they account for 58% of the total exports to Japan, 73% in Korea, and 39% in China.

Table II.6 Banana Exports by brand and by country of destination (million boxes), 2003

Brand	Japan		Middle East		Korea		China		Others		Total	
	Boxes	%	Boxes	%	Boxes	%	Boxes	%	Boxes	%	Boxes	%
Del Monte	15.03	25	5.94	19	7.72	46	4.38	19	2.77	40	35.84	26
DOLE	20.17	33	4.32	14	4.52	27	4.56	20	3.16	46	36.73	27
Gracio	10.14	17	0.54	-	1.2	7	-	-	-	-	11.89	9
Chiquita	9.5	16	15.78	51	1.6	10	2.22	10	-	-	29.1	21
Estrella	3.43	6	3.72	12	1.06	6	7.04	31	0.7	10	15.95	12
Stareyna	0.93	2	-	-	-	-	-	-	-	-	0.93	1
Others	1.26	-	0.73	2	0.66	-	4.68	-	0.29	-	7.62	6
Total	60.46		31.03		16.76		22.88		6.92		138.05	
% Share	44		22		12		17		5			

Source: PBGEA Statistics 2004.

In terms of growers, on the other hand, Dole-managed growers account for 25% of the total volume exported in 2003. This is followed by the Lapanday group with 28.5 million boxes, comprising over 22% of the total volume exported. While FAPCI of Lapanday only ranks fourth in terms of exports, it ranks second in terms of volume of bananas produced because they also supply to other exporters such as Del Monte and Sumitomo. Anflo (Antonio Floirendo) group, which supplies solely to Del Monte, is ranked third (Table II.7). Total area planted as of 2003 is over 32,000 hectares, which exceeds the total hectareage allowed for banana produced for exports under Letter of Instruction (LOI) 790 issued in 1979. Among the seven major growers presented in Table II.7, the highest productivity in terms of boxes per hectare is achieved by the Lapanday group with 4,356 boxes/ha. Stanfilco is last because its figures reflect only Class A bananas, which accounts for 80% of the total boxes produced.

Table II.7 Production area, boxes sold and productivity, by company as of Dec. 2003

Company	Total Area (hectares)	% share to total area	Boxes Sold (13.5 Kg.)	% share to total boxes sold	Boxes/Ha
Lapanday	6,552	20	28,542,538	22	4,356
Anflo	6,474	20	28,140,385	22	4,347
La Frutera	988	3	4,289,615	3	4,342
Marsman	2,941	9	12,663,923	10	4,306
Soriano	4,000	12	16,431,538	13	4,108
Dizon	624	2	2,348,692	2	3,764
Stanfilco	9,503	29	32,115,923	25	3,380
Others	1,192	4	3,026,846	2	2,539
Total/Ave.	32,274	100	127,559,460	100	3,952

Source: PBGEA Statistics 2004.

Table II.8 Banana exports, by grower & destination as of December 2003(million boxes)

Grower	Japan		Middle East		Korea		China		Others		Total	
	Boxes	%	Boxes	%	Boxes	%	Boxes	%	Boxes	%	Boxes	%
Lapanday	9.81	17	7.89	30	2.75	17	5.20	29	2.89	37	28.54	22
Anflo	10.68	18	4.71	18	5.80	36	5.91	33	1.04	13	28.14	22
Stanfilco	14.11	24	5.19	19	4.63	29	5.30	30	2.89	37	32.12	25
Soriano	14.65	25	0.54	2	1.25	8	-	0	-	-	16.43	13
Marsman	5.65	10	5.34	-	0.83	5	0.84	5	-	-	12.66	10
La Frutera	1.39	2	2.42	-	0.29	2	0.33	2	-	-	4.44	3
Others	2.32	4	0.26	-	0.07	0	0.21	1	0.01	-	2.88	2
Dizon	0.44	1	0.24	1	0.62	4	0.10	1	0.95	12	2.35	2
Total	59.04		26.61		16.24		17.88		7.78		127.56	
% Share	46		21		13		14		6			

Source: PBGEA Statistics 2004.

The volume of exports has been increasing every year from 105 million boxes in 2000 to about 128 million boxes in 2003 (Table II.9). The fastest growth is between 2002 to 2003, increasing by 19% compared to 2000 to 2001 and 2002 to 2003, when it increased only by 1.03% and 1.69%, respectively. While Japan remains to be the leading market, its share relative to total exports has been declining from 59% in 2000 to 46% by the end of 2003. The Middle East market, on the other hand, increased dramatically from 8% to 21% during the same period.

Table II.9. Banana exports by destination, 2000-2003.

Market	2000			2001			2002			2003		
	Value	% share	% Gr Rate	Value	% share	% Gr Rate	Value	% share	% Gr Rate	Value	% share	% Gr Rate
Japan	61.79	59		56.08	53	-9.24	50.57	47	-9.82	58.68	46	16.03
Middle East	8.38	8		13.76	13	64.18	23.67	22	72.09	26.79	21	13.16
Korea	13.61	13		13.76	13	1.03	13.99	13	1.69	16.58	13	18.55
China	16.76	16		15.87	15	-5.28	15.06	14	-5.09	17.86	14	18.55
Others	4.19	4		6.35	6	51.55	4.30	4	-32.21	7.65	6	77.83
Total Boxes	104.73	100		105.81	100	1.03	107.60	100	1.69	127.56	100	18.55

Source: PBGEA Statistics 2004.

2.4 Downstream and upstream linkages of multinational and large domestic companies

For the purpose of discussing linkages in the supply chain of bananas, the upstream linkage of the supply chain presented in Figure II.1 is the growing of bananas. The stages after growing are referred to as downstream linkages.

2.4.1 Upstream linkages (Growing of Bananas)

The main linkage of multinational and large domestic companies that export bananas is in the growing of bananas. This is the part of the supply chain presented in Figure II.1, where banana exporters decide to buy and not to make or produce the bananas for exports. As presented in Table II.4, exporters have their own growers that range from large corporate farms like TADECO (Tagum Development Corp.) of the Anflo group of companies to small growers or cooperatives of small growers. With the implementation of the Comprehensive Agrarian Reform Law (CARL), exporters have to resort to contract growing, lease arrangements or joint ventures.

2.4.1.1 Contract growing

There are a number of production modes employed by multinational companies and large domestic firms. These include contract growing, lease arrangements, company-managed farms and joint ventures. No data are available on the number of hectares cultivated under each production mode. But based on the key informant interview conducted in 2004, the trend is towards contract growing. The following are common growership agreements:

- The exporter advances 100% of the growers' costs like payroll, fertilizers, chemicals, packaging materials and overheads. In exchange, the grower commits to sell all his produce to the exporter at a price agreed at the start of the year.
- The exporter advances portion of the growers' costs like irrigation and aerial spray. The grower commits a certain volume of only, say, 2,000 boxes/ha at a fixed price agreed at the start of the year. He has the option to sell the remainder of the produce to the exporter or other traders.
- A grower is independent of the exporter and decides whom to sell his produce.

The banana contract growing scheme is a joint venture between a grower and a multinational company. Under this scheme, a grower is contracted by the banana company to plant his/her land with bananas that will be exclusively purchased by the latter. In principle, a 70%-30% sharing of production cost is observed by the company and the grower. The 70% portion comes in the form of financing and technology. The company provides the capital for farm inputs and the infrastructure facilities, equipment, and technical know-how in the production of bananas. This amount is eventually deducted from the sale of processed bananas. The grower's 30% is in the form of land and labor, which the growers provide and pay for. The revenues derived by the grower are net of the deductions for the financing provided by the

company. The grower is tasked to manage the land and provide labor while the company exclusively buys and exports the bananas produced.

The terms and conditions of the contract can be classified into two categories. The first category refers to the terms and conditions regarding the output. The other category refers to inputs used to produce the product or output. It is interesting to compare the terms and conditions of the contract based on the above components across banana buyers or exporters as shown in Table II.10. The main advantage of contract arrangements in banana is the minimization of uncertainties. One of these uncertainties is the assurance of achieving the quality levels desired by the market. By providing the technology and the management systems, specifying the prices as well as the sharing of production costs, and specifying the incentives and disincentives of not following the terms of the contract, the uncertainty of not meeting the quality requirements is lessened. Thus, information on the quality levels desired by the market is specified in the contract. This promotes efficiency because the quality requirements of the market are known to the producers who, in turn, allocate resources to meet such requirements. To ensure that the desired quality levels are met, the terms and conditions are specified in the contract. In open market transactions, market information on quality levels is not always known to producers. This situation results in wastage or opportunity losses due to overproduction or underproduction.

While contract growing promotes efficiency, there are also issues in inequality. There are only a few buyers of bananas for the export markets and these buyers have the tendency to set prices lower than competitive prices. Agents do not have perfect information about the market and therefore may sign the contracts, trusting that the principal will not extract monopoly rents.

An exporter usually offers to buy the produce at a specific point in the supply chain, to wit:

FOB Ex Patio	Bananas are sold as bunches upon delivery to the packing house. Recovery risk is borne by the exporter
FOB Ex Truck	An exporter buys packed bananas and a grower's produce is classified as Class A or B.
FOB Ex Wharf	It is like FOB Ex Truck except that hauling cost is borne by the grower.

Stanfilco's main strategy is contract growing with cooperatives complemented by corporate growing that covers approximately 7,200 hectares. Its production areas cover Panabo, Tanglaw, Compostela-Osmiguel, Dole Valley Zones. Other areas planted to Stanfilco banana are Maragusan Davao City (Barangay Carmen, Baguio District) and Bukidnon. However, problems have been encountered with regard quality control and standardization of produce of contract growers. Stanfilco incurs large transaction costs since it has to deal with many growers/farmer groups. In fact, it has created a division for grower relations.

Table II.10. Contract growing features by major banana producer-exporter

Provisions	Dole	Lapanday Foods	Del Monte	Marsman-Drysdale
Land	Specified the land for production, for exclusive purchase of produced exportable banana	Specified the land for production, for exclusive purchase of produced exportable banana	Specified the land for production, for exclusive purchase of produced exportable banana	Specified the land for production, for exclusive purchase of produced exportable banana
Price	US\$2.60/box (13kgs/box Class A with prescribed specifications and quality) less deductions on hauling US\$.07, stevedoring documentation US\$.08, facility rentals US\$.08 and US\$.15 for other charges and documentations. Net of US\$ 2.22/box FOB	US\$ 1.80/box, net, company will shoulder everything from packing shed operations, hauling, documentations and shipping.	US\$ 2.00/box, net, the company will handle stevedoring and documentation	No data available
Contract Period	2 – 10 years	2 – 10 years	2 – 10 years	No-record

Source: Digal (2004)

Del Monte obtains its bananas from farms of large companies like Tagum Agricultural Development Corp., Inc. (TADECO) and Lapanday Foods Corp.. It does not grow its own bananas nor does it enter into contract growing with cooperatives unlike Stanfilco-Dole. Del Monte may not be involved in production but it requires very high quality standards for the bananas they export. Thus, they prefer to deal with large companies rather than small/individual growers because it allows them to exercise control over quality and volume requirements. The large companies provide their own agricultural chemicals, aerial spray, cleaning, sorting, packing (using their own box plant), and transportation from farm to the port. While multinational companies deduct expenses incurred from the quoted price for the small growers, they no longer deduct from the large contractors since they do the services normally provided by the multinational companies. In the case of Lapanday Corp., the company -- aside from supplying to Del Monte -- also exports directly using its own brands.

As its primary strategy, Unifrutti Philippines Inc. (UPI), formerly Oribanex, employs partnerships and joint venture arrangements. It buys bananas from corporate farms like Marsman-Drysdale Agri-group, Lapanday, ARDEXCOR and La Frutera.

Recently, UPI established a company to handle purchase agreements with small growers and cooperatives that they call external growers. UPI's suppliers deliver bananas to its own wharf in Tibungco Davao City where quality control is undertaken.

To ensure continuous supply of exportable bananas, UPI decided to operate its own farm by acquiring Marsman's Nova Vista Agriventures Corp. in Tagnanan, Compostela Valley. They are also planning to expand to Wao, Lanao del Norte.

Lapanday Foods Corp. (LFC) grows bananas for Del Monte through its lead export farms in the municipalities of Santo Tomas, Panabo, and Luna, all in Davao del Norte. It also supplies to Unifrutti/Chiquita through two production outfits: Malalag Ventures Plantation, Inc. and Tortuga Valley Plantation. Lapanday also has ISO 9002 accreditation.

2.4.1.2 Lease Arrangement

Land rentals vary depending on the location or area. In Maragusan, Compostela Valley, for example, land rentals range from P30,000 to P35,000 per hectare. For undeveloped land, a landowner usually leases the property to the exporter for a term of 10 to 15 years. During this period, he or a member of his family is employed with the firm. At the end of the lease term, the landowner enters into a growership agreement with the exporter. An exporter may advance farm inputs deductible from the proceeds of banana sale. At this stage, landowners gain supplier power by organizing themselves into cooperatives. Having learned the technology, they are already in the position to negotiate with the exporter.

2.4.1.3 Production processes

A typical growing cycle of bananas takes nine to ten months. Planting is normally done only once. With proper care and soil nourishment, a plantation would still be productive for 30 years. There are approximately 1,900 to 2,000 banana plants per hectare; and the average yield is about 3,600 to 5,000 boxes per hectare, depending on the soil condition, irrigation, fertilization and pesticide programs. Major inputs in the care and cultivation of bananas are labor, fertilizer and pesticide (which are administered by spray planes), plastic sheets to cover and protect the fruits as they ripen.

The major components of production costs are fieldwork, harvesting and packing, and hauling expenses. Fieldwork expenses account for over 60% of production costs. Components of fieldwork expenses include pest and disease control, farm overhead and plant and fruit care costs.

Aerial spray is necessary to control infestation, particularly Sigatoka. There are diseases that cannot be remedied through manual application. Most companies own aerial spray planes and employ pilots to operate them. It is therefore necessary that an airstrip be constructed in a plantation. If not available, however, adjacent airstrips may be used. Currently, most banana companies have airplanes and in-house pilots, who are required to conduct aerial sprays. These plus the airstrips in its other farms can be made available to the growers at an hourly per hectare rates.

Research and Development facility is provided where studies are done to evaluate diseases, the causes and remedies to stimulate banana plant growth and development. R&D recommends and prescribes the appropriate cure for the diseases hitting the farms. At the project

outset, R&D will provide the banana seedlings to the growers. Dole Stanfilco, for example, has its own tissue culture laboratory and nursery (Musatech).

2.4.1.4 Production cost

Table II.11 shows that labor and chemicals needed to control pest and disease account for about 65% of the total production cost. Fertilizers and depreciation contributed over 16% of total cost. While labor is sourced locally, most of the chemicals are imported. Capital expenditures include packinghouse, cableway, power lines and transformers, water system, and service vehicles which are depreciated in order to get the depreciation cost per hectare. Please refer to Annexes 1 to 2 for details of project cost and development cost.

Table II.11 Banana production cost per hectare, 2005.

Cost Item	Cost/hectare	% to total
Labor	118,300	36.89
Fertilizers	25,500	7.95
Pests and disease control chemicals	89,410	27.88
Propping materials	15,848	4.94
Bagging materials	19,500	6.08
Fuel, oil and lubricants	15,165	4.73
Depreciation	27,000	8.42
Overhead	10,000	3.12
Total	320,724	100.00

2.4.2. Downstream linkages

While exporters buy bananas from suppliers through various contract or lease arrangements, they exercise control by providing technical assistance to growers as well as by specifying incentives or disincentives for meeting quality and production requirements. Downstream linkages cover those levels in Figure II.1 after growing.

Packing is a post-harvest operation that includes processing and packing bananas, based on specifications and fruit quality standards set by the buyers. Of all the areas of production, packaging is the most critical to bananas as the processed/selected fruits could be damaged and rendered worthless if there are scratches or injuries on the peel. The sensitivity of this operation requires packinghouses to support and accelerate sorting, processing and packing of bananas.

Dole Stanfilco has its own box manufacturing plant (Carmen Corrugated Containers Corp., and plastic plant (Panabo Plastic Plant). Moreover, Stanfilco has ISO 14001 (environmental management standard) accreditation for its transportation and communication, warehousing, cooling, operation of terminal facilities and vessel discharging and loading. Stanfilco has closely linked its production and distribution system with quality approach to environmental protection. With regards marketing, some of the smaller growers sell to other independent buyers. Dole purchase agreements with growers have been freight on board (FOB) terms. That is, Dole buys the bananas from the port of loading. Other production costs including aerial spray and packing/processing of export document costs are shouldered by the grower.

However, it outsources its trucking requirements by tapping former employees who have gone into this business. Stanfilco prefers this type of arrangement because of the established ties with its former employees. It also exports its own bananas, has its own port (Panabo), and owns and charters vessels for this purpose.

Del Monte, on the other hand, has an arrangement with Davao Packaging Corp. -- a sister company of TADECO -- for its boxes and other packing materials and with Mindanao Corrugated (MINCORR)-- a subsidiary of San Miguel Corp. -- for box manufacturing.

Lapanday is also vertically integrated. Global Fruits Corp. manages, grows and packs bananas. Lapanday Biotrends is in charge of tissue cultures. Lapanday Packaging Corp./Macondray is into production of plastic packing materials and is currently constructing its box plant which will be in full operation before the end of 2005. Meanwhile, they toll manufacture with Steniel Mindanao Packing Corp.. The cold storage requirements are provided by the Davao Cold Storage Corp. located in Madaum wharf in Tagum City. The Mindanao Fresh Produce Services Corp. provides quality check requirements while marketing is handled by Fresh Asia Produce Company International Corp.

Lapanday started exporting its products in 1997 by chartering reefer vessels from Seabridge Reefer, Inc. To access the market, the company partners with one of the largest retailers in the world -- Carrefour -- which operates in 30 countries for the marketing and distribution of its products.

2.5 Key findings

2.5.1 Competitive Edge and Opportunities

Philippine banana exports are competitive. While exports of the top two exporters in the world declined from 1997 to 2003, the Philippines increased by 54%, moving up the rank from 4th to 3rd.

The success of the banana industry in the export market is largely due to the suitable agro-climatic conditions in the country as well as the entry of multinational companies that brought in the technology and the capital.

