FAC RS INFLUENCING VEGE ABLE PRICES:

A STUDY OF THE VEGETABLE ECONOMY IN SRI LANKA

P.J. Gunawardena
Athula Chandrasiri

Research Study No.35
February 1980

AGRARIAN RESEARCH AND TRAINING INSTITUTE
COLOMBO, SRI LANKA.

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F O R E W O R D

VEGETABLES FORM A VERY IMPORTANT PART OF THE DAILY DIET OF THE PEOPLE IN SRI LANKA. IT IS ESTIMATED THAT ABOUT TEN PERCENT OF THE AVERAGE HOUSEHOLD EXPENDITURE ON FOOD IS SPENT ON VEGETABLES. THEREFORE, EVEN A SMALL INCREASE IN THE PRICE OF VEGETABLES COULD LEAD TO AN INCREASE IN THE COST OF LIVING, THEREBY REDUCING THE LEVEL OF REAL INCOMES OF A LARGE SECTION OF THE POPULATION. A RAPID INCREASE IN VEGETABLE PRICES OFTEN BECOMES A PROBLEM OF NATIONAL INTEREST.

AT THE REQUEST OF THE COMMISSIONER OF MARKETING DEVELOPMENT, THIS STUDY WAS UNDERTAKEN TO ASCERTAIN THE FACTORS INFLUENCING THE VEGETABLE PRICES IN SRI LANKA. IN PARTICULAR AN ATTEMPT WAS MADE TO DETERMINE WHETHER THE INCREASE IN THE PRICE OF VEGETABLES DURING THE RECENT PAST WAS THE RESULT OF ANY REDUCTION IN THE LAND AREA UNDER VEGETABLE CULTIVATION. IT WAS ALSO INTENDED TO FIND OUT WHETHER SOME OF THE VEGETABLE CULTIVATORS WERE SHIFTING THEIR LAND RESOURCES FOR THE CULTIVATION OF SUBSIDIARY FOOD-CROPS, BECAUSE OF THE MORE ATTRACTIVE PRICES THEY FETCH.

THE FINDINGS AND POLICY IMPLICATIONS OF THE STUDY WITHIN ITS LIMITATIONS ARE EXPECTED TO SERVE AS A TIMELY AND USEFUL DATA BASE FOR THE POLICY MAKERS WHO ARE CONCERNED WITH THE DEVELOPMENT OF VEGETABLE CULTIVATION IN THIS COUNTRY. IT IS ALSO HOPED THAT THIS REPORT WILL BE OF INTEREST TO A WIDER SECTION OF THE POPULATION SINCE IT IS ONE OF THE MOST COMPREHENSIVE STUDIES SO FAR DONE ON ASPECTS OF PRODUCTION, MARKETING AND THE CONSUMPTION OF VEGETABLES IN SRI LANKA.

MR.P.J.GUNAWARDENA, RESEARCH AND TRAINING OFFICER WHO ACTED AS THE CO-ORDINATOR OF THE RESEARCH PROGRAMME WAS RESPONSIBLE FOR THE WRITING OF THIS REPORT. MR.L.R.A.CHANDRASIRI, R.& T.O, PARTICIPATED IN THE RECONNAISSANCE SURVEY IN THE KANDY AND BADULLA DISTRICTS AND IN THE TRAINING AND SUPERVISION OF INVESTIGATORS. HE ALSO CONTRIBUTED TO CHAPTER(7) OF THE REPORT. MR.S.M.P.SENANAYAKE, R.& T.O, FUNCTIONED AS A MEMBER OF THE RESEARCH TEAM IN THE INITIAL STAGES AND ASSISTED IN CONDUCTING RECONNAISSANCE SURVEYS IN THE ANURADHAPURA AND JAFFNA DISTRICTS AND TRAINING OF INVESTIGATORS.

I THANK THE RESEARCHERS FOR THEIR VALUABLE EFFORT IN BRINGING OUT THIS PUBLICATION.

(T.B.SUBASINGHE)
DIRECTOR

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Agricultural Economics and Extension Unit,
Agrarian Research and Training Institute,
February, 1980.

P.J.G.
A.C.

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CHAPTER I

INTRODUCTION

1.1 The Problem

Vegetables being an essential component in the daily diets of the people in Sri Lanka occupy a significant place in the domestic food production and consumption. On an average, about 10 percent of the monthly household food expenditure is on vegetables. Next to rice, vegetables account for the second largest category of food expenditure.[1] Hence, even a small increase in the price of vegetables is reflected in the cost of living so far as the average consumer is concerned.

Fluctuations of prices render the producers' income unstable. In the absence of reliable statistics on vegetable farmers it is safer to assume that a significant proportion of the farming population is dependent upon vegetable cultivation. It is estimated that the annual production of vegetables in Sri Lanka amounts roughly to about 600,000 tons. On an average about 300,000 acres of land is annually devoted to vegetable cultivation in this country.[2]

The middlemen are often alleged to have exploited both the producers and the consumers of vegetables. This means that the middlemen absorb the major proportion of the price paid by the consumer. Studies carried out so far, have pointed out about the possibility of price manipulations by some traders, but these results are not substantiated with conclusive

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[1] Central Bank of Ceylon (1953, 1963, 1973) Reports of the Consumer Finance Surveys of Sri Lanka, Colombo.

[2] See Chapter 6 for details.

evidence.[1] It may therefore, be relevant here to test this hypothesis.

A close look at the vegetable prices during the last fifteen years or so suggests a general increasing trend, with a sudden and unprecedented increase, especially during the last 4-5 years. The prevailing high prices have become a question of national concern, even attracting the attention of the members of the legislature, during the 1977/78 budget debate.

The causes of the observed upward trend in vegetable prices could be a-priori, related broadly to forces that influence farm supply, marketing and consumer demand. It becomes topical to identify and analyse the influence of each of these forces in a study of the factors affecting vegetable prices. Once the effects of these forces are identified, effective policies could be formulated mainly with regard to the production and marketing aspects in order to keep the prices of vegetables within reasonable limits.

1.2. Objectives

This study seeks to identify and to analyse the factors that influence the price of vegetables in Sri Lanka. The specific objectives of the study are :-

(a) to identify the trends and the seasonal variations in vegetable prices, and to examine the factors leading to such trends;

(b) to ascertain the factors influencing the farm supply, marketing and consumer demand and their effects on the determination of prices; and

(c) to examine the effectiveness of the vegetable marketing system with special reference to the pricing efficiency.

1.3 Methods of Study

This study is based on data and information obtained through three main approaches.

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[1] Abeysekera, Terrence and Piyadasa Senanayake (1974) Economics of Vegetable Production and Marketing, ARTI, Colombo, Research Study Series No: 2.

(A) A field survey was conducted in four important vegetable growing districts, i.e. Anuradhapura, Badulla, Kandy and Jaffna, to collect data and information on economic aspects of production and marketing of vegetables, representing the Dry Zone, Upcountry Wet Zone, Midcountry Wet Zone and the Jaffna peninsula, respectively.

(B) Time series data on production, acreage, prices, consumption, population, income etc., was collected from various sources i.e. The Central Bank of Ceylon, Department of Census and Statistics, and the Department of Marketing Development.

(C) Available publications which deal mainly with the aspects of production, marketing and pricing of vegetables in Sri Lanka are used in reviewing the literature and will be refered to at the appropriate places.

The Field Survey

A reconnaissance survey was undertaken in Anuradhapura, Badulla and Kandy districts during August, 1978 and in Jaffna during December 1978.[1] The objectives of this reconnaissance survey were three fold i.e. (a) collection of preliminary information on vegetable production and marketing, (b) selection of suitable localities for conducting the survey proper in each of the districts, and (c) pretesting the questionnaire designed for the sample survey of vegetable producers.

In the selection of localities to collect data on production and farm level marketing, priority was given to the areas where vegetable cultivation predominates. The number of localities selected in each of the districts varied according to the adequacy of the number of vegetable cultivators to be interviewed in each locality. Except in Jaffna, 2 villages in each of the other districts were selected for this purpose. The villages so selected were as follows:-

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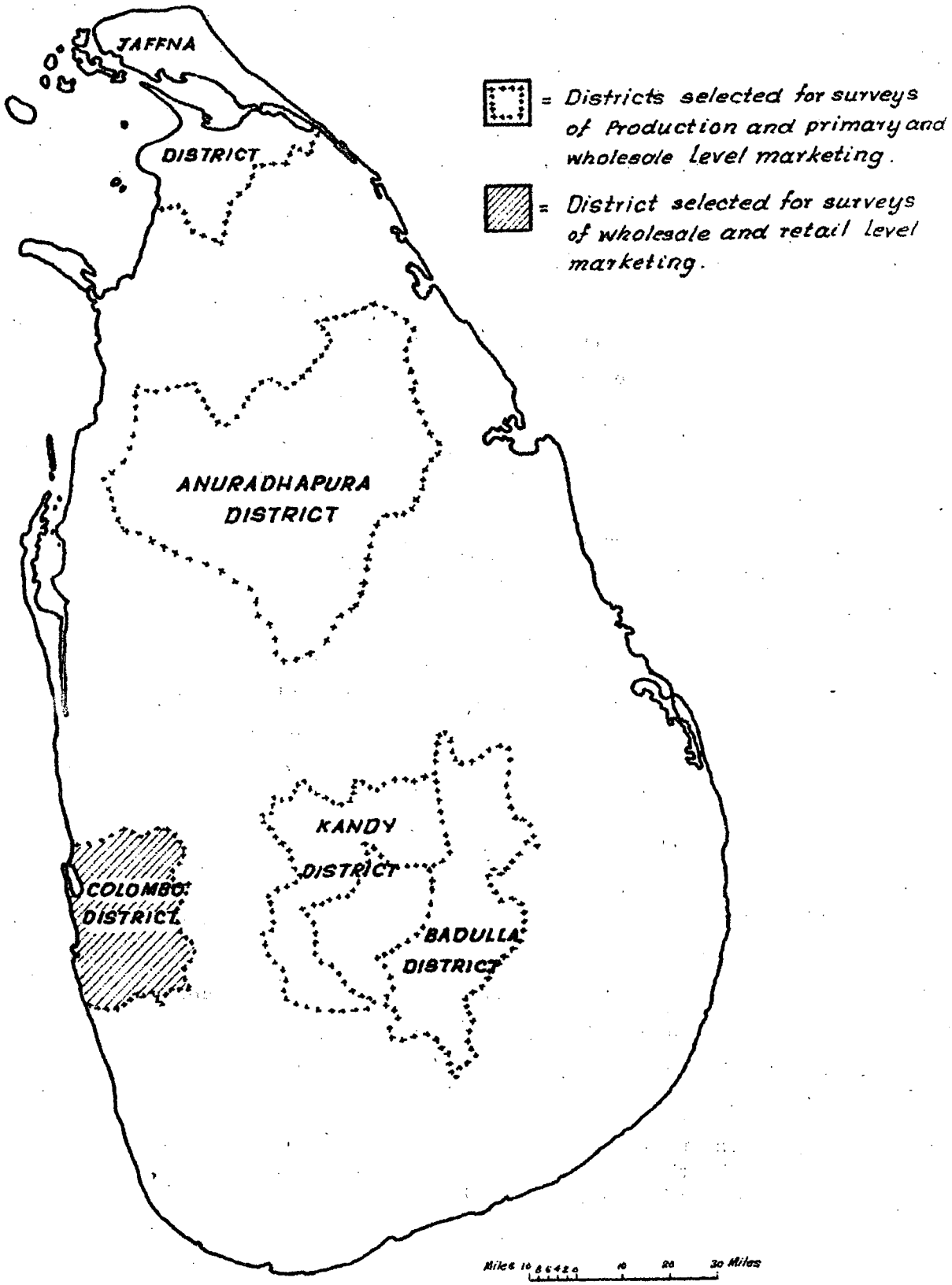
[1] Though the researchers intended to conduct the survey in Jaffna district alongwith that in other districts, this had to be postponed due to factors beyond their control.

igure: 1. LOCATION OF THE DISTRICTS SELECTED FOR FIELD SURVEYS.



District	AGA Division	Village
Anuradhapura	Talawa	Lunuwewa Ikiriwewa
Badulla	Welimada	Vidurupola Kovilpathana-Gorakapathana (Boragas)
Kandy	Patha-Hewaheta	Meeruppa Hewavissa

In Jaffna district, the growers who supply vegetables to Chunnakam and Chavakachcheri markets are fairly scattered over a wide areas so that one or two villages were considered inadequate. Hence, the following villages were selected to represent the Jaffna district;-

District	AGA Division	Villages	
Jaffna	Uduvil, Valinorth, Valisouth, Valieast, Tellipalai	Mallakam, Mailiddy, Vasavilan, Kopay, Chunkuvelli, Puttur	Udvil Keerimalai.
	Chavakachcheri,	Kaithady, Maruthady, Kodikamam, Meesalai, Sarasalai, Madduvil.	Kaithady Madduvil

Apart from the vegetable producing areas, the following market centres were also selected to gather information on various aspects of vegetable marketing:

(a) Producer Fairs
1. Welimada (Badulla)
2. Talawa (Anuradhapura)
3. Tambuttegama (Anuradhapura)
4. Chunnakam (Jaffna)

(b) Wholesale Markets
1. Pettah (Colombo)
2. Kandy
3. Chunnakam (Jaffna)

(c) Retail Markets
1. Borella
2. Nugegoda
3. Dematagoda
4. Maharagama
5. Kandy
6. Chunnakam

The survey proper in all the localities was carried out in two phases. The phase 1 of the survey in all villages and market cnetres, except those in Jaffna district, was conducted from 3rd October. to 18th November, 1978.

During the phase 1 of the survey primary emphasis was on various aspects of vegetable production and marketing at farm, wholesale and retail levels except specific data on costs of production. Details of the respondents involved in phase 1 of the sruvey are given in table 1-.

Table 1- Number of Persons Interviewed During Phase I of the Survey

Category of Personnel	Anuradh-apura	Badu-lla	Colombo	Jaffna	Kandy	Total
1. Vegetable cultivators	50	46	-	51	69	216
2. Assembly Agents	12	--	--	--	08	20
3. Brokers	--	04	05	16	--	25
4. Trucker-buyers	--	03	--	--	12	15
5. Transport Agents	--	--	09	02	05	16
6. Wholesalers	--	09	11	18	20	58
7. Retailers	13	07	91	52	03	166
8. Marketing Dept. Officials	--	04	12	06	07	29
9. Co-operative Officials	--	04	03	--	--	07
10. Other Officials	03	10	04	07	09	33
11. Market Labourers	--	--	45	06	02	53
12. Consumers	08	--	48	61	01	118
Total	86	87	228	219	136	756

During the Phase II of the survey, specific data on costs of production of vegetables were gathered from a selected sample of vegetable cultivators. In the selection, the rigorous statistical sampling methods could not be followed due to the absence of a complete list of vegetable growers. The sample of cultivators for the final survey was drawn from a list compiled by the research assistants with the help of another list provided by the Cultivation Officers. The number of cultivators in the sample in each locality is given in table 2-.

Table 2-. Number of Cultivators Interviewed During Phase II of the Survey

District	Villages	No: of Cultivators in the sample	Period of survey
Anuradhapura	Lunuwewa	18	18/1/79-01/2/79
	Ikiriwewa	20	03/2/79-17/2/79
Badulla	Vidurupola	20	16/1/79-30/1/79
	Kovilpathana/Gorakapathana(Boragas)	18	- do -
Kandy	Meeruppa	20	17/1/79-31/1/79
	Hewavissa	20	- do -
Jaffna	Mallakam, Mailiddy Vasavilan, Kopay Chunkuwelli, Puttur (Uduvil-Keerimalai)	26	15/2/79-28/2/79
	Kaithady, Maruthady, Kodikamam, Meesalai, Sarasalai, Madduvil (Kaithady-Madduvil)	35	- do -
Total		177	

Apart form collecting cost of production data from these localities, a re-survey of vegetable marketing was conducted in the market centres (primary, wholesale and retail) involved in phase 1 to collect supplementary data and information. The re-sruvey helped cover both peak and slack periods of marketing activities in all the localities selected. The periods of survey in this regard in various localities except in the case of markets in Colombo, are the same as given in table 2. The market centres in and around Colombo were re-surveyed during the period 15/1/79 to 31/1/79.

Thus, the reference periods of data collected through field surveys are as follows:-

(a) Marketing aspects - October, 1978 - February, 1979

(b) Aspects of production including Cost of Production data. - i. Maha 1977/78
ii. Yala 1978
iii. Maha 1978/79

The methods of data collection varied from informal and guided interviews and prestructured questionnaires to direct participant observation. During both phases of the field surveys, the data was collected by 13 research assistants, stationed in the localities throughout the period

of the survey under the continuous supervision of the researchers.

1.4 Nature and Accuracy of Data

Time series data on production and acreage, collected from the Department of Census and Statistics, are not perfect in themselves. They are not measured levels of actual production and acreage, but rather rough estimates based on the official's rule of thumb techniques. Therefore, due consideration has to be given to possible under and over estimation.

Price data collected by the Marketing Department could be regarded as fairly accurate since the officials themselves visit the markets and record prices. But these data for the most part are inconsistent. Only the wholesale and retail prices are available in the Department. This prevents a meaningful historical comparison between prices received by the producers and prices prevailing at subsequent levels of the marketing chain.

The accuracy of the data and information collected through the current field surveys is assumed to be high, since the research assistants made individual observations and kept records. However, some data, especially the cost of production, past prices , etc., are subject to memory lapses of the respondents.

Time series data are lacking mainly in respect of vegetable production and marketing and these aspects are analysed mainly on cross-sectional data and information. However, the consumption aspect, as it relates to vegetable prices, will be analysed on the basis of time series data.

CHAPTER 2

TREND AND SEASONAL VARIATION IN VEGETABLE PRICES[1]

This chapter attempts to identify the trend and seasonal variation in retail prices of selected vegetables.

In an exercise of this nature it is not possible to deal with all the vegetable variaties grown in Sri Lanka and only 10 vegetables are selected for the analysis. These are, beans, beetroot, cabbage, carrot, leeks brinjal, cucumber, lady fingers, red pumpkin and snake grourd. The first five vegetables represent the exotic vegetables while the balance represent the indigenous varieties. These ten vegetables are regarded as fairly representative of the important vegetables that are produced and consumed in the domestic markets.

Furthermore, the retail prices prevailing at the Colombo central market are used in this analysis as proxy of prices at all the retail markets in Sri Lanka. This is necessitated by the difficulty of examining price data for all the retail markets. On the other hand, even if retail price data are available in respect of each principal town in the country, they are rather scanty. Thus Colombo prices are used on the basis of two assumptions.[2] First , it is assumed that the Colombo market price determines the prices elsewhere in the country. Second and corollary to this, it is assumed that outstations' retail prices are somewhat highly correlated to Colombo prices.

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[1]Price of same vegetable varies depending on quality differences. It is difficult to consider prices of different grades of vegetables. Therefore, price of "Fair Average Quality" produce is used in the analyses throughout this report.

[2]These simplifying assumptions are made on the basis of findings of some of the earlier studies. An example of such a study is; " The Report to the Minister of Foreign and Internal Trade on the Role of the Marketing Department and the All Ceylon Producers' Union. (1971)

Moreover, the retail prices of vegetables at the Colombo central market are assumed to be higher than those prevailing at vegetable producing areas and lower than those at market centres in suburban areas around Colombo and at other principal towns outside Colombo.

(a) Trend in Vegetable Prices:-

Table 3-. Annual Average Retail Prices of Selected Vegetables (1965-78)

(Rs. cts. per lb. at current values)

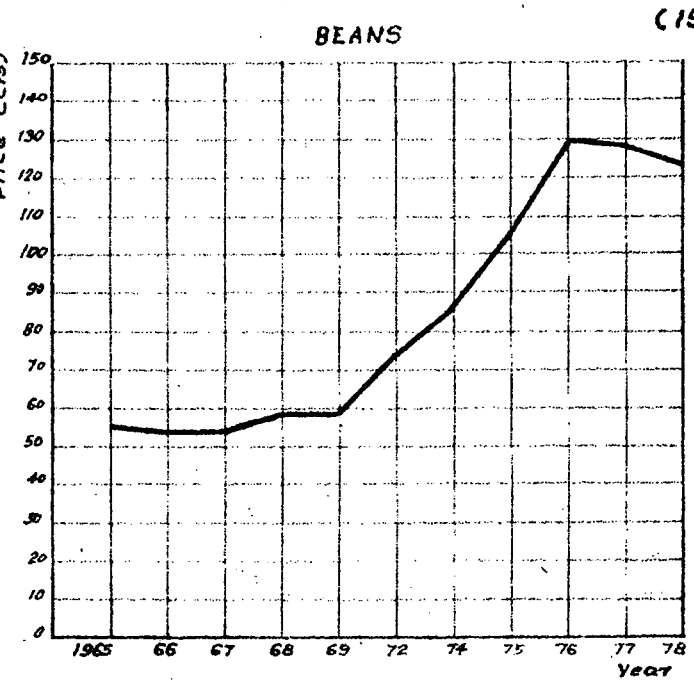
Year * / Vegetable	1965	1966	1967	1968	1969	1972 (a)	1974	1975 (a)	1976	1977	1978 (a)	% change over the period
Exotic Vegetables												
1. Beans (b)	.55	.54	.54	.58	.58	.74	.86	1.05	1.30	1.28	1.24	+ 127
2. Beetroot	.39	.42	.47	.49	.46	.46	.76	1.03	.85	1.07	.94	+ 137
3. Cabbage	.38	.34	.34	.35	.36	.38	.55	.66	.67	.85	.70	+ 84
4. Carrot	.38	.42	.45	.46	.47	.52	.66	.78	.79	1.21	1.47	+ 300
5. Leeks	.30	.31	.31	.38	.37	.53	.65	.71	.81	1.08	1.29	+ 300
Indigenous Vegetables												
6. Brinjal	.33	.26	.32	.39	.34	.42	N.A.	N.A.	.71	.68	.71	+ 111
7. Cucumber	.20	.21	.23	.23	.24	.26	.27	.30	.38	.36	.36	+ 80
8. Lady fingers	.37	.34	.40	.44	.38	.44	.49	.55	.68	.67	.84	+ 140
9. Red pumpkin	.16	.17	.21	.25	.15	.31	.41	.41	.67	.69	.67	+ 32
10. Snake gourd	.26	.27	.30	.31	.27	.33	.42	.46	.57	.62	.52	+ 100

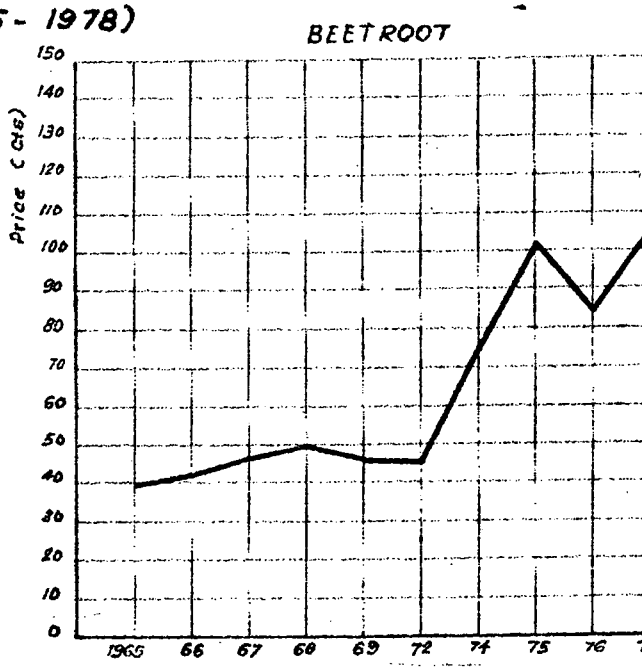
Source: Department of Marketing Development

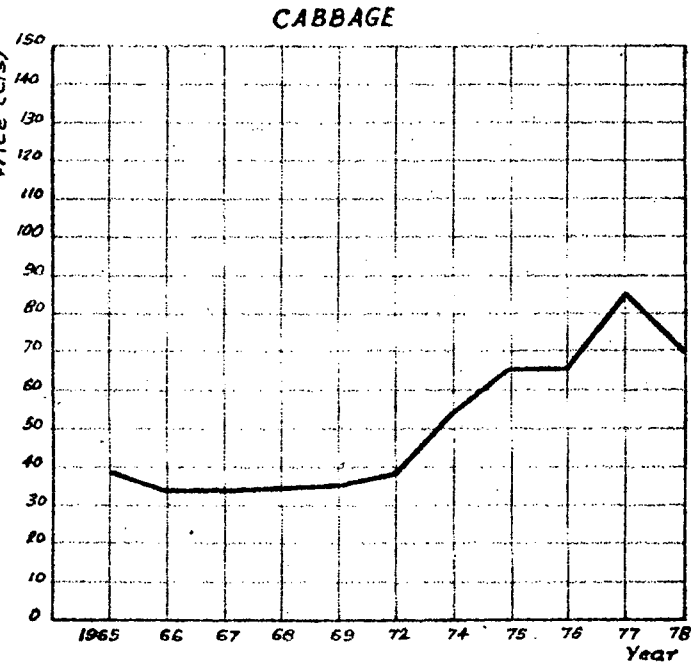
Notes : * Prices for years 1970, 1971 and 1973 are not available.
(a) Average prices from January to September only.
(b) Average prices of green, butter and kidney beans.
N.A. = Not available

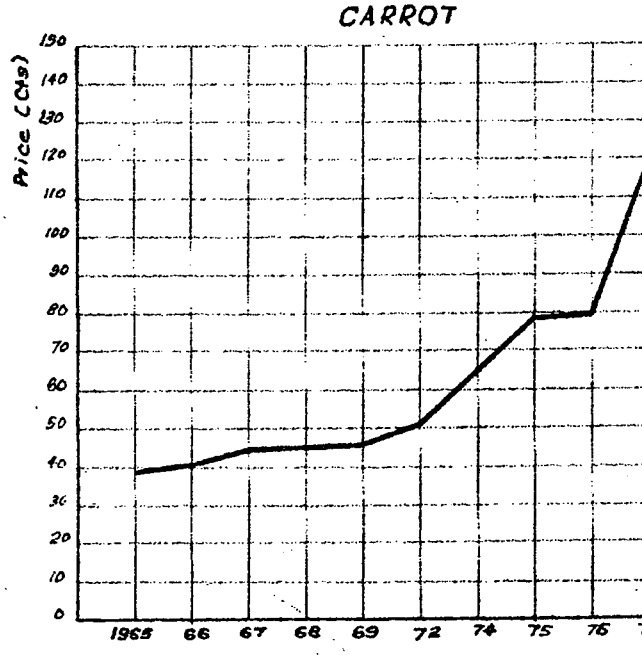
Figure- 2

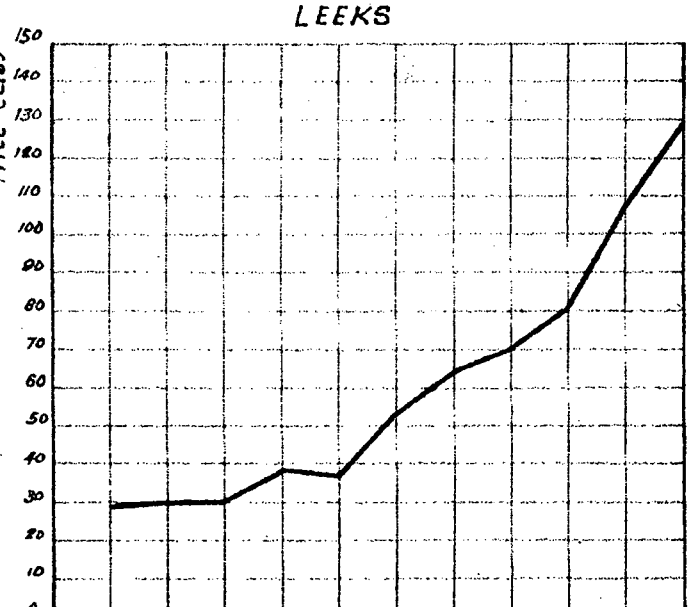
ANNUAL AVERAGE RETAIL PRICES OF SELECTED VEGETABLES AT CURRENT VALU (1965 - 1978)











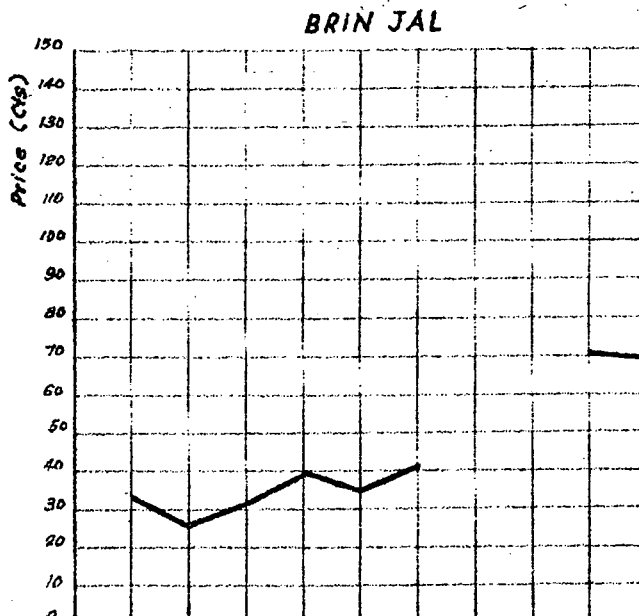
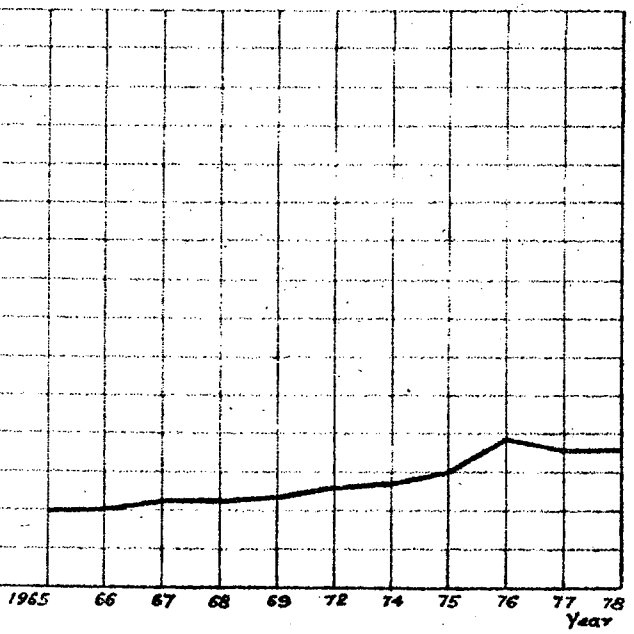
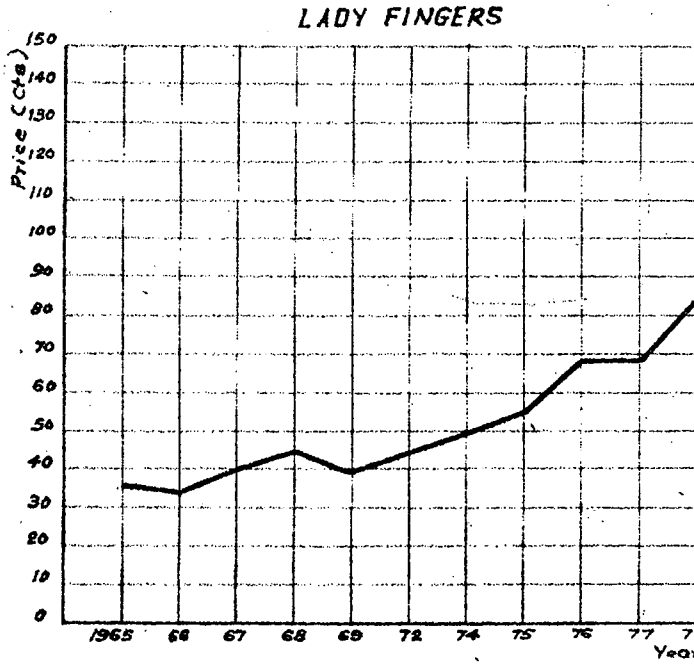


Figure-2

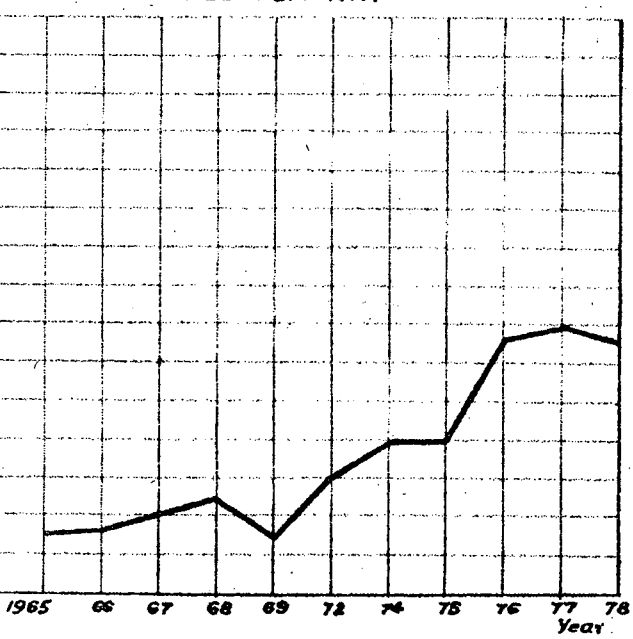
CUCUMBER



LADY FINGERS



RED PUMPKIN



SNAKEGOURD

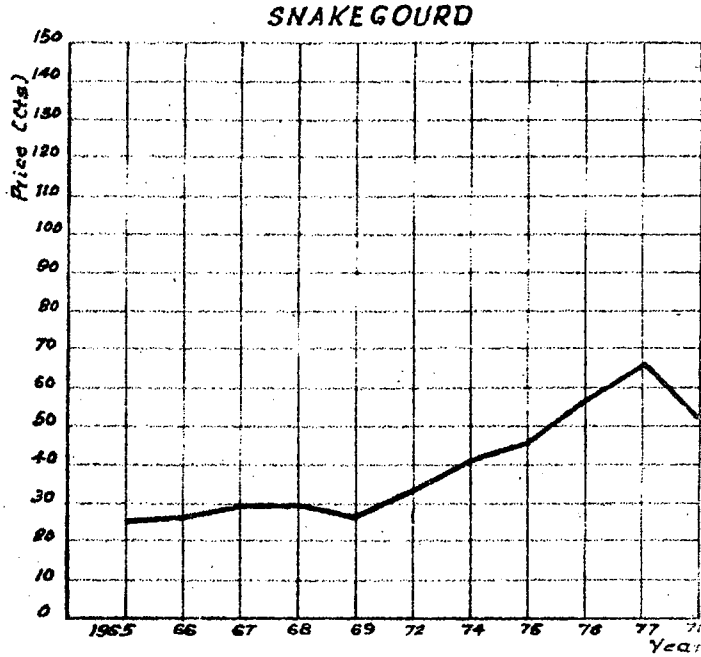


Table 3 and figure 2 show an upward trend in price of all the selected vegetables from January 1965 to September 1978, with its fluctuations in the middle years. The relative increase in price within this period varies from 75% for red-pumpkin to 300 percent for leeks and carrot. In general, the price increases are more pronounced with exotic vegetables than with indigenous vegetables, Another notable feature is that the price of all vegetables have increased at a sharper rate from about 1974 onwards than in the previous years. This may be due to the inflationary trends in the economy during the period under consideration . This trend of prices has to be viewed taking into account not only the current prices but the real prices as well. Table 4 presents the prices of vegetables after making adjustments for increases in the general Consumer Price Index.

