Republic of the Philippines
Department of Agriculture

Upland Development Programme in
Southern Mindanao (UDP)

A MARKETING EFFICIENCY STUDY
ON

MANGO

IN BARANGAY PITU, MALALAG,
DAVAO DEL SUR

MAY 2001

PREFACE

This report is one of a series of market efficiency studies conducted in the UDP-covered areas for selected commodities. The marketing efficiency of mango in Barangay Pitu, Malalag was evaluated through the deconstruction of the marketing margins. Recommendation to improve marketing efficiency is herein provided.

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DEFINITION OF TERMS

Cash costs — costs where actual money is involved.

Cash returns — the earnings, where actual money is involved, from the sale of the farm produce.

Depreciation — the expense brought about by the wear and tear of a piece of equipment, building or tool used in an enterprise for a given period of time.

Exchange labor — the value, non-monetary in nature, of the work (in man-days) put in by neighbors, friends or other laborers in exchange for the farmers help with similar farm activities in their respective farms.

Given away — the value, non-monetary in nature, of the farm produce given out by the farmer to others without any monetary payment.

Hired labor — the cash expense for engaging the services of farm laborers.

Home consumption — the value, non-monetary in nature, of the farm produce consumed by the farmer and his family.

Losses/shrinkage of produce - the value, non-monetary in nature, of the damages and spoilage sustained by the produce.

Market information — basic information on prices and quantities traded of major commodities, from all markets—assembly, wholesale and retail.

Marketing channel — the inter-organizational system composed of interdependent institutions tasked in moving the product from production to consumption.

Marketing efficiency — the maximization of the input-output relationship where inputs refer to resources (land, labor, capital) used in moving the products from point of consumption to the point of production and output referring to consumer satisfaction on goods and services made available in the market.

Marketing margin — the difference in prices between the different levels of the marketing system.

Marketing	-	series of services performed in moving the product from the point of production to the point of consumption.
Net farm income	-	returns of the use of capital and labor. The overall profit of the farm after all the expenses, cash and non-cash, have been paid off.
Non-cash costs	-	costs items used in the production process wherein no direct outlays occurred or the costs incurred are not monetary in nature.
Non-cash returns	-	the value, non-monetary in nature, of the farm produce consumed by the farmer and his family or those given away.
Opportunity cost of capital	-	the price of foregone opportunity in the use of the capital invested in the enterprise. It is usually pegged at the current savings interest rate.
Point of consumption	-	last sale of the product.
Point of production	-	point of first sale.
Profit margin	-	the return to the middlemen for their entrepreneurship, the risks and the cost of money.
Return on investment	-	measures the amount of cash that the entrepreneur gets from the capital investment after first paying the opportunity expenses on the value of family labor and management. It also determines how much money the producer got in return for every one peso invested.
Unpaid family labor	-	also called own labor. The value, non-monetary in nature, of work (valued in man-days) by the farmer and his family.

MANGO

INTRODUCTION

1.   Mango (Mangifera indica Linn.) is the most popular indigenous fruit crop in the Philippines. It is a yellowish pear-shaped fruit with a thin rind, typically 7 cm in diameter and 12 cm in length. Fibrous and with a sub-acid juicy pulp and hard-flattened central seed, it has a tangy flavor.

2.   Ripe mango is normally taken fresh and sometimes processed into jams, candies or dehydrated mango, ice cream flavoring, pickle mix, mango scoops, tid-bits and chunks. It can also be made into beverages like mango juice, puree and wine. Green mango, on the other hand, can be used in salads, pickled, and served as an appetizer or as a fermented fruit or juice drink.

3.   The Philippines has several distinct varieties of mango namely Mango Cebu or Carabao, Pico, Duldul, Señora and Puhulan. The Mango Cebu, more commonly known as the Manila Super Mango is considered as the best variety for fresh fruit export because of its perfect blend of sweetness and sourness.

4.   Mango production is predominant in Barangay Pitu, Malalag, each farmer having 5 to 10 mango trees covering on average an area of 0.5 hectares. For a farmer in Barangay Pitu the average yield per hectare of mango is 604.4 kilograms. Three types of mangoes are produced in the area, namely, Class A Carabao "Cebu", Class B Carabao and Batuta.

5.   Mangoes are usually harvested immediately upon maturity in order to prolong its shelf life and avoid pest infestation and rotting during transport.

