

The Philippine Banana Industry: Market Performance, Constraints and Policy Directions

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Objectives

- ∨ To provide an overview of the banana production-marketing-consumption systems;
- ∨ To analyze the market performance of the banana industry in selected research sites;
- ∨ To analyze the constraints/problems encountered in the banana industry; and
- ∨ To suggest policy directions to improve the market performance of the banana industry.

Overview of the Banana Industry

Banana Production

National level: positive growth of 2.72 % annually (4.24 million mt in 1995 to 6.79 million mt in 2006).

Sources of growth:

- ∨ increasing number of bearing hills (3.12%/year) from 163.14 million hills to 228.04 million hills in 1995-2006
- ∨ expanding hectarage (2.16%/year) which ranged from 339,398 hectares to 428,804 hectares.

Banana Production

Regional level: Mindanao-major contributors (Regions XI, XII and X) - nearly two-thirds of banana production in 2006.

- ∨ Region XII- highest annual growth in production (9.63%)
- ∨ Region X (6.29%) despite its decline in yield (0.85%/year). Exhibited the fastest growth in area planted to banana (7.57%/year) because some banana plantations from Davao have relocated to Bukidnon.
- ∨ Luzon: Region II (5.80%/year) and Region IV-B (4.38%/year) showed moderate growth. Sources of growth: Region II- yield improvement (4.65%/year); Region IV-B- expansion in area planted (5.47 %/year) for the period 1995-2006.

Banana Production

- ∨ **Provincial level:** Compostela Valley, South Cotabato and Bukidnon in Mindanao; Oriental Mindoro and Isabela in Luzon. Quirino in Luzon also showed an increase in banana production due to improvement in yield in recent years.

Lantican et al. (2006):

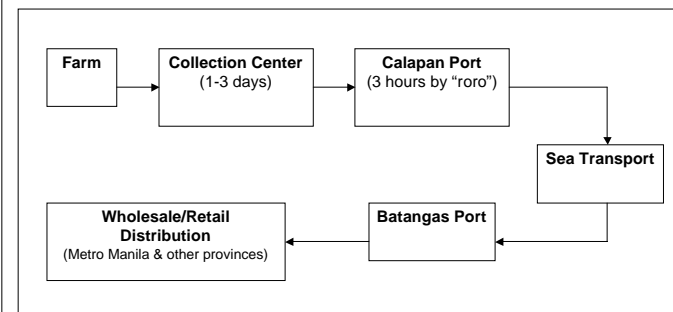
- ∨ Region XI: Cavendish (> 70 % of regional production); Saba (19 %); Lakatan (7%); and Latundan (2%).
- ∨ Region X: Saba (46 % of the total banana output); Lakatan (27%); Latundan (17%); and Cavendish (4%).
- ∨ Luzon: Region IV-B (Oriental Mindoro) – Saba (57% of total production); Lakatan (20%) and Latundan (15%).

Geographic Flows

Saba from Oriental Mindoro.

- ∨ Banana produce coming from Saba farms in Oriental Mindoro are hauled using animal-drawn sleds or 10-wheeler trucks.
- ∨ Fruits are temporarily stored at the assembler's place or collection center (1-3 days)
- ∨ From the collection center, bananas are loaded by bulk in large jeeps and ferried by the roll-on/roll-off "roro" ship, from Calapan, Oriental Mindoro to Batangas port.

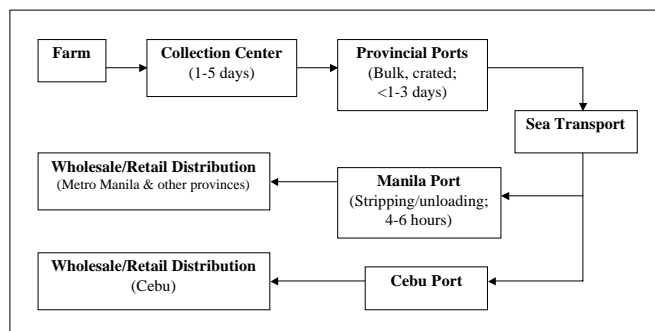
Figure 1. Commodity flow of Saba from farm (Oriental Mindoro) to final destination