Table 4-: Annual Average Retail Prices of Selected Vegetables

(1965-78) in Rs. cts. per lb. (deflated by the Consumer Price Index)

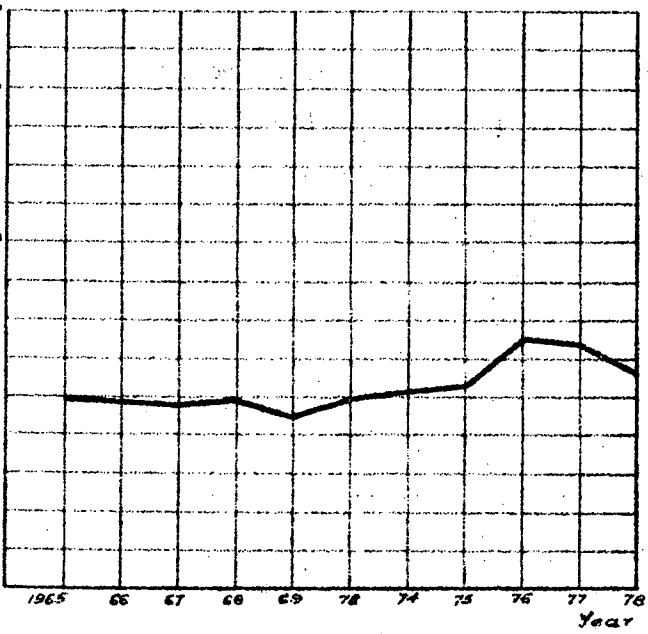
Year* / Vegetable	1965	1966	1967	1968	1969	1972 (a)	1974	1975 (a)	1976	1977	1978 (a)	% change over the period
Exotic Vegetables												
1. Beans (b)	.49	.48	.47	.48	.44	.49	.52	.53	.65	.63	.56	+ 14
2. Beetroot	.35	.37	.41	.41	.35	.32	.46	.52	.42	.53	.42	+ 14
3. Cabbage	.34	.30	.30	.29	.28	.25	.33	.33	.33	.42	.32	- 6
4. Carrot	.34	.37	.39	.38	.36	.34	.40	.39	.39	.60	.66	+ 94
5. Leeks	.27	.28	.27	.31	.36	.35	.39	.36	.40	.53	.58	+ 111

Contd:

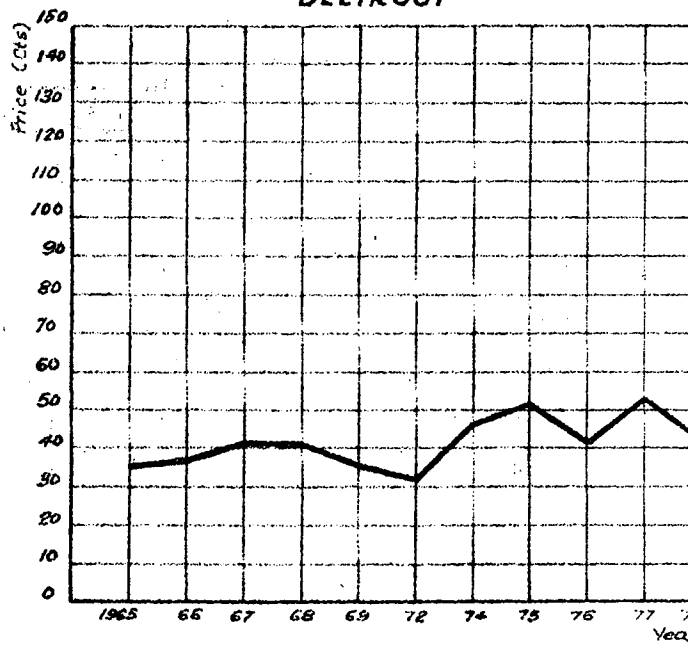
Figure - 3

ANNUAL AVERAGE RETAIL PRICES OF SELECTED VEGETABLES AT REAL VALUES (1965 - 1978)

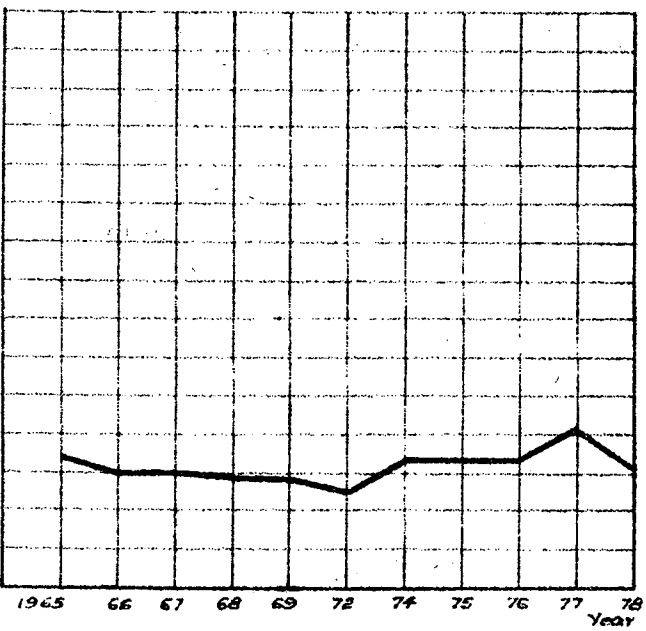
BEANS



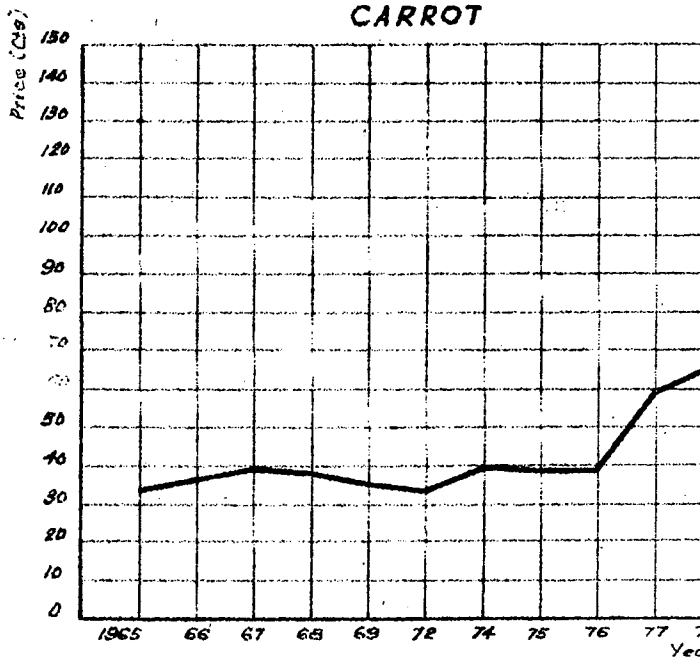
BEETROOT



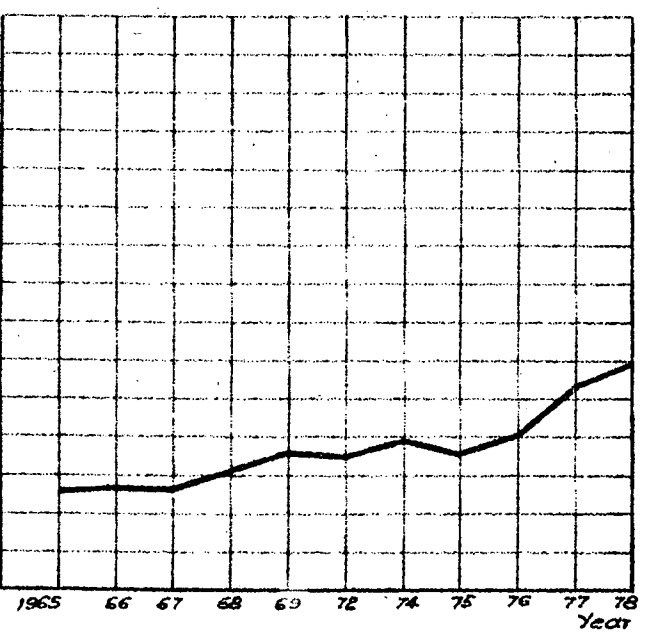
CABBAGE



CARROT



LEEKS



B RINJAL

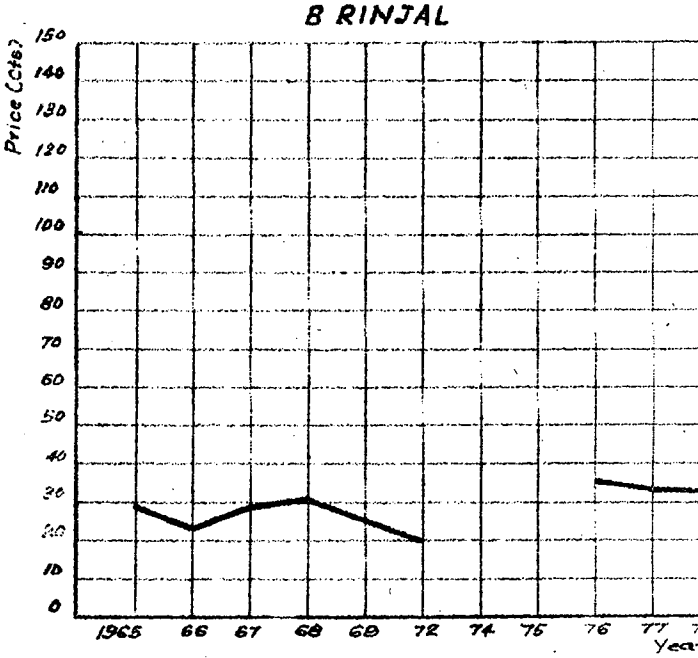
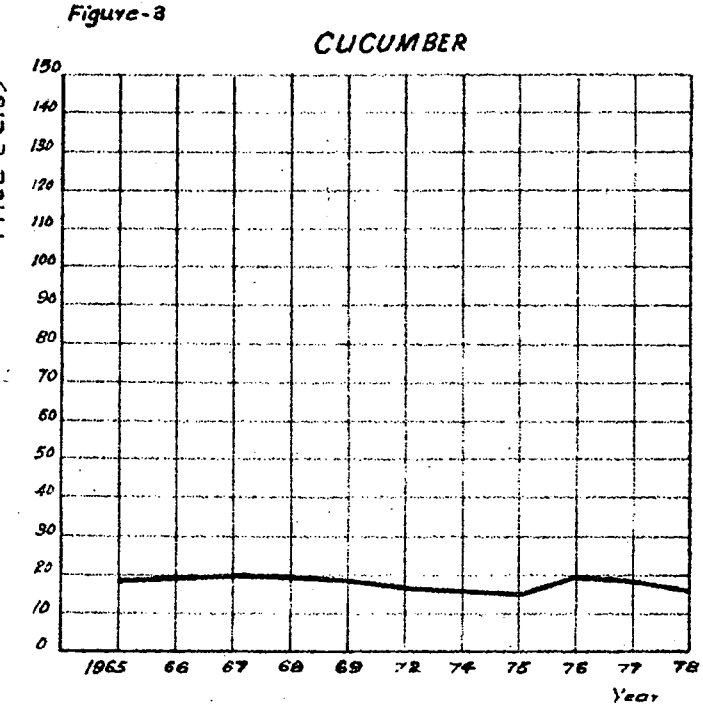
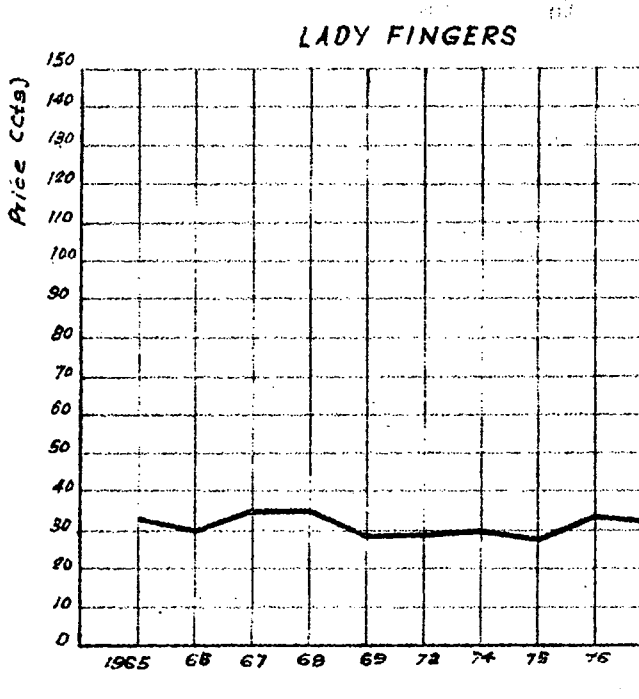
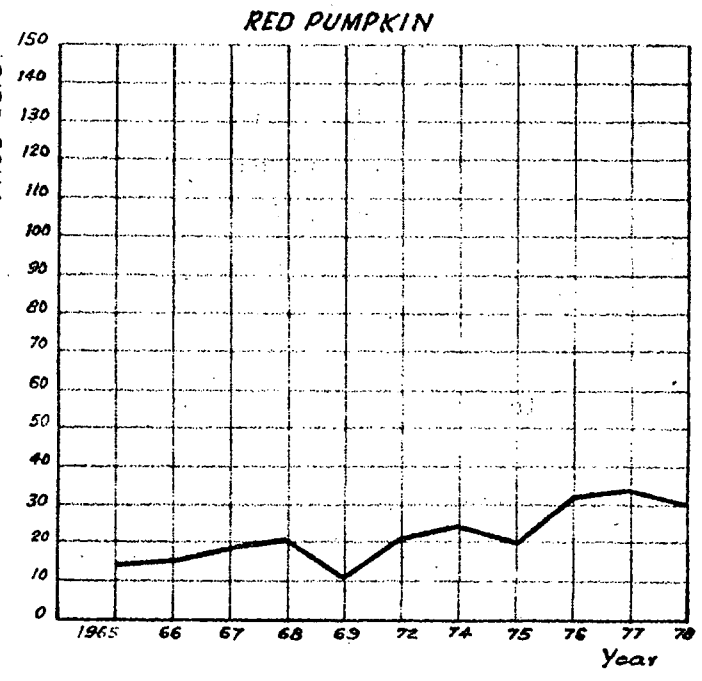


Figure-3


CUCUMBER
Price (Cts)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1965 66 67 68 69 72 74 75 76 77 78
Year


LADY FINGERS
Price (Cts)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1965 66 67 68 69 72 74 75 76


RED PUMPKIN
150
140
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120
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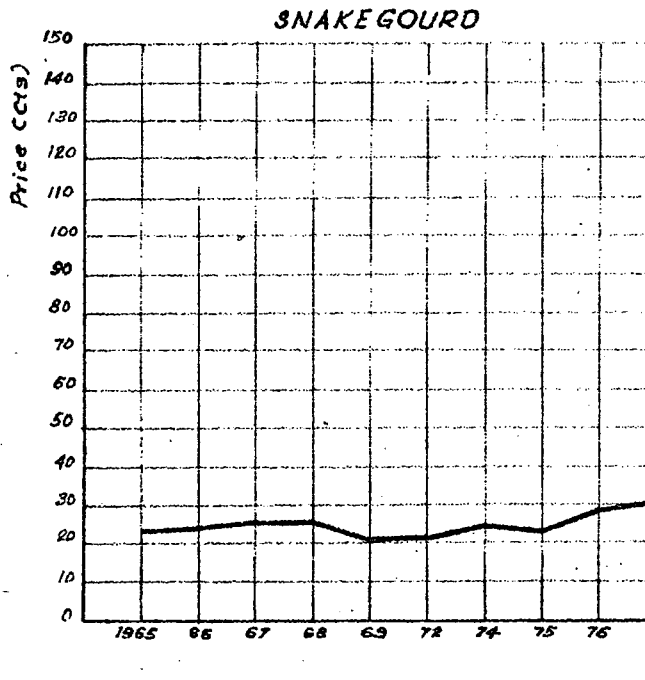
1965 66 67 68 69 72 74 75 76 77 78
Year


SNAKEGOURD
Price (Cts)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1965 66 67 68 69 72 74 75 76

Indigenous Vegetables												
6. Brinjal	.29	.23	.28	.32	.26	.21	N.A.	N.A.	.35	.33	.32	+ 10.3
7. Cucumber	.18	.19	.20	.19	.18	.17	.16	.15	.19	.18	.16	- 11
8. Lady fingers	.33	.30	.35	.36	.29	.29	.30	.28	.34	.33	.38	+ 15
9. Red Pumpkin	.14	.15	.18	.21	.11	.21	.25	.21	.33	.34	.30	+ 114
10. Snakegourd	.23	.24	.26	.26	.21	.22	.25	.23	.28	.31	.23	0

Source : Department of Marketing Development
Notes : * Prices for years 1970, 1971 and 1973 are not available

(a) Average prices from January, to September only
(b) Average Prices of green, butter and kidney beans
N.A. = Not available

Table 4 and figure 3 suggest a general increase in the prices of the majority of vegetables even after disentangling the effect of inflation. The prices of carrot, leeks, and red pumpkin show a sharper increase. But it is clear that the increase in prices is not as greater as in the case of current prices. Some vegetables-cabbage and cucumber - have shown a declining trend in real price.

It is also evident from table 4 that vegetable prices have increased due to factors other than the increases in the general price level in the economy of Sri Lanka. Our main objective is to identify and analyse these other factors.

(b) Seasonal Variation in Vegetable Prices

This section deals with the pattern of monthly[1] price variation of selected vegetables.

The price of agricultural produce tends to fluctuate according to the seasons in which such produce enter the market. This fluctuation or inst-

[1] Vegetable prices also vary weekly, daily and even within a day. But the analysis of weekly or daily prices is a difficult process when one considers a series of data for 14 years from 1965 to 1978.

ability in price is more pronounced in the case of perishables and crops which do not have a stable supply situation throughout the year. Almost every variety of vegetables has its seasonal supply whereas the demand remains relatively stable throughout the year compared to supply. Thus in months when the supply is low the price moves up and in peak periods price moves down. Being perishable in nature large supplies of vegetables come into the market in peak months, leading to severe price fluctuations in different months of the year. This causes great inconvenience to the consumers in turn resulting in undersirable variations in the income of the producers. Therefore, it is useful to identify seasonal variations in the price of each individual vegetable, so that steps could be taken to stabilize the year-round production patterns for those vegetables which have greater price fluctuations.

Tables 5 to 8/figures 4 and 5 show the monthly variation in retail prices seperately for the selected exotic and indigenous vegetables for 11 years from 1965 to 1978. (Price data for the years 1970, 1971 and 1973 were not available). All the selected exotic vegetables roughly exhibit a general pattern of monthly price variation. In general, the prices of these vegetables are relatively higher in the months of May, June, July, December, and January and are lower in the other months. However, the seasonal indices (constructed according to percentage variation from the mean price of the year) are different from one vegetable to another. The retail price index for beans reaches its peak in June (128.1) while it reaches its slack in October (81.9). The same for beetroot occur in December (135.8) and April (81.3), for cabbage in July(127.2) and February (74.8), for carrot in June (135.3) and September(74.6) and for leeks in June (127.8) and March (83.9).

As shown in table 6, the amplitude of seasonal price variation within the year is considerable. Among the selected exotic vegetables, carrot has the highest seasonal price difference which shows its greater instability with regard to supply. Beetroot also shows relatively higher amplitude of price variation compared to other vegetables. These two vegetables and leeks are grown only in a few selected areas of the country and their prices go up considerably in certain months when

the supply is limited.[1] In contrast, beans and cabbage are grown in many areas and have a fairly stable supply throughout the year. Hence, the moderate amplitude of seasonal price variation.

Table 5: Monthly Average Retail Prices* and Seasonal Price Indices of Selected Exotic Vegetables ; 1965-1978 (year average = 100)

Vegetable	Beans		Beetroot		Cabbage		Carrot		Leeks	
Price & Index Month	Price (Cts.)	Seasonal Index	Price (Cts.)	Seasonal Index	Price (Cts.)	Seasonal Index	Price (Cts.)	Seasonal Index	Price (Cts.)	Seasonal Index
January	85.2	102.4	86.2	132.0	45.4	88.2	74.3	108.3	61.5	101.3
Febryary	78.1	93.9	69.2	105.9	38.5	74.8	60.2	87.8	54.4	89.6
March	78.5	94.4	50.5	75.3	41.9	81.4	59.9	87.3	50.9	83.9
April	75.1	90.3	53.1	81.3	47.8	92.8	70.8	103.2	56.0	92.3
May	101.5	122.0	63.1	96.6	49.2	95.5	85.6	124.8	61.3	100.9
June	106.6	128.1	69.2	105.9	60.6	117.7	92.8	135.3	77.6	127.8
July	96.3	115.7	68.5	104.9	65.5	127.2	72.4	105.5	69.5	114.5
August	88.2	106.0	56.9	87.1	51.5	100.0	61.7	89.9	57.4	94.6
September	71.0	85.3	57.5	88.1	52.3	101.6	51.2	74.6	53.6	88.3
October	68.1	81.9	51.7	79.2	58.2	113.0	52.3	76.2	51.6	85.0
November	72.6	87.3	68.4	104.4	53.6	104.1	59.6	86.9	64.3	105.9
December	83.0	99.8	88.7	135.8	53.6	104.1	82.9	120.8	70.3	115.8
Year Average	83.2	100.0	65.3	100.0	51.5	100.0	68.6	100.0	60.7	100.0

* Source : Department of Marketing Development

Table 6: Amplitude of Seasonal Variation in Prices of Selected Exotic Vegetables

Vegetable	Index of Season		Difference
	Low	High	
Beans	81.9	128.1	46.2
Beetroot	81.3	135.8	54.5
Cabbage	74.8	127.2	52.4
Carrot	74.6	135.3	60.7
Leeks	83.9	127.8	43.9

[1] See also, Abeysekera and Senanayake (1974) op. cit.

Figure-4 SEASONAL VARIATION IN RETAIL PRICES OF SELECTED EXOTIC VEGETABLES DURING 1965 - 1978 (YEAR AVERAGE = 100)

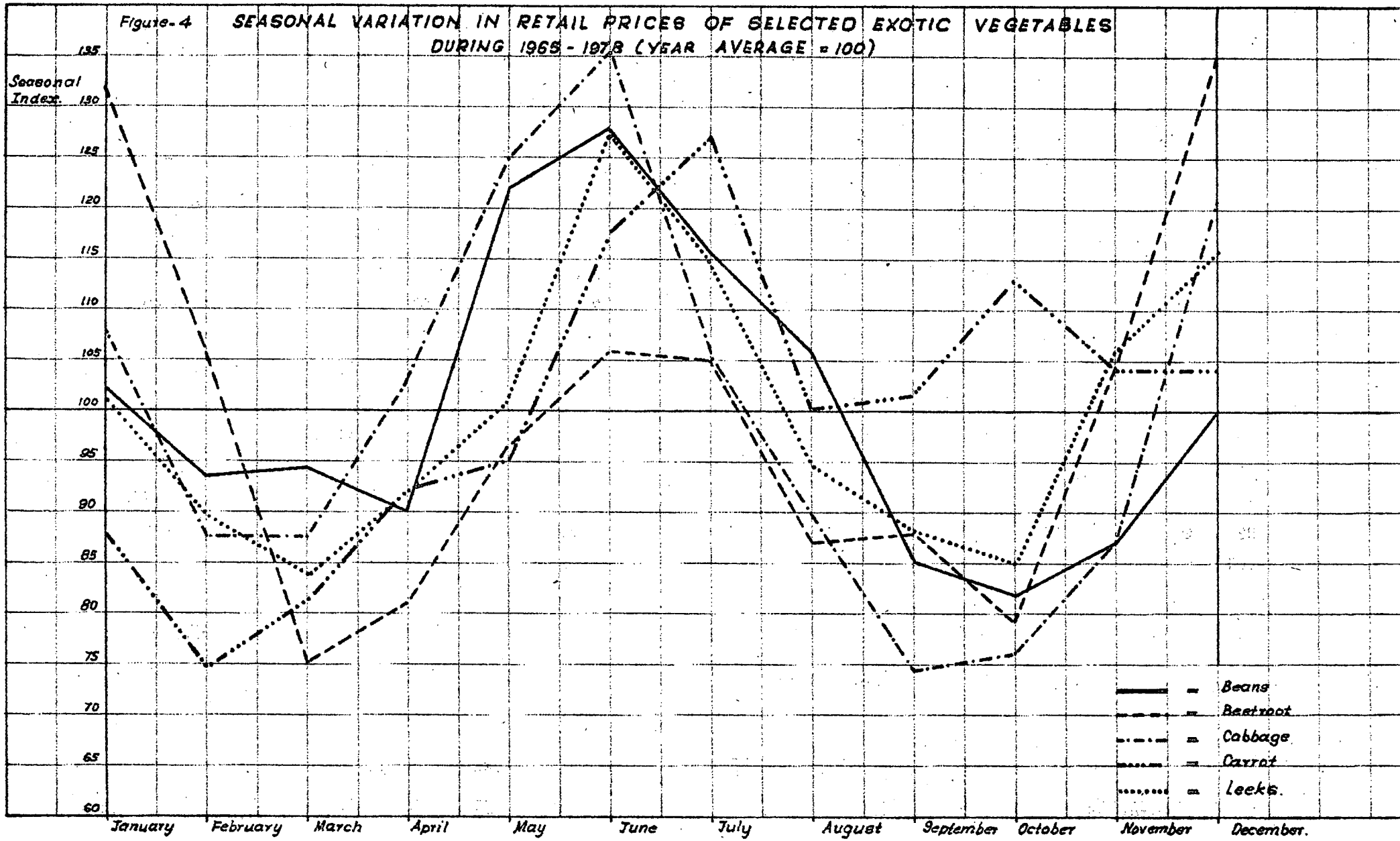


Table 7-; Monthly Average Retail Prices * and Seasonal Price Indices of Selected Indigenous Vegetables; 1965-1978

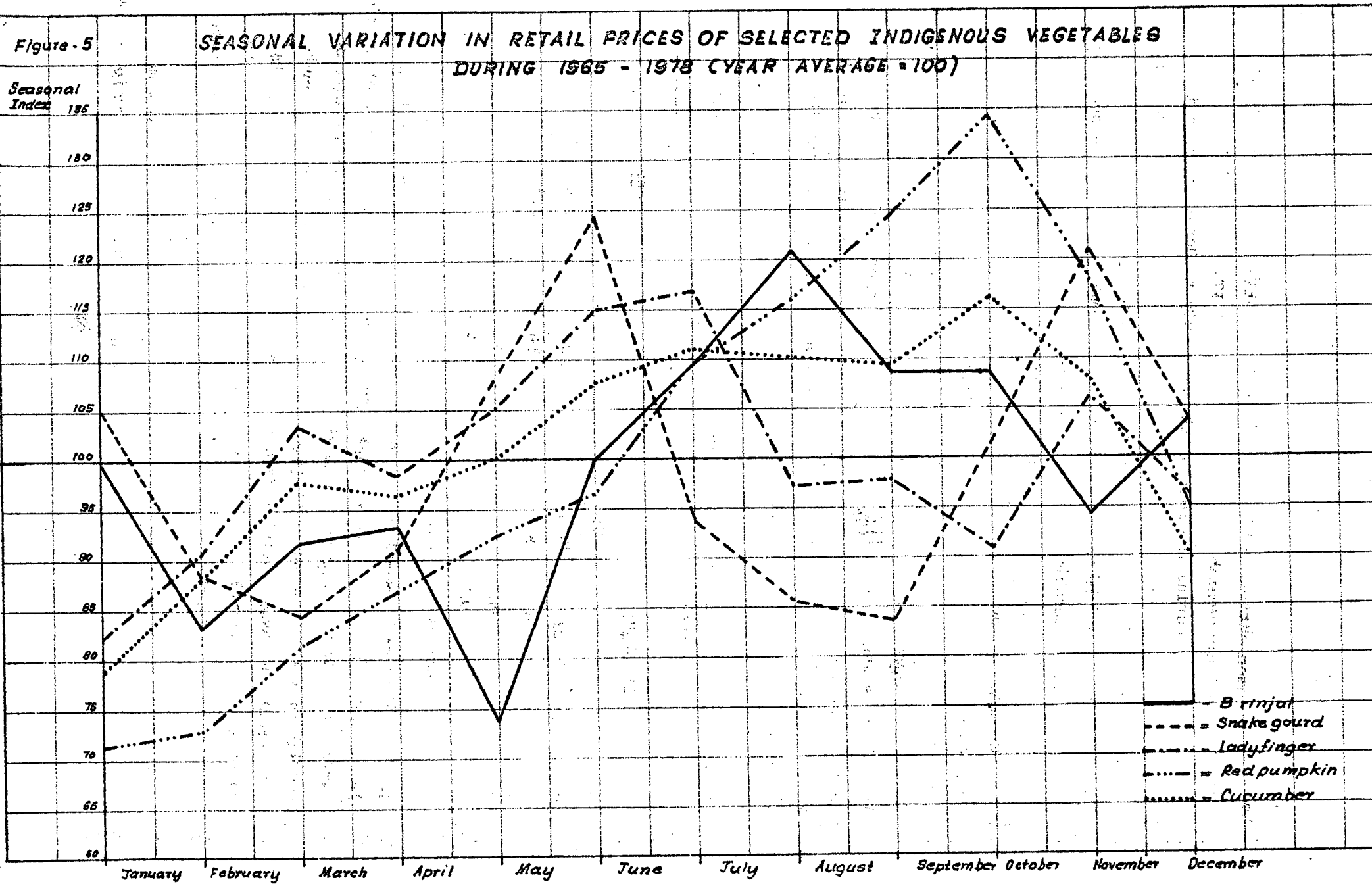
(Year Average = 100) Vegetable, Price and Index

Month	Brinjal		Cucumber		Lady fingers		Red pumpkin		Snake gourd	
	Price (Cts.)	Seasonal Index	Price (Cts.)	Seasonal Index	Price (Cts.)	Seasonal Index	Price (Cts.)	Seasonal Index	Price (Cts.)	Seasonal Index
January	47.0	99.4	21.9	78.8	41.8	82.1	26.9	71.2	41.5	105.1
February	39.3	83.1	24.5	88.1	46.1	90.6	27.5	72.8	35.0	88.6
March	43.4	91.8	27.2	97.8	52.7	103.5	30.7	81.2	37.3	94.4
April	44.2	93.4	26.8	96,4	50.1	98.4	32.9	87.0	36.0	91.1
May	34.8	73.6	27.8	100.0	53.4	104.9	34.9	92.3	42.7	108.1
June	47.3	100.0	29.9	107.6	58.6	115.1	36.5	96.6	49.0	124.1
July	51.7	109.3	30.9	111.2	59.4	116.7	41.5	109.8	37.0	93.7
August	57.2	120.9	27.4	98.6	49.5	97.2	43.8	115.9	33.8	85.6
September	51.3	108.5	30.4	109.4	49.8	97.8	47.0	124.3	33.0	83.5
October	51.3	108.5	32.3	116.2	46.3	90.9	50.8	134.4	40.1	101.5
November	44.5	94.1	30.0	107.9	54.1	106.3	44.6	117.9	47.8	121.0
December	49.3	104.2	24.9	89.6	48.4	95.1	35.9	94.9	40.9	103.5
Year Average	47.3	100.0	27.8	100.0	50.9	100.0	37.8	100.0	39.5	100.0

* Source: Department of Marketing Development

Figure - 5

SEASONAL VARIATION IN RETAIL PRICES OF SELECTED INDIGENOUS VEGETABLES DURING 1965 - 1978 (YEAR AVERAGE = 100)



There is no common pattern of seasonal price variation with regard to the selected indigenous vegetables. For example, the price of brinjal is relatively higher during the four months from July to October while it is lower during the other months whereas the price of cucumber is relatively higher during the seven months from May to November. The price of red pumpkin rises progressively from January to November. The price peaks and slacks for these vegetables are as follows:-

Brinjal : August (120.9) and May (73.6)

Cucumber: October(116.2) and January (78.8)

Lady fingers: July (116.7) and January (82.1)

Red pumpkin: November (134.4) and January (71.2)

Snake gourd: June (124.1) and September (83.5).

It is interesting to note that cucumber, lady fingers and redpumpkin have their price slacks in January which shows that the availability of these varieties in large quantities in the market at the same time contribute to the very low prices they fetch.

Table 8- Amplitude of Seasonal Variation in Prices of Selected Indigenous Vegetables.

Vegetable	Index of Season		Difference
	Low	High	
Brinjal	73.6	120.0	47.3
Cucumber	78.8	116.2	37.4
Lady fingers	82.1	116.7	34.6
Red pumpkin	71.2	134.4	63.2
Snake gourd	83.5	124.1	40.6

The amplitude of seasonal price variation of cucumber, snake gourd and lady fingers is not of a very high nature when compared with that of exotic varieties. These indigenous vegetables are grown in almost every part of the country except in the up country wet zone and have a more regular supply throughout the year. Brinjal is also grown in almost every part of the country but in certain months, the supply is very limited. All these four vegetables are long-term crops in the sense that once cultivated harvesting can be done over 6-8 months. Red pumpkin, however, exhibits a higher amplitude of seasonal price variation because of its limited supply mainly from chenas in the dry-zone and Jaffna peninsula. The peak harvesting season of this crop is limited to 5 months from December to April.

The seasonal price variations discussed above are generally consistent with the major seasons in which the supplies of each vegetable enters in the market. This pattern is of course disturbed in times when bad weather conditions or other random disturbances affect the crops.

Our main concern here is not the seasonal behaviour of prices because it is more related to ecological and climatic factors which govern the production pattern of individual vegetable varieties. This study primarily deals with economic reasons behind the upward trend in prices, recurrent high prices and price structure of vegetables.

CHAPTER 3

HYPOTHESES: IDENTIFICATION OF FACTORS INFLUENCING VEGETABLE PRICES:

The recurrent high prices and their upward trend over recent years are hypothesized, a priori to be due broadly to factors related to farm supply, marketing and consumer demand. The components of each of these factors will be briefly outlined below. These hypotheses will be tested in depth in the later chapters.

3.1 Factors Related to Farm Supply:-

The upward trend nad recurrent high prices may be a result of lower supply of vegetables and constant demand over the period under consideration. It could also be due to the fact that the total supply of vegetables remained almost static, while the demand increased at a faster rate. However, there seems to be either a shortfall or a stagnation of production of vegetables over the last decade. This could again be due to several reasons. The major reasons are indicated below.

(a) It is possible that a part of the total acreage hitherto devoted to vegetable cultivation may have been transferred for cultivation of other food crops which yield higher profits than vegetables. High Prices fetched in the market for such crops as potatoes, cowpea, chillies, green-gram, onions, maize, groundnuts etc., might have encouraged the earlier vegetable growers to shift over to these crops. Sometimes, it is probable that Chena lands in the dry-zone, where the major part of the indigenous vegetables came from, are being converted to permanent highland crop farming and paddy cultivation under irrigation development projects.

(b) The supply price of vegetables at the farm-gate may have gone up due to increases in the cost of production. The price of inputs used in vegetable cultivation such as land, labour, seed, fertilizer, chemicals, etc., has increased over the last 4-5 years leading to a hike in the cost of production.

(c) Problems connected with the availability of inputs used in vegetable production might also have acted as a disincentive for the producers to increase the farm supply of vegetables.

3.2 Factors Related to Marketing:

The high prices of vegetables may also be due to the imperfections and inefficiencies of the vegetable marketing system. Increases in marketing costs, which are exogenous to the marketing system, might also have contributed to the upward movements of vegetable prices. These explanations need further analysis. In this context, the following considerations are relevant.

(a) The vegetable marketing system, the process of price determination and pricing efficiency will be reviewed in order to ascertain whether the demand and supply process is the sole determinant of the price or there are other forces operating.

(b) There may be genuine reasons to increase the cost of marketing services such as handling, transport, packing, etc. In fact fuel prices, labour charges, prices of containers, market levies, etc., have gone up in recent years, having their effects on the retail prices of vegetables. The magnitude of the effect of each of these factors on vegetable prices, is examined

(c) The possible imperfections in primary, wholesale are retail markets whcich limit competition leading to abnormal profiteering by a few traders and firms, will also be examined. This study seeks to ascertain the causes underlying the imperfections which facilitate the price manipulation by traders.

(d) The nature, extent and effectiveness of the government intervention in vegetable marketing and their influence in pricing of vegetables will also be analysed.

(e) Of the total production of vegetables, the proportion that is used for processing and canning is negligible when compared with the quantity that enters the fresh market. These industries may be having their own effect on prices of certain varieties like tomatoes, red pumpkin and ash pumpkin, especially during periods of short-supply. The marginal nature of the effect of such industries have on market

prices of fresh vegetables precludes us from a discussion on this issue.

3.3 Factors Related To Consumer Demand:

Consumer demand for vegetables might have increased over the last decade or so, due to several reasons, In a situation of lower or static annual supply and increasing demand, the prices invariably show an upward trend over the years. The major possible factors influencing the increasing demand are listed below.

(a) Overall population increase and changes in it's structure may be one of the major factors that lead to a higher demand for vegetables.

(b) The demand for vegetables among the average consumers, might also have increased due to the fact that vegetables have been still cheaper compared with the price and the availablity of substitutes (fish , meat, dry-fish, eggs, green-gram, cowpea, dhall, etc.,)

(c) Demand also goes up with the increases in the real incomes of the consumers. Some of the earlier studies have pointed out that real income per capita has a more significant impact on the demand than price of vegetables. Moreover, it has been shown that with the increases in real per capita income, the consumers attach a higher preference to exotic vegetables over indigenous vegetable varieties.[1]

(d) With the expansion of the tourist industry in Sri Lanka, a certain proportion of such vegetables as tomatoes, cucumber, and carrot is absorbed by the tourist hotels at a higher price. But this has very little impact on the prices of vegetables as a whole.

(e) In the recent past some firms have started exporting fresh vegetables, especially to Middle East countries in quantities not large enough to make a substantial impact on vegetable prices prevailing at local markets. This may contribute to price increases

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[1] Gunawardena, P.J. (1977) Towards the Estimation of Supply and Demand Functions for Vegetables in Sri Lanka, Unpublished MA Thesis, ANU Canberra.

in months of short supply. But again, as in the case of vegetable processing and tourist industry, it too makes only a little impact on the price of vegetables as a whole.

Chapter 4 will discuss the effect of the factors related to farm supply of vegetables on their prices.

CHAPTER 4

FARM SUPPLY AND PRICE OF VEGETABLE

4.1 Background:-

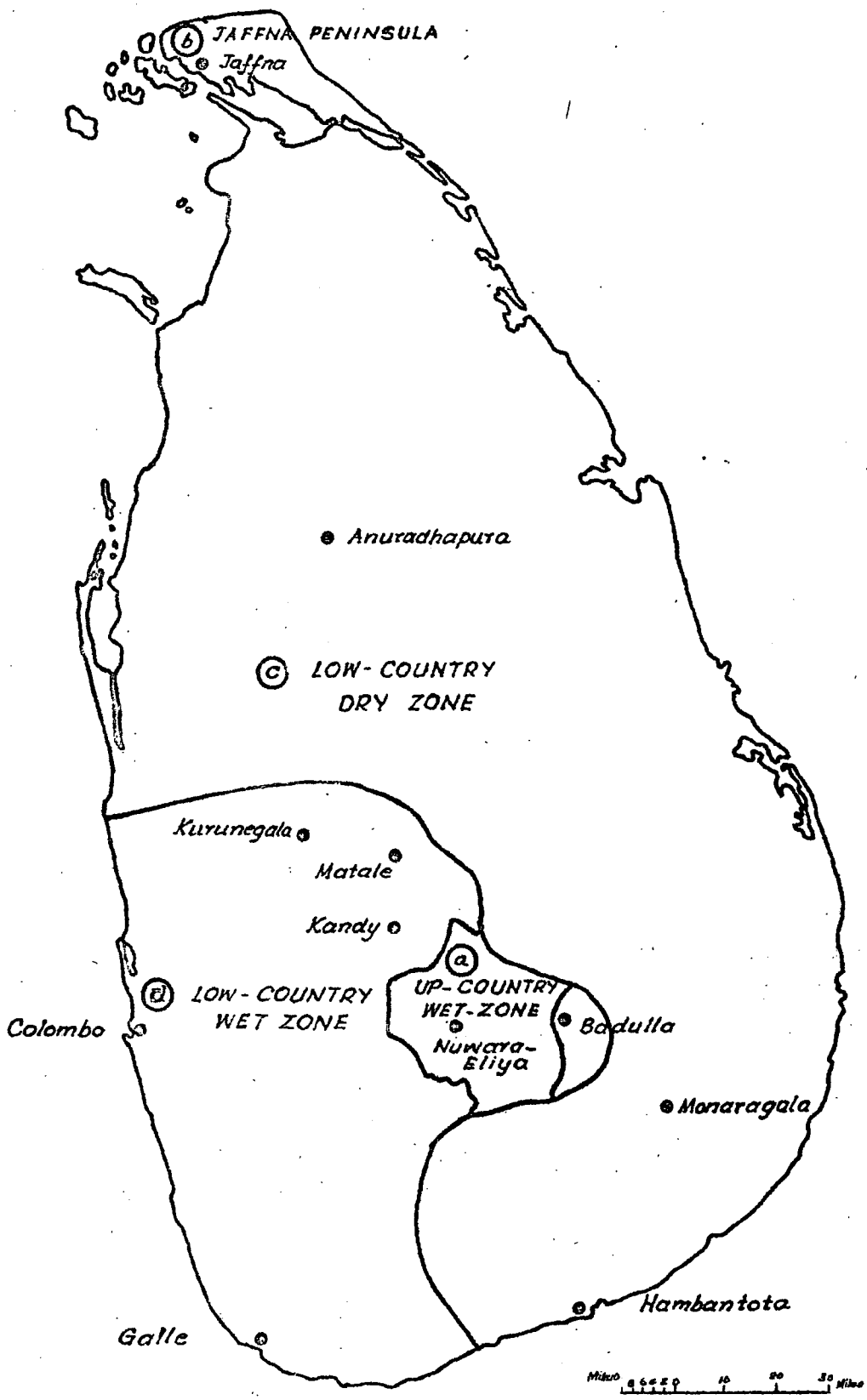
(i) Vegetable Cultivation in Sri Lanka

Sri Lanka's economy is primarily based on agriculture. The agricultural economy of the country is traditionally devided into two sectors, i.e. the plantation sector and the domestic or small farm sector. The plantation sector is concerned with the production of tea, rubber, coconut and other minor perennials for export while the domestic sector concentrates on the production of a number of food crops and livestock products mainly for consumption within the country. Rice is the major crop, while vegetables occupy the next place in the domestic food production sector.