6.   Farmers harvest mango during the months of April to June and November to December. Volume of production is highest on months of June and December. However, production declines in the months of August to October and from January to February.

7.   The marketing efficiency study for mango in Barangay Pitu, Malalag was conducted in March 13, 2001.

Objectives

8.   The main objective of the study is to assess the impact of existing marketing systems of mango vis-à-vis income of the farmers.

9.   Specifically, the study aims to determine the levels of participants in the marketing chain of mango;

10.   Determine the marketing practices involved in terms of storage, handling, pricing, delivery systems and terms of payment;

11.   Determine the percentage of consumer price that the producer receives through the deconstruction of marketing margins of mango at each level in the system, exclusive of production costs;

12.   Identify strengths and weaknesses of the existing marketing system of mango; and

13.   Determine appropriate marketing interventions needed to improve economic efficiency of mango in Barangay Pitu, Malalag.

Methodology

14.   From the initial agribusiness profile of UDP – Davao del Sur, 12 mango farmers were identified; six of who come from Barangay Pitu, Malalag. Complete enumeration of the Barangay Pitu mango farmers was done for the interview.

15.   The farmers were asked about their production and marketing practices, production and marketing costs of mango. They were also asked on available market information with emphasis on what they need to know to improve their production and marketing practices, thereby increasing the farmers' income.

16.   The respective buyers of mango from each farmer were then traced accordingly.

17.   The traders were, in turn, asked about their marketing, costs, and the problems and constraints they have encountered in the marketing of mango.

18.   The marketing margins (MM), or the total value added to the mango per kilogram as it moves along one marketing channel to another, were then deconstructed and the profitability of each marketing participant was also analysed. In the case of the farmers, the Net Farm Income (NFI) was determined. An NFI greater than zero (0) would mean that the production and marketing activities of the mango farm is profitable, whereas an NFI less than zero (0) would mean that the farm is at a loss.

19.   On the part of the trader, the Return on Investment (ROI) was compared with the opportunity cost of capital, pegged at the existing current savings interest rate of eight percent (8%). An ROI higher than the opportunity cost of capital would mean that marketing mango is more profitable than just saving the trader's money in a bank. While an ROI less than the opportunity cost of capital would mean that it would be more profitable for the trader to invest his money in a bank rather than spend it on marketing mango.

20.   The percent share to the consumer peso of each marketing participant was also determined by getting the percentage of the marketing participant's selling price (in the case of traders, less their buying price) relative to the final buying price of the

consumer. This indicates the proportion of the final buying price that goes to each marketing participant for mango.

21.   Moreover, focused group discussions (FGDs) with key informants and selected farmers were conducted to probe into the importance and the demand for market information in each province. This provided rapid feedback on the available market information and the information dissemination strategies existing in the area.

22.   Also, key informants such as the Municipal Agriculturists and the Agricultural Technicians were interviewed to obtain an overview of the local agriculture industry.

Limitations and Constraints

23.   Upon interview, the farmers only recalled their past production level, income, farm tools and equipment used, as there were no records kept of their operations. Thus the cost and return that were analyzed were only estimates. The Return on Investment (ROI) was excluded on the analysis of the farmer's income due to the ambiguity of the values arrived at, as some factors on capital investment were not quantified. For instance, land valuation was excluded because none of the farmers hold titles to the land that they cultivate. Land, therefore, was not considered a fixed investment in this enterprise and was merely considered as an expense through the credit of land cost (land tax if owned, rent if tenanted).

24.   For the marketing aspect, the respondents interviewed were the middlemen identified by the farmers. Most of who also based their answers on their memories since they too do not keep records of their marketing operations.

25.   On the analysis of the marketing efficiency of the farmers, only the Net Farm Income (NFI) analysis was utilized since the available data could only allow for this kind of analysis and not the more complicated input-output efficiency analyses.

26.   Lastly, the size of the mango market, specifically, the estimation of demand was not included in the study.

Margin of Error

27.   Aside form the UDP Agribusiness Profile, there are no other available data on the population size of mango producers in the area. The margin of error on the analysis, therefore, cannot be established since the formula requires not only the sample size, but the population size as well.

Marketing Channels

28.   The marketing participants involved in the mango commodity system in Barangay Pitu, Malalag are as follows:

a.   Farmer

The first type of farmer is the farmer/lessee who does not have any financing/marketing/contract-growing arrangements with any trading entities/individuals. The farmer solely assumes all production activities including marketing of the produce.

