Vol II Issue XII Jan 2013
Impact Factor : 0.2105
ISSN No : 2230-7850

Monthly Multidisciplinary
Research Journal

Indian Streams Research Journal

Executive Editor
Ashok Yakkaldevi

Editor-in-chief
H.N.Jagtap

IMPACT FACTOR : 0.2105

Welcome to ISRJ

RNI MAHMUL/2011/38595 **ISSN No.2230-7850**

Indian Streams Research Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double - blind peer reviewed referred by members of the editorial Board readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

International Advisory Board

Editorial Board

Address:-Ashok Yakkaldevi 258/34, Raviwar Peth, Solapur - 413 005 Maharashtra, India
Cell : 9595 359 435, Ph No: 02172372010 Email: ayisrj@yahoo.in Website: www.isrj.net

Indian Streams Research Journal
Volume 2, Issue.12,Jan. 2013
ISSN:-2230-7850
Available online at www.isrj.net
ORIGINAL ARTICLE

AN ANALYSIS OF SUPPLY CHAIN OF COLE VEGETABLE FROM FARM TO RETAILOUTLETS FOR PALAMUTHIR NILAIYAM IN COIMBATORE CITY

K.C.PRAKASH AND P.G.DHAMOTHARAN

B.Sc.,(Agri), MBA.Department of Agricultural and Rural Management,
Tamil Nadu Agricultural University,Coimbatore.

Abstract:

Marketing of fresh vegetables owing to their perishable nature and lack of cold storage facilities creates a problem of marketing. The supply of most vegetables is seasonal and their production is concentrated in few areas in favorable situation of soil and climatic conditions. Because of long distance that often separate producing areas from / consuming one, a large proportion of vegetables deteriorates in transit, the extent of spoilage being sometimes noticed as large as forty percent. It might be due to defective method of harvesting, packing, handling and inefficient way of transportation, seasonal gluts and less demand by consumers. An efficient marketing system becomes very important in case of Cole vegetables, which consumer has to buy on a day to day basis. The manner in which the product is presented to the consumer has to meet his requirements. In the present scenario, aggressive marketing has become very essential for any retail industry to stay in the market because of high competition. Moreover, many of the companies are going for diversification of business to stay in the market. Delivering high quality products to the consumers has become a strategy adopted by many companies to challenge the competition. In this connection I had undertaken this study to analyze the supply chain of cole vegetable from farm to retail outlets with appropriate stetergies.

KEYWORDS:

Supply chain, Retail and Procurement .

INTRODUCTION

Cabbage (cole vegetable), a member of the cruciferous family that includes broccoli, mustard, cauliflower, Brussels sprouts, kale, kohlrabi and bok choy, is thought to have been domesticated as a crop in the Mediterranean region of Europe (Baldwin). Ancient Romans and Greeks originally valued it as a medicinal for use with a variety of ailments including gout, headaches, and ingestion of poisonous mushrooms (Economic Research Service (ERS) 2002). Today cabbage is primarily valued as a fresh market vegetable, although research continues on the value of the medicinal properties of cruciferous vegetables that have been found to aid in the prevention of cancer. It is a cool season perennial with moderately high frost tolerance. U.S. commercial production of cabbage can be found throughout every state with the top producing states including California, New York, Texas, and Georgia.

ORGANIZED RETAILING

Organized retailing is growing very rapidly in recent years. We see a tremendous growth in the retail business. A second revolution is sweeping across the country as India has to reengineer two

Title : AN ANALYSIS OF SUPPLY CHAIN OF COLE VEGETABLE FROM FARM TO RETAILOUTLETS FOR PALAMUTHIR NILAIYAM IN COIMBATORE CITY Source:Indian Streams Research Journal [2230-7850] K.C.PRAKASH AND P.G.DHAMOTHARAN yr:2013 vol:2 iss:12

millennium-old supply chain dynamics. The plough to plate will be future plan of the enterprising-farmers. A sizable proportion of fresh fruits and vegetables are wasted due to lack of post-harvest handling, storage and processing facilities. Intermediaries or 'middlemen' corner a disproportionate share of price paid by the consumer otherwise, which would go to the farmer. Not only that, the middlemen caused delays in delivery from farm to ultimate consumer, which in a business of perishable goods can be self-defeating.

Therefore, the overall objective of the study was to examine the supply chain involved in sourcing of Cole Vegetable (cabbage) from the farmer at the sourcing point to delivary at Palamuthir retail outlets.

The specific objectives of the study are:

i. to analyze the costs and benefits of sourcing selected cole vegetables from farm to Pazhamudir Nilayam retail outlets in Coimbatore city.
ii to evaluate marketing efficiency of alternate marketing channels for the selected cole vegetables.
iii. to provide the suggestions for improving procurement and the sale of selected cole vegetables through Pazhamudir Nilayam retail outlets in Coimbatore city.

CONCEPTS AND REVIEW

Marketing intermediaries

Retailer

Kotler (2004) defined retailer as a business enterprise whose sales volume primarily carries from retailing, which included all activities involved in selling goods or services directly to final consumers for their personal non business use.