Generally, vegetables are grown in almost every part of Sri Lanka. However, certain types of vegetables are area specific. Thus, four broad vegetable producing zones can be identified on the basis of regional variations in agro-climatic conditions. These zones are:- (a) the up-country wet zone, (b) the Jaffna peninsula, and (c) the dry zone and (d) the low-country wet zone.(See figure 6.)

It had been customary to group vegetables that are grown in Sri Lanka into two main categories, namely; (a) up-country or exotic vegetables, and (b) low-country or indigenous vegetables. Cabbage, carrot, beetroot, beans, leeks, tomatoes and raddish are exotic and brinjal, ash plantain, okra (lady fingers) cucumber and various kinds of gourds and pumpkins are indigenous. Although there was a marked difference between the areas in which these two categories of vegetables are cultivated about 10 years back, almost all vegetables are grown in all localities today. Clearly, the categorization in terms of up-country and low-country has therefore, little meaning in the present context. However, the categorization in terms of their origin (exotic and indigenous) is useful and will

Figure: 6. SRILANKA: MAJOR VEGETABLE PRODUCING ZONES.



be maintained throughout this repot.

The exotic vegetables are mainly grown in the temperate and hilly areas such as Nuwara-Eliya, Badulla, Kandy and Matale districts. Certain varieties of them are also grown in the Jaffna Peninsula and even in some dry zone districts where the soil and weather conditions are favourable. Although the exotic vegetables are grown throughout the year irrespective of Yala and Maha , a glut of production is normally experienced in the months of March, April, May, September and October (during Yala). These vegetables need intensive care and improved seeds, chemical fertilizers, agro-chemicals and even irrigation.

Mostly , the indigenous fruit vegetables are produced in the "chena"s (where shifting or slash-and-burn cultivation is practiced) in low-country dry zone, in low-country wet zone areas and in the Jaffna peninsula. These vegetables are grown for the most part in Maha which normally extends from July-August to February-March. The peak months of production are January and February. In the low-country wet zone areas the major production season is Yala which usually extends from April to August, but the quantity so produced is far smaller than that produced in chenas in the dry zone during the Maha season . Yala is the main season in Jaffna also. The season there extends from January to August. In all the zones except the dry zone, vegetables are grown in paddy fields as well as on highlands during Yala when adequate water is not available for paddy cultivation. In contrast, paddy is cultivated in paddy fields during Maha and vegetables on highlands. The Yala vegetable crop in the dry zone comes from the colonies where irrigated water supply is assured . The chena type of vegetable cultivation has special characteristics. Several varieties of vegetables are grown together with a number of cereals and millets. Land preparation is minimal and crop care such as weeding, fertilizing, etc., is almost non-existent. This is primarily because of the unpredictable nature of rainfall.

Although the indigenous leafy vegetables have a comparatively high nutritional value, only a smaller proportion of their production enters the market compared to other types of vegetables. The cultivation of these vegetables on a commercial basis is done in and around Colombo city.

However, the extent of land devoted to this cultivation is in a declining phase due to the expansion of the city.

Indigenous root vegetables consist of manioc, sweet potatoes and a number of other local yam varieties. These are mostly grown in the dry zone and in the low country wet zone areas. There are no seasonal differences in the cultivation of these vegetables. In the present context, these are consumed only as a secondary food item with rice while in the recent past these were consumed (mainly by rural people) as a major substitute for rice.

(ii) The Government Policy Regarding Vegetable Production:-

In the annual crop production programmes (Agricultural Implementation Programmes) of the government of Sri Lanka considerable emphasis is placed on raising the production levels of vegetables for realising the ultimate objective of increasing the consumption levels of vegetables.

Many policy measures have been recommended in the Agricultural plans and Development Proposals prepared by the Ministry of Agriculture and Food as far back as 1958. In 1958, the government had recognised the significance of zoning of vegetable cultivation as follows:-

> "....In the course of investigation, it was considered whether the cultivation of vegetables ..... should be zoned in different parts of the country on the basis of suitability of the soil and the particular climatic conditions of the area....It would be worthwhile if a scientific survey is carried out on the soil and climatic conditions for different varieties of vegetables....to ascertain the best possible variety that could be grown in a particular zone...."[1]

The 1958 Agricultural Plan also proposed planing production through the establishment of state-owned farms and collective and co-operative organisations, encouraging orderly marketing and stabilization of prices. The significance of the provision of finance, improved inputs, transport and storage facilities, better

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[1] Ministry of Agriculture and Food, 1958, Agricultural Plan, First Report of the Ministry Planning Committee, pp 229-242.

methods of grading and packing, market information and research has also been recognised in this plan.

In subsequent years, the successive governments concentrated more on the policies designed to increase the total production of vegetables without increasing the area under cultivation. This has been recorded as follows:-

"...The problem of development of production is not to increase the area under cultivation, but to stabilize the existing areas of production, to change the pattern of production to ensure a better balance in the supply of different types of vegetables through the year....improvements in levels of production to meet increasing demand can be affected on these existing areas by the introduction of modern techniques of vegetable production and by improving the facilities now available to the vegetable cultivators....." [1]

The views expressed above are justifiable as there is less hope for the expansion of area under cultivation due to the worsening land/man ratio in the country.

The Draft Agricultural Development Plan of 1971 - 77 of the Ministry of Agriculture (Vol. 4) has also made proposals to develop vegetable production. The major proposals are:-

(a) not to expand the acreage under vegetable cultivation;

(b) to prevent on farm wastage of produce;

(c) to improve the quality of the produce by introducting better methods of cultivation and providing quality seed; and encouraging the producers to harvest the crop at correct time, and;

(d) to take steps to encourage off-season cultivation of vegetables.

All the Agricultural Plans mentioned above and the Agricultural Sector

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[1] Ministry of Agriculture and Food, Agricultural Development Proposals, 1966-70, pp. 243-259

Plan prepared in 1977 emphasize the significance not only of planning the production but also of the improvement of input and product marketing, extension and research-services.

Marketing and distribution of inputs in vegetable cultivation is handled by the goverment through the Department of Agriculture, the Department of Agrarian Services and the co-operatives. The government's intervention in the marketing of vegetables is through its Department of Marketing Development.[1]

Extension services for vegetable cultivation are handled mainly by the officials of the Department of Agriculture. Technical research into vegetable production has been mainly undertaken by the following government sponsored research stations:-

1)	Up country wet zone	- Sitha-eliya
2)	Mid country wet zone	- Peradeniya, Katugastota
3)	Low country wet zone	- Walpita
4)	Dry zone	- Mahailluppallama

In sum, it is apparent that the government policy regarding vegetable procudtion has been designed towards increasing the volume and quality of the produce by introducing new methods of cultivation and the provision of improved seeds and other related inputs while encouraging the acreage under cultivation to be kept stable as far as possible. In the achievement of this objective, the role of the government can be defined as providing better and adequate marketing, extension and research facilities.

4.2 Trends in Acreage and Production of Vegetables;

The difficulty in getting complete time series data on the overall acreage and production aspects of all the vegetables has confined our analysis to 10 vegetables selected to represent the important varieties grown and consumed in the country.

In analysing the trends in acreage and production, both simple linear and quadratic regressions were tried but the latter was found to be

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[1] Aspects of government intervention in vegetable marketing will be discussed in detail in Chapter 5.

unsuitable in terms of statistical performance. Thus, the mathematical model used in analysis is as follows:-

$$Y = a + bt + e$$

where,

Y = Acreage or Production

t = time trend

e = error term

a = constant

b = coefficient to be estimated

4.2.1 Trend in Acreage:

The estimated acreage trend equations are given in table 9. Of the the ten vegetables, beans, carrot, leeks and brinjal show a marked increase in acreage. Although beetroot and red pumpkin have positive trend coefficients they are not statistically significant. Cabbage, cucumber, lady fingers, and snake gourd have negative but non-significent trend coefficients, It can be said that the acreage devoted to these vegetables have stagnated throughout the period under consideration. It is interesting to note that only one of the indigenous vegetables shows a marked increase in its acreage.

The change in quantity produced is more important here because the aim of government policy had been to keep the acreage as stable as possible with increased production through higher productivity.

Table 9-: Estimated Linear Trend Equations for the Total Acreage of 10 selected vegetables (1962/63-1976/77, No: of observations = 15)

Vegetable	Constant	Annual trend coefficient b	R^2
Exotic			
1. Beans	7441.07	276.94* (3.621)	0.50
2. Beetroot	1926.43	83.99 (1.407)	0.13
3. Cabbage	7366.35	-122.02 (1,194)	0.10
4. Carrot	899.67	43.2 * (3.317)	0.46
5. Leeks	622.12	44.98 ** (2.6)	0.34

	Indigenous:			
6.	Brinjal	22318.06	640.64*** (2.158)	0.26
7.	Cucumber	7174.09	-81.004 (1.079)	0.08
8.	Lady fingers	19544.75	-154.91 (0.853)	0.05
9.	Red pumpkin	15562.56	190.08 (0.682)	0.03
10.	Snake gourd	9180.01	-89.82 (0.884)	0.06

Notes: Source of data : Department of Census and Statistics
Figures in parantheses are absolute t values.
* Significant at 0.5 percent level
** Significant at 1 percent level
*** Significant at 2.5 percent level

Table 10-: Estimated Linear Trend Equations for the Total Production of 10 Selected vegetables (1962/63-1976/77No: of observations - 15)

	Vegetable	Constant	Annual Trend Coefficient b	R^2
	Exotic			
1.	Beans	15162514.62	514968.41 (1.71)	0.18
2.	Beetroot	5626790.52	266867.22 (1.205)	0.10
3.	Cabbage	35423101.32	-557580.21 (0.461)	0.02
4.	Carrot	4395504.22	-12779.14 (0.091)	0.006
5.	Leeks	-123904.44	971752.37* (3.556)	0.49
	Indigenous:			
6.	Brinjal	42577830.51	1035027.46 (0.507)	0.019
7.	Cucumber	23992546.31	-658011.49 (0.376)	0.01
8.	Lady fingers	55370094.27	2955805.11 (1.124)	0.09
9.	Red pumpkin	36812272.41	1459167.56 (0.849)	0.05
10.	Snake gourd	3829689.11	-1616978.45 (0.858)	0.05

Continued...

Notes: Source of data; Department of Census and Statistics. Figures in parantheses are absolute t values.

* Significant at 0.5 percent level

4.2.2 Trend in Production:

As shown in table 10, total production of selected vegetables does not show a significant trend in any direction, except in the cases of leeks. The production of leeks shows a significant increasing trend over the period under consideration. This may be due to the shortage and high price of red-onions in the recent past which gave the opportunity for the vegetable cultivators to grow more leeks, a near substitute for red-onions, especially in up-country wet zone districts. This itself might have affected adversely the production of other up country exotic vegetables such as cabbage and beetroot.

4.3 Why the Acreage and the Production of Vegetables Have Not Increased Significantly?

Trends in acreage and production are in fact dependent upon the price responsiveness of the vegetable growers. It has been found in earlier studies that the vegetable cultivators in Sri Lanka respond positively to increases in prices [1]. But, despite increasing demand and retail prices of vegetables, the acreage and the production of most of them have not increased significantly. This suggests the effect of several factors other than the nature of producer's supply response itself. We identified four broad factors affecting this situation. These are (a), competition from subsidiary food crops and certain other crops, (b) effects of dryzone irrigation settlement projects, (c) problems of the expansion of vegetable production and (d) inability of farmers to get their fair share of the retail price. The rest of this chapter is devoted to a discussion of the first three aspects while the fourth aspect in analysed in chapter 5.

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[1] For example, see : Gunawardena (1977), op.cit.

4,3,1 Competition From Other Crops[1]

The import substitution policy of the government as related to subsidiary food items such as potatoes, dhal, chillies and onions has been in force from about 1968. These items fetched higher prices and farmers being price responsive, started cultivating these crops locally, (except masoor dhal) and found them much more profitable than hitherto grown vegetables or other crops. There were several other traditional crops which were also fetching good prices, such maize, groundnuts etc. Many of these crops had guaranteed prices but often the market prices were very much higher. Due to these factors, until about 1978 when some of the import restrictions were relaxed, the acreage and production of almost all these subsidiary food crops expanded rapidly.

The estimated trend equations show that the acreage of potatoes, cowpea, greengram, chillies, red onions, groundnuts, kurakkan and maize exhibit a highly significant positive trend. The total quantities produced of these crops also, except in the case of kurakkan and maize which are traditional chena crops, have shown a significantly increasing trend over the period under consideration .(See table 11 and 12)

Table 11-: Estimated Linear Trend Equations for the Total Acreage of 8 selected subsidiary Food Crops.(1962/63-1976/77 No: of observations = 15)

Crop	Constant	Annual Trend Coefficient b	R^2
1. Potatoes	1468.46	597.41+ (7.079)	0,79
2. Cowpea	5714.28	1190.72+ (4.521)	0.61
3. Green gram	6589.98	1391.12* (3.439)	0.48
4. Chillies	20909.3	7359.39+ (7.786)	0,82
5. Red onions	12192.9	838.84+ (10.096)	0.89
6. Groundnuts	3793.48	1580.38+ (11.566)	0,91
7. Kurakkan	46652,44	2777.40** (2.658)	0.35
8. Maize	18847.58	4942.49+ (7.603)	0.82

Notes: Sources of data; Dept; of Census and Statistics. Figrues in parantheses are absolute t values
+ Significant at 0.1 percent level
* Significant at 0.5 percent level
** Significant at 1 percent level

[1] Paddy is excluded

Table 12: Estimated Linear Trend Equations for the Total Production of 8 Selected Subsidiary Food Crops (1962/63 - 1976/77; No. of observations = 15)

Crop	Constant	Annual Trend Coefficient b	R^2
1. Potaotes	91668.66	42145.15+ (5.953)	0.73
2. Cowpea	40169.89	11593.48* (3.017)	0.41
3. Green gram	38204.87	15734.34* (3.335)	0.46
4. Chillies	332634.28	33042.66+ (4.362)	0.59
5. Red-onions	530516.69	42110.03+ (8.116)	0.84
6. Ground nuts	95861.8	19559.06+ (8.017)	0.83
7. Kurakkan	598730.83	13833.61 (1.859)	0.21
8. Maize	503905.21	48585.82 (0.816)	0.05

Notes : Source of data : Department of Census and Statistics
Figures in parantheses are absolute t values.
+ Significant at 0.1 percent level
* Significant at 0.5 percent level

Apart from incentives given to the subsidiary food crops mentioned above in terms of guaranteed price etc., government credit facilities have also been extended largely to this sector. In the process, the vegetable subsector has received low priority. As shown in table 13, chillies red-onions and potatoes have received more than 90 percent of credit granted to the subsidiary food crop sector under the New Agricultural Credit scheme. Even when these three crops were getting increasing amounts of credit up to 1973/74 crop year, vegetables have received decreasing creidt facilities. After that year, total amount granted decreased for all crops and vegetables received less than 1 percent of the total amount of credit granted.

The low priority accorded to the vegetable sector in the governemnt credit schemes paves the way for the private lending sources to dominate with low prices accuring to the producers and less accent on the part of the government in marketing of vegetables. Low producer prices inturn act as a barrier to the expansion of vegetable production.

Table 13-: Loans Granted for Subsidiary Food Crops Under New Agricultural Credit scheme; 1967/68 - 1976/77.

Amount granted Rupees Hundred.

Year	Crop						
	Chillies	Red-onions	Potaotes	Vegetables		Other(1)	Total
				Amount	% of total		
1967/68	19483	19798	11452	4138	8.8	-	54871
1968/69	20596	24679	15066	4347	6.7	-	64688
1969/70	23592	30120	18360	3422	4.5	56	75550
1970/71	12025	16038	22428	1370	2.6	74	51935
1971/72	20179	29350	42339	2508	2.7	30	94406
1972/73	36546	19073	44062	1407	1.4	110	101198
1973/74	61818	30703	28228	1122	0.9	1288	123159
1974/75	6570	5920	5951	325	1.7	154	18920
1975/76	2681	2686	5310	89	0.8	-	19766
1976/77*	1212	715	1320	29	0.9	53	3329

(1) Include : Groundnuts, maize, B-onions etc.,

* Incomplete data

Source: Central Bank of Ceylon, Annual Report - 1978

At the national level, we saw the expansion of other food crops which compete with the acreage devoted to vegetable cultivation in Sri Lanka. Available evidence at local level proves that the expansion of these crops has led to the acreage devoted to vegetable cultivation being decreased.

Amoung the other crops mentioned above, potatoes are now cultivated in up country wet zone districts and in the Jaffna Peninsula. For example, in Badulla district, there were only paddy and traditional up-country vegetables before potatoes were introduced around 1968. Potaotes were cultivated on new lands and it did not affect the acreage devoted to vegetables . Vegetable growers, nevertheless, prefer potatoes because they are more convenient than vegetables in view of minimal crop care and also more profitable although the total cost of production per acre is relatively high. Potatoes are a relatively short-term crop whose harvest yields a/money lump sum of at once, unlike vegetables. Therefore, farmers have increased the acreage of potatoes while keeping the acreage devoted to traditional vegetables as stable as possible.

In Keeppetipola area, about 80 percent of the paddy fields in Yala are cultivated with potatoes. Almost every farmer cultivates potatoes at least once in three seasons in this area. At present, tobacco also competes with vegetables for land in this area. However, some individual farmers in the Vidurupola village of the same area have already shifted over to potatoes exclusively, due to the unremunerative prices they get for other vegetables. Some intend to grow sugar-beets instead of vegetables in the future. In fact all the farmers interviewed for the cost of production survey had cultivated potatoes as their major crop in Yala 1978. This evidence substantiates the fact that farmers in this area would grow vegetables only if the prices are remunerative. If not, they would understandably shift over to more profitable crops.

In Marassana area, though maize had been a popular crop which once competed with vegetables, now it is almost non-existent due to the non-availability of marketing outlets. Now, the major competitor for vegetables in this area is the expanding tobacco cultivation. The Ceylon Tobacco Company provides the growers with facilities to buy necessary inputs and for the processing of tobacco. This crop has been a threat, especially to the Maha vegetable crop on highlands. Some individual farmers in Meeruppa, however, expressed fears that a low price of tobacco again will lead every farmer to cultivate vegetables resulting in a glut and poor prices.

In the dry zone areas, farmers' preference to such crops as chillies, red onions, maize, groundnuts, cowpea, blackgram, tobacco etc., had certainly led to a reduction of the vegetable acreage in chenas during Maha seasons,[1] especially in the years from about 1974, Chena type of vegetables collected by the Marketing Department in the last 4 - 5 years show a dramatic decrease . This partly explains the fact that the acreage of such vegetables as red pumpkin and cucumber have not been expanded.

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1 This has been further supported by a recent study of the ARTI(1979)which states that " the shift towards cash crops such as chillies, cowpea, tobacco, and black gram in chena had replaced the conventional chena crops, pumpkin, cucumber, okra, etc.;" p.38

Competition for land devoted to vegetables from other crops such as chillies, red-onions, potatoes, banana and tobacco is higher in the Jaffna district than any where else in the country.

4.3.2. Effects of Dry Zone Irrigation Settlement Projects:

The dry zone irrigation settlement projects aim at stabilized farming systems, and a considerable part of chena land would come under these settlement schemes. In both immediate pre-settlement and post-settlement stages, a shortage of chena type of vegetables has to be anticipated. For example, in the Tambuttegama area, the Mahaweli officials have discouraged the farmers from growing vegetables in the chena lands anticipating a take over of such lands for redistribution. But the land had not been taken over even at the end of February, 1979. Some farmers had cultivated vegetables on the lands neglecting the orders of the officials while the majority obeyed the orders and let the lands lie fallow. After the Mahaweli project is implemented, each settler will be given ½ acre of highland to be used as homesteads, in addition to 2½ acres of irrigable land. Clearly, ½ acre is not sufficient to grow highland crops and the farmers would invariably grow paddy on lands which are under assured water supply. The farmers, who are used to extensive cultivation under chena conditions would not like to grow vegetables intensively on these 3 acres of land. Irrigated vegetable farming would be unprofitable compared to paddy or chillies. Moreover, unless and untill many other problems related to production and marketing of vegetables, not only in irrigation settlement schemes but generally in all areas of the country are solved, it is doubtful whether a substantial number of farmers would resort to vegetable cultivation even as a minor occupation. This aspect needs thorough investigation since the Mahaweli project intends to encourage the settlers to grow vegetables, pulses and other subsidiary food crops during Yala season because the reddish brown earth is unsuitable for growing paddy during that season in view of the higher cost of irrigation.

The project is still under way and we are unable to make a complete evaluation of this aspect. However, the Agrarian Research and Training Institute recently undertook a survey in Galnewa region (H_1 and part of H_2) where the project had already been implemented, to investigate why the settlers did not substantially cultivate vegetables and other subsidiary

food crops[1]. Some of the major findings of this survey are worth mentioning here to understand the issues related to the expansion of vegetable cultivation in the dry zone irrigation settlements.

There were 3996 allotments in the Galnewa region of which 929 consisted of reddish brown earth which were meant to be cultivated with subsidiary food crops. But during Yala 1978, only 11 allotments were used to cultivate exclusively subsidiary food crops including vegetables. 689 allotments had been left fallow due to difficulties in cultivation. Some cultivator-settlers on these allotments came from surrounding purana villages and were not used to intensive cultivation of subsidiary crops.

The above mentioned survey later selected a sample of 129 settlers to investigate the pronlem in detail.

Table 14-: Average Acreages Cultivated With Different Crops by the Sample Households. (Galnewa Region, Yala - 1978)

Crop	Average Acreage
Paddy	1.92
Chillies	1.2
Perennials	.15
Unclassified crops	.25
Cowpea	.09
Vegetables	.06

Source : Wijeratne and Wanasinghe; Preliminary data

Table 14 shows the low priority given to vegetables by the settlers in the Galnewa region for reasons given below.

Only 46 percent of the sample settlers were of the view that vegetables grew well on there allotments while 24 percent state that the allotments were not suitable for vegetable cultivation at all.

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1 Wijeratne, C.M. and Wanasinghe, A., Factors Influencing the Cultivation of Subsidiary Food Crops in the Mahaweli Area, ARTI. (Forthcoming)

72 out of 129 sample settlers reported various problems which they presently encounter in the cultivation of subsidiary food crops including vegetables (Table 15).

Table 15-: Problems in the Cultivation of Subsidiary Food Crops Including Vegetables. Reported by 72 Settlers in the Galnewa Region, Yala, 1978.

Problem	No: reported	% of the reported
1. Lack of marketing outlets	17	23.6
2. Uncertainty with regard to price	6	8.3
3. Lack of water	13	18.1
4. Lack of finance	7	9.7
5. Difficulties in buying agro-chemicals and fertilizer	8	11.1
6. Shortage of labour	9	12.5
7. Non availability of tractors and sparyers at the required time	4	5.6
8. Losses due to theft	8	11.1
Total	72	100

Source:- Wijeratne and Wanasinghe, preliminary data.

As shown in table 15, the uncertainty with regard to marketing facilities was the most important constraint for settlers to hesitiate in growing subsidiary food crops. Even if the marketing facilities are available, farmers would resort to these crops only if the other related problems are solved.

These findings are useful in designing future policies with regard to the programmes for the expansion of subsidiary food crops in the dry zone irrigation settlements.

4.3.3 Problems in the Expansion of Vegetable Production

The most important problems encountered by the vegetable growers are the small size of land holdings, high land rent, high labour charges shortage of labour, high prices and the non-availability of material inputs such as seed, fertilizer, agro-chemicals and equipment at the correct time, lack of finance, lack of marketing outlets in main harvest-

ing seasons, severe fluctuations in price and low producer prices. High prices of land, labour and material inputs have resulted in higher production costs. The cost of production is analysed in more detail in section 4.4.

Problems relating to marketing and price are discussed in chapter 5 in detail. The following sections are devoted to a discussion of the problems connected with the major factors of production, i.e. land, labour, material inputs and other equipments.

(i) Size of Land Holdings and Land Rent

The market-oriented vegetable production in Sri Lanka is carried out mostly on small land holdings. However, there are a few exceptions where it is undertaken on relatively large farms. But the quantity of vegetables produced on such large farms is small compared to that produced on the scattered small holdings throughout the country.

According to a survey conducted by the Department of Agrarian Services in 1964 in Nuwara-eliya district, the average size of a vegetable farm varied form 1 to 10 acres.[1]

Department of Census and Statistics (1968) found that the average size of a vegetable farm was less than an acre in Kandy and Badulla districts.[2] Abeysekera and Senanayake (1974) discovered that the average size of a vegetable farm varied from 1.4 to 3.6 acres, in 4 villages in the Welimada area in Badulla district.[3]

The present survey revealed that the average land area under different vegetables shows a wide variation in different localities and in different seasons (Table -16, 17, 18). The total average extent cultivated with all

1 Department of Agrarian Services (1964) Proceedings of A Ceylon National Training Centre on Agricultural Marketing, Colombo.

2 Department of Census and Statistice (1968) Survey of Vegetable Production , Kandy and Badulla Districts; Yala 1966 and Maha 1966/67.

3 Abeysekera and Senanayake (1974), op, cit.

vegetables varied from 0.23 acres in Madduvil-Kaithady and Uduvil-Keerimalai (Jaffna) to 0.92 acres in Lunuwewa (Anuradhapura).

Table 16-: Average Land Area Under Different Vegetables Cultivated in Maha 1977/78 (extent in acres)

Locality / Vegetable	Vidurupola	Boragas	Uduvil-Keerimalai (Jaffna)
Beans	0.41	0.53	0.33
Cabbage	0.22	0.52	0.21
Knolkhol	0.19	-	-
Raddish	0.17	-	-
Carrot	-	0.45	0.13
Leeks	-	0.25	-
Beetroot	-	-	0.32
Capsicum chillies	-	-	0.25
Tomatoes	-	-	0.23
Brinjal	-	-	0.27
Lady fingers	-	-	0.38
Long beans	-	-	0.13
Bitter gourd	-	-	0.03
Snake gourd	-	-	0.06
Red pumpkin	-	-	0.37
Total average extent for all vegetables (acres)	0.25	0.44	0.23

In no locality of our survey the total average land extent (for all vegetables) exceeded 1 acre. However, there were a few exceptions with regard to individual vegetables such as brinjal and tomatoes in the villages of Ikiriwewa and Lunuwewa (Anuradhapura).

In all the wet zone areas and in the Jaffna peninsuala small parcels of land are intensively cultivated. In Anuradhapura on the other hand, chena land was still available for cultivation even during Maha 1978/79. This will no longer be possible with the implementation of the Mahaweli Project.

In the wet zone areas the population pressure on land is very high and the cultivation of vegetables had been carried out on minute land holdings since early times. It is certain that further fragmentation is already shrinking the average farm size.

Table -17 Average Land Area under Different vegetables Cultivated in Yala 1978 (extent in acres)

Locality	Vidurupola	Boragas	Hewavissa	Meeruppa	Ikiriwewa	Lunuwewa	Uduvil-Keerimalai	Maddu-vil-Kaithady
Vegetable								
Beans	0.59	0.28	0.43	0.57	-	-	-	-
Cabbage	0.21	0.38	-	0.62	-	-	-	0.13
Knolkhol	0.13	-	-	0.25	-	-	-	-
Raddish	0.19	0.50	-	-	-	-	-	-
Carrot	-	0.65	-	-	-	-	-	-
Leeks	-	0.13	-	-	-	-	-	-
Beetroot	-	-	-	-	-	-	0.26	0.42
Capsicum chillies	-	-	-	0.75	-	-	-	-
Tomatoes	-	-	0.42	0.58	-	1,5	-	0.25
Brinjal	0.13	-	-	-	1.39	1.0	0.37	0.30
Lady fingers	-	-	-	0.50	0.13	-	-	0.13
Long beans	-	-	-	0.50	0.50	-	0.25	0.13
Bitter gourd	-	-	0.46	0.57	-	-	-	0.25
Snake gourd	-	-	0.51	0.63	-	0.25	-	0.13
Red pumpkin	-	-	-	-	0.13	-	-	0.30
Luffa	-	-	-	-	0.13	-	-	-
Mixed vegetables	-	-	0.47	-	-	-	-	-
Total average extent for all vegetables. (acres)	0.25	0.39	0.46	0.55	0.46	0.92	0.29	0.23

Almost all the farmers interviewed were prepared to expand vegetable cultivation but they were constrained by non-availability and high price of land in the first place. Many vegetable growers in Vidurupola, Boragas, Hewavissa and Meeruppa villages had rented-in or leased-in land for vegetable cultivation under various terms. Some had to pay ½ of the harvest while others pay a considerable amount of money per acre of land. Still some others, especially in Boragas, Ikiriwewa and Lunuwewa had encroached on crown lands.

Table -18: Average Land Area under Different Vegetables Cultivated in Maha 1978/79 (extent in acres)

Locality / Vegetable	Hewavissa	Meeruppa	Lunuwewa
Beans	0.65	0.36	-
Tomatoes	0.80	0.66	0.63
Raddish	0.25	-	-
Capsicum chillies	0.19	0.46	-
Brinjal	-	0.50	1.95
Snake gourd	0.27	0.75	-
Bitter gourd	0.31	0.55	-
Long beans	-	-	0.13
Mixed vegetables	0.80	-	0.33
Total average extent for all vegetables (acres)	0.47	0.55	0.76

Table -19: Average Land Rent Reported by the Producers: (Rs.per season)

Locality	Paddy land	High land
1.Vidurupola (yala 1978)	-	125.00
2.Hewavissa (Maha 1978/79)	500.00	750.00
3.Meeruppa (Maha 1978/79)	400.00	500.00
4.Jaffna (Yala 1978)	-	1200.00

Under the share cropping system, the crop share that goes to the landlord is substantial. The remaining share with the real cultivator has to be priced to cover all costs including a reasonable profit margin. Thus, the share cropping system also contributes to increased production costs . The majority of share croppers cannot compete with owner cultivators as far as average cost is concerned. The encroachers have difficulties in getting cultivation loans from the banks or co-operatives and other inputs from institutional sources. Thus, adverse land tenure conditions also impede the expansion of vegetable cultivation.

(ii) Availability and Price of Labour

Almost all the vegetable cultivators interviewed had employed hired labour during Maha 1977/78, Yala 1978 and Maha 1978/79, irrespective of the size of their land holdings. Most of them reported problems with regard to finding the labourers at required times and high wage rates.

Table 20: Number of Vegetable Cultivators Reporting Problems About Getting Hired Labour

Locality	Vidurupola		Boragas		Hewavissa		Meeruppa		Lunuwewa		Uduvil-Keerimalai	
Problem	No:	%	No:	%	No:	%	No:	%	No:	%	No:	%
1. Difficult to obtain when necessary	19	95.0	11	61.1	15	75.0	17	85.0	5	27.8	7	26.9
2. High wage rates	13	65.0	0	0.0	7	35.0	0	0.0	4	22.2	23	88.5
Total * No: reported problems	32		11		22		17		9		30	

* Total number reported does not add up to the number in the sample because the cultivators gave multiple responses.

Percentages refer to those of the total number of cultivatiors interviewed.

Table 21-: Average Labour Charges Reported by the Producers (Rs. per day)

	Maha 77/78		Yala 78		Maha 78/79	
Locality	Males	Females	Males	Females	Males	Females
1. Vidurupola	7.00	4.00	10.00	5.00	-	-
2. Boragas	8.00	4.00	10.00	5.00	-	-
3. Hevavissa	-	-	7.00	4.00	8.00	6.00
4. Meeruppa	-	-	6.00	4.00	8.00	6.00
5. Ikiriwewa	-	-	-	-	12.00	10.00
6. Lunuwewa	-	-	-	-	12.00	10.00
7. Jaffna	-	-	10.00	5.00	-	-

As shown in table 21, wages payable to the hired labourers have risen considerably, even from Maha 1977/78 to Maha 1978/79 in all the localities concerned. Table 21 shows only the wages with meals. In providing food and victuals to the labourers, a considerable amount of money is involved .When the farmers complained that wages were high, it implied that the expenses on food provided to the labourers were also high.

(iii) Availability and Price of Vegetable Seeds

Although many vegetable cultivators produce their own seed requirements of many indigenous vegetable varieties, they have to purchase exotic vegetable seeds. Certain farmers, buy even the indigenous vegetable seeds . A common complaint was that the cultivators have to purchase seeds from private traders at higher prices since the seed requirements are not timely met by the institutional sources such as the co-operative and Agricultural Service Centre. Another major complaint was that seeds supplied by the institutional sources as well as by the private traders are of poor germinating quality. The number of farmers reporting seed problems is given in table 22.

Table 22-: Number of Vegetable Cultivators Reporting Problems About Getting Seeds:

Locality	Vidurupola		Hewavissa		Meeruppa		Uduvil-Keerimalai	
Problems	No:	%	No:	%	No:	%	No:	%
1. Difficult to obtain when necessary	15	75.0	13	65.0	0	0.0	14	53.8
2. High price	4	20.0	2	10.0	13	65.0	0	0.0
3. Poor germinating capacity	10	50.0	3	15.0	5	25.0	16	61.5
Total* No: reported problems	29		18		18		30	

* Total number does not add up to the number in the sample because the cltivators gave multiple responses.

Percentages refer to those of the total number of cultivators interviewed.

An examination of the price of seed prevailing in the study localities shows that prices have gone up considerably even from Maha 1977/78 to Maha 1978/79 (within one year). Table 23 presents data on price of seeds prevailing in study localities in three cultivation seasons.

Table 23-: Average Seed Prices Reported by the Producers (Rs.per unit)

Locality	Crop	Unit	Maha 1977/78	Yala 1978	Maha 1978/79
1. Vidurupola	Cabbage	1 oz.	38.00	42.50	-
	Beans	1 measure	30.00	35.00	-
	Raddish	1 lb.	48.00	85.00	
	Knolkhol	1 oz.	2.25	4.50	
2. Boragas	Beans	1 measure	30.00	35.00	-
	Cabbage	1 oz.	-	37.50	-
	Carrot	1 lb.	66.50	72.00	-
	Beeroot	1 lb.	-	72.00	-
3. Hewavissa	Snakegourd	1 measure	-	30.00	50.00
	Bitter-gourd	1 measure	-	40.00	40.00
	Beans	1 measure	-	30.00	30,00
	Tomatoes	1 measure	-	100.00	100.00
4. Meeruppa	Tomatoes	1 lb.	-	80.00	100.00
	Snake-grourd	1 lb.	-	10.00	10.00
	Beans	1 measure	-	30.00	-

(iv) Availability and Price of Fertilizer

As in the case of seeds, even fretilizer is not available at the required times from the institutional sources. Therefore, cultivators have to rely on private traders for their requirements, who supply fertilizer at higher prices. Co-operatives are unable to make correct estimates of the input requirements of the cultivators in the area. Often co-operatives give high priority to consumer items from which they can make higher profits. They also claim that they do not have enough funds to stock various agricultural inputs.

Farmers in Boragas area claimed of profiteering in fertilizer by some co-operatives whose officials connive with private traders to create artificial shortages of fertilizer.

Vegetable cultivators in Marassana area accepted that the fertilizer application was necessary in view of the infertile nature of the soil but they could not afford it because the fertilizer prices at private sources had gone up over 100 percent compared with the prices of the previous year.

Table 24-: Number of Vegetable Cultivators Reporting Problems About Getting Fertilizer.

Locality	Viduru-pola		Boragas		Hewavissa		Meeruppa		Uduvil-Keerimalai	
	No:	%	No:	%	No:	%	No:	%	No:	%
Problem										
1.Difficult to obtain when necessary	18	90.0	10	55.6	12	60.0	8	40.0	0	0.0
2.High price	12	60.0	10	55.6	10	50.0	18	90.0	26	100.0
3.Transport difficulties	15	75.0	0	0.0	0	0.0	0	0.0	2	7.7
Total * No: reportng problems	45		20		22		26		28	

* Total number does not add up to the number in the sample because the cultivators gave multiple responses.

Percentages refer to those of the total number of cultivators interviewed.

Increased price of fertilizer was the major problem reported by the cultivators in Meeruppa (Kandy) and Uduvil-Keerimalai (Jaffna) while it was also an important problem in the other areas.

With the increasing price of petroleum products, fertilizer price increases are inevitable unless the government subsidizes the fertilizer prices.[1]

[1] Since the draft of this report was prepared, the government in fact annuounced price reductions in all types of fertilizer on 20th September, 1979.

Table 25-: Average Fertilizer Prices Reported by the Producers (Rs.per unit)

Locality	Type	Unit	Maha 1977/78	Yala 1978	Maha 1978/79
1. Vidurupola	mixed	1 cwt	48.00	70.00	-
	lime	1 cwt	18.00	22.00	-
	Cowdung	1 bag	20.00	22.00	-
2. Boragas	Green manure	1 cwt	36.00	66.00	-
	Urea	1 cwt	90.00	112.00	-
	Special potato mixture	1 cwt	36.00	77.00	-
	Cowdung	100 baskets	120.00	200.00	-
	Lime	1 bag	-	15.00	-
3. Hewavissa	Lanka	1 cwt	-	29.50	52.50
	Urea	1 cwt	-	57.00	85.00
	Cowdung	1 cwt	-	60.00	60.00
4. Meeruppa	Lanka	1 cwt	-	30.00	70.00
	Urea	1 cwt	-	60.00	90.00
5. Ikiriwewa	Urea	1 cwt	-	-	100.00
6. Lunuwewa	Urea	1 cwt	-	-	100.00
7. Jaffna	V_1	1 cwt	-	75.00	-
	Urea	1 cwt	-	105.00	-

In the future too, this will affect adversely not only the cultivation of vegetables but also other crops. Though we do not have complete data on price increases in specific vegetable fertilizer mixtures, it can be said that the price of widely used types of fertilizer in vegetable cultivation has doubled in the year of 1978 as shown in table 26.