The second type of farmer is one who engages in a contract growing arrangement for a contract grower. In this arrangement, the farmer's investments are land, mango tree, cultivation, cleaning and maintenance of the farm. The contract grower assumes the responsibility of the farm from floral induction, harvesting and marketing to the assembler-wholesaler. The sharing scheme follows the 60-40 ratio, where 60% of the sales go to the contract-grower and 40% to the farmer.

b.   Municipal Assembler- Wholesaler

Assembler-wholesalers based in Malalag Market bought the mangoes from the Barangay Pitu mango farmers. Mangoes are assembled in the trading area and brought to the Assembler-shippers and retailers. The mango does not stay long with the assembler-wholesaler. It is sold immediately to Assembler-shipper in Davao City or Retailers in Digos City and Malalag.
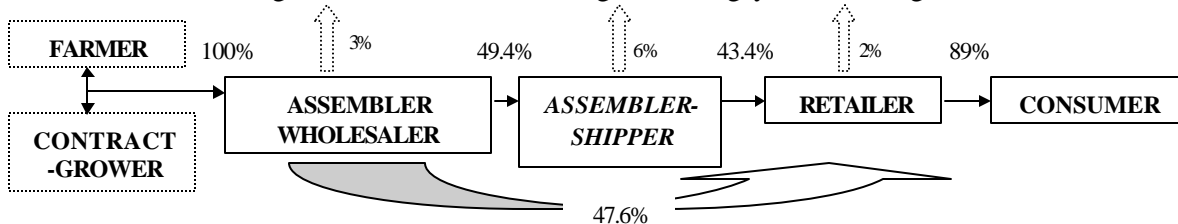
c.   Assembler- Shipper

The assembler-shipper plays an important role in transporting the mango to different areas like Manila and Cebu. The assembler shipper only ships the quality Cebu mango with an average weight of 200 grams and higher. They usually ship the produce by plane while some by boat. They would prefer to ship it by plane due to the perishable nature of the commodity.

d.   Retailer

Retailer transfers the goods to the consumer. The location of the retailers is in the market areas of Malalag, Digos City, Davao City and Manila.

29.   Mango marketed from the producers was traced from the farms to the retailers and the product flow is established.

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Figure 1. Product Flow of Mango in Barangay Pitu, Malalag.

Selling Price (P/kg):

	Farmer	Assembler-Wholesaler	Assembler-Shipper	Retailer
Case 1:	18.00	20.00	35.00	*na*
Case 2:	18.00	20.00	*nil*	27.50

30.   After the contract-grower, along with the farmer, sell 100% of the mangoes to the assembler-wholesaler. The assembler-wholesaler, in turn, sells 49.4% of the mangoes to the assembler-shipper who then transports it to Davao City and Manila. The rest (47.6%) of the mangoes are then sold to the retailers.

31.   The figure also illustrates the losses incurred in the different marketing levels. Assembler-shipper posted the highest loss of 6%. This can be attributed to poor packaging materials used in transporting the product. At the assembler-wholesaler level loss is at 3% and 2% at the retailer level.

32.   Figure 2 illustrates the geographical flow of mango. For the first channel (Case 1), the assembler-wholesaler based in Malalag passed the mango to the assembler-shipper in Davao City, then mango is shipped to Manila. On the other hand, in the second channel (Case 2), the assembler-wholesaler based in Malalag pass on the mango to the retailers in Davao City, Digos City and Malalag.

Figure 2. Geographical flow of mango from Barangay Pitu, Malalag.

CASE 1

CASE 2
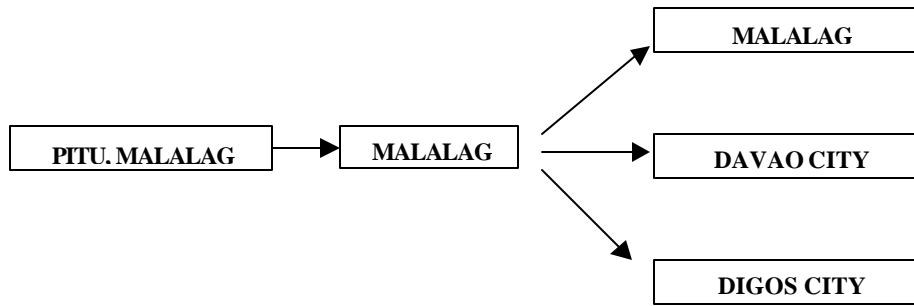
Marketing Practices and Costs

33.   The mango farmer's main marketing activity is to package the mango in a *kaing* basket, right after harvest. Storing is not practiced in the farm.

