

# Production Pattern and Marketing Practices of Vegetable Cultivators in Coimbatore

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## INTRODUCTION

In India, the vital role of agriculture arises out of the position the agrarian sector occupies in the overall economy and its potential for becoming a leading sector in development. Within the agricultural sector, vegetables have a key role. As Bhalerao et al (1982) state, "Besides providing rich minerals and vitamins to the consumers, they provide additional income as well as employment to the producers and valuable foreign exchange to the nation". India can grow virtually all the vegetables on account of her geographical situation and climatic conditions. She can develop as one of the leading producers of all vegetables. Bhatia and Rao (1982) remark that "India produces a kaleidoscopic range of vegetables in varying quantities thanks to the bountiful nature which has endowed it with suitable soil, climate and topography. These include several items of not only country-wide consumption demand but also abundant export potential."

Vegetables have as much importance in our food intake as cereals. In India, where we are living on an inadequate diet of meat, vegetables help the people to improve their diet conditions. It is heartening that the availability of vegetables has been increasing as the years went by. But we have not still reached the recommended consumption level. Against the recommended daily requirement of 240 grams of vegetables including 40 grams of fruits per capita per day (Gopalan et al, 1981), the actual availability was 38 grams in 1951,

110 grams in 1950 and 160 grams in 1974 (Ramachander and Subraman-  
yan, 1981). The per capita availability does not give a complete  
picture of consumption as a large percentage of the people live  
below the poverty line and their consumption of protective foods  
falls much short of the average.

The low consumption of vegetables in India is due to a  
variety of reasons such as their low production and less productivi-  
ty leading to their short supply and the consequent higher prices in  
the market. The comparatively higher cost of production of vege-  
tables coupled with high pricing make it difficult for the medium  
and low income groups of the population to consume vegetables to the  
desired extent. Improved nutrition through increased vegetable con-  
sumption will necessitate a considerable increase in the production  
of vegetables, which in turn depends on an increase in the area  
under vegetables and their productivity. An increase in the supply  
of vegetables will take care of their availability to the poor as a  
rise in supply will moderate the rise in prices.

According to Prasad, "vegetable cultivation has not made  
the desired progress because it is labour intensive and requires  
great care and constant attention throughout the crop period. Also  
the cultivation is restricted to garden lands. Vegetable cultivation  
depends largely on the timely supply of quality seeds, fertilizers,  
pesticides and irrigation. Further it requires a well developed  
marketing system. A comparison of the growth rates of vegetables  
and fruits vis-a-vis other agricultural crops has been attempted by

Bhatia and Rao (1982). According to them, the area under vegetables is a very small portion of the total area under agriculture. The current area under vegetables is only about three per cent of the gross cropped area in the country. They have estimated the rates of growth of cereals, pulses and food grains for the period 1960-61 to 1972 - 73. According to their estimates the area under vegetables and fruits have increased by about seven per cent per annum, as against less than a per cent increase in area under food grains. However, they did not maintain their lead over food grains in respect of productivity, (.99 per cent as against 1.74 per cent) highlighting that enough attention has not been paid for improving the productivity of vegetables and fruits.

Although the green revolution contributed to an increase in agricultural production in India, it was mainly the cereal revolution. The vegetable crop remained more or less untouched by the revolution. Now that we have stabilised food grains production to some extent and we are no longer dependent on food aid and imports from abroad for meeting our cereals requirements. We should turn our attention to the qualitative aspect of our food problem namely rising the productivity and production of vegetables and fruits.

The Sixth Five Year Plan (1980 - 85) targeted to increase vegetable production to 24.69 million tonnes from 18.39 million tonnes in 1976-77. It aims at raising vegetable production by about one third (34.31 per cent). To accomplish this target the outlay on the

development of the horticulture has also been substantially increased. It was Rs.5,00,000 in Fourth Five Year Plan and Rs.2,00,00,000 in Fifth and Sixth Five Year Plans.

According to Agarwal (1981) at present the development of agriculture does not merely depend on increasing the agricultural produce and its productivity, but also on the promotion of better and well organised marketing system. One of the means of having better results in agriculture is to see that the farmers get a fair price for the produce. Agricultural marketing is the crux of the problem of agricultural improvement in India. It is through an efficient marketing system that the required environment and conditions for an increased a farm production are created.

Marketing, in fact, emerges as the second generation problem of agricultural development, even as production remained the first generation problem. "India produces more than 50 million tonnes of perishable agricultural products, involving transactions at the whole sale and retail levels of the value between Rs.5,000 and Rs.7,000 crores. It is estimated that by 1984 - 85 the production of fruits and vegetables will cross 60 million tonnes. The marketing of these perishable crops had received inadequate attention particularly in areas where transport facilities are inadequate or ill developed. The marketing of fruits and vegetables tend to be characterised by very high wastage, estimated at between 20 and 40 per cent at different stages" according to Gupta and Ram (1979).

Vegetables constitute an essential part of daily diet and are, therefore, in great demand throughout the year from all sections of population. So farmers take to vegetable cultivation, as cash crop that would assure them enough returns for meeting their working capital needs and family expenses. The farmer is not at all a bad businessman. Consciously or unconsciously he knows the maximum of business 'buy cheap and sell dear,' vegetable production and marketing is peculiar in nature, because of the perishability, bulkiness and seasonability characterising them. The farmer's resources are limited and staying power in the market is very low. The farmer as the seller, sells his produce at a low price immediately after harvesting.

The producer of vegetables who is generally a small or marginal farmer, seldom gets the full benefit of his efforts. This is mainly due to imperfections in the marketing system of these commodities. Generally it is the middlemen who have benefited by buying cheap and selling dear. In the opinion of Diwakar and Muralidharan (1980), "In the current marketing set up, both producers and consumers stand to lose, farmers because of low prices received and consumer because of the high prices paid. The agricultural marketing system is very often viewed as exploitative due to the intermediaries in marketing system, it is alleged, who make abnormal profits at the cost of producer and the consumer."

According to Gupta and Ram (1979), the farmer receives a very low share in consumer rupee. It is because of many factors such as inadequate marketing information services, poor transport facilities available to the village etc. The retailer margin and marketing costs are quite substantial each appropriating one fourth of consumer rupee. Indian farmers are still bad marketers not only because of their ignorance towards modern methods of marketing, but also because of the peculiar structure of market in which they forced to accept the prices offered by the traders. In the words of Sankaran (1979): "The system agricultural marketing saddled with a long chain of middleman. These are various agencies that stand between the cultivators and ultimate consumer. The number of middleman take away the lion's share of the price paid by the consumer and consequently the producer - farmer get a poor share of price." In the view of Jayade and Patil (1982), "unchecked profit making tendency of the middleman is the main reason for low farm income of the farmers. The traders, commission agents and others have taken undue advantage, of the perishable and seasonal nature of agricultural production." Thus there is a great need of an efficient marketing system for sustaining and accelerating vegetable production.

A review of the existing studies of the vegetable farming and marketing showed that many of those studies have been done in North India. Since the problem of agriculture are location specific, the investigator felt that the study on vegetable cultivation and marketing in the context of the agricultural condition in Tamil Nadu

will be worthwhile. Hence the current study on the vegetable growing farmers of the two villages namely Valukkapparai and Arichipalayam in Madukkarai Panchayat Union in Coimbatore District.

The main objectives of the study are:

1. 1. To find out the relative area under vegetable cultivation.
2. 2. To assess the relative profitability of vegetable cultivation.
3. 3. To find out the cost of cultivation of specific vegetable crops and find out the weightage of the various cost components.
4. 4. To estimate the returns of the specific vegetable crops.
5. 5. To estimate the marketing cost of specific vegetable crops.
6. 6. To find out how the producer price of vegetables is shared among the cost of cultivation and cost of marketing and producers' margin.
7. 7. To find out the marketing practices of vegetable cultivation.
8. 8. To locate the problems in vegetable cultivation and marketing.

It is hoped that the study will contribute to the literature on agricultural marketing in general and vegetable marketing in particular and will highlight the problems faced by the farmers in increasing the area under vegetable crops, raising the productivity of vegetable cultivation and suggest the marketing support that is needed for raising the share of vegetables in the total crop production.

## REVIEW OF LITERATURE

The studies relating to vegetable production and marketing are discussed under the following heads:

- A. Production of vegetables;
- B. Demand and Supply response of vegetable crops;
- C. Marketed surplus of vegetable crops;
- D. Arrivals and prices of vegetables;
- E. Price behaviour of vegetables;
- F. Services rendered by market functionaries, marketing cost and margins; and
- G. Credit and pricing policies for vegetables.

### A. Production of Vegetables:

When we analyse the production side, we find many studies that have been done on the economics of vegetable production. A case study on vegetable cultivation was done by Prasad in 1980 in the Kankipadu Block in Andhra Pradesh. He selected 90 vegetable cultivators from five villages to study the problems faced by them in vegetable production.

The study found that in the villages farther from the marketing centre, the small farmers reported weak financial support, lack of transport and inadequate community facilities as reasons for not taking up vegetable cultivation in large number as compared to other classes of farmers.

Prasad further found that garden land formed 10 per cent of the total land owned by the small farmers as against 34 per cent in case of large farmers. Non-availability of garden land with good irrigation sources was an other constraint faced by the small farmers in taking to vegetable cultivation.

A study on "Production and Utilisation of Potato in Farrukhabad District in Uttar Pradesh" was conducted by Diwakar (1982). He aimed to find out the relative importance of potato production for different categories of farms in the area; and to observe the utilisation and disposal pattern of potato at farm level on different categories of farms. Sampling plan of his study was as follows: one primary market was selected from each of tehsil of the district. Around each selected market, three villages were selected from each tehsil totalling 12 villages in the district. A list of potato growers from each of selected villages were prepared. Six farmers were selected from each village randomly and the total sample consisted of 72 farmers.

Diwakar's study indicated that the percentage of the total consumption of potato increased with decrease in the size of holding; The marketed surplus was positively correlated the size of holding; the past harvest sales of potato was negatively correlated with the size of farm; and the sales of cold storage potato was positively associated with farm size.

Shukla conducted a study on "Marketing of Potato" in Varanashi in 1968. He wanted to find out the total output and cost of production of potato and examine utilisation and the extent of marketed surplus of the produce. The study extended over 50 sample producer - sellers bringing their produce to channwasatti from different villages.

The results of the study were:

1. The average yield was 60 quintals per acre.
2. The average cost of cultivation per acre of potato was Rs.687.82, while the value of gross produce was Rs.1.740.
3. The sample producers consumed 15.2 per cent the produce at home, paid 1.2 per cent as wages, kept 5.8 per cent for seeds and the marketed surplus was 17.8 per cent.

Shete et al (1980) measured the price spread of tomatoes. Their study was based on the cost of production of tomatoes from a sample of 71 tomatoes producers drawn from eight sample village of the sangner and Akola Tehsils of Ahmadnagar District in Maharashtra.

Among other things he found that the per hectare cost of production, output, gross return and net return of irrigated tomatoes were more than these of rainfed tomatoes. They estimated that the per quintal cost of production at Rs.59.28, Rs.63.92 in case of irrigated and rainfed tomatoes respectively.

## B. Demand and Supply responses of Vegetable crop:

There were various types and varieties of vegetable which are complements or substitutes, superior or inferior; necessary or luxurious. An understanding of the nature of demand for vegetables is essential to guide for decision making and programme operation by producers, traders and other public or private agencies. Price, cross-price and income elasticities of demand for a commodity are termed as demand activities. Demand elasticities define the nature of the products from the stand point of consumer preferences; whether the products are more or less important in consumer preference.