Wholesaler

Vachhajahi (1976) explained that wholesaler might be an institutional agency or private organization. They might be one or more in a given area. They distributed principal products through a number of retailers and in some cases, they did retailing by themselves. Kotler (2004) defined the wholesaler as one who carries all the activities involved in selling goods or services to those who buy for resale or business use.

Village Merchant

According to Rajkumar (1992) the village merchant was a person who bought the produce from the local farmers and sold to the terminal market. He may assemble the produce and help in concentration.

Marketing Channel

According to Riaz. (2002) Marketing channel is defined as a path traced in the movement of a good from the primary producer to ultimate consumer. Kotler (2004) remarked that marketing channels can be viewed as a set of interdependent organizations involved in the process of making product or service available for use or consumptions.

Price Spread

Maheswarappa et al. (1998) described price spread as the difference between the price paid by the ultimate consumer and price received by the grower for an equivalent quantity of farm produce. According to Rajoo (2002) price spread is defined as the difference between price paid by the consumer and net price received by the producer.

Marketing Efficiency

Ramamoorthy (1982) defined that marketing efficiency must be determined by the marketing margin received by the each intermediary and their proportion to the consumer's price. According to Riaz (2002) effectiveness of market to perform various functions is reckoned as marketing efficiency.

Retailing

Lucas (1997) defined retailing as all activities involved in the marketing of goods and services directly to the consumers for their personal, family or household use. Varshney (2000) explained retailing as the final connection in the marketing channel that brings goods from manufacturers to consumers. In other words, retailing is the combination of activities involved in selling or renting consumer goods and services directly to ultimate consumers for their personal or household income.

Supply Chain

Christopher and Martin (1993) reported that supply chain as an intricate network of suppliers, distributors and customers who share carefully managed information about demand, decisions and performance, and who recognize that success for one part of the supply chain means success for all. Chandra and Pankaj (1994) reported "Don't think of it as a chain. Think of it as an intricate network of suppliers, distributors and customers who share information. your business success depends on it". According to Ramalingha Rajoo (2002) supply chain is defined as the complete network or links involved right from farm to the consumers for the produce.

Supply Chain Management

Raghuram and Rangaraj (2000) referred that supply chain management (SCM) is managing the flow of goods, services and information between suppliers, manufacturers, wholesalers, distributors, stores, consumers and end- users. According to Kotler (2004) supply chain management starts earlier than physical distribution; attempts to procure the right inputs (raw materials, components, and capital equipment) convert them efficiently into finished products; and despatch them to the final destinations.

METHODALOGY

The present study was conducted to analyze the supply chain of cabbage from farm to Pazhamudir Nilayam retail outlets in Coimbatore city. The case firm Pazhamudir Retail Limited is intending to venture into fresh fruits and vegetables trading and was interested to conduct a study on supply chain of cole vegetable. The study area for the research work was Ooty taluk of Nilgiri district and Coimbatore district as the case firm traditionally procured cole vegetables from Ooty by establishing a consolidation centre there. The present study is based on information collected from the supply chain of the selected cole vegetable farmers, commission agents/wholesalers, retailers and consumer in and around the selected cities. The supply chains were interviewed/consulted for gathering the information on the overall activities of these supply chain, infrastructure and other related information. Based on the percentage of area under cole vegetable in Nanjanadu block in Nilgiri district was purposively selected. Similarly six villages in the selected block were selected randomly

From each village, 10 farmers were selected at random. Thus, altogether 10 farmers from each of the village constituted a sample of 60 farmers who are all Cole vegetable growers. The selected sample is presented in Table 1. Among the cole vegetable, cabbage occupied the highest percentage of area under cultivation. Therefore cabbage was selected for the present study.

To trace the supply chain for selected cole vegetable, 30 wholesalers were selected at random from the Coimbatore vegetable wholesale market. The retailer was selected purposively because he was a agent for cabbage supply to the consolidation centre in the study area. Thus, the total sample included 60 farmers, 30 wholesalers and 15 Pazhamudir Nilayam retail outlets.

Data collection

The primary data was collected from farmers and commision agent/wholesaler by personal interview method. Secondary data for the study was collected from the office of the department of horticulture ooty.

Tools of Analysis

The appropriate tools used for the study namely; conventional analysis, Rank Based Quotient (RBQ), Price spread analysis and Estimation of Marketing Efficiency used by Shepherd's Formula.

RESULTS AND DISCUSSION

General Characteristics of the Sample Farmers

Analyzing the general characteristics of the farmers of Nilgiris district with respect to gender, family type, family size, educational status, income level of the household will be helpful to the case firm in accomplishing the needs of the farmers.