34.   The traders set grading classifications. Commonly used grading classification is based on the weight of the mangoes. The grading weight classification is as follows:

    a. Minimum of 200 grams
    b. Minimum of 150 grams
    c. All-in class.

33.   The farmers and contract-growers prefer to sell to traders with a high buying price which was determined to be an average of P18 per kilogram. The farmers and contract-growers are pain in cash upon purchase of the mangoes.

34.   The assembler wholesaler then delivers the mango to the assembler-shipper and retailer. The usual payment scheme was cash on delivery. Again, due to the perishability of the product, mango is sold right away to the next chain.

35.   Although the mangoes are graded by the contract-grower immediately upon harvest, the retailer grades the mangoes again. This is done to make sure that the mangoes are properly graded.

36.   Table 1 summarizes the marketing costs for every marketing level.

Table 1. Marketing cost for different marketing levels of mango.

MARKETING PRACTICES	Farmer	Assembler-wholesaler	Assembler-shipper	Retailer
Harvesting	0.31	*na*	*na*	*na*
Cleaning	0.59	*na*	*na*	*na*
Packing	0.77	*na*	*na*	*na*

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Transportation	0.21	0.68	10.6	0.2
Labor	*na*	0.33	1.2	*na*
Supplies and Materials	*na*	0.32	0.18	0.39
Fees and payments	*na*	*na*	0.64	0.04
Non-Cash costs	*na*	0.64	0.02	1.67
TOTAL	1.88	1.97	12.64	2.3

37.   It shows that assembler-shipper has the largest marketing cost at P12.64/kg. This is due to excessive cost of transporting the produce to Manila. Marketing cost for farmer is at P1.88/kg, assembler-wholesaler at P1.97/kg and retailer at P2.30/kg.

Price Formation

38.   Price plays an important role in the decision making of the farmers. It is the basis of their production decision.

39.   In Barangay Pitu, Malalag farm gate price is highly sensitive to the fluctuations in the supply of mango. For the pervious year, there was an abundant supply of mango in the months of November, December and from April to June. Consequently, it was during these months when farm prices were pegged at lower levels (Table 2).
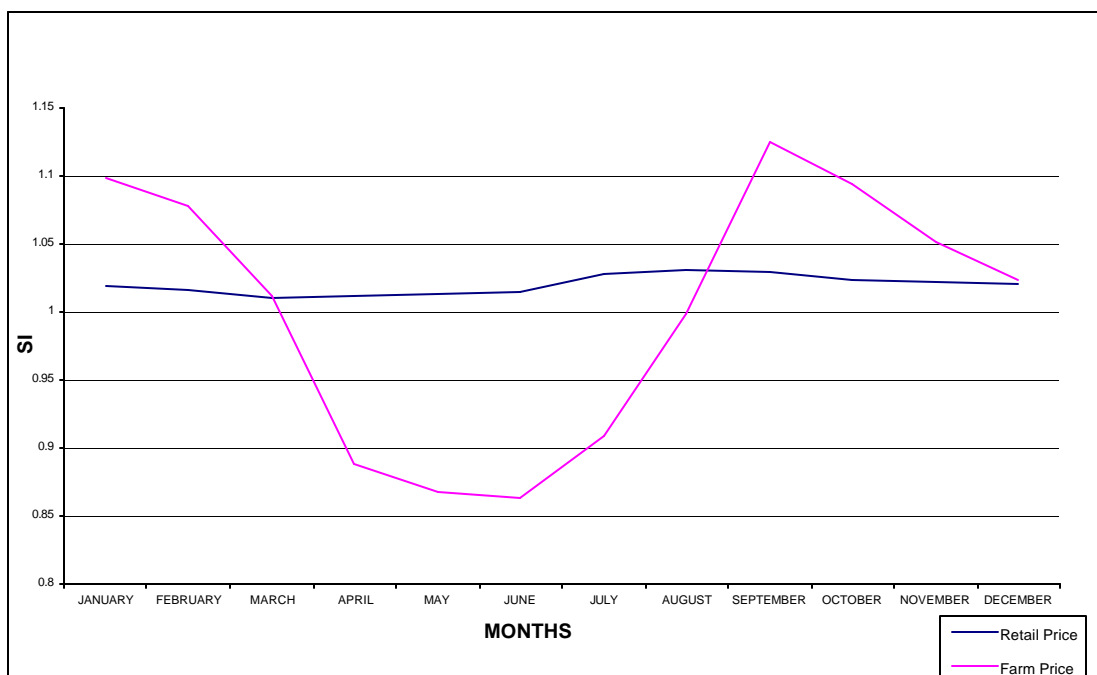
Table 2. Price mapping of mango in Barangay Pitu, Malalag (P/kg).