A study on the nature of demand elasticities of potato and brinjal in Mymensingh Town, Bengaladesh was reported by Molla et al (1974). They estimate the demand elasticities of these farm products using panel data, that was obtained from a group of consuming units over a period of time. The data were drawn elected 30 cross-sectional families in Mynensingh town and Agricultural University Campus during Jany 8 and March 15, 1973 have been used. The families were stratified incomewise into six groups for estimating various income consumption function, linear, double-log, semilog, log inverse and quadratic equations were employed in analysing the consumer demand.

The study revealed that the estimates of efficiencies of elasticities of potato and brinjal were less than one indicating that these are necessary food items. And potato consumption was mostly responsive to its own price due to the fact that consumer

preferred to consume varieties of vegetables when available. The price elasticity of potato was estimated to be around three and was relatively more price elastic than brinjal.

Sidhu and Singh (1981) conducted a study on the absorptive capacity of Delhi Market in particular and other markets in India in general for fruits and vegetables grown in Punjab. The study hypothesised that the absorptive capacity of Delhi and other markets depend primarily upon the extent of net price differential between different markets. Secondary data regarding arrivals and prices of fruits and vegetables in the Delhi market and other markets were collected. The study revealed that:

1. The Delhi Market with its daily turnover of more than rupees one crore has got a tremendous absorptive capacity. Already, in respect of malta potatoes Punjab is contributing a significant share.

2. Tomato export to Calcutta was found to be a highly profitable proposition during October to December.

The authors found that there was tremendous scope for export of fruits and vegetables from Punjab to the various markets in different states in general and Delhi Market in particular.

A study on "Dynamics of Potato market in Punjab" was conducted by Kahl and Jain (1980). It sought to analyse the potato

producer response to change in prices and to uncertainty associated with prices using a single model and 2, to study the dynamic behaviour of potato market and workout the long run and short run impact multiplier by using a three equation economic model.

Following partial acreage adjustment model, the estimating equation used by him was of the form:

$$x_t = a_0 \beta + a_1 \beta (PR_t - 1) + (1 - \beta) x_{t-1} + a_2 \beta CV_t - 1 + V_t$$

with  $\partial x_t / \partial PR_t - 1 > 0$ ;  $\partial x_t / \partial CV_t - 1 > 0$ .

Where  $x_t$  is the area under potato;  $x_{t-1}$  is the area under potato lagged by one year;  $PR_t - 1$  is the relative profitability of the crop; and  $V_t$  random residual with usual spherical properties. The analysis showed that profitability of potatoes was less than that of wheat because the wheat crop, benefitted by an improvement in yield and rise in support price. The long run elasticity was higher than the short run elasticity, showing that, as the relative profitability of potato decreases the supply of potato will also decrease in long run.

The researchers also used a three equation simplified model for projecting potato prices and quantities to be supplied and consumed. The model consisted of:

$$\begin{aligned} \text{Supply equation } Y_{1t} &= f(Y_{1t-1}, P_{1t-1}, Z_{1t}, U_{1t}) \\ \text{Price equation } Y_{2t} &= f(Y_{1t}, P_{1t-1}, Z_{1t}, U_{2t}) \\ \text{Demand Equation } Y_{3t} &= f(P_{1t}, Z_{3t}, U_{3t}) \end{aligned}$$

Where  $Y_{1t}$  - per capita production of potato in the period

$P_{1t}$  = Real average price received by the growers of potato  
in the period

$Y_{3t}$  = Quantity per capita consumed as food in the period  $t$ .

$Z_{1t}$  = time period;  $Z_{3t}$  = Real per capita disposable income  
in  $t^{\text{th}}$  period,  $U_{1t}, U_{2t}, U_{3t}$  are error terms in the three equation  
respectively and  $Y_{1t-1}, P_{1t-1}$  are respective variables with  
are one year lag.

They inferred that in the long run, initial annual change  
would increase the per capita production by 0.179 quintals and the  
price will be reduced by Rs. .0112 per quintal, while the per capita  
consumption will increase by .0052 quintals.

### C. Marketed Surplus:

Diwakar and Muralidharan (1980) studied the variations in  
distribution pattern of marketed surplus and factors influencing the  
marketed surplus of potatoes in Farrukhabad District of Uttar Pradesh.  
The objective of the study were:

1. To observe the behaviour of marketed surplus  
of potatoes among different groups of farms and

2. To find out the factors affecting the marketed surplus of potatoes at farm level. The multiple regression analysis is used as follows:

$$M.D = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5.$$

where M.D = Marketed surplus of potato in quintal on a farm; a = constant;  $b_1 b_2 b_3 b_4 b_5$  = Regression co-efficients of respective variables.

$x_1$  = sale price of potato in rupees per quintal;  
 $x_2$  = Cross area of potato in hectares;  $x_3$  = size of family;  $x_4$  = Distance from market in kms and  
 $x_5$  = Indetedness of family in rupees.

The study found that (1) the medfum and large farmers accounted for 20 per cent and 42 per cent of total marketed surplus respectively.

The marketed surplus of potatoes at farm level were influenced by the prices of potato, area under potato size of farm households and not so much by the size of land holdings.

Gills (1981) examined economics of major marketing operations and economics of different alternative methods, periods and markets for sale of potato by comparing the price spread and net return to the potato by comparing the price spread and net return to the potato growers. They selected Jullundur and Hoshiarpur district as the area for study. A list of villages in the potato belt

of each district was prepared and two villages from each potato belt were selected randomly 50 potato growers from each belt were selected at random with probability proportion to size.

As part of their findings, the author found that twelve per cent of the marketable surplus was sold at local markets. Eighty per cent was sold by the farmers directly to big consuming centres such as Delhi, Bombay and Calcutta.

#### D. Arrivals and Prices of Vegetables:

An analysis of prices and Arrivals of Potato in Nilgiris District of Tamil Nadu was done by Balakrishnan (1981). Using the time series data for sixteen years (1962 - 1977) collected from the Co-operative Marketing Society of Mettupalayam Market, they fitted a linear equation.

$Y = a + b^t + u$  to estimate the trends in marketing of potato.

They found amount other things:

1. Both arrivals and price remain steady over the years at about their mean level.
2. Average price had increased in all market periods but from June to September the percentage of arrivals of potato had declined from 62.72 per cent to 51.67 per cent over the years.

Jain and Kaul (1980) conducted a spectral analysis of potato arrivals and prices in Punjab in 1980. For studying the behaviour of trend in potato arrivals and prices; the seasonal fluctuation in potato markets and identifying existence of cycles and working of its periodicity, they used the time series data for the period 1961 - 62 to 1975 - 76 and 1963 - 64 to 1975 - 76 of the Ludhiana, Pathankot and Hashiarpur, Jullundur markets respectively. The equation fitted to the data was of the form.

L.C.  $Y_t = T_t S_t C_t I_t$  where  $Y_t$  denotes the time series data on arrivals and prices.  $T_t$  and  $S_t$  denotes the trend component and seasonal variation while  $C_t$  and  $I_t$  denotes the cyclical and irregular variations. Trend was estimated by a simple twelve months moving average method. The linear regression equation  $Y = a + b^t$  used, where  $y$  indicated the arrivals and prices and 't' indicated the time in years.

The study shows that;

1. The arrivals had increased significantly overtime in all the markets except pathankot.
2. There was no cycle of uniform period in arrivals of potato in Punjab. But prices exhibited a cycle of three years period.

### E. Price Behaviour of Vegetables:

The low production and high cost of cultivation of vegetables coupled with a high marketing price spread pushes up the prices of vegetables. In the study on "Marketing of vegetables from producer through the wholesalers and retailers to the consumer in Chandā<sup>w</sup> and Kamachacha markets in Varanashi. The study concludes that the range of percentage variations in prices was relatively correlated (value of  $r$  being 0.87 for Chandwa and 0.83 for Kamachacha market calculated by rank correlation method) with that of arrivals of vegetables in the market.

Chatta and Kaul's (1982) "price behaviour and marketing margin of potato in Punjab" analysed the price behaviour of potato in Punjab in the long run and short run. For this purpose, the time series data of wholesale prices of potato were made free from trend and seasonal variations and then it subjected to periodogram analysis. The study found that,

1. The potato prices did have a definite cycle of three years period in all the markets of Punjab.

2. Correlogram analysis is further supported the results obtained by periodogram analysis. The analysis showed a divergent pattern in the behaviour of prices of this crop. Oscillation kept the prices away from reaching the equilibrium.

Diwakar and Muralidharan (1980) in their study on the price efficiency of potato in Farrukhabad District of Uttar Pradesh findings tried to observe the spatial price intergration of potato and work out the temperal price efficiency of potato in selected markets of the District. The data on monthly prices of potato, variety wise were obtained from selected markets of the District for the period 1967 - 76. To calculate temperal price efficiency cross section data were obtained from selected farmers. Simple correlation analysis was used to work out the spatial integration of selected markets. For temporal price efficiency cost benefit analysis was carried out.

The authors' found that all the correlation co-efficients were very high and significant in producing and consuming markets, indicating a very high degree of market integration within the district. Price differential for the same variety of a commodity between two markets was not more than the transport cost between the markets.

#### **F. Services rendered by Market functionaries, marketing cost and margins:**

The producers and the consumers are both exploited by the middleman. In spite of comprehensive agriculture legislations in various states due to the superfluous chain of middleman's exploitation, the farmer is still not in a position to get a remunerative price.

An Empirical Assessment of the role of middleman in Agricultural Marketing was carried out by Anandakumar and Samba Murthy (1982). Their study examined the role of middleman in agricultural marketing with following objectives:

1. To assess the existing pattern and mode of sales adopted by the farm producers / sellers.
2. To evaluate the services rendered by commission agents towards the farmers.
3. To test whether the existence of the institutions of commission agents is indispensable in the chain of distribution of agriculture produce.

On the basis of purposive sampling method, a sample of sixty respondents was drawn at random from a village situated in Telengana region of Andhra Pradesh. The data was collected using a structured questionnaire.

The study reported that:

1. 36.6 per cent of the respondents preferred to sell their produce directly, 43.4 per cent through commission agents, 1.7 per cent to co-operatives, 18.5 per cent to Government and FCI.

2. The provision of credit by the commission agents was used by 40 per cent of the respondents and remaining 60 per cent were not getting credit from the commission agents.

3. By using the Five Point Scale, a considerable percentage of the respondents rated that the services rendered by the commission agents were not indispensable.

Jayade and Patil (1978) conducted a study on the price spreads in Marketing of selected vegetables. They determined the share received by different functionaries and the producers from the vegetables sold in the Mahatma Phule Market - Pune. The data were collected from 26 commission agents and 48 retailers for the period from September 1976 to February 1978.

The study reveals the following facts.

1. The producers net share ranged between 32 to 57 per cent and
2. The retailers share ranged between 33 to 60 percent. The retailers were found receiving a lion's share of the consumer rupee.

Shukla's study (1968) "Marketing of Potato" analysed the spread over the consumer price.

From the results of the study;

1. It is evident that producer's share in the consumer rupee for the sale of potato was 77.39 per cent at village level and 79.42 per cent in the market level.
2. Whole saler and retailer shares in the consumer rupee for the sale of potato was 2.82 per cent and retailer 5.60 per cent respectively.
3. The village money lenders completely dominated the producer as regards market finance. Government finance was almost nil and co-operative finance was insignificant.

Sharma et al (1980) studied marketing channels and producers share in vegetable market in Almora District. They studied the effect of different marketing channels in the vegetable market on the producer's share of consumer's rupee.

The authors found in their investigation that the farmers who had little to sell, sold their produce locally, knowing fully well that the village petty shop keepers offered comparatively low prices. The most important marketing channel was the agent of exporters. The maximum purchase was done by pre harvesting contracts made by the agents of exporters which amounted to 64.31 per cent of the total amount marketed through various marketing channels.

The marketing cost incurred by all market functionaries constituted a significant portion of the consumer price. Marketing costs were largely accounted for by transport and handling charges, labour and packing expenses, market fees and tax etc. Variations in the margin of the market functionaries depends upon the marketing costs in their business.