Multinational companies have established linkages with large domestic companies. Linkages with small and medium enterprises (SMEs) are mostly with upstream firms particularly agrarian reform cooperatives supplying bananas through contract growing. Linkages in the downstream industry are with large domestic firms. However, small and medium enterprises, particularly those engaged in the supply of bananas, can avail of the following benefits:

- Accelerated transfer of technology through farm management assistance provided by exporter.
- Indirect access to large markets.
- Inputs and production assistance provided by contractors.

- Credit availability through the exporter
- New technology and skills learned.
- Reduce price risks, as prices are often pre-determined.
- Open up new markets
- Convert available land to an income earner.
- Learn new production technologies.
- Increase production thru leasing additional areas and applying for growership.
- Employment opportunities

2.5.2. *Issues*

Moreover, there are issues that need to be addressed to promote linkage development in the industry. Table II.12 provides a list of issues raised by the players in the industry both from the private and public sectors during the key informant interview conducted in 2004.

The implementation of the agrarian reform program has affected the industry, particularly in the early part of the reform as it created a volatile environment and spawned problems in the implementation. Gradually, although problems still exist, issues in the implementation are addressed and the situation becomes more stable.

The list in Table II.12 shows the range of problems faced by the players in the industry that include the multinational companies, business support organizations, cooperatives, large domestic firms, and certain government agencies. Issues include those pertaining to land ownership and use rights, high production costs due to high costs of inputs, diseases and environmental problems, peace and order, and trade policies. Discussed below are some policy issues that need to be addressed to promote linkage development.

2.5.2.1 *Contracts and Polevaulting*

One of the key issues underlying polevaulting is the perceived inequitable contracts whether formal, written, and legally binding contracts or informal, implicit, unwritten (based on trust) contracts. Here, a case of a formal contract particularly between agrarian reform beneficiaries and multinational companies in the banana industry is reviewed to identify issues and explore policy implications. One of these is the determination of land rent of farms under contract arrangements with multinational companies or large domestic growers. Until now, the issue of polevaulting and inequitable contracts still persist, which affect the reliability of the supply of bananas.

Table II.12 Issues affecting linkage in the Banana Industry

Category	Issues
<i>Production</i>	High cost of agricultural chemicals
	Inadequate access to credit
	High labor costs due to mandated wages
	Diseases like sigatoka
	Difficulty in producing organic products because of diseases
	Lack of incentives to invest in agriculture because ownership large

	land is prohibitive
	Succession issue in Comprehensive Agrarian Reform Law
	Pole-vaulting
	Constrained, expansion programs of commercial farms due to CARP
	Volume of boxes sold is dependent on the requirements of the exclusive buyer.
	Grower may be constrained to sources inputs from the buyer, which may price inputs higher than market rate.
	Some grower cooperatives lack the technical skills to manage their operations
	High power rates
	Letter of instruction 58 and 790 restrict supply of land and competition
	Other countries have lesser tariff on fertilizers. Making fertilizer cost in Mindanao relatively cheaper.
Marketing/Processing	High cost of packaging materials
	High freight/shipping cost
	10% vat on wharfage
	High transportation costs, due to inadequate farm to market roads.
Trade	Australian quarantine requirements
	Competition from other countries such as Thailand and Indonesia
Environmental	Watershed issues raised by water district
Others	Peace and order problem

Source: Key informant interview 2004

The Comprehensive Agrarian Reform Law (Republic Act 6657) or CARL which was enacted in 1987 stipulates the provision of a production and profit sharing scheme (PPS) for farm workers. However, under this law, the distribution of commercial farms was deferred for 10 years from 1987 to 1997.

One of the justifications in the deferment of the distribution of commercial farms, which include banana and pineapple plantations, is to prepare the farm workers as owners of the redistributed lands. During this 10-year deferment, the total private land in hectares that was targeted to be distributed in 1988 was 3,267,600 but at the end of 1997, this target was reduced by 268,000 hectares. One of the reasons of this reduction is the passage of RA 7881 in 1995, which exempted fishponds and prawns from CARL coverage. Another reason was a Supreme Court ruling in 1990 that allowed conversion of lands to poultry, cattle grazing and swine farms. Under Section 10 of RA 6657, plantation owners are also allowed to convert lands into parks, reforestation sites, fish sanctuaries, school and church sites. Moreover, there were also reports that banana companies dismissed workers and retrenched contract workers during this deferment period and placed their own people in the farms to muddle the identification of beneficiaries and gain control of the plantation (Abadilla 1992).

The first “model” contract was developed in 1995 between Dole-Stanfilco and the agrarian reform beneficiaries (former employees/farm workers of Dole-Stanfilco) who were supposed to own the land. This was supposed to serve as a model for other commercial farms to emulate. However, this led to several problems as beneficiaries did not receive separation pay

upon implementation of the contract and received a very low buying price at P22.50 per box or 13 kilograms. During that time, the buying price in Japan was \$2.18/kg and the exchange rate was US\$1 to P27.7. In November 1997, three farmer groups went on farm strike to demand a higher price. They asked the Department of Agrarian Reform to allow them to sell bananas to other buyers because they learned that Dole-Stanfilco offered other sellers at US\$2.80 per box and they were only receiving P22.50/box. Also, a banana trading company offered these groups to buy their bananas at US\$2.80 per box. Finally, Dole-Stanfilco offered them a buying price of US\$2.10 per box to be picked up at the farm or US\$2.60 per box if delivered by farmers at the wharf.

The above case shows that there are a number of issues underlying pole vaulting, which stem from the unacceptability of terms of the contract and the lack of preparation or orientation of agrarian reform beneficiaries. While this is limited to contract growing in the banana industry, there are other cases of pole vaulting under lease arrangements, contract buying and output sharing in other crops such as mango.³ Some farmers in Mabini, Compostela Valley in Region XI under lease arrangements with Lapanday Corp. are now on strike, demanding an increase in lease rental from P6,250 per year per hectare to P45,000 per year per hectare. The issue has not been settled but Lapanday Corp. has agreed to settle at P26,000 per year per hectare (MCBC 2004).

2.5.2.2 *Letters of Instruction 58 and 790*

In 1973, President Ferdinand Marcos issued Letter of Instruction (LOI) 58 upon request by growers to restrict banana hectareage to 21,000 hectares. This was based on a 10 kg per capita consumption of Japan. Total hectareage was allocated to 18 growers. In 1979, LOI 790 was issued, increasing the hectareage to 26,250 hectares to respond to the increase in demand in the Middle East. This increased the number of growers from 18 to 22 in 1979 and 24 by the end of 1991. In 1999, the total number of hectares planted to banana in Region XI was 34,646, exceeding the total limit by 9,163 hectares. Until today, the area planted to banana for exports has been expanding.

There had been attempts to repeal LOI 790. In 1995, House Bill 60 was filed to repeal it but accredited growers strongly opposed it as it would allow entry of new players and consequently increase supply and competition. In 2001, another attempt did not materialize when a resolution was presented to the President of the Philippines during the 10th Mindanao Food Congress.

However, there are varied views on this as shown by the interviews conducted. On one hand, some sectors believe this policy has become obsolete due to the implementation of the Agriculture and Fisheries Modernization Act (AFMA). Other sectors argue that this should be repealed to enhance competition. There are allegations that the total hectares currently planted to bananas currently already total 50,000 hectares although it is argued that the expansion is in the ARMM (Autonomous Region in Muslim Mindanao) region where the policy does not apply. The Philippine Banana Growers and Exporters Association opposes the repeal of this policy.

³ Based on interview of growers and traders conducted in June 2004.

2.5.2.3 *CARP lands as collateral*

Production continues to expand as demand in the global market increases. This would require additional production area even as it would provide opportunities for small farmers to contract grow with exporters. However, with limited access to credit, they would turn to exporters for capital. As a result, farmers would resort to leasing their land to allow them opportunities to be employed in the farm. While they could earn as high as P100,000 per hectare per year as grower, they only receive around P30,000 per year under lease arrangement. This lack of credit access is compounded by the fact that agricultural land under CARP is not accepted by banks as collateral.

3.0 Pineapple

This section looks at linkage development in the pineapple industry. Key industry trends in terms of production and export are reviewed to determine how the Philippines fares relative to its competitors. The industry value chain is presented followed by a review of the key players in the industry. The upstream and downstream linkages of selected firms are then described to provide empirical examples of existing linkages. Finally, opportunities and issues or challenges are discussed, incorporating information gathered from key informant interviews.

3.1 *Production and export trends*

World production of pineapple continues to expand from 13 million metric tons in 1997 to over 15 million metric tons in 2004, an increase of 18% (Table III.1).

Thailand remains the largest producer of pineapple, followed by the Philippines and India in that order.

The Philippines accounts for 11% of the world production. While production slightly increased from 1997 to 2004, its share of world production declined from 13% to 11% during this period. This implies that other producers expanded faster than the Philippines. As shown in Table III.1, the Philippines grew by less than a percentage from 1997 to 2004, while the average world production growth during this period was 18%.

Table III.1 World pineapple production, 1992-2004

Pineapple Production	Production (metric tons)			% Change	
	1992	1997	2004	1992-97	1997-04
Total World Production	11,722,086	12,935,846	15,287,413	10.35	18.18
Largest producer -Thailand	2,180,000	2,083,390	1,700,000	-4.43	-18.40
3 rd largest Producer -India	859,000	1,250,000	1,300,000	45.51	4.00
Philippines (2 nd largest producer)	1,135,151	1,638,000	1,650,000	44.30	0.73
Philippines as % of World (%)	9.68	12.66	10.79	--	--

Source: FAOSTAT 2005

Total area devoted to pineapples has expanded in the last 12 years, increasing faster in the last five years. Most of this growth came from Costa Rica, Indonesia and the Philippines. Expanding area in the last five years by 13%, 10% and 4 %, respectively. Thailand, the largest producer, expanded only by 0.17% but declined on the average by 1% in the last 12 years.

Of the major pineapple exporters in Asia, the Philippines has the highest yield producing 315,027 hectograms per hectare, compared to Thailand (233,370) and Indonesia (90,160). The latter is below the world average of 187,703. South American exporters have higher yields than Asian exporters.

The largest exporter is Costa Rica followed by France. However, considering only the value of exports in 2003, Belgium, which started exporting in 2000 and with exports of over US \$149 million in 2003, would have ranked second.

World exports of fresh pineapples grew faster in more recent years. From 1997 to 2003, world exports increased by 128% compared to 107% growth from 1990 to 1997 (Table III.2).

Table III.2 World fresh pineapple exports, 1992-2003.

Fresh Pineapple Exports	Exports (000 US \$)			% Change	
	1992	1997	2003	1990-97	1997-03
Total World Exports	178,352	369,124	841,774	107	128
Largest exporter –Costa Rica	34,741	102,848	198,889	196	93
2 nd largest exporter – France	4,217	59,753	75,502	1317	26
Philippines	22,946	27,189	38,096	18	40
Philippines as % of World (%)	13	7	5	--	--

Source: FAOSTAT 2005

Taking advantage of this growth is Costa Rica, the largest exporter, accounting for 24% of the world exports in 2003 followed by France. The Philippines' share of world exports in 2003 was only 5%, much smaller than its share in 1992 of 13%.

The Philippines share of world exports of fresh pineapples is shrinking because of its lower growth compared to global growth. An increase of 40% from 1997 to 2003 appears high but relatively low compared to the global growth of 128% in the same period. Thus, despite an increase in the value of exports, its share of world exports declined.

World exports of canned pineapple in 2003 reached US\$650 million. Of this amount, the largest exporter, Thailand, contributed 43%, followed by the Philippines and Indonesia with shares of 13% and 11%. respectively (Table III.3).

Table III.3 Canned Pineapple Exports, 1992-2003

Canned Pineapple Exports	Exports (000 US\$)			% Change	
	1992	1997	2003	1992-97	1997-03
Total World exports	665,843	538,191	649,667	-19.17	20.71
Largest exporter-Thailand	328,840	202,409	282,253	-38.45	39.45
3rd largest exporter - Indonesia	47,048	47,473	68,363	0.90	44.00
Philippines (2 nd largest exporter)	96,233	85,789	84,279	-10.85	-1.76
Philippines as % of World (%)	14.45	15.94	12.97	--	--

Source: FAOSTAT 2005

In terms of growth, total world exports increased by 21% from 1997 to 2003 from a decline of 19% from 1992 to 1997. Thai and Indonesian exports increased faster than world growth compared to Philippine exports which suffered a decrease from 1992 to 2003.

World exports of pineapple juice concentrates increased rapidly from US\$49 million in 1997 to US\$ 260 million in 2003 (Table III.4).

Table III.4 Pineapple Juice Concentrates Exports, 1992-2003.

Pineapple Juice Concentrates Exports	Exports (000 US\$)			% Change	
	1992	1997	2003	1992-97	1997-03
Total World exports	40,419	49,440	259,901	22.32	425.69
Largest exporter –Thailand	0	0	130,755	-	-
3rd largest exporter - Indonesia	0	14,131	14,378	-	1.75
Philippines (2 nd largest exporter)	23,648	27,610	52,637	16.75	90.64
Philippines as % of World (%)	58.51	55.85	20.25	--	--

Source: FAOSTAT 2005

Thailand, the largest exporter of pineapple juice concentrates, responded to increasing demand and started exporting in 2002, producing more than half of the world exports in 2003. The Philippines, which ranks second in exports, also responded to increasing demand, doubling total exports in 1997 by 2003. However, its share declined substantially from 56% in 1997 to 20% in 2003.

On the other hand, world exports of pineapple juice single strength stagnated in 2003, increasing by a little over 1% compared to 1997 exports (Table III.5).

Table III.5 Pineapple Juice Single Strength Exports, 1992-2003.

Pineapple Juice Single Strength Exports	Exports (000 US\$)			% Change	
	1992	1997	2003	1992-97	1997-03
Total World exports	170,018	206,002	208,707	21.16	1.31
Largest exporter –Thailand	79,002	73,424	824	-7.06	-98.88
2nd largest exporter -Netherlands	25,009	43,605	100,580	74.36	130.66
Philippines (3rd largest exporter)	6,918	8,959	29,437	29.50	228.57
Philippines as % of World (%)	4.07	4.35	14.10	--	--

Source: FAOSTAT 2005

The Netherlands in 2003 exported more than US\$100 million of pineapple juice single strength in 2003 which makes it the largest exporter in 2003. But considering a 10-year period, Thailand still remains the top exporter although its exports in 2003 were almost nil. The Philippines, ranked third, accounted for 14% of the world exports in 2003. Like the Netherlands, it aggressively expanded exports in 2003, which amounted to over US\$29 million compared to only US\$9 million in 1997.

In summary, of the four pineapple products exported, only canned pineapple exports declined. Moreover, in terms of percent share to total exports, only exports of pineapple juice single strength managed to expand, while the rest shrunk (Table III.6). Thus, while exports of pineapple products generally continue to increase, the pace is slow – a possible indicator of eroding competitiveness.

Table III.6 Production and export performance of Philippine pineapple products (1992-2004)

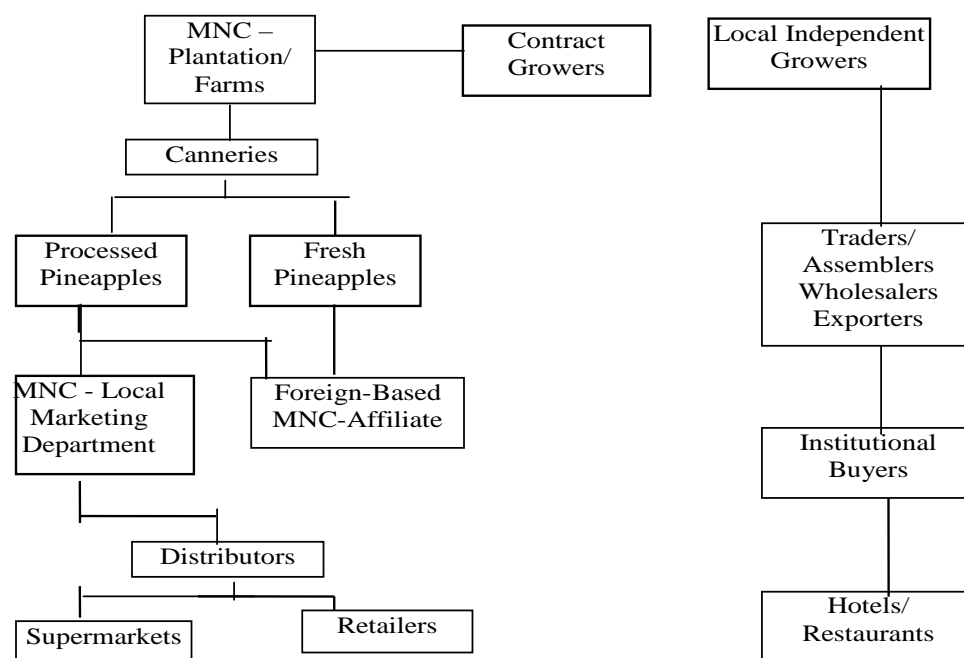
Pineapple Products	Production		Exports	
	% Share	Trend	% Share	Trend
Fresh Pineapples	Decrease	Increase	Decrease	Increase
Canned Pineapples			Decrease	Decrease
Pineapple Juice Concentrates			Decrease	Increase
Pineapple Juice Single Strength			Increase	Increase

Source: Based data from FAOSTAT 2005

3.2 Industry structure

Multinational companies (MNCs) in the Philippine pineapple industry source their raw materials (pineapples) through plantations under leasehold arrangements and contract growing. These pineapples are either processed or exported as fresh. Several intermediaries are involved in the marketing of pineapple. From the growers, the fruits are either sold to wholesalers, wholesalers-retailers, *viajeros* or travelers, and retailers or directly sold to processors before they reach the consumers. Contract growers, however, sell directly to big company processors. Pineapple is sold in fruit stalls and supermarkets in many different forms: dried, processed in chunks, tidbits, juice, etc. A typical description of the supply chain of pineapples is presented in Figure III.1.

Figure III.1. Pineapple industry value chain



Prices of fresh pineapple in Japan remained stable between 2001 to 2002 (Table III.7). The share of farm price of fresh pineapples in the Philippines to the price of fresh pineapples in Japan was only 19% in 2001 and declined to 17% in 2002. It can be observed that the retail price of fresh pineapples in the Philippines was higher than the export price. This is because the export price was based on freight on board (FOB) and did not include transportation cost from port of origin. The retail price also reflects the retail costs. Considering the inadequate infrastructure facilities in the country, marketing cost is high and hence, retail price is relatively high. Data on Japan prices were sourced from FAO and were derived by dividing value of imports from the Philippines by the volume of imports from the same country. The exports prices (freight on board) were sourced from the Central Bank of the Philippines while farm, wholesale and retail prices were gathered from the Bureau of Agricultural Statistics.