Table -26: Price Increases in Selected Types of Fertilizer

Type	Price per ton (Rs.) before 18.7.78	Price per ton (Rs.) after 18.7.78
Urea	1044	2088
NPK	1080	2160
V_1 with SA	1186	2372

Source : Fertilizer Corporation

(v) Availability and Price of Agro-chemicals

In every locality we studied, almost every farmer had used chemical weed killers, insecticides and fungicides to protect his vegetable cultivations from the seed-bed stage to the end of harvesting.

Institutional sources have failed in the proper supply of agro-chemicals to the vegetable growers. The cultivators suspect that the agro-chemicals supplied by the private traders are not only arbitrarily priced but also adulterated. They are also of the view that the chemicals issued to co-operatives and Agricultural Service Centres go either to a few influential cultivators or to the black-market.

A major problem with regard to agro-chemicals is the non-availability of the correct variety at the correct time. Farmers in Boragas area complained of a general scarcity of popular brands, such as Anthrocol, Tamaron, Endrex etc., in the area. They were not available either with the private traders or the institutional sources.

Table 27-: Number of Vegetable Cultivators Reporting Problems About Getting Agro-chemicals

Locality	Vidurupola		Kewavissa		Meeruppa		Ikiriwewa		Uduvil-Keerimalai	
Problem	No:	%	No:	%	No:	%	No:	%	No:	%
1.Difficult to obtain when necessary	5	40.00	3	15.0	6	30.0	8	40.0	8	30.8
2.High price	11	55.0	11	55.0	18	90.0	4	50.0	25	96.2
Total* No: reporting problems	19		14		24		12		33	

* Total number does not add up ot the number in the sample because the cultivators gave multiple responses.

Percentages refer to those of the total number of cultivators interviewed.

As shown in table 27, the major problem reported by the cultivators except in case of Ikiriwewa, is the expensive price of agro-chemicals. Non-availability is the major problem at Ikiriwewa (Anuradhapura).

In fact, prices of agro-chemicals have gone up from season to season during the period of our field investigation. The price increases in petroleum products will invariably worsen the situation.

The prices of agro-chemicals prevailing in the study localities from Maha 1977/78 to Maha 1978/79 are given in table 28.

Table 28-: Average Prices of Agro-chemicals Reported by the Producers

(Rs. per unit)

Locality	Brand name	Unit	Maha 1977/78	Yala 1978	Maha 1978/79
1.Vidurupola	Diamethol	16 oz.	48.00	68.00	-
	Tamaron	16 oz.	60.00	80.00	-
2.Boragas	Rogor	16 oz.	52.00	60.00	-
	Tamaron	16 oz.	65.00	78.00	-
	Anthrocol	1 pkt.	26.00	40.00	-
	Endrex	16 oz.	65.00	-	-
	Diamethol	16 oz.	-	34.00	-
	Thayodon	16 oz.	-	34.00	-
3.Hewavissa	Diamethol	16 oz.	-	44.50	44.50
	Polythion	16 oz.	-	70.00	70.00
	Tamaron	16 oz.	-	80.00	80.00
	Rogor	16 oz.	-	46.50	54.00
	Endrex	16 oz.	-	32.00	62.00
	Laned-L	16 oz.	-	55.00	55.00
4.Meeruppa	Rogor	16 oz.	-	45.00	48.00
	Laned-L	16 oz.	-	40.00	64.00
	Lebysid	16 oz.	-	28.00	-
5.Ikiriwewa	Parathion	16 oz.	-	-	34.00
	Eckatos	16 oz.	-	-	110.00
	Endrex	16 oz.	-	-	32.50
	Tamaron	16 oz.	-	-	80.00
	Lebysid	16 oz.	-	-	40.00
	Nairan	16 oz.	-	-	42.00
6.Lunuwewa	Endrex	16 oz.	-	-	37.00
	Eckatos	16 oz.	-	-	114.00
	Melathion	16 oz.	-	-	10.00
7.Jaffna	Anthrocol	16 oz.	-	-	35.00
	Polydol	16 oz.	-	-	70.00
	Asodryn	16 oz.	-	-	75.00
	Endrex	16 oz.	-	-	32.00

(vi) Availability and Price of other Allied Implements

The farmers reported problems in getting sprayers and water pumps. High cost of these items has resulted in the concentration of their ownership in the hands of a few rich cultivators. High repair costs made the owners reluctant to lend or hire these implements to those who need

them. A sprayer cost about Rs.1000/- in August 1978 at Boragas whereas it was available for Rs.145/- about 10 years ago. A water pump, including the accessories and installation charges, cost about Rs.15000/- at Ikiriwewa, in October, 1978.

Vegetable cultivators at Boragas further complained of their inability to get mammoties because they are issued only to those who have Agro-Identity cards. These cards had been issued only to paddy farmers. The cultivators at Boragas who grow vegetables only on highlands have not been issued Agro-Identity cards.

Certain additional material requierments are involved in cultivation of several vegetables, namely stakes for pole beans, stakes, dead branches, cadjan and coir-rope for fencing, webbing, trellising and thatching in case of snakegourd, bittergrourd and luffa. The cost of these items have to be taken into account in the computation of cost of production of these vegetables. These vegetables are mostly grown, among our study localities, at Vidurupola and Boragas (beans) and at Hewavissa and Meeruppa (snakegourd, bittergourd, luffa). Almost all materials mentioned above can be used for about 2 seasons.

The vegetable cultivators complained of the increases in the price of these items, along with other inputs discussed earlier.

As shown in table 29, the price of 1000 stakes for pole beans has gone up by Rs.15/- at Vidurupola and by Rs.10/- at Boragas from Maha 1977/78 to Yala 1978. The price of same has increased by 100 percent at Hewavissa and Meeruppa from Yala 1978 to Maha 1978/79. Stakes used for trellising, coir-rope and cadjan too record considerable price increases.

Table 29-: Average Prices of Other Materials Used In Vegetable Cultivation Reported by the Producers (Rs.per unit)

Locality	Item	Unit	Maha 1977/78	Yala 1978	Maha 1978/79
1. Vidurupola	Stakes for pole beans	1000	35.00	50.00	-
2. Boragas	Stakes for pole beans	1000	40.00	50.00	-
3. Hewavissa	Stakes for Trellising	1000	-	1000.00	1500.00
	Stakes for pole beans	1000	-	40.00	80.00
	Coir rope	1 cwt	-	145.00	150.00
	Dead branches	1000	-	15.00	30.00
	Cadjan	100	-	35.00	45.00
4. Meeruppa	Stakes for pole beans	1000	-	40.00	80.00
	Coir rope	1 cwt	-	90.00	100.00
	Cadjan	100	-	40.00	50.00

(vii) Other Problems of Production Encountered by the Vegetable Cultivators

In general, inability to get the required inputs, materials and equipment and their high prices were the major problems of production faced by vegetable cultivators. In addition, cultivators in each study locality stated several problems regarding vegetable cultivation. The important problems are briefly discussed below:

(a) Uncertainty and Risk Attached to the Rainfed Cultivation

In Vidurupola and Boragas areas heavy rains cause a threat to beans production, usually from May to September each year. On the other hand, during dry seasons , there is a shortage of water because of the non-availability of even minor irrigation facilities. The cultivators of Ikiriwewa and Lunuwewa (Anuradhapura) also expresed difficulties in getting irrigation facilities for vegetable cultivation and the risk attached to rainfed cultivation. The rainfall is unpredictable and subject to extreme fluctuations. In Jaffna distirct, lands cultivated with vegetables get water logged during the rainy season. Thus, it is clear that the cultivation of vegetables is a risky enterprise from the view point of the cultivators, in the absence of a Crop Insurance Scheme.

(b) Inefficiencies of Extension Services:

Many vegetable growers complained that extension officials serve only influential farmers and that there is no way of acquiring knowledge about scientific methods of vegetable cultivation. The officials are not prepared to solve problems regarding vegetable cultivation, faced by the average farmers. The same applies even to Co-operative officials and Cultivation Officers.

(c) Difficulties in Getting Institutional Credit

Due to inefficiencies of the institutional credit sources (banks, co-ops etc.). cultivators resort to borrowing from Commission Agents and other private sources . In these circumstances, producers are obliged to sell their produce to private traders and are compelled to accept a low producer price.[1]

Even if vegetable cultivators are provided with interest free institutional loans, borrowing is too riskly in the absence of a Crop Insurance Scheme to cover the cultivation risks.

Eligibility of vegetable cultivators for institutional credit is also restricted by the constraints of size of land holdings and adverse land tenure conditions. For example, as we saw earlier, many cultivators grow vegetables on extents less than 1 acre . Some cultivators grow them even on lands of less than ¼ acre in extent. In Meeruppa village, it was found that the vegetable cultivators who operate less than ¼ acre were regarded as ineligible for credit from the Bank of Ceylon.

In Boragas area, the majority of the vegetable cultivators have not been issued agro-identity cards and operate encroached crown lands and therefore, are ineligible for institutional credit.

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[1] See Chapter 5 for a detailed discussion of this aspect.

Almost every farmer interviewed expressed the view that the cost of production of vegetables had gone up considerably, thereby leading to insufficient net incomes from vegetables, whcih may even force them to give up vegetable cultivation. This of course would occur with very low producer prices. Section 4.4 attempts to analayse the cost of production and compare producer prices of vegetables with costs.

4.4. Cost of Production and Proudcer-Price of Vegetables

The average cost of production per acre for 9 vegetables was calculated on the basis of data collected through a questionnaire administered to a sample of 177 cultivators in the 4 selected districts. The cost of production of each vegetable could not be computed for each locality because the cultivators in some localities had not cultivated all the vegetables concerned. Some vegetables by nature cannot be cultivated in some of the selected localities. The average cost figures are confined to Maha 1977/78, Yala 1978 and Maha 1978/79. The figures for most vegetables were available only for two out of these three seasons.

In the computation of cost of production, the following major items of expenditure were taken into consideration.

1. Wages and estimated cost of food given to hired labourers.
2. Tractor charges.
3. Cost of material inputs.
4. Cost of transport of produce within the farm and/or from the farm to farm house.

In the production of vegetables, in most localities, the family labour component was as high as hired labour input. Therefore, the average cost of production per acre was computed on two bases i.e. (i) with imputed cost of family labour and (ii) without imputed cost of family labour, to see what difference it makes to the total average cost. The average estimated cost of production per acre of the selected vegetables on these two bases are presented separately in tables 30 and 31.

Table 30-: Average Estimated Cost of Production Per Acre of Selected Vegetables with Imputed Cost of Family Labour (Rs.)

		Area	Season		
			Maha 1977/78	Yala 1978	Maha 1978/79
1.	Beans	Vidurupola	3914.60	4499.33	-
		Boragas	4155.10	4109.35	-
		Meeruppa	-	3877.86	5030.00
		Hewavissa	-	4503.57	3736.11
2.	Beetroot	Uduvil	6191.75	7883.03	-
		Keerimalai	7929.86	8841.61	-
3.	Cabbage	Vidurupola	3864.00	5100.00	-
		Boragas	3564.00	4779.00	-
		Uduvil	8162.36	N.A.	-
		Keerimalai	10871.20	N.A.	-
4.	Carrot	Boragas	3318.83	3609.65	-
5.	Raddish	Vidurupola	2756.50	3445.50	-
6.	Tomatoes	Meeruppa	-	2640.00	1991.12
		Hewavissa	-	3101.30	2645.50
		Keerimalai	9376.99	N.A.	-
7.	Brinjal	Ikiriwewa	-	N.A.	1414.49
		Lunuwewa	-	N.A.	1430.41
		Uduvil	10471.03	N.A.	-
		Keerimalai	13359.04	N.A.	-
		Kaithady	N.A.	13771.15	-
		Madduvil	N.A.	10967.00	-
8.	Bitter-gourd	Meeruppa	-	3853.25	5165.66
9.	Snake-gourd	Meeruppa	-	5237.36	N.A.
		Hewavissa	-	6843.80	7086.40

N.A. = Not available

\- = Did not collect data for the season.

Table 31-: Average Estimated Cost of Production Per Acre of Selected Vegetables Without Imputed Cost of Family Labour (Rs.)

		Area	Season		
			Maha 1977/78	Yala 1978	Maha 1978/79
1.	Beans	Vidurupola	3813.36	3827.63	-
		Boragas	2937.54	3362.06	-
		Meeruppa	-	3261.57	3790.20
		Hewavissa	-	4161.57	3524.47
2.	Beetroot	Uduvil	5627.75	6168.03	-
		Keerimalai	6624.82	7864.61	-
3.	Cabbage	Vidurupola	2618.67	1889.33	-
		Boragas	3144.21	3855.34	-
		Uduvil	6938.86	N.A.	-
		Keerimalai	7221.20	N.A.	-
4.	Carrot	Boragas	2281.69	2749.49	-
5.	Raddish	Vidurupola	1774.67	1712.53	-
6.	Tomatoes	Meeruppa	-	2222.56	1706.88
		Hewavissa	-	2790.00	2421.83
		Keerimalai	8051.69	N.A.	-
7.	Brinjal	Ikiriwewa	-	N.A.	841.26
		Lunuwewa	-	N.A.	995.06
		Uduvil	8826.29	N.A.	-
		Keerimalai	9215.56	N.A.	-
		Kaithady	N.A.	5631.59	-
		Madduvil	N.A.	5812.68	-
8.	Bitter gourd	Meeruppa	-	3729.75	4820.01
9.	Snake-gourd	Meeruppa	-	4979.47	N.A.
		Hewavissa	-	6426.51	6405.53

N.A. = Not available

- = Did not collect data for the season

The most important feature as is shown in tables 30 and 31 is that the cost of production of almost every vegetable has increased from one season to another (i.e., from Maha 1977/78 to Yala 1978 or Yala 1978 to Maha 1978/79). This can be attributed to the increases in labour charges and price of material inputs, as discussed in section 4.3.3.

Another notable feature is that, for the same vegetable, the cost is generally higher in areas where irrigated and mechanised farming are practised than in areas where the rainfed labour intensive cultivation is adopted. For example, in Maha 1977/78, the average cost of production per acre of Cabbage was about Rs.4,000/- in Vidurupola and Boragas villages (Welimada) while the same was about Rs.10000/- in Uduvil-Keerimalai area (Jaffna). Same applied to the cost of production of brinjal between Ikiriwewa/Lunuwewa and Uduvil-Keerimalai/Kaithaddy-Madduvil(Jaffna). Infact the cost is the lowest in Ikiriwewa and Lunuwewa where chena cultivation is practised. The main items of expenditure are labour charges for land preparation and the cost of agro-chemicals.

Intensive cultivation in the wet zone areas (Badulla and Kandy) is certainly costlier than extensive chena cultivation.

Time series data on the cost of production of the individual vegetables analysed here is lacking to compare the increases in the costs over time.[1] However, one earlier study made an effort to estimzte the cost of production of certain vegetables under various water supply conditions and yield potentials.[2] Another estimated the actual average cost of production of a small number of vegetables, incurred by producers on the basis of a survey conducted in Nuwara-Eliya district.[3] Although the data given in the above two studies are not strictly comparable with findings in this study, these data can give a general idea about the increases in the cost of production of certain vegetables.

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[1] Department of Census & Statistics (1968) and Abeysekera & Senanayake (1974) have computed the costs on the basis of perfarm and per acre for all vegetables, but not on the basis of individual vegetables.

[2] Sathasivampillai, K (1976) Cost of Production of Some Selected Crops in Sri Lanka, Agricultural Economic Study 15, Department of Agriculture, Peradeniya.

[3] De Silva, G.A.C. & K.Sathasivampillai (1976) Potato-vegetable Cultivation in Nuwara-eliya District of Sri Lanka, Agricultural Economic Study 16, Department of Agriculture, Peradeniya.

(1)

Table 32-: Estimated Average Cost of Production Per Acre of Some Vegetables and Their Changes (from 1976 to Maha 1978/79)

Vegetable	Watersupply condition	Average cost (Rs.) (1976)[2]	Average cost data estimated by the present suryey					
			Yidurupola Yala 1978	Boragas Yala 1978	Hevayissa Yala 1978	Meeruppa Yala 1978	Ikiriwewa/ Lunuwewa Maha 78/79	Uduvil/Keerimalai Maha 77/78	Kaithady/Madduvil Yala 1978
Beans	rainfed	1160.00	4499.33	4190.35	4503.57	3877.86	-	-	-
Beetroot	Irrigated	1559.00	-	-	-	-	-	8362.32	-
Cabbage	Irrigated	1647.00	-	-	-	-	-	9516.78	-
	rainfed	1193.00	5100.00	4479.00	-	-	-	-	-
Carrot	rainfed	1163.00	-	3609.65	-	-	-	-	-
Raddish	rainfed	1166.00	3445.50	-	-	-	-	-	-
Tomatoes	Irrigated	1343.00	-	-	-	-	-	9376.99	-
	rainfed	758.50	-	-	3101.30	2640.00	-	-	-
Brinjal	rainfed	866.90	-	-	-	-	1422.45	11915.04 (irrigated)	12369.08 (irrigated)

(1) The cost estimates include the imputed cost of family labour too.

(2) Source : Sathasivampillai (1976)

Table 33-: Actual Average Cost of Production Per Acre[1] of Some Vegetables Reported by the Producers (Rs.)

Vegetable	Nuwara-Eliya (1976)[2] Cost (Rs.)	Vidurupola (Badulla) (1978 Yala) Cost (Rs.)	Boragas (Badulla) (1978 Yala) Cost (Rs.)
Cabbage	2081.97	5100.00	4179.00
Carrot	3392.72	-	3609.65
Raddish	1049.30	3445.50	-

1 The cost estimates include the imputed cost of family labour too.

2 Source -: De Silva & Sathasivampillai (1976)

Table 32 and 33 show that the actual cost of preduction per acre has increased considerably, from 1976 to Maha 1978/79.

However, the high average cost of production and their increases over time should be offset by increasing net producer prices, thereby leading to stable or increasing net incomes to the producer. The decision whether or not to cultivate a particular vegetable variety will depend on its net income, irrespective of increasing and high average cost of production. Therefore, it is useful to examine how net prices received by producers compare with the average cost of production per lb. of vegetables.

According to table 34, the net average price received by the producers (computed after deducting the costs of transport, labour, containers, sales commission and wastage) for beans, cabbage, snake gourd, and tomatoes were lower than the average cost per lb. with imputed cost of family labour in almost all the localities. However, when the cost of family labour is deducted, beans seems to be profitable except in the case of Hewavissa. Other vegetables mentioned above remain unprofitable even after deducting the cost of family labour , except in the case of carrot in Boragas and bitter gourd in Meeruppa. In contrast, brinjal in Ikiriwewa and Lunuwewa seems to be giving a fairly reasonable profit to the producers even with imputed cost of family labour. This is because, the average cost of production per acre is relatively lower in

Table3 4-: Comparison of Net Producer Price Per lb.and Average Cost of Production Per lb. of Selected Vegetables

Locality(a)	Net average price received by the producers during the season(cts. per lb.)	Estimated average Yield per acre (lb.) (b)	Cost with imputed cost of family labour (cts./lb.)	Cost without imputed cost of family labour(cts./lb.)
Vidurupola (Yala 1978)				
Beans	0.65	6000	0.75	0.63
Cabbage	0.22	18000	0.28	0.10
Carrot	0.11	7000	0.49	0.24
Boragas (Yala 1978)				
Beans	0.69	6000	0.68	0.56
Cabbage	0.16	18000	0.25	0.21
Carrot	0.38	15000	0.24	0.18
Hewavissa (Yala 1978)				
Beans	0.60	6000	0.75	0.69
Snakegourd	0.19	15000	0.46	0.43
Tomatoes	0.30	5000	0.62	0.56
Meeruppa (Yala 1978)				
Beans	0.62	6000	0.65	0.54
Bittergourd	0.39	12000	0.32	0.25
Snakegourd	0.15	15000	0.35	0.33
Tomatoes	0.26	5000	0.53	0.44
Ikiriwewa (Maha 1978/79)				
Brinjal	0.36	10000	0.14	0.09
Lunuwewa (Maha 1978/79)				
Brinjal	0.34	10000	0.14	0.10

(a) The localities in the Jaffna idistrict were excluded because comparable producer price series were not available.

(b) Calculated on the basis of the reported yield by the cultivators and data given in Sathasivampillai (1976)

these areas, as discussed earlier.[1]

However, the cultivators usually do not compute values of their family labour in calculating their total costs and gross incomes. Therefore, with regard to certain vegetables, e.g. beans, cabbage, bittergourd and brinjal, as shown in table 34, the producers can still remain in cultivation since they can get some return at least to their own labour. If the present position with regard to the other vegetables continues to persist the average producer would be compelled to give up the vegetable cultivation.[2] The remedial action lies in assuring a fair net average price to producers. Chapter 5 attempts to bring into focus, the major factors that prevent the producer from getting a fair share of the consumer's price.

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[1] The relatively large farmers (larger than the average) with large land holdings may realise a higher profit margin than this. But here we are concerned with the average situation only. Moreover, under-reporting of yields and prices and over reporting of costs are possible on the part of producers. Hence, above data has to be treated with a certain degree of caution.

[2] Only the farmers with relatively large land holdings will stay in the cultivation in the long-run because their average cost is relatively small due to economies of scale .

CHAPTER 5

MARKETING AND PRICE OF VEGETABLES

5.1 Background - The Marketing System

5.1.1 Marketing Channels (Outlets)

The primary task of the marketing system is to collect vegetables produced in various parts of the country and redistribute them to the consumers throughout the country, especially to the people in urban areas. In between the collection or assembly and redistribution, many other functions and services are involved, e.g. packing, transport, bulk-breaking, pricing, financing, retailing and so on.

The operational ownership of the marketing system for vegetables in Sri Lanka can be categorised into three groups.

i.e., (i) Private (traditional) marketing system
(ii) Government (Marketing Department) marketing system
(iii) Co-operative " "

These three groups operate at all three levels , i.e. (a) primary (farm) (b) wholesale, and (c) retail, in the marketing chain, but not in every locality. However, at all levels, private sources are believed to handle about 80% of the vegetable trade in Sri Lanka.[1]

(a) Primary Level Outlets:-

These outlets vary from area to area. Table 35 presents the relative significance of each outlet in vegetable collection at the farm level in the localities where field surveys were conducted.

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[1] Indraratne, A.D.V. de.S. (1975) "Food Marketing in the City of Colombo" in Food Marketing Systems in 13 Asian Cities, FAO, Bangkok.

Table 35-: Significance of Each Marketing Outlet at Primary Level According to First Preference by Farmers ;

Area	Total No:of farmers	Percentage of farmers selling their produce to: (1) Assembly agent	(2) Trucker buyer	(3) Commission agent	(4) Other private traders	(5) Pola (fairs)	(6) Village boutique	(7) Mkt: Dept.	(8) Co-operative	Total
Anuradhapura										
1.Ikiriwewa	18	88.9	5.6	0.0	0.0	0.0	0.0	5.5	0.0	100
2.Lunuwewa	32	12.5	50.0	6.25	25.0	3.1	0.0	3.15	0.0	100
Baudlla										
1.Vidurupola	19	0.0	0.0	94.7	0.0	5.3	0.0	0.0	0.0	100
2.Boragas	27	7.4	0.0	92.6	0.0	0.0	0.0	0.0	0.0	100
Kandy										
1.Meeruppa	36	27.8	61.1	0.0	0.0	0.0	0.0	11.0	0.0	100
2.Hewavissa	33	51.5	45.5	0.0	0.0	0.0	0.0	3.0	0.0	100
Jaffna	51	0.0	0.0	0.0	13.7	82.4*	0.0	3.9	0.0	100
Preference by all farmers	216	22.7	25.0	20.8	6.9	20.4	0.0	4.2	0.0	100

* Including Chunnakam, Marathanamadam and Chavakachcheri markets.

As shown in table 35 , assembly agents [1] and trucker-buyers [2] were the most important marketing outlets at primary level in the selected villages in both Anuradhapura and Kandy district. Commission Agents [3] were the most dominant outlet in the two villages in Badulla district. In

[1] Agents or brokers who collect the produce from the farmers for the commission agents or trucker-buyers. They usually keep about 5% margin. They are essentially agents of the traders.

[2] Traders who come in lorries or vans (trucks) and purchase the produce direct from the producers or through the assembly agents.They could be retailers or wholesalers.

[3] Wholesalers who undertake selling the produce for the farmers on commission basis. They usually keep 10% margin.

Jaffna district, the majority of the vegetable cultivators had sold their produce to private retailers or wholesalers at the major markets and producer fairs. It was also clear that, except in the case of Lunuwewa (Anuradhapura), a single outlet dominates the primary level produce collection.

On the whole, the most prominent outlet has been trucker-buyers while the assembly agents, commission agents and producer fairs, registered second, third and fourth places respectively. The significance of the Marketing Department was negligible while no cultivator we interviewed had selected the co-operative as the major marketing outlet. 96% of the farmers had used private marketing outlets while only 4% had used government outlets.

(b) Wholesale level outlets

Private wholesalers/commission agents, the Marketing Department (MD) and the Co-operative Marketing Federation (MARKFED) handle the wholesale trade of vegetables at the Pettah (Colombo) market. During the period of this investigation it was found that about 95% of the daily average turnover of vegetables is handled by the private wholesalers/commission agents, about 3% by the MARKFED and only 2% by the MD.

Most private wholesalers procure vegetables from the farmers through transport agents while some traders also buy them from the producers and traders who bring the produce to the market. The MD and the MARKFED collect vegetables from the producers through their collecting points and transport the produce with their own lorries.

In Kandy wholesale market too, the private traders/ commission agents dominate the wholesale trade of vegetables. The MD stall at this market acts as a regional collecting point. The producers sometimes send their vegetables to the wholesalers on a commission basis but the more regular feature is that the wholesalers go to villages and collect produce with their lorries.

The private wholesalers inn Jaffna markets (Chunnakam, Chava-Kachcheri and Marathanamadam) usually procure vegetables direct from the producers

who bring the produce to the markets. Sometimes they buy vegetables through transport agents. The Marketing Dept: also buys vegetables from the same sources.

Apart from the activities of the three main wholesale markets mentioned above, the wholesaling and bulk-breaking also take place at major markets in almost every principal city in the country. Examples are Galle, Matara, Kalutara and Kurunegala.

(c) Retail Level Outlets

The private retailers include stall holders at market centres and fairs, pavement vendors, hawkers etc. They may get vegetables from all the sources at producer level and wholesale level mentioned above. Some retailers may themselves be producers, primary level collectors, or wholesalers. As at other levels, the private ownership dominates in the retail trade too.

The MD sells vegetables to the consumers through its retail stalls (People's depots). It also supplies vegetables to government institutions such as hospitals, prisons, armed forces, university etc.

The MARKFED sells vegetables to consumers through its small number of retail stalls in Colombo and through a mobile lorry service. It also supplies vegetables to ships, government institutions etc.

Both the MD and the MARKFED retail points procure vegetables from their respective wholesale floors. The MD's wholesale floors are situated at Pettah . The wholesale floor of the MARKFED is situated at Saunder's place.

The vegetable marketing system in Sri Lanka is, however, very complex and characterised by " too many " channels. This has many implications for pricing, price structure and efficiency of the marketing system[1].

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[1] These aspects will be discussed in depth in the section 5.2.

Figure. 7. THE FLOW DIAGRAM OF THE VEGETABLE MARKETING SYSTEM IN SRI LANKA

(As Identified during the Survey)

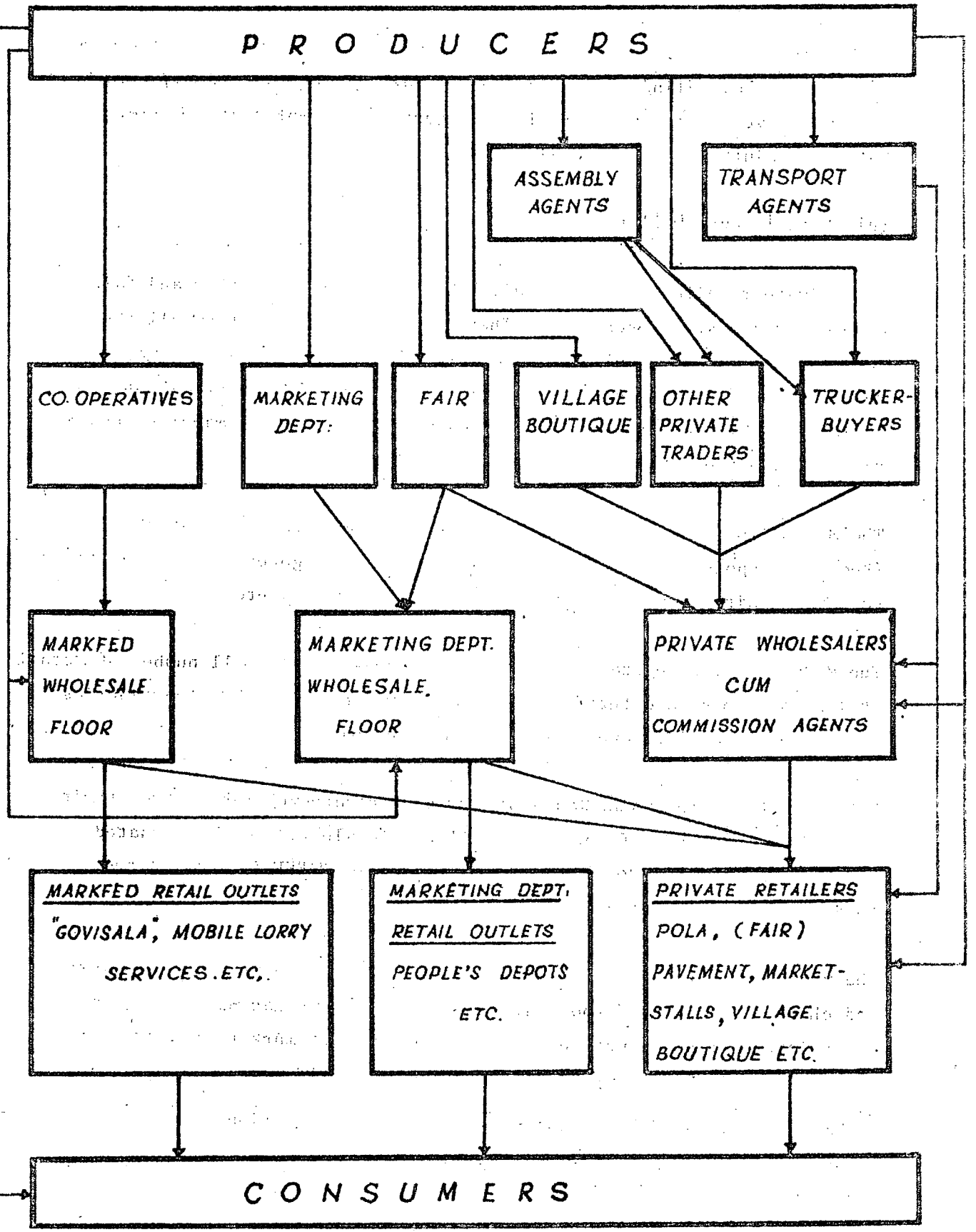

Figure 7 shows the complex nature of the marketing system concerned.

5.1.2 Marketing Functions

Discussed here are the aspects of cleaning of produce before selling, grading/sorting, packing, weighing and transport.[1]

a) Cleaning of Produce:

It was observed that at the farm level very little or no cleaning of produce was undertaken before selling . Such cleaning, if at all is limited to removal of spoiled and damaged produce as in the case of bitter gourd, brinjal, snake gourd etc., and removal of leaves which are of bad quality and adhering soil as in the case of beetroot, carrot, cabbage, leeks and raddish. Some vegetables simply do not require such cleaning. Examples are beans, red pumpkin and luffa. Because of the fact that producers are not much concerned about cleaning, vegetables arriving at the major terminal (wholesale) markets are often in an uncleaned state.

At the wholesale level, usually, no cleaning is undertaken and most retailers take the produce away in the form it is sent by the producers. Consumers are generally concerned about cleanliness and appearance of vegetables and therefore, the retailers have to clean the produce before selling. In fact it is at the retail level that vegetables are cleaned to a great extent. However, it was observed that although the private retailers paid much attention to cleaning, the produce at the government marketing institutions, especially at the Marketing Dept: was often in an uncleaned state.

b) Grading/Sorting

Grading of vegetables can be defined as the sorting out of the produce into lots with the same quality characteristics. Producers should be able to obtain higher prices for better grades than for the average

[1] Costs of these functions are discussed in section 5.2.1 under marketing costs.

produce. However, the present traditional marketing system gives little incentive for producers to grade vegetables.

Private traders usually pay a flat rate for produce and are not concerned about grading. Therefore, the producers invariably avoid any grading and are not satisfied with the grading done by the MD.

Some vegetables are graded by the traders at the producer level according to their types e.g. kidney beans, butter beans, green beans and as herculese, and KY varieties of cabbage etc. There are two grades of carrot, i.e. with leaves and without leaves. Usually, there is a price difference of about 10 cts. per lb. between one grade and another.

In Marassana area, trucker-buyers and assembly agents are not concerned about grading but are particular about the removal of damaged vegetables before packing. However, the MD's collecting centre at Appallagoda grades vegetables, the basis of which is not easily understood by the farmers. For example, during Yala 1978, MD paid the producers on average Rs.1.30 per lb. of grade 1 beans, 90 cts. per lb. of grade 2 beans and 50 cts. per lb. of grade 3 beans.

In Tambuttegama area, the private traders do not apply a strict grading system. However, as in the case of brinjal, removal of insect-damaged and spoiled fruits is undertaken. In later months of the harvesting season, brinjals are graded as small and large fruit. Varietal differences, e.g. white and purple varieties of brinjal, sometimes result in differential prices.

It was observed during the survey that some commission agents/wholesalers at the Pettah market sort out vegetables in to several grades before selling to retailers. It was clear that producers were paid at the price of the lowest grade. It is only when a larger quantity is ordered that a retailer gets vegetables in the form sent by the producers. On such occasions produce is sold even direct from the lorries. At Kandy wholesale market too, the traders sort out vegetables into different grades. Some large wholesalers however, sell produce in bulk without such grading.

At the retail level, grading is according to cleanliness, size, appearance and the freshness of the produce. Price differs according to the degree of the above characteristics. Market segmentation at the retail level is also clearly visible depending on the differences in the above qualities. For example, the produce offered for sale by private traders at the Nugegoda super market can be considered grade 1 with regard to quality characteristics. The produce at the retail stalls at the Janatha Pola is of fair average quality whereas at the pavement vendors produce is ot low quality. Thus, the prices of the same vegetables offered for sale at these three segmented markets are also different.

It was also observed that though the MD does grade vegetables at the producer level, it sells vegetables of a substandard quality in ungraded form , at retial stalls.

c) Packing

Transport of vegetables from the producing areas to the terminal markets usually takes about 1 to 1½ days so that the importance of proper packing methods can not be over-emphasized. If the produce is not suitably packed before despatching to the market, considerable damage could result.

Farmers use gunnies to pack vegetables such as beans, cabbage , carrot, beetroot, leeks, brinjal, bitter gourd etc. Wooden boxes are used to pack tomatoes and capsicum chillies. Snakegourd are usually wrapped in cadjan while no containers are used for red pumpkin, ash pumpkin and ash plantains. Some vegetables such as drumsticks and raddish are bundled by tying with coir rpoes and dispatched to markets.

Producers try to minimize the cost of containers by packing the maximum possible weight in a container. Usually about 100-150 lbs. are packed in one container. The traders and transport agents try to load the maximum quantity of containers into one vehicle to economise the transport cost. The containers receive little or no ventilation in the vechiles. The results of all these is a considerable wastage or produce in transit and handling.

Though the packing methods adopted by the producers may seem technically inefficient and unscientific, there is no economic incentive for them to undertake proper methods. Better and improved packing would only be more costly if modern transport and storage facilities are not available. Sri Lanka does not have refrigerated-transport facilities for vegetables at present. Cold storage is virtually absent for private vegetable marketers. The storage for vegetables is very temporary, e.g. farmers' house floors and inside lorries. The MD has very limited cold-storage facilities which are mostly used to keep vegetables and fruit over night. In the absence of these facilities, proper packing at the farm level would not pay dividends.

d) Weighing

The majority of the vegetable cultivators at Vidurupola village stated that they usually weigh the produce before selling to the commission agent. Often there is no difference between the weights mentioned by the commission agent and the cultivators' records, after making adjustment for drying and wastage in transit. The producers complained that the traders at the Welimada fair underweighed the produce. They were also not satisfied with the weights adopted by the Marketing Department. Farmers at Boragas also expressed the same views. Even if there is a difference of weight by 2-3 lbs. the cultivartors overlook it because they have various other attachments to the commission agents. The commission agents usually deduct about 5 lbs. for the weight of the container. The private traders at Welimada fair deduct about 20% of the total weight for the containers, excessive moisture, drying spoiled vegetables etc.

At Hewavissa, it came into light that the farmers were helpless even if they know that the traders were using incorrect weights. The trucker-buyers too deduct about 5 percent of the weight for drying and about 3 lbs. for each gunny bag . This can be viewed as an unjustified duplication. In 1978, there were about 10 instances where the authorities of the Price Control Dept: took faulty scales into custory.

Farmers at Meeruppa also expressed their dissatisfaction with the weights applied by the traders. The traders deduct about 6 lbs. for

the weight of a gunny bag and 8 lbs. for a wooden box from the total weight. At this village too, faulty scales have been taken into custody from about 15 traders in 1978.

At Lunuwewa and Ikiriwewa, only a few producers weigh the produce before selling. Those who weigh their produce know that their produce is underweighed by the traders. Those who do not weigh the produce too are victims at the hands of traders. The traders usually deduct about 3-5 lbs. for the weight of a gunny bag, about 7 lbs. for a wooden box and about 3 lbs. per container for damaged vegetables.

Some traders at the retail level try to recover the loss incurred because of low prices and damaged goods by applying incorrect weights. This practice is mostly adopted by the pavement vendors and the retailers at periodic markets rather than by permanent/semi permanent stall holders at major market centres.

e) Transport

The majority of the vegetable farms in the study localities are not accessible by motor vehicles. The producers have to transport the produce from the farm to the nearest motarable road or to a major assembly point, on head loads employing either family or hired labour. Trucker-buyers or transport agents also prefer this method as it saves time and cost of transport. They go to the farms only if the quantity of produce is fairly large provided the farms are easily accessible by lorries. Sometimes traders as well as the producers transport produce by carts and tractor-trailers, from the farms to an assembly point. Farmers who bring the produce themselves to the major terminal markets or periodic rural markets (fairs) use hired lorries, carts, bicycles and even public buses.