Many empirical studies have been reported on the marketing cost and margin of vegetables. A study on "Marketing costs and margin of potato in Farrukhabad District of Uttar Pradesh". In this study, the potato marketing channel in Farrukhabad District were identified and analysed to examine the cost and margin to various intermediaries dealing with potato at different levels.

#### Sampling Plan of the Study:

From the each tehsils in the district, Farrukhabad market Chhbramace market, Kaimgani Market and Kannuj Market were selected. The list of 72 potato growing farmers are selected from three villages in each tehsils in the district. The list exhibited the number of farmers in proportion of 4:1:1 as small, medium and large farmers respectively.

The study indicated the following facts:

1. There was eleven different channels through which potato were marketed.

2. Commission agents and wholesaler shared 50 per cent of the marketed surplus in the marketing channel for potato.
3. By using Fishers 't', the difference of producer share in consumer rupee are calculated. The small farmers get lower price compared to medium and large farmers.
4. The share of the farmers in consumer's rupee varied from 51 per cent to 75 per cent depending on the channels of the marketing.

Gupta and Ram (1980) made comparative analysis of business structure of traders in Delhi vegetable market. They obtained with different market functionaries.

Their study showed that:

1. Commission agent get about 25 per cent net return over his investment in vegetable business of the total cost nearly 60 per cent was fixed and 40 per cent variable;
2. The labour wage was major component of fixed cost. It accounted upto 40 per cent to the total cost and
3. The amortized value of building accounted for about eight per cent to the total cost.

The study on "Marketing of vegetable - A sample study was conducted by Bhale Rao et al (1981). The study was based on the data collected by survey method from 150 randomly selected vegetable growers in Varanashi City. The major findings of the study were:

1. 67.74 per cent and 68.50 per cent of the total marketing charges are payable by the producers. 10.08 per cent and 9.84 per cent paid by wholesaler and 22.18 per cent and 21.66 per cent paid retailers in Chandwa and ~~Kanachacha~~ Kanachacha markets respectively.

2. The producers share in the consumer's rupee for the vegetables was lowest for green pea and highest for brinjal. The price spread accounted for more than 32 per cent of the price paid by the consumers for the major vegetables under study.

In the study on "Measurement of price spread of tomatoes" conducted by Shete et al (1980), the marketing cost and margin of tomato producers were analysed.

The study revealed that:

1. The total cost of marketing was Rs.20.97 and Rs.20.76 per quintal in case of irrigated and rainfed tomatoes respectively.

2. The producer, itinerant traders, commission agent and retailers incurred on an average Rs.20.80, Rs.42.05, Rs.8.75 and Rs.27.30 as the total cost of marketing of tomatoes.

3. The producer got a net profit of Rs.14.94 and Rs.24.92 per quintal over the total cost of production of tomatoes and three intermediaries together desired a profit of Rs.54.65 and Rs.48.87 per quintal incurred by them in marketing of tomatoes.

A study on the price behaviour and marketing of margin of potato in Punjab was conducted by Chatta and Kaul in 1982. They examined the potato price behaviour in Punjab in the long run and short run and composition of potato price spread at a point of time, by analysing the time series data of wholesale prices of potato.

The reported that:

1. On an average labourers earn Rs.10 per day for transporting the potato.

2. Margin of all intermediaries taken together was 27.28 per cent in the sale. Primary and secondary wholesaler shared 3.78 per cent and 4.50 per cent respectively where as retailer's share was 19.00 per cent.

Gill and Gill (1981) did economic analysis of potato marketing in Punjab. They concluded that:

1. The farmers paid three types of charges such as grading, cost of packing material, weighing and stitching. In local and distant market, farmers paid the additional cost on transport, unloading, commission etc.

2. The maximum net gain of Rs.7.93 and 18.40 per quintal was obtained in the month of the July and November respectively as compared to immediate post harvest sale.

Subramaniam (1981) studied the effect of marketing on cost of production and returns on vegetables. He analysed:

1. The expenditure involved in production;
2. The expenditure on various items of marketing and their relative importance in the total cost of production; and
3. The effect of marketing cost on cost of production and returns. The study area was Malur and Chickballapur taluks of Kolar District in Karnataka. The data was collected through personnel interviews by investigator of the scheme. The reference period of the study was the Khariff season of 1979. The sample for this study consisted of 106 cultivators.

The study indicated the following results:

1. The input costs incurred for raising the crop was around 40.50 per cent of the total cost of production and the rest was shared by the fixed and marketing cost.
2. Induction of marketing costs increased the cost of production by around 37 per cent, 57 per cent and 26 per cent in respect of brinjal, tomato and bean. This clearly shows that the marketing costs have a considerable impact on cost of production.

Gupta and Ram (1979) estimated the share of marketing costs and margin in the consumer price for selected vegetables in Delhi. They selected specific lot in the consumer market and traced it back through the marketing system. Comparing prices at successive levels of marketing to get an idea of gross margin of the intermediaries. Daily data on the prices and expenses incurred by different market functionaries were gathered by this method from January 15 to March 20 1979. They analysed the level of differences in retail margin of a vegetable in different income status markets by using the "Critical difference"

Gupta and Ram found that,

1. The retailer got the highest net margin which accounted for almost  $\frac{1}{2}$  of the consumer price, due to his large handling operations and assumption of great risk.

2. Margin of the retailer bore a direct relationship with income status of the locality. High income localities 25 to 38 per cent, medium income localities 19 to 28 per cent and low income localities 14.6 to 22.6 per cent of margins.

3. Location was an important factor influencing retail margin, transport, packing and labour expenses are major component of marketing costs.

The Economics Department of Gobi Arts College (1981) conducted a study of the vegetable market in Gobichettipalayam.

The study attempted to find out the pricing practices in different vegetable markets (daily market, moore market and pudupalayan Market) of Gobi Municipal Town.

The researcher found that:

1. Earning more money and attracting more customers were the objectives behind selling more than one type of vegetables. Compensating the less in one vegetable by the gain in another was also a prominent objective.

2. The market margin in general for all vegetables was about 12.75 per cent. Pudupalayan market enjoyed a larger market margin (16.75 per cent) due to its location (far away from daily market, moore market) with fewer venders enjoying oligopotistic conditions.

A survey of all these studies suggest that the marketing margins where in range of 77 to 79 per cent to producers; 2.8 per cent to wholesaler and 5.6 per cent to retailers of the consumer rupee in the marketing of potato. In tomato marketing, 14.94 per cent, 54.65 per cent, and 48.87 per cent shared by producers, commission agents and retailers respectively. Marketing cost depend on retail margin, transport, packing and labour expenses. The studies showed that the activities of market functionaries where to a large extent responsible for reducing price differential of vegetables specially and temporally.

### **G. Credit and Pricing Policies for Vegetables:**

A study on "Credit and pricing policies for vegetables" was conducted by Bholerao et al (1982). They traced the relationship between the bulk line cost and average cost of major vegetables (grown by a sample farmers in Kashividya derth Block of Varanashi District, Uttar Pradesh) as a basis for fixing the scale of finance for credit institutions and for fixing support prices of vegetables. Their study revealed that in case of all the vegetables more than 80 per cent in every respect (output, farmers, and area) is covered by bulk line cost of production. Hence they recommended that this cost be adopted for fixing the scale of finance and price.

### III. METHODOLOGY

The methodology adopted by the investigator for the study on "Production pattern and Marketing practices of vegetables in selected area" consisted of the following steps:

1. Selection of the area;
2. Selection of the sample;
3. Collection of data;
4. Hypothesis framed;
5. Methods of analysis;
6. Definition of concepts; and
7. Consolidation and Tabulation of data.

#### 1. Selection of the Area:

The area chosen for the study was the Valukkappari and Archipalayam of Maddukkarai Panchayat Union in Coimbatore district. In these villages almost all the households are engaged in farming. These two villages are noted for their contribution to vegetable production in Maddukkarai Panchayat Union. Therefore these villages were chosen for study by the investigator.

#### 2. Selection of the sample:

There were 670 farmers in the two villages together, of whom 100 farmers were selected at random for the study. The sample constituted about 15 per cent of the total universe under study.

The procedure of systematic random sampling was used to locate the individual farmers. When the particular farmer was not found cultivating the vegetables, the next farmer was selected by the process of substitution.

### 3. Collection of Data:

The investigator collected primary data by using an interview schedule. The cultivators were interviewed with a suitable interview schedule. The interview schedule contained questions pertaining to area under vegetable cultivation; production pattern and practices; marketing practices and problem of the farmers. The interview schedule was refined after a pre-test, which was done in the month of December 1982. The reference period of the study was 1982 - 83. The data collection was done by the investigator in January 1983.

### 4. Hypothesis tested in the study:

The hypothesis tested in the study are:

- a. Size of holding does not determine the cropping pattern of the farmers.
- b. Cost of cultivation and gross revenue of crops is independent of the size of holdings in vegetable cultivation.
- c. Productivity of vegetable crops does not vary as between different groups of farmers.

d. Returns on vegetable cultivation are same for all the farmers.

#### 5. Method of analysis:

For purposes of analysis, the sample was post - stratified into four groups depending on the size of land holdings.

- |    |                |   |                     |
|----|----------------|---|---------------------|
| 1. | 5 to 10 acres  | - | Small farmers       |
| 2. | 11 to 15 acres | - | Semi-medium farmers |
| 3. | 16 to 20 acres | - | Medium farmers      |
| 4. | Above 20 acres | - | Large farmers.      |

The data thus collected was cross classified and summarised using averages and ratios wherever they were relevant.

The statistical tool used for testing the hypothesis in the study was students 't' test. It was used to find out if there were any significant differences in the cropping pattern, cost, revenues and returns of the farmers with varying sizes of holding. An illustrative conclusion is given in Appendix II.

#### 6. Definition of Concepts:

**Cost:** The term cost of cultivation is used here in a restrictive sense. The economic meaning of cost would include both direct and imputed costs such as the rate of return on fixed investment and land that would have been used in raising the crop under consideration. The investigator wanted to avoid the problem of

estimating these imputed cost involved in cultivation, on account of the arbitrariness, inherent in such cultivation. Hence the cost of cultivation in the study simply refers to the immediate expenses of cultivation like money spent on procuring seeds, fertilisers and insecticides, the labour charges and the payment made for hired labour that was used for preparing the land, tending the crop harvesting it and assembling it for sale.

#### **Net Revenue :**

Net revenue was obtained by deducting the cost incurred in farming from the gross revenue obtained by the farmers. The net revenue realised from each crop was calculated. The net revenue received by the farmers from the cultivation of various crops and per kg., of vegetable output was also calculated.

#### **Marketing Cost:**

Cost incurred by the farmers for the sale of their produce at the market are called marketing costs. The marketing costs of vegetables (tomato, and brinjal) above were analysed.

#### **7. Consolidation and Tabulation of Data:**

The data that had been consolidated and tabulated are presented in the next chapter on results and discussions.

#### IV. RESULTS AND DISCUSSIONS

The results of the study on the "Production pattern and marketing practices of vegetables in selected area" are analysed and presented under the following heads:

1. Background information of the farmers;
2. Production pattern of vegetables and non-vegetables;
3. Marketing practices of vegetables;
4. Cost of marketing and returns from vegetable crops;
5. Problems in cultivation and marketing of vegetables.

##### 1. Background Information of the Farmers:

The background information of the farmers relate to their size of holding, sources of income, family size, and educational status.

##### a. Size of holding:

The classification of holdings adopted in the study differed from the classification used by others. For instance Uyas (1979) had classified the holdings reported in N.S.S. rounds under five categories: Marginal land holders (those owning less than one acre) small land owners (owning between one and five acres); Medium land

owners (owning five to fifteen acres); and Big land owners (owning more than fifty acres of land) Such a classification did not suit the requirements of the current study as the land under cultivation was irrigated or garden land that could be used relative intensively throughout the year and allocation of land for vegetable cultivation will depend among others on the working capital requirements of the farmers and their ability to mobilise from other sources. Therefore, the investigator used a different classification as in Table I . Table I also gives the distribution of farmers in each group.

