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Department of Agriculture

Upland Development Programme in
Southern Mindanao (UDP)

**A MARKETING EFFICIENCY STUDY
ON**

CARROT

**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 carrot in Barangay Pitu, Malalag, Davao del Sur was evaluated through the deconstruction of existing marketing margins. Recommendations to improve marketing efficiency are herein offered.

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Farmers:

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Danilo Alon
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Ortega Alon
Fernando Aya

Traders:

Henry Ludivice
Arman Ludivice

Retailers:

Rolando Delmo
Leonora Ruto

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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.
Economies of scale	-	the economic concept wherein production at a larger scale (more output) can be achieved at a lower cost.
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.
Saved for seeds	-	the value, non-monetary in nature, of the farm produce kept by the farmer for use as planting material in the following production cycles.
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.

CARROT

INTRODUCTION

1. The carrot (*Daucus carota*) of the parsley family (parsley, parsnip, celery, etc.) is a cultivated-biennial plant that normally requires two growing seasons with a cool rest between them to complete its life cycle; from the planting of the seed to the maturing of the seeds. A single season will cover 60 to 90 days depending on the variety and growing conditions.
2. The carrot *root* not only anchors the plant, but also absorbs nutrients from the soil and acts as a storage depot for carbohydrates, especially starch and sugar. A carrot root is produced in a suitable size best for marketing.
3. Carrots grow best at temperatures between 60° and 70°F. On hot, bright, sunny days young plants may be badly injured or ruined caused by a developing high temperature at or below the soil surface. Prolonged hot weather during the later development stage of the plant may not only retard growth and depress yield, but also may cause undesirable strong flavor and coarseness in the roots. Temperatures below 50°F tend to make the roots longer, more slender, and paler in color than is typical.
4. Deep sandy loams and muck soils are most desirable for carrot culture. Such soils are among the easiest to work with. Also, it permits good development of the edible roots. In addition, silt loams are also extensively used.
5. The climate and soil condition in Barangay Pitu, Malalag meets the necessities for carrot cultivation. With an average landholding of 3.8 hectares, Barangay Pitu carrot farmers plant carrots twice a year at a two-month production cycle. Average yield for one production cycle is 220.6 kilograms per hectare of carrots.
6. Since the production cycle of carrots is relatively short, Barangay Pitu farmers are able to measure their harvests in time with the peak-buying season for carrots.
7. The marketing efficiency study for carrot 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 carrot vis-à-vis income of the farmers.
9. Specifically, the study aims to determine the levels of participants in the marketing chain of carrot;
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 carrot at each level in the system, exclusive of production costs;
12. Identify strengths and weaknesses of the existing marketing system of carrot; and
13. Determine appropriate marketing interventions needed to improve economic efficiency of carrot in Barangay Pitu, Malalag.

Methodology

14. From the initial agribusiness profile of UDP-Davao del Sur, nine (9) carrot farmers were identified; five of which come from Barangay Pitu, Malalag. Purposive sampling and complete enumeration of the Pitu carrot farmers was done for the interview.
15. The farmers were asked about their production and marketing practices, production and marketing costs of carrot. 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 carrot 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 carrot.
18. The marketing margins (MM), or the total value added to the carrot 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 carrot 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%) per annum. An ROI higher than the opportunity cost of capital would mean that marketing carrot 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 carrot.
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 carrot.

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 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. On 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 carrot market, specifically, the estimation of demand was not included in the study.

Margin of Error

27. Aside from the UDP Agribusiness Profile, there are no other available data on the population size of carrot 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 SYSTEM OF CARROT

Marketing Channels

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

a. Farmer

A person engaged in crop cultivation for sustenance or commercial purposes. He sells his produce to the assembler based in JP Laurel, Sarangani;

b. Assembler- shipper

A trader whose primary activity is to buy the carrots delivered to them by the farmers and ship it to a wholesaler in General Santos City;

c. Wholesaler

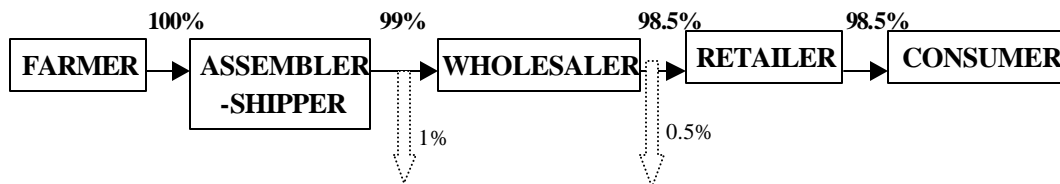
A type of trader who specializes in the distribution of large volumes of carrots to retailers based in General Santos City;

d. Retailer

Relies on wholesalers for their merchandise. Sells directly to the consumers.