Transport of vegetables for commission agents, from the rural assembly points to the major wholesale markets, is the responsibility of the transport agents. The trucker-buyers transport vegetables from rural areas to wholesale and/or retail markets either by their own or hired lorries.

The lorries of the MD, MARKFED and Co-operative also go to the villages and collect vegetables from the producers. Sometimes, the producers themselves transport produce to the collecting centres of these institutions.

From the wholesale markets to the retail markets, transport of vegetables is carried out by transport agents, retailers and even producers. The MD and MARKFED use their own vechicles to transport vegetables from wholesale floors to their retail outlets.

Long distance transport of vegetables is done mostly by road because it is less costly, quicker and avoids multiple handling compared with railway. However, in a limited scale railway is also used,e.g. to transport vegetables between Colombo and Jaffna. Rail transport is more costly and inconvenient in terms of multiple handling, wastage due to delays, procedural difficulties such as filling forms etc. Therefore, road transport is widely used irrespective of the present problems attached to it in terms of physical inadequacy and quality inefficiencies.[1]

5.1.3 Marketing Services

The major marketing services discussed here are farm financing and the provision of price and other market information.

(a) Farm Financing

The two major sectors which finance the vegetable cultivation are the private sector and the institutional sector. As we discussed in Chapter 4, the total amount of credit granted by the institutions (banks, co-operatives etc.) to the vegetable sector shows a dramatic decrease over recent years. This invariably paves the way for the dominance of the

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[1] See for a detailed discussion of the aspects of transport of agricultural produce in Sri Lanka, Sundaralingam, K (1974) "Transport and Marketing in Sri Lanka with Special Reference to Agriculture", Paper presented at the Ceylon Studies Seminar on Agriculture in the Economic Development in Sri Lanka, Peradeniya. 15-20 August, 1974.

private sector. Private sector money lenders for vegetable cultivation include commission agents, other private traders, professional money-lenders, neighbours, friends and relatives. Commission agents and other private vegetable traders are the most important among the lenders for vegetable cultivation in the study localities.

Private commission agents provide credit at all levels. The producers get credit for cultivation and other purposes allied to vegetable marketing. The loans are free of a formal interest and producers consider this as a great benefit.

Bnaks and co-operatives charge formal interest rates. Procedural difficulties, borrowers have to experience at these sources, contribute to the dominance of the private lending.

The MD and the MARKFED do not offer lending facilities to the vegetable cultivators. Therefore, vegetable marketing by these two organisations is not tied in any way with the production process.

Production credit plays an important role in determining the dominance of a particular outlet in vegetable marketing.[1] This aspect is discussed in more detail in section 5.2.4.2.

(b) Provision of Market Information[2]

The purpose of the provision of information about prices, volumes etc., is to assist growers and traders in balancing demand and supply in particular markets and so to limit excessive fluctuations in prices and supplies.

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[1] Relative importance of each source in supplying credit to the vegetable cultivators in Palugama area (Welimada) has been shown in Abeysekera and Senanayake (1974) op.cit. pp 33 - 34 and Narayanasamy, C (1976) A Case Study On Co-operative Marketing. (Unpublished)

[2] See for details, Abeysekera and Senanayake (1974) op.cit. pp 43 - 44 and section 5.3 of this chapter.

The sources of price information for vegetable growers in Sri Lanka are the radio, newspapers, bills and personal communications with private traders and neighbour-producers.

Colombo wholesale market prices of vegetables are broadcast by the MD for the use of producers. The majority of the vegetable growers receive this information but are not able to make full use of it because of the strong bargaining position of the traders, unavailability of competitive marketing outlets, the perishable nature of vegetables and socio-economic relationships between the producers and the traders.

Most of the cultivators in Baddulla and Kandy were of the view that commission agents' prices were more indicative of Colombo market prices. The actual price, the farmers get from the private traders is substantially different from that announced over the radio. In some instances, it was observed that if the prices are not announced farmers would be able to get even higher prices.

The majority of the cultivators at Ikiriwewa and Lunuwewa (Anuradhapura) claim that they receive little or no prior information on price and come to know about price only after offering the produce for sale.

5.2 Traditional (Private) Marketing Mechanism and Price of Vegetables

This section is concerned with price structure, pricing efficiency and price determination in the private marketing system for vegetables. Section 5.3 then deals with the institutional marketing reform and its implications on pricing of vegetables in Sri Lanka.

5.2.1 Marketing Costs, Margins and Price of Vegetables

The retail price of vegetables can be treated as the sum of : (a) cost of production (b) producers' margins , (c) marketing costs and margins accrued to middlemen and (d) loss and waste of produce in handling and transit. Cost of production and producers' margins were discussed in Chapter 4. This section discusses the marketing costs and margins in detail. A part of marketing costs is also incurred by the producers. The net profits of

the middlemen are the grosss margins less cost. Profit in this regard must also be treated as a payment of risk bearing and enterpreneurship.

It is difficult to analyse the cost items for each individual vegetable. Therefore, the following analysis is mainly applicable for vegetables as a whole.

5.2.1.1. Marketing Costs

The cost items discussed here include transport , containers, labour, commissions, broker fees, market levies, taxes etc. In addition to these, there are costs involved in communication, risk of operations and interest on loans. But it is difficult to quantify these, and these are regarded as a residual which is included in margins accrued to the traders. The cost is discussed here on the basis of a lot of 100 lbs. of vegetables for the convenience of computation of costs and margins. The wastage of the produce is also regarded as a cost item.

(a) Transport Cost[1]

It was observed that transport charges were on three bases i.e. (i) piece-rate e.g. per gunny or box (ii) per lb. cost and (iii) a fixed rate for a lorry load to a particular distance. The most prevalent were the first two .

Producers bear a certain part of the total transport cost. When selling vegetables to commission agents, they have to bear the total transport cost up to the wholesale point. If they sell to village assembly traders or to trucker-buyers, they have to incur only the cost attached to transporting the produce from the farm to the assembly point. Thus, the transport cost incurred by producers varies according to the outlet to which they sell their produce.

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[1]The transport and other costs discussed here are the those prevailing during August 1978 to February 1979. Between the time of data collection and writing up of this report, diesel price was increased by the government by about Rs.5/- per gallon. This has led to further increases in the costs of transport of vegetables .

Table 36-; Average Transport Cost Reported by the Producers According to Marketing Outlet

(Rs. for 100 lbs.)

	Outlet and Description					
	Trucker → buyer		Commission Agent			
	(a)	(b)	(a)	(b)	(c)	
	From the farm to nearest motorable road (average distance = ¼ mile)	From the farm/ road to assembly point (average distance ¼ to ½ mile)	From the farm to nearest motarable road (average distance ¼ to ½ mile)	From the farm/ road to assembly point (average distance ¼ to ½ mile)	From the farm/ road/assembly point to the terminal market	
					Colombo	Kandy
1. Vidurupola	-	-	-	2.00	5.00	-
2. Boragas	-	-	1.00	-	5.00	-
3. Hewavissa	1.50	1.50	1.50	1.50	5.00	3.00
4. Meeruppa	1.00	1.00	-	1.00	5.00	3.00
5. Ikiriwewa	1.00	-	-	-	-	-
6. Lunuwewa	1.00	-	-	-	-	-
7. Jaffna	-	-	1.50	1.50	7.00	-

The average cost of transport incurred by the producers is shown in table 36. However, these may change depending on the conditions of roads etc.

The transport costs incurred by the producers at Boragas are lower than those at Vidurupola because of the involvement of the Boragas Transport Union. In this case the farmers do not have to pay a transport cost from the road to the assembly point. The union however, charges 2 percent of the total transport bill, for the distance between the assembly point and Colombo. The farmers who use tractor-trailers to transport vegetables from the farm to the road also pay about 01 ct. per lb.

The average costs of transport incurred by the trucker-buyers are presented in table 37. In addition to these, they also have to pay daily wages to drivers and their assistants. For example, the trucker buyers who come to Hewavissa, Meeruppa and Ikiriwewa areas reported that they pay on average Rs.20/- per day for the driver and Rs.15/-per day for the assistant working in the lorry.

Table 37-: Average Transport Cost Reported by Trucker-buyers (Rs.for 100 lbs.)

To / From	Colombo (Pettah)	Kandy	Badulla	Kurunegala	Galle	Horana	Anuradhapura	Jaffna	Matara	Hatton	Batticaloa	Kegalle	Yatiyanto ta
Hewavissa	3.50	1.50	2.00										
Meeruppa	3.50	1.50	2.00	1.25	2.00	1.75	1.00						
Ikiriwewa	4.50		3.50					4.00					
Lunuwewa	4.50		3.50					4.00					
Welimada fair									4.00	5.00	4.00	2.25	
Talawa/ Tambuttegama fairs		1.50						3.00					1.90
Jaffna	7.00												

Table 38-:Average Transport Cost Reported by Retailers (Rs. for 100 lbs.)

From \ to	Kandy	Borella	Dematagoda	Nugegoda	Moratuwa	Kirulapana	Ragama	Veyangoda	Grandpass	Kalutara	Maharagama
Pettah (Colombo)		1.00	1.25	1.50	1.25	1.00	1.50	2.00	0.75	2.00	2.00
Badulla											3.00
Kandy											2.50
Anuradhapura	2.00										
Jaffna	4.00										
Mahiyangana	3.50										
Embilipitiya											5.00

The increases in transport cost due to increasing cost of fuel, vehicles, spare parts and wages is substantial over the years. For example, in 1964 the transport cost per 100 lbs. of vegetables from Nuwara-Eliya to Colombo was about Rs.1.50[1] whereas it increased up to Rs. 3.50 in 1974.[2] During the present survey (1978/79) it was about Rs.7/-. This shows an increase of over 350 percent from 1964 to the begining of 1979. The transport cost has gone up further in the latter part of 1979 owing to the increase in fuel cost.

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[1] Department of Agrarian Services (1964) op.cit. p. 350

[2] Abeysekera and Senanayaka (1974) op.cit, p. 55.

The transport cost from Hewavissa to Kandy has increased by about 100 percent from 1976 to 1978.

Though one could expect the transport cost to be decreased with the liberalisation of imports of lorries and vans,[1] this does not in fact happen because of the concentration of ownership of these vehicles among a few. It was observed during the survey that most of the new lorries had been acquired by the existing transport agents and owners. Moreover, the lorry owners specialise in certain routes in the collection of vegetables. Hence the existing transporters have maintained or increased their charges.

(b) Cost of Containers

Some commission agents supply gunny bags to the producers, but most of the producers use their own containers. The farmers in Vidurupola have to pay Rs.6/- for a gunny bag purchased from private traders. The farmers earlier used discarded fertilizer gunnies . But, most fertilizers are now being packed in polythene bags.

If the containers are supplied by the commission agents, they keep a deposit of about Rs.4/- per container.

The gunny bags can be used only for about 3 times. A wooden box can be used for about one month during a season and hence is more expensive. Cadjan can be used only once. The average cost of these containers are presented in table 39.

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[1] Given other things remain constant, e.g . Prices of diesel and spare parts etc., remain unchanged.

Table 39-: Average Cost of Containers to the Producers (Rs. for 100 lbs.)

Type of Containers	Viduru pola	Bora gas	Hewavi ssa	Meeru ppa	Ikiri wewa	Lunu wewa	Jaffna
Gunny (Normal)	2.00	1.25	-	1.75	-	-	1.50
Gunny (Coarse-mesh)	-	0.75	1.25	1.25	0.75	0.75	0.75
Wooden box	-	-	2.25	2.00	1.75	1.75	-
Cadjan	-	-	0.25	0.20	-	-	-

The cost of containers has also increased over time. For example, at Boragas, a gunny bag cost only Rs.2/- in 1977 whereas it increased to Rs.5/- in 1978. The cost of a wooden box has increased by about Rs.4/- over the same period. In 1973, a wooden box cost Rs.2.50 for the producers at Hewavissa while it increased to about Rs.8/- in 1978.

(c) Marketing Labour Charges

Marketing labour charges include loading and unloading expenses and wages paid to clerks, sales assistants etc., who are working at market places.

Farmers have to pay both loading and unloading charges, when they sell their produce through the commission agents. The charges are mostly on per-container basis. When the farmers sell their vegetables to trucker-buyers, they have to pay only for loading. The commission agents in Colombo deduct 25 cts. per container as labour charges from farmers' bills while wholesalers in Kandy usually charge 20 cts.

Average marketing labour charges paid by producers are given in table 40.

The average labour charges paid by retailers for loading and unloading comes to about Rs.1/- per 100 lbs. of vegetables (67 cts. for loaders at Pettah and 33 cts.for unloaders at the retail markets).

Table -40 Average Marketing Labour Charges Paid by the Producers (Rs. for 100 lbs.)

Labourers	Locality						
	Viduru pola	Bora gas	Hewavi ssa	Meeru ppa	Ikiri wewa	Lunu wewa	Jaffna
Loading & unloading	0.17	0.17	0.15	0.32	0.66	0.66	0.33

Wages paid to clerks and sales assistants at the retail and wholesale markets are mostly on a per day or per month basis.

Wholesalers in Kandy pay, on average, about Rs.16/- per day per clerk and Rs.10/- per day per sales assistant. At the retail level, wages paid to sales assistants very from Rs.5.50 at Dematagoda to Rs.7.50 at Nugegoda and Maharagama.

(d) Commissions & Broker Fees

It is the normal practice of the commission agents to retain 10 percent of the proceeds of sale payable to the vegetable producers, as their sales commission.[1] However, it was observed that they obtain a higher margin than this, but it is difficult to compute for each individual vegetable. Therefore, the sales commission should not be regarded as the commission agents' profit margin.

Broker charges are payable by producers and retailers. Those paid by producers are presented in table 41.

Table 41-: Average Broker Charges Reported by Producers (Rs. for 100 lbs.)

	Bora gas	Hewavi ssa	Meeru ppa	Ikiri wewa	Lunu wewa
Normal broker charges	8.00	7.50	12.50	7.50	15.00
Transport union commission	0.13	-	-	-	-
Transport union broker charges	0.37	-	-	-	-
For getting proceeds of sale	-	3.00	-	-	-
Total	8.50	10.50	12.50	7.50	15.00

[1] A commission of 5 percent is charged from the proceeds of sale of potatoes.

Retailers who purchase vegetables from the Pettah market have to pay, on average, Rs.10/- per 100 lbs. of vegetables to the brokers, if they are to get their requirements promptly and in good quality .

At the Pettah market there were complaints of having to pay protection money (kappan) to a particular broker, who is responsible for the unloaders and loaders, turning around and parking lorries etc. The protection money paid to this broker vary from Rs.30/- per lorry load to 5 percent of the proceeds of sale per lorry load. Some traders admitted that they had to pay about Rs.400/- to this broker on the occasions of the New year and Christmas.

(e) Market Levies, Taxes and Rent etc.[1]

Producers bring their vegetables for sale at the producer fairs e.g. Welimada, Talawa, Tambuttegama and Chunnakam. At the Welimada fair, the producers have to pay 50 cts. per container of goods brought to the fair and another 50 cts. for weighing of containers.

The persons who come to Tambuttegama and Talawa fairs have to pay a tax of Rs.2/- per market day for a space of 2 x 1 yards. At Chunnakam too, the producers are charged Re.1/- for entry into the market and another Rs.1/- for weighing of the produce (per container).

There are four grades of wholesale stalls in the Pettah market. The annual rent payavle to Colombo M.C. varies according to grades. The higher grade-stall fees vary from Rs.1181.25 to Rs.1312.50, while the lower grade-stalls pay a rent between Rs.354.38 and Rs.708/-. Some wholesalers have sub-let their stalls. The sub-lessees have to pay a rent of Rs.15/- 30/- per day to the original lessee. The wholesalers at the Kandy market pay Rs.210/- as stall rent to Kandy M.C. The monthly rents include the maintenance of stalls as well. At Chunnakam the wholesalers pay, on average, Rs.3.50 per market day. The average market levies and stall rent payable by the retailers per day are given in table 42.

[1] In addition, there are electricity fees, telephone charges and maintenance of stalls. However, all these and market levies, taxes and rent are difficult to take into account for 100 lbs. of vegetables.

Table 42-: Average Market Levies and Rents Reported by the Retailers (Rs. per day)

Item	Welimada	Talawa/ Tambuttegama fairs	Kandy	Jaffna	Boralla	Dematogoda	Nugegoda Pola	Nugegoda Supermarket	Nugegoda Pavement	Maharagama
Market levy	0.50	3.50	-	1.00	-	-	-	-	0.75	1.00
Stall rent	-	-	2.00	-	11.50	5.00	1.50	13.50	-	2.75

(f) Wastage

Shrinkage, drying and spoilage cause loss of weight from the point of harvesting to the time of final disposal. The producers reported that, on average, about 12% go waste between these points. When sending vegetables to the commission agents farmers have to bear the loss in weight in transit too which amounts, to about 16% of the original weight. At retail level, it was computed that the average loss due to cleaning, washing, spoilage and shrinkage is about 17% of the original weight.

The average loss of produce at farm level, in transit and at retail level is given in tables 43 and 44.

Table 43-: Average Wastage Incurred by Producers: (lbs. for 100 lbs. of vegetables)

Description	Place					
	Vidurupola	Boragas	Meeruppa	Ikiriwewa	Lunuwewa	Average
After harvest & before selling	3	-	-	20	13	12
In transit	8	18	22	--	--	16

Table 44-: Average Wastage Incurred by the Retailers: (Lbs. for 100 Lbs. of vegetables)

Description	Place					
	Welimada	Talawa/ Tambutt-egama fairs	Kandy	Nugegoda	Mahara gama	Average
Waste due to cleaning & washing ; spoilage & shrinkage	22	16	10	20	15	17

For cabbage, tomatoes, and brinjal the wastage Percentage is relatively high. Beans, carrot and beetroot have moderate waste percentages while red pumpkin has very low or no loss rate. However, for the convenience of computation, the average loss rates are used in out analysis of price spreads and marketing margins, for selected vegetables.

5.2.1.2 Price Spread and Marketing Margins

The marketing margin refers to the difference between the price paid by the ultimate consumer and the price received by the producer for an equivalent quantity of farm produce. Price spread refers to the value added to the price of a specific lot of produce at various levels i.e. producer level, wholesale level and the consumer (retail) level, by various marketing functionaries and functions. Marketing margins include all the costs of performing the various marketing functions and services and also the profit margins of various market functionaries involved in the marketing process.

Analysis of marketing margins is useful for this study to :

1. understand and compare the relative efficiency of the different marketing channels in order to judge whether the services of middlemen are provided at a reasonable cost; and
2. formulate policies in order to assure the producers of a legitimate share in the consumers'rupee and to protect the latter against unduly high prices.

In theory, marketing margins and price spreads can be computed by three methods, i.e. "lot method", "turnover-method" and "mode method". However, due to practical difficulties involved in computing the price spread and margins by the first two methods, the "mode" method is used in the present analysis.

The prices received by the producers and those paid by the traders and consumers at the selected localities and markets were collected during the first phase of the survey i.e. from 07.10.1978 to 18.11.1978. The modes of each of these price series were then calculated for different levels of the marketing system.

Marketing margins vary for different marketing channels and for different vegetables. Since it is difficult to calculate margins for a larger number of channels and vegetables, typical and manageable number of vegetables and two important marketing channels were selected for this analysis. To represent typical cases of the vegetables and the marketing channels, three areas of origin (three out of eight localities) were further selected. The selected vegetables are as follows:-

1. Beans	2. Beetroot	3. Cabbage
4. Carrot	5. Leeks	6. Tomatoes
7. Raddish	8. Knolkhol	9. Capsicum chillies
10. Brinjal	11. Bitter gourd	12. Cucumber
13. Lady fingers	14. Long beans	15. Luffa
16. Red pumpkin	17. Snake gourd	

The selected marketing channels are as follows:-

1. Producer-----Commission Agent----- Retailer-----Consumer
2. Producer-----Assembly Agent-----Trucker buyer/Retailer-----Consumer

The villages selected were (1) Vidurupola to represent the first channel and the first ten vegetables (2) Meeruppa to represent the second channel and five of the first ten vegetables and (3) Hewavissa to represent the second channel and the last seven vegetables.

In this analysis, the marketing margins and price spread are measured in terms of (i) rupees per 100 lbs. of vegetables and (ii) as percent

of consumer ' price.

The data on the marketing costs and wastage taken for this analysis are those discussed and presented in section 5.2.1.1. However, operating costs of the traders were not easily ascertainable and are presented together with their commissions and margins. The operating costs include, wages paid to sales assistants, clerks etc., costs of communication, risk of operations, interest on loans, maintenance of stalls, stall rents, taxes and market levies.

Table 45 presents the costs incurred at each level of gross marketing margins for 100 lbs. of 10 selected vegetables marketed through commission agents, by the producers at Vidurupola, As the table shows, the gross marketing margins vary from 55.7 percent for beans to 84.3 percent for raddish. Conversely, the net price received by the producers varies from 15.7 percent of the consumers' price for raddish and 44.3 percent for beans. It is interesting to note that the gross marketing margins of vegetables with relatively higher loss ratio are comparatively higher than those vegetables with relatively lower loss ratio. For example, the percentage gross marketing margins of raddish, knolkhol, tomatoes, and cabbage are relatively larger than those of other selected vegetables. It is also worth mentioning that the net price received by the producer is less than 50 percent of the consumer price, for all the selected vegetables. The producers bear an important proportion of the total cost of the marketing services, under the commission agency system of vegetable marketing.

Table 46 and figure 8 present the percentage shares of the consumers' price accruing to each category of personnel under the commission agency system of marketing. Again, as mentioned earlier, the producers' share is less than 50 percent for all the selected vegetables.

Table 45:- Analysis of Marketing Costs and Margins for Selected Vegetables (Rs. for 100 lbs.)

Marketing Channel:- Producer -----Commission Agent -----Retailer-----Consumer

Producer Price:- Prices received by the producers at Vidurupola

Crop	Beans		Beetroot		Cabbage		Carrot		Leeks		Tomatoes		Raddish		Knolkhol		Capsicum chillies		Brinjal	
Description	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price
1.Producer level																				
Net price received by the producers	64.63 (44.3%)		38.39 (32.5%)		21.99 (19.8%)		40.03 (34.8%)		34.29 (30.6%)		41,67 (17.8%)		11,33 (15.7%)		22.81 (23.8%)		72.83 (31.4%)		41.67 (30.2%)	
Transport	7.00		7.00		7.00		7.00		7.00		7.00		7.00		7.00		7.00		7.00	
Containers	2.00		2.00		2.00		2.00		2.00		2.00		2.00		2.00		2.00		2.00	
Loading & unloading	0.17		0.17		0.17		0.17		0.17		0.17		0.17		0.17		0.17		0.17	
Wastage	7.20		4.64		3.04		4.80		4.24		4.96		2.00		3.12		8.00		4.96	
Sales commission 10%	9.00		5.80		3.80		6.00		5.30		6.20		2.50		3.90		10.00		6.20	
2.Commission Agents Level	90.00		58.00		38.00		60.00		53.00		62.00		25.00		39.00		100.00		62.00	

Contd/...

Table 45 continued..

Crop	Beans		Beetroot		Cabbage		Carrot		Leeks		Tomatoes		Raddish		Knolkhol		Capsicum chillies		Brinjal	
escrip-ion	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price
Retail-rs level	90.00	58.00	38.00	60.00	53.00	62.00	25.00	39.00	100.00	62.00										
ransport	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50										
oading & nloading	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00										
roker harges	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00										
astage	24.82	20.06	18.87	19.55	19.04	39.78	12.24	16.32	39.44	23.46										
etailers argin & perating osts	18.68	27.44	41.63	22.95	27.46	119.72	22.26	28.18	80.06	40.04										
Price paid by consume rs	146.00	118.00	111.00	115.00	112.00	234.00	72.00	96.00	232.00	138.00										
Gross marketing margin(4-1)	81.37 (55.7%)	79.61 (67.5%)	89.01 (80.2%)	77.97 (67.8%)	77.71 (69.4%)	192.33 (82.2%)	60.67 (84.3%)	73.19 (76.2%)	159.17 (68.6%)	96.33 (69.8%)										

Table 46-: Prices Paid by the Consumers and the Shares Accruing to the Producers and Others (For 100 lbs.)

Marketing Channel: Producer ——— Commission Agent ——— Retailer ——— Consumer

Producers: Producers at Vidurupola

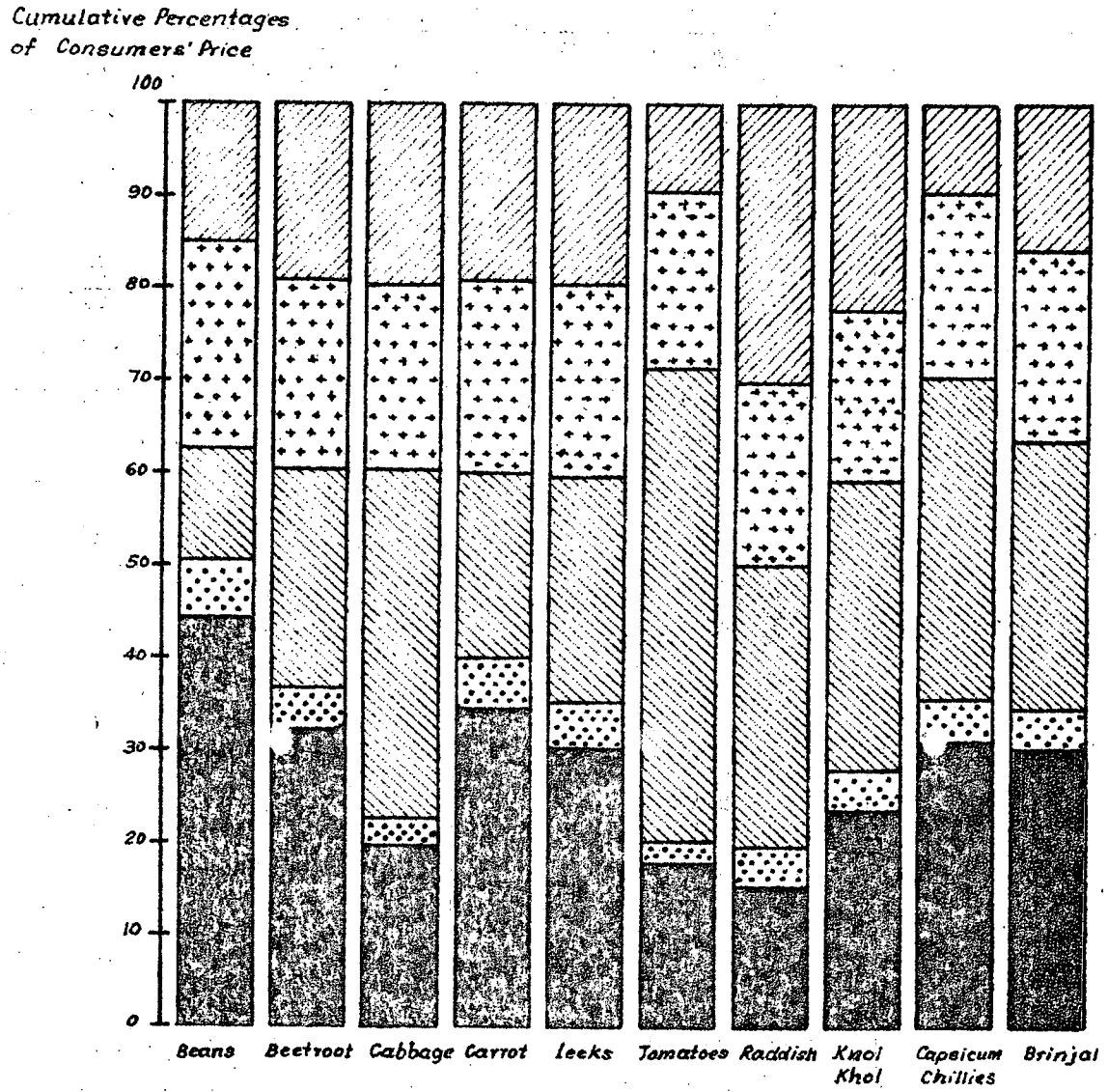
CROP

Description	Beans		Beetroot		Cabbage		Carrot		Leeks		Tomatoes		Raddish		Knolkhol		Capsicum chillies		Brinjal	
	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	%of consumer price	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	% c
. Producer	64.63	44.3	38.39	32.5	21.99	19.8	40.03	34.8	34.29	30.6	41.67	17.8	11.33	15.7	22.81	23.8	72.83	31.4	41.07	30
. (a)Commission Agents' margin....	9.00	6.2	5.80	4.9	3.80	3.4	6.00	5.2	5.30	4.7	6.20	2.6	2.50	3.5	3.90	4.1	10.00	4.3	6.20	4
(b)Retailers operating costs & margin	18.68	12.7	27.44	23.3	41.63	37.5	29.95	20.0	27.46	24.5	119.72	51.2	22.26	30.9	28.18	29.4	80.06	34.6	40.04	29
. Traders' total margin (a+b)	27.68	18.9	33.24	28.2	45.43	40.9	28.95	25.2	32.76	29.2	125.92	53.8	24.76	34.4	32.08	33.5	90.06	38.9	46.24	33
. Wastage	32.02	21.9	24.70	20.9	21.91	19.7	24.35	21.2	23.28	20.8	44.74	19.1	14.24	19.8	19.44	20.2	47.44	20.4	28.42	2
5. Cost of all other marketing services	21.67	14.9	21.67	18.4	21.67	19.6	21.67	18.8	21.67	19.4	21.67	9.3	21.67	30.1	21.67	22.5	21.67	9.3	21.67	1
6. Consumer price..... (1+3+4+5)	146.00	100.0	118.00	100.0	111.00	100.0	115.00	100.0	112.00	100.0	234.00	100.0	72.00	100.0	96.00	100.0	232.00	100	138.00	100

FIG. 2: PERCENTAGE SHARES OF THE CONSUMER'S PRICE ACCRUING TO PRODUCERS AND OTHERS (CONSUMERS' PRICE = 100)

MARKETING CHANNEL: Producer → Commission Agent → Retailer → Consumer.

PRODUCERS : Producers at Vidurupola.



The share accruing to the commission agent is the lowest of those mentioned. In fact, it is lower than the brokers'/subwholesalers' margin. However, as discussed earlier, the commission agents seem to be enjoying an "hidden" margin which is not ascertainable in an analysis like this. The prices used for this analysis are those reported by producers at Vidurupola. Therefore, it is reasonable to think that this "hidden" margin is obtained from the retailers and that the retailers' margin may be lower than those presented here.

The retailers' operating costs and margins also cannot be regarded as small. It varies from 18.9 percent for beans to 53.8 percent for tomatoes . It is also clear that the percentage share of the ascertainable cost of marketing services are lower than the shares absorbed by the traders and wastage factor. The broker fees paid by the retailers are also included here as a cost of a marketing service. But, if it is added to the traders' margin, then the share of the genuine marketing services is reduced further. The traders' total percentage share is higher for more perishable vegetables such as cabbage , tomatoes, raddish and knolkhol and capsicum chillies.

Table4 7 presents gross marketing margins and cost incurred for 100 lbs. of 5 selected vegetables marketed through assembly agents and trucker-buyers, by producers at Meeruppa. According to this table, the gross marketing margins vary from 57.4 percent of consumer price for beans to 92.2 percent for raddish.

The net price received by the producers under this system is higher than that under the commission agency system except for beans and raddish. The prices paid by the assembly agents/trucker- buyers for these two vegetables to the producers at Meeruppa were very low compared to those paid by the commission agents to the producers at Vidurupola.

The total marketing costs incurred by the producers under this channel is lower than those incurred under the commission agency system. The ascertainable costs incurred by the retailers (trucker-buyers) are also lower under this system. For example, there are no broker fees involved, unlike in the case of the commission agency system. However, the assembly agents' commission paid by the producers is comparatively higher than the commission

Table 47-: Analysis of Marketing Costs and Margins for Selected Vegetables (Rs.: for 100 lbs.)

Marketing Channel: Producer ----- Assembly Agent ----- Trucker buyer/Retailer ----- Consumer

Producer Price: Prices received by the porducers at Meeruppa

Description	CROP									
	Beans		Beetroot		Cabbage		Raddish		Knolkhol	
	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price
1.Producer Level Net price received by the producers..		62.13 (42.6%)		47.58 (40.3%)		23.33 (21.0%)		5.61 (7.8%)		25.98 (27.1%)
Transport.....	2.00		2.00		2.00		2.00		2.00	
Wastage	2.37		1.92		1.17		0.39		1.02	
Assembly Agents' commission	12.50		12.50		12.50		5.00		5.00	
2.Trucker buyer/ Retailer Level...	79.00		64.00		39.00		13.00		34.00	
Transport	5.00		5.00		5.00		5.00		5.00	
Loading and unloading.....	0.23		0.23		0.23		0.23		0.23	
Containers.....	1.50		1.50		1.50		1.50		1.50	
Wastage.....	32.12		29.96		24.42		15.84		21.12	
Trucker buyers' operating costs and margin.....	28.15		21.31		40.85		36.43		34.15	
3.Price paid by consumers		146.00		118.00		111.00		72.00		96.00
Gross marketing margin (3-1)	83.87 (57.4%)		70.42 (59.7%)		87.67 (79.0%)		66.39 (92.2%)		70.02 (72.9%)	

agents' margin.

Under this marketing system, the ascertainable costs of genuine marketing services are the lowest while the traders' share is the highest component of the consumer's price (Table 48 figure 9). Wastage factor is also considerable where, on average, 23 percent of the consumer price is attributed to it. In this case too, the share accruing to the producer is less than 50 percent for all the selected vegetables.

Table 49 shows the cost of marketing services and gross marketing margins of 7 selected indigenous vegetables marketed through the assembly agent/ trucker buyer, by the producers at Hewavissa. This table shows that the net price received by the producers is below 50 percent of the consumer price except in the case of red pumpkin. It varies from 22.7 percent for snake gourd to 53.7 per cent for redpumpkin. Conversely the percentage gross marketing margin is lowest for redpumpkin (46.3) and highest for snake gourd(77.3 percent).

Relatively low priced and more perishable vegetables exhibit higher gross marketing margins. Examples are snakegourd, cucumber and long-beans. The cost of containers and wastage factor do not apply to red pumpkin, and hence a lower gross marketing margin.

Table 50 and figure 10 show the relative shares of the consumer price for these vegetables accruing to different categories of personnel, marketing services, and wastage factor.

In this case, the assembly agents' share is lower than in the case of Hewavissa. The traders' total margin is higher than the share accruing to the producers for 4 out of 7 selected vegetables, namely bitter gourd, cucumber, long beans and snakegourd. The ascertainable costs of marketing services are lower than both the share accruing to the traders and the wastage factor. Wastage is also considerable, (except in the case of red pumpkin) which is about 23 percent of the consumers price.

Table 48-; Prices paid by the Consumers and the Shares Accruing to the Producers and Others (for 100 lbs.)