**Table I**  
**DISTRIBUTION OF LAND HOLDINGS AMONG FARMERS**

S.No.	Size of holding	Number of farmers
1.	5 - 10 acres (Small)	23
2.	11 - 15 acres (semi-medium)	27
3.	16 - 20 acres (Medium)	24
4.	Above 20 acres (Large)	26
	<b>Total</b>	<b>100</b>

The table reveals that all the sample farmers having large size of holding. The size of holding decisively affects the income from agriculture farming of certain size under certain conditions determine the scale on which farming operations can be undertaken and yields the best results and maximum return to the farmers. Thus size of farm affects cost of production. The post stratification of farmers by their size of holding revealed that they were fairly equally distributed among the four groups, facilitating a comparative study of their cultivation and marketing behaviour.

#### b. Family Size:

In farming, there are economic advantages in having large families. Family is the immediate source of supply of labour for the farm operations. In this context a large family is considered a gainful proposition particularly by marginal and small farmers when they are unable to hire paid labour for their needs.

The family size of different groups of farmers is given in Table II.

**Table II**  
**FAMILY SIZE OF FARMING GROUPS**

S.No.	Farming Groups	Family size
1.	Small	6.1
2.	Semi - medium	5.8
3.	Medium	5.9
4.	Large	5.6
	Overall	5.6

As expected small farmers had large families and the family size of the large farmers was the smallest.

### **C.Education:**

Literacy of the farmers is crucial for modernising the agricultural methods and raising the farm productivity. Galbraith aptly remarked, "No where in the world is there an illiterate peasantry that is progressive.". According to Roster "Education with appropriate rural technology is a must in the process of transforming the rural economy into an innovative self generating one." Hence the investigator studied the education status of the sample farmers. The details of which are given in Table III.

**Table III**  
**EDUCATION LEVEL OF FARMING GROUPS**

S.No.	Farming groups	Illiterate	Level of Education Literate			
			Primary	Middle	Secondary	College
1.	Small	48(77.4%)	11	3	-	-
2.	Semi-medium	35(68.6%)	9	5	2	-
3.	Medium	39(79.5%)	5	-	3	2
4.	Large	41(74.5%)	10	1	-	3
5.	Total	163(75.1%)	35 (16%)	9 (8%)	5 (2.3%)	5 (2.3%)

217 adult workers reported that they were engaged in cultivation, of whom as much as 75 per cent were totally illiterate. And only 4.6 per cent of the cultivators had received either secondary education or collegiate education. By and large the literacy level of these cultivators remained far below the national average of 36 per cent. No relationship however could be ascertained between the size of holding of these cultivators and their educational level.

d. Source of income:

Apart from dairying, which was reported by all the farming families, poultry and beekeeping as subsidiary sources of income were reported by a few. They are described in Table IV.

Table IV

DISTRIBUTION OF FARMERS BY SUBSIDIARY SOURCES OF INCOME

S.No.	Farming groups	Number of families reporting	
		Sub-sources of income	
		Poultry	Beekeeping
1.	Small	6	1
2.	Semi - medium	5	2
3.	Medium	10	2
4.	Large	7	-
	Aggregate	28	5

One third of the farmers under study (33 per cent) had poultry or bee keeping as a subsidiary source of income. This was expected to have a bearing on their vegetable cultivation and marketing practices, in so far as they provide them some money for their day to day commitments in agriculture.

## 2. Production Pattern of Vegetables and Non-vegetables:

Cropping pattern, cost and returns of different crops, duration of vegetable cultivation, cost, productivity, wastage, home consumption, and marketed surplus of vegetables are covered under this heading.

### a. Cropping Pattern:

Cropping pattern refers to proportion of area under different crops at a point of time. The cropping pattern of any region is an outcome of the long process of historical evolution.

At one time, it was believed that cropping pattern in India could not be changed. Sinha (1964) write - "In a tradition - ridden country with a very low level of knowledge, the peasants are unwilling to make experiments. They accept everything with a spirit of resignation and a sense of fatalism. From them, agriculture is a way of life rather than a commercial position. In an agricultural community where the members are illiterate and tradition - ridden, there is hardly any possibility of crop shifts."

Among the economic motivations that are crucial in influencing farmer's decisions about the cropping pattern, price and availability of irrigation appear to be important. Price influences the acreage under the crops in two ways. One is that the variations in the inter crop price parties lead to shifts in acreage as between the crops. Another is that the maintenance of a stable level of prices for crop provides a better incentive to the producer to increase the output than what a very higher level of prices does, if there is no uncertainty of this level being maintained over a number of years. Cropping pattern is also dependent upon the availability of irrigation. The NCAER estimated that if additional irrigation facilities were provided in the Punjab the cropping pattern as much as 3.4 million acres could be changed, of which nearly 1.6 million acres now under gram could be put to more paying crops - (Sankaran, 1972).

In the light of these considerations, the investigator studied the cropping pattern of the sample vegetable growers. Table V gives the details of the cropping pattern of the sample farmers.

**Table V**  
**CROPPING PATTERN OF SAMPLE FARMERS**

S.No.	Name of crops	Area under cultivation (in acres)	Percentage of area Under cultivation
1.	Coconut	396.5	23
2.	Cotton	143	8
3.	Paddy	353.65	21
4.	Groundnut	28.5	1.5
5.	Sugarcane	222	13
6.	Maize	65.5	4
7.	Ragi	5	0.3
8.	Ladies finger	3.5	0.2
9.	Brinjal	71	4
10.	Tomato	430.25	25
<b>Total</b>		<b>1718.9</b>	<b>100</b>

The distribution of acreage under different crops in the two villages under study shows that this area was endowed with favourable topographic and climatic conditions that enabled the farmers to diversify their cultivation, adding a number of commercial crop in their cropping pattern. The facility of year round irrigation through wells combined with the enterprise of farmers had led them to take a number of commercial crops for cultivation. Nearly three out of every ten acres of the cultivated area was under vegetable crops.

In the aggregate, nearly 500 acres are under vegetable crops. Thus vegetable crops became the staple crop of this region. The next in priority of cultivation was the coconut (about 400 acres) followed by paddy (350 acres)

**b. Distribution of area under various crops:**

The production pattern depends upon the size of holding of the farmers. Table VI shows the distribution of area under various crops.

**Table VI**  
**DISTRIBUTION OF AREA UNDER VARIOUS CROPS BY**  
**FARMING GROUBS**

(In acres)

S.No.	Name of crops	Size of holding (5 - 10)		Size of holding (11 - 15)		Size of holding (16 - 20)		Size of holding (20 & above)	
		Area	Percentage	Area	Percentage	Area	Percentage	Area	Percentage
1.	Coconut	19	11	41	11	130.5	29.6	206	28
2.	Cotton	10.5	6	61	17	33	7.5	38.5	5
3.	Paddy	28.4	16	54.5	15	70	16	200.75	27
4.	Groundnut	4	2	12.5	3	6	1	6	6
5.	Sugarcane	32.5	18	52	14	51.5	12	86	12
6.	Maize	16	9	12.5	3	10	2	27	4
7.	Ragi	1.5	.8	3.5	1	-	-	-	-
8.	Ladies finger	.5	.2	1.5	.4	.5	.1	.1	.1
9.	Brinjal	4.5	2	17	5	20	4.8	29.5	4
10.	Tomato	63.5	35	108	30	118.5	27	140.25	19

Footnote: Student's 't' test t value = 6.366, significant at 5 per cent level.

Statistical analysis was done to find out whether the cropping pattern of farmers was influenced by the size of their size of holdings. The 't' value was statistically significant at 5 per cent level, indicating that the size of land holdings decisively influenced the cropping pattern of the farmers.

The relative acreage under tomato declined with increase in the size of the land holdings. Tomato is considered a promising cash crop more by the small farmers than by others. They devoted a large proportion of their area for this crop because it fetches them money for meeting day to day needs.

#### C. Cost and Returns of Different Crops:

The investigator compared the expenses of cultivating different crops against the value of production or gross revenue that resulted from <sup>it</sup>. The data on costs and gross revenue were used to calculate the net revenue per acre under different crops. The relative profitability of the crop was thereafter ascertained.

Table VII gives details of the direct expenses involved in cultivation of different crops, the gross revenue realised from them and the net revenue enjoyed by the farmers in each of these crops.

**Table VII**  
**PER ACRE COST AND REVENUE CROPWISE**

(in Rs.)

S.No.	Name of crops	Revenue per acre.	Cost per acre	Net Revenue per acre
1.	Coconut	12,869	2,561	10,308
2.	Cotton	2,047	974	1,073
3.	Paddy	2,184	976	1,208
4.	Groundnut	2,920	917	2,003
5.	Sugarcane	3,623	1,141	2,482
6.	Maize	1,287	687	600
7.	Regi	1,474	635	839
8.	Ladies finger	1,290	983	309
9.	Brinjal	7,133	1,624	5,509
10.	Tomato	2,330	880	1,496

The net revenue yielded by the coconut crop was the highest, the amount being Rs.10,308 per acre. The perennial nature of the crop together with the low cost of maintenance had brought down the cost of production of coconut to a remarkable extent. The gross revenue realised by the farmers was at the same time very high on account of year round yield and steady demand for coconut oil seed and ordinary purposes. Leaving coconuts as an exception, cultivation of brinjal was even more profitable than sugarcane, yielding a net revenue of about Rs.5,510 per acre, as against Rs.2,480 per acre yielded by sugarcane. The order of profitability of various crops were: coconut, brinjal, sugarcane, groundnut, tomato, paddy, cotton, ragi and maize.

Cost and returns of different crops were also computed for specific groups of farmers. The difference in the profitability of crops that may exist among these different groups of farmers was expected to indicate the difference in their efficiency. The cost of the farmers would differ from one another depending on their farming practices and farm productivity. The gross revenue would also differ depending on the quality of the crop raised by them and the time and point of sale used by them. The efficiency of the farmers would be reflected in the different net revenue they obtained. Hence a comparative analysis of per acre cost and revenue on different crops was made as in Table VIII.

The larger the farm size, the lower was the cost of cultivation in respect of brinjal, except for semi - medium farm groups. The least cost cultivation Rs.1,463 per acre of brinjal crop reported by large farmers groups. Revenewise however the small farming group was found to be most efficient with gross revenue of Rs.10,179 per acre of brinjal crop. This helped him in maximising the net revenue from this crop Rs.8,553 per acre. It was thus clear that large farmers enjoyed a cost advantage over the small farmers. But opportunities available to the small farmers for higher productivity and better marketing out weighed their cost disadvantage. No particular relationship was discernible about other crops.

The 't' test that was done to find out if the cost of cultivation of individual crop varied with size of holding yielded a 't' value that was significant only at one per cent level. This indicated that the size of holding influenced the cost of cultivation of a crop only to a certain extent, the latter depending on other variables also as far instance the acreage under the particular crop and the quantity and quality of inputs used. Even as the cost the gross revenue realised from various crops was associated with the size of the holding only to a certain extent.

Relatively large areas of land were reported under tomato and paddy. These two crops were compared for their cost and returns. Cost of tomato ranged from Rs.800 to 920 per acre; The gross net return Rs.1,200 to Rs.1,740. It was found that cost of cultivation of

paddy ranged from Rs.470 to Rs.1,070. The gross revenue from paddy varied from Rs.1,020 to Rs.3,520. The net revenue ranged from Rs.570 to Rs.2,680. The spread between the maximum and minimum net returns was less in the case of tomato than in paddy. The net yield from tomato was more stable than the net yield from the paddy. This again explains why the farmers of the area have taken to tomato cultivation in a large measure. This finding was in line with what as Gill et al (1980) stated about the tomato crop: "Being a short duration crop, it dominates in the vegetable market throughout the year. Besides being a short duration crop, it fits well in the cropping pattern of the farmers and fetches high returns per unit of area and time."