Source: DA-SAP (2002)

Lakatan and Latundan from Mindanao

Figure 2. Commodity flow of Lakatan & Latundan from farm (Mindanao) to final destination



Source: DA-SAP (2002)

Banana Consumption

- √ Banana is most popularly consumed as food, with 48% share of total fruit utilization from 1995 to 2006.
- √ Filipinos consume more bananas than other fruits

2006 Annual Per Capita Consumption

Banana	-	35.57 kg
Mango	-	9.65 kg
Pineapple	-	9.04 kg
Papaya	-	1.66 kg

4. Marketing Performance

The market performance of the banana industry was measured using four dimensions:

- (1) spatial price efficiency;
- (2) analysis of the pricing system;
- (3) effectiveness and progressiveness; and
- (4) cost and returns analysis.

4.1 Spatial Price Efficiency

- √ To determine whether the banana market is spatially efficient or inefficient and to what degree is to test for market integration
- √ Price efficient- prices are fully transmitted between farm-to-wholesale or farm-to-retail levels or if price changes in geographically separated markets moved in unison between market levels that prohibit private traders from generating abnormal profit.

Ravallion Model (January 1995- December 2005)

Reference Markets:

Oriental Mindoro: Farm-wholesale level: Metro Manila
Farm-retail level: Batangas and Tarlac for 3 cultivars

$$FP_t = a_0 + a_1 FP_{t-1} + a_2 (W_{Pt} - W_{Pt-1}) + a_3 W_{Pt-1} + a_4 DS + \epsilon_t \quad (1)$$

where:

FP_t = banana farmgate price per kg at time t;
FP_{t-1} = banana farmgate price per kg lagged one month;
W_{Pt} = banana wholesale price per kg in the reference market at time t;
W_{Pt-1} = banana wholesale price per kg in the reference market lagged one month;
DS = dummy for season (1 with classes; 0 if summer); and
ε_t = error term

$$FP_t = b_0 + b_1 W_{Pt-1} + b_2 (R_{Pt} - R_{Pt-1}) + b_3 R_{Pt-1} + b_4 DS + \epsilon_t \quad (2)$$

where:

FP_t = banana farmgate price per kg at time t;
FP_{t-1} = banana farmgate price per kg, lagged one month
R_{Pt} = banana retail price per kg in the reference market per kg at time t;
R_{Pt-1} = banana retail price per kg, in the reference market lagged one month;
DS = dummy for season (1 with classes; 0 if summer); and
ε_t = error term

Table 1. Testing for market integration results: farm-to-wholesale and farm-to-retail levels for different banana cultivars, Oriental Mindoro and selected reference markets, Philippines, January 1995- December 2005

Banana Cultivar/ Reference Market	Regression Results (T-value in Parenthesis)							
	C	FP-1	DWP/DRP	WP- 1/RP-1	D- SEASON	IMC	R2	DW
Farm-wholesale level								
Saba	0.01	0.85***	-0.04	0.06	0.02***	15.09	0.76	2.26
Metro Manila	(-0.03)	(18.49)	(-0.40)	(0.85)	(2.28)			
Lakatan	0.15	0.81***	-0.12	0.04	0.03*	21.33	0.69	2.16
Metro Manila	(2.09)	(16.04)	(-1.28)	(0.88)	(1.91)			
Latundan	-0.09	0.83***	0.01	0.16	0.02	5.13	0.81	2.14
Metro Manila	(-1.25)	(16.73)	(0.07)	(2.16)	(1.41)			
Farm-retail level								
Saba								
Tarlac	0.06	0.86***	0.03	0.02	0.02***	52.84	0.76	2.41
	(2.19)	(19.69)	(1.11)	(0.81)	(2.28)			
Batangas	-0.07	0.84***	0.18***	0.12	0.02**	7.20	0.77	2.37
	(-1.05)	(18.85)	(2.86)	(1.74)	(2.19)			
Lakatan								
Tarlac	0.11	0.82***	-0.01	0.01	0.02	132.77	0.68	2.23
	(2.32)	(16.21)	(-0.35)	(0.38)	(1.67)			
Batangas	0.08	0.82***	-0.06	0.02	0.02	174.72	0.69	2.21
	(0.98)	(16.46)	(-1.24)	(0.32)	(1.70)			
Latundan								
Tarlac	0.03	0.88***	0.05	0.02	0.02	46.24	0.81	2.21
	(0.72)	(21.21)	(1.43)	(0.82)	(0.93)			
Batangas	0.02	0.89***	0.01	0.02	0.02	37.83	0.81	2.22
	(0.21)	(22.56)	(0.08)	(0.42)	(1.10)			