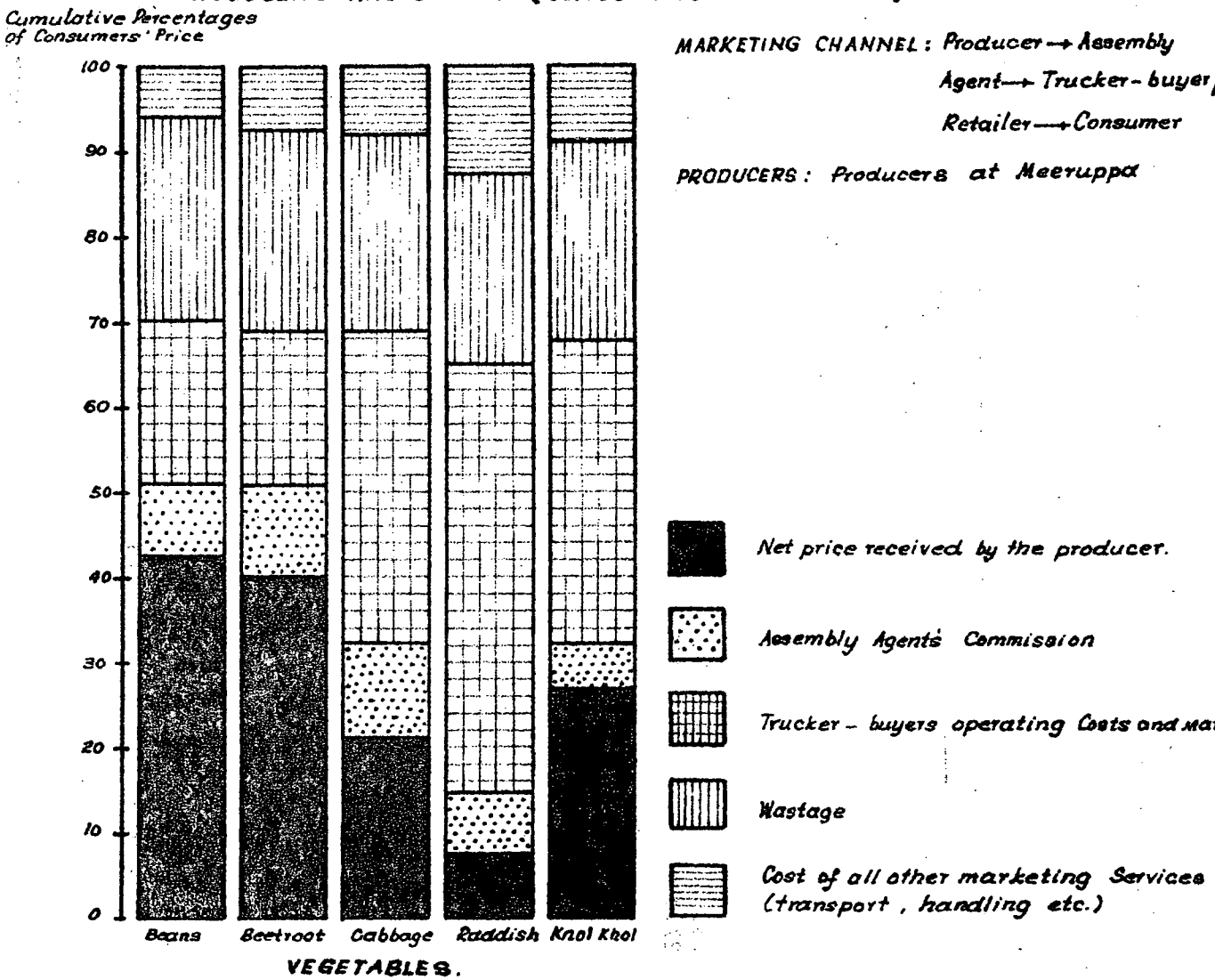
Marketing Channels : Producer ----- Assembly Agent ----- Trucker buyer/Retailer ----- Consumer

Producers: Producers at Meeruppa

CROP

Description	Beans		Beetroot		Cabbage		Raddish		Knolkhol	
	Price/margin (Rs.)	% of consumer price	Price/margin (Rs.)	% of consumer price	Price/margin (Rs.)	% of consumer price	Price/margin (Rs.)	% of consumer price	Price/margin (Rs.)	% of consumer price
1.Producer	62.13	42.6	47.58	40.3	23.33	21.0	5.61	7.8	25.98	27.1
2.(a) Assembly Agents' Commission	12.50	8.6	12.50	10.6	12.50	11.3	5.00	6.9	5.00	5.2
(b) Trucker buyers' operating costs & margin	28.15	19.3	21.31	18.1	40.85	36.8	36.43	50.6	34.15	35.6
3.Traders' total margin(a+b)	40.65	27.9	33.81	28.7	53.35	48.1	41.43	57.5	39.15	40.8
4.Wastage....	34.49	23.6	27.88	23.6	25.59	23.1	16.23	22.5	22.14	23.0
5.Cost of all other marketing services	8.73	5.9	8.73	7.4	8.73	7.8	8.73	12.2	8.73	9.1
6.Consumer price (1+3+4+5)	146.00	100.00	118.00	100.00	111.00	100.00	72.00	100.00	96.00	100.00

Figure. 9. PERCENTAGE SHARES OF THE CONSUMERS' PRICE ACCRUING TO PRODUCERS AND OTHERS (CONSUMERS' PRICE = 100)



Marketing Channel:- Producer ----- Assembly Agent ----- Trucker buyer/Retailer ----- Consumer

Producer Price :- Prices received by the producers at Hewavissa

Description	CROP													
	Bittergourd		Cucumber		Lady fingers		Long beans		Luffa		Red pumpkin		Snakegourd	
	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price	Cost	Price
1. Producer Level:														
Not price received by the producers.....		42.85 (33.2%)		23.45 (27.9%)		42.85 (40 0%)		38.00 (31.7%)		33.15 (36.8%)		79.50 (53.7%)		18.60 (22.7%)
Transport	3.00		3.00		3.00		3.00		3.00		3.00		3.00	
Wastage	1.65		1.05		1.65		1.50		1.35		-		0.90	
Assembly Agents' Commission	7.50		7.50		7.50		7.50		7.50		7.50		7.50	
2. Trucker buyer/ Retailer level....	55.00		35.00		55.00		50.00		45.00		90.00		30.00	
Transport	5.00		5.00		5.00		5.00		5.00		5.00		5.00	
Loading & unloading	0.23		0.23		0.23		0.23		0.23		0.23		0.23	
Containers	1.25		1.25		1.25		1.25		1.25		-		0.25	
Wastage	28.38		18.48		23.54		26.40		19.80		-		18.04	
Trucker buyer's operating cost & margin....	39.14		24.04		21.98		37.12		18.72		52.77		28.48	
3. Consumer price		129.00		84.00		107.00		120.00		90.00		148.00		82.00
Gross marketing margin (3-1)	86.15 (66.8%)		60.55 (72.1%)		64.15 (60.0%)		82.00 (68.3%)		56.85 (63.2%)		68.50 (46.3%)		63.40 (77.3%)	

Table 50-; Prices Paid by the Consumers and the Shares Accruing to the Producers and Others (For 100 lbs.)

Marketing Channel;- Producer ----- Assembly Agent ----- Trucker buyer/Retailer ----- Consumer

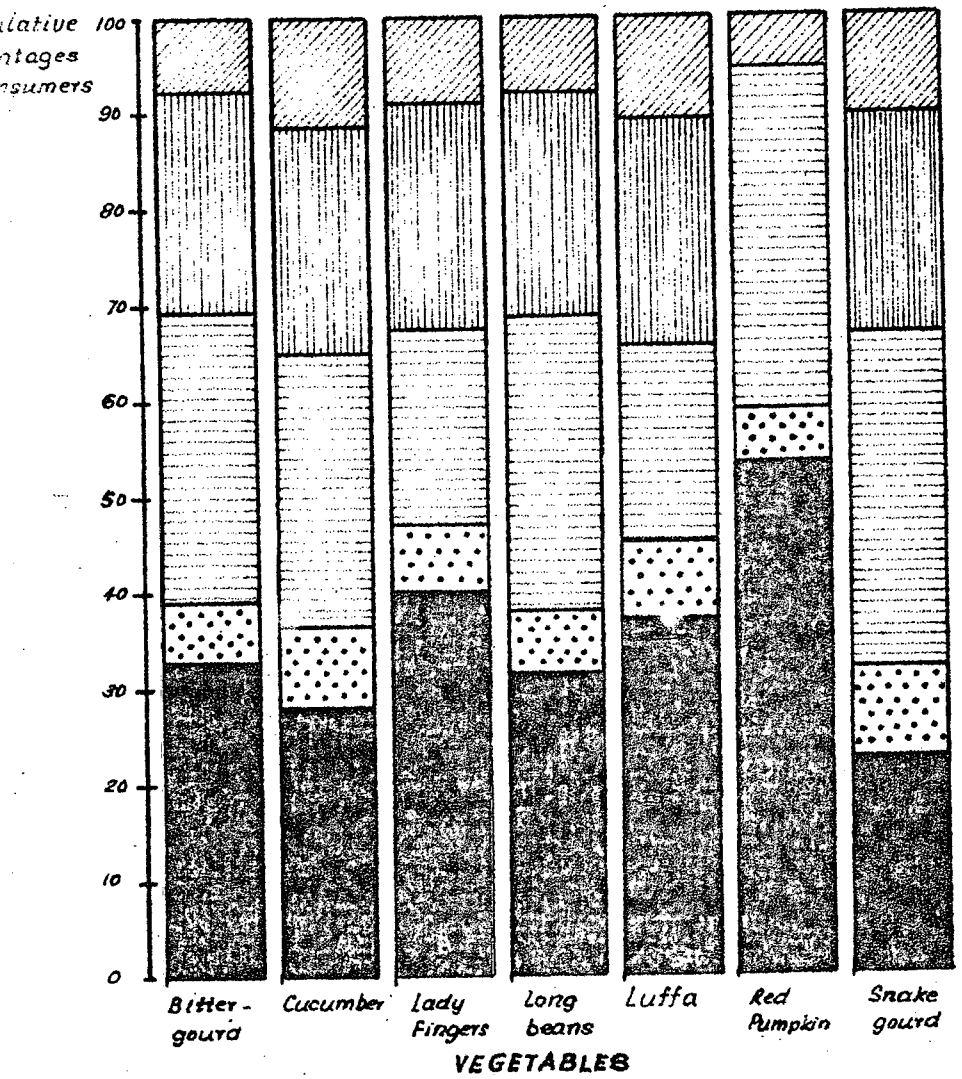
Producers :- Producers at Hewavissa

Description	CROP													
	Bittergourd		Cucumber		Ladyfingers		Long beans		Luffa		Red pumpkin		Snakegourd	
	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	% of consumer price	Price/ margin (Rs.)	% of consumer price
1. Producer	42.85	33.2	23.45	27.9	42.85	40.0	38.00	31.7	33.15	36.8	79.50	53.7	18.60	22.7
2. Assembly Agents' Commission (a)	7.50	5.8	7.50	8.9	7.50	7.0	7.50	6.3	7.50	8.3	7.50	5.1	7.50	9.2
Trucker buyers' (b) operating cost & margin....	39.14	30.4	24.04	28.6	21.98	20.5	37.12	30.9	18.72	20.8	52.77	35.6	28.48	34.7
3. Traders' total margin (a+b)	46.64	36.2	31.54	37.5	29.48	27.5	44.62	37.2	26.22	29.1	60.27	40.7	35.98	43.9
4. Wastage	30.03	23.3	19.53	23.3	25.19	23.5	27.90	23.3	21.15	23.5	-	-	18.94	23.1
5. Cost of all other marketing service	9.48	7.3	9.48	11.3	9.48	9.0	9.48	7.8	9.48	10.6	8.23	5.6	8.48	10.3
6. Consumer price (1+3+4+5)	129.00	100.00	84.00	100.00	107.00	100.00	120.00	100.00	90.00	100.00	148.00	100.00	82.00	100.00

gure.10. **PERCENTAGE SHARES OF THE CONSUMERS' PRICE ACCRUING TO PRODUCE AND OTHERS (CONSUMERS PRICE = 100)**

Marketing Channel: Producer ⟶ Assembly Agent ⟶ Trucker-buyer/ Retailer ⟶ Consumer.

PRODUCERS : Producers at Hewarissa.



The following factors about the price spread and marketing margins of selected vegetables emerge from the analysis.

1. The net price received by the producers is below 50 percent of the consumer price for all except one vegetable.
2. The gross marketing margin conversely constitutes more than 50 percent of the consumer price.
3. The gross marketing margin is lower for some vegetables marketed through the trucker-buyers than that for the same vegetables marketed through the commission agents.
4. The gross marketing margins are higher in the case of more perishable varieties.
5. The share accruing to all those who provide transport and handling is very low compared to that accruing to traders and wastage factor.
6. Retailers acquire the highest poercentage of the share accruing to the middlemen.

The above analysis reveals that the gross marketing margins are by no means small, given the fact that vegetables are marketed in an unprocessed form and without costly preparation for sale. This is not solely due to retailers making higher profits. The defficiencies in the marketing system itself should also be taken into account. As discussed earlier, an avoidable waste occurs in between harvesting and first selling and in transit. Also the risk involved in vegetable retail trade, especially with regard to those vegetables with comparatively short market lives, compels the retailers to markup a high margin in order to recover any loss due to further wastage in terms of spoilage, shrinkage, damage and leftovers.

The overhead costs of the retailer such as wages, market levies, stall rents, taxes etc; are also considerable.[1] In addition, the retail price is fixed on the basis of consumers preference and their purchasing power.[2]

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[1] See section 5.2.1.1 for details

[2] See chapter 6 for details

If the retailers cater to consumers with higher purchasing power and sell vegetables with greater consumer preference they tend to mark up a higher price for those vegetables.

There are certain other factors too which contribute to high retail costs and margins. Most retail traders have small scale establishments with no economies of scale. Most of them are part-time operators, who rely on family labour. Low prices during periods of greater supply and high prices during periods of short supply further compel the retailers to maintain a constantly high margin in order to avoid income fluctuations.

These points, however, need further in depth investigation and clarification. Two of the earlier studies on vegetable marketing have made estimates of gross marketing margins for beans, cabbage and carrot marketed through the commission agents, by the producers in Palugama (Welimada) area. According to one of these,[1] the gross marketing margins for those three vegetables were 44.7 percent, 81.4 percent and 55.1 percent, respectively, in 1974.

In 1976, another study[2] estimated that the gross marketing margins were 26 percent for beans and 55 percent for cabbage. The same (under the commission agency system) in 55.7 percent for beans, 80.2 percent for cabbage and 67.8 percent for carrot in 1978 as estimated by this study.

It can generally be concluded that the gross marketing margins have not shown any meaningful reduction over the years. The earlier studies mentioned above did not consider wastage at the producer level and the cost of containers incurred by the producers in calculating the net price received by the producers. If adjustments are made for these too, then the gross marketing margins may exhibit even higher increases from 1974 to 1978.

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[1] Abeysekera and Senanayake (1974) op.cit pp 55-56

[2] Narayanasamy (1976) op.cit.

5.2.2. Efficiency of the Traditional (Private) Marketing System

Efficiency of the marketing system can be looked into in terms of (a) operational efficiency and (b) pricing efficiency.

5.2.2.1. Operational Efficiency

Operational efficiency encompases technical, managerial and financial performance. It underlies the effectiveness of the marketing system in maximizing output of services per unit of input at any given point of time. It can safely be assumed that the traditional marketing system for vegetables in Sri Lanka is operationally inefficient in view of the high costs and margins involved, loss of produce in marketing, technicla inefficiencies stemming from bad packing etc; and physical congestions at the major markets.

5.2.2.2. Pricing Efficiency

Pricing efficiency means the accuracy with which information about consumer preferences is conveyed to the producers and information about producers' cost to the consumers within the marketing system. The vegetable producers generally lack information regarding prices and consumer preferences. Producers' cost is not reflected in the consumers' price due to unacceptably high marketing margins.

The price differentials between the producer, wholesale and retail markets are considerably higher than the transport charges, handling cost, wastage and a reasonably adequate profit margin, due to various imperfections in the marketing system. This is indicated by the fact that inter-market price series correlation co-efficients are considerably lower, after making due allowances for transport cost, handling charges, wastage and for a 10 percent [1] profit margin. Table 51 presents the price series correlation

[1] A 10 percent margin is taken on the basis of the wholesalers' normal commission. This is a bit arbitrary, but considered a reasonable profit margin.

co-efficients for 5 selected vegetables between Vidurupola, Pettah and Nugegoda. The correlation is higher between Vidurupola and Pettah as expected, since the net producer price approximates the wholesale price after adding the cost of transport, handling charges, wastage and sales commission under the commission agency system. Between Vidurupola and Nugegoda and Between Pettah and Nugegoda, the correlation co-efficients are considerably lower showing no interdependence among these markets in the formation of prices.

Table 51-: Correlation Co-efficients of Producer, Wholesale and Retail Prices of Five Selected Vegetables At Vidurupola, Pettah and Nugegoda, Respectively:

(For 5 observations from 24-10-78 to 03-11-78)

i Beans

	Vidurupola	Pettah	Nugegoda
Vidurupola	1.00	0.99	0.60
Pettah		1.00	0.60
Nugegoda			1.00

ii Cabbage

	Vidurupola	Pettah	Nugegoda
Vidurupola	1.00	0.99	- 0.32
Pettah		1.00	- 0.34
Nugegoda			1.00

iii Carrot

	Vidurupola	Pettah	Nugegoda
Vidurupola	1.00	0.99	- 0.17
Pettah		1.00	- 0.15
Nugegoda			1.00

iv Knolkhol

	Vidurupola	Pettah	Nugegoda
Vidurupola	1.00	0.99	0.68
Pettah		1.00	0.65
Nugegoda			1.00

v Raddish

	Vidurupola	Pettah	Nugegoda
Vidurupola	1.00	0.99	- 0.15
Pettah		1.00	- 0.15
Nugegoda			1.00

Table 52 shows the correlation coefficients of prices between Meeruppa, Pettah and Nugegoda for four selected vegetables. In this case, the vegetable produce of Meeruppa is mostly handled by the trucker buyers and only a minor portion is transacted through Pettah market. Thus, the price correlation coefficients are very much lower between Meeruppa and Pettah.

This shows that the prices prevailing at the Pettah wholesale market have very little or no effect on producer prices paid at Meeruppa. Same applies to price correlation coefficients between Meeruppa and Nugegoda.

Table 52-: Correlation Co-efficients of Producer, Wholesale and Retail Prices of Four Selected Vegetables at Meeruppa, Pettah and Nugegoda Respectively.

(For 5 observations from 24-10-78 to 03-11-78)

i Beans

	Meeruppa	Pettah	Nugegoda
Meeruppa	1.00	- 0.96	- 0.79
Pettah		1.00	0.60
Nugegoda			1.00

ii Cabbage

	Meeruppa	Pettah	Nugegoda
Meeruppa	1.00	0.41	0.06
Pettah		1.00	- 0.34
Nugegoda			1.00

iii Knolkhol

	Meeruppa	Pettah	Nugegoda
Meeruppa	1.00	0.28	0,25
Pettah		1.00	0,65
Nugegoda			1.00

iv Raddish

	Meeruppa	Pettah	Nugegoda
Meeruppa	1.00	0.19	0.65
Pettah		1.00	- 0.15
Nugegoda			1.00

However, the above analysis has limitations in terms of the small number of price observations and markets considered. In fact, it would have been much more relevant to analyse the correlation of prices between

different producer markets, different wholesale markets and different retail markets for a considerable length of time. But such consistent time series data were not available for the present analysis.

The pricing efficiency of the traditional (private) marketing system for vegetables in Sri Lanka can be regarded fairly low owing to lack of proper price information, low level of integration between producer, wholesale and retail markets, large size of gross marketing margins and price spread. However, the high marketing margins may also be due to the distance between producing and consuming areas, the nature of the produce and the nature of the demand, and not only due to the low pricing efficiency.

The foregoing discussion on price structure and pricing efficiency suggests the existance of certain imperfections in the traditional marketing system. The next few sections will ocncentrate on the price formation, the nature of competition and market imperfections and causes of imperfections.

5.2.3. Aspects of Price Formation

Theoritically, the primary demand for vegetables is from the consumers at the retail level. The retailers' demand from wholesalers and the wholesalers' demand from the producers are derived demands. The price formation thus should take place at the retail level and be transmitted to the wholesalers and from them to the producers.

However, in practical terms the price making for vegetables in Sri Lanka takes place at the wholesale level. Prices determined at this level form the fundamental basis of price formation at other levels despite price variations depending on specific forces operating at each level.

In areas where the producers have direct links with the major wholesale markets, they are paid according to the wholesale price despite the fact that most wholesalers underpay the producers or pay the lowest grades' price. Trucker-buyers rely on the wholesale prices prevailing in the areas where they come from. The village level assembly agents who operate for wholesalers at distant markets also base their prices on wholesale price. Thus, the base for producer prices is the wholesale price which

again varies in terms of the following considerations.

(a) Volume of vegetables offered for sale by the producers at a particular point of time.
(b) Number of producers and traders at a particular market place.
(c) Quality of vegetables.

Apart from these, the producer level price determination is affected by the following factors too, all of which weaken the bargaining position of the producers,

(a) Gluts of supply at peak harvesting periods.
(b) Producer's urgent financial needs.
(c) Socio-economic relationships between the producers and the traders.
(d) Lack of price information.
(e) High margins kept by the primary level brokers and assembly agents to hedge against risks expected at subsequent levels.

The wholesalers who have a long " experience " in this respect determine their selling prices and the prices payable to producers on the basis of previous prices and likely reactions they may cause on future prices. Price rings, leadership pricing and influences of trader associations are common at the wholesale level. The predetermined prices are, however, subject to variations due to the influence of major market forces i.e, (a) supply by the producers/assembly agents and (b) demand and competition from the retailers.

When lorries carrying vegetables are held up due to exigencies such as bad weather, the selling price goes up considerably. Aggregate demand from the retailers is generally higher than the supply by the wholesalers, Retailers compete with each other to get their requirements quickly and their bargaining with wholesalers is restricted due to acute congestion at the wholesale markets. Therefore, the wholesalers have a bigger say in the determination of their own selling prices.

Retailers determine their selling prices on the basis of wholesale price, their operating costs and margins and the consumer characteristics,

The net result of the entire process of price formation is that the traders maintain uniform prices at individual market centres at all levels-producer, wholesale and retail. The price differences, if any, depend on the quality characteristics of each type of vegetables and the variations in overhead costs of the traders. Such price defferences are clearly seen at the retail level where segmented markets which serve consumers in different income strata are present.

5.2.4. Nature of Competition, Market Imperfections and Vegetable Prices

It is obvious that the vegetable marketing system differs considerably from the perfect competition model which is regarded by many as ideally efficient. The imperfections in the marketing system partly explain the causes of its inefficiency.

5.2.4.1. Nature of Competition and Imperfections

(a) Producer Level

The majority of the producers at Vidurupola sends vegetables to the commission agents through transport agents. Three private lorry services enjoy a near monopoly in the transport of vegetables. These are (1) P.M.T. Transport Service, (2) B.M.S. Transport Service and (3) S.H.A. Transport Service. The last two now operate as a single enterprise and exercise a control over almost all aspects of vegetable transport from the farm level to the wholesale level. These three services have divided the days of the week among themselves so as to restrict the competition with regard to the collection and transport of vegetables.

The outstations' trucker-buyers get their quantities of vegetables through brokers who enjoy the benefit of competition among the former. This happens at Boragas village too. The commission agents and trucker-buyers sometimes compete with each other for limited quantities of vegetables not through different prices, but through various other ways (see section 5.2.4.2).

At the Welimada fair, there is a competitive situation when vegetables for sale are limited and traders are many. But the competitiveness does

not reflect much on price. Even this limited price advantage is grabbed more by the brokers and other intermidiaries.

The trucker-buyers who come to Hewavissa during peak harvesting seasons are not quite enough to cater to the large number of producers, who have to dispose of their produce at prices agreed on and predetermined by the buyers. There is no competition among the buyers in terms of price. If at all, the competition is there during slack seasons when some traders prefer better quality vegetables while others want to maximize the volumes purchased. Even the presence of a large number trucker-buyers would not do justice to the producers because the latter have to sell their vegetables to the former mostly through 3 brokers who operate on a large scale. Three types of price agreements, which prevent competition can be noted in case of Hewavissa. They are (i) agreements among the trucker-buyers, (ii) agreements between the trucker-buyers and the brokers (assembly agents) and (iii) agreements among the brokers.

In Meeruppa village too, the above situation prevails. In addition, only one transport service operates between this village and the Colombo Commission market. It has a monopoly over the transpotation of vegetables between these two points.

In the villages Ikiriwewa and Lunuwewa (Anuradhapura), the dominance of a few village assembly traders and brokers prevents the farmers from benefitting from any competition that exists among the traders in outstations. There are price agreements between the village traders and such outstation traders and also among the village traders. During the Yala season, vegetables are collected mostly by 3 influential village traders, who enjoy a monopoly power in the purchase of vegetables. However, when small scale outstation itinerary traders visit the village towards the end of a season, farmers are able to get higher prices because these traders come direct to the ~~traders~~ farmers. But their visits are irregular.

Thus, it is apparent that competition among traders at the producer level is there only in slack seasons and even then the producers are not benefitted because their produce is not enough for them to procure a significantly higher total revenue.

(b) Wholesale level

The Pettah (Colombo) market as discussed earlier is the main centre which determines the prices of vegetables elsewhere. A relatively small number of wholesalers have a large influence on prices as they cater for numerous producers and retail traders not only in Colombo but in other parts of the country as well.

Of the 302 stalls in the market, only about 70 stalls are engaged exclusively in the commission agency system for vegetables. It is these traders who control the entire vegetable trade in the market. They act in collusion to limit the competition among themselves, thereby suppressing producer (buying) prices and increasing selling prices.

There are only 43 vegetable wholesalers in the Kandy wholesale market. Competition among them is only for hard to get and quality vegetables. Even this competition at times is in terms of socio-economic relations with the producers. About 20 transport agents bring vegetables to the market. Each of them specialises in a certain area , so that there is no competition among them. At the Chunnakam market, there is a certain degree of competition both among wholesalers and retailers in terms of price. When certain vegetables are in excessive stocks, they attempt to dispose of it even at a lower price but with some profit margin.

Brokers often function between and within each group, i.e. producers and wholesalers, wholesalers and retailers and so on. They are the beneficiaries of competitive conditions that exist among the wholesalers.

(c) Retail Level

The retail trade of vegetables in Sri Lanka may seem to be highly competitive because of the presence of large numbers of buyers and sellers. This however, does not hold true for individual market centres. Market segmentation, in terms of the quality of the produce and the type of buyers to which the market centres cater, is also widespread at the retail level. Therefore, even though there is a certain degree of competition between the segmented markets, e.g. between the stall holders

and pavement vendors, it entirely depends on the differences in quality of produce offered for sale and operating costs. However, within a particular group, the price-competition is almost non-existent for vegetables of the same quality. The competition within a group of retailers,however, is present when there is a glut of vegetables of the same quality. In such instances, some individual traders lower the price below the average prevailing price. The consumers are benefitted in this case.

In the transport of vegetables from the wholesale markets to the retail markets too, the competition is limited due to the presence of a few transport agents. For example, from Pettah to Nugegoda, one transport agent enjoys monopoly powers while 4 persons control the transport operations from Pettah and Embilipitiya to the Maharagama fair. These few transport agents charge fixed fares and the retailers have no bargaining power.

5.2.4.2. Causes of Market Imperfections

The foregoing section showed that the competition of the vegetable marketing system is limited and various imperfections exist at all levels of the marketing chain. These imperfections result in low prices for the producers, higher prices payable by the consumers and abnormal profits for the middlemen. This is not merely due to the size of the markets (number of buyers and sellers at each level) but also due to the operation of certain other factors which are related to the nature of the produce and to the market conduct.

(i)
Most vegetables are perishable by nature so that the farmers cannot keep the produce for long once harvested, in expectation of the arrival of alternative marketing outlets which pay higher prices. Therefore, they have to sell it to an available outlet at whatever price is offered by it. This gives the opportunity to the traders to maintain a particular price level. The absence of proper storage facilities at the producer level also adds to this problem.

(ii)
Presence of a large supply of vegetavles, particularly during the peak harvesting seasons also weakens the bargaining power of the producers. They are in a better position during the slack season but each of the

producers does not have enough produce to get a significantly higher totoal revenue.

During peak harvesting seasons, the traders pay low prices as the farmers want to dispose of their produce as quickly as possible,

(iii)
The insulated nature of the producer-level markets also contributes to the emergence of imperfections in village level marketing. This is associated with poor infrastructural facilities which lead to the dominance of a few buyers who could find suitable transport facilities. The producer-level markets are also fairly scattered so that price information does not properly flow between the markets. This enables the traders to pay differnt prices for the same produce offered for sale at different markets even in the same village.

(iv) Barries to entry into the vegetable trade

(a) Producer Level

At producer level, various types of barriers operate limiting competition in the collection and transport of vegetables thereby leading to imperfections in these aspects.

At Vidurupola, the three transport agents mentioned earlier do not spare even the slack season allowing little or no scope for an outsider to venture into the transportation of vegetables. The new comers run the risk of even physical harm.

From the traders' point of view, entry into the Welimada fair is constrained by the necessities of heavy capital investment for both fixed assets such as vehicles, scales, containers etc., and working capital in cash form. If these requirements cna be met, then there does not arise a problems of entering into trade in terms of other requirements such as labour and space at the fair. But sometimes, newcomers are even physically threatened because the existing firms (brokers and traders) naturally do not like to see new entrants, for they loose their shares in the market even in limited proportions. Though there are about 50 brokers at the fair, there

is no apparent price competition among them. The most important requirement for the buyers (wholesalers and retailers) to enter into fair is the formation of relationships with the brokers.

The traders who come from outside to Hewavissa and Meeruppa should get to know the producers and brokers in the villages before starting the collection of produce. Thus, the major requirements to enter into the vegetable trade in these villages are (a) a knowledge of the village (b) relationship with producers and brokers and (c) a good working capital. Same situation prevails at Ikiriwewa and Lunuwawa (Anuradhapura).

Brokers operate between the producers and traders at Talawa and Tambuttegama fairs too. These brokers sometimes resort to physical threats to obstruct the new comers.

(b) Wholesale Level

New entrants have no opportunities for wholesale trade at the Pettah (Colombo) market primarily due to lack of space. At present all 302 stalls are occupied. Sometimes new comers can rent out a stall but that too is restricted in view of exorbitant rents. Usually, the ownership of stalls is hereditary. In the absence of family members the ownership rights are accrued to the most senior worker of the stall.

The above holds true for Kandy market too. The essential preconditions for entry are the knowledge about the personnel and environment and experience in every aspect of wholesale business. Space is also limited.

(c) Retail Level

Retailing of vegetables is also an inherited business in that new comers from outside the existing trader-circle find it difficult to enter into retail trade. Lack of space in the market centres, tender systems etc., also act as barriers. These are especially true in the case of major retail market centres, e.g. super market-Nugegoda and Borella market. However, this is not the case for the pavement vegetable trade. The traders who operate at periodic retail markets, e.g. Maharagama fair, have to establish

good relationships with the brokers and their touts to avoid harassment.

(v) Provision of Multiple Economic Services:

The provision of multiple economic services is perhaps the most important factor influencing the imperfections, especially at the producer level. These multiple economic services include moneylending, marketing as well as merchandizing. Money lending plays an important role in producer-price determination.

The commission agents lend money to their farmer-clients in Vidurupola and Boragas villages not only for cultivation pruposes but for other needs of the farmers as well. The amount of loan that a particular farmer could borrow depends on the expected volume of vegetables that he could send to a particular commission agent. The commission agents do not insist on a formal interest rate. However, they may recover a hidden interest from the proceeds of sale by underinvoicing and underweighing the produce. The average amount of loans granted by the commission agents to the farmers sometimes extends up to Rs.5000/- per season. One particular commission agent lends over a million rupees per year for the cultivators at Vidurupola.

The vegetable cultivators in Hewavissa and Meeruppa villages who transact business with commission agents enjoy such " interest free" loans. The trucker-buyers do not lend money for vegetable cultivators. But the village level assembly traders and brokers lend money to their clients who supply vegetables regularly.

In Ikiriwewa and Lunuwewa villages, the village assembly traders lend money to the cultivators at the begining of the cultivation season. The cultivators have to repay the loans in kind with the vegetable produce. The village traders sometimes borrow money from the wholesalers in the major markets for lending to the cultivators. The village traders usually deduct about Rs.5/- per 100 lbs. of vegetables as an indirect interest from the farmers. Some traders are more popular money lenders. For example, one particular village trader at Ikiriwewa had a clientele of about 200 farmers during Maha 1978/79. This implies his dominance

in the collection of vegetables.

Besides providing credit, most of the traders and transport agents provide certain other facilities to the cultivators. For example, the transport agents who come to Welimada area transport agricultural inputs, building materials and even furniture for the farmers. Trucker-buyers who come to Hewavissa and Meeruppa also transport fertilizer, coir rope, cadjan etc; from the various areas for the farmers, mostly free of charge .

In Tambuttegama area, almost all assembly traders who collect vegetables have retail shops which sell a wide range of consumer goods. They sell the consumer goods and various agricultural inputs to the cultivators on credit too. The repayment is through the supply of produce.

(vi) Social Relations

The majority of the farmers know their commission agents personally. The commission agents are invariably invited to the social functions of farmers. On such occasions, the traders strengthen their relationships through gifts, donations etc. It was noticed during the survey that farmers who came to collect the proceeds of sale were treated well in turn by the commission agents.

The trucker-buyers have direct social relationships with the brokers and village assembly agents, as in the case of Hewavissa and Meeruppa. The village assembly agents at Ikiriwewa and Lunuwewa also have established this type of relationships with the producers. The client farmers are entertained at informal gatherings during festive occasions and they are financially redressed on occasions such as weddings, funerals etc.

Through the relationships such as credit ties, provision of inputs and consumer goods and social relations, the traders have been able to maintain good will among the producers and assure a regular "clientele". The result is the establishment of mutual trust between groups so that one group does not bargain with the other. This however, paves the way for the prevalence of trade abuses such as underweighing, underinvoicing etc.

(vii) Other Factors

Apart from the reasons discussed above, lack of reliable market information, physical characteristics of the market centres, specialisation of producing areas and differentiation and specialisation of products also contribute to the emergence of imperfections in the private marketing system for vegetables.

The price information given by the commission agents and other private traders is taken for granted by the majority of producers. It is cross-checked only with prices announced over the radio to find that the prices offered by the agents are higher. Hence, the trust the producers repose in the traders is strengthened. Prior price information does not help some producers firstly because they have been selling to a particular trader for a long period of time and secondly they could not easily change the trader due to credit-ties. On the other hand, all the traders usually pay a uniform price to the producers in a particular locality.

Physical congestion at the major wholesale markets as in the case of Colombo, obstructs any sort of bargaining between the retailers and the wholesalers. The retailers try to get their requirements as soon as possible, without much bargaining.[1]

Some wholesalers specialize in certain producing areas. For example, each wholesaler at Kandy market concentrates on a particular producing area to collect vegetables. The transport agents for Kandy wholesalers too have their own beats in the collection and transport of vegetables. Thus, each trader has some degree of monopoly at a particular point of time, over vegetables that come form particular areas.

Some wholesalers at the Chunnakam market too, specialize in vegetables coming to the market from areas outside the Jaffna peninsula. The others

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[1] See also The Report....(1971) op.cit., Abeysekera and Senanayake (1974) op.cit., pp 22-23 and Indraratne (1975) op.cit.p. 249.

specialize in the vegetables grown in the Peninsula itself. Outstation-vegetables come only to a few traders and they have a monopoly position over such vegetables.

It was also noticed that some wholesalers at Pettah specialize in certain types of vegetables (e.g. ash pumpkin, red pumpkin, drumsticks etc.,). They have a monopoly position in selling such vegetables. This is in fact associated with the relatively non-perishable nature of these vegetables.

Relative scarcity of certain types of vegetables in certain periods of the year also leads to imperfections. For example, there was a general shortage of red pumpkin, brinjal and beetroot in October, 1979, at the Pettah market. The major source of supply of these vegetables was Jaffna and the wholesale trade in such vegetables had been the monopoly of a few Tamil traders.

Market segmentation and specialisation in different consumer communities-at retail level also result in imperfections leading to diffrrential price. For example, supermarkets usually cater for higher income strata and diplomatic communities (e.g.supermarkets at Kollupitiya and Nugegoda) while retail stall holders at market centres cater for middle class. The pavement vendors usually cater for the low income segment. However, these price differentials are more dependent on the quality differences of vegetables and differences in operating cost incurred by traders in each group.

In addition, some traders, especially among the pavement vendors, under-weigh vegetables by manipulating the scales to their own advantage. In this manner, they realise an additional profit which also helps in recovering any losses due to selling at lower prices, if any.

5.3. Institutional Marketing Reform and Its Effectiveness

The inefficiencies in the traditional (private) marketing system for vegetables in Sri Lanka had been identified as early as the 1930's. Over the years, the focal point in policy discussions has been the influence exerted by the middlemen over the producers and consumers by way of

realizing the biggest share of the prices paid by the consumers for vegetables. The major objective of the establishment of countervailing institutions[1] such as the Marketing Deparrment, Co-operative Marketing Federation (MARKFED) and Producers' Unions has been to compete with the private trade in vegetables thereby assuring a reasonable price to the producer and a fair price to the consumer.

5.3.1. Marketing Department(MD)

The MD was established in 1935 with the following objectives :

(a) to assist the local producer to obtain a fair price for his agricultural produce by providing an alternative marketing channel;

(b) to promote the sale of local produce at reasonable prices and provide marketing facilities to increase the production of local foodstuffs; and

(c) to popularise the consumption of local foodstuffs.

The MD does not specialize in vegetable marketing alone but is engaged in marketing of many other agricultural products as well.

However, vegetable trade constitutes a major part of the Department's activities. The Department started its vegetable collection scheme in 1942, by opening up collection centres in different parts of the country. Although at present, the Department has about 76 vegetable collecting centres only about 40 of these function throughout the year. The Department collects the produce through a lorry transport service along prearranged routes during fixed days to collect vegetables direct from the producers and runs a wholesale floor in Colombo and a net-work of retail shops and mobile selling services in urban areas. It also broadcasts price information for the benefit of the producers.

In addition, the MD has a pricing unit which is mainly concerned with maintaining data on price and quantities and setting producer prices payable by the collection centres of the MD.

1 Establishment of countervailing institutions has been the main measure of marketing reforms in Sri Lanka.

5.3.1.1. Advantages of the MD's Marketing Activities

In fact, during the initial period of its operation, the Department served the vegetable producers in many ways. These can be summerised as follows:

(a) Provision of marketing arrangements in rural areas where sufficient marketing facilities did not exist. The producers found the MD as a useful outlet especially during glut seasons when private traders did not offer an adequate service.
(b) The running of lorries along prearranged routes displaying price boards indicating buying prices might have resulted in the producer realizing better prices than he would otherwise have obtained from the private traders.
(c) Encouraging producers to a certain extent in correct methods of cleaning, grading and packing.
(d) Dissemination of marketing information through bulletines and annual reports.

5.3.1.2. Drawbacks of the MD's Marketing Activities

(a) Producer level

As far as the activities of the MD are concerned, several limitations surfaced during the survey. Some noteworthy shortcomings are :

(1) MD does not purchase all vegetables brought by the producers to the collecting centres, over and above a certain limit. The officials have to adhere to the orders placed by the head office in Colombo.
(2) MD buys vegetables through a few brokers in the villages, rather than from the producers themselves. The MD has been able to realise economies of scale by purchasing through the brokers, but at the expense of small scale producers.

(3) The MD lorries in certain localities, do not go to the farms or along prearranged routes, so that the producers are compelled to transport the produce to a far off collecting centre.

(4) The very limited transport facilities of the MD collecting centres are certainly inadequate to cater to the large numbers of producers.

(5) In direct-purchasing MD is influenced by certain producers and those who have good relationships with the officials.

(6) The MD often gets substandard vegetables from the brokers which are often rejected by other private traders.

(7) The producers as well as the MD are played out by some officials at regional collecting points. They write false bills, especially in transactions with relatively less educated producers who do not ask for receipts.

(8) The producers are not satisfied with the weights and grading systems adopted by the MD's collecting centres.

(9) The MD often pays a lower price to the producers than that paid by the private traders.

(10) The collecting centres of the MD do not pay the proceeds of sales to the producers promptly.

(11) The centres often do not promptly return the containers belonging to the producers.

(12) The collecting centres open for business at 9.00 a.m. daily. Also, they are closed on public holidays especially during lean seasons of vegetable supply. These factors cause inconveniences to producers and benefit to private traders.

(13) MD does not have a loan scheme for vegetable cultivators which means it has less control over vegetable marketing.

For these reasons the MD fails to provide a competition to private traders in terms of quantity collected and prices paid to the producers. To most vegetable producers, the MD is a source of price information rather than a principal marketing outlet. The popularity the MD has enjoyed about 10 years back, in the areas where field surveys were conducted, has waned because of these shortcomings.

However, the officials at the producer level collecting centres along are not responsible for this situation. They also have their own problems. The case study we conducted about the MD's collecting centre at Keppetipola (Welimada) gives some useful information about this situation and is presented below.

MD's Collecting Centre-Keppetipola: A Case Study

The officials admitted that all the vegetables brought by the farmers could not be purchased because they have to adhere to the orders placed by the head office. If the officials purchase over and above the ordered quantities or low quality vegetables, they alone are reponsible for any losses.

There are two other centres in Welimada area at (1) Boralanda and (2) Bogahakumbura. All centres have only 4 lorries. This fleet is inadequate to cover each and every route and the producers are naturally displeased with the services of the MD. The officials, who are liable to be transferred often do not stay long enough at one place to cultivate a sound relationship with the farmers. Restirctions imposed on them not to work beyond normal working hours prevent them from working sometimes even late into the night when an occasion demands.