#### d. Duration of Vegetable Cultivation:

With the transformation of agriculture from the way-of-life-approach to the market - oriented - agriculture, the performance in the field of fruits and vegetables has also been by and large improving. As short duration crops, vegetables fit well into the cropping pattern of the farmers and fetch them high returns per unit of area.

The investigator examined the duration of the vegetable crops cultivated by the sample farmers, the details of which are given in Table IX.

**Table IX**

**DURATION OF VEGETABLE CROPS - SIZE OF HODDINGWISE**

<b>S.No.</b>	<b>Name of the crop with duration.</b>	<b>Number of the farmers reporting</b>	<b>Percentage to total</b>
<b>1. Tomato</b>			
a.	4 months	56	56
b.	5 months	26	26
c.	6 months	18	18
	<b>Total</b>	<b>100</b>	<b>100</b>
<b>2. Brinjal</b>			
a.	9 months	5	18
b.	10 months	9	32
c.	12 months	14	56
	<b>Total</b>	<b>28</b>	<b>100</b>

All the farmers were cultivating tomatoes. Among those 56 per cent of farmers produced tomatoes involving four month duration. 26 per cent had tomato crop of five months duration. Six month duration was reported by 18 members.

The brinjal crop was cultivated by 28 per cent of the farmers, duration of the crop ranged from nine months to twelve months. The long duration brinjal crop was favoured by 56 per cent of this cultivators.

#### e. Cost Structure of Vegetable Crops:

Production cost at farm level include Rent on land, amount expended on purchase of seeds, fertilizers and pesticides, amount paid for labour, amount spent on purchase and maintenance of farm charges. Of these items some like rent on land, amount spent on purchase and maintenance of farm equipments and electricity charges are indivisible in that it may not be possible to allocate them to particular crops. Hence, the investigator extended these terms in the analysis of cost of cultivation, included only the expenses incurred on the purchase of seeds, fertiliser and pesticides and amount spent on labour. The analysis of costs of cultivation was restricted to the two major vegetable crops of the area, tomato and brinjal, Ladies finger was excluded from the analysis in view of the very small acreage reported under that crop. Table X gives the details of cost structure of tomato crop.

In respect of tomato cultivation a comparative analysis of direct expenses of cultivation comprising the expenditure on seeds, fertiliser and labour share that the medium and large farmers are most efficient than the small and semi-medium farmers. Their cost of cultivation per acre are lower than the aggregate value figure of Rs.579 per acre, the first group of small and semi - medium farmers incurred more than acreage expenses of cultivation. The group which had the least cost of cultivation of tomato was the medium size farmers, their direct expenses per acre being Rs.543.

In the aggregate out of every producer rupee sent in the cultivation of tomato, 21 paise went for seeds, 43 paise was spent on fertilizer and 36 paise spent on labour.

Table XI gives the break up of the cost of cultivation of brinjals.

In the cultivation of brinjal crop, the direct expenditure of cultivation for the entire group was Rs.960 per acre. The large farm group which was able to minimise the expenditure of only Rs.831 against the aggregate of Rs.960. The semi-medium group turned to be the least efficient with the maximum cost of cultivation of brinjal as it happened in the cultivation of tomato.

A break down of direct expenses of cultivation of brinjal into its components revealed that of every rupee that was spent on its cultivation 65 paise went towards seeds, 48 paise spent on fertilizer and pesticides, and 36 paise was spent on labour. The most remarkable fact was that the labour charges that the farmer incurred on cultivating both tomato and brinjal appeared to be the same namely 36 paise out of every rupee spent on cultivation. This implied that both vegetable crop required the same amount of attention in the field. The balance was distributed between other two expenditure on expenses namely seeds, fertilizers and pesticides, brinjal claiming five paise fertilizer than tomato out of every producer rupee.

#### f. Production and Productivity of Vegetable Major crops :

The productivity of different farm groups in respect of tomato and brinjal - the major vegetable crops of the villages under study was compared to identify the group that maximised its productivity as against others. This assessment was found necessary to distinguish the group which maximise its production with others which were not able to achieve this maximising objectives.

Table XII gives details of the production and productivity in respect of major vegetable crops of the Farm groups.

**Table XII**  
**PRODUCTION AND PRODUCTIVITY OF MAJOR VEGETABLE CROPS**

(In kgms)				
S.No.	Farm Group	Acreage	Total output	Productivity per acre
<b>Tomatoes</b>				
1.	Small	63.5	1,20,130	1892
2.	Semi-medium	108	2,76,950	2564
3.	Medium	118.5	2,05,900	1737.5
4.	Large	140.25	2,17,800	1550
	Overall	430.25	8,20,780	1907.6
<b>Brinjal</b>				
1.	Small	4.5	42,000	9556
2.	Semimedium	17	97,500	5735
3.	Medium	20	1,37,000	6850
4.	Large	29.5	2,39,000	8122
	Overall	71	5,17,100	7283

Foot note:  $t$  value of productivity of tomato 1.90, significant at 1 per cent level.

$t$  value of brinjal 3.36 significant at 5 per cent level.

On an average about 1,900 kgms of tomato and 7,280 kgms of brinjal were raised in an acre of land. The productivity of the small farmer group in respect of tomato was around the aggregate level. However they were the most efficient group in the cultivation of brinjal, recording the highest productivity of 9,556 kgms. of brinjal per acre. The least productive group of farmers in the tomato cultivation were the large farmers, with 1,550 kgms of tomato per acre. The farmers with semi-medium holdings were the most productive group, their productivity being 2,564 kgms., of tomato per acre. It was, however, the least efficient group in cultivating brinjals.

Statistical analysis was done to examine whether the farmers would have realised varying productivities of the vegetable crop in accordance with their size of holdings. The productivity of brinjal crop varied with the size of holding, its 't' value is significant at 5 per cent level. The productivity of tomato crop however did not exhibit a pronounced relationship with their size of holdings.

#### g. Estimation of Marketed Surplus of Vegetables:

Marketed surplus of the vegetables for different groups of farmers was arrived at after from their deducting total of output of vegetables, the amount lost in the field and in storage and the amount of the output used for self consumption of the farm families.

### Amount of Vegetables Lost by Wastage:

The vegetables crops are characterised by perishability, bulkiness and seasonability. Being perishable in nature, wastage arising in the production of vegetables are considerable. Modern techniques of cultivation and inputs used by the farmers aim at reducing the rate of wastage at farm level. Wastage of vegetables as recorded in different farm groups are shown in Table XIII.

**Table XIII**  
**WASTAGE OF VEGETABLES - FARM GROUPWISE**

( in kgms. )

S.No.	Farm groups	Total output	Amount of wastage	Percentage
<b>Tomato</b>				
1.	Small	120130	810	0.67
2.	Semi - medium	276950	1315	0.47
3.	Medium	205900	1125	0.54
4.	Large	217800	965	0.44
	<b>Overall</b>	<b>820780</b>	<b>4215</b>	<b>0.51</b>
<b>Brinjal</b>				
1.	Small	43000	130	0.30
2.	Semi-medium	97500	295	0.30
3.	Medium	137000	320	0.23
4.	Large	239600	620	0.25
	<b>Overall</b>	<b>517100</b>	<b>1365</b>	<b>0.26</b>

The proportion of the produce wasted was relatively larger in the tomato than brinjal in aggregate. 0.44 per cent of the total output of tomatoes was lost in wastage, where as the wastage recorded in brinjal was only 0.26 per cent of the total output. In otherwords, the wastage suffered by the farmers in tomato cultivation was twice the amount of wastage they encountered in the brinjal crop, expressing both in quantitative physical terms.

## 2. Details of Home Consumption of Vegetables:

A part of the vegetable production is set aside by farms for day to day consumption of their families. Though this may be insignificant very small amount compare to their total output of their vegetables still it has to be deducted from the total output for arriving at the amount of marketable surplus. The quantum of vegetable output used by farmers forhome consumption is shown in Table XIV.

**Table XIV**  
**AMOUNT OF HOME CONSUMPTION OF VEGETABLES**

S.No.	Farm Groups	Total output	Amount of home consumption	Percentage
<b>Tomato</b>				
1.	Small	120130	705	.58
2.	Semi-medium	276950	950	.24
3.	Medium	205900	915	.44
4.	Large	217800	800	.36
	<b>Overall</b>	<b>820780</b>	<b>3360</b>	<b>.41</b>
<b>Brinjal</b>				
1.	Small	43000	135	.31
2.	Semi-medium	97500	225	.23
3.	Medium	137000	265	.19
4.	Large	239600	390	.16
	<b>Overall</b>	<b>517100</b>	<b>1015</b>	<b>.19</b>

The amount used of both the vegetables for home consumption was far less than the amount wasted. The amount they used up for self-consumption was less than the amount they wasted in both the vegetables.

### 3. Marketed Surplus of Vegetables:

The details of marketed surplus of vegetables crops at the disposal of different groups of farmers are given in Table XV

TABLE XV

MARKETED SURPLUS OF VEGETABLES—CROP WISE AND FARM GROUP WISE :

(in kgms)

S.No.	Farm Group	Total Output	Marketed Surplus	Percentage
<b>Tomato</b>				
1.	Small	120130	118615	98.7
2.	Semi-Medium	276950	274685	99.1
3.	Medium	205900	203860	99
4.	Large	217800	216035	99
	Overall	820780	813195	99
<b>Brinjal</b>				
1.	Small	43000	42635	99.1
2.	Semi-medium	97500	96980	99.1
3.	Medium	137000	136415	99.5
4.	Large	239600	238590	99.5
5.	Overall	517100	514620	99.5

No variations were observed in marketed surplus of these two vegetables among different farm groups. Except for about one per cent of the output lost in self-consumption and wastage, 99 per cent of the total output was marketed in both the cases.

### 3. Vegetable Marketing Practices of the Farmers:

All the farmers were marketing their vegetables outside the village. None of them sold their produce within the village. They marketed them both in the Sundarapuram daily market which was away from the villages, by seven kilometers and in the Coimbatore Market which was ten kilometers away.

All the vegetable producers sold their produce directly in the market. They did not sell through agents. A few farmers (six) engaged vendors to sell their vegetables inside the villages. Vegetables were sold immediately after they were collected from the field because they were highly perishable, and the farmers did not have storage facilities to preserve their keeping quality. The loss of output suffered by the farmers in marketing vegetable crop, was very small less than the per cent of the total marketed surplus. It is very insignificant compare to the marketing losses reported by Gupta and Ram (1979) at 20 to 40 per cent. However it cover only the losses reported at one market stage, not all the losses in marketing.

The reasons given by them for their direct sale to merchants in the market area area tabulated in Table XVI.

**Table XVI**

**REASONS BEHIND THE CHOICE OF DIRECT MARKETING CHANNEL**

S.No.	Farm groups	Number of farmers reporting		
		Quicker sale	Greater margin	Convenience
1.	Small	4	8	11
2.	Semi-medium	10	7	10
3.	Medium	6	5	13
4.	Large	7	11	8
	Overall	27	31	42

According to 42 per cent of the farmers, marketing through the agents involved greater risk, therefore they considered marketing to be convenient and beneficial to them. The other reasons mentioned by them were greater margin of profits and quicker sale of the output.

**a. Pricing of Vegetables:**

According to Chatta et al (1982), "The large production, seasonal and perishable nature of the crop and the limited storage facilities has a profound effect on the growers' income and economic efficiencies of the production, due to wide fluctuations in prices of vegetables". The price spread varies depending upon various marketing channels adopted for marketing the produce. According to National Planning Committee (1947), "The farmer in general, sell his produce at an unfavourable place and at an unfavourable time and usually get very unfavourable terms."