***Significant at 1% probability level; **Significant at 5% probability level; *Significant at 10% probability level Source: (Lantican, et al. (2006)

Results of Test for Market Integration (Lantican et al., 2006)

- Estimated coefficients a₂ of DWP and b₂ of DRP for all banana types were less than one - slow price transmission (i.e., changes in wholesale or retail prices for banana have limited impact on farm gate prices).
- Oriental Mindoro- negative a₂ and b₂ signs for Saba and Lakatan – implying a delay in price transmission from Metro Manila, Batangas and Tarlac to the local market in the production area.
- Season dummy significantly affected the farmgate prices of Saba and Lakatan grown in Oriental Mindoro (FP of Saba higher- June-Oct with classes.; lower-summer)
- Very few DWP and DRP coefficients were significant, implying a weak integration in the short-run between market pairs.
- Supported by IMC indices of greater than one. Very high value of IMC indices indicates that the previous price in the reference market has limited effect on the present price in the local market.

Contributory factors to weak market integration between farm and wholesale or retail markets:

- limited access to reliable and updated market information
- poor farm-to- market roads that entail high transportation cost in hauling banana.

Table 2. Augmented Dickey-Fuller Unit Root Tests for banana price series by type of banana cultivar in Oriental Mindoro, and selected reference markets, Philippines, January 1995 to December 2005

Type of Banana Cultivar/Price Series	Test Statistic	Critical Value (5%)	Conclusion
Saba Banana			
FP - Oriental Mindoro	-2.54	-2.88	Has unit root
WP – Metro Manila	-3.95	-2.88	Stationary
RP – Tarlac	-4.14	-2.88	Stationary
RP - Batangas	-4.52	-2.88	Stationary
Lakatan			
FP - Oriental Mindoro	2.09	-2.88	Has unit root
WP – Metro Manila	-1.46	-2.88	Has unit root
RP – Tarlac	-4.70	-2.88	Stationary
RP - Batangas	-3.73	-2.88	Stationary
Latundan			
FP - Oriental Mindoro	-2.63	-2.88	Has unit root
WP – Metro Manila	-2.63	-2.88	Stationary
RP – Tarlac	-3.95	-2.88	Stationary
RP - Batangas	-4.78	-2.88	Stationary

Source: Lantican, et al. (2006)

- v Like Saba, there is no significant connection for Latundan price series in Oriental Mindoro and its reference markets (e.g., Metro Manila, Tarlac and Batangas).
- v Results confirm that the pricing system for banana is inefficient considering that price transmission is so weak between the local market and reference market

Cointegration Analysis: Engel and Granger (1987)

- v Farmgate prices of Saba in Oriental Mindoro had unit root implying a nonstationary price series. Among reference markets for Saba, wholesale price series in Metro Manila and retail price series in Tarlac and Batangas were stationary. As a rule, a nonstationary price series can never be cointegrated with stationary price series.
- v Results of the Augmented Dickey-Fuller unit root tests for banana price series revealed that for Saba cultivar, there was no significant connection between farmgate prices and wholesale/retail prices. For example, Saba farmgate prices in Oriental Mindoro was nonstationary, hence it could not be cointegrated with wholesale prices in Metro Manila and retail prices in Tarlac and Batangas.
- v For Lakatan, farmgate price series in Oriental Mindoro do not cointegrate with retail price series in Tarlac and Batangas, the two reference markets considered in the study.
- v In the case of price series at the farm level in Oriental Mindoro and wholesale level in Metro Manila, a cointegration test was done and the result was also not cointegrated.
- v Although the Augmented Dickey-Fuller (ADF) test for the residual of the cointegrating equation indicates that the two price series seemed to be cointegrated, it was not supported by the results of the absolute error correction model.
- v All the adjustment coefficients- statistically insignificant implying no long run cointegration between the price series in the local market in Oriental Mindoro and wholesale market in Metro Manila. Consistent with the results of the Ravallion model.