	MONTHS			
MANGO CLASS	Aug-Sept-Oct	November	December	January
Class A "Cebu" Carabao	27.50	19.00	15.50	18.50
Class B Carabao	12.50	7.00	4.50	11.00
Batuta	11.50	7.00	4.50	11.00

40.   During the months of August to October, and from January till February prices were at its peak levels as a result of depressed volume of production.

41.   The movements of the seasonal price indices in the province of Davao del Sur justify the prices given by the farmers.

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Figure 3. Seasonal farm and retail price indices for Carabao green mango, Davao del Sur.

42. Seasonal price indices are used as indicators of the seasonal variations of mango prices. Seasonal price variations follow a more or less uniform pattern within the year. Prices conform to this pattern over a period of time. As seen in Figure 6, farm gate price exhibited greater price variations as compared to retail price. This may be due to greater fluctuations in supply at the farm level causing prices to behave accordingly. Seasonal price index in September suggests that prices are higher by 15% compared to the price in the average month. In the same manner, the seasonal price index in June suggests that prices are typically set lower by 12% than that in the average month.

43. Meanwhile, retail prices show less fluctuation. This means that retail prices are stable in the whole year period. This observation can be attributed by the steady supply of mango in the retail markets. This is because other farms are able to harvest during off-season by using the flower induction technology.

Marketing Margins

44. Table below illustrates the marketing margins and the Net Farm Income (as established in Appendix A) for the two cases of the different marketing levels.

Table 3. Marketing margins and income for mango at different marketing levels.

	FARMER 1	FARMER 2	ASSEMBLER WHOLESALER	ASSEMBLER SHIPPER	RETAILER
Case 1					
Selling Price	18.00	18.00	20.00	35.00	*nil*
Buying Price	*na*	*na*	18.00	20.00	*nil*
Marketing Margin	*na*	*na*	2.00	15.00	*nil*
Marketing Cost	1.88	1.88	1.97	12.64	*nil*
Profit Margin	*na*	*na*	0.03	2.36	*nil*
Net Farm Income (NFI)	9.39	4.35	*na*	*na*	*na*
MC as % of MM	*na*	*na*	99%	84%	*nil*
PM as % of MM	*na*	*na*	2%	16%	*nil*
%ROI	*nil*	*nil*	5%	17%	*nil*
Opportunity Cost of Capital	*na*	*na*	8%	8%	*na*
Case 2					
Selling Price	18.00	18.00	20.00	*nil*	27.50
Buying Price	*na*	*na*	18.00	*nil*	24.50
Marketing Margin	*na*	*na*	2.00	*nil*	3.00
Marketing Cost	1.88	1.88	1.97	*nil*	2.30
Profit Margin	*na*	*na*	0.03	*nil*	0.70
Net Farm Income (NFI)	9.39	4.35	*na*	*na*	*na*
MC as % of MM	*na*	*na*	99%	*nil*	77%
PM as % of MM	*na*	*na*	2%	*nil*	23%
%ROI	*nil*	*nil*	5%	*nil*	18%
Opportunity Cost of Capital*	*na*	*na*	8%	*na*	8%

45.   Case 1 illustrates that an assembler-shipper posted the highest cost at P12.64/kg due to the large transportation cost. The assembler wholesaler, on the other hand, has a marketing margin of P2/kg only.

46.   In Case 2, results showed that the assembler-wholesaler has marketing margin of P2.00/kg while the retailer has a P3.00 per kilogram marketing margin. Marketing margin is mainly composed of marketing cost.