Table III.7 . Prices of Fresh Pineapples in the Value Chain

Market Level	Prices (US\$/kg)*		% to Japan Price	
	2001	2002	2001	2002
Price in Japan	0.50	0.50	100	100
Phil Export (Freight on Board)	0.16	0.15	32.26	30.33
Retail	0.18	0.18	36.4	35.11
Wholesale	0.14	0.14	28.41	27.27
Farm	0.10	0.08	19.41	16.82

*56 pesos to 1 US\$

Source: Bureau of Agricultural Statistics, Central Bank of the Philippines

Table III.8. Cost structure, fresh and canned pineapples, 2005.

Price/Cost Item	Prices/cost per box (US\$)		% Share to Price in Japan			
	Fresh (1 box=10 kilos)	Canned #2 tall (1 box =24 cans)	Fresh		Canned #2 tall	
			CIF	SP	CIF	SP
Price in Japan (CIF)	7	6	100		100	
Selling Price in Japan(SP)	10.5	8		100		100
Transport cost	1.9	1.2	27	18	20	15
Packaging materials cost	0.8	1.6	11	8	27	20
Tin can		1.2	0	0	20	15
Label	0.1	0.1	1	1	2	1
Box	0.7	0.3	10	7	5	4
Growing Cost	3.5	2.5	50	33	42	31
Labor	1.0	0.7	14	10	12	9
Planting materials	0.6	0.4	9	6	7	5
Chemicals	1.3	0.9	19	10	15	11
Trucking	0.5	0.4	7	5	7	5

Source: Key informant interview (2005)

In terms of the cost structure, the cost of growing pineapples accounts for the bulk of the total with a share of 50% of the price in Japan (CIF) for fresh pineapples and around 42% for canned pineapples. Of the growing cost, the cost of chemicals is the largest, accounting for 19% of the price in Japan (CIF). Details of production cost are presented in Annex 3. The difference between CIF price and selling price is larger for fresh pineapples because of the nature of the product, which entails a higher handling cost. Transport cost is also significant which accounts for 27% and 20% of price in Japan (CIF) for fresh and canned pineapples, respectively. Cost of packaging is also substantial, particularly for canned pineapples with a share of 27% and 20%, respectively. For canned pineapples, cost of tin can is 20% of price in Japan (CIF). Labor cost is also significant, contributing about 14% of the price in Japan (CIF).

3.3 Key players and linkage development

The global players for the pineapple industry are Dole, Del Monte, Chiquita and PT Great Giant of Indonesia. Dole and Del Monte export fresh pineapples to the US, Japan, the Middle East and other countries in the Asia-Pacific. Processed pineapples, on the other hand, are marketed to Japan, South Korea, the Middle East and China. Chiquita, however, exports both fresh and processed pineapples to Australia and Europe aside from the US. The products of PT Great Giant are sold in the Asia-Pacific region.

In the Philippines, the main players in the pineapple industry are Dole Philippines (Dolefil) and Del Monte. There are two Del Monte companies in the country. One is Del Monte Fresh Produce Philippines (Del Monte Fresh) with plantations in Calinan, Davao City and the other is Del Monte Pacific Limited Philippines with plantations in Bukidnon for fresh and

processed pineapples. The two companies have different owners. It is also interesting to note that while the Lorenzo family maintains a substantial share of investment in Del Monte Pacific Limited, their company, Lapanday Foods Co. also has a considerable interest in fresh pineapple operations under their subsidiary Lapanday Diversified Products Corp..

To better understand each of the members of the supply chain, a list of key players in the supply chain is provided in Tables III.9 and III.10.

Table III.9 Players in the supply chain.

Node in the Chain	Players
Production	Dole, Del Monte, Lapanday, Davao Agricultural Ventures, T'boli Agricultural Development Inc. (TADI)
Processing	Dole, Del Monte, T'boli Agricultural Development Inc.
Wholesale/Distribution	Seven Eleven, Sumitomo
Retail	Rustan, SM, Gaisano, NCCC, KCC, MAKRO
Customer	<i>Institutional:</i> Jollibee, Mc Donald's, Fast food chains, Hotels, Hospitals, Restaurants <i>Individual:</i> High end social class (A, B), Low end social class (C, D)

All the companies use the MD2 variety of pineapples although these pineapple companies have their own names. Dolefil plants the Mayang Gold 3 for their fresh and the F-200 for their processed. It is Sweet 16 for Del Monte Pacific for their fresh while Clone 74 is used for their processed. Del Monte Fresh plants the Del Monte Gold while Lapanday plants the Honey pines.

In what follows, we look at the three major pineapple companies in the Philippines.

3.3.1. Dole

Dole's Worldwide Packaged Food Division operates three canneries in Asia: two in Thailand and one in the Philippines. These canneries supply North America, Europe, Asia, Australia and the Middle East. These canneries have significantly expanded their operations into diversified products, including plastic cups and pouches. The pineapples used at these canneries are sourced from a large Dole-operated plantation and independent growers in the Philippines and, primarily, from independent growers in Thailand.

In the Philippines, Dole's operations are located in the island of Mindanao. Farming in the Philippines began over 35 years ago with the establishment of pineapple production at Dolefil, the Dole subsidiary in Polomolok. Dolefil currently produces almost one-half million tons of fresh and processed pineapple per year. Dolefil has been among the top 200 corporations in the country in terms of net income, and among the top 50 in terms of gross revenue in past years.

Table III.10 List of Key Suppliers

Inputs	Suppliers
Land	Farmers (with landholding of 1 hectare Average), Department of Agrarian Reform beneficiaries
Heavy equipment & agricultural machineries	International Harvester (IH), Ford, Komatsu, Caterpillar, John Deer
Labor	Agrarian reform communities residents, local folks
Hauling trucks	IH, Caterpillar, Ford
Planting materials (crowns, suckers, slips)	Company-propagated and supplied
Fertilizer	Atlas Fertilizer Corporation, Viking, Philphos
Chemicals: pesticide, nematocide, insecticide, fungicide, herbicide, lime, magnesium Phosphate	Bayer, Cyanamid, Shell, Dupont (For Dole, local suppliers are mostly employees)
Boom sprayers	CAMECO (U.S.), Local Fabricators

Of the total annual production of Dole, only 20% are sold as fresh fruits and the rest are processed. In terms of sales, only 5% of the canned products produced by Dole are sold locally while the rest (95%) are exported. Yield per hectare, in terms of harvested pineapple, is 40 metric tones and a large chunk of this is processed.

The main raw materials (pineapple) come from two main sources. One is from company- managed farms, most of which are lands of Dolefil Agrarian Reform Beneficiaries Cooperative (DARBCI). These comprise more or less 60% of the total company- managed farms. About 40% are lands leased by private individuals through a Farm Management Contract (FMC) with the company. In an FMC, the company plants and cultivates these lands and harvests the fruits and delivers to its cannery. FMC landowners are paid annual rentals plus royalty based on land production. The company spends for the inputs for the farms (fertilizers and chemicals), most of which are imported. Urea is imported from Indonesia, while other fertilizers and chemicals come from other countries. The other source of raw materials for processing is from contract growers. About 3,000 hectares (and increasing) are under Grower Agreement with individual farmers. This is a tripartite agreement, where the rule of the company is to provide technology and to purchase the fruits from the farmers. Land Bank of the Philippines (LBP) provides the money while the grower manages the farms. Most growers are members of growers cooperatives, a requirement of LBP before they can avail of loans. Otherwise, it will be difficult for them to get a loan. There are, however, some growers who are financing their own operations without any loan from LBP. As against the company- managed farms, the growers plant and cultivate their farms then harvest and deliver the fruits to the cannery or to the fresh fruit packing plant as the case may be. Fruits are paid when delivered to the company's facility. Grower contract is usually for one cycle (about 3 years), after which both parties renegotiate the contract.

Aside from the pineapple fruits, the main raw material needed in the canning operation is sugar. Sugar used by the company is imported from Australia and Thailand (raw) and refined in Korea. The other raw materials (for other pineapple-based products) include nata de coco, which is supplied by individual nata growers. Many growers are from Davao and deliver the

materials to a receiving area outside the cannery where these are inspected and graded. Materials are paid at the FOB receiving area. Papaya is also supplied by individual growers. The fruits are delivered to the cannery, inspected and graded. Only fruits of acceptable quality are paid. Mandarin, strawberry, peaches and other ingredients are imported.

Packing materials are manufactured by the company although the raw materials are all imported. The company has its own box plant and a can manufacturing plant. Materials for the boxes are imported mainly from the US (direct) while tin plates for the cans come from Japan. Although materials for labels are imported, these are printed locally, by a printing press 80% owned by Dolefil.

As to the marketing of the finished products for export market, marketing of fresh pineapple (including logistics planning) is done by a marketing group based in Japan. This group gets orders from the customers (institutional) and forwards them to the plant in the Philippines. This group decides the shipping schedules and volume. The production group communicates with this marketing group. For canned pineapple, about 90% are shipped to foreign markets. The main market is North America while Europe and Asia are secondary markets. Marketing is handled by the main office located in Wastelake.

Quantum Foods, a subsidiary of Dole Philippines, Inc., handles the local marketing of Dole products. Most local sales are canned pineapple and pineapple-based drinks. A very small volume of fresh pineapples is sold locally.

3.3.2. Del Monte

The Del Monte brand originated in the United States in 1892, and has since become a household name all over the world. Del Monte Corp. is the owner and licensor of the Del Monte brand name and trademarks in most territories of the world. To date, it has granted a number of perpetual, exclusive, royalty-free licenses for the use of the Del Monte name and trademarks outside the United States.

Del Monte Pacific Limited

Del Monte Pacific Limited owns the Del Monte trademark in the Philippines and the brand rights for the India subcontinent territories. The company has long-term supply contracts with Del Monte Asia/Kikkoman, Cirio Del Monte, Del Monte Foods, Kraft Canada and Del Monte Fresh Produce, all of which have exclusive rights to the Del Monte trademark in their respective territories or product categories.

Del Monte Pacific Limited and its subsidiaries are not affiliates of Del Monte Corp. and its parent, Del Monte Foods Company, or Fresh Del Monte Produce, Inc. and its subsidiaries, or Kikkoman Corporation and its subsidiaries, including Del Monte Asia Pte Ltd.

Del Monte Pacific is a group of companies engaged in the production, marketing and distribution of premium-branded food and beverage products. The group owns the Del Monte brand in the Philippines, where it enjoys leading market shares for pineapple juice, juice drinks, pineapple solids, mixed fruits, tomato sauce, spaghetti sauce and tomato ketchup, and also markets products under its second-tier brand, Today's.

Operating one of the world's largest fully integrated pineapple operations, the Group is the global low-cost producer of pineapple and has long-term supply agreements with Del Monte trademark owners and licensees around the world. Del Monte Pacific also holds the exclusive rights to produce and distribute food and beverage products under the Del Monte brand in the Indian sub-continent.

Del Monte Pacific's mission is to be a leading fully integrated Asian-based international food and beverage company that develops and markets quality branded products to customers all over the world. In order to achieve such mission, they have the following four-pronged growth strategy:

- Adding value by introducing higher-margin, value-added products, line extensions and innovative packaging formats that cater to customers' needs. The goal over time is to change the product mix from traditional, canned products to premium products that have higher margins and greater growth potential.
- Improving customer service by introducing new packaging capabilities to meet worldwide requirements with greater flexibility and better time-to-market.
- Enhancing product quality and reducing costs with prudent investments in productivity programs, production technology and supply chain management.
- Building markets by growing existing markets and expanding into new ones. This is planned to be achieved by pursuing acquisitions, joint ventures, and/or strategic alliances that make sound business and financial sense.

Asia is Del Monte Pacific's largest market, and includes the Philippines, where Del Monte Pacific owns the Del Monte trademark for premium-branded food products, and the Far East, where the group sells Del Monte branded processed food products to Del Monte Asia/Kikkoman Corp and fresh pineapples to Del Monte Fresh Produce International.

In Europe, Del Monte Pacific sells its products through Cirio Del Monte International. In the USA, Del Monte Pacific sells its products through Del Monte Foods and Dr. Pepper/Seven Up, while in Canada, its products are sold through Kraft Canada.

The company operates one of the world's largest pineapple processing and canning facilities in the Philippines. The production facility has a current annual capacity to process approximately 700,000 tons of pineapples, representing approximately 20% of the world's processed pineapple production. The competitiveness of this operation is complemented by an on-site can-making operation. As the global low-cost producer, the group produces pineapples in its own 18,600-hectare plantation -- an area outside the typhoon belt, which makes it ideal for growing .

Del Monte Pacific's fully integrated operations ensure the delivery of premium quality and a very efficient supply chain from production to market. The group continues to implement cost-reduction and productivity-enhancement programs, and invests in new technology and equipment to maintain its leadership position in the industry.

Fresh Del Monte Produce Inc.

Fresh Del Monte Produce Inc. is the holding company of the Del Monte Fresh Produce Company. Although no longer related to Del Monte Foods, the company holds the license to use the name on the fresh fruit that it grows, transports, and markets in North America, Europe, and Asia/Pacific. Its Del Monte Gold Pineapples have made it the world's number one pineapple seller, with about 50% of the market. The firm is also one of the world's top banana producers, with 15% of the world market share. Produce is grown on company-owned farms and purchased from contract growers. The Abu-Ghazaleh family (including CEO Mohammad) owns 51.4% of Fresh Del Monte Produce. Fresh Del Monte Produce Inc. is one of the world's largest producers and marketers of fresh fruit, vegetables and other produce. The company grows, distributes, transports and markets its fresh products to more than 50 countries worldwide.

The company has a vertically integrated network that allows it to manage the transportation and distribution of its products in a temperature-controlled environment, which translates to freshness and quality. It has investments to meet growing demand from supermarket chains, club stores, mass merchandisers and independent grocers and to provide value-added services, including the preparation of fresh-cut fruit and vegetables, ripening, customized sorting and packing, direct-to-store delivery and in-store merchandising and promotional support. In total, it markets and distributes its products to retail stores, wholesalers, distributors and foodservice operators in more than 50 countries around the world.

The Case of Del Monte Fresh Produce Philippines, Inc.

Del Monte has been in the country since 1968. It was then owned by the corporation. Del Monte Fresh Produce Philippines, Inc. in partnership with Antonio Florendo Management and Investment Corporation (ANFLOCOR) which manages the Davao Agricultural Ventures Corporation (DAVCO) in Calinan, Davao City. It currently has 1,000 hectares of pineapple plantation in Subasta, Baguio District and Sirib, Calinan. DAVCO, now almost 21 years in existence, was actually originally administered by ANFLOCOR as a grower of pineapples for Chiquita. However, a number of operational problems persisted, causing wastage and resulting to the dissolution of the growership with Chiquita. Del Monte Fresh, then, sought the opportunity for a new alliance with ANFLOCOR. Del Monte has nine supervising personnel, including the Director for Pineapple Operation Mr. Luis Gerardo G. Alvarado, a Costa Rican stationed in the plantation. They head the operations and are in-charge of all the inputs and technology required while DAVCO supervises the other human resources (office workers in the plantation as well as laborers). There are currently almost 200 employees of Del Monte Fresh. Their main office is located in barangay Pampang, Davao City. Before, the company had almost 450 employees. The decrease in the number of employees was due to the termination of redundant positions and the empowerment through multi-skilling of retained employees. Employee flexibility by way of rotation and full training was done.

Del Monte Fresh specifically exports fresh pineapple produce to Iran, New Zealand, Hong Kong, Korea, Kuwait and Japan, among others. Their variety is the MD2, otherwise called Del Monte Gold. Del Monte Gold™ Extra Sweet Pineapple is a hybrid pineapple grown in Costa Rica exclusively by Del Monte. It is much smoother tasting than other pineapples. It is

twice as sweet and has four times more vitamin C than a regular pineapple. However, as the company admits, other pineapple companies got hold of the said plant from their Costa Rica plantation. This resulted to the proliferation of the variety. Yet, Del Monte maintains that others may have duplicated their plant but theirs is still the best because their technology has not been copied. This is why Del Monte Fresh is very strict with visitors and very careful not to leak information. Only the nine personnel stationed in the area can freely go around the plantation. Other company employees (even from abroad) have to secure clearances before they can go to the plantation. They prohibit people with technical agriculture know-how, even those from other Del Monte Banana plantations. All operations and technical employees sign a contract with the company prohibiting them to work in similar businesses for five years after the termination of their employment with the company. Taking of pictures within the plantation is not allowed.

Planting and harvesting is done almost daily. Areas planted 14 months ago are harvested while planting takes place in another area ready. . The company harvests approximately from 6,000 to 10,000 boxes of pineapples per hectare. For delivery to their foreign buyers, the produce exits the country via Panabo Port in Del Monte- owned vessels. Before, the company used chartered vessels but lack of control on the temperature the fruits are exposed to while in the vessel compelled it to use company-owned boats instead. Temperature is very critical to fresh produce.

The pineapples are harvested at green-mature or green-ripe (like how bananas are harvested). Del Monte Gold is evenly very sweet even at green-mature and can be eaten right at once. Other pineapple varieties still taste sour at green-mature and need further maturing before it can be eaten. Del Monte Gold also has low fiber content, a quality that makes the variety not suited for processed pineapple products. The Champaka variety is the most commonly used by Del Monte companies for canned products. High fiber content is required for canned products to ensure its longevity.

The original plants of the Del Monte Gold variety were from abroad. The company has been propagating the plants and making use of the suckers and slips for future planting. Almost all their inputs are sourced from local companies. Their fertilizer and pesticide requirements are taken care of by ANFLOCOR, whose urea supplies are bought from Modern Times Enterprises, which in turn sources it from Israel. Fungicides, on the other hand, are bought from Jardin Agchem which also imports them from Israel. Agway Chemical and Congenta supply the pesticides while the boxes used are from Davao Packing Corp. (DAPACOR), an ANFLOCOR company.

Most of the research and development of the company are done abroad by other Del Monte companies. However, R&D inputs from abroad are reviewed locally to gauge their suitability to the conditions in the locality. R&D can actually be done in the country but research has to be proposed to the company headquarters abroad.