Maximum and minimum prices reported by the farmers for their vegetable crop in the last harvest season are given in table XVII.

**Table XVII**

**REALISED PRICES OF VEGETABLES - GROUP WISE AND GROUP WISE  
(Price per kg.)**

S.No.	Farm groups	Maximum	Minimum
<b>Tomato</b>			
1.	Small	1.32	1.00
2.	Semi-medium	1.30	1.00
3.	Medium	2.00	0.50
4.	Large	1.10	0.40
	Overall	5.72	2.90
<b>Brinjal</b>			
1.	Small	1.25	0.60
2.	Semi-medium	1.50	0.50
3.	Medium	1.00	0.75
4.	Large	1.20	0.60
	Overall	4.95	2.45

**b. Objectives held by the Farmers in Marketing Vegetable Crops:**

Farmers cultivating vegetables are price takers rather than price maker in so far as they are not in a position to with hold the produce for the sake of pushing up the prices of vegetables in the market. They prefer to acceptancy the prevailing prices if they think that those prices satisfy the objectives which they have set before themselves earlier in cultivating and selling vegetable crops.

Objectives that influenced the farmers about the disposal of the vegetable produce were elicited and they are given in Table XVIII.

**Table XVIII**

**OBJECTIVES HELD BY THE FARMERS IN THE DISPOSAL OF THE VEGETABLE  
PRODUCE**

S.No. Farm groups	Number of respondents mentioning		
	Maximising Profit	Earning reasonable profit	Minimum Margin of profit
1. Small	22	23	2
2. Semi-medium	18	16	15
3. Medium	15	24	22
4. Large	15	25	25
Overall	80	88	64

The rate of return on the two vegetable crops were obtained by different group of farmers. They were calculated from the total cost and revenue figures given in Table XIX. Table XX gives average cost, revenue and profit obtained by farmers an every acre of cultivated vegetable crop.

Average profit realised from cultivating tomato crop was Rs.1190 per acre. The small and semi-medium farmers appeared to have an advantage over the other farmers in regard to tomato crops. Their cost of cultivation was higher than those of others yet they scored a higher profit than others because of the high revenue which they realised unlike others. The semi-medium groups had the highest cost of marketing Rs.969 per acre of tomato crop in line with its high marketing costs, the revenue that it obtained was also highest namely Rs.2,704 per acre of cultivation of tomato.

The farmers obtained a net return of Rs.3,090 per acre when they cultivated brinjal. The size of profits was inversely related to the size of the land holdings of the farmers. The small farmers obtained the highest return Rs.7,608 per acre from brinjal cultivating the returns of others were found declining with increase in size of holdings.

The statistical analysis revealed that profit from brinjal tended to vary more with size of holding unlike the profit from tomato crop which did not depend that extent on the size of holding.

The investigator also computed the cost, revenue and profit figures per kgms., of vegetable crops cultivated by the farmers, so as to find out how the producer price was divided between the cost and profits. Table XXI gives per unit cost, revenue and profit realised from cultivating tomato and brinjal.

Table XXI

PER KILOGRAM COSTS, REVENUES AND RETURNS ON VEGETABLE CROPS - FARM  
GROUP WISE

S.No.	Farm group	Cost per Kg.		Revenue per Kg.	Profit per Kg.
		In Cultivation	In Marketing		
<b>Tomato</b>					
1.	Small	.49	.10	1.36	.77
2.	Semi-medium	.38	.19	1.06	.56
3.	Medium	.46	.15	1.16	.56
4.	Large	.56	.17	1.43	.70
	Overall	.46	.14	1.23	.63
<b>Brinjal</b>					
1.	Small	.16	.09	1.00	.80
2.	Semi-medium	.35	.19	1.53	1.00
3.	Medium	.23	.13	.89	.53
4.	Large	.18	.13	.80	.40
	Overall	.22	.13	.98	.62

On an average one kilogram of tomato was sold by the farmers Rs.1.23 of which 46 paise went towards the cost of cultivating it. 40 paise bringing it to market and 63 paise remain as the profit on the quantity produced. In regard to brinjal on an average it sold at the rate of 98 paise per kilogram, of which 22 paise was spent on cultivation, 13 paise was spent on marketing and 62 paise remained as producers profit.

#### Problems in Cultivation and Marketing of Vegetables:

Srinivasan (1980) considered inadequate marketing and related infrastructural facilities, fragmented markets and uneconomic and unpredictable prices, as major constraints affecting agricultural marketing in general and vegetable marketing in particular. When the sample farmers asked to state the problems they faced in cultivation and marketing of vegetables, they came out with a number of problems. They are given in Table XXII.

**Table XXII**  
**PROBLEMS IN CULTIVATION AND MARKETING OF VEGETABLES**

S.No.	Problems	Number stating
1	2	3

**Cultivation**

1. Spread of diseases caused by insects	75
2. Higher price for inputs	71
3. Labour problems	70
4. Limited land	54
5. Inadequate finance	50
6. Lack of modern methods of cultivation	49
7. Lack of knowledge in applying HYV in farm cultivation	45
8. Lack of irrigation facilities	40

**Marketing**

1. Transportation problem	91
2. Distance to market	91
3. Lack of storage facilities	91

1	2	3
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- 4. Strikes, bus breakdown etc., all unforeseen problems 83
- 5. Demand fluctuations (specially during festivals off season) 79
- 6. Produce is highly perishable affected by climatic conditions 79
- 7. Competition in the market 72
- 8. Price fluctuations 64
- 9. Lack of information about ruling price 41
- 10. High rent for the shop 34
- 11. Labour problems 20

The first major problem faced by farmer is diseases that the plant suffer on account of which they suffered losses in production. 45 per cent of the farmers felt that while high yielding of these vegetable crop are available they did not have know how to use them. Another group believed that scientific break through and vegetable cultivation has not yet been effected by Indian Scientist as in the case of the table series and cash crops. These responses regarding the need for developing new technology in vegetable cultivation hoping with pests and for increasing yield is very imperative.

The distance location of the market was cited as a major problem in marketing (91 per cent). Farmers experienced difficulties in transporting their vegetables from their village to market. Particularly when the public transportation system was paralysed, because of exogeneous circumstances like strikes, and mechanical failure. An equal number of farmers felt that they did not have adequate storage facilities to preserve the vegetables, when they like to wait for higher prices in market. Fluctuations in demand for vegetables during festival and off season affected the price at which the farmers were able to dispose of their produces. 79 per cent of farmers felt that vegetable crop was highly affected by climatic conditions, and hence they were forced to make distress sale of the produces during the certain circumstances.

What matters most in vegetable marketing is the time lines of scale. If the whole sale dealer of vegetable could mobilise the output of vegetables at the farms themselves instead of waiting for the producer to their door step, the farmers could save themselves the burden of bringing the vegetables to the market.

## V. SUMMARY AND CONCLUSION

Vegetable farming is of crucial importance in India, where majority of the people live on an inadequate diet of meat. The per capita availability of vegetables has increased rather slowly and is still not anywhere near the recommended level. Therefore the investigator undertook a study on the economics of vegetables cultivation and marketing, so as to explore the possibilities that exist for increasing vegetable production and suggest suitable policy measures towards actualising it. The study had following objectives:

1. To find out the relative area under vegetable cultivation.
2. To assess the relative profitability of vegetable cultivation.
3. To find out the cost of cultivation of specific vegetable crops and find out the weightage of the various cost components.
4. To estimate the returns of the specific vegetable crops.
5. To estimate the marketing cost of specific vegetable crops.
6. To find out how the producer price of vegetables is shared among the cost of cultivation and cost of marketing and producer's margin.

7. To find out the marketing practices of vegetables cultivation.
8. To locate the problems in vegetable cultivation and marketing.

The sample farmers numbering 100 were selected on the basis of systematic random sampling from the two villages Valukkapparai and Alichipalayam, known for vegetable cultivation in Madukkarai Panchayat Union of Coimbatore District. They were classified into four groups according to their size of holdings for purposes of analysis.

The findings of the study are:

1. In the group of vegetable cultivators who had been studied, they were 23 small farmers operating an area of 5 to 10 acres. 27 semi-medium farmers having an operated area of 11 to 15 acres. 24 medium farmers operating an area of 16 to 20 acres. 26 large farmers having more than 20 acres. Vegetable cultivation thus was not restricted to farmers of any particular groups. Small as well as large farmers had taken to vegetable cultivation.

2. The small farmers had large family and the family size of the large farmers was smallest.
3. Out of 217 adult workers in agriculture 75 per cent were totally illiterate. And only 4.6 per cent of the cultivators had been educated beyond the primary level.
4. 33 per cent of the farmers had poultry or beekeeping. Income from these sources provide them some money to meet their daily expenses.
5. Nearly three out of every ten acres of the cultivated area was under vegetable crops (29.2 per cent)
6. Tomato was considered a promising cash crops more by the small farmers than by others.
6. Cultivation of brinjal was even more profitable than sugarcane yielding a net return of about Rs.5,500 per acre, as against Rs.2,480 per acre yielded by sugarcane. The order of profitability of various crops were: Coconut, brinjal, sugarcane, groundnut, tomato, paddy, cotton, ragi and maize.

7. The farmers of the area had taken to tomato cultivation in a large measure, because the net yield from tomato was more stable than the net yield from tomato was more stable than the net yield from the other crops (paddy).

8. All the farmers were cultivating tomatoes. Among those 56 per cent of farmers produced tomatoes in four months duration. 26 per cent had tomato crop of five month duration and lastly six month duration was reported by 18 members. Similarly the long duration brinjal crop was favoured by 56 per cent of the cultivators.

9. Large farmers were more efficient than others in brinjal cultivation as their costs of cultivation per acre was lower than the aggregate value figure of Rs.579 per acre.

10. In the aggregate out of every producer rupee spent in the cultivation of tomato, 21 paise went for seeds, 43 paise was spent on fertilizers and 36 paise was spent on labour.

11. The direct expenditure on cultivation of brinjal for the entire group was Rs.960 per acre. Among them Rs.831 incurred by the large farmers which was the minimum.

12. A break down of direct expenses of cultivation of brinjal into its components revealed that of every rupee that was spent on its cultivation 65 paise went for seeds, 48 paise spent on fertilizer and pesticides and 36 paise was spent on labour.

13. On an average about 1,900 kgs of tomato and 7,280 kgs of brinjal were raised in an acre of land. The most efficient farm group in the cultivation of tomato was semi - medium farmers (2564 kgs. per acre) and small farmers recording the highest productivity of 9,556 kgs., of brinjal per acre.

14. The proportion of the produce, wasted was relatively large in the tomato crop (.44 per cent of the total output) than brinjal where the wastage was only 0.26 per cent of the total output.

15. The amount used of both the vegetables for home consumption was far less than the amount wasted.

16. No variations observed in the marketed surplus of tomato and brinjal among the four farm groups. With one per cent of the output lost in consumption and wastage, 99 per cent of the total output was marketed in both the cases.

17. All the farmers were marketing their vegetables outside the village. None of them sold their produce within the village. They marketed them both in the Sundarapuram daily Market which was away from the villages, by seven kilometers and in the Coimbatore Market which was ten kilometers away.

18. All the vegetable producers sold their produce directly in the market. They did not sell through agents.

19. Vegetables were sold immediately after they were collected from the field because they were highly perishable, and the farmers did not have storage facilities to preserve their keeping quality.

20. The farmers selected the direct marketing channel because it was convenient (42 per cent); gave them greater margin of profit (31 per cent); and facilitated the quicker sale of the output (27 percent).

21. The farmers disposed of the vegetable produce if they thought the market price gave them a reasonable profit (88 per cent); or it helped them to maximise the profit or it provided than a minimum margin.

22. Average profit realised from cultivating tomato crop was Rs.1,183 per acre. The small and semi-medium farmers received greater profit than other farm groups through they had the highest cost of cultivation and marketing.