47.   The composition of the marketing margin is shown in Figure 3 and Figure 4.

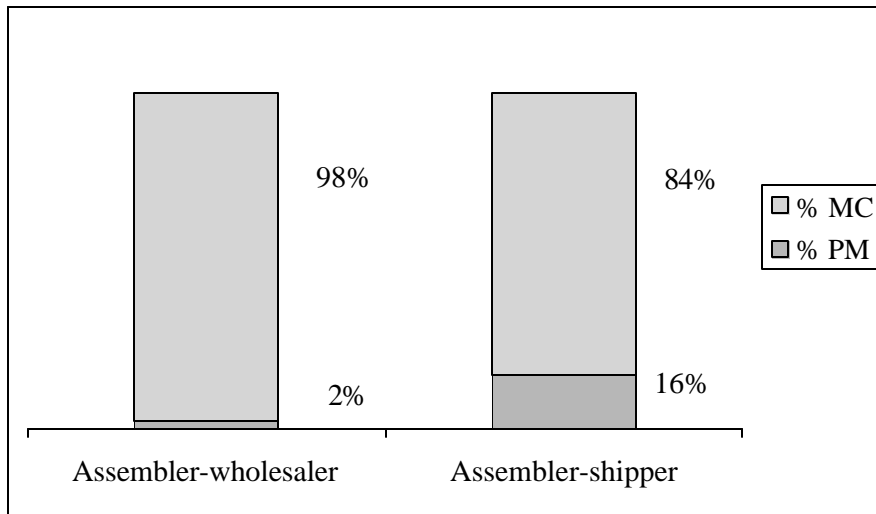Figure 4. Case 1 Marketing Margins of Barangay Pitu, Malalag Mango.

Figure 5. Case 2 Marketing Margins of Barangay Pitu, Malalag Mango.

48.   For Case 1 (Figure 4), the marketing margin from the farmer to the assembler-wholesaler is composed of 2% profit margin and 98% marketing cost. Meanwhile, marketing margin from assembler-wholesaler to assembler-shipper is composed of 84% MC and 16% profit margin.

49.   With the same composition from farm to assembler-wholesaler, case 2 (Figure 5) shows that the marketing margin for assembler-wholesaler to retailer is composed of 77% marketing cost and 23% profit margin.

50.   In comparison, the profit margin for the retailer posted the highest. While the lowest is at the assembler-wholesaler level. The retailer has the lowest marketing cost and the wholesaler the highest.

51.   Table 4 and Figure 6 analyzes the composition of the consumer price.

Table 4. Percentage share of mango prices to the consumer peso (for Case 1 only).

Marketing Participants	Selling Price (P/kg)	% Share
Farmers	18.00	45.0
Assembler-wholesaler	20.00	27.7
Retailer	27.50	27.2

Figure 6. Percentage share of Mango Prices to the Consumer Peso.
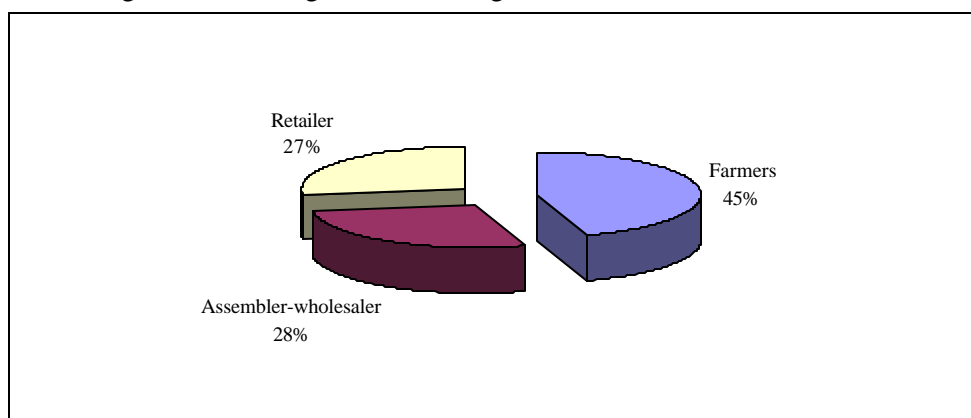
52.   The breakdown of the consumer peso indicates that 45% of the final price is attributed to farmer price, 28% goes to the assembler-wholesaler and the other 27% to the retailer.

STRENGTHS AND WEAKNESSES

53.   The strength in the marketing of mango is the well-established marketing system. Results showed that the role of each participant in the marketing chain is well defined.