At present, DAVCO is home to the most modern packing facility in the world. Used for only a year now, it was built because the venture proved to be very profitable for the owners that further investments were approved. The Del Monte pineapple packing plant in Costa Rica is not as modern because it was not as profitable as the DAVCO's operations. Del Monte Fresh plans

to expand its operations, although in the fresh pineapple business only. It has no plans of going into the canning business because for them, fresh pineapple is a more profitable operation owing to the lack of additional inputs for processing (sugar, tins, etc). The company wants to lease more lands in the area. One factor that is limiting this is unattractive proposals (too high lease fees per hectare) they receive from landowners. Another is the sentimentality of the land owners who, most, cannot foresee the trees in their land cut.

All the equipment used by DAVCO are imported. Their tractors cost a million pesos each while the two harvester equipment they have cost P12 million each. Because of CARP, neither Del Monte Fresh nor ANFLOCOR owns any land on the plantation area. They lease the land from the owners for a minimum of five years.

The plantation is almost seven kilometers from the center of Calinan. The way is 80% rough roads. Most of the few cemented portions have already deteriorated. DAVCO straddles nine barangays. As the company's commitment to the improvement of the community, they assist, through labor and equipment support, repairs of roads and drainage. DAVCO does the scraping of the road to render it passable. For DAVCO, it is the government's job to improve the roads since the company pays what is due in terms of taxes. Moreover, the company also provide jobs. For landowners, two to five workers can be hired permanently per five hectares of land leased. For non-landowners but living within the community of the plantation, contractual employment is offered so long as residence certification is issued by the barangay chairman.

The company chose the Philippines (Calinan in particular) because of its fertile land, low labor cost and the favorable climate (rainfall is regular) suitable for pineapple and banana growing although there is not much incentives and support from the government. Ten years after putting up operations in Indonesia, Del Monte decided to close down three years ago even if that country offers very cheap labor. Del Monte experienced many production problems there, causing its departure from that country. Another reason for leaving is the prevalence of plant diseases (Fusarium) which are very severe and rampant in Indonesia. While the company may have saved on labor costs, additional costs incurred due to the diseases more than offset the savings. Japan, on the other hand, is considered by the company as very expensive in terms of labor cost that is why they do not manage plantations there.

In terms of worldwide operations, Del Monte Fresh considers itself as the largest fresh pineapple exporter and second largest in bananas. Dole, its closest rival, is the largest exporter of fresh bananas and second largest in fresh pineapples.

The chain of activities for Del Monte Fresh Produce/DAVCO operations is presented in Table III.11.

3.3.3 Lapanday Diversified Products Corporation

Lapanday Diversified Products Corp. (LDPC), a division of Lapanday Foods Corp., has 200 hectares planted to pineapples in Bukidnon beside that of Del Monte, which covers 20,000 hectares. LDPC produces Honey pines pineapple. Like their bananas, they only sell fresh pineapples. Their pineapple plantation is considerably smaller compared to their banana

plantation. The company branched out to pineapples in response to customers' demands. Besides the availability of a market, Lapanday sees the profits that can be made in pineapples. Lapanday pineapples are also delivered to Japan, Hong Kong and Singapore, the same markets for their bananas.

Their plantation is in Bukidnon because location is critical to the quality of the fruits. Pineapples must be planted at 800 to 1000 feet elevation. The company believes that technology and infrastructure are significant in creating a more viable pineapple business.

The pineapple plants are sourced from their existing plants. The crown as well as the slips and suckers of a pineapple can be planted when the existing ones no longer bear quality fruits. It is said that a pineapple plant is good only for two harvests, which are 18 months apart. After the second harvest, the ensuing fruits are no longer as big as the first two. As for the fertilizers needed, Lapanday's Fertilizer Central Purchasing Group source theirs from China because of lower prices (they piggyback their pineapple operations' needs to that of their banana operations' needs). Eighteen months after planting (or harvesting for second generation fruits), the pineapples are harvested. The lower parts of the fruits are dipped in a fungicide solution and then wrapped in a paper before being boxed in LDPC's own packing plant. The boxes they use are supplied by the Mindanao Corrugated Fibreboard, Inc. and Steniel Mindanao Packaging Corp., the same ones which supply their requirements for bananas. When the pineapples are ready, they are placed in a reefer van and exit the country via Madaum or Cagayan de Oro in a Lapanday-chartered boat.

LDPC eventually plans to contract grow pineapples. This is expected since the lessors realize that they get more profits in contract growing than leasing. Another plan is the creation of Lapanday's own packaging plant in the near future. The owners of Lapanday envision their pineapple division to be more significant. When this happens, they have already laid the groundwork.

Chain of activities for LDPC is presented in Table III.12.

3.4. *Upstream linkages*

Compared to other export commodities, the contractual arrangements in the pineapple industry are mostly lease-back agreements between multinational processors and farmers' cooperative-producers. Leaseback agreement was an offshoot of Section 8 of the Comprehensive Agrarian Reform Law which created a cooperative among agrarian reform beneficiaries from the transfer of the National Development Corp. lands (formerly leased to multinationals) to the plantation workers. Leaseback agreement was then the best option considering the large capital requirements, long gestation of production (three years from planting to harvest) and the high-end technology requirements of pineapple production. The agreement was designed to have the least impact on both the plantation workers and the multinational company.

Table III.11. Davao Agricultural Ventures Corporation/Del Monte Operations, Inputs and Sources

Process	Inputs/needed resources	Source
Planting	Suckers/slips	Own-bred; pioneer seeds from Costa Rica
	Fertilizers	Local
	Labor	From the community Technical know-how and supervision from Del Monte
	Water	From rainfall/irrigation (when needed)
Maintenance	Fertilizers	Local (ANFLOCOR sources)
	Pesticides/Fungicides	Local (ANFLOCOR sources)
	Labor	From the community Technical know-how and supervision from Del Monte
Harvesting	Equipment	Imported
	Labor	From the community Technical know-how and supervision from Del Monte
Cleaning of produce	Labor	From the community Technical know-how and supervision from Del Monte
	Antiseptic Solution	Local
	Water	From local source
Packing	Boxes	DAPACOR (ANFLOCOR Company)
	Plastic Containers	- (reusable)
Transporting for exports	Refrigerated Van	Company's owned (imported)
	Vessels	Company-owned
Selling for off-specs		Merchants purchase from the company

Source: Key informant interview, 2004

Table III.12. Lapanday Diversified Products Corporation Operations, Inputs and Sources

Process	Inputs/needed resources	Source
Planting	Crown/suckers/slips	Own-bred; pioneer seedlings from Costa Rica
	Fertilizers	Imported from China
	Labor	From the community Technical know-how and supervision from LDPC
	Water	From rainfall/irrigation (when needed)
Maintenance	Fertilizers	Imported from China
	Pesticides/Fungicides	Imported from China
	Labor	From the community Technical know-how and supervision from LDPC
Harvesting	Equipment	Imported
	Labor	From the community Technical know-how and supervision from LDPC

Cleaning of produce	Labor	From the community Technical know-how and supervision from LDPC
	Fungicide solution	Imported from China
	Water	From local source
Packing	Paper	-
	Boxes	Mindanao Corrugated Fibreboard, Inc. and Steniel Mindanao Packaging Corporation
	Pallentize	-
Transporting for exports	Refrigerated Van	Company's own (imported)
	Vessels	Chartered by the company

The Comprehensive Agrarian Reform Program (CARP), implemented by the national government, impacted negatively on some of the lease agreements. A case revealed that, in order to subvert CARP, some large tracts of farmland owned by one agent were subdivided into small parcels and named after the landlord's children. Individual contracts were then drawn out for each title but the transaction remained exclusively between the original owner and the company.

Del Monte Pacific Resources Ltd (DMPRL) owns the Del Monte trademark in the Philippines and manages Del Monte Phils., Inc. which operates the world's largest contiguous pineapple plantation. It covers over 14,000 hectares (1,600 feet above sea level and a plateau) in Bukidnon (Northern Mindanao) and produces in excess of 600,000 metric tons of pineapple per annum. This plantation is located in Manolo Fortich, Libona, Impasug-ong and Sumilao. DMPI is considered to be the biggest pineapple plantation in the Far East, and one of the oldest in the Philippines, having started in 1926. It now produces pineapples under leaseback agreement contract with the Del Monte Philippines Inc (DMPI) Employees Agrarian Reform Beneficiaries Cooperative (DEARBC).

Dole Philippines, Inc. (Dolefil) operates around 9,000 hectares of pineapple plantation and a processing plant at the foot of Mt. Matutum, covering the municipalities of Polomolok, Tupi and Tampakan. Pineapples are produced from the plantation under lease contract with DoleFil Agrarian Reform Beneficiaries Cooperative and a portion from contract growers under an expansion project. Dolefil basically has three types of contract arrangements to interested landowners:

1. Growership Agreement

Under contract-growing, landowners are required to go through farmer cooperatives such as the Integrated Pineapple Production and Marketing financed by the Land Bank of the Philippines. This association is supported by LBP's "Todo Unlad" project that links all significant players in a specific geographic area. The interested agent or seller must commit a paid-up capital to the cooperative to achieve membership status and request for a survey to be conducted on his land. The survey encompasses cadastral assessment and validation of his area's suitability for pineapple farming.

The owner must also attend a seminar and provide the necessary papers such as land titles to establish his ownership. Once these steps are completed, the farm will undergo land preparation to be included in the cooperative's financing budget for the next crop cycle. Then, planting commences and all of the farm's production will be marketed by the cooperative to Dole under an exclusive marketing contract with prices largely dependent on quality. Current price for pineapple harvests is pegged at P 2.20 per kilo. Payment of certain government taxes is also shouldered by the company as part of the agreement.

More than 60% of Dole's currently operated area, estimated at 15,000 hectares, fall under this type of arrangement. The company already moved to as far as Maasim, Malandag and Malungon while farms in the South Cotabato-Sultan Kudarat boundaries are being established in addition to the old areas covering Polomolok, Landan, Tupi and Tampakan. Former TADI plantations in T'boli are also being converted into Dole-operated lands. Under the growership program, farmers can earn an annual net income of ₱ 40,000 per hectare of pineapple.

2. Self-financed Farms

Growers under the self-financing program only forge a marketing agreement wherein all the farm's harvest is exclusively bought by Dole based on prices and quality conditions stipulated in the contract. The grower manages all farm activities while the company provides free planting materials and technical assistance. Input requirements like fertilizers and pesticides are also supplied by the company at cheaper costs.

3. Farm Management Contract (FMC)

FMCs provide the company with exclusive rights to develop, cultivate, and manage all aspects of pineapple farming in the leased lands for a period of 25 years. Previously, 10-year renewable contracts were implemented in the FMCs but the increasing competition in securing land areas encouraged the development of longer contract periods to ensure that the company is assured of its future production volume.

Dole pays an annual rental of ₱ 8,000/hectare plus yearly incremental adjustments that range from 7%–10% for the succeeding years. Production incentives and profit sharing are also provided for in the agreement. To attract new agents and convince old lessors to renew their contracts, advance lump sum payments equivalent to a minimum of five years rental is a common practice in the industry.

There are have been cases where there is a positive relationship existing between principal and agent that influence the agent's decision to renew expired land rental agreement with the company. Some portions of the land rented by Dole are owned by current or former employees that have developed a sense of loyalty towards the firm, thus, they tend to extend the contracts rather than terminate their relationship with the company.

T'Boli Agricultural Development Inc (TADI) is a Filipino-owned company with a pineapple packing and processing plant in the municipality of T'boli, South Cotabato. It operates around 5,000 hectares of pineapple farms covering the municipalities of T'Boli and Surallah.

TADI mainly sources fresh pineapples from the contract growers under joint agreement with the Land Bank, the farmers and the company.

Table III.13 provides a comparison of the features of agricultural contracts among key players in the pineapple industry.

3.5 Key findings

3.5.1 Competitive edge and opportunities

Except for canned pineapples, exports of pineapple products such as fresh pineapples, pineapple juice and concentrates have been increasing. There are opportunities to expand production for fresh pineapple exports as demand continues to increase. In the last five years, imports of fresh pineapples have been increasing by an average of 11% per year.

In 2002, the Philippines supplied 98% of Japan's fresh pineapple imports equivalent to 120,164 metric tons valued at ¥ 7,448. This monopoly of the Japanese market's huge demand makes it a very attractive industry to participate in.

Recently, Dole and the Polo Samahang Nayon Multi-Purpose Cooperative financed by LBP unveiled a proposed ₱ 100 million pineapple plantation expansion project in the 3,720-hectare agricultural area of Amsipit in Maasim, Sarangani Province. It started with pilot plantations in some test sites in one sitio and later expanded into six other neighboring sitios in the area. The project will develop about 3,000 hectares of Amsipit land into pineapple plantations in the next five years.

The low number of competing companies in the region reduced intensity of internal rivalry within the industry. Further integration of the activities of small-scale growers can help improve their cost structure and allow them to participate competitively in the market.

Table III.13. Features of agricultural contracts in the pineapple industry, by producer-exporter

Provisions	Del Monte Phils – DEARBC	Dole Phils Inc- DARBC	Dole Phils Inc- Growers	TADI
Land	Exclusive right to develop, cultivate, improve, plant, administer and manage agricultural projects on the land (14,000 hectares)	Exclusive right to develop, cultivate, improve, plant, administer and manage agricultural projects on the land (8,937 hectares)	Expansion project in view of the increasing demand for fresh pineapple. A nucleus enterprise that extends technical assistance, free planting materials and growers handles production to harvest (2,500 hectares)	A pure contract growing under production agreement with Land Bank, small farmers/cooperatives and the company. The farmers fully in-charge of production with technical assistance from TADI and financial support from LBP (5,000hectares)
Term	25 years renewable	25 years renewable	Every cropping (one plant crop and two rattons)	Every cropping (one plant crop and two rattons)

Payment	Annual rentals (P8,000 per hectare) (adjusted at 7% per annum), production bonus of P500/hectare and profit share of 3% of the net income	Annual rentals (P8,000 per hectare) (adjusted at 7% per annum), production bonus of P500/hectare and profit share of 3% of the net income	Pays P1.5 per kilo to all fruits produced in the farm (big or small) and pays premium at P2/kilo on fresh fruit quality	Pays P1.5 per kilo to all fruits produced in the farm (big or small) and pays premium at P2/kilo on fresh fruit quality fruits
Others	Pays taxes, priority employment of ARBs and their dependents	Pays taxes, priority employment of ARBs and their dependents	Grower pay taxes; exclusive production for the company; provided with free planting materials, technical assistance, and credit on fertilizers and chemicals; must be a member of a cooperative to facilitate Land Bank financing	Grower pay taxes; exclusive production for the company; provided with free planting materials, technical assistance, and credit on fertilizers and chemicals; must be a member of a cooperative to facilitate Land Bank financing

Source: Digal (2004)

The cooperatives can consolidate operational requirements of the growers in input materials, transportation and logistics to secure greater discounts or achieve economies of scale by spreading the involved costs over a higher number of growers.

Consumers around the world continue to show a growing preference for healthy food products like fresh fruits. The pineapple fruit has great nutritive value as it contains carbohydrates, fiber, other valuable minerals and fair amounts of potassium, vitamin C, vitamin A, B1, and B2.

The entry of further-processed pineapple products into the world market is also seen to attract more foreign investments in manufacturing, which will further push domestic demand of pineapples. Since the fruits will go through a series of manufacturing processes, quality requirements may not be as stringent as those imposed by importing countries on fresh produce.

The case of TrailMix (dried fruits) contributed to an increase in the demand for fresh pineapple, which is expected to vigorously boost production. Small farmers and integrators will now have a fair chance of competing efficiently in the local market that has a lower cost structure than the export trade.

Dole is now producing and exporting fresh and processed pineapples to Korea and the European markets, a development that promises to open up a wider playing field for Philippine pineapple producers. Utilizing the force of a unified group can help the growers compete strongly in capturing a fair share of the world market.

As contribution to Dole's expansion programs in Maasim, the local government pledged to build more farm-to-market roads and rehabilitate their existing infrastructure using funds from the taxes that will be generated from the project. The roads will ensure easier and faster

movement of products to and from the plantation sites and open up the area for other opportunities. Agriculture Assistant Secretary Maya Santos also committed to secure funding for additional infrastructure and farming equipments for the farmers when she visited the area.

Aside from the road networks, the cooperatives can also optimize the benefits of the government's roll-on roll-off (RORO) initiative to address their difficulties in shipping. Instead of going through the inefficiencies of the nation's port systems, the RORO provides better option to shippers.

3.5.2 *Issues*

There are still a lot of inadequacies in the region's infrastructure despite the established road networks linking farms to the market. Some pineapple plantations are located in areas that are not easily accessible, making the transfer of products more costly.

Fresh pineapples require appropriate temperatures in order to maintain its freshness and quality upon reaching its destination markets. In the case of small integrators, shipping fresh products entails higher costs and greater risks due to the inefficiencies in handling and shipping especially if they rely on local port agencies and carrying vessels.

Small shippers are often forced to make under-the-table transactions with the loading crew to ensure that their cargoes are prioritized or given favorable spaces in the ship to maintain its quality. This widespread fraudulent practice further drives up shipment costs.

Only large companies are capable of meeting the technical requirements of pineapple production as small growers are deficient in agricultural technologies and improvement processes. The contract growing scheme helps improve this condition since principals are obligated to extend technical assistance to the farmers.

The prevalent practice of pole vaulting among contract growers is still a problem that besets the pineapple industry in the region. It is becoming increasingly difficult to determine whether the fresh pineapple sold by local fruit vendors were bought from contract growers or harvested from their own backyards. Pole vaulters and illegal buyers have established informal relationships that they are not willing to endanger due to mutually beneficial arrangements they get. Buyers can get the products at a lower cost while growers sell their produce with lesser quality considerations. The cash exchange that results from the transaction also increased its attractiveness especially to contract growers who are dissatisfied with the terms of agreement with the company.

The ongoing initiatives of LBP have shown great potentials in improving the situation of small growers. Replicating this achievement in other agricultural sectors with the help of different public agencies will allow the local industry to increase its capabilities and reinforce its bargaining position over suppliers, buyers and business partners.

The deficiency of small growers in addressing their technical concerns can be resolved by giving them the opportunity to undertake skills training, field exposure and other learning

methods. Further, extending their affiliation in the various sectors is a good way of expanding their contacts base and helps them establish and develop larger marketing networks. These groups can even seek accreditation in international food organizations to gain collective benefits in pricing and distribution.