4.2 Pricing System

Method of Pricing

- v Banana pricing system is inefficient.
- v 94% of small-hold banana growers in Luzon (Oriental Mindoro and Quirino) claimed that their buyers set the price.
- v 84 % of the Oriental Mindoro banana producers and 76 percent in Quirino relied on the traders as main sources of price information.
- v Pricing of fresh banana is based on the method of selling; according to size (B-S/B-S-M) or rumble per piece instead of per kilogram at the farm level.
- v More than half of the growers sold banana as all-in or rumble (lower price than banana sorted according to size).
- v Practice of providing quantity discount to traders at the farm level at the disadvantage of banana producers

Three methods of quantity discounting:

- (1) Automatic provision of a 10 percent additional quantity of marketable supply of banana as allowance for losses to traders in Quirino;
 - v Sell 1,000 pieces of banana per week at the farm, but only 900 pieces are actually counted and paid for .
- (2) Counting of banana by fives or *lima-lima*; and
 - v Excess of 5, 10 and 15 fingers or pieces are not paid although these bananas are marketable.
 - v Excess fingers account for about 15- 20 percent of the marketable surplus.
- (3) Discounting of small-sized bananas

- v The worst; banana growers entail huge losses in terms of uncounted marketable volume. If there are 15 pieces in one *piling*, only 5 pieces will be counted and paid by traders.
- v Total losses in terms of quantity not counted are estimated to be between 18-30 percent of the total marketable supply. If the farmer sells 1,200 pieces of banana, in reality, the actual volume of banana involved are more than the said quantities.
- v Banana growers receive payments only for 1,440 pieces of banana although the total volume involved is 2,000 pieces. This figure is derived given the situation in Quirino where there is a 28 percent uncounted volume (i.e., 10% additional quantity and 18% of the excluded quantities from the counting of banana by fives).
- v Traders claim that these uncounted volumes are allowances for losses in transporting the commodity. In most cases, bananas are sold straight or *derecho* including uncounted bananas. *Viajeros* have two (big and small) to three classifications (big, medium and small) when they sell at the trading areas.

4.3 Effectiveness and Progressiveness

Effectiveness- refers to the stakeholder's ability to match demand preferences with corresponding supply situations

- v The practice of traditional way of growing Saba banana without fertilization, continuous use of suckers or corms taken from their own farms or within the community and limited initiative to clean their banana farms resulted in low production and non-uniform sizes of banana harvests.
- v Oriental Mindoro and Quirino growers can not meet the quantity requirements of banana chips processors (additional supply from the Visayas and Mindanao).
- v High demand for Saba by snacks food processors further limits the available supply for banana chips processing.
- v High incidence of pests and diseases for Lakatan and Latundan reduces the capacity of the two research sites to provide adequate supply of these two banana cultivars.
- v More than half of the wholesalers and all retailers in Metro Manila and other provinces prefer buying banana classified according to size but unfortunately less than half of banana growers interviewed in Oriental Mindoro and none in Quirino practice sorting of banana before selling.
- v Different marketing strategies adopted by assembler-shipper-wholesalers/ assembler-wholesalers

Different marketing strategies adopted by assembler-shipper-wholesalers/ assembler-wholesalers

- ♣ provision of cash advances (P1,000-P5,000) to regular suppliers;
- ♣ extension of credit to *suki* buyers;
- ♣ offering of price discounts/additional quantity to regular buyers (e.g., 2 pcs/100 pcs);
- ♣ hiring of local agents to obtain supply of banana;
- ♣ maintaining an effective communication system to monitor prices;
- ♣ selling of resorted banana.
- ♣ direct procurement of banana from the farm or designate assembly points and deliver these to their market outlets.