Table 1 General Characteristics of the Sample Farmers (n=60)

SL. No	Age (years)	Number of Farmers	Percentage to Total
1.	Up to 30	6	10.00
2.	31-45	39	65.00
3.	Above 45	15	25.00
S.no.	**Educational status**	**Number of respondents**	**Percentage to total**
1	Primary	5	8.33
2	Secondary	18	30.00
3	Higher Secondary	15	25.00
4	Degree	22	36.67
S.no	**Occupation**	**Number of Farmers**	**Percentage to Total**
1.	Agriculture only	48	80.00
2.	Agriculture+ secondary	12	20.00
S.no	**Size of Land Holding (in ha)**	**Number of respondents**	**Percentage to total**
1	Small (1 – 2 ha)	9	15.00
2	Medium (2- 5 ha)	29	48.33
3	Large (> 5 ha)	22	36.67
S.no	**Annual family Income (Rs 000's)**	**Number of respondents**	**Percentage to total**
1	<50	9	15.00
2	50 - 100	29	48.33
3	>100	22	36.67
S.no.	**Experience in cabbage cultivation (years)**	**Number of farmers**	**Percentage to total**
1.	Up to 5	8	13.33
2.	6-10	33	55.00
3.	Above 10	19	31.67

It could be observed that in the study area, 65 per cent of the sample farmers belonged to the age group of 31 - 45 years, 36 per cent of the farmers belonged to the educational status of degree level, about 80 per cent of the respondents had agriculture as their main occupation, 48 per cent of the sample respondents were having two to five hectares of land under cultivation. nearly 50 per cent of the farm families earned Rs 50,000-1,00,000 as annual income, 50 per cent of the sample farmers had six to 10 years of experience in cabbage cultivation, about 53 per cent of the sample farmers used river stream as their main source of irrigation

Crops cultivated by the sample farmers

The sample farmers were classified in to five categories based on cropping pattern such as cultivation of Cole vegetables only like cabbage, cauliflower, sprouting broccoli, Brussels sprouts (calagose) only and other crops like beet root, carrot and potato and the details are given in the Table

Table 2. Crops Cultivated by Sample Farmers (n=60)

	Particulars (ha)	Number of respondents	Percentage to total
1	Cabbage	60	100.00
2	Cauliflower	32	53.33
3	Brussels Sprouts	30	50.00
4	Sprouting Broccoli	20	33.33
5	Other crops	15	25.00

From the above table it could be observed that majority of the farmers (100 per cent) have cultivated cabbage only followed by cauliflower (53 per cent), sprouting broccoli (50 per cent), Brussels sprouts (33 per cent) and only 25 per cent of the farmers have cultivated along with other vegetable crops.

Reasons for growing cabbage

The sample farmers were asked to rank the reasons for cultivation of cabbage and the same were analyzed using rank based quotient method. The results are presented in Table

Table 3. Reasons for Growing Cabbage by Sample Farmers (n=60)

	Reasons Score	Rank	
1	**High level of profit**	70	I
2	Suitable for all seasons	47.5	II
3	Favorable soil condition	25	III
4	Traditional cultivation	11.66	IV

It could be seen from table high level of profit stood first followed by suitability of cabbage for cultivation during all seasons, the favorable soil condition and traditional cultivation were the major reasons for cultivation of cabbage in the study area.

General problems faced by the sample farmers in cabbage cultivation

The sample farmers were asked to rank the problems in cultivation of cabbage, The same was analyzed using rank based quotient technique and the results are presented in Table

Table 5.General Problems Faced by Sample Farmers in Cabbage Cultivation (n=60)

S.no	Problems Score	Rank	
1	Pest and disease incidence	75	I
2	Non availability of skilled Labor	50	II
3	Lack of technical advice	31.66	III
4	Non-availability of adequate irrigation water	14.58	IV

According to the sample farmers, pest and disease incidence stood first followed by non availability of skilled labor, lack of technical advice and non availability of adequate irrigation water were the next major problems in cultivation of cabbage in the study area.

Problems faced by sample farmers in marketing of cabbage

The sample farmers were asked to rank the problems in marketing of cabbage and the same were analyzed using rank based quotient technique. The results are presented in Table

Table 6. Problems Faced by Sample Farmers in Marketing of Cabbage (n=60)

S.no	Problems Score	Rank	
1	Wide price fluctuations	80	I
2	High transportation cost	50	II
3	High commission charge	30	III
4	Lack of market information	13.75	IV

According to the sample farmers, wide price fluctuations was the major problem followed by the high transportation cost, high commission charge and lack of market information of cabbage.

Value chain-cultivation, harvesting, post harvest handling and packing

Value chain starts from farmer's activities and end with consumer of the produce. Good agricultural practices and maturity at harvest are the most important determinants of value chain because these are important for storage-life and final quality. Matured cabbages are highly susceptible to shriveling and mechanical damage. Mechanical injuries can accelerate loss of water and vitamin C resulting in increased susceptibility to decay-causing pathogens. This could be reduced by packaging and safe transport of the produce from farm gate to the market center.

Expectation

Hence, primary data were collected and analyzed to find out the present status of the value chain of

cabbage and results are summarized in Table.

Table 7. Expectation of the Farmers **(n=60)**

S.no	Expectations Score	Rank	
1	Fair price	81.66	I
2	Prompt payment	56.25	II
3	Credibility	33.33	III
4	On farm disposal	14.58	IV

According to the sample farmers the majority of farmers expect fair price followed by prompt payment, credibility and on farm.