Just like any other business enterprise, cooperatives endeavor to maximize their profits while providing assistance to its members. Integration of small farmer cooperatives into regional associations will allow the member groups to enjoy better economies of scale and scope as they consolidate their logistics and distribution activities.

The economies of scale and scope enjoyed by the two companies pose considerable obstacles to future entrants in the pineapple fruit sector. Small players compete in a very minimal way in the acquisition of fresh fruit supply but the processing techniques, infrastructure, marketing and financial edge of Dole and TADI are beyond their capabilities.

This is further aggravated by the learning economies acquired by both firms through their lengthy operation. The technical proficiency gained by the large operators in all aspects of the pineapple business makes it very difficult for new aspirants to participate efficiently. For instance, the pink disease prevalent in pineapple growing is a quality issue that must be properly addressed by competent technical staff which the companies already possess.

Shipping is another significant entry barrier in pineapple export. Dole enjoys a considerable cost advantage over all other players in the area since they own some of the shipping vessels used in transporting pineapple products to other countries such as the white vessels that carry fresh fruits. These vessels are manned by the company's own crew and supported by technologically advanced equipment to maintain product quality and freshness. The company also utilizes contracted carrying vessels owned by other shipping companies like PM & O and Maersk. As of 2004, Dole's transportation cost from General Santos City to Japan was estimated at less than \$2,000/20-footer container for fresh pineapple and canned products are 70% - 80% lower.

The company also has its own port facilities that enhance its shipping operations. On the contrary, the little farmers have to contend with the red tape, bureaucracies and corrupt practices in the region's port authority. Small-scale growers and even TADI cannot directly compete with the benefits of a highly-integrated operation such as Dole's.

The establishment of a large-scale plantation requires consolidated areas and this is significantly hindered by the implementation of the government's Comprehensive Agrarian Reform Program that reduces the area owned by an individual. Interested entrants will need substantial financial backing to integrate vast tracts of land through different schemes. However, consolidation of farmers through cooperatives or associations is gradually enhancing the small growers' competitiveness.

Aside from labor, land rentals, fertilizers, pesticides and other input materials are major components of the cost structure in the fresh pineapple business. In the processed pineapple segment, sugar, packaging and other manufacturing expenses further increase production costs.

Fresh pineapple is currently produced between \$3 and \$4 per box while canned pineapple costs almost twice the amount due to further processing steps. Total production cost is estimated at ₱ 340,000 per cycle per hectare.

Reducing these expenses can greatly improve the company's profitability, thus, upstream integration of some input materials is implemented by large processors. In the case of Dole, it operates its own box and tin can manufacturing plants to supply the manufacturing division's packaging requirements. Labels are even produced by a local printing firm in General Santos City of which Dole is a major shareholder. This strategy helps lessen the bargaining power of suppliers over the company.

While this benefit is not enjoyed by the cooperatives and other small farmers, growers under Dole's financing agreements profit from the company's substantial influence over suppliers. This is better experienced in the farm chemical requirements of self-financed growers that buy input materials from Dole. The company is given deep discounts when purchasing the item in bulk from Indonesia and they transfer this benefit to the farmers by selling the product at a lower cost as provided for in their contract agreements.

Big importing countries like Japan wield significant bargaining muscle over food safety and other quality specifications for pineapple exports despite the product's strong position in the overseas market. Japan alone has set three criteria for imported fruits and vegetables: plant quarantine in accordance with the Plant Protection Law, food sanitation inspection based on the Food Sanitation Law, and customs inspection. Most of their standards relate to the maximum limits of pesticide and antibiotics residue, sanitary issues, packing and labeling, and company quality specifications particularly on fresh produce. They impose company-specific factors (size of the company and culture and training of staff) and country-specific factors (public sector assistance to producers and exporters and the degree of implementation of food sanitation regulations).

Imposition of these stringent quality requirements, especially the company-specific ones, often hinders the exportation activities of minor players, including those that were already integrated into associations and supported by public policies. Only the large multinational processors can sufficiently meet these conditions, leaving the integrators at a significant disadvantage in the export field.

Domestic buyers, on the other hand, are mostly wholesalers and retailers that trade fresh pineapple either for immediate consumption, like in the hotel and restaurant business, or further processing such as Trail Mix production. They may impose quality restrictions but the lower price commanded in the local market and the seasonal nature and irregular availability of pineapple supply somehow restrict their level of influence over the producers.

There are a number of issues that need to be addressed to improve performance of the industry. Some of these were identified during the key informant survey and are presented in Table III.14. As can be noted, some of these issues are the same ones affecting other fruit industries such as the banana industry. For example, the issue of land ownership and use rights is also prevalent in the pineapple industry. Demand for land for expansion is increasing particularly with expanding export demand. Unlike banana, processing is a key business in the value chain as pineapples are processed into juice, canned pineapples and concentrates. The high

cost of sugar thus becomes a major issue. Below are some of the policy issues that affect the industry.

Table III.14. Issues affecting linkage in the pineapple industry

High cost and low quality of sugar
High cost of agricultural chemicals
High cost of packaging materials
Inadequate access to credit
High freight/shipping cost
High cost of sugar/liquidation of sugar
Food equipment are expensive and imported
High labor costs due to mandated wages
High fuel costs
Difficulty in implementing clean-air act
Succession issue in Comprehensive Agrarian Reform Law
Watershed issues raised by water district
Poor infrastructure facilities
High power rates
Competition from other countries such as Thailand and Indonesia
Lack of incentives to invest in agriculture because ownership large land is prohibitive
Peace and order problem

Source: Key informant survey, 2004

4.0 Mango

4.1 Production and export trends

Total world production of mango reached more than 26 million metric tons in 2004 from 18 million metric tons in 1992. The 33% increase from 1992 to 1997 was faster than the 11% increase from 1997 to 2004 (Table IV.1).

The largest producer of mangoes in the world is India, which accounts for 42% of the world production. This is followed by China, which expanded production rapidly from 1.1 million metric tons in 1992 to around 4.7 million metric tons in 2004. This growth in production is much faster than the rest of the world. India and Philippines, for example, decreased production from 1997 to 2004.

The Philippines' share of world production in 2004 was 3.39%. This share is lower compared to 1997 but higher compared to 1992. This is because production declined by 11% from 1997 to 2004.

The Philippines' expansion in area for mango production is the fastest among the top 10 mango producers in the world. Total area increased annually by 9% between 1992 to 2003 and started to slow down during the last five years, growing only by 7%. China and Papua New Guinea increased their areas planted to by 8% and 7% per year in the last 10 years. It should be noted, however, that Papua New Guinea expanded more aggressively during the last five years, increasing its mango area by 13% per year.

Table IV.1 World mango production, 1992-2004

Mango Production	Production (MT)			% Change	
	1992	1997	2004	1990-97	1997-04
Total World Production	17,851,353	23,665,317	26,286,255	32.57	11.08
Largest producer –India	9,223,256	11,000,000	10,800,000	19.26	-1.82
2nd largest producer– China	1,123,834	2,409,787	3,622,000	114.43	50.30
Philippines	330,131	1,004,700	890,000	204.33	-11.42
Philippines as % of World (%)	1.85	4.25	3.39	--	--

Source: FAOSTAT 2005

The largest mango exporter in the world is Mexico, followed by the Philippines and Brazil (Table IV.2).

Table IV.2 World mango exports, 1992-2003.

Mango Exports	Exports (000 US\$)			% Change	
	1992	1997	2003	1992-97	1997-03
Total World Exports	210,979	358,538	560,362	69.94	56.29
Largest exporter -mexico	84,858	127,576	117,200	50.34	-8.13
3rd largest exporter -Brazil	6,905	20,182	75,744	192.28	275.30
Philippines (2 nd largest exporter)	28,669	40,479	45,000	41.19	11.17
Philippines as % of World (%)	13.59	11.29	8.03	--	--

Source: FAOSTAT 2005

World exports of mango have been rapidly increasing from around \$211 million in 1992 to more than \$560 million in 2003. The top three exporters have been responding to this opportunity. In particular, Brazil increased exports from only \$7 million in 1992 to about \$76 million in 2003. The Philippines, on the other hand, increased exports during this period but not as fast as Brazil. Although Brazil surpassed the Philippines in mango exports in 2003, average exports of the Philippines from 1992-2003 were greater than Brazil's.

Exports of mango juice had been erratic for the last decade, increasing rapidly from 1992 to 1997 but declined from 1998 to 2003. Egypt increased exports significantly, supplying around 92% of the world requirements in 2003 (Table IV.3).

The Philippines used to be the top exporter in 1992, accounting for 38% of the world exports that year. In 1997, it contributed around 26% of the world exports. However, it did not export in 2003.

In the Philippines, mango ranks third among fruit crops in production, area and value; next to banana and pineapple. It is one of the priority crops under the High Value Crop Law and

is supported by the major programs of the Department of Agriculture (DA), thus ensuring the necessary support for the development of the mango industry.

Table IV.3 World mango juice exports, 1992 to 2003.

Mango Juice Exports	Exports (000 US\$)			% Change	
	1992	1997	2003	1992-97	1998-03
Total World Exports	6,418	9,564	7,114	49.02	-25.62
Largest exporter –Egypt	722	1,384	6,571	91.69	374.78
2 nd largest exporter –Saudi Arabia	1,701	5,583	21	228.21	-99.62
Philippines (2 nd largest exporter)	2,440	2,487	0	1.92	-100.00
Philippines as % of World (%)	38.01	26.00	0.00	--	--

Source: FAOSTAT 2005

4.2 Industry Value Chain

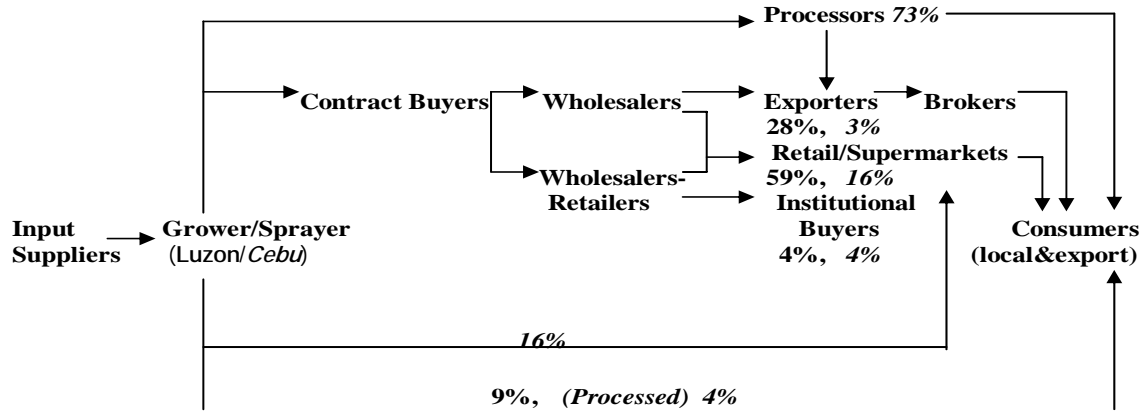
The mango supply chain participants can be classified as follows: 1) input suppliers; 2) growers; 3) sprayers; 3) traders/middlemen consisting of contract buyers, sprayer-traders, wholesalers, wholesaler-retailers, retailers/supermarkets; 4) exporters; 5) processors/exporters; and 6) end consumers.

The supply chain for fresh mango in Luzon is as follows: from the grower-sprayer, 59% goes to retail supermarkets (sourced from grower, wholesaler, wholesaler-retailer), 28% to exporters (sourced from wholesalers and their own buying stations), 9% to direct consumers (sourced from wholesaler-retailer), and 4% to institutional buyers like big hotels and restaurants (sourced from wholesaler-retailer). In Cebu, from the grower, 73% goes to the processors, 16% to retail supermarkets (sourced from contract buyer to wholesaler or wholesaler-retailer), 3% to exporters (sourced from wholesalers), 4% to institutional buyers (sourced from wholesaler-retailer), and 4% to end-consumers (sourced from grower and wholesaler-retailer) (See Figure IV.1).

The mango-processing sector produces various product forms of mango such as mango puree, mango juice, dried mangoes, mango concentrates, frozen mangoes, mango glaze, edible parts, mango in brine and mango preserves. The Philippine mango processors can be characterized as small and medium scale processors.

Companies engaged in the processing of mango into various product forms sell their products for local consumption as well as for export. Most of these small- and medium-scale processors are located in the National Capital Region (Manila), as well as in the surrounding Luzon provinces of Bulacan, Pampanga, Laguna and Cavite. Cebu, however, is where majority of the processors are located. As of 2000, based on the listing of companies registered with the Bureau of Investments (BOI) and other industry listings, there were approximately 17 processors based in Luzon, 11 in Visayas, and four in Mindanao.

Figure 4.1. Philippine Mango Industry Supply Chain



Source: DA, 2002

These processors may be further classified as simply processors, processor/exporter or processor/wholesaler and/or retailer. The annual rated capacity of this sector is estimated at 47,232 MT per year. Of this volume, 13% or 6,349 MT goes to the export market, while the remaining 87% or 40,883 MT are retailed in the domestic market, mostly in supermarkets.

Unlike the retailing sector, the food manufacturing sector is highly concentrated. In 1994, for example, at the five-digit Philippine Standard for Industrial Classification (PSIC), 11 of the 53 industries had four-firm concentration ratio of 100%. Of these 11 industries, five were dairy products. Canning and processing vegetables and vegetable juices, smoking of fish and other marine products, cassava flour milling, manufacturing grain mill products, manufacturing chocolates and sugar confectionery products and wine manufacturing all had 100% four firm concentration ratios. There are also 11 industries with four-firm concentration ratios of at least 90%. Thus, almost half of the 53 sectors are extremely concentrated with ratios of at least 90%.

Prices of mango in Japan in 2002 were around US\$2.83/kg. However, farm price of mango in the Philippines during that time was only \$0.33/kg. This was roughly 12% of the price in Japan. Export price of mango in 2002 was approximately US\$0.84 which accounted for 30% of the price in Japan (Table IV.4). This is roughly the same share if one considers the retail price of mango in the Philippines during that period. Retail prices include retail costs while export price was based on freight on board price and does not include transportation cost.

Compared to banana and pineapple, mango's share of farm price is relatively small. This is because the upstream linkage in the mango industry is relatively weak. More than half of mango production in the country is produced by backyard farms, which is unlike plantation farming in banana and pineapple. Thus, production and marketing costs are low for banana and pineapple compared to mangoes.

Table IV.4 . Prices of mango in the value chain

Market Level	Prices (US\$/kg)*		% to Japan Price	
	2001	2002	2001	2002
Price in Japan	2.85	2.83	100	100
Phil Export (Freight on Board)	0.71	0.84	24.40	29.97
Retail	0.78	0.81	26.72	29.05
Wholesale(US\$/kg)	0.58	0.59	19.88	21.13
Farm(US\$/kg)	0.35	0.33	12.00	11.83

*56 pesos to 1 US\$

Source: Bureau of Agricultural Statistics, Central Bank of the Philippines

Decomposing components of domestic retail price of mango, production cost accounts for 33% for the regular season (April to July) and 39% for the off-season (August to March) (Table IV.5). Around 55% of production costs during the regular season are due to pest control, flower induction and fertilization which require the use of chemicals. This amount increases to about 70% during off-season (Table IV.6) due to application of potassium nitrate. Production, shrinkage and post-harvest losses contribute almost a quarter of domestic retail price particularly during regular season.

4.3. *Upstream and downstream linkages*

One of the concerns in the industry is the lack of forward and backward linkage between growers/suppliers and buyers/exporters, which has affected the mango's market potential. A key factor is the smallness of most farms, which increases cost of consolidation as well as transaction costs in general. Moreover, the pioneering work in the mid-1970s on chemical flower induction, in particular the discovery of potassium nitrate (KNO₃), has allowed the rapid expansion in mango production. This has also been exploited by other mango-producing regions in the world. On the other hand, the predominance of small-scale, often backyard, growers usually engage contractors/sprayers for seasonal production of mango to avoid production risks. This set-up between the growers and traders/middlemen assures the small growers a net income regardless of changes in market prices. Under this scheme, however, the grower is unable to improve neither his income nor his productivity.

Mango farming in the Philippines is dominated by small growers whose farm size is less than three hectares. Based on the latest census on agriculture conducted by the National Statistics Office (NSO) in 1991 pertaining to the distribution of mango farms by size of farm lot, 73% of mango farms are owned by small growers, while 24% operate farm sizes between 3 to 9.99 hectares. Those operating 10 hectares and above constitute only about 3%.

Interestingly, the mango industry in the Philippines is not dominated by any multinational corporation, unlike the banana and pineapple industries where big multinational corporations such as Dole-Stanfilco (Philippines) and Del Monte, Inc. have virtual monopoly over the market, particularly the export markets. However, Dole Philippines and Lapanday Corp. have started venturing into mango production. A few years ago, Dole started with buying from traders and running an experimental farm. Now, they are into contracting a large mango farm where they provide technical assistance in terms of agricultural inputs and management practices. As has been noted, 73% of mango growers can be classified as small to medium scale growers with

roughly 51% who are into backyard farming. The fresh mango industry has some 2.5 million farmers and farm family members who provide raw materials for the varied product lines of the mango processing industry.

Table IV.5 Fresh Mango Production Cost Structure - Regular Season (April-July), 2004

Activity	P/kg	%	Item	Cost	Price	%
Maintenance	1.10	11.00	Production Cost	10.00	10.00	33.3
Fertilization	1.35	13.50	Farm's Profit	5.00	15.00	16.7
Flower Induction	1.45	14.50	Packaging	1.00	16.00	3.3
Pest Control	2.70	27.00	Transport	1.00	17.00	3.3
Bagging	1.40	14.00	Shrinkage	3.50	20.50	11.7
Harvesting	0.30	3.00	Retailer Rental	0.50	21.00	1.7
Trucking	0.30	3.00	Losses	2.00	23.00	6.7
Losses	1.40	14.00	Retailer's Profit	7.00	30.00	23.3
Total Production	10.00	100.00	Total Retail Price	30.00	30.00	100.00

*10- year-old trees, 8 metric tons / hectare, 100 trees / hectare

Table IV.6 Fresh Mango Cost Structure - Off-Season (August-March), 2004

Activity	P/kg	%	Item	Cost	Price	%
Maintenance	2.40	12.00%	Production Cost	20.00	20.00	38.5%
Fertilization	2.80	14.00%	Farm's Profit	10.00	30.00	19.2%
Flower Induction	3.40	17.00%	Packaging	1.00	31.00	1.9%
Pest Control	7.80	39.00%	Transport	1.00	32.00	1.9%
Bagging	1.50	7.50%	Shrinkage	3.50	35.50	6.7%
Harvesting	0.30	1.50%	Retailer Rental	0.50	36.00	1.0%
Trucking	0.30	1.50%	Losses	2.00	38.00	3.8%
Losses	1.50	7.50%	Retailer's Profit	14.00	52.00	26.9%
Total Production	20.00	100.00%	Total Retail Price	52.00	52.00	100.00%

*10 year old trees, 4 metric tons / hectare, 100 trees / hectare

Source: Dept. of Agriculture, Dole Asia and Samal Dream Dev't. Inc.