Banana chips processors

- √ Sell products in the local markets and key cities in
- √ One Manila-based food processor interviewed trades banana chips abroad particularly in United States, China, Hong Kong, Germany, France, and Netherlands.
- √ Forged a contract marketing arrangement with producers of first fried banana chips to be packed in materials provided by the processor. Purchase price ranges from P30-42/kg at pick up basis.
- √ Joining the local trade fairs and missions (e.g., Alabang, Mega Mall, and Festivals)
- √ Tap local radio stations, use posters and flyers for local advertisements, and allow to be featured in national and local newspapers and magazines (e.g., Manila Times and *Kumikitung Kabuhayan*).
- √ Maintain a retail outlet either closer to the port or in the departure area in Calapan City port, in bus stations and supermarkets (Oriental Mindoro).
- √ Offer free samples to promote their product and give discounts/extra quantity to regular buyers. In most cases, new buyers learned about their product by word-of-mouth from their regular or existing buyers.
- √ Coordinate with school officials to sell their products in school canteens and with local government offices especially during special events (e.g., trainings/seminars and sports fest in Quirino)

Progressiveness- measures the stakeholder's ability to perform efficiently using newly developed technologies and institutional capabilities.

- ♣ The absence of strong farmers' groups/industry associations limits the access of small-hold growers to improved production and postharvest technologies/practices.
- ♣ Resorting banana increases the traders' chance of catering to wider group of buyers aside from generating higher income.
- ♣ Many *viajeros* in Luzon have invested on communication systems (e.g., radios, computers and cell phones) to monitor prices and supply and demand situation. Own vehicles to fast tract the movement of banana
- ♣ Only the Manila-based processor-exporter designs better packaging materials and proper labeling of the product and follow the quality standards required by the foreign buyers.
- ♣ Slicing of Saba is done mechanically . Conducts market research

Cost and Returns Analysis

Case 1: Grower selling Saba banana as rumble (assorted)

Table. Annual costs and returns of a typical Saba farm with quantity discount and reduction of postharvest losses and without size classification of fruits in Oriental Mindoro and Quirino, Philippines, 2005.

Item	Oriental Mindoro		Quirino	
	P/ha	P/100 pcs ^c	P/ha	P/100 pcs
Gross Returns ^a	30,318	60.52	26,214	51.52
Costs				
Labor ^b	4,380	8.73	4,140	8.13
Food Expenses	990	1.98	900	1.77
Depreciation	162	0.32	206	0.40
Total Costs	5,532	11.03	5,246	10.30
Net Returns	24,786	49.49	20,968	41.22

^aReduction of 24% in Oriental Mindoro and 28% in Quirino

^bInclude replanting, leaf pruning/trimming/desuckering and harvesting, dehandling and hauling (80%)

^c Farmgate price in Saba banana in Oriental Mindoro (P60.52/100 pcs) and P51.52/100 pcs in Quirino

Case 1. Grower selling Saba banana as rumble (assorted)

- ∨ Many growers did not practice base cleaning, weeding, stem and mat sanitation, and fertilization
- ∨ No fertilizer and pesticides applied
- ∨ Total production and postharvest costs: P 5,532/ha in Oriental Mindoro and P 5,246 in Quirino.
- ∨ Bulk of expenses went to labor (79%), followed by food expenditure for laborers (18%) and depreciation costs (3%) of tools and equipment used (bolo, cart, scythe, shovel and sled).
- ∨ Net returns (P24,786/ha or P 49.49/100 pcs in Oriental Mindoro, and P 20,968/ha or P 41.22/100 pcs in Quirino).

Case 2. Selling Saba by size: small (26%); big (74%)

Farm price = P 80/100 pcs. (big size)
= P 40.84/100 pcs. (small size)

Oriental Mindoro

Net returns = P 25,421/ha or P 50.75/100 pcs

Removing the quantity discount through proper counting of Saba would increase net returns by P 2,117/ha or P 3.34/100 pcs.