23. A net return Rs.3,090 was obtained when the farmers cultivated brinjal. The small farmers obtained the highest return of Rs.7,608 per acre.

24. Tomato producers received Rs.1.23 as the average revenue per kilo gram of which 46 paise went towards the cost of cultivation,

25. In regard to brinjal, revenue obtained by the farmer was 98 paise per kg., of which 22 paise was spent on cultivation, 13 paise was spent on marketing and 62 paise was received by farmers as profit.

26. In cultivation of vegetables, the major problem faced by the farmers was spread of diseases caused by insects followed by higher prices for inputs and labour problems.

27. Problem of transportation, distant location markets and lack of storage facilities were some of the major problems faced by the farmers in vegetable marketing.

## Conclusion:

Statistical analysis was carried out to find out how far the size of land holding influence the cropping pattern of the farmer and cost and revenue of different crops, while cropping pattern decisively depended on the land holdings, cost of cultivation of crops and revenue obtained by them was not so much influence by the size of land holdings. In regard to vegetable cultivation, the productivity and profit from the cultivation of brinjal were negatively associated with the size of land holdings, were as the productivity and profit of tomatoes did not so much vary with the size of land holdings.

It may be observed that vegetables have emerged as an important cash crop, cultivated by the farmers on par with cotton, sugarcane and groundnut, claiming three out of every ten acres of the cultivated area. Crops like brinjal, yielding a net return of about Rs.5,510 per acre even more profitable than sugarcane, which yielded a return Rs.3,620 per acre. They sold the vegetable produces directly to the merchants in the market.

The producer price of tomato was Rs.1.23 per kg., of which 40 paise went towards the direct expenses of cultivating it, 40 paise was the marketing cost of farmer and 63 paise was the profit. Brinjal sold at an average rate of 98 paise per kg., of which 22 paise was spent on cultivation, 13 paise was spent on marketing, 63 paise remain as the farmer's profit.

On account of perishability of the vegetables farmer were not in a position to withhold stocks in expectation of higher price. This suggested the need for developing community cold storage facilities either at the market centres or at the villages themselves so that farmer would be able to store their vegetable output at a nominal cost for the sake of minimising their difficulties, in transporting in large quantities in town market centres, the merchants might think of organising transportation to the villages to collecting vegetable products fresh from right at the farm itself. They felt problem in regard to vegetable cultivation of lack of modern methods of cultivation which points to a new direction in horticultural research namely the need for evolving scientific methods of cultivation for raising the productivity of vegetables. Hereafter, agricultural research should give the highest priority to vegetable cultivation, as it gave to cereals in the past.

## BIBLIOGRAPHY

### JOURNALS

1. Agarwal (1981) : "Problems of Agricultural marketing in India" - Indian Journal of Marketing - Vol.XI Pp.23-25.
2. Ananda Kumar and Samba Murthy (1982) : "Role of middleman in agricultural marketing" - An empirical assessment Indian Journal of Marketing, Vol. XIII Pp.3 - 12.
3. Balakrishnan (1981) : "An analysis of prices and arrivals of potato in Nilgiris District of Tamil Nadu" - Agricultural Marketing Vol.XXIII. Pp 1 - 4
4. Bhalerao, Ansari and Jyagi (1981) : "Marketing of Vegetables" - A sample study Agricultural Marketing Vol.XXIV pp 26-29.
5. Bhalerao, Ansari Rama Shanj Singh and Jyagi : "Credit - Pricing policies for vegetables" - ( A Case study for bulk line cost) Rural India, Vol.44 Pp.172 - 174.
6. Bhatia and Kutumbao Rao (1980) : "Fresh fruits and vegetables grading: A study in retrospect and prospect Agricultural Marketing. Vol.XXIV Pp.51-56.
7. Chatta and Kaul (1982) : "A study into the price behaviour and marketing margin of potato in Punjab" Agricultural Marketing Vol.XXV, Pp.10-14.

8. Dalbir Singh Gill and Gurmukh Singh Gill (1981) : "An economic analysis of potato marketing in Punjab" - Agricultural Marketing, Vol.XXIV. Pp.1012
9. Diwakar (1982) : "Production and utilisation of potato in Farrukhabad District in Uttar Pradesh", Agricultural Marketing, Vol.XXIV, Pp.1-5
10. Diwakar and Muralidheran (1980) : "A study on the distribution pattern and Factors influencing the marketed surplus of potatoes in Farrukhabad District in Uttar Pradesh". Agricultural Marketing Vol.XXIII.
- "An analysis of price efficiency of potato in Farrukhabad District of Uttar Pradesh", Agricultural Marketing. Vol.XXIII. July 1980. Pp.21 - 25.
- "A study of marketing cost and margin for potato in Farrukhabad District of Uttar Pradesh". Agricultural Marketing, January 1981. Pp.19.27
11. Gupta and Ram (1981) : "Price spread behaviour of vegetables in Delhi" Agricultural situation in India - Vol.XXVI pp. 557 - 559.

12. Harsh Jain and Kaul  
(1980)

: " A spectral analysis of potato arrivals and prices in Punjab" Agricultural Marketing, Vol.XXII Pp.20-24.

"Dynamics of potato in Delhi Market in Punjab" Agricultural Marketing. Vol.XXIII. October 1980, Pp.15-18-

13. Jogafah and Atma Kinga Murthy:  
(1981)

: " Functional aspect of Warrangal Agricultural Market in Andhra Pradesh" Indian Journal of Marketing Vol.XI. Pp.(11-16)

14. Jayade and Patefi  
(1981)

: "Price spreads of Marketing of selected vegetables" - Indian Journal of Marketing Vol.XI. Pp.26-29.

15. Kshir sagar and  
Mallik  
(1982)

: "Correlation between packaging and quality control fruits and vegetables" Vol.XXV pp.10-13.

16. Lall  
(1980)

: "Augmenting vegetable production" Indian Horticulture. Vol.25 P.1.

17. Lekar  
(1982)

: "Better steps for agricultural Marketing" - Kisan World Vol.9 P.17.

18. Mohandoss  
Murthy Unjaya and  
Subramanyam  
1981
19. Nair Mathur  
(1981)
20. Prasad  
(1980)
21. Rafiqul Islam  
Molla, Majibur Rahman  
Sakar, Humayan Kabir  
and Shahadat Hossain  
(1974)
22. Rajagopal  
(1982)
23. Ram and Gupta  
(1980)
24. Ramachander and Subramaniam  
(1980)
25. Ramaswamy
- : "A study of fruits and vegetables cold store units in Bangalore city Agricultural situation in India Vol.XXXV, Pp.765 - 772.
- : "Rural Marketing" Indian Journal of Marketing Vol.XI, pp.1-8.
- : Vegetable cultivation in Karikipadu Block - Andhra Pradesh" - A case study. Yojana , Vol.XXIV. pp.25-26
- : "A Note on the nature of demand elasticities of poultry potato and brinjal." Indian Journal of agricultural economics. VolXXIX. Pp.54 - 59
- : "Rural Marketing" Kurukshetra, Vol.XXV. Pp.13-15.
- : "A comparative analysis of business structure of vegetables traders in Delhi", Vol.XXIII. Pp.31-34.
- : " Tips for boosting vegetable production" Indian Horticulture. Vol.25 P.1.
- : " Market regulation as applied to terminal markets for fruits and vegetables" same issue Agricultural Marketing Vol.XXII PP45 - 49.

25. Rashid Ahmed Ansari  
(1982)
- Sharma A.W. and Sharma V.K.  
(1981)
28. Shete, Patel Jaganatha Rao  
and Pauer  
(1980)
29. Shukla  
(1968)
30. Sidhu and Singh  
(1981)
31. Subramaniam
32. Wyes
- : "Banks and Dairy Farming",  
Indian Farmers Digest, Vol.XV.  
Pp.21-22.
- : "Marketing channels and producers'  
share in vegetable market in  
Almora District" Indian Farmers  
Digest. Vol.XIV, Pp.42 - 48.
- : "Measurement of price spread of  
tomatoes" Indian Journal of  
Marketing, Vol.X. Pp.1-6.
- : "Marketing of Potato" Agricultural  
Situation in India. Vol.XXIII  
Pp.25 - 31
- : "Potential for marketing of fruits  
and vegetables from Punjab in  
Delhi and other markets".  
Agricultural Marketing.  
Vol.XXIII, Pp.13-16.
- : "Effects of marketing costs on  
cost of production and returns"  
A Case study of vegetables.  
Agricultural Marketing  
Vol.XXIV. Pp.7-9.
- "Economics of Investment in Ferti-  
lizers and Pesticides" → A Case  
Study of vegetables. Agricul-  
tural situation in India  
Vol.XXXIV, Pp.857 - 862.

Uyas  
(1979)

: "Same aspects of structural changes  
in Indian Agriculture". Indian  
Journal of Agricultural Economics  
Vol. XXXIV  
Pp.16.

**BOOKS**

1. Coale and Hoover  
(1959)

: "Population growth and economic  
development in low income countries"  
Oxford University Press, P.10.

2. G111  
(1981)

: "Economic development past and present  
Indian Economic Development, Sankaran  
Progressive corporation, Private Ltd,  
Bombay - Madras.

3. Gopalan  
(1981)

: "Nutritive value of Indian Foods"  
National Institute of Nutrition  
Indian Council of Medical Research  
Hyderabad.  
p-29.

4. Thingan  
(1982)

: "The Economic of Development and  
Planning" Vicko Publishing House  
Private Ltd., New Delhi P.209.

5. Ruddar Datt  
and Sundaram  
(1972)

: "Indian Economy" Chand & Co.(Pvt) Ltd  
Ram Nagar, New Delhi. P.9

6. Sankaran  
(1972)

: "Indian Economic Development" Progre-  
ssive Corporation, (Pvt) Ltd.,  
Bombay - Madras P.201.

**7. Department of Economics  
(1978)**

**• "Retail pricing of vegetables  
in Gobi Market" Research Survey  
Manograph. Economics Department  
Gobi Arts College, Gobi.**

**8. Srinivasan  
(1980)**

**• "Prospectives of Agricultural  
Marketing Research" 7th  
chapter.  
National Seminar on Research  
Prospectives in Agricultural  
Economics.  
Centre of Agricultural and  
Rural Development studies  
Tamil Nadu Agricultural  
University - Coimbatore.**

APPENDIX I

Interview schedule to elicit information from the agriculturists about their vegetable farming and marketing practices.

1. Name of the Village : St. No.
2. Name of the head of the family : D.No.
3. Occupation of the head of the family :
4. Details of the family :

Sl. No.	Name	Age	Sex	Relation-ship with head of the family	Illiterate	Literatee	
						stud-ied	Study-ing

5. Occupational pattern:

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Serial Number of the members	Agriculturists	Non-Agriculturists	
		Types of job	Income
-----			
-----			
-----			
-----			
-----			

6. Sources of Income:

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Sl. No.	Sources	Income/month or year
1.	Farm Cultivation.	
2.	Poultry	
3.	Dairy	
4.	Beeweeeping	
5.	Others.	
-----		
-----		

**7. Total area cultivated by the family**

**a) Total area under various crops:**

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S.No.	Crops	Duration	Area under cultivation	
			(1981-82)	(1982-83)
-----				
-----				

**b) Total area left as follow:**

-----

Sl.No.	Types of area	Area	
		(1981-82)	(1982-83)
1.	Non Fertile.		
2.	Non irrigated.		
3.	Waste.		
4.	Others.		
-----			

8. Vegetable cultivation:

Sl. No.	Vegetable Variety	Area in acres	Duration	Quantity of output	Amt of waste if any	Net output	Amt. for home consumption	Amt. sold	Total revenue
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9. Production pattern:

Sl. No.	Crops	Area under cultivation in acres	Total yield	Sale per unit	Price standard	Total revenue
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10. Cost of cultivation

S.No.	Crops	Acreage	Dura- tion	seeds	Ferti- lizer	Labour char- ges	Equ ip- ment	Power	Any other
-------	-------	---------	---------------	-------	-----------------	------------------------	--------------------	-------	--------------

II. Problems in cultivation of vegetables:

- |  | Yes   | No. |
|--|-------|-----|
| 1. Inadequate finance                                    | ----- |     |
| 2. Lack of irrigation facilities                         | ----- |     |
| 3. Limited land  | ----- |     |
| 4. Labour problems                                       | ----- |     |
| 5. Higher price for inputs                               | ----- |     |
| 6. Lack of modernisation                                 | ----- |     |
| 7. Lack of knowledge in apply<br>HYV in farm cultivation | ----- |     |
| 8. spread of diseases caused<br>by insects.              |       |     |

**12. Marketing of vegetables**

**1. Marketing of vegetable within the village:**

**a) Do you dispose the vegetables at the farm site  
itself?**

Vegetable No. 1	(	)	.....
Vegetable No. 2	(	)	.....
Vegetable No. 3	(	I	.....