In the Philippines, 73% of total mango production is predominantly grown in farms of less than three hectares in size and most of the growers can be characterized as backyard growers (51%). Thus, it is difficult to consolidate and market when farms are fragmented and scattered all over the country.

Product grades and standards are sets of product quality specifications and classifications developed by national and private industry to ensure minimum standards of quality for domestically produced crops. Grades and standards facilitate disposal, providing a common language for wholesale trading. As such, they should be efficiently transmitted in the supply chain so that upstream agents can meet the requirements of the market. When standards are

distorted, the incentives to produce quality products are also distorted, resulting to inefficiency in the supply chain. Below are government, industry and international standards currently being harmonized by government and industry groups. Standards are critical market information containing the requirements of the market.

The Bureau of Product Standards (BPS) has set specifications for dried mangoes and mango puree under PNS 197:1989. For dried mango, BPS specifies grading, sulfur dioxide residue, additives, moisture content, packaging and labeling requirements. For mango puree, specifications include grading, general requirements (total soluble solids, titratable acidity and microbiological count), sampling, methods of analysis, packing, and labeling.

CODEX, surprisingly, has none except those for canned mangoes and this is specified under CODEX 159-1987. While most processors conform to the PNS, which is less stringent, they normally follow the standards that are buyer-specified to ensure acceptability of their product in their export markets. For instance, the US market requires no sugar, artificial preservatives and food coloring. Germany and the Netherlands accept dried mangoes with sulfite levels of less than 500 ppm, while Japan requires sulfite levels of not more than 5 ppm.

Most processors use first-grade mangoes that are not immature, without bumps, cracks and black spots. For the “carabao” variety, the size required by processors is at least 180g normally classified as super small. However, mangoes used for processing is often at the 250 grams per piece weight classification, which is medium-sized. The range for sugar content based on Philippine standards is at least 15⁰Brix. Most exporters include nutritional facts as required by the US and EU markets. The most common detention case for mango puree is lack of registration as a food-canning establishment, which is required by the US market.

Some exporters of mango products are also processors such as Drysdale Corp.. Thus, procurement system for exporters and processors is similar. Procurement system for processors is limited to raw material (mango) and excludes other inputs such as packaging materials and sugar.

Because ordinary growers/suppliers are not familiar with fruit classification, the prevailing system of buying assorted mangoes in the province, as practiced, is “all in”; the growers unable to command a better price for the lack of knowledge on product grades and standards. This is also practiced by exporters and processors.

Some exporters directly source from farmers and cooperatives particularly those with large areas. Others source their mangoes through their buying stations such as Drysdale Corp. located in Metro Manila, one of the large exporters of fresh mangoes to Japan. They also export and supply mango concentrates to large food manufacturers such as San Miguel Corp. and RFM Corp. and produces its own mango juice in bottles with the Drysdale brand. Currently, they do not have direct activities with mango growers. They have eight buying stations all over the country. Off-season mangoes are bought from Mindanao. In the past, these companies ventured into contract growing with farmers where they handled the spraying but farmers pole vaulted or sold mangoes to other buyers who offered better price.

In Cebu, fresh mangoes are sourced by processors directly from the growers who sell 73% of their produce to the processors. Exporters, on the other hand, procure their fruits through their own buying stations, which are strategically located in key mango-producing areas or through wholesalers. In some instances, exporters purchase mangoes from wholesaler-retailers or from sprayers-traders.

As processor/exporters buy “all-in,” they segregate the mangoes for export and those for processing. Export grade mangoes are bought at a premium price (P30/kilogram and up) while those for processing are bought currently at P15/kg but can go as high as P21/kg. According to one processor interviewed, farmers need to be disciplined. They harvest mangoes which are immature or “floaters” (since they float when placed in chemically treated water). Ideally, mangoes are harvested 120 days after flower induction but they harvest them at 90 days to avail of good price. This affects quality of raw materials and, consequently, the recovery rate. Some farmers do not honor contract (pole vault) as mentioned earlier. Thus, they prefer consolidators who are more reliable and have close contacts or better relationships with farmers.

Farmers must realize that prices are dictated by the market. If buyers of processed mangoes pay low price, consequently, buyers of raw materials will also have to lower the buying price.

The procurement system of retailers varies, depending on the type of mango products. Procurement strategies for the fresh produce category vary from procurement strategies for processed mangoes. For fresh mangoes/fruits, there are three types. One type is where fruits are supplied by a concessionaire who pays the retailer a fixed rent on retail space. The retailer does not have to manage the category. The concessionaire may provide his own people or could also be provided by the retailer. In this case, the concessionaire is charged by the retailer for labor service. Depending on the type of concessionaire contract, the spoilage is borne by the concessionaire and the retailer provides services like store-wide promotion to attract traffic. Retailers sometimes require the concessionaire to meet a minimum number of varieties of fruits. The second type is where the retailer manages the category or retailing of the product. Under this arrangement, the retailer assumes the risk of spoilage but does the merchandise planning, evaluation and control. The retailers interviewed buys from large wholesalers of fruits. They do not buy directly from farmers because they want a regular supply (daily) of fresh fruits as well as variety. They are relatively in small amount and variety. Wholesalers provide the variety and can sell in small amounts in a daily basis because they supply to many retailers. The third type is where the retailer combines the two earlier strategies and may adopt different procurement systems for different stores. One retailer, for example, assigns one supplier per store.

No concessions are made on processed products such as processed mango products. These are bought either from distributors or supplied directly by processors through their marketing arm. In the case of mango juice, for example, large retailers buy directly from processors such as San Miguel Foods or RFM Corp.. These processors market directly to key or national accounts but do not market to small accounts as these are being serviced by their accredited distributors.

The extent of decentralizing decision-making for buying fresh fruits and processed food categories would depend on several factors. These include the nature of the products or type of category, the number of outlets, the store format, and the availability of merchandising expertise. Decision-making for fresh produce needs to be decentralized. For some retailers, they assign specific suppliers for each branch and allow flexibility such that if one supplier fails to provide adequate variety of fresh fruits, other suppliers not officially assigned to the store can supply the fruits. This is practiced by Shopwise Supermarket, which is owned by Rustans. The buyers may also be decentralized by store and may have the authority to decide the quantity and price (selling and buying) of the products. The Davao branch of Makro, for example, does the procurement for other stores for specific products that are abundant in the locality such as fruits and vegetables. The store format also affects the procurement strategies. For multinational retailers such as Pricemart, decision-making is relatively decentralized but decisions are based on specific merchandising plans and policies. However, buying is centralized for some products.

The retail sector of the mango industry in the Philippines is composed of numerous traders classified as contract buyers, sprayers-traders, wholesalers, wholesaler-retailers, retail supermarkets, and exporters. These traders are engaged in the procurement and sale of mango from the growers, facilitating its reach to the end-consumers. Because of the regulated use of potassium nitrate, KNO_3 , only those that are required to register their activities such as sprayers are known. The names and locations of traders and other industry players can be found in the various directories of the Department of Agriculture and the Department of Trade and Industry at the local and national levels, which may be incomplete since not all growers and traders are registered with these agencies.

Those involved in the export market are generally known in the industry. These are usually corporations or multinationals who normally only source their mangoes locally through contract buying arrangements, but do not operate their own farms, owing to the long gestation period of the crop.

Informal arrangements between growers and the various traders/middlemen are common in the Philippines, mainly because majority of the growers are backyard and small-scale growers. Relationships forged over the years build trust among suppliers and buyers; no formal contract is necessary. For big processors and exporters, however, contracts are often drawn with suppliers who can be the growers themselves or wholesalers or wholesaler-retailers for delivery of size-specific mangoes at specific times and places. Multinational companies who are into fresh mango export like Tropifresh, a division of Dole Philippines Inc., and even Lapanday Foods Corp. which until recently suspended its fresh mango export operations, source their fruit supplies through various growers around Mindanao by way of their respective logistics groups. Having ceased operation for nearly a year, Tropifresh of Dole has embarked on leasing mango areas in Samal Island and Bansalan province in Mindanao starting April of this year. Tropifresh caters to exports of fresh produce such as papaya, asparagus and mango and has the distinct advantage of owning and operating the only vapor heat treatment (VHT) facility located in Mindanao.

Payments to growers/wholesalers/wholesale-retailers are often made in cash or are paid within 15-30 days. Retail supermarkets pay up to a maximum of 90 days from the date the produce is delivered and arrangements with supermarkets are on a consignment basis, meaning unsold delivered produce are returned to the supplier without compensation. Any loss on this transaction is solely for the account of the supplier. It is not surprising, therefore, that direct sales from growers to retail supermarkets are minimal. For example, growers from Luzon and Cebu only sell 2% and 4%, respectively, of their produce directly to retail supermarkets. In the mango supply chain, however, it may appear that retail supermarkets get a large share of the supply from the growers and this is explained by the additional sources of supply retail supermarkets get from contract buyers, wholesalers and wholesale-retailers.

Buyers from processors usually pay within a 60- 90 day period.

There are generally three types of contractual arrangements in production and marketing mangos. These are leasehold contract, output-buying scheme and contract buying (Table IV.7).

4.4. Key findings

4.4.1. Competitive edge and opportunities

There are opportunities in the Philippine mango industry as indicated by investments made by multinational companies such as Dole Philippines in the last three years. The Philippines ranks fourth in the world in terms of volume of exports but second in terms of the value of exports since it fetches a high price in the world market.

Table IV.7 Types of contracts in mango production

Type of Contract	Sharing Scheme	Description
Leasehold contract	Fixed per tree	Under this agreement, there is no sharing of output involved between contractors and farmers. The farmer only leased out his trees for a certain period of time in exchange for a fixed amount of money or rent which is usually paid in cash by the contractor at the beginning of the season. The lease contract usually lasts for an average of 1 year to enable the contractor to recover expenses in case of losses during the first fruiting season. The lessee will then become the temporary owner of the trees. This usually involved a written agreement for large-scale farms. In the case of small-scale farmers/lessors with an average of 100 trees planted usually there is no written agreement signed.
Output Sharing scheme	50:50 or 60:40	<p>This means that 50 or 40% of the Gross Sale or total harvest goes to the farmer or the owner of the trees while the remaining 50 or 60% goes to the contractor. Contractors usually give or pay the share of the farmer after the harvest period. There is no fixed duration of contract under this agreement as long as farmers are willing to contract out their trees. Sprayer or Sprayer-trader intermediaries provide spraying services to the growers. They do not own the trees but shoulder all the expenses involved in the spraying and production of mango. Depending on the agreement made sprayer-traders also buy the farmer's share of fruits apart from the share they obtained as payment for their spraying services. They take charge of harvesting, packaging, transporting and selling of fruits.</p> <p>Sprayer-traders shoulder all the risks involved in the production and marketing of the produce. These include weather problems and insect damages to which they adjust spraying and/or practice repeat spraying depending on the damage done on the crop.</p> <p>The contractors provide the hired labor utilized in mango farming. Some</p>

		<p>contractors maintain permanent laborers. The usual payment is 5% of the gross income share of the contractor in mango. Workers are being paid on installment basis. After marketing of the fruits, all the cash advances incurred by the laborers will be deducted from their share (5% of gross income). The remaining amount is given in cash to the laborers after marketing all the fruits.</p> <p>Farmers who availed of contract spraying of their mango trees have nothing else to do but to wait for their share of fruits at harvest time. However, they see to it that the contractors do not abuse their trees. Among the farm activities, irrigation, weeding and pruning are participated in by some farmers to help the contractors. Farmer-growers utilized family labor in the performance of their tasks.</p>
Contract buying	Per kg payment based on size of fruits	<p>Contract buying is another form of contract agreement in mango. They do not provide spraying services to the owner of the trees but specializes only in buying the fruits. They roam around in different areas and contact the producers of mango before harvest time and offer price based on prevailing market price for different sizes of fruits. They also provide the materials used in harvesting and packaging. Advance payment is done before the harvest period to ensure that the fruits would be sold to them.</p>

Source: De la Cruz, A. (2004)

The Philippine mango industry is fairly competitive as evidenced by the increasing demand in both the domestic and foreign markets despite the increasing number of competitors.

Although mango is a commodity, differentiation of mangoes is attainable due to recent technological developments. Farmers who fail to keep up with improved production and post-harvest technologies would surely be eased out of the competition.

Multinational companies such as Dole and Lapanday have started investing in the mango industry, a development that could improve economies of scale similar to what happened in the banana and pineapple industries.

In the export market, the Philippine's "carabao" mango is regarded as one of the world's best varieties, a definite competitive edge. Processed mango both domestic and export are highly susceptible to other processed products unless they attain differentiation like Drysdale's "Diced Mango."

Lending institutions like Quedancor assist farmers by providing the financing needed to purchase these inputs that allow the farmers to get discounts. Labor is usually sourced from the farmers' families. Nevertheless, if the task is labor-intensive, contracts are extended to neighboring farmers or, sometimes, to middlemen.

Recently, inputs from China have penetrated the Philippine market, thus providing farmers affordable options. There are also cases when input suppliers integrate forward by providing inputs for the farmers and purchase the mangoes through contract buying.

Consumers dictate the price of mango. There is low buyer switching cost for the mango industry. Most of the time, buyers identify fresh mangoes' quality with its farm origin. This is partly due to factors such as the type of soil, which affects the taste of the mango.

For processed mangoes, brand awareness plays a major role in the market such as Gina's Mango nectar, Nutrilicious' Mango Juice, etc.

4.4.2. *Issues and Challenges*

While the grower may be said to have links with the direct consumer in the chain, there are many layers of middlemen/traders that clutter the supply chain. Forward and backward linkages between growers/suppliers and buyers/exporters/processors are weak and information is not freely shared among the participants in the chain. With no knowledge about the need to properly grow the fruit and insufficient access to production technology and resources, there is no appreciation for good agricultural practices that enhance fruit yield, productivity and quality. Having no market information, the growers are unaware of the requirements on size and quality of the exporters and processors because most of their produce are coursed through contract buyers, wholesalers, wholesaler-retailers and buying stations. This is further aggravated by the lack of implementation of product grades and standards that leave the growers with minimal control over the price of their produce. This situation is not helped any by the country's wide variations in rainfall, soil fertility, temperature and cultural practices such as fertilization, pruning and irrigation, among other things. There are also vast differences in growing conditions, contributing to quality variations. The predominance of small, backyard growers, which constitute 73%, often resort to contracting their farms to sprayers/contract buyers for seasonal production to avoid production risks. Contractors, however, do not fertilize trees and control pests only during flowering and fruiting, which results to low yield and poor fruit quality.

Exit barriers vary from one industry player to another. Growers have low exit barriers since they can do intercropping or they can utilize the land for raising animals. Processors, however, have relatively high exit barriers due to the high-cost fixed assets like the depreciating equipment they use for manufacturing their products.

There are high barriers to entry due to the following: long growth period of mangoes (fruit-bearing age is on the fourth to fifth year), high cost of inputs, packaging, transportation, handling and processing equipment.

There are only a few input suppliers for the chemicals especially for the potassium nitrate, the chemical used for off-season production. Growers, especially those with "backyard" farms, would resort to purchasing inputs in retail due to financial constraints.

Inadequate support facilities and improper post-harvest control and differences in handling practices at each stage in the post-harvest and marketing chain further affect quality. The archipelagic nature of the country's geography also contributes to the high cost of transport expense. Inter-island transport by air, land and sea can be very expensive particularly in areas far from key transshipment points like Mindanao. Mango is not considered priority cargo, and the low ship loading priority of the fruit and its highly perishable nature contribute further to losses for traders and exporters alike. These are some of the issues that affect linkage development in the sector.

Apparently, the solution of problems in the upstream linkage is key to any major improvement in the chain. This condition has constrained the industry in responding to the demand for both fresh and processed mango in the domestic and global markets. Competitors in the global market, particularly Brazil, China, Papua New Guinea and Thailand, have fortified their ranks. However, there are positive signs. The entry of

multinational companies and large firms such as Dole and Lapanday may address the quantity and quality issues. But what will be the implication of this to the small and medium enterprises in the industry particularly the small mango farmers?

At the farm production level, the issue of quality starts from the choice of planting material. Unfortunately, there is no one nursery in the country that uses NSIC-registered mango varieties. Growers are therefore left with no assurance as to the quality of the planting they are purchasing for planting. Given the long gestation period of mango, the importance of the quality of the planting material cannot be overstressed. Appropriate knowledge about the proper techniques of growing mango is also imperative to produce quality fruits. Response to different production techniques, however, vary across specific locations and the failure of the grower to properly implement the technical requirements due to lack of knowledge and resources has been an impediment in achieving higher quality yield. Since mango production involves heavy usage of pesticides and chemicals, increase in the cost of these inputs have impacted production by small growers. It is noteworthy to emphasize that, in spite of the predominance of small growers that cannot fully implement the best cultural practices, the Philippines has remained competitive with other mango-producing countries.

The importance of proper production and post-harvest technology in mango farming cannot be over-emphasized, mango being a highly perishable fruit and susceptible to a wide range of pests infestation and diseases. Commencing at the farm level, the choice of quality planting material is of critical importance as the long gestation period for mango growing and the cost of maintaining the farms do not allow for mistakes in this area. The lack of proper technology to assure consistent quality and supply has constrained mango production, and since the bulk of the country's mango output are grown in backyard farms, has made difficult the assurance of a uniform and consistent supply of mangoes. There are only a limited number of commercial farms, and exports are basically a consolidation of produce from backyard orchards and small farms. Unproductive and inconsistent strains of mango seedlings have resulted in investment losses to growers/farmers since they only know about the quality of seedlings after the fruiting stage.

The grower's limited understanding of the importance of good agricultural practices such as fertilization, pest and disease control, pruning and irrigation has also affected yield and fruit quality. There is an apparent lack of information and dissemination of production and post-production technologies.