Grading practices at farm level

The value additions due to different quality characteristics have impact on prices of cabbage in the markets. Hence grading practices of sample growers were collected and it is given in Table

Table 8. Grading Practices Followed at Farm Level **(n=60)**

S.no	Particulars	Total number of respondents	Percentage
1	Yes	53	88.33
2	No	7	11.66
	Total	60	100.0

Eighty eight per cent of sample cabbage growers practiced grading at farm level based on various physical characters such as size, colour, and freshness etc.

Source of purchase of fertilizers/pesticides

The sources of purchase of inputs have a great influence on adoption level behavior of the farmers. The sources of purchasing fertilizers and pesticides are presented in Table.

Table 9. Source of Purchase of Fertilizers/Pesticides **(n=60)**

S.no	Sources	Number of respondents	Percentage
1	Private shop	53	88.3
2	Neighbours	4	6.7
3	Company representatives	1	1.7
4	Government	2	3.3
	Total	60	100

It could be seen from the table that 88 per cent of the farmers purchased fertilizers and pesticides from private shops. About seven per cent of the farmers purchased from neighbors. Only few farmers purchased from government and company representative.

Criteria for grading practices at farm level

Grading of cabbage at farm level was done on the basis of certain physical characteristics viz.,, size, colour and freshness. The numbers of respondents who have used different criteria for grading were collected and it is presented in Table

Table 10. Criteria for Grading Practices at Farm Level (n=60)

S.no	Characters	Total number of respondents	Percentage
1	Size	32	53.33
2	Colour	4	6.67
3	Freshness	6	10.00
4	Size, colour and freshness	18	30
	Total	60	100

Packaging materials used for transporting

Preparation of produce for market may be done either in the field or at the packing house. Packaging protects the produce from mechanical injury, and contamination during marketing. The packing materials used for marketing of cabbage from the field to market centre is presented in Table. Majority of the farmers used gunny bags 66 per cent and bamboo baskets 33 per cent.

Table 11. Packaging Materials Used for Transporting (n=60)

S.no	Buyers	Total number of respondents	Percentage
1	Gunny bags	40	66.67
2	Bamboo baskets	20	33.33
	Total	60	100.0

Preferred market intermediaries

After production, farmers have to sell it as early as possible. The farmer's preference of disposal is presented in Table. Most of the farmers are preferred commission agent (63 per cent) followed by wholesalers (36 per cent).

Table 12. Preferred Market Intermediaries by Sample Farmers (n=60)

	Market intermediaries	Total number of respondents	Percentage
1	Commission agent	38	63.33
2	Wholesaler	22	36.67
	Total	60	100

Means of transport

The various means of transport used by the farmers for transporting the cabbage to local and distant markets were analyzed and presented in Table. Majority of the farmers preferred lorry to transport cabbage (46 per cent) followed by local tempos (30 per cent) and own vehicle (23.33 per cent) to minimize the transport cost and to realize better price of the product.

Table 13. Means of Transport (n=60)

	Particulars	Number of respondents	Percentage
1	Lorry	28	46.67
2	Local Tempos	18	30.00
3	Own vehicle	14	23.33
	Total	60	100

Identification and Evaluation of Marketing Channels for Cabbage

The pathway of cabbage from producer to consumer was identified in the study area and the channel and cost incurred are presented in two sections.