Officials at the centres grade vegetables brought by the farmers, according to a system stipulated by the head office. Farmers take this as a sort of harassment and resort to selling to the private traders.

The centres do not have the flexibility to change the prices during a given day. This allows the private traders to clear the market at a higher price, leaving the MD at a disadvantageous position.

Sometimes, the centre is faced with shortages of packing material. This prevents the centre from purchasing even the small quantities ordered by the head office.

The vegetables collected at the centre have to be dispatched to various areas like Colombo, Jaffna and Anuradhapura on the day of collection. But this is difficult due to the shortage of vehicles.

Absence of proper storage facilities makes high chances for the vegetables to go waste.

The officials involve in corrupt pracitces making the MD lose, because of their frustrations emanating from the awareness that they are not provided with facilities which their counterparts in other Government Departments enjoy

(b) Wholesale level: Case Studies

(i) Colombo

The MD's wholesale floor obtains vegetables from the various collecting centres of the MD throughout the country. The collecting centres also send vegetables direct to Mahajana Pola and the Tripolli market. A part of the supply goes to the hospitals, prisons etc.

Producers in the villages complained that the MD purchased "grade 1" produce from them. But at the wholesale floor at Pettah, the vegetables are of the lowest quality. This substantiates the hidden transactions between the private intermidiaries and MD's officials at the producer level. It a was also observed that the MD's wholesale floor received a day or two days old vegetables. Some stocks were in fact not of marketable quality.

There were only 215 lorries (out of which 139 are 5 tons lorries) for the MD at the time of our investigation. This fleet is inadequate to transport vegetables from a large number of collecting centres situated all over the country and to distribute the produce to an even larger number of retail outlets.

It was also observed that the MD sells vegetables to private wholesalers at the Pettah market and the latter re-sell it at a profit.

MD certainly can not compete with the private wholesalers because it handles only a small proportion of the total quantity that comes to the market. During the period of investigation, it was estimated that the MD handled only about 2 percent of the total quantity that came daily to the Colombo wholesale market.

(ii) Kandy

The MD centre at the Kandy market is only a regional collecting point. It has to supply about 7500 lbs. of vegetables daily to government institutions such as the University, Inservice Agricultural Training Centre, College of Agriculture, Prison, Hospital etc. A part of the collection is sent to

the Colombo wholesale floor. The centre, however, has to adhere to the orders placed by the above institutions and Colombo wholesale market. In addition, MD has five retail shops in Kandy town. Including these, the wholesale floor at Kandy handles about 9000 lbs. of vegetables daily. It does not sell to private traders, unlike in Colombo.

(iii) Chunnakam (Jaffna)

Vegetables are purchased by the MD from the producers who bring the produce to the market and from a private supplier. Very often the MD lorries do not go to the villages for want of repairs. The MD, however, buys only the daily requirements of it's 6 retail stalls and the needs of the government institutions in Jaffna area.

Prices of outstation-vegetables are determined by the MD after taking Colombo wholesale and retail price plus transport cost into account. Local vegetables are priced according to the prices prevailing in the Chunnakam market itself.

(c) Retail Level

The retail shops (Peoples' Depots) of the MD in and around Colombo obtain vegetables from the Tripolli and Mahajana Pola. The MD caters for the general consumers through these retail shops, but current retail outlets of the Department are inadequate for this purpose.

Case Studies:

(i) Borella

The MD has a retail stall at Jathika Pola, Borella which caters to a large number of consumers. The stall obtains its supplies mostly from the MD collecting centres at Maturata, Matale, Nuwaraeliya, Boguhakumbura and Neeldandahinaa. The quality of vegetables is relatively lower than that at the private retail stalls at the Borella market. Sometimes, the MD gets supplies in excess and in the absence of cold storage facilities,

a good part of the produce perishes in excess supply situations.

(ii) Nugegoda

There are two retail stalls of the MD in Nugegoda town, i.e. at the supermarket and at Janatha Pola.

About 800-1000 customers patronizes the MD stall daily at the Janatha Pola. The stall sells nearly 1500 lbs. of vegetables daily brought from the Mahajana Pola. It often gets substandard vegetables and therefore, retail prices are comparatively lower.

About 8 workers are employed at the stall in any given day. They are paid out of the proceeds of the sale.

The MD stall at the supermarket often does not get its full requirements. Quite often, the stall receives uncleaned and spoiled produce. There were complaints of malpractices against the management. Long queues at the MD stall are not tolerated by all buyers and they prefer to buy their requirements from the private retailers.

If good quality produce is available, the buyers are prepared to purchase their requirements from the MD for the price is lower. The MD should have enough stocks and cold storage facilities.

Officials are not concerned about improving the business activities of the department. A sort of incentive scheme in addition to their salary would help minimize the malpractices. Each individual centre (retail or primary) should have the flexibility to change the prices depending on the current market situation provided they incur no loss.

(iii) Maharagama

The MD retail stall at Maharagama caters for about 800 customers on normal days and about 1000 customers on Pola days. The stall receives vegetables from the Mahajana pola. Consumers have to be satisfied with what is available at the MD stall. The stall often sells substandard vegetables.

(iv) Chunnakam (Jaffna)

The consumers who purchase vegetables from the MD's retail stall at the Chunnakam market made the following general complaints.

(1) Vegetables sold by the MD are not fresh, though cheap.
(2) Retail stall is open at odd hours.
(3) Some vegetables are cheaper at private retail stalls within the market.
(4) The MD does not have all vegetable varieties required by the consumer.

However, the consumers are satisfied with the accuracy of weights at the MD retail stall.

MD retail stalls sometimes fail to dispose of all the quantities ordered for a day. The remaining produce go waste or are sold at very low prices.

5.3.2. Co-operative Societies Engaged in Vegetable Marketing

The entire co-operative sector including the MARKEFED[1] handles only about 15% of the total marketed surplus of vegetables in Sri Lanka.[2]

Although Sri Lanka has a well organised network of consumer co-operatives, there is no such network as producer co-operatives. As far as vegetable marketing is concerned , only one of the co-operative societies specialises in vegetable marketing as a major activity. A few others are engaged in vegetable marketing only to a limited extent.

Udapalatha MPCS - Keppetipola: A Case Study:

The Udapalatha Multipurpose Co-operative Society at Keppetipola in Badulla district specialises in vegetable marketing on a wide scale. Before 1978, the society had been a principal marketing outlet for vegetable producers in the area. The society was established in 1939 as the Udapalatha Co-operative Agricultural Production and Sales Society. This co-operative had the advantage of being situated in a major vegetable producing area. In 1971, the society was amalgamated with 18 other co-operative societies in the Keppetipola area to form the

1 See section 5.3.3. for a discussion of MARKFED.
2 Indraratne (1975), op.cit.

Udapalatha MPCS. From 1971 to 1977, it had a near monopoly in supplying inputs and credit to vegetable growers and had been able to procure a considerable proportion of vegetables produced in the area.

The society had 18 vegetable collecting units, each with a manager who was paid 2½% commission on the vegetables purchased by him. The Co-operative sent the collected vegetables by its own lorries to Colombo market. The produce was then disposed of through the society's wholesale floor and the Marketing Department's wholesale floor.

However, after 1978, the co-operative lost its monopoly over supply of inputs to farmers and the little grip it had over purchasing of vegetables. Now the society's activities have come down to retailing a small quantity of vegetables brought by the producers and sending a small quantity to the MARKFED, Colombo.

At present this society has only 9 vegetable purchasing centres, at:

1) Udubadana,
2) Kimbiliyagolla,
3) Girambe,
4) Madorawita,
5) Tennakoonwela,
6) Nugatalawa,
7) Ella,
8) Palugama, and
9) Uva-Paranagama.

Before 1978, the society had been able to buy about 20% of the vegetables produced in the Udapalatha area but this has now decreased to less than 5%, loosing its countervailing power.

The society now supplies only Rs: 50000/- per cultivation year as loans for the farmers in the entire Udapalatha area whereas it amounted to nearly Rs;2 million per year in 1975. (Now, one commission agent supplies about Rs. 1 million to farmers in the Vidurapola village alone). Even this amount is lent after careful and long procedural formalities.

Repayment rate is only 75%. The Co-op. has also failed in the supply seeds, fertilizer and agro-chemicals in time, unlike in the past.

Before 1978, when the Co-op. was engaged in large scale lending, it was able to send daily about 3-4 lorry loads of vegetables to Colombo. Now this has decreased to less than 1 lorry load. Earlier, the Co-op. had 3 stalls at the Colombo wholesale market but now it has only one stall. Unlike in the past, the society now limits its wholesale transactions to Colombo alone.

The retail stall of the Co-op. set up in 1978 aims at supplying vegetables to the consumers in the area at cheap prices. The prices are lower than at the private retailers in the town. However, the daily turnover is as low as 80 lbs.of all vegetables. The retail stall keeps a margin of about 10-20 cts. for a lb. of vegetables . Only a very few producers bring vegetables to this stall. The stall mostly buys its requirements from Nuwara Eliya or Welimada fair.

The vegetable producers at Vidurupola too pointed out the lapses of this society. At present there is no co-operative vegetable collecting centre in this village. The Keppetipola co-operative society sends a lorry to the village to collect vegetables. Most farmers are reluctant to sell their produce because of inaccuracy of weights, strict grading system etc. Although the co-op. also deducts 10% commission from the farmers' bill, the price paid by the co-op. is lower than the Commission Agents' price.

Farmers who sell their vegetables to the wholesale market on commission basis through the co-operative get a different price from the price that is paid by the retail stall as is obvious from the following table.

Vegetable	Buying price (cts.) Wholesale * Basis	Retail Stall	Selling price (cts.) 07-10-79' Retail stall
Cabbage	45-50	70	85
Carrot	-	75	90
Beans	85-90	70	75
Knolkhol	35-40	50	70
Brinjal	90-100	75	90
Leeks	-	70	90
Tomatoes	90-100	60	80

* Farmers' price is 10% less than this.

Procedural difficulties associated with the loan schemes of the Co-op. make the farmers prefer the private trader.

Delays involved in the collection of vegetables and the payment of the proceeds of sale have created dissatisfaction among the farmers so far as the activities of the Co-op. are concerned in the sphere of vegetable marketing.

At present, the co-operative society is not engaged in retail trade in vegetables in the main cities such as Colombo , Kandy and Jaffna.

It was observed during our reconnaisance survey that the Naranvita Co-op. society in Gampola was engaged in vegetable marketing before its reorganisation in 1972 . Before 1972, the society was able to send two lorry loads of vegetables per day to the All Ceylon Producer Unions' wholesale floor at Saunders Place, Colombo, and to Kandy, Jaffna and Kurunegala markets. In 1972, the society had a capital worth Rs.100,000. After the reorganisation, these activities gradually weakened. The Co-op. charged only 5% commission from the farmers. The society is no longer engaged in any activity regarding vegetable marketing.

The Marassana Co-operative society too was actively engaged in vegetable trade before 1972. The society lent about Rs.50,000/- per season to the farmers as cultivation loans. By 1972, it had shares worth Rs.33,000/-.

In 1968, it purchased a lorry for Rs.45,000/- which was utilized to collect vegetables from the cultivators and distribute various inputs to them. After the reorganisation, these functions ceased.

5.3.3. Co-operative Marketing Federation (MARKFED)

MAEKFED was established in 1973 amalgamating the activities of the former Ceylon Agricultural Producers' Co-operative Union, All Ceylon Co-operative Consumers' union and the Northern Division Agricultural Producers' Co-operative Union. It now acts as an apex organisation to serve the Multipurpose Co-operative Societies (MPCS) in the sphere of agriculture. The MARKFED operates a wholesale floor in the Colombo market, three retail stalls and a mobile consumer service.

5.3.3.1. Primary Level Activities of the MARKFED

The MARKFED gets a major part of its vegetable collection from the producers through its 10 major collecting centres situated in the following areas:

Welimada, Borelanda, Halpe, Ekiriya, Pannalawila, Lunuwatta, Keppetipola, Erabadda, Galedanda, Bogahakumbura.

MARKFED buys vegetables from the farmers on the basis of 10% commission. A transport cost of Rs. 4-6/- per 100 lbs. is also deducted from the farmers' bills.

The producers interviewed during this survey were not satisfied with the marketing facilities provided by the MARKFED. For example, farmers at Boragas complained that the MARKFED makes its purchases through a broker at Ambewela junction. This broker has obtained the orders direct from Colombo. Sometimes the MARKFED pays lower prices than those of the private traders.

Some farmers at Hewavissa complained of an instance where the MARKFED has failed to pay their dues and return the containers. This had happened about 2 years ago and since then the MARKFED lorries had not come to the village. Some farmers were prepared to sell their vegetables to the MARKFED provided they get a good price and sell direct to the MARKFED, avoiding the brokers. For Meeruppa farmers the problem was that they

had to wait 3-4 days before they get the proceeds of their sales from MARKFED.

5.3.3.2. Wholesale Vegetable Trade of the MARKFED

The wholesale floor of the MARKFED is situated at the Saunders Place, Colombo. Vegetable stocks are kept on a floor area of 20' x 40'. MARKFED transports vegetables from its collecting centres to Colombo by its own lorries.[1] From this point, vegetables are supplied to hotels, ships and to private retailers who come from various areas such as Horana, Balapitya, Ambalangoda etc.

The quality of some vegetables at the MARKFED is better than those of MD, but lower than those at the private traders. Prices of the MARKFED vegetables are therefore, higher than those of the MD and lower than those of the private traders.

Because of the small number of collecting centres it has, the MARKFED is not able to provide enough competition to the private sector. But its daily average collection at the Pettah market was higher than that of the MD during the time of investigation.

5.3.3.3. Retail Trade of Vegetables by the MARKFED

Retail activities of the MARKFED with regard to vegetables are negligible compared to those of the MD and the private sector. It now runs three retail stalls at Saunders Place, Union Place and Kollupitiya. The prices of vegetables at these stalls are generally higher than those prevailing in the traditional market places. Therefore, in a sence they serve only a certain segment of the consumers.

5.3.4. Vegetable Producers' Associations

This is a relatively new concept introduced in 1978. There were 4 of these unions operating at the time of our investigation in the Welimada

1 The MARKFED had about 40 lorries during the time of investigation.

area [1]. These are :

1) Keppetipola vegetable producers' association
2) Boralanda " " "
3) Bogahakumbura " " "
4) Dambavinna " " "

All these were established under the "Welimada Vegetable Producers' Association."

Some major features of one of these Unions are presented below but a detailed evaluation of it seem to be premature at present.

The Keppetipola Vegetable Producers' Union : A Case Study:

This union covers the Keppetipola Village Council area.

objectives:

1. Systematic and rapid development of marketing with special attention to vegetables and fruit with the guidance of the Department of Marketing Development (MD) and planned production of vegetables and fruit in order to prevent frequent fluctuations of supply and prices.

2. To obtain a maximum possible price for the produce of the members.

3. To render the following services to the members with the assistance of the MD:
   (a) to supply necessary inputs and equipment for vegetable and fruit cultivation;
   (b) to transport the produce and inputs at reasonable charges;
   (c) to grade, pack and transport vegetables and fruit ; and
   (d) to obtain specialists' service for these activities.

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[1] Since this report was prepared, 19 new Producer Unions have been set up in this and other areas. viz. Kurunegala, Kandy and Jaffna.

4. To obtain, hire-in and hire-out vehicles, buildings etc; for the activities of the union.

5. To develop a system of self-help and mutual help among the members and provide facilities for careful and useful appropriation of members' income.

structure

Persons who cultivate vegetables on a land situated within the Keppetipola VC area qualify for membership in the Union. All the members should adhere to the guidance given by the committee on production, grading, packing and selling of vegetables.

The committee of the union consists of the chairman, vice chairman, secretary, vice secretary, treasurer and 18 other members, all of whom are elected at an annual general meeting and 3 persons named by the competant authority.[1] These three persons can be selected from the Department of Marketing, Agrarian Services and Agriculture. The Union can be liquidated only by the competant authority.

functions and progress

By late 1978, the union had about 700 members. However, the union is not yet in a position to store inputs for supplying to the members in time. As a temporary arrangement, the MD distributes the inputs to the member producers. The MD had also given a lorry to the union to transport the members' produce. The MD's charges are as follows:

* when goods are trnasported = Rs.3.00 per mile, and
* Empty lorry = Rs. 1.50 per mile, and
* fare for being late = Rs. 2.00 per hour.

The individual members can hire the lorry to transport their produce not only to Colombo but also to other areas, subject to above charges. They have to pay, in addition 1% of the income to the Union.

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[1] Competant authority in this case is the minister who is in charge of the Marketing Department.

The most important feature of the Union is that it expects to undertake input supply, credit services and produce marketing to have a vertical integration over the vegetable production and marketing system. The Union also hopes to take their transactions in vegetables not only to Colombo but to other cities as well in an effort to curtail the dominance of the Colombo market as the major source for price determination.

CHAPTER 6

CONSUMER DEMAND FOR VEGETABLES AND PRICES OF VEGETABLES

This chapter aims at ascertaining the factors related to the consumer demand for vegetables and their influence over prices. The major factors discussed here are the trends in consumption of vegetables, population increases, price and availability of substitutes, incomes and purchasing power of the consumers, and consumer tastes and preferences.

6.1 Trends in Vegetable Consumption

The ultimate objective of the production and marketing programmes discussed earlier is to raise the consumption level of vegetables, which are an important item of food of the people in Sri Lanka.

The total quantities consumed of each individual vegetable (or the market demand) for a period of time are difficult to estimate in Sri Lanka context. If the total production is known, the above can be estimated according to the following formula .

$$MS = QT - (FC + S) \text{ ------ (1)}$$

$$MD = MS - W \text{ ---------- (2)}$$

Where, MS = Market supply
MD = Market demand
QT = Total output
FC = Consumption by farm families
S = Seed requirements
W = Waste

However, since there are no regular estimates in relation to the above mentioned variables, the estimation of market demand or total consumption is made difficult. In view of this, we have to treat the total production as a proxy for quantity consumed.

Due to the above mentioned difficulties, it is not expected to carry out this discussion on the basis of individual vegetable varieties. Thus, this discussion will be more on the basis of "Vegetables" as a single group of commodities.

The optimum daily requirements of vegetables of different categories of persons have been worked out by the nutritionists at the Medical Research Institute of Sri Lanka (see table 53) .

Table 53-: Optimum Daily Requirements of Vegetables of a Person: Recommendations of the Medical Research Institute

Age group and other categories	Leafy Vegetables (grams)	Fruit Vegetables, roots & tubers (grams)	Total (grams)
Children 1-2 years	14.38	28.75	43.13
3-10 years	28.75	57.5	86.25
Boys 11-14 years	57.5	115	172.5
Girls 11-17 years	57.5	115	172.5
Expectant Mothers	57.5	172.5	230
Nursing Mothers	57.5	172.5	230
Working Women	57.5	115	172.5
Women without Exercise	28.75	86.25	115
Working Men	57.5	115	172.5
Men without Exercise	57.5	115	172.5
Average	47.44	109.25	156.69

As shown in table 53, the average optimum daily requirements of a person is 156.69 grams of which 47.44 are leafy vegetables and 109.25 are fruit vegetables, roots and tubers. Assuming that these requirements are constant over time, some comparisons can be made with the figures given in annual food balance sheets prepared by the Department of Census and Statistics. The food balance sheets give estimates on the annual availability of food nett and the daily per capita consumption of vegetables. Table 54 and figure 11 present a comparison of data from these two sources to get a general idea about the extent to which the people of Sri Lanka fulfil their vegetable requirements.

Table 54-: Comparison Between Optimum Daily Requirements Per capita and Daily Availability for Per capita Consumption of Vegetables (1967-1976)

Year	Percapita Requirement (grams per day) (Assumed to be constant). (a)	Percapita Net availability (grams per day) (b)	Fulfilment Rate: % (c)
1967	156.69	105.81	67.5
1968	156.69	103.40	66.0
1969	156.69	106.25	67.8
1970	156.69	130.05	83.0
1971	156.69	100.82	64.3
1972	156.69	96.19	61.4
1973	156.69	96.41	61.5
1974	156.69	97.21	62.0
1975	156.69	92.9	59.3
1976	156.69	92.65	59.1

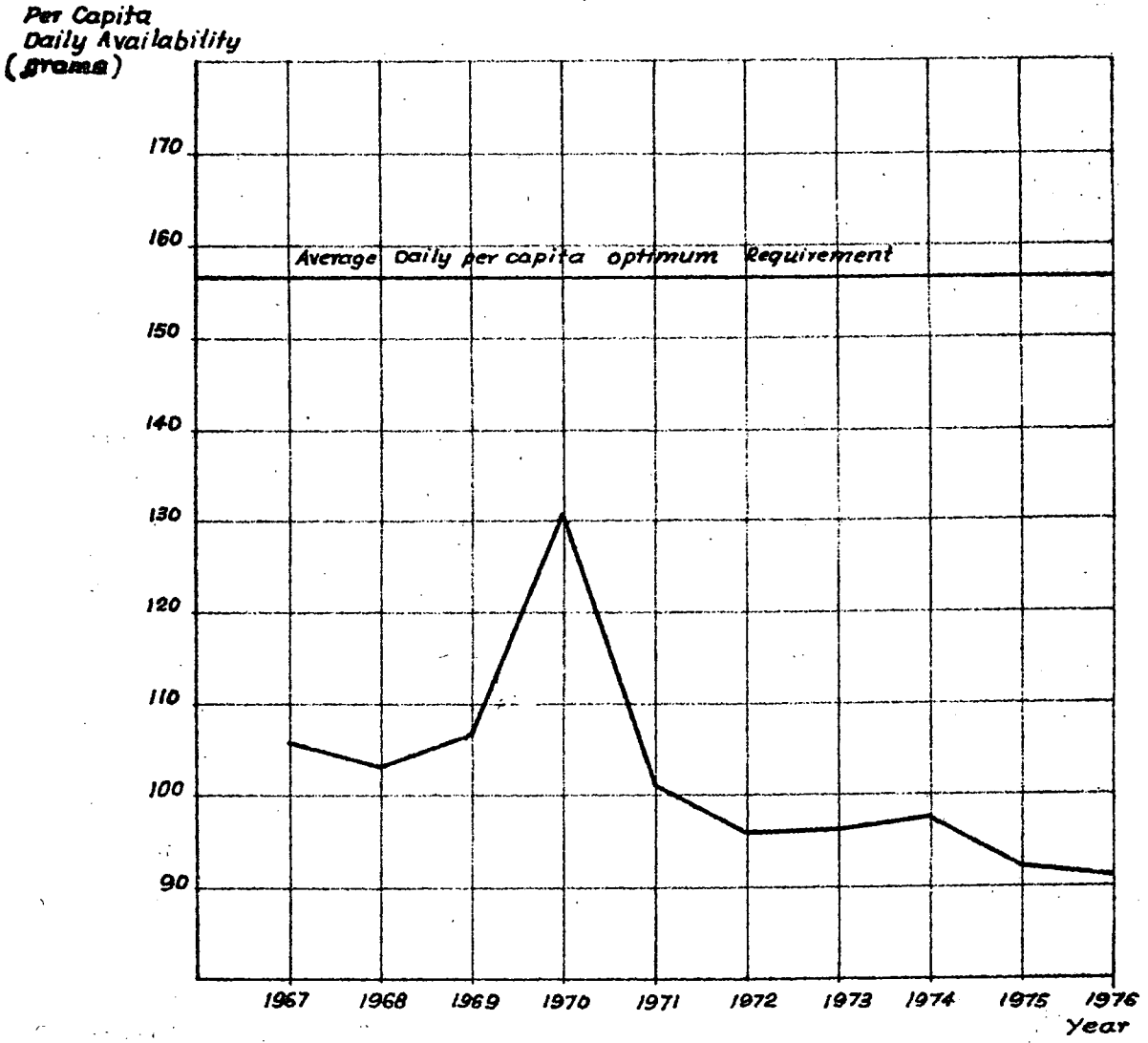
Source : (a) Medical Research Institute
(b) Department of Census and Statistics
(c) Availability as a percentage of requirements

It is evident that there has been a considerable gap between the optimum requirements and net availability for consumption of vegetables over the period under consideration. Furthermore, it is clear that the available per capita food net of vegetables has shown a slow but significant decreasing trend, especially from 1970.

The available data from the Socio-economic and Consumer Finance Surveys also suggest that there has been a reduction in the per capita consumption of vegetables. For example, the Socio-economic Survey conducted by the Department of Census and Statistics in 1969/70 estimated the per capita consumption at 105 grams per day whereas the Consumer Finance Survey conducted by the Central Bank of Ceylon in 1973 estimated the same at 62 grams per day. (Recognising the fact that the methodologies adopted by the two surveys are different, it can be said that these figures reveal a considerable reduction in the per capita consumption).

The decreasing trend in per capita availability suggests an increase in deamnd for vegetables due to population increases (other things being constant), while the production (supply) has remained relatively static (chapter 4). In such a situation, the price increases are also inevitable.

Figure 11. TREND IN PER CAPITA DAILY NET AVAILABILITY OF VEGETABLES DURING 1967-1976.



6.2 Effects of Population Increases on Demand for Vegetables

The increases in population result in increasing aggregate demand for vegetables since it is a major food item of the people in Sri Lanka, if other variables remain constant. The total population has increased by 1031000 from 1971 to 1976. The expected demand, based on the MRI recommendations, has gone up by 72070 tons of vegetables between these two years. But the actual available quantity has decreased by 3689 tons (see table 55).

However, the data given in table 55 cannot be considered as the actual demand by the consumers but they are estimates of optimum recommendations and actual gross production of vegetables. Thus, on the basis of these data we cannot conclude that the consumer demand has decreased. However, these data reveal that there has been a widening gap between the optimum requirements and the actual availability of vegetables.

Between these years, i.e. from 1971 to 1976, there has not been much of a change in age structure of the population. For example total number of children below 10 years of age remained around 26 percent of the total population. Therefore, the effect of population on the vegetable consumption has been from the increase in its total number rather than from changes in its age structure.

Based on the assumption that per acre yield of vegetables remained at 2 tons, the total acreage devoted to vegetable cultivation is estimated to be about 300,000 according to actual per capita gross availability. The acreage needed to fulfil the MRI requirement is estimated at 500,000. These estimates are dependent on the estimated population levels over the period under consideration.

Table 55-: Estimated Population and Requirements and Actual Availability of Vegetables in Sri Lanka(1970-1976)

1 Year	2 Mid year[a] population (thousands)	3 Total[b] MRI Gross requirement(tons)	4 Total actual gross availability(tons)	5 Estimated (c) MRI acreage requirements.	6 Estimated actual acreage (d)
1970	12514	875980	729263	437990	364632
1971	12699	888930	573712	444465	286856
1972	12951	906570	558225	453285	279113
1973	13091	916370	565551	458185	282776
1974	13284	929880	578651	464940	289326
1975	13514	945980	562569	472990	281285
1976	13730	961000	570023	480550	285012

(a) Dept. of Census estimates according to Reports of the Registrar General

(b) 0.07 Tons per head per year (25 per cent was added to the net availability on account of wastage).

(c) - 5 - = - 3 - / estimated yield per acre (2 tons)

(d) - 6 - = - 4 - / estimated yield per acre (2 tons)

Table 56 presents the projections of the population and the resultant demand for quantity and acreage of vegetables up to the year 2001. According to these projections, the total population will rise by 2096,000 in 1981 and by 8056,000 in 2001, from 1976 level. Thus, the MRI gross requirements will work out to an additional quantity of 537797 tons of vegetables in 1981 and 954997 tons in 2001, from the actual quantity in 1976. The additional extent of land needed to fulfil this demand resulting from the population increase will be, according to MRI requirements, 268898 acres in 1981 and 477498 acres in 2001, above the actual acreage in 1976.

On the basis of 1976 per capita availability levels, the additional quantity of production will work out to 82800 tons in 1981 and 328650 tons in 2001, above the level of 1976. The additional extent of land needed to meet this demand will be 41400 acres in 1981 and 208325 acres in 2001.

Table 56-: Projections[a] of Population and Requirements of Quantity and Acreage of Vegetables :

1. Year	2. Population (thousands) (Medium Projections (b)	3. Total MRI Gross Requirements (Tons (c)	4. Total likely gross availability (Tons) (d)	5. Estimated MRI Acreage Requirements (e)	6. Estimated likely Acreage (f)	(additional acreage needed (base=1976=285012) 7a. According to MRI Requirements	7b. According to Estimated likely acreage
1981	15826	1107820	652823	553910	326412	268898	41400
1986	17357	1214990	715976	607495	357988	233483	72976
1991	18868	1320760	778305	660380	389153	375368	104141
2001	21786	1525020	898673	762510	493337	477498	208325

(a) These projections are based on two basic assumptions (1) Yield per acre will remain constant .
(2) Actual Percapita availability will remain constant at 1976 level (0.033 tons net or 0.04125 tons gross)

(b) Based on the following assumptions :
(1) Fertility will decline gradually to 60 percent in the year 2001, from the level of the year 1971 (Census).
(2) Growth rate in 1971 = 2.2 percent and the same in 2001 = 1.3 percent
(3) Life expectations will reach the values 72.2 years for females and 68.5 years for males in 2001.

(c) 0.07 tons per head per year
(d) Based on the actual gross availability in 1976.
(e) 5 = 3/ estimated yield per acre (2 tons)
(f) Estimated on the basis of actual acreage and percapita consumption level in 1976 (6 = 4/yield per acre = 2 tons)

All the above estimates however, depend on two basic assumptions, i.e (i) the actual availability per capita of vegetables will remain constant at the 1976 level and (ii) the yield per acre will remain constant.

Table 57 shows the estimated net requirements of quantities of vegetables according to districts depending on the mid-year population estimates for 1978. The gorss quantity required according to MRI standards is 992, 880 tons whereas the same according to likely availability on the basis of 1976 figure is 510090 tons. The corresponding total acreage figures are 496,440 and 255,045.

Table 57-: Estimated Net Requirements of Vegetables According to Districts

District	Mid year Estimated population,1978(a) (ooo')	Percentage of total population, in each district %	Net Requirements (tons) MRI Standards	Likely availability on the basis of 1976 actual figure
Colombo	2972	21.0	166432	98067
Kalutara	808	5.7	45248	26664
Kandy	1285	9.1	71960	42405
Matale	354	2.5	19824	11682
Nuwaraeliya	468	3.3	26208	15444
Galle	814	5.7	45584	26862
Matara	660	4.6	36960	21780
Hambantota	388	2.7	21728	12804
Jaffna	801	5.6	44856	26433
Mannar	90	0.6	5040	2970
Vavunia	111	0.8	6216	3663
Batticaloa	300	2.1	16800	9900
Ampara	316	2.2	17696	10428
Trincomalee	223	1.6	12488	7359
Kurunegala	1159	8.2	64904	38247
Puttalam	437	3.1	24472	14421
Anuradhapura	458	3.2	25648	15114
Polonnaruwa	190	1.3	10640	6270
Badulla	665	4,7	37240	21945
Monaragala	228	1.6	12768	7524
Ratnapura	739	5.3	41384	24387
Kegalle	718	5.1	40208	23694
Total-Sri Lanka	14184	100.0	794304	408072

(a) Source: Registrar General's Office

6.3 Price and Availability of Substitutes and Demand for Vegetables

The substitutes for an individual vegetable may be the other individual vegetables, i.e. one vegetable variety can be substituted for another. But when we consider "vegetables" as a single commodity, the major substitutes in Sri Lankan context are potatoes, dhall, meat, fish (fresh), dryfish and eggs. The price increases and short supplies of these substitutes may have compelled the average consumer to demand more vegetables because the latter would have been still cheaper. Higher demand created in this manner might also have contributed to increased vegetable prices.

Masoor dhall, which is prefered as a major substitute for vegetables by the average consumer was not available at normal market prices from 1975 to 1977. Even before 1975, this item was issued only in limited quantities by the co-operatives.

Average prices of the other major substitutes are given in table 58.

Table 58-: Colombo Market Average Prices of Major Commodities Used as Substitutes for Vegetables, 1973-1978 (in Rupees)

Item	Unit	1973(a)	1974(a)	1975(b)	1976(b)	1977(b)	1978(b)*
1.Potaotes	1 lb.	1.18	1.59	1.83	1.88	2.32	2.53
2.Beef	1 lb.	2.28	3.08	3.53	3.66	3.91	4.47
3.Fish(fresh)	1 lb.	3.38	3.88	2.53	3.05	4.16	4.30
4.Dry fish(c)	1 lb.	2.83	3.69	5.25	5.83	N.A.	N.A.
5.Eggs(d)	Each	0.30	0.45	0.55	0.65	0.75	0.79
Average Price of all vegetables(e) (excluding leafy vegetables.)	1 lb.	0.66	0.77	0.92	1.00	1.27	1.64

Source: (a) = Dept. of Census and Statistics (b) = Central Bank of Ceylon.
(c) = Dept. of Census & Statistics, (d) = Marketing Department.
(e) = Dept. of Census & Statistics, Central Bank of Ceylon.
(b)*= Average prices for January - June, except in the case of eggs.
N.A. = Not available.

The ratio of substitution between vegetables and other commodities in terms of quantity is different from one substitute to another. Roughly, the ratio per unit can be estimated as 1:1 between the first three commodities given in table 58 and vegetables , ½:1 between dryfish and vegetables and 5:1 between eggs and vegetables. Depending on these substitution

ratios, we can work out price ratios between the substitutes and vegetables to see the relative cheapness of these commodities, from the view point of the consumers.

Table 59-: Price Ratios(a) Between Major Substitutes and Vegetables, 1973-1978

Item	Substitution ratio per unit	1973	1974	1975	1976	1977	1978
1.Potatoes	1:1	1.79	2.06	1.99	1.88	1.83	1.54
2.Beef	1:1	3.45	4.00	3.84	3.66	3.08	2.73
3.Fish(fresh)	1:1	5.12	5.04	2.75	3.05	3.28	2.62
4.Dry fish	½:1	2.14	2.40	2.85	5.83	N.A.	N.A.
5.Eggs	5:1	2.27	2.92	2.99	3.25	2.50	2.41

(a) = Price of substitutes / Price of vegetables.

N.A. = Not available.

Table 59 reveals two important factors about the relative cheapness of vegetables compared to the substitutes. First, the price ratios between substitutes and vegetables have been significantly greater than 1 (one) showing the relative cheapness of vegetables which motivates the consumers to demand more and more vegetables. The greater price ratios are shown between fresh fish and vegetables and between beef and vegetables. Secondly, due to increases in demand and other factors, the price of vegetables has gone up at a faster rate than that of the substitutes. This is shown by the decreasing trend in price ratios between almost all the substitutes and vegetables, especially from 1975/76.

6.4 Income and Purchasing Power of the Consumers and Demand for Vegetables

The increasing demand for and the resulting high prices of vegetables can also be partly atrributed to the increasing trends in income and the purchasing power of the people in the country. The percapita income, in current terms, has increased significantly over the last decade or so (see table 60). These increases have contributed to a higher purchasing power (indicated by the real income) of the consumer in general , except in the years between 1969 and 1972, and hence to a higher demand for vegetables as a whole, among other consumer goods.

Table 60-: Per Capita Income in Sri Lanka, 1965-1977

Year	In Current terms (Rs.)	In real terms (Rs.:) (Deflated by cost of living index)
1965	670	596
1966	673	599
1967	706	615
1968	824	678
1969	875	670
1970	924	669
1971	928	654
1972	974	646
1973	1159	701
1974	1480	797
1975*	1623	818
1976*	1754	874
1977*	2084	1026

* = Provisional estimates

Source: Central Bank of Ceylon

However, it is generally believed that the consumers spend decreasing proportions of their total income on basic staple food items as their income levels rise. This has been true to some extent in the case of vegetables in Sri Lanka. For example, the proportionate expenditure on vegetables by spending units has been 11.3 per cent in 1953, 10.6 per cent in 1963 and 8.3 per cent in 1973, out of the total food expenditure.[1] On the other hand, the proportionate share of the total food expenditure spent on animal protien (fish, meat, eggs, milk etc;) has increased indicating the increases in per capita income levels.

However, the consumption of vegetables by different income earning groups is different from the average consumption by all income groups. The data given in the Consumer Finance Surveys makes this clear. The Consumer Finance Survey conducted by the Central Bank of Ceylon in 1973 estimated the per capita consumption of vegetables as a whole at 62 grams per day. But, the consumption level is less than this for lower

[1] Central Bank of Ceylon (1953, 1963 and 1973), op.cit.

income groups and more for higher income groups (see table 61).

Table 61-: Per Capita Consumption of Vegetables by Different Income Groups (grams per day)

Income group	Per capita consumption	Deviation from the mean
0-50	41.82	- 20.18
51-100	48.18	- 13.82
101-200	50-91	- 11.09
201-400	55.0	- 7.0
401-800	58.64	- 3.36
801-1600	71.36	9.36
1601-2000	79.55	17.55
2001-3000	87.73	25.73
over 3000	82.73	20.73

Mean Consumption = 62 grams per day.

Source: Calculated from the estimates given in the Report of the Sruvey of Sri Lanka's Consumer Finances 1973, Part II, Statistical Tables, Central Bank of Ceylon.

With regard to different types of vegetables, it has been found that the consumers attach greater preference to relatively high priced vegetables such as beans, as their income increases. Some of the low priced indigenous vegetables like cucumber and snake gourd have even shown a decreasing trend in demand with increasing levels of real incomes between 1965 to 1974.[1] These variations depend on the varying degrees of preference attached to each individual vegetable by the consumers in different income groups. However, the degree of preference does not depend on the consumers taste alone. It is constrained by the price of a particular vegetable itself. For example, even if a consumer in a relatively low-income group prefers a high priced-exotic vegetable, he will resort to a cheaper variety, if he cannot afford it.

The Socio-Economic Survey conducted by the Department of Census and Statistics in 1969/70 presents data on the consumption pattern of some selected individual vegetables by different income groups. The data

[1] Gunawardena, (1977), op.cit.

gives some idea about the effect of changes in income levels on demand for selected individual vegetables (see table 62).

It can be observed from table 62 that in general, the consumption of selected vegetables has a direct positive relationship with the income levels. The data also shows that the consumers attach greater preference for beans, cabbage and redpumpkin over the other selected vegetables, for the price of these vegetables is lower than that of some exotic vegetables such as beet-root, carrot, leeks etc. However, consumers in the lowest income strata prefer to have indigenous vegetables at lower prices. After reaching the income level of Rs.1,000/- per month, the consumers prefer more exotic vegetables.