Post-harvest techniques in handling mango also affect export quality. Philippine exporters and processors have complained about low recovery of good quality, exportable fruits, noting that of total harvest, barely 50% are of good quality. The low recovery rate for processed mango (10%-12% for dried mango and 60% for mango puree) is also attributed to the low quality of mango fruits grown in the country. This may be the reason why 95% of domestic production ends up in local consumption and only 5% make it for export to other countries. Inadequate and inefficient infrastructure, transportation and communications systems have added to the constraints facing the delivery of fresh produce in a state of quality required by the markets.

The need to develop and implement a well-planned quality assurance program and the development of the appropriate infrastructure for post-harvest facilities and the rationalization of the transport system for fresh produce to reach its market with some degree of efficiency is imperative.

Small, backyard mango growers manage their own farms and often engage contractual arrangements with buyers or sprayers under a payment sharing scheme that allows them to earn income while avoiding the risks attendant to mango farming (such as expenses for inputs, harvest and transport of produce, weather changes). Very few run their farms in a professional manner where, for instance, receipts for purchases made are kept and harvests/income are recorded. Commercial producers who normally delegate the running of the farms to tenants may keep records for assessment of comparative performance in yield and earnings but for the most part, leave the running of day-to-day operations to the tenant. Large processors and exporters do not necessarily grow their own trees for production; most of them source their fruits from growers or through wholesalers. Run in a corporate manner, all transactions are recorded and formal contracts are drawn with buyers/partners within and outside the country to provide basis for action and decision-making. The formal lines of organization for large exporters allow for separate functions and responsibilities particularly in sourcing, post-harvest handling, packaging, marketing and distribution of their produce. Despite this formal set-up and despite the high incidence of low recovery for exportable or processed quality mangoes, there still has been no tracking or monitoring system to trace the sources and causes of rejection.

Some of the small growers in the Philippine mango industry, particularly in Luzon, have formed their own associations to enable them to meet volume requirements and negotiate for prices. The more prominent of the groupings are those involving processors and exporters, among which is the Mango Producers and Exporters Confederation (MPEC), the Philippine Mango Industry Foundation Inc., and the Philippine Mango Council. These private associations have banded in order to have a voice and be able to act collectively on issues affecting the mango industry, and, more importantly, to lobby for government action or intervention and assistance in support of improvements in the industry.

For a medium-sized processor with an output of 42 tons per month, the estimated expenses for raw materials, labor and packaging is roughly PH P1.0 million. Equipment investment outlay for a high temperature aseptic technology is estimated to be around PH P1.7 million, which can only provide a recovery rate of 10%-12%. The high capital investment, the need for newer technology to improve recovery rates (which is expected to be more expensive), the rising costs of input materials (such as sugar and packaging materials), and the low quality of fruits – all these taken from the view that full year production for processing runs only for four months -- have not provided incentives for more players to come in.

Apparently, there are many issues that affect the mango industry. Table IV.8 presents issues identified from the key informant survey.

Table IV.8 Issues affecting linkage development in the mango industry

High cost and low quality of sugar
High cost of agricultural chemicals
Low quality of seedlings
High cost of packaging materials
Smes cannot meet volume and quality requirements
Pole-vaulting
Inadequate access to credit
Lack of market access
Low quality of products
Lack of market information (price, volume, buyers)
High freight/shipping cost (see Figure IV.2 for illustration)
High cost of sugar/liquidation of sugar
High labor costs due to mandated wages
Succession issue in CARL
Lack of incentives to invest in agriculture because ownership large land is prohibitive
High raw material costs
Unavailability of supply of raw materials
Peace and order problem
Difficulty in meeting standards required by export markets (aseptic, haccp,etc)

Source: Key informant survey, 2005

5.0 Summary of Findings

5.1 Trends in the Tropical Fruits Industry

Global demand for tropical fruits such as banana, pineapple and mango has been increasing due to higher income, preference for healthy foods, increasing population and lower prices. Quality of fruits has also improved due to better technology. Transportation cost has decreased, resulting to lower prices of fruits while flow of goods has been less constrained due to international agreements that promote market access.

Generally, world imports for fresh fruits have expanded although in the last five years, imports of banana have declined. While total imports of pineapple products have increased, canned pineapple and pineapple juice have declined in recent years.

Despite the decline in banana imports in recent years, the Philippines posted the fastest expansion in production and exports among the top four banana exporters. In fact, in the last six years, the Philippines has displaced Colombia as the third largest banana exporter.

On the other hand, the value of Philippine exports of fresh pineapples and pineapple juice increased but not the value of exported canned pineapples and pineapple concentrates. However, in terms of volume, Philippine exports of canned pineapple have increased annually by 2% in the last five years while Indonesian exports increased by 45%. Despite this, the Philippines still ranked second in exports behind Thailand. But its share of total exports has declined.

Mango has a big export potential as world imports for fresh mango and mango juice continue to increase per year by 7% and 68%, respectively. Exports of other processed mango products have also increased. Philippine mango fetches a higher value in the world market.

While the Philippines ranks fourth in terms of volume of exports, it ranks second in terms of value.

The fastest growing exporter of mango is Brazil with exports and production increasing annually by 33% and 10% in the last 10 years. While world demand is increasing, and countries like China and Thailand have been increasing production by 11% and 7%, respectively, per year, Philippine mango production has decreased by 2% per year in the last five years. This, despite an expansion in the area planted to mangoes, which slowed down in the last five years.

Generally, the Philippines continues to respond to increasing world demand for these tropical fruits by expanding area and production. The presence of multinational companies and large domestic agribusiness firms has enhanced competitiveness of the Philippines in these industries.

5.2. *Benefit diffusion*

The presence of multinational companies in Cavendish banana, pineapple and mango industries has been beneficial to the country in terms of generating investments, employment and exports. Direct employment, which includes individuals employed under contract growing and lease arrangements, is estimated at 20,000 people. Exports generated revenues of over \$600 million per year. In general, these three fruit industries support around nine million farm households in the country.

Indirect benefits brought about by linkages developed in the supply chain are substantial. The size of indirect employment is estimated to be three times the size of direct employment. These include those employed by support industries not under multinational companies such as corporate growers like Lapanday Foods Corp., Davao Agricultural Ventures, and Tagum Agricultural Development Corp., and other support industries such as agricultural chemicals, plastics, sugar, packaging materials, financial and transportation industries.

One distinct strategy employed by multinational companies in banana and pineapple industries in the Philippines that enhanced efficiency and competitiveness is the reduction of production costs through large plantation-type production systems that benefit from economies of scale. Thailand has higher costs in pineapple production compared to the Philippines as they produce pineapples through small independent growers.

There is a transfer of technology from multinational companies to small, medium as well as large domestic firms from production, processing to marketing of fruits. Multinational companies provide technical assistance to small and medium enterprises (SMEs) and individuals under contract and leasehold arrangements. These SMEs include agrarian reform cooperatives such as the Dole Agrarian Reform Beneficiaries Cooperative (DARBC) and the Del Monte Philippines Employees Agrarian Reform Beneficiaries Cooperative (DEARBC). In fact, a number of these cooperatives particularly in the banana industry have formed into a federation and, for the past five years, have ventured into direct export of Class B bananas. Moreover, employees of multinational companies who lease their lands have the option to contract grow after five years. On the other hand, large domestic firms have adopted technologies not only in production but also in the processing and marketing of fruits.

There are levels, however, of technology transfer from multinational companies to small, medium and large domestic firms. Level 1 is limited to production technology or the transfer of farm management systems and practices. This is the case with farmers and firms under contract and leasehold arrangements. Level 2 involves transfer of production technology, and processing. Unlike Level 1, production technology transfer under this level also involves management of inputs other than land and labor but also management and/or production of agricultural chemicals, aerial spray, packaging materials and plastics. Processing includes cleaning, sorting and packing in the case of bananas and processing of canned fruits, juices, and dried fruits in the case of pineapple and mango. Level 3 of technology transfer involves production, processing and marketing of fruits. This also includes transportation (trucking), ripening, shipping and distribution to wholesale, retail and institutional buyers such as hotels, restaurants and fast food outlets.

There are sublevels or degrees of technology transfer. In the first level, for example, some contract growers buy their own inputs while others depend on multinational companies. In the second level, some large firms buy their packaging materials from other companies while others have their own box manufacturing firms. In the third level, some domestic firms are limited to trucking while one firm like Lapanday Foods Corp. has chartered vessels and has established its own brands and strategic alliance with a multinational retailer (Carrefour). The Federation of Agrarian Reform Cooperatives has also established Mindanao Organic Ventures Enterprises in 2002 (MOVE), a joint venture with Alter-Trade based in Japan which has a link with the Maronaka chain of stores. MOVE directly exports low chemical bananas to Japan.

The degree of technology transfer in the fruit industry varies among SMEs and large domestic firms. Technology transfer of the multinational companies to large domestic agribusiness firms is more extensive compares to SMEs. Large agribusiness firms have reached at least Level 2 of technology transfer. Tagum Agricultural Development Corp. in the banana industry, for example, controls both production and processing, have their own research and tissue culture laboratories, plastic and box manufacturing firms, source their own agricultural companies, and provide their own trucking services. Its affiliate that supplies pineapples to Del Monte Fresh has a modern packing plant and claims to protect the technology in producing Del Monte Gold MD2 variety, which was copied by competitors but not the technology of producing it. In fact, as mentioned, one firm has established even its own brands, and has tapped the retail end of the supply chain.

Multinational companies have provided programs to the members of the agrarian reform cooperatives and their families who compose the community proximate to the production areas. These include education, health, credit, retail outlets and other infrastructure facilities. Banana and pineapple plantations in the Philippines have vibrant communities not only those managed by multinational companies but also those run by large domestic firms.

Finally, since most of these multinational companies are located in conflict areas in the Philippines, the benefits that they infuse in terms of investment and employment have alleviated poverty in these areas and, consequently, enhanced peace and development.

5.3. *Linkage development*

Linkages may be categorized by two major nodes in the supply chain: the upstream and downstream linkages. The upstream linkages cover those in the production side of the chain. These include production of fruits and agricultural inputs such as agricultural chemicals, plastics, poles, palettes, packaging materials, seedlings, etc. The downstream linkage refers to the processing and marketing (transport, distribution, wholesale, retail, export) sides of the chain.

5.3.1. *Upstream linkage*

The linkage in production or upstream agents between multinational companies (MNCs) and domestic firms, particularly the large ones, is established in the banana and pineapple industries.

MNCs, particularly Dole Philippines, and large domestic firms have weak upstream linkage in the mango industry. More recently, however, they have expanded their operations. The weak link is expected considering the fact that, compared to bananas and pineapples that are produced in large plantations for export markets, mangoes are predominantly grown in farms of less than three hectares or mostly backyard farms and only 5% of the total output is exported.

The linkage of MNCs and large domestic firms with SMEs in the upstream industry is generally weak for all fruit industries covered. In banana and pineapple, these SMEs are mostly agrarian-reform cooperatives. But they also include suppliers of pallets, poles, organic fertilizers, etc. In mango, these include SMEs that are cooperatives (agrarian reform beneficiaries and otherwise), individual farmers and traders.

The difference in the degree of linkage between SMEs and large domestic firms can be attributed to several factors. These include the cost of dealing with many suppliers, quality and cost of products, among others. Some of these are discussed further in section B.

The linkage of MNCs with farmer cooperatives is a necessity due to the implementation of the Comprehensive Agrarian Reform Law (CARL). Members of these cooperatives were previous employees before the implementation of CARL. From the data gathered, no cooperatives have established linkage with multinational companies that have no previous affiliation (eg employer-employee relationship) before the CARL implementation.

Cooperatives, particularly the agrarian reform cooperatives, play a major role in the pineapple and banana industries. For example, in pineapples, these cooperatives account for over 82% of the total area utilized for pineapple production. The Del Monte Employees and Agrarian Reform Beneficiaries Cooperatives covers 46% or 14,000 hectares, the Dole Agrarian Reform Beneficiaries Cooperatives accounts for 29% or 8,937 hectares, and the partner cooperative of the Tiboli Agricultural Development Inc. utilizes 16% or 5000 hectares. Only 3,000 hectares are planted through contract growing with independent growers.

However, multinational companies have encountered some problems with agrarian reform cooperatives. According to Dole Philippines, they plan to expand production through

contract growing while maintaining production with agrarian reform beneficiaries' cooperatives under a leasehold arrangement. In the banana industry, a number of agrarian reform beneficiaries have organized themselves into a federation and now export bananas. These indicate that multinational companies may prefer to deal with other suppliers as cooperatives have increased their bargaining power in negotiating for better prices and benefits as well as higher wages.

Fertilizers and chemicals are imported or sourced locally from traders. MNCs import most of their agricultural chemical requirements although they also source their requirements locally as tariffs for agricultural chemicals are generally low. Domestic firms such as contract growers, independent growers, cooperatives and corporate farms mainly source their requirements locally. Seedlings are produced through their own tissue culture laboratories. Plastics and packaging materials are either produced by the exporting firms or by their large corporate growers. Paper, brand labels and resins for plastic production are imported. Pallets, poles and some organic fertilizers, on the other hand, are sourced locally, the latter from the communities in banana plantations like in the case of Dole Philippines and Lapanday Foods Corp.. Equipment and machinery for banana production are manufactured locally.

The linkage developed between multinational companies and domestic firms is basically in the production of bananas, poles, pallets, plastics and packaging materials. Fertilizers, chemicals, papers and resins are imported. On the other hand, air spraying, irrigation, production of seedlings, research and development are done by exporters.

Raw material sourcing for Dole and Del Monte fruit processing operations is through their fresh produce operations.

5.3.2 Downstream linkage

The main linkage in the fruit processing industry, whether multinational or domestic fruit processors, is in production. For multinational companies, particularly in pineapple, this linkage is quite developed. For domestic processors, particularly those engaged in mango and other fruits, the link with the upstream agents needs to be enhanced. The availability of quality and adequate quantity of raw materials is a perennial problem for fruit processors.

The linkage in fruit processing between multinational companies and domestic firms, especially those in the pineapple business, is minimal. There are, however, some linkages between Del Monte and domestic firms through contract manufacturing for their tomato-based products, but not with Dole Philippines.

Linkage of domestic firms in the fruit industries with large domestic and multinational retailers is underdeveloped, particularly with the latter. Multinational companies such as Dole, Del Monte, Sumitomo, and Unifrutti have control in the marketing of fresh and processed fruit exports, especially bananas and pineapples, to distributors or multinational retailers abroad.

Lapanday Foods Corp. is the only domestic firm that exports fruits under its own brands and have existing strategic alliance with a multinational retail chain: Carrefour. Through this

linkage with a large retailer, Lapanday has gained greater understanding of the requirements of the buyers and consumers, reinforcing their focus on quality of products. It has also invested in producing other fruits since its buyers/retailers require a mix of fruits. While it traditionally produces only bananas, it has recently ventured into pineapples and mangoes although it has stopped marketing mangoes this year. Moreover, it receives faster feedback and spots trends and therefore responds quicker to consumer needs. With more efficient feedback of market information, it is able to adjust its production to meet buyers' needs.

Mangoes, where only 5% of total production is exported, also do not have strong linkages with large retailers in both fresh and processed mangoes. According to Drysdale, which exports mangoes to Japan, it is difficult to supply directly to retailers particularly in Japan. In the past five years, Dole has dominated the distribution of fruits in Japan, displacing the Japanese distributors (seikas). This is a logical move for Dole. First, dominance of retailers is increasing not only in Japan but in other countries including those in Asia. Second, production cost is increasing due to mounting pressure from upstream agents who demand higher price for their produce or higher rents for their land (at least in the case of the Philippines). Thirdly, upstream agents are gaining more bargaining power due to technology adoption, access to credit and information, notwithstanding the transfer of commercial farms to agrarian reform beneficiaries (again like in the case of the Philippines). Moreover, there are now domestic corporate growers who directly export. Lapanday Corp. exports under its own brands through its strategic alliance with Carrefour. The Federation of Agrarian Reform Cooperatives have also established Mindanao Organic Ventures Enterprises in 2002 (MOVE), a joint venture with Alter-Trade based in Japan, which has a link with the Maronaka chain of stores. MOVE directly exports low chemical bananas to Japan. There are now medium-size corporate growers such as Puyod Farms which are beginning to look at directly exporting their produce.

However, it is difficult for domestic firms to follow the example of Lapanday because of market access issues. Multinational companies have established brands and have control of the markets abroad. It is interesting to note that, while Lapanday competes with multinational firms, it also supplies to them and, in fact, has investments in Del Monte.

Trucking services are either provided by the exporters or outsourced. Ships are either owned or chartered by exporters. However, for those outside pineapple and banana industries, the cost of transport and shipping of raw materials and products is big a concern.

5.4 Policy issues in linkage development

The underdeveloped linkage between multinational companies and domestic firms, particularly among small and medium local enterprises, can be attributed to a number of factors. Table V.1 summarizes the issues identified by firms from the three fruit industries covered as well as from government, non-organizations, business support organizations and other food industries. Issues per industry have been discussed in previous sections. Here, the policy issues that cut across the three industries are highlighted. Of the 31 issues identified in the key informant survey, there are about seven issues that cut across three industries. Except for peace and order problem, these common policy issues are discussed below.

5.4.1 *Access to land*

The implementation of CARL is a catalyst to upstream linkage as multinational companies and large domestic firms particularly in pineapple and banana industries have limited options but to deal with CARP beneficiaries through lease arrangements, contract growing and joint venture schemes. Even now, however, multinational companies, particularly Del Monte, rely on large domestic firms that have supply arrangements with farmers to supply them with raw materials. For example, Del Monte sources the bulk of its fresh pineapple exports from Davao Agricultural Ventures and their banana requirements from Tagum Development Corp. and Lapanday.

Generally, with the implementation of CARL, it is quite difficult for multinational companies to deal with many beneficiaries, notwithstanding the organization of these beneficiaries into cooperatives. Expansion areas, in particular, incur transaction costs in dealing with many small landowners and therefore prefer to deal with large corporate farms which, in turn, have to deal with small farmers. Even with large domestic firms, there are a number of constraints they have to deal with like the five-hectare ceiling required for ownership of land and the cost of dealing with many farmers. Moreover, the 60:40 equity provision limits foreigners to have access to land and, hence, restricts investment.