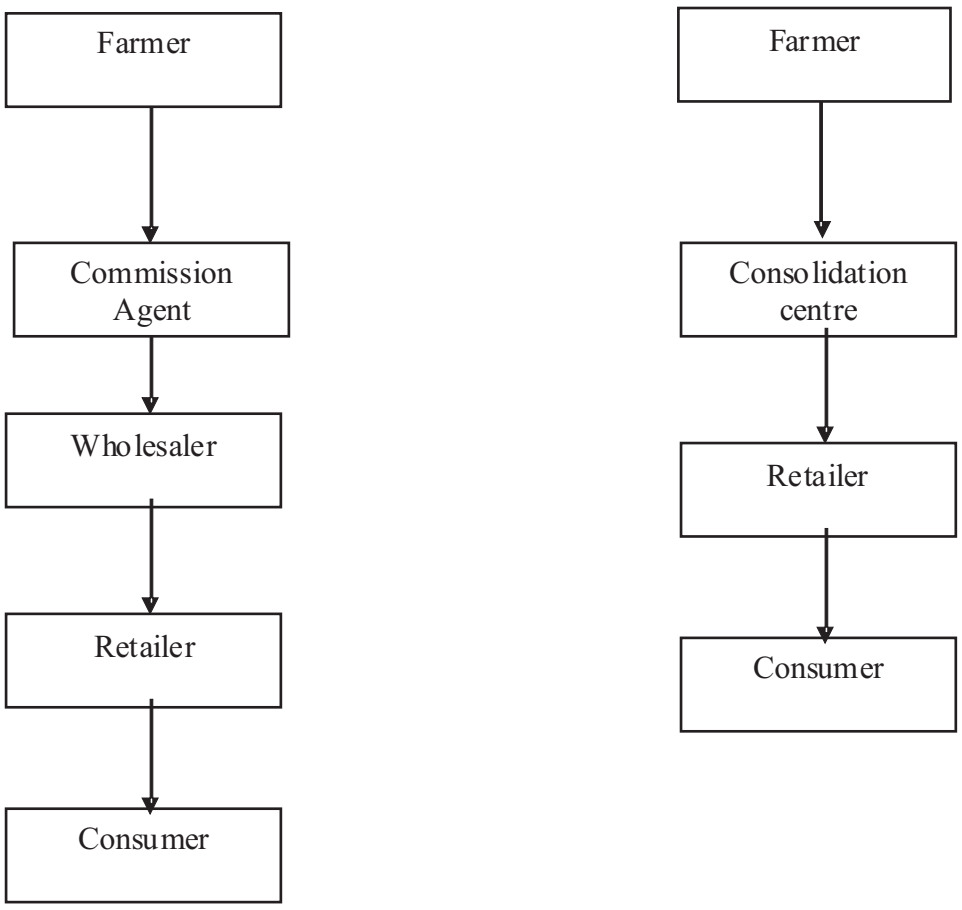
Marketing channel

Marketing channel are routes through which agricultural produce move from producers to consumer. The length of the channel varies, depending on the quantity of consumer demand and degree of regional specialization in production.

The length of marketing channel decides the marketing cost, marketing margin and price spread. Thus, many marketing functions involved in the movement of goods from the producer to its ultimate consumer. It varies from market to market, the level of economic development of the region and final form of consumption.

The existing marketing channels for cabbage were identified during discussion with the sample farmers in the study area. Further, the alternate marketing channels were evaluated by estimating the price spread to identify the efficient marketing channel. The two components of price spread, namely the marketing cost and marketing margin were worked out for the identified channels.

Marketing Channel for Cabbage



In marketing channel I, the farmers sold the cabbages to the wholesaler through commission agent at the market. The wholesaler after grading the produce at the grading centre located in the market, transported and sold to the retailer in Coimbatore vegetable wholesale market. The retailers in Coimbatore sold to the consumers in the city.

In marketing channel II, the farmers sold cabbages to consolidation centre. Then in the consolidation centre the quality of cabbages was checked by a quality control officer based on the criteria like size, shape, colour, and cleanliness of the cabbages. Finally the produce was staked in plastic containers and transported to retail outlets for selling to consumers.

Comparison of traditional and improved supply chain for Cole vegetable

S.no	Attributes	Traditional	Improved SCM
1	Sourcing emphasis	Short term	Long term relationship with consolidation centre
2	Supply base	Multiple sourcing	Single sourcing
3	Information sharing	Less information sharing	Greater information sharing and joint planning for volumes, pricing developments and improvements
4	Management and technical assistance	No	Yes
5	Cost reduction	No	Yes (No commission and Less spoilage)
6	Spoilage	10 % at wholesaler level and 15 % at retailer level	Only 15 % at retailer level
7	Order receiving	Large batch size to be delivered in frequently	Smaller batch size and frequent deliveries
8	Support from IT (Information Technology)	No	Very much IT enabled
9	Value added activities	No	Grading, quality checking based on size, colour and freshness
10	Transparency	No	Transparency in demand, availability, price, consumer preference
11	Customer price	High	Low
12	Net price received by producer	Low	High

In traditional supply chain information sharing is very less where in improved supply chain well information shared which ensures balanced demand and supply of cabbage. In traditional supply chain, involvement of top level management was less and spoilage is more of cabbage where as in improved supply chain involvement is more by top level management and spoilage is less. In improved supply chain IT (information technology) enabled activities were more, value added activities like grading, packing at convenient size where in traditional supply chain IT (information technology) was not used. Transparency will not be there in traditional supply chain where as in improved supply chain, transparent in price, demand and consumer preferencTable 14. Price Spread Analysis for the Identified Marketing Channels for Cabbage

AN ANALYSIS OF SUPPLY CHAIN OF COLE VEGETABLE FROM .....