These differences are, however, not dependent on the income levels alone. It should be noted that there is a great interdependence between price and income as far as their effects on demand for vegetables are concerned.

Purchasing power of the consumers also influences the price determination at the retail markets. As discussed earlier, this has a direct bearing on market segmentation, e.g. formation and developement of pavement trade, retail market centres, supermarket centres etc., which cater for the consumers with varying income levels.

The buying habits of the consumers are to a certain extent dependent on their income levels and purchasing power. It also affects the price fixation at the retail level. The majority of the consumers in lower and middle income groups do not have refrigeration facilities at home and therefore, purchase vegetables to fulfil the requirements of only a day or two . It was observed during the survey that, on average, 1 to 1½ lbs. of each vegetable were purchased by the consumers in these income groups, per market visit. Thus, the retailers cannot fix such a higher price which the particular consumers visiting them cannot afford to pay. Consumers who have refrigeration facilities at home behave in a different manner. They often purchase 2-3 lbs of each vegetable, per market visit. However, this category makes very little impact on the day to day price of vegetables as a whole, at retail level.

Table 62-: Per Capita Monthly Consumption of Selected Vegetables - According to Household Income Groups (Quantity in lbs.)

Vegetable	MONTHLY HOUSEHOLD INCOME(Rs.)							
	Under 100	100-149	150-199	200-399	400-599	600-799	800-999	1000 & over
Exotic								
Beans	0.25	0.31	0.40	0.42	0.57	0.71	0.78	0.85
Beetroot	0.09	0.10	0.12	0.13	0.18	0.23	0.28	0.35
Cabbage	0.40	0.47	0.53	0.55	0.65	0.74	0.84	0.90
Carrot	0.02	0.04	0.04	0.08	0.14	0.21	0.27	0.39
Leeks	0.05	0.08	0.09	0.13	0.21	0.26	0.25	0.37
Indigenous								
Cucumber	0.14	0.14	0.14	0.14	0.16	0.17	0.17	0.30
Lady fingers	0.16	0.26	0.25	0.29	0.34	0.35	0.44	0.42
Luffa	0.16	0.22	0.25	0.23	0.30	0.29	0.27	0.31
Redpumpkin	0.70	0.75	0.75	0.73	0.68	0.61	0.71	0.61
Snakegourd	0.25	0.26	0.28	0.36	0.42	0.43	0.39	0.35

Source: Dept. of Census and Statistics, 1973, Socio-Economic Survey of Sri Lanka, 1969-70. Rounds 1-4, Statistical Tables: Vol. II

CHAPTER 7

CONCLUSIONS AND POLICY IMPLICATIONS

SUMMARY

1. The major objectives of this study were:
   (a) To identify the trends and seasonal variations in price of vegetables;
   (b) To analyse the factors related to farm supply, marketing and consumer demand and their influence on the trends in prices, price determination, and price structure of vegetables, and
   (c) To examine the pricing efficiency of the vegetable marketing system.

2. The price of vegetables has shown an increasing trend over the last decade or so, even after discounting the effect of general inflation in the economy of Sri Lanka. The prices have shown a sharper increase from about 1974 onwards.

3. The seasonal variations in prices were dependent on the variations in supply of each individual vegetable according to climatological reasons, rather than on economic variables. *Therefore, our main concern was to examine the factors leading to the increasing trend in the price of vegetables.*

4. *It was also decided to examine the cause of recurrent high price of vegetables by analysing the process of price determination, price structure and pricing efficiency.*

5. The factors influencing vegetable prices were analysed under three broad headings, i.e. factors related to (i) farm supply, (ii) marketing and (iii) consumer demand.

6. A mathematical model with price as the dependent variable and other explanatory factors as independent variables would have ideally suited

for estimating the effects of each factor on vegetable prices. But this could not be done due to the obvious reason that the consistent, accurate and quantitative series of data needed for such an exercise were not available for each of these variables. Thus, the study appraoch was to examine and explain the effect of one variable at a time, mainly on the basis of the assumption that "other things remain constant".

7. Data and information through field surveys and from various publications and institutions form the basis of this investigation. The interpretations are subject ot the limitations of data and information.

8. Unless otherwise specified, the aspects dealt with here are on the basis of "vegetables" as a single commodity. Similarly "price" refers to the price of the "fair average quality" produce.

9. Factors Influencing the Trends in Vegetable Prices

9.1. Factors Related to Farm Supply

(a) The increasing trends in vegetable prices are partly attributable to the fact that the production of vegetables has remained more or less constant, while the demand has grown with the increases in population. The trends in acreage showed that only a few vegetables have expanded in their extent from 1962/63 to 1977/78. Out of the 10 selected vegetables, only one shows significant increases in its production throughout this period

(b) The vegetable subsector was relegated to a secondary place during the last decade or so, both by the producers and the government. The relatively more profitable and convenient crops such as potatoes, onions, chillies, cowpea, green gram, tobacco etc; have offered a competition to vegetables in terms of both acreage and production. This is evident from the fact that the production and acreage of these crops have increased significantly during the same period when the vegetable subsector registers a recession. This situation

especially affected adversely the production of vegetables in the chena lands in the dry zone.

(c) The dry zone irrigation settlement schemes have encouraged the producers to grow more paddy because it is the most profitable enterprise on irrigated land from the view point of the producers. Acoording to the producers, large scale vegetable cultivation on such lands is not only uneconomical but also inconvenient. Expansion of dry zone irrigation settlements has also affected adversely the production of chena type of vegetables because it calls for intensified settled cultivation instead of extensive chena cultivation. It has also been found that the lack of marketing outlets, uncertainty with regard to price, lack of water and shortage of required equipment and inputs have impeded the cultivation of vegetables in the major dry-zone settlement schemes.

(d) The Price of vegetables has also gone up due to increases in the cost of production associated with price hikes on land, labour, seed, agro-chemicals, fertilizer etc. The average cost of production per acre of 9 selected vegetables were calculated and these data reveal a substantial increase even from Maha 77/78 to Maha 1978/79, within a single crop year. A comparison of our estimates for cabbage, carrot and raddish with those estimated by an earlier study suggests an increase of about 150 percent of their average cost of production per acre from 1976 to 1978.

(e) It was found that the net average profits to producers are negative in the case of most vegetables.(e.g. carrot at Vidurupola, cabbage at Boragas, beans, snakegourd and tomatoes at Hewavissa, snakegourd and tomatoes at Meeruppa,) even discounting the imputed cost of family labour. Some vegetables are profitable (in terms of net profits) when the imputed cost of family labour is not accounted. In such cases, the net profit from the vegetable cultivation can be regarded as the net return accruing to family labour. However, the decreasing profitability is a disincentive

to the majority of small cultivators to expand the production of vegetables. The net profits decrease due to increases in the prices of factors of production and the marketing costs incurred by the producers, given relatively low producer prices.

(f) In the present context, an expansion of acreage and/or production can keep the prices within reasonable limits to the consumer, provided other things remain unchanged. But there are certain constraints such as decreasing profitability, shortage and the high price of land, labour and material inputs. Other major problems reported by the vegetable cultivators are:
(i) the risks and uncertainties attached to rainfed cultivation in the absence of a crop insurance scheme,
(ii) deficiencies in extension services, and
(iii) difficulties in obtaining institutional credit.

9.2 Factors Related to Marketing

(a) The increases in the price of vegetables are also partly explained by the rises in the costs of marketing functions and services over time. Transport costs have gone up considerably with increases in prices of fuel, spare parts, vehicles and wages. It was also observed that the concentration of transport services among a few prevents any reduction of transport charges, which would have otherwise been possible with the liberalisation of imports of vehicles.

Similarly, the costs of containers, marketing labour charges, market levies, rents, taxes, cost of communication etc; have also gone up considerably.

(b) The countervailing institutions established by the government (e.g. the Marketing Department, the MARKFED) or the co-operatives have not been able to offer adequate competition to private trade in vegetables. Their countervailing effect has not been strongly felt due to various operational

drawbacks and difficulties over time.Thus, they have not been able to contribute much to a policy of "keeping the price of vegetables within reasonable limits to the consumers and the producers".

9.3 *Factors Related to Consumer Demand*

(a) It is difficult to make estimates of quantities demanded of each vegetable by the consumers over time. However, available data from the food balance sheets, Socio-Economic Surveys and Consumer Finance Surveys show that there has been a progressive reduction in per capita consumption of vegetables and that there is a considerable gap between the optimum daily per capita requirement and per capita available quantity for consumption. Decreasing per capita consumption further suggests relatively lower or static production levels and simultaneous increases in total population.

(b) Increases in population have a considerable positive effect on demand for vegetables since it is a major food item of the people. *Although the population has increased by 1031000 from 1971 to 1976, the actual available quantity of vegetables has decreased by 3689 tons.* Given a short-supply relative to the demand, price increases are inevitable.

(c) *The price increases and short-supply situations of substitutes for vegetables such as dhall, meat, fresh fish, dry fish, eggs etc., have compelled the consumers to demand more and more vegetables.* The price ratios between these substitutes and vegetables have been significantly greater than 1 (one) during 1973-78, showing the relative cheapness of vegetables. This has further resulted in increased demand and hence increased price of vegetables subsequently.

(d) The per capita income, in money terms, has increased significantly over the last decade or so. Except in the years between 1969 and 1972, the real income of the consumers has also gone

up registering an increase in their purchasing power. This has partly contributed to a higher demand for vegetables. Socio-Economic and Consumer Finance surveys also suggest that there is a significant positive relationship between the income levels and demand for vegetables. It is also evident that the proportionate expenditure on vegetables out of total food expenditure has decreased and that on animal protien has increased reflecting the rises in per capita income levels.

10. *Aspects of Current Price Structure Within the Private Marketing System for Vegetables:*

10.1 *Price Spread and Marketing Margins*

(a) Marketing margins for 17 individual vegetables were analysed using the mode method. The margins were calculated according to two marketing outlets, i.e. (i) commission agent system and (ii) trucker-buyer system.

(b) The total marketing costs incurred by the producers and the traders are higher under the commission agent system than under the trucker-buyer system.

(c) The net price received by the producers is higher under the trucker-buyer system than under the commission agent system in the case of most vegetables. However, the broker fees paid under the trucker-buyer system are larger than the sales commission charged by the commission agents.

(d) *In general, the net price received by the producers is below 50 percent of the consumers' price and the gross marketing margin constitutes more than 50 percent of the price paid by the consumers. The gross marketing margins cannot be regarded as small by any standard since vegetables are mostly marketed in an un-processed form without costly preparation for sale.*

(e) The gross marketing margins are relatively higher in the case of relatively more perishable vegetables.

(f) The wastage which occures in transit and handling is considerable. This is due to bad packing practices and unscientific methods adopted in transport and handling. However, the current price structure does not provide economic incentives for adopting scientific methods of packing and transport. The share attributed to the wastage factor is, on average, 23 percent of the consumers' price.

(g) The share of the consumers' price accruing to transport and handling services is very low compared to that accruing to traders and the wastage factor.

(h) The highest proportion accruing to the middlemen is absorbed by the retailers. This includes the operating costs of the retailers which are not easily ascertainable. They are market levies, stall rents, wages and other overhead costs. Besides, the retailers tend to mark up a higher margin in order to avoid any losses due to further wastage of vegetables at the retail level, especially with regard to vegetables that are easily perishable. They also tend to maintain constantly high margins in order to avoid vicissitudes in their incomes in times of fluctuating prices. Most retail establishments are small in scale in economic terms, involving large numbers of part-time operators and family labour.

(i) Present study and some earlier studies suggest that the gross marketing margins of certain vegetables do not show any meaningful reduction from 1974 to 1978.

10.2 Efficiency of the Traditional Marketing System

(a) Operational Efficiency

It is assumed that the traditional marketing system for vegetables is operationally inefficient in view of high

marketing costs and margins, wastage of produce, technical inefficiencies stemming from bad packing , unscientific transport methods etc., and physical congestion at the major markets. This aspect needs further investigation.

(b) *Pricing Efficiency*

The vegetable producers generally lack information regarding prices and consumer preferences. Producers' cost is not reflected in the consumers' price due to high gross marketing margins. . Various imperfections in the marketing system render the price differentials between producer, wholesale and retail markets considerably higher than the transport costs, handling charges and wastage plus a normal profit margin. Though the producer-price and the wholesale price under the commission agent system are highly correlated, there is very low or negative correlation between retail prices and wholesale prices and between retail prices and producer prices. The correlation is low or negative even between the producer and wholesale prices under the trucker-buyer system.

10.3 *Process of Price Formation*

(a) *In practice, the price is determined at the wholesale level. The prices so determined is the fundamental basis for price formation at producer and retail levels.* However, this varies according to specific forces that affect the demand and supply process operating at each level.

(b) Producers who send their produce direct to major wholesale markets are paid according to the wholesale price. Trucker-buyers also pay the producers according to prices prevailing at the wholesale markets where thy come from. However,

these prices could vary depending on the degree of working of the following factors.

(i)

Volume of vegetables offered for sale by the producers at a given point of time.

(ii)

Number of producers and traders present at a particular market place.

(iii)

Quality of vegetables.

(iv)

Producers' urgent financial needs.

(v)

Socio-economic relationships between the producers and the traders.

(vi)

Producers' access to accurate price information.

(vii)

Risk attached to perishability of vegetables.

(c) *Wholesalers base their selling and buying prices on the previous prices and likely reactions they may cause on future prices. Price rings, leadership pricing and influences of trader associations are common at this level.* Thus, the wholesale prices are predetermined but can vary according to supply by the producers and demand from the retailers.

(d) Retailers determine their selling prices on the basis of wholesale price, their operating costs and margins and consumer characteristics.

(e) *At individual market centres at each level the buying and selling prices are not competitive. The price differences, if any, depend on the quality characteristics of each type of vegetables and on the variations in overhead costs of the traders.*

10.4 *Nature of competition and Market Imperfections*

(a) Various elements of imperfections operate at various levels which limit the competition among the traders which in turn result in low producer prices, abnormal profits to the middlemen and high prices payable by the consumers.

(b) It was observed that the produce collection and transport at the farm level in some localities were handled by one or two transport services/assembly agents. *Some transport services enjoyed a near monopoly with regard to the collection of vegetables on different days of the week and by specialising on routes. Such transport services often control the transport at all levels i.e. from the farm to the wholesale points.*

(c) Even though there is competition sometimes among the traders (buyers), the producers cannot realise the benefits due to the involvement of the brokers. *Brokers are the beneficiaries of this competition.*

(d) *The competition among the buyers at producer level, if it exists at all, is limited to slack seasons of harvesting. The producers are not benefitted here since they do not have enough produce to earn a significantly higher total income.*

(e) A relatively small number of wholesalers at any given wholesale market has a large influence on prices, as they cater for numerous producers and retail traders all over the country. It is not difficult for such a relatively small group to work in a collusive manner and limit the competition among themselves thereby suppressing producer-prices and increasing selling prices.

(f) Within a given retail market, there is no price-competition among the traders. Price differentials are a result of differences in the quality of the produce and operating costs of the traders.

10.5 *Causes of Market Imperfections*

(a) Perishability of vegetables and resulting risks and uncertainties in the absence of proper storage facilities at the farm level compel the producers to sell their vegetables to an available outlet. This gives the opportunity for the traders to maintain a particular price level.

(b) The producers are in a weak bargaining position during peak harvesting seasons. Though the farmers are in a relatively better bargaining position during slack seasons, they do not have enough produce to get a higher total revenue.

(c) The insulated and scattered nature of producer markets enables the traders to maintain a particular price level at a given market but differential prices at different markets even in the same village. *Due to poor transport facilities and inadequacy of price information, the producers are unable to fill the gaps in supply at particular markets so that they are not in a position to realise the benefits of higher prices prevailing at those markets.*

(d) *Various barriers to entry into vegetable trade limit the competition.* At the producer level, new entrants to transportation of vegetables need heavy capital investments in terms of vehicles etc. Even if these requirements can be met, the new comers have to run the risks of threats and even physical harm by those who already control the transport services.

(e) The trucker-buyers can come to the villages if they have adequate working capital and access to transport facilities. But the existing firms (brokers and traders) try to prevent them even with physical threats. *The major requirements for new comers are (a) knowledge about the villages, (b) relationships with the producers, brokers and traders who are already operating in the villages and (c) high volumes of working capital.*

(f) The entry into the wholesale trade of vegetables is very difficult primarily due to the lack of space, exorbitant rents, requirements of knowledge about personnel and environment and experience in every aspect of wholesale business and necessity for heavy volume of working capital

(g) Entry into the retail trade of vegetables, especially at the supermarkets and market centres, is difficult due to the involvement of the tender systems, high stall rents, lack of space etc. A long experience in every aspect of vegetable trade too is a prerequisite. At the periodic retail markets, the traders have to establish good relationships with the brokers and touts to avoid various types of harassment.

(h) The provision of multiple economic services in relation to vegetable production and marketing is perhaps the most important factor influencing the imperfections. These include marketing, merchandizing as well as money lending.

(i) The primary level traders, especially commission agents, lend large sums of money to their producer-clients not only for cultivation but also for other purposes. The repayment of loans is by way of sending vegetables. The loans are granted without any formal procedures or obvious interest rates. However, it was observed that the traders charged a hidden interest from the farmers by under-invoicing and paying low prices. The wholesalers are the major money lenders. They lend money to the producers and primary level assembly traders as well as to the retailers. This contributes to their dominance over pricing of vegetables.

(j) Most of the transport agents and trucker-buyers transport various goods free of charge for the producers. These include inputs needed for vegetable cultivation, consumer goods and even building materials and furnitures.

(k) In some areas, primary level collectors run retail shops which supply consumer goods to their producer-clients on credit . The repayment of such credit is also by kind in the form of vegetables.

(l) It is the general practice of most traders, especially of commission agents and assembly agents, to attend the social activities of their producer-clients and make presentation in cash and kind. It was also observed that there were even kinship ties between the wholesalers and farmers, wholesalers and retailers and so on.

(m) *Through the provision of multiple economic services and various social relationships, the traders are able to maintain a regular clientele of producers. The result is that the producers are obliged not to bargain over prices paid to them and not to make queries about the malpractices adopted by their trader-patrons such as underweighing, underinvoicing etc.*

(n) Most producers lack information on current daily market prices and are compelled to accept the traders' offers. They rely on the price information given by the private traders and peers.

(o) Physical congestion at major wholesale markets often prevents effective bargaining between buyers and sellers.

(p) *Some wholesalers specialise in certain producing areas and in certain types of vegetables. This leads to a monopoly position of a few traders over those particular vegetables.*

(q) At the retail level, there seems to be a specialisation in different consumer communities which lead to differential prices. Some market centres cater mainly for the diplomatic and high income communities while some others cater for the lower income groups.

11. *Institutional Marketing Reform and Its Implications On Vegetable Prices*

11.1. The major complaint against the traditional (private) marketing system for vegetables has been the issue of influence exerted by the middlemen over the producers and consumers by way of realising the biggest share of the consumers' price. *The major measure adopted by the government in order to reduce the middlemen's share, thus assuring a reasonable price to the producer and a fair price to the consumer has been the establishment of countervailing institutions such as the Marketing Department (MD) , the MARKFED, and the Producers' Unions.*

11.2. However, the institutional sector handles less than 25 per cent of the total marketed surplus of vegetables, and the above mentioned institutions have not been able to effectively influence the price of vegetables as a whole. Operational and management problems of these organisations which are detailed below have led to this situation.

11.3. *The Marketing Department (MD)*

(a) The MD was established in 1935, to assist the local producers to obtain a fair price for their agricultural produce by providing an alternative marketing channal and to promote the sale of local produce at reasonable prices to the consumers. Though the MD does not specialise in marketing of vegetables alone, it constitutes a major part of the department's activities.

(b) The MD as an effective alternative outlet was able to assist the producers, in its initial period of operation, for realising better prices than they would have other wise obtained from the private traders. *The dynamism and the effectiveness of the Department 10 years ago had begun to wane.*

(c) Over the years, several managerial and technical difficulties have cropped up leading to less dominance of the MD at the

producer level, compared with the private traders. The Officials at the local purchasing centres do not have a flexibility to purchase vegetables over and above the orders placed by the head office and to change the buying prices depending on the local market situations. In most localities, the MD purchases vegetables from the brokers bypassing the genuine vegetable cultivators. It also serves more the influential producers. Malpractices of some of the officers who resort to practices like falsification of bills and underinvoicing etc., and the odd hours at which the centres are kept open have worsened the situation.

(d) The producers in fact shun the MD in some areas because it pays prices lower than that of the private traders, applies complicated grading systems which are often without a reasonable basis, does not promply pay the proceeds of sales and does not return the containers of the producers.

(e) The officials at the collecting centres alone are not responsible for this situation. They are not in direct-line authority regarding prices and quantities to be purchased. One reason for their indulgence in malpractices may be the denial of facilities which are enjoyed by their counterparts in other government departments. The transport facilities available to the centres are certainly inadequate to cover wider areas which come under the purview of each collecting centre. Quite often, the centres do not have enough gunnies and wooden boxes used for packing of vegetables. They have no proper storage facilities, at the centres.

(f) The MD is not, and cannot be, engaged in money lending for vegetable cultivation which implies it has also no contral over the vegetable marketing at the producer level, unlike the private sector.

(g) At the wholesale level, the MD receives vegetables of sub-standard quality which further substantiates the hidden transactions between the officials and the brokers at the

producer level. Moreover, the MD is unable to compete with the private traders at the wholesale markets because it handles only a small proportion of the total quantity transacted at this level.

(h) At the retail level, the MD serves a useful purpose in selling vegetables to consumers at a cheaper rate. The consumers prefer to buy vegetables from the MD's retail shops, but often complain about the low quality of the produce offered for sale and the inaccuracy of weights.

(i) On the whole, the MD does not have an effective influence on producer prices paid by the private traders and prices charged by retailers from consumers. This is primarly because it handles only a limited proportion of the total marketed surplus of vegetables at producer, wholesale and retail levels.

11.4. Cooperative Societies

(a) A co-operative society which specialises in vegetable production and marketing is virtually absent in Sri Lanka. Some societies, however, handle marketing of vegetables as a part of their enterprises .

(b) The only co-operative society which specialised in vegetable trade at producer, wholesale and retail levels was the Udapalatha Co-operative Agricultural Production and Sales Society at Keppetipola in Welimada area. From 1939 to 1971, until such time that the society was amalgamated with the Udapalatha Multipurpose Co-operative Society, this served the vegetable producers in the area by way of supplying inputs, marketing the produce and lending money . Even after the reorganisation (from 1971 to 1977), the society had a near monopoly in rendering these services to the producers. However, after 1977, the situation has changed. Its provision of credit

for cultivation purposes is minimal compared with that supplied by the commission agents. The number of the vegetable collecting centres of the society has been reduced from 18 to 9. The wholesale stalls of the society at the Colombo market also have been reduced from 3 to 1.

(c) The producers reported that after the reorganisation of 1972, hitherto successful operations of the co-operatives with regard to vegetable production and marketing had ceased also in Marassana and Naranvita (Gampola) areas.

11.5. *The Co-operative Marketing Federation (MARKFED)*

(a) The MARKFED was established in 1973 and now acts as an apex organisation to serve the Multipurpose Co-operative Societies in the sphere of agriculture. Vegetable marketing is only one of its wide range of activities. It also distributes agricultural inputs to the producers on a limited scale but is not involved in granting cultivation loans.

(b) *At the producer level, there were complaints that the MARKFED purchased vegetables through the brokers bypassing the genuine cultivators. It also pays lower prices than those paid by the private traders. Farmers have also experienced difficulties in getting proceeds of sale and their empty containers, back from the MARKFED.*

(c) It was observed that the MARKEED handled a larger quantity of vegetables than the MD at the wholesale level despite the fact that it has relatively a lesser number of collecting points at the producer level. The quality of the vegetables at the wholesale floor of the MARKFED is also generally higher than those of the MD. However, the quantity of vegetables handled by the MARKFED is very small compared with that handled by the private sector. Therefore, the MARKFED is unable to provide an effective competition to the private sector in terms of price.

(d) The retail vegetable trade of the MARKFED is negligible compared to those of the private sector and the MD. *Retail shops of the MARKFED in Colombo usually serve the consumers in the higher income groups.* It was observed that the retail prices were higher than those prevailing at the traditional (private) market centres.

11.6. *Vegetable Producers' Associations*

(a) The concept of Producer Associations is somewhat different from the concept of Co-operatives. This was introduced and implemented first in 1978 in Welimada area. During the time of investigation, there were 4 of these Unions operating in the area.

(b) The major objective of the Unions is to plan and develop the production of vegetables systematically under the guidance of the Marketing Department thereby preventing frequent fluctuations in supply and price. By eliminating the middlemen at the primary level, it hopes to assure the maximum possible share of the consumers' price to the producers.

(c) The Unions hope to handle every activity regarding vegetable production and marketing which include supplying inputs and equipment, transportation of inputs and produce, grading and packing of produce, obtaining specialists' services and developing the habit of thrift among the members.

(d) The Unions also hape to supply vegetables to various parts of the country. This would reduce the dominance of the Colombo wholesalers/commission agents as price makers and help balance the demand and supply in outstations at reasonable retail prices.

(e) During the time of our investigation, the Unions have just begun their work and an evaluation was premature. However, they had served a useful purpose regarding transport of vegetables for the members. The Marketing Department was

handling the distribution of inputs to the producers and had provided lorries at low hiring rates for the activities of the Unionsas a temporary arrangement.

POLICY IMPLICATIONS

It must be emphasised at the outset that most of the general findings of this study are not entirely new, They have also been clearly pointed out in earlier studies on vegetable marketing and production, e.g. Department of Agrarian Services (1964), The Report.....,(1971), A Preliminary Report.....,(1972) and Abeysekera and Senanayake (1974).These earlier studies have given recommendations based on their own findings. Most of these recommendations were aimed at (a) providing competition to the private sector by streamlining the state sector marketing activities and (b) improving the physical services and functions in the marketing system. Even these recommendations have either not been implemented fully or have been failures where they were implemented, as evident from the findings of the present study.

It is clear that the piecemeal approach will prove inefficient in an attempt to solve the complex problems in the vegetable economy in Sri Lanka today, and more specifically, the problems connected with the price structure of vegetables. Assuring a fair price to the producer and a reasonable price to the consumer is a contradictory objective and with the existing socio-economic structure,it is not all that easy to achieve this objective unless concrete efforts are made which have to be planned carefully and experimented over a considerable period of time. The following recommendations should be treated as broad guidelines for a planned blueprint for promoting the vegetable industry in Sri Lanka.

RECOMMENDATIONS

The major objectives of a programme designed to solve the problems in pricing of vegetables will be to: (1) solve the problems in the production frontier (2) regulate various aspects of private trade, (3) reorganise the marketing activities of the state sector and (4) streamline the activities of the Producer Unions.

1. SOLVING THE PROBLEMS IN THE PRODUCTION FRONTIER

(a) The government policy has so far been aimed at encouraging the producers to keep the total acreage under vegetables as stable as possible and to expand the production through increased productivity. This is the most rational approach since extensive cultivation will not be possible due to worsening land/man relationship. New technology in terms of improved seeds, fertilizer, agro-chemicals and scientific cultural practices is essential. However, it was evident during the survey that the cultivators are unable to meet these requirements in time. Private trade of these essential inputs has resulted in exorbitant prices. It is, therefore, vital that these inputs are distributed to the cultivators by the co-operatives and/or Agrarian Service Centres alone, at subsidized prices.

(b) It was observed that cultivators in some areas prefer particular brand names of agro-chemicals, and these were not available to them, whereas such chemicals were available in plenty in areas where those were not very popular. Therefore, the institutions could, after a survey, concentrate the selling of particular brands of chemicals in areas where they are most popular among the cultivators.

(c) Institutional lending for vegetable cultivation has decreased dramatically during the last decade. The institutions should adopt a more liberal lending procedure towards the vegetable subsector. However, this will be too risky, especially in the

absence of a Crop Insurance Scheme. Therefore, we recommend that the Crop Insurance Scheme which is now operating in case of paddy (and even animal husbandry) should be extended to cover the vegetable sub-sector as well.

(d) It was observed that the majority of vegetable cultivators had no proper contacts with extension personnel and consequently unaware of new methods of cultivation. It is suggested that the Department of Agriculture explore the possibility of providing exclusive extension services for vegetables.

(e) It was evident that a few influential cultivators, especially in the dry zone, purchase water pumps and lend them to the average cultivators at excessive hire charges. It is suggested that water pumps be made available at reasonable prices to assure water supply to the dry zone vegetable cultivators.

(f) The Agrarian Services Committees can help in a rent regulation scheme for the vegetable farmer who works on a land on rent.

(g) The extensive chena cultivation will no longer be possible due to the expansion of irrigation-settlements in the dry zone. During the immediate post-settlement stages, there will be a (short-term) shortage of vegetables, in these new settlements. Therefore, immediate thoughts have to be given to the ways in which vegetables could be supplied to these areas. This factor has to be taken into account in planning the vegetable production in other areas of the country.

2. REGULATION OF VARIOUS ASPECTS OF PRIVATE TRADE

(a) It was clearly evident that market imperfections at various levels of the private marketing channel lead to arbitrary price fixing. The collusive behaviour of the middlemen in trnasport, assembly, pricing, wholesale and retail trade of vegetables has led to near monopoly situations, resulting in lower prices for the producers and higher prices for the consumers. It is, therefore, imperative that the government enforces regulations

to assure more competitive conditions within the private marketing system before embarking on an effort to create competition between the private and state sectors. For example, the government could enforce legislation to prevent the specialisation of routes by private transporters and collectors and try to assure a more equitable distribution of lorries used in the transport of vegetables.

(b) The government should enforce legislation to prevent various malpractices of the private traders at primary, wholesale and retail levels, e.g. under invoicing, under weighing etc. The pavement vendors not only supply low quality produce but also apply incorrect weights, though they sell vegetables at cheap prices. The pavement trade of vegetables in a sense prevents the adoption of correct methods of grading and packing because it gives a ready market for low qyality produce. Thus, it would be desirable to provide the present pavement vendors with semi-permanent/permanent stalls thereby gradually replacing the pavement trade. This should be done in a careful way in which the interests of both the pavement traders and the low income consumers are protected.

(c) It is very important to eliminate the operations of the brokers at the primary level and touts at the wholesale level who ask for protection money (kappan). These two groups increase the costs of marketing incurred by the producers, primary level collectors and retailers, which are ultimately passed on to the consumers.

(d) The importance of the improvement of the physical conditions at the markets, upgrading the infrastructural facilities such as roads etc; making containers available at reasonable prices and the provision of accurate and prompt price and other market information can not be over-emphasized.

3. *REORGANISATION OF STATE MARKETING ACTIVITIES*

(a) *It is evident that the Marketing Department is deeply entrenched in marketing of vegetables at present. But, it has not been able to provide an effective compotition to the private sector in order to keep the price of vegetables within reasonable limits to the producers and the consumers. The following are some of the suggestions which would help ensure a better service of this institution to realise the above objective.*

(b) *The quota system presently adopted by the Marketing Department's purchasing centres must be done away with. A more rational solution would be to increase the Departments' activities at wholesale and retail levels. Also, if adequate and proper cold storage facilities are made available at the purchasing centres, there should not be a problem of excessive stocks which then can be diverted to deficit areas.*

(c) *The grading system presently adopted by the Marketing Department at the producer level only discourages the producers and does not help in any way at subsequant levels of the marketing chain. The current retail price structure does not allow the grading to be economical to the producers. In such circumstances, a strict grading system only leads to various malpractices. For example, the brokers purchase vegetables at the price of the lowest grade from the producers and resell them to the Marketing Department at a higher price. Therefore, it is important to implement a proper grading system at the retail level too, if the grading at the producer level is to be continued.*

(d) *These remedial actions can also be adopted in streamlining the activities of the Sri Lanka Co-operative marketing Federation (MARKFED), with regard to marketing of vegetables.*

4. *STREAMLINING THE ACTIVITIES OF PRODUCER UNIONS*

(a) *During the time of this investigation, the Producer Unions existed only in the Welimada area. Farmers in other villages we studied, especially at Meeruppa, Hewavissa, Ikiriwewa and Lunuwewa were also keen to have such unions. They realise the value of collectivisation vaguely, but lack institutional support at present. Our view is that the "Welimada Model" can be extended to other areas, if it proves successful in practice, because in theory it is the best model of counter-vailing power that the country's vegetable producers can build in order to bargain with the middlemen.*

(b) *It is important for the Unions to take care of possible influence of the middlemen of the areas and the excessive bureaucratisation. It is also necessary that the MD withdraws from the Unions' activities after their effective operation over a period of time. The Unions should essentially involve in every aspect of vegetable production and marketing at the producer level i.e. input supply, financing, supply of market information, transport etc., if they are to compete effectively with the middlemen thereby assuring a fair price to the producers.*

(c) *The Producer Unions in each area will not be able to handle wholesale and retail marketing activities effectively, unless some Apex organisation direct and control such activities at the regional and national levels. The Unions, as they are at present, can not assure even a fair price to the producers since they have no control over the wholesale and retail trade of vegetables. Hence, vertical integration of all the aspects of vegetable marketing at producer, wholesale and retail levels is essential. For this purpose, an organisation which deals exclusively with production and marketing of vegetables is of utmost significance.*

(d) *The Unions could undertake wholesale and retail distribution of vegetables in every major city of the country. At present a*

major part of the vegetable produce is first transported to Colombo by the private sector as well as by the state institutions, and then redistributed to various areas. But, by dispatching vegetables direct from producing areas to other deficit areas of the country, as proposed, price differentials between the markets could be minimized by reducing transport and handling costs and the wastage factor. This will also lessen the dominance of private wholesalers in pricing of vegetables.

(e) At each Producer Union's collecting points, adequate and proper cold storage facilities should be established and refrigerated transport facilities should be made available. Then, the Unions could buy vegetables without restrictions on the volume and adopt scientific packing and grading techniques. These will have advantages also in terms of freshness and quality of vegetables. Moreover, vegetables can be supplied systematically according to the demand in various areas. During a glut, Unions can export fresh and quality vegetables.

(f) Finally, if the unions are to be successful, there should be sufficient produce, a commited membership and efficient management. These are the prerequisites for effective functioning of any form of cooperation.

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Appendix 1.

Level of Education of the Vegetable Growers Selected for the Sample Survey of Cost of Production

Educational Standard	Localities															
	Vidurupola		Boragas		Hewavissa		Meeruppa		Ikiriwewa		Lunuwewa		Uduvil-Keerimalai		Kaithady-Madduvil	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1. No schooling	2	10.0	2	11.1	1	5.0	1	5.0	3	15.0	3	16.7	1	3.8	0	0
2. From grade 1 to 5	7	35.0	8	44.4	6	30.0	7	35.0	6	30.0	5	27.8	4	15.4	6	17.1
3. From grade 6 to G.C.E.(O.L)	7	35.0	5	27.8	5	25.0	9	45.0	7	35.0	8	44.4	14	53.9	24	68.6
4. Passed G.C.E.(O.L) up to G.C.E.(A.L.)	4	20.0	2	11.1	8	40.0	1	5.0	3	15.0	2	11.1	6	23.1	4	11.4
5. Passed A.L. and higher	0	0	1	5.6	0	0	0	0	1	5.0	0	0	0	0	0	0
6. Professional/ Technical Qualifications	0	0	0	0	0	0	2	10.0	0	0	0	0	1	3.8	1	2.9
Total	20	100.0	18	100.0	20	100.0	20	100.0	20	100.0	18	100.0	26	100.0	35	100.0

Appendix 2

Total Extents of Land Operated by the Vegetable Growers in the Sample at the Time of Survey According to Tenurial Status

Tenurial Status	Locality															
	Vidurupola		Boragas		Hewavissa		Meeruppa		Ikiriwewa		Lunuwewa		Uduvil-Keerimalai		Madduvil - Kaithady	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
1.Owned :																
(a) Singly	27.6	92.1	8.75	32.7	47.75	59.7	62.88	65.0	19.5	21.7	33.5	32.2	1.31	4.3	45.79	78.3
(b) Jointly	-	-	-	-	26.55	33.2	0.25	0.3	4.0	4.5	15.0	14.4	19.32	63.9	3.5	6.0
2.Rented/leased/ mortgaged	2.13	7.1	3.0	11.2	5.65	7.1	33.5	34.7	4.0	4.5	3.0	2.9	9.59	31.8	9.21	15.7
3.Encorached	0.25	0.8	12.0	44.9	-	-		-	62.25	69.3	52.5	50.5	-	-	-	-
4.Jointly operated	-	-	3.0	11.2	-	-	-	-	-	-	-	-	-	-	-	-
Total	29.98	100.0	26.75	100.0	79.95	100.0	96.63	100.	89.75	100	104.0	100.0	30.22	100.0	58.5	100.0

Appendix 3 Average Income of the Vegetable Growers' Households During 1978 According to Sources (To the nearest rupee) +

Source of Income	Locality													
	Vidurupola		Boragas		Hewavissa*		Meeruppa*		Lunuwewa**		Uduvil-Keerimalai		Madduvil-Kaithady(a)	
	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%	Rs.	%
1.Vegetables	7871.00	37.2	9570.00	61.6	4602.00	32.9	11918.00	42.6	9251.00	53.3	225439.00	86.9	74391.00	22.5
2.Paddy	1680.00	7.9	-	-	3144.00	22.4	4925.00	17.6	-	-	-	-	11490.00	3.5
3.Other field crops	6593.00	31.1	5091.00	32.8	188.00	1.3	900.00	3.2	3804.00	21.9	33486.00	12.9	236524.00	71.3
4.Animal husbandry	-	-	340.00	2.2	910.00	6.5	300.00	1.1	-	-	-	-	6695.00	2.0
5.Jobs outside Agriculture	1000.00	4.7	330.00	2.1	3898.00	27.8	7350.00	26.3	1383.00	8.0	400.00	0.2	990.00	0.3
6.Renting land	80.00	0.4	-	-	350.00	2.5	100.00	0.4	-	-	-	-	-	-
7.Renting Equipment	50.00	0.2	-	-	150.00	1.1	-	-	50.00	0.3	-	-	1090.00	0.4
8.Other (Trade, Labour etc.,	3900.00	18.5	203.00	1.3	767.00	5.5	2500 00	8.8	2860.00	16.5	-	-	-	-
Total	21174.00	100.0	15534.00	100.0	14009.00	100.0	27993.00	100.0	17348.00	100.0	259325.00	100.0	331180.00	100.0

+ = Data is not available in case of Ikiriwewa.

* = Incomplete data on the income of Vegetables, Paddy and other field crops.

** = Income from paddy has not been reported . Two households did not report income from any source.

(a)= Income data on vegetables is incomplete.

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