29. Based on farmer interviews, an estimated 4,230 kilograms of carrots from Barangay Pitu, Malalag were sold in the year 2000 and the following product flow was established:

Figure 1. Product flow of carrot.



30. One hundred percent of the carrots is sold by the farmers to the assembler-shipper and is then transported to the wholesaler in General Santos City. However, the assembler-shipper suffered a 1% loss due to bruising and spoilage of carrots during transport. The retailer then purchases the carrots from the wholesaler. However, the retailer loses 0.5% of his merchandise to bruising and spoilage during the transport from the wholesaler.

31. Figure 2 shows the geographical flow of the carrots. From the farm in Barangay Pitu, Malalag the carrots were brought to JP Laurel and the end destination was General Santos City.

Figure 2. Geographical flow of carrot.



Marketing Practices and Costs

32. After harvest, the carrots are then rid off soil residues by washing. The carrots are graded and packed in sacks according to grade.

33. Based on the size of the carrots, grading classifications are set by the traders. However, there is neither specific description nor standards for the grades since grading is done crudely through *eyeball* estimate. The classification of carrots are as follows: Big (B), Medium (M), Small (S), Good Reject (GRJ) and Last Reject (LRJ).

34. Due to its perishable nature, carrots are sold immediately right after harvest. Majority of the farmers deliver their produce to the assembler-wholesaler in JP Laurel. The carrots are transported by motorcycle, through a badly maintained tertiary mountain path to JP Laurel. They are then paid in cash for the sale of the carrots. The average price received by the farmers for the carrots was P4.00/kg.

35. The assembler-wholesaler then immediately ships the carrots to General Santos City. Upon delivery to the wholesaler in General Santos City, the assembler wholesaler, is paid in cash at an average selling price of P11.00 per kilogram of carrots.

36. At the wholesaler's stall, retailers buy the carrots, on a cash basis, at an average price of P16.60 per kilogram. The retailer then transports the carrot to his stall in the General Santos City Public Market.

37. Lastly, the retailer sells the carrots to the consumer on a per gram or kilogram basis, at an average price of P22.00 per kilogram.

38. Table 1 summarizes the marketing costs for each level.

Table 1. Marketing costs for different marketing levels of carrot (P/kg).

ACTIVITY	FARMER	ASSEMBLER- SHIPPER	WHOLESALE	RETAILER
Cleaning	0.33	<i>na</i>	<i>na</i>	<i>na</i>
Packing	0.22	<i>nil</i>	<i>nil</i>	<i>nil</i>
Transportation	1.12	0.33	0	0.08
Labor	<i>na</i>	0.38	0.06	0.26
Supplies and materials	<i>na</i>	0.33	0.19	0.77
Fees and payments	<i>na</i>	0.42	0.02	0.04
Non-cash costs	<i>na</i>	0.26	0.89	0.36
TOTAL	1.67	1.72	1.16	1.51

39. It shows that the farmer has a high marketing cost of P1.67 per kilogram. This can be attributed to the high transportation cost from the farm to the assembler-shipper in JP Laurel. Marketing cost for assembler-shipper is at P1.72 per kilogram.

Price Formation

40. Price plays an important role in the carrot production. Programming of production depends on the previous prices. Farmers observed that in the months of June and December price tends to rise. With the two-month production cycle, farmers would plant two months before June and December.

41. Prices during the months of June and December are high because of the high demand for carrot. June is the start of the classes while December is the Christmas season.

42. Farmers also noted that the prices in August were relatively lower because of the high supply in the market. Table 2 shows the previous prices for carrots according to grade.

Table 2. Farm-gate prices of carrots by grade in Barangay Pitu, Malalag (P/kg).