S.no	Particulars (cabbage)	Channel I Price/kg	Percent	Channel II Price/kg	Percent
1	Net price received by the farmer	1.80	24.00	2.90	38.67
2	**Marketing cost**	-			
	Harvesting, grading, packaging and Loading	0.30	4.00	0.30	4.00
	Packaging material cost	0.15	2.00	0.15	2.00
	Transportation	0.25	3.33	0.25	3.33
	Unloading & weighment	0.20	2.67	-	
	Commission agent charges (10%)	0.30	4.00	-	
	Sub total	**1.20**	**16.00**	**0.70**	**9.33**
3	**Grand Total**	**3.00**	**40.00**	**3.50**	**46.67**
4	**Purchase price in consolidation centre**	**-**	**-**	**3.50**	**46.67**
5	**Marketing cost in consolidation centre**	-	-		
	grading, weighing and packaging and loading	-	-	0.20	2.67
	Packaging material cost	-	-	0.15	2.00
	Transportation	-	-	0.95	12.67
	Unloading, cleaning, grading, weighing and packaging and loading	-	-	0.30	4.00
	Sub total			**1.60**	**21.33**
6	**Grand Total**			**5.10**	**68.00**
7	**Purchase price of wholesaler**	**3.00**			
	Loading and unloading, grading, weighing and packaging and loading	0.30	4.00		
	Transportation	0.70	9.33		
	Spoilage (10%)	0.30	4.00		
	Sub total	**1.30**	**17.33**		
8	**Margin of wholesaler**	**1.00**	**13.33**		
	Purchase price of retailer	**5.30**	**70.66**		
9	**Marketing cost of retailer**				
	Loading and unloading, grading, weighing and loading	0.20	2.67		
	Transportation	0.20	2.67	0.30	4.00
	Spoilage (15%)	0.75	10.00	0.75	10.00
	Sub total	**1.15**	**15.33**	**1.05**	**14.00**
10	**Margin of retailer**	**1.05**	**14.00**	**1.35**	**18.00**
	Net price received by the consumer	**7.50**	**100.00**	**7.50**	**100.00**

(Figures in parentheses are the percentage to total)

In the marketing channel I the marketing cost of producers was 16 per cent of the consumer price of the cabbage (Table). Major portion of the marketing cost of producers were commission charges which accounted for 4 per cent followed by harvesting, cleaning, grading packing and loading charges 4 per cent, packaging material charges 2 per cent, transport charges 3.33 per cent and unloading and weighment 2.67 percent. The marketing cost of the wholesaler was Rs 1.30 and 17.33 percent of the consumer price and majority of the expenditure was transportation charges 9.33 per cent, spoilage charges 4 per cent and packing, loading and unloading, cleaning, grading, weighing; and packaging and loading 4 per cent borne by the wholesaler.

It was observed that from the Table that marketing cost per kg of cabbage incurred by the producers was maximum in the channel I (Rs.1.20/kg) than the channel II (Rs.0.70/kg). In channel I the total marketing cost was Rs.3.65/kg which was together incurred by producer, wholesaler and retailer. In channel II producer, consolidation center and retailer incurred the total marketing cost Rs.3.35/kg.

Share of the producer

The producer who sold his cabbage in channel II realized maximum share 38.67 per cent of

consumer rupee, with a net price of Rs 2.90 / kg of cabbage. The producers share in consumer price in channel I was 24 per cent (Rs 1.80/kg).

Share of commission agent charges

The marketing cost incurred by commission agent was nil. But the commission charged by commission agents was 10 per cent which accounted to 4 per cent of the consumer rupee in marketing channel no commission agent and I was involved in the marketing channel II.

Share of wholesaler

In marketing channel I net margin of wholesalers was 13.33 per cent (Rs1.00/kg) of the consumer rupee.

Share of retailer

In marketing channel I net margin of retailer was 14 per cent (Rs 1.05/kg) consumer rupee while in the marketing channel II it was 18 per cent (Rs 1.35/kg) to the consumer price of the cabbage.

Marketing efficiency

The marketing efficiency calculated using Shepherds formula for marketing channel I and II were 105.47 per cent and 123.88 per cent respectively. So, the channel II was more efficient than the channel I.

It can be concluded that commission charged by the commission agent constituted the major portion of price spread. The commission agent can be replaced so that cabbage can be procured directly at much higher price of Rs 3.50/ kg than the prevailing value realization of Rs 3.00/ kg. This price could well be reduced if the company did proper grading, loading and unloading practices. Spoilage and transportation contributed a major portion of the marketing cost of wholesalers. Hence, transportation could be taken up by the companies own transportation fleet from the market to Pazhamudir Nilayam retail outlets. All these would definitely enable higher price realization for the farmer at 72.2 per cent of the consumer price, less price to be paid for the consumers creating a win-win situation.

Mode of transportation

The basic requirements during transportation are proper control of temperature and humidity and adequate ventilation. In addition, the produce should be properly packed and stacked, to avoid excessive movement or vibration. Vibration and impact during transportation may cause severe bruising or other types of mechanical injury. Mode of transportation plays important role in quality of cabbage during transportation. Transport vehicle speed must be suited to the quality and conditions of the roads and truck and trailer suspensions keep the in good condition. Optimum tire air pressure on transport vehicles will reduce the amount of motion transmitted to the produce, and thus result in minimum mechanical injury during transportation.

Distance of transportation

Long distance transportation will increase loss and affect the quality of cabbage. For better quality maintenance during transportation roads between the field and the packing house should be free from large ruts, bumps and holes. Field boxes must be well-secured during transport and stacked to the optimum. Transport speeds must be suited to the quality and conditions of the roads, and truck or trailer suspensions kept in good condition.

In the study area, the sample vendors were classified into three categories based on the distance of cabbage transported from the field to market and results are presented in Table.