**B) who comes and collect them?**

Vegetable No. 1	(	)	.....
Vegetable No. 2	(	)	.....
Vegetable No. 3	(	)	.....

**c) Quantity and prices of vegetables procured at the  
farm site:**

S.No.	Name of Vegetable	Amount sold per day			Sale price per standard unit		
		Max.	Mfn.	Average	Max	Mfn.	Average.

**II. Marketing of vegetables outside the village:**

a) Do you take the vegetables to the market?

Yes

What is the distance to the market?

b) Do you sell through agents or do you sell directly?

Reasons:

c) To whom do you sell the vegetables in the markets.

Sl. No. Name of vegetable

Amount sold to the merchants

Amount sold directly to the retailers and consumers

Dty. Price/std. unit qty. price / std. unit.

Max

Mfn.

Ave.

Max.

Mfn.

Ave.

13. Do you engage vendors:

Yes

No.

Reasons:

14. Do you give commission for the vendors / shop keepers:

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S.No.	Name of Vegetable	Quantity Sold	Charge per Unit	Total commission.
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-----

15. Do you have your own vegetable shop?

Yes                      No.

If so,

Place of the vegetable shop:

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S.No.	Name of vegetables	Price	Amount sold average per day	Rent for the shop	No.of labour appointed	Salary for labour ers.	Any others
-------	--------------------	-------	-----------------------------	-------------------	------------------------	------------------------	------------

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**16. Pricing of vegetables:**

What is your objective in fixing the selling price?

Yes      No.

- a. Maximising profit .....
- b. Earning reasonable  
profitable by pushing  
up sales as much as  
possible .....
- c. Minimum marginal profit .....
- d. Any other objective .....

**17. When will you get greater margin or profit.**

Yes      No.

- a. When the wholesale prices are low .....
- b. When the wholesale price are high .....
- c. At the festive seasons .....
- d. In the first week of the month .....
- e. At any other point of time .....

18. Do you transport the vegetables to the markets:

Yes      No.

If so, how do you transport the vegetables to the market?

- a. Labourer.
- b. Bus
- c. Bullock Cart
- d. Lorry.

19. What is the cost of transportation:

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Sl. No.	Name of vegetable	Transportation cost per standard unit	Labour cost in transportation	Any other
---------	-------------------	---------------------------------------	-------------------------------	-----------

-----

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20. Do you find any wastage of vegetables during the marketing of vegetables?

Yes. No.

If so.

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S.No.	Name of vegetables	Quantity of vegetable for sale	Quantity of vegetable as wastage.
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21. Problems in Marketing:

Yes No.

- a. Lack of information about the ruling price .....  
b. transportation problem .....  
c. Distance to market .....

- d. Price fluctuation .....
- e. Labour problems .....
- f. High rent for the shop .....
- g. Demand fluctuations  
 (specially during festivals  
 off seasons) .....
- h. Lack of storage facilities .....
- i. Since produce are perishable  
 commodities - climater conditions .....
- j. Strikes but breakdown etc.  
 all unforeseen problems .....
- k. Competition in the market .....
- l. Other problems .....

## APPENDIX II

### Sample calculation of "t" test

Test the difference between the cost per acre of various crops among farmers with different sizes of holdings.

The analysis was done by using the following students

't' test formula:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{s} \times \sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

Where  $s = \frac{(\sum x_1 - x_1)^2 + (\sum x_2 - x_2)^2}{n_1 + n_2 - 2}$

$\bar{x}_1$  = Average cost incurred by the semi - medium farmers.

$\bar{x}_2$  = Average cost incurred by the large farmers.

$n_1$  and  $n_2$  are the number of crops they cultivated and  $s$  is the combined deviation.

S.No.	$x_1$	$(x_1 - \bar{x})$	$(x_1 - \bar{x}_1)$	$x_2$	$(x_2 - \bar{x}_2)$	$(x_2 - \bar{x}_2)$
1.	1560	340	115600	970	26.7	712.89
2.	880 (-)	340	115600	1210	266.7	71128.89
3.	850 (-)	370	136900	1065	121.7	14810.89
4.	990 (-)	230	52900	740	(-)203.3	41330.89
5.	1780	560	313600	1140	196.7	38690.89
6.	810 (-)	410	168100	590	(-)353.3	124820.89
7.	1130 (-)	90	8100	450	(-)493.3	243344.89
8.	2010	790	624100	1460	516.7	266978.89
9.	970 (-)	250	62500	865	(-) 78.3	6130.89

$$\bar{x}_1 = 1220 \quad (x_1 - \bar{x}_1)^2 = 1594700$$

$$\bar{x}_2 = 943.3 \quad (x_2 - \bar{x}_2)^2 = 807950$$

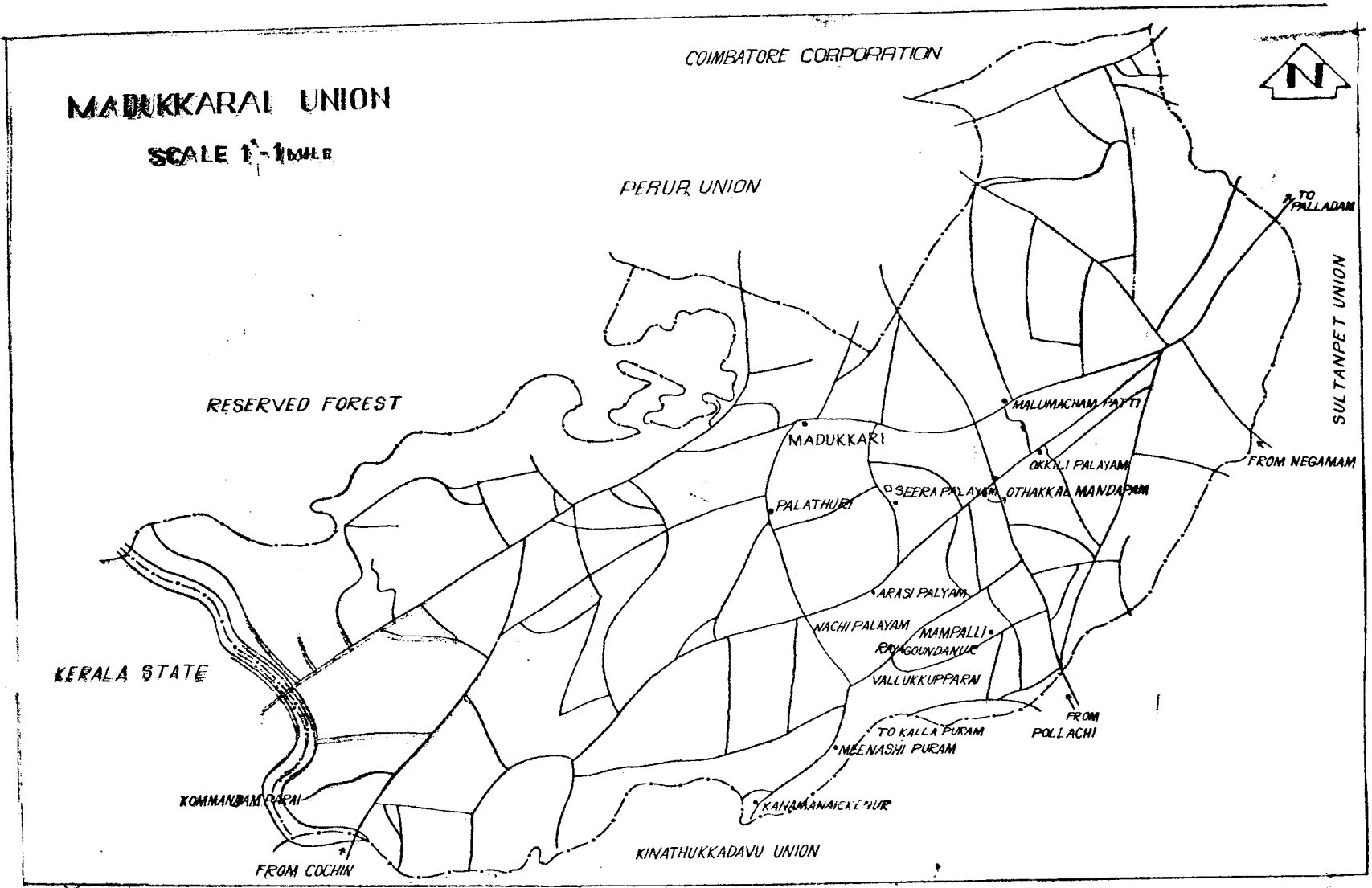
$$t = \frac{1220 - 943.3}{s} \times \frac{81}{18}$$

$$s = \frac{\sqrt{(1597400 + (807950))}}{16} = 387.72$$

$$= \frac{1220 - 943.3}{387.72} \times 2.12$$

$$= 1.512$$

Calculated 't' value = 1.512 significant at one per cent level.  
 Thus the result in the analysis accept the research hypothesis  
 and rejected null hypothesis.



**Table VIII**  
COMPARATIVE ANALYSIS OF PER ACRE COST AND REVENUE ON DIFFERENT  
CROPS

( in rupees)

S.No.	Name of the crop	Small Farm Groups			Semi-Medium Farm			Medium Farm Group			Large Farm Group		
		Revenue	Cost	Net Revenue	Revenue	Cost	Net Revenue	Revenue	Cost	Net Revenue	Revenue	Cost	Net Revenue
1.	Coconut	7770	3780	3990	6460	1560	4900	6350	1070	5280	3495	970	2520
2.	Cotton	1980	830	1150	2300	880	1420	2255	910	1340	1490	1210	275
3.	Paddy	1080	470	610	3520	850	2670	1595	1020	570	2180	1065	1120
4.	Groundnut	1500	740	760	5220	990	4230	1245	970	270	830	740	90
5.	Sugarcane	1690	490	1200	4050	1780	2270	3490	1220	2270	3310	1140	2160
6.	Maize	3980	780	3200	1100	810	290	1600	1100	510	1010	590	420
7.	Ragi	900	800	100	1720	560	1150	-	-	-	-	-	-
8.	Ladies finger	1420	1040	380	1480	1130	357	950	550	450	1100	450	650
9.	Brinjal	10180	1620	8560	8740	2010	6740	6050	1530	4515	6470	1460	5010
10.	Tomato	2550	920	1630	2700	970	1740	2000	800	1200	2210	805	1405

1. F. Note : The figures relating to costs and returns have been rounded to the nearest rupee. This applies to all other tables also.

2. F. Note : 't' value of costs, 1.512 significant at one per cent level, 't' value of gross revenues 1.76 significant at one per cent level.

Table X

## DETAILS OF DISTRIBUTION OF COST OF TOMATO PRODUCTION

( in Rupees )

S.No.	Farm Groups