Case 3. Diversified farm: 3 Cultivars

Oriental Mindoro

Farmgate price

Saba = 61% P 60.52/100 pcs

Lakatan = 22% P 84/100 pcs

Latundan = 17% P 70/100 pcs

Case 3. Diversified Farm: 3 Cultivars

Table. Annual Costs and Returns of a diversified banana farm with quantity discount and reduction of post-harvest losses, and without size classification of fruits

Item	Oriental Mindoro	
	P/ha	P/100 pcs
Gross Returns	52,309	68.31
Costs		
Labor	5,256	6.86
Food expenses	990	1.29
Depreciation	162	0.21
Total Costs	6,408	8.36
Net Returns	45,901	59.95

^aIncluded Saba, Lakatan and Latundan; with 24% reduction (20% quantity reduction and 4% postharvest losses)

Case 4. Diversified Farm: 3 Cultivars with Size Classification

Oriental Mindoro

- Net Returns = P 47,530 or P 60.68/100 pcs

Case 5. Progressive Diversified farm: Cultivars

Item	Oriental Mindoro	
	P/ha	P/100 pcs
Gross returns	98,048	91.89
Costs		
Labor	8,760	7.62
Fertilizer	7,300	6.35
Food expenses	1,584	1.43
Transport (Batangas)	13,248	12.00
Depreciation	162	0.15
Total costs	31,054	27.55
Net returns	66,994	64.34

Progressive Diversified Farm: 3 Cultivars

- Practice farm fertilization (a sack of Muriate of Potash, 7 bags Complete fertilizer and 4 bags Ammonium Sulfate)
- Production higher by >10% than typical diversified farm
- Labor cost higher due higher marketable surplus
- Better income than the typical diversified farm (higher by P 21,093/ha or P 4.39/100 pcs)

Constraints/Problems Encountered

Constraints/Problems/Subsystem	Province			
	Oriental Mindoro		Quirino	
	Number	Percent	Number	Percent
Input Supply/Production				
Lack of supply of disease free and high yielding planting materials	53	53	45	63
High incidence of pests and diseases	37	37	27	38
Limited financing	28	28	18	25
Limited access to information on appropriate production technologies	27	27	21	30
Absence of strong banana farmers association/ cluster of growers	32	32	23	32
Unaware of government assistance/support				
On banana production and pest management	95	95	48	68
Strong typhoons	20	20	15	21
Postharvest				
Inadequate information on improved/newly developed postharvest technologies/practices	30	30	12	17
Poor farm-to-market roads	27	27	11	15
Inadequate postharvest infrastructure /facilities	22	22	6	9
Processing				
Unpredictable supply of Saba banana	2	67	1	50
Poor quality of raw materials	1	33	1	50
High cost of cooking oil and sugar	1	33	1	50
Marketing				
Inefficient pricing	50	50	19	27
Limited access to reliable and accurate information	28	28	14	20
Inability to join trade fairs/exhibitions due to financial constraint	1	33	1	50

Source: Lantican et al. (2006)

Suggested Marketing Strategies and Procedures

6.1 Strengthen Existing Farmers' Associations or Formation of a Strong Banana Cluster

- v Increase the bargaining power of small-hold banana growers and attain economies of scale by strengthening the weak ones or form a banana cluster.
- v A banana cluster is defined as a group of 5 to 10 producers who undertake a common production and marketing plan for specific banana cultivar(s) for identified and committed market(s).
- v Banana clusters can be classified based on the volume of production by type of cultivar and location of the farms of the small-hold growers.
- v Organize one banana cluster for each province as a pilot case. Long-run, two separate clusters could be organized: Saba banana cluster and Lakatan/Latundan cluster if economies of scale are attained.
- v Clustering concept (Northern Mindanao) for high value crops: six clusters (e.g., lettuce, broccoli, tomato, carrot, strawberry, and peanut).

Strengthen Existing Farmers' Associations or Formation of a Strong Banana Cluster

Joan Uy of the Bukidnon lettuce cluster:

Benefits:

- v can tap better markets due to high volume of production and stable supply of quality products;
- v have advantage of economies of scale;
- v can share resources;
- v can effectively relate with government and other resource organizations for support; and
- v enjoy good image in the business community.