Table 15. Distance Transported Per Time by Wholesaler (n=30)

S.no	Distance (in Km)	Number of wholesaler	Percentage to total
1	<25	6	20.00
2	25-50	10	33.33
3	>50	14	46.67
	Total	30	100.00

From the above table, it could be inferred that, majority of the wholesaler transported cabbage more than 50 kms (46 per cent), followed by 25 to 50 kms distance (33 per cent) and the rest less than 25 kms distance. The vendor reported that physical damage was caused at this stage.

Transportation of cabbage from field to consolidation centre

During transportation of cabbage from field to wholesale market, cabbages were loaded into the trucks. The farmers and retailer reported that physical damage was caused at this stage and thereby quality of the cabbage was reduced. The interview with the retailer and quality checking of wholesale revealed that during this operation the containers were handled roughly, thereby damaging the cabbages and thus the quality of cabbages was reduced during transportation.

Transportation of cabbage from consolidation centre to Pazhamudir Nilayam retail outlet

In the consolidation centre, Cole vegetable were packed and transported to Pazhamudir Nilayam retail outlets.

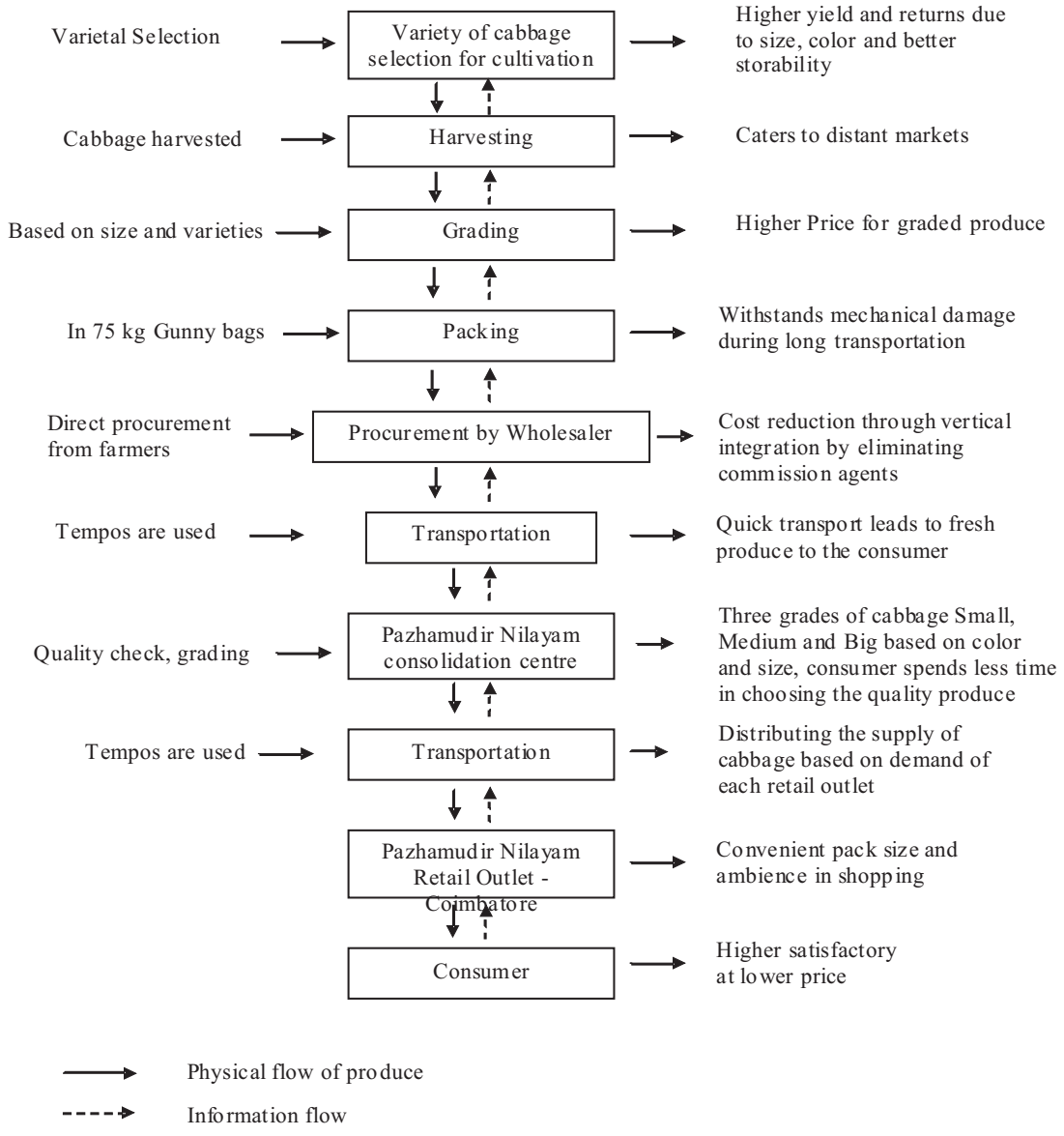
Method of grading

Essentially all fruits and vegetables sold in modern markets are graded and sized into two or more grades according to trade standards. Sophisticated marketing systems require precise grading standards for each kind of product. Improper grading causes poor quality.