54.   High demand for mango also adds to its strength. These factors make the marketing system more competitive.

55.   However, poor post harvest handling practices contributes to its weaknesses. The farmer's lack of knowledge and technology become the major problem in the system.

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56.   Wrong packaging practice (kaing packaging) which produces bruises lessen the marketability of the produce to the consumer.

CONCLUSION

57.   The Net Farm Income (NFI) of Farmer 1 is P9.39/kg and Farmer 2 (with contract arrangement) the NFI is P4.35/kg. This illustrates that the farmer with no contract arrangement has a higher net income as compared to the farmer with contract arrangement. Results also revealed that for the two cases the farmers are gaining profit which puts the farmer in the efficient side of production.

58.   Marketing efficiency for each level is analyzed. Looking at the cost structure we could say that the level posting the lowest percentage of marketing cost performs efficiently. In Table 2, retailer has the lowest marketing cost with only 30.67%, while the assembler-wholesaler and assembler-shipper posted a high percent marketing cost at 99% and 84%, respectively.

59.   Based on these results, we could say that while the retailer is performing efficiently, the assembler-wholesaler and assembler-shipper are performing inefficiently.

60.   Using the ROI as the measure of efficiency, assembler-shipper and retailer having a greater ROI (17%) for the assembler-shipper, and 18% for the retailer) than the opportunity cost of capital are performing efficiently. This means that it is more profitable for the assembler-shipper and retailer to invest on the agricultural business than putting their money in the bank.

61.   In contrast to this result, the assembler-wholesaler is performing inefficiently because the ROI is less than the opportunity cost of capital (8%).

62.   Lastly, It was determined that farmers have a 45% share of the consumer's final buying price. This means that for every peso paid by the consumer, P0.45 goes to the farmer.

RECOMMENDATIONS

62.   Improve farm to market roads in Barangay Pitu, Malalag. Construction of 13 km road is very important to reduce transportation cost and to maintain the quality of the product from the farm to the market. This will maintain the marketability of the produce.

63.   In maintaining the marketability of mango, right packaging techniques are also important. Styrophore net like those in the apple can be use. Boxes will be most appropriate to use than the kaing.

64.   For the farmers to be competitive, technology transfer should be made readily available. Training on correct harvesting, Hot Water Treatment (HWT) and other beneficial production and marketing activities should also be encouraged.

65.   Day to day information on prices, demand and supply in different markets should be made available to the farmers. It can be posted on the barangay bulletin board accessible to the farmers.

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APPENDIX A. Cost and returns per unit of mango in Barangay Pitu, Malalag.

ITEM	P/kg
RETURNS	
Cash	
Sales	18.00
Total Cash Returns (A)	18.00
Non-cash	
Consumed	0.09
Given away	0.09
Total Non-cash Returns (B)	0.18
TOTAL RETURNS (C)	18.18
COSTS	
Cash	
Land cost	0.33
Seeds	0.72
Fertilizers	2.41
Pesticides	0.23
Hired labor	0.34
Flower inducer	0.65
Transportation	0.03
Total Cash Costs (D)	4.71
Non-cash	
Unpaid family and/or exchange labor	0.62
Depreciation	0.42
Losses/Shrinkage of produce	1.76
Opportunity cost of capital	0.46
Total Non-cash Costs (E)	3.26
TOTAL COSTS (F)	7.97
Net Returns Above Cash Costs (C-D)	13.47
Net Farm Income	10.21

APPENDIX B. Breakdown of costs per unit of mango in Barangay Pitu, Malalag.

ITEM	P/kg
I. Production Cost	
Land cost	0.33
Depreciation	0.42
Seeds	0.72
Fertilizers	2.41
Pesticides	0.23
Own labor	0.62
Hired labor	0.25
Total Production Cost	
II. Marketing Cost	
A. Cleaning	
Hired labor	0.04
Losses/shrinkage	0.55
Sub-Total	0.59
B. Ripening	
Hired labor	0.01
Losses/shrinkage	0.30
Sub-Total	0.31
C. Packing	
Hired labor	0.04
Losses/shrinkage	0.73
Sub-Total	0.77
D. Transportation	
Transportation	0.03
Losses/shrinkage	0.18
Sub-Total	0.21
Total Marketing Cost	1.88
III. Opportunity cost of capital	0.46
TOTAL COSTS	7.97