Forging Strong Linkages between Banana Growers and/or Government/Input Suppliers and Potential Buyers

- v Need government assistance in linking them to reliable sources of disease-free planting materials and improved production and postharvest practices/technologies.
- v Conduct training of banana growers and agricultural technicians on pest and disease control, and improved production and postproduction practices/technologies
- v Distribute updated techno guide jointly prepared by government agencies (e.g., DOST-PCARRD, DA-ATI/BAR and academe) and private organizations (e.g., INIBAP and industry associations in Mindanao) to small-hold banana growers.
- v Invite buyers including processors in the training to undertake market matching.
- v Forge linkages between banana growers and potential buyers (e.g., processors, wholesalers, wholesaler-retailers and institutional buyers to increase access to markets.

Enhancement of Market Infrastructure and Facilities

- ∨ Fast track the rehabilitation and construction of farm-to-market roads
- ∨ Develop tramlines in mountainous production areas in Mindoro, fresh bananas can be transported to the nearest market centers in lesser time and at a lower cost. This transportation facility can be provided by LGUs with technical and financial assistance from DA-BPRE, DA-RFUs, DOST and international donor agencies.
- ∨ Establish functional packinghouses in strategic production sites like Socorro and Pinamalayan in Oriental Mindoro to improve the quality of banana and minimize the high allowances for losses. Place for pre-market preparation activities such as dehanding, washing, sorting and temporary storage, among others.
- ∨ Nuevo et al (2001): ideal packinghouse- with washing tanks, sorting tables, weighing scale, push carts and drying racks.

Adoption of Proper Grading/Sorting of Banana

- ∨ Starting at the farm level following the recommended size classification of BAFPS in collaboration with UPLB-PHTRC and representatives of the banana industry.
- ∨ Some banana growers in Oriental Mindoro practice selling banana in two (big and small) to three sizes (big, medium and small).
- ∨ The estimated number of banana fingers by size when converted into per kilogram basis according to grower-respondents could range from 7-8 pieces for big, 9-10 pieces for medium, and 11-14 pieces for small classifications.
- ∨ Proper grading must be demonstrated by the postharvest expert and representative trader or processor
- ∨ Pricing of banana on a per kilogram basis must also vary by size classification with the biggest commanding the highest price and the smallest, the lowest price.

Establishment of an Effective Market Information System

- ∨ Small-hold banana growers need updated and reliable market information on:
 - prices at specific market levels (e.g., farmgate, wholesale buying or retail) in major trading centers within and outside the province,
 - production statistics and areas per banana cultivar,
 - trading volumes of the different *bagsakan* or wholesale markets, and
 - profile of buyers by segment (e.g., institutional buyers, processors, supermarkets) including volume and quality specifications
- ∨ Short-run: the DA-AMAD, DA-BAS, LGUs, DOST-PCARRD can establish a pilot market information service (MIS) similar to the one developed and implemented in two pilot municipalities in Bukidnon for 11 high-value vegetables under DA-FAO Farm Income and Market Development Project in 2002-2003.
- ∨ Conduct MINA (information needs of growers, determine effective mechanism of disseminating information to farmers, and develop consensus on the roles and responsibilities of the MIS participants)

Undertaking an Aggressive Market Promotion (Lantican, et al., 2002).

- ∨ Domestic front- trade fairs and exhibitions can be partly financed by concerned government agencies (e.g., DA-AMAS and DTI-CITEM) to increase the participation of small-hold growers groups/clusters, and small-and medium-sized processors in these business events.
- ∨ Export market- establish a cost-sharing arrangement with medium-sized banana processors in financing promotional activities. Involve the Department of Foreign Affairs in adopting unified and focused market promotions with the participation of attaches in the export markets

Appendix Table 1. Result of the Augmented Dickey-Fuller Cointegration Tests for residual of cointegrating equations for Lakatan, Oriental Mindoro and Metro Manila, Philippines, 1995- 2005

Price Series	Test Statistic	Critical Value (5%)	Conclusion
FP Mindoro (Regressand)			
WP – Metro Manila	-2.93	-1.943	Stationary

Appendix Table 2. Average Absolute Error Correction Model Speed-of-Adjustment Parameter Estimates for Lakatan, Oriental Mindoro and Metro Manila, Philippines, 1995 - 2005

From	To	Adjustment Coefficients	
		Value	t-statistic
FP - Oriental Mindoro	WP – Metro Manila	-0.015	-1.45
WP - Metro Manila	FP - Oriental Mindoro	-0.011	-0.23