Method of packing

Packing is meant to protect the commodity by immobilizing and cushioning it, but temperature management can be made more difficult if packing materials did not bore ventilation holes. Packing materials can act as vapor barriers and can help maintain higher relative humidity within the package. In addition to protection, packaging allows quick handling throughout distribution and marketing and can minimize impacts of rough handling.

Supply chain Process of cabbage Sold through Pazhamudir Nilayam Retail Outlets



Farmers selected cabbage which had attributes like higher yield and better storability. They harvest after graded the cabbage based on size at farm level to fetch higher price. They packed graded cabbage in 75-80 kg Gunny bags/plastic trays to avoid mechanical damage and long transportation. Wholesaler procured cabbage from farmers and then transported through tempos to consolidation centre where cabbages are graded as Small, Medium and Big based on color and size, consumer spends less time in choosing the quality produce and packed in polythene bags for consumer's preference. Cabbages are transported to various retail outlets in Coimbatore city to meet the consumer demand.

SUGGESTIONS

Udagai taluk is a very ideal place for procurement of cabbage because of its size of production, suitability of soil, water and climate, and the presence of well experienced farmers who are cultivating the crop traditionally .The predominance of small and medium sized land holdings, wide fluctuation in prices, lack

of market information provides ideal setup for further integration of the procurement process by entering into some kind of contract farming directly with the farmers eliminating the intermediaries. This would definitely lead to better control of production variables that may result not only in better quality of cabbage but also in better economies of scale and operations.
Farmers preferred hybrids of large size and high yielding and quality.
Farmers were doing grading at farm level based on colour and size before transporting.
The Pazhamudir Nilayam purchase of cabbages through wholesaler ensured quality at farm and consolidation centre
As the number of intermediaries reduced, then the marketing cost also declined considerably.
Quality cabbages are available to consumers at convenient size in Pazhamudir Nilayam Retail outlet at lesser prices due to integration of activities by reducing the marketing intermediaries.
Comparison of traditional marketing channel and Pazhamudir Nilayam marketing channel the later ensured quality, less consumer price, freshness, convenient packing, and lesser marketing cost, timely availability and higher price to cabbage growers.

RECOMMENDATION FOR MARKETING STRATEGY

1)Grading at farm level by wholesaler and consolidation centre should be improved by setting standards for quality parameter at farm and consolidation centre.
2)Transportation workers should be educated for further reduction in mechanical damage and spoilage during handling of produce.
3)Cabbage growers in other areas can also be organized as cabbage growers association to further enhance physical and information flow between producer and consumer. Also it ensures transparency, forward flow of cabbages and backward flow of information on price, quality, size, and colour from consumer to producer.

BIBLIOGRAPHY

BOOKS

Chandra and Pankaj, (1994), "Note on Supply Chain Management", (Technical Note, Indian Institute of Management, Ahmedabad.), 37.
Christopher and Martin. (1993), "Logistics and Supply Chain Management", (London: Pitman Publishing Company.), 34.
Dale,C. Dahl., Jerome N. Hammand, Lucas (1977), "Market and Price Analysis - The Agricultural Industries" (New Delhi : S.Chand & Company Ltd.), 65-71
Raghuram, G. and N. Rangaraj, (2000), "Logistics and Supply Chain Management" (New Delhi : Mac Millan India Limited.),17.
Shepherd, G.S. (1962), "Marketing of Farm Products",(Ames : Lowa University Press).23.
Vachhajahi,N.M., (1976), "Establishing Distribution Network Methods and Criteria Hand Book of Fertilizer Marketing",(New Delhi: Fertilizer Association of India.),135-147.

JOURNALS

Maheswarappa, B.O., L.B. Kunnal and S.M. Patil, (1998), "Economics of Production and Marketing of Sugarcane in Karnataka", The Bihar Journal of Agricultural Marketing, 6(2): 238-244.Singh, K. and K.S. Kahlon, (1994), "Marketing Margin in Grapes in Punjab", Agricultural Marketing, 11(4).

UNPUBLISHED THESES

Ahamed Riaz.K.. (2002), "A Study of Supply Chain of Pomegranate from Chitra Durga District of Karnataka", (Unpublished M.B.M thesis, Department of Agricultural and Rural Management, submitted to Tamil Nadu Agricultural University, Coimbatore).
Rajkumar.(1992) " A study on the marketing, price spread and export of pepper and ginger in Kerala",(Unpublished MBM thesis Department of Agricultural Economics, Submitted to Tamil Nadu Agricultural University, Coimbatore).
Ramalinga Rajoo A.K.D. (2002). "A Study on Supply Chain of Sapota from Chitradurga District of Karnataka", (Unpublished M.B.M thesis, Department of Agricultural and Rural Management, submitted to Tamil Nadu Agricultural University, Coimbatore).

Ramamoorthy, K. (1982), "An Economic Analysis of Production, Marketing and Consumption of Tomato in Coimbatore Region", (Unpublished Ph.D. thesis, Department of Agricultural Economics, submitted to Tamil Nadu Agricultural University, Coimbatore).

Other resources

www.fao.com