GRADE	MONTH		
	June	August	December
Big (B)	20.00	5.00	20.00
Medium (M)	17.50	4.00	17.50
Small (S)	14.50	3.00	14.5
Good Reject (GRJ)	8.00	2.00	8.00
Last Reject (LRJ)	6.00	1.00	6.00

Marketing Margins

43. Table 3 shows the marketing margins of the different traders and the income of the farmers. Details on the Net Farm Income are established on Appendix A.

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

ITEM	FARMER	ASSEMBLER- SHIPPER	WHOLESALE	RETAILER
Selling price (P/kg)	4.00	11.00	16.60	22.00
Buying price (P/kg)	<i>na</i>	4.00	11.00	16.60
Marketing Margin (P/kg)	<i>na</i>	7.00	5.60	5.40
Marketing Cost (P/kg)	1.67	1.72	1.16	1.51
Profit Margin (P/kg)	<i>na</i>	5.28	4.44	3.89
Net Farm Income (P/kg)	0.70	<i>na</i>	<i>na</i>	<i>na</i>
MC as % of MM	<i>na</i>	25%	21%	28%
PM as % of MM	<i>na</i>	75%	79%	72%
% ROI	<i>nil</i>	18%	12%	18%
Opportunity cost of capital	<i>na</i>	8%	8%	8%

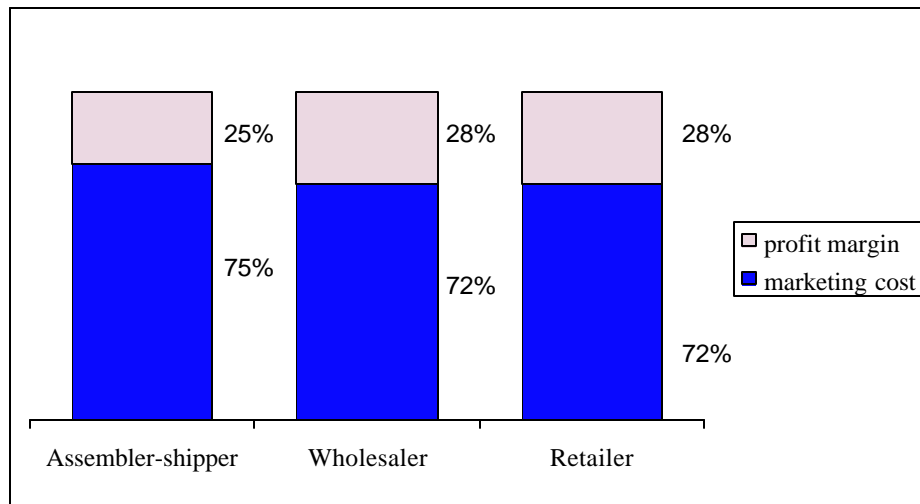
44. The P0.70 per kilogram Net Farm Income (NFI) of the farmer, as indicated on Table 3 show that the production and marketing of carrots in Barangay Pitu Malalag is profitable.

45. For the traders, the marketing margin as shown in Table 2 measures the total value added to the carrot as it goes through one intermediary to another. The components of the marketing margin of carrot are the costs and profit.

46. Different channels have different marketing margins. The marketing margin from the producer to the assembler-shipper is P7.00 per kilogram, from assembler-shipper to the wholesaler-P5.60 per kilogram and from the wholesaler to the retailer-P5.40 per kilogram. Results showed that assembler-wholesaler posted the highest margin. While cost is highest for the assembler-shipper and lowest for the wholesaler. In terms of profit, wholesaler posted the highest profit margin. This result could be attributed to the low investment cost on the part of the wholesaler.

47. The marketing profit as percentage to the marketing margin is higher as compared to the percentage marketing cost, as shown on Figure 3.

Figure 3. Marketing margins of carrots traders.