Moreover, while areas planted to banana for exports have been expanding, there is an existing policy that restricts areas planted to banana for exports. In 1973, President Marcos issued Letter of Instruction (LOI) 58 upon the request of growers to restrict banana hectarage to 21,000 hectares. This was based on a 10 kg per capita consumption of Japan. The total hectarage was allocated to 18 growers. In 1979, LOI 790 was issued, increasing the hectarage to 26,250 hectares to respond to the increased demand in the Middle East. This increased the number of growers from 18 to 22 in 1979 and 24 by the end of 1991. In 1999, the total number of hectares planted to banana in Region XI was 34,646, exceeding the total limit by 9,163 hectares.

There had been attempts to repeal LOI 790. In 1995, House Bill 60 was filed to repeal it but accredited growers strongly opposed it as it would allow entry of new players and, consequently, increase supply and competition. In 2001, another attempt did not materialize when a resolution was presented to President Gloria Macapagal Arroyo during the 10th Mindanao Food Congress

However, there are varied views on this as revealed by the interviews conducted. On one hand, some sectors believe this policy has become obsolete due to the implementation of the Agriculture and Fisheries Modernization Act (AFMA). Other sectors say this should be repealed to enhance competition. There are allegations that the total area planted to bananas is already 50,000 hectares although it is argued that the expansion is in the ARMM (Autonomous Region in Muslim Mindanao) region where the policy does not apply. The Philippine Banana Growers and Exporters Association opposes the repeal of this policy.

Table V.1. Issues in Linkage Development, selected fruits

Issues	Banan a	pineapple	mango	Others*	general**
<i>Access to land</i>					
lack of incentives to invest in agriculture because ownership large land is prohibitive	X	x	x		
succession issue in Comprehensive Agrarian Reform Law	X	x	x		
<i>High cost of inputs</i>					
high cost and low quality of sugar		x	x		
high cost of agricultural chemicals	x	x	x		
high cost of packaging materials	x	x	x	X	
inadequate access to credit	x	x	x	X	x
high fuel costs		x			
high cost of sugar/liquidation of sugar		x	x		
high labor costs due to mandated wages	x	x	x		
high raw material costs			x		
unavailability of supply of raw materials			x		
high power rates	x	x		X	
<i>Limited market access</i>					
lack of market access			x		x
smes cannot meet volume and quality requirements			x		x
australian quarantine requirements	x				
lack of market information (price, volume, buyers)			x		x
difficulty in meeting standards required by export markets (aseptic, haccp,etc)			x		x
competition from other countries such as Thailand and Indonesia	x	x		X	
<i>Inadequate infrastructure facilities</i>					
poor infrastructure facilities				X	x
<i>High logistics and transportation cost</i>					
high freight/shipping cost	x	x	x		x
no farm to market support				X	x
10% vat on wharfage	x				
<i>Production issues</i>					
low quality of seedlings			x		
diseases like sigatoka	x				
low quality of products	x		x		
difficulty in producing organic products because of diseases	x				
<i>Environmental</i>					
food equipment are expensive and imported		x			
watershed issues raised by water district	x	x			
difficulty in implementing clean-air act		x			
<i>Others</i>					
pole-vaulting	x	x	x	X	
peace and order problem	x	x	x	X	x

*other industries interviewed such as marine, and other fruits

** government, ngo and business support organizations

5.4.2 “Pole vaulting”

Pole vaulting occurs when suppliers do not honor commitments to supply if the spot price available from other purchasers is higher than the price agreed in the contract. Pole vaulting is a serious concern as it deters potential linkages between small and large firms. One example is a

contract growing project for pineapples implemented by KLT Inc., a large fruit processor based in Luzon. The target was to produce pineapples on 800 hectares of land but turned out to be only 200 hectares. The farmers were organized into cooperatives. However, growers did not sell to KLT but to other buyers who offered a higher price. This was also the experience of RFM Corp., a large agribusiness firm in its corn project as well as with Nestle Philippines in coffee contract growing.

Firms in the fruit industry particularly the multinational companies such as Dole and Del Monte have come up with means to respond to the issue of pole vaulting. One strategy is to maintain their own farms. However, with the implementation of the comprehensive agrarian reform law, this becomes difficult to carry out. Moreover, they enter into lease contracts instead of contract growing. In pineapples for example, 12,000 hectares are on leasehold arrangement for 30 years with a cooperative whose members are former employees of Dole. Another 3,000 hectares are on growership arrangement where Dole provides the technical assistance and the grower provides the land and labor and has the option to source inputs from the buyer. Thus, they organize small farmers into cooperatives or if they are not organized, new or inexperienced small farmers who want to lease out their lands are given opportunities to go into contract growing after five years. This way, farmers have gained exposure to the technology and good farm management practices. Given high transaction costs, multinational companies tend to vertically integrate or establish strategic alliance with large agribusiness firms. This is the case with Del Monte, which has forged a partnership with TADECO for banana and DAVCO for pineapple. These two are sister companies owned by the Floirendo-Del Rosario family. By dealing with companies that belong to one group, transaction cost is minimized.

There are examples of successful partnership between small and large firms. One key lesson from these effective partnerships is the involvement of the local government unit (LGU) to provide support to investors in minimizing pole vaulting. An example is the Datu Paglas case where the LGU was not only involved in consolidating labor and land to ensure control but the national government also helped in brokering foreign investment (Oribanex-Chiquita) and facilitated infusion of services such as credit and infrastructure (Concepcion, et al. 2003). Another example is Dole's asparagus production in Bukidnon. When the local government began to run after persons who transport asparagus within their plantations but are not certified farmers, theft of this produce was significantly reduced. In this regard, farmers themselves can organize community watchers to take an active role in defending their interests and securing their farms against unscrupulous pole vaulters. Hence, organization of farmers to police themselves is another important element in minimizing pole vaulting.

5.4.3 Access to credit

One problem in pole vaulting is the perceived inequality in contractual arrangements. Farmers have limited flexibility in managing resources of their farm because they lack access to credit. There are contractual arrangements where farmers rely solely on the contractor to supply the capital. Thus, some farmers complain that deductions in their proceeds are unreasonable and that little is left for them, and that some end up in debt with the contractor.

For CARP beneficiaries, lack of access to credit is compounded by the fact that their land is undervalued because it cannot qualify as collateral, and there are limits to transferability even when the land is fully paid.

5.4.4 Shipping

It has been repeatedly mentioned that it is expensive to ship goods from Mindanao to Manila than from Manila to Singapore. It should be noted, however, that multinational companies and large domestic firms particularly those that export bananas and pineapples are not as affected as firms that supply to domestic markets like those in the mango industry and other agricultural products which charter or use their own ships.

Based on the literature and key informants interviews, this issue is multi-dimensional that is related to the lack of competition in both cargo and port handling services, inadequacy of consolidation facilities, corruption within the Philippine Ports Authority, etc. While the government promotes roll-on-roll off (RORO) sea transport to enhance competition in port handling business, there are still allegedly unnecessary charges that exist (PCCI, Basilio).

5.4.5 Trade Policies

5.4.5.1 Sugar

Sugar is one of the major ingredients for processed food. As such, it affects processing industries such as processed fruits, and carbonated drinks and juices (de la Pena, 2005). Dried mango, for example, contains 58%-62% sugar. Tariff for sugar is 50% for in-quota and 65% for out-quota. As of May 2004, production cost of sugar in the country is approximately P600 per bag or 50 kilos. The retail price is about P800 to P850 per bag. World price, however, is around P270/bag. Imported sugar costs around P400-P450 per bag but including tariff, it would be the same as the price of local sugar. There are allegations that some food manufacturers bring in sugar with coloring or package it in a different form.

Importation of sugar is also bureaucratic as experienced by one of the fruit processors located in an export processing zone (EPZ). It requires authority to import from the Sugar Regulatory Authority (SRA) which is not based on the annual requirement of the firm. Even when the firm is located in an EPZ, it is still inspected by the Bureau of Customs. Monthly reports are also submitted to the SRA to liquidate the amount of sugar imported.

5.4.5.2 Packaging materials

Packaging materials are expensive. Tin sheets for cans used for processed fruits are imported. Some papers for labels are also imported. The high cost of packaging materials does not only increase cost of products but also stunts development of retail products. Current tariff on packaging materials is pegged at 15%.

5.4.5.3 *Agricultural chemicals*

As discussed earlier, agricultural chemicals account for a substantial portion of production costs in the three industries covered. One of the reasons why they are costly is because of tariffs. In the case of fertilizer, for example, there are a number of countries that have lower tariffs than the Philippines. Australia has zero tariff while Malaysia also has zero tariff on all fertilizer products except for one product that has 5% tariff rate (HS Code 920 “Other: calcium cyanamide containing more than 25% by weight”). Moreover, Indonesia has zero tariff on all fertilizer products except for two that have a 5% duty (HS Code 3101.00.140 “Supplement fertilizers, in liquid” and HS Code 3102.70.900 “Other”). Urea, as of May 2004, costs around P650/bag in Davao (1 bag=50 kilos). Imported urea is around P450-P500 per bag, landed cost in Davao.

Aside from the issues that cut across the three industries covered by the key informant interviews, there are other issues that contribute to high production and marketing costs of agricultural products. High production and post-production losses due to poor infrastructure and inadequate post-harvest facilities increase cost of raw materials for fruit processing industries and constrain linkage development. High labor cost is also considered a problem due to minimum wage increases that exert upward pressure on wages set with unions. Costs of fuel and power are also important issues particularly for fruit processing industries. For Dole Philippines, cost of fuel is around \$15 million/year and power cost is even higher than fuel cost. The underlying issues are not discussed here but a common one that leads to high cost of production and marketing cost is the structure of these input industries. There are allegations that firms in these industries like shipping, agricultural chemicals, sugar, and packaging materials exercise market power or cartel-like behavior. These high production and marketing costs have hindered linkage of multinational or large domestic firms with small and medium agribusiness firms. To lower cost, they prefer to deal with large agribusiness firms as what has been observed in the banana and pineapple industries. For example, production cost for pineapple production and processing is lower in the Philippines compared to Thailand because of the presence of corporate farms. Aside from implementing appropriate competition policies, there is potential in developing strong agricultural cooperatives particularly due to the fragmentation of farms brought about by the implementation of agrarian reform.

6.0 Conclusions and recommendations

Multinational companies and large domestic firms in the banana, pineapple and mango industries have generated substantial benefits for the country in terms of exports, investments and employment.

While there are opportunities to enhance linkages of these firms with small farmers and enterprises, there are also challenges that need to be addressed to improve these linkages so that small farmers and enterprises may be able to tap higher value chains and improve quality, production and competitiveness of their produce.

Below are some recommendations to improve linkages.

Strategies/Recommendations	Responsible agency/group	Time frame
<p>A. Strengthen upstream linkage</p> <p>1) Improve access to land</p> <p>a) This requires addressing agrarian reform issues on ownership ceiling, transferability and holding period. Following Dy (2005), this would entail amendment of Section 12 (National Economy and Patrimony) of the Philippine Constitution and the 60:40 equity provision to allow foreign investors to have access to public lands</p> <p>b) Repeal LOI 790</p> <p>c) Revisit CARL (Osmena Bill)</p> <p>2) Establishment of production centers/villages (to be linked with consolidation centers)</p> <p>This is particularly relevant to mango and other fruits and vegetables similar to the model of banana and pineapple where farms are consolidated to attain economies of scale not only in production but also in processing and marketing.</p> <p>3) Reduce import-export tariff on agricultural chemicals</p> <p>This will benefit small farmers and enterprises as large exporters have their own bonded warehouses for imported inputs (De la Pena 2005). This may require an Executive Order.</p> <p>4) Development of new varieties, provision of seedlings and accreditation of nurseries in mangoes</p> <p>New varieties of mango such as shorter mangoes to save on labor cost (eg harvesting) which is approximately 40% of production cost</p> <p>5) Improve infrastructure and post-harvest facilities for priority production centers/villages that are linked to consolidation centers</p> <p>6) Education and capacity building of cooperatives and producer associations to minimize pole vaulting and enhance entrepreneurial skills</p>	<p>Constitutional convention</p> <p>DA, Mindanao Business Council</p> <p>Congress</p> <p>DA</p> <p>DA, DTI, Chamber</p> <p>DA</p>	<p>Long term (over 6 years)</p> <p>Medium term (2-6 years)</p> <p>Medium</p> <p>Short (below 2 years)-medium</p> <p>Medium</p> <p>Short to long term</p> <p>Short-medium</p> <p>Short-medium</p>
<p>B. Improve downstream linkages</p> <p>1) Reduce input-output distortions in sugar and packaging materials to lower cost in food processing and encourage development of new products.</p> <p>This may require an executive order similar to agricultural chemicals. According to key informant interview, one constraint in the development of new processed and retail products is the high packaging cost.</p> <p>2) Development of strategic consolidation centers particularly for fruits (or horticultural products – vegetables and cutflowers) with common service facilities (eg post-harvest/storage, cold chain, processing/repacking) and are linked to production villages/centers</p> <p>3) Lower shipping costs through consolidation (similar to the grains highway program of the national corn board) and elimination of charges in RORO ports</p>	<p>DTI, DA, Chamber</p> <p>DA, chamber and producer associations</p> <p>Chamber of Commerce</p>	<p>Medium</p> <p>Short-medium</p> <p>Short-medium</p>

<p>C. Improve access to credit</p> <ol style="list-style-type: none"> 1) Restore collateral value of CARP land by addressing CARP issues on ownership ceiling, transferability and holding period (Osmena Bill). 2) Improve capacity of Land Bank to evaluate and package loans to expand lending to perennial crops such as banana, pineapple and mango by creating a task force to assist regional offices. One constraint identified is the delay in the processing of loans due to lack of capability at the local level (suggested by a top official of Land bank) 3) It may be noted that a credit program in banana is being implemented by Quedancor this year through Mindanao Business Council. It is suggested that this be part of the linkage development program discussed below. 	<p>Congress</p> <p>Land Bank, Chamber of Commerce</p>	<p>Medium-long</p> <p>Short- medium</p>
<p>D. Establish a linkage development program</p> <p>This can be pilot-tested in Mindanao initially with horticultural products (fruits or vegetables).</p> <p>The program provides an integrated assistance to selected or targeted producer associations of small farmers involved in production of horticultural products to link and equip them to supply to high-value domestic (initially, then foreign) markets particularly supermarkets, hotels, fast food chains, restaurants including processing firms.</p> <p>These high-value markets require quality, volume and variety. By providing an integrated assistance to a group of producers that may include credit, training/capability/institutional development, infrastructure, equipment, technology, brokering, networking, etc., they will be able to meet market requirements. Studies show that in the case of vegetables, there are a number of reasons why farmers fail to meet quality requirements of markets. These include misconceptions of quality requirements of market, price distortions that do not provide incentive for farmers to produce quality products and cost of producing quality of products (Concepcion et al 2003).</p>	<p>DA, producer associations, Mindanao business council, DTI</p>	<p>short-medium</p>

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ANNEX A. Project cost per hectare, banana production 2005.

Project cost is P435,000 per hectare, consisting of:

Capital expenditures	P140,500
Development cost	125,000
Working capital	130,000
Pre-operating expenses	40,000
	P435,000

Capital expenditures:

Cableway	P65,000
Guying	60,000
Packinghouse	5,000
Power lines and transformers	2,500
Water system	4,500
Service vehicles	1,400
Other equipment	2,100
	P140,500
Development cost	
Land development (including drainage)	60,000
Planting	25,000
Pre production cost	40,000
Overhead	5,000
	P125,000

ANNEX B. Land development cost per hectare, banana operations, 2005.

Land Development Cost Per Hectare consists of:

Activities	Unit	Unit Cost	Standard/ Efficiency	Cost/Ha.
Survey (1 survey team of 4 members	Ha.	850	4.72MD/Ha	
a) Relocation/blocking survey	Ha.	850	4.72MD/Ha	
b) Topographic	Ha.	767.75	4.15MD/Ha	767.75
c) Contour lay outing	Ha.	767.75	4.15MD/Ha	767.75
d) Planting guide lay outing				
Clearing				
A) Under brushing				
A1) For Banana				
Manual Chopping	MD	195	2 MD/ha	
A2) For assorted tress <6" O				
i. Cutting/chopping/filling				
hauling (manual)	MD	195	8 MD/ha	234.00
ii. Hauling of debris for firewood	Hr	550	4 hr/ha	300.00
iii Fuel	Ltr	32.5	15 ltr/ha	73.12
iv Oil and lubricants	Qrt	80	1 qrt/ha	12.00
v Chainsaw rental w/ operator	Day	550	4.28 tree/hr	122.60
B. Tumbling/scratching	Hr	1100	4 min.tree	733.33
C. Cutting/trimming/deleafing/slicing				
i Hauling of debris for firewood	Hr	500	4 hr/ha	200.00
ii Manual	MD	195	8MD.HA	156.00
iii Fuel	Ltr	32.50	15 ltr/ha	48.75
Iv Oil and lubricants	Qrt	80	1 qrt/ha	8.00
v Chainsaw rental w/ooperator	Day	550	4.28 tree/hr	122.60
D Knockdown harrowing	Ha	1500	1.76 hr/ha	1,500.00
Organic Matter Application				
a) Cow manure application (5 tons/ha)	Has.	2051	8 hr/ha	2,051.00
b) Gypsum application (3 tons/ha.	Has			
Ripping	Hrs.	2500	8 hr/ha	18,003.00
Mouldboard	Hrs.	650	9 hr/ha	5,266.00
Harrowing	Has.	1500	2.31 hr/ha	1,350.00
Construction of Contour Canal				
A) Surface drainage	Cu. Mtr	21	154 cu.m/ha	2,173.87
B) Collector canal	Cu Mtr	21	117 cu.m/ha	2,192.77
C) Drop structure	Lot	1518		264.74
Travel Time	Hr	1100	1 hr./ ha	1,092.38
Road Forming/ Construction				
Road forming	LM	128.03	420 lm./ha	16,952.48
Contingencies				7,143.36
				60,000.00

ANNEX C. Production cost per hectare, pineapple operations, 2005.

Item	Cost/Ha	% share to total
Labor	38000	28.46
• Land preparation	4,300	3.50
• Planting	8000	6.50
• Spraying	700	0.57
• Fertilization	4000	3.25
• Weeding	8000	6.50
• Harvesting	13000	10.57
Planting materials	20500	16.67
Chemicals	46500	37.80
• Herbicide	10500	7.87
• Fertilizer	36000	29.27
Trucking	18000	14.63
Total	123000	100.00