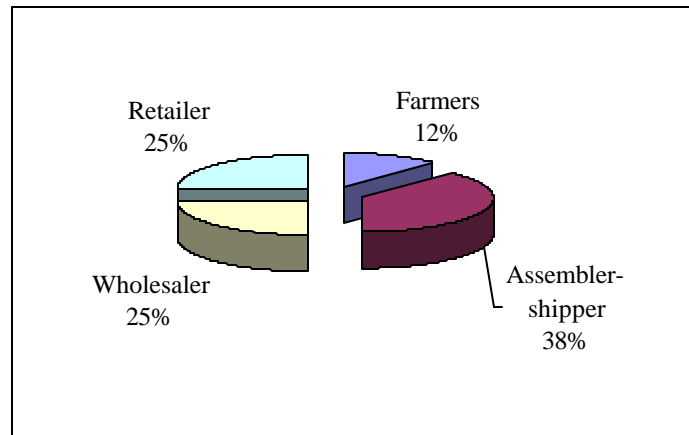
48. For the breakdown of the consumer peso, Table 3 is presented.

Table 3. Percentage share of carrot prices to the consumer peso.

Marketing Participants	Selling Price (P/kg)	% Share
Farmers	4.00	18
Assembler-shipper	11.00	32
Wholesaler	16.60	25
Retailer	22.00	25

49. Results show that the Assembler-shipper gets the largest percentage share (32%) out of the consumer price while the 25% of it goes to the wholesaler and the other 25% to the retailer. The remaining 18.2 % goes to the farmers. These results showed that farmer's pricing has the lowest effect on the consumer price (Table 3).
50. Figure 4 illustrates the graphical percentage share of the carrot price to the consumer peso.

Figure 4. Percentage share of carrot prices to the consumer peso.



STRENGTH AND WEAKNESSES

51. The strength of the marketing system of carrot is that it is well established such that each participant has a well-defined role in the marketing chain.
52. However, weaknesses such as the poor road system in the area contributes to the high transportation cost and losses.
53. Also, farmers also cited the problem on insufficient price, supply, grading and demand information. This results to a weak bargaining power of the farmers to the traders as the trader dictates the price and classification/grading of the produce.

CONCLUSION

54. The farmer is earning a Net Farm Income of P0.70 per kilogram (Appendix A), concluding that carrot farming is profitable. However, carrot farmers in Barangay Pitu, Malalag has no bargaining power over the price since the assembler-shipper dictates the price, returning a lesser profit to the farmer.

55. The return on investment of the traders as is greater than the opportunity cost of capital means that they are efficiently performing in the market. In addition, marketing profit is much higher than the marketing cost leaning the business to the efficient side.

RECOMMENDATIONS

56. The following recommendations are herein offered:

?? Improved infrastructure and road system for efficient movement of products from farm to market. Construct a farm to market road from Barangay Pitu, Malalag to JP Laurel.

?? The need for organized market information on price, grading, demand and supply. A daily information on these from different markets should be posted on the barangay bulletin board to help the farmer in their decision making on production and marketing (when to produce and where to market).

?? Form cooperatives or farmers group to help in the capital formation, bulk selling and price monitoring to increase the bargaining power of the farmers.

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

<i>ITEM</i>	<i>P/kg</i>
RETURNS	
Cash	
Sales	4.00
Total Cash Returns (A)	4.00
Non-cash	
Home consumption	0.01
Given away	0.01
Total Non-cash Returns (B)	0.02
TOTAL RETURNS (C)	4.02
COSTS	
Cash	
Seeds	0.38
Hired labor	0.94
Transportation	1.00
Total Cash Costs (D)	2.32
Non-cash	
Unpaid family and/or exchange labor	0.35
Depreciation	0.27
Losses/Shrinkage of produce	0.19
Opportunity cost of capital	0.19
Total Non-cash Costs (E)	1.00
TOTAL COSTS (F)	3.32
Net Returns Above Cash Costs (C-D)	1.70
Net Farm Income	0.70

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

<i>ITEM</i>	<i>P/kg</i>
<hr/>	
I. Production Cost	
Seeds	0.38
Depreciation	0.27
Own labor	0.30
Hired labor	0.51
 Total Production Cost	 1.46
II. Marketing Cost	
A. Cleaning	
Own labor	0.03
Hired labor	0.18
Losses/shrinkage	0.12
Sub-Total	0.33
B. Packing	
Own labor	0.02
Hired labor	0.18
Losses/shrinkage	0.02
Sub-Total	0.22
C. Transportation	
Hired labor	0.07
Transportation	1.00
Losses/shrinkage	0.05
Sub-Total	1.12
 Total Marketing Cost	 1.67
III. Opportunity cost of capital	0.19
 TOTAL COSTS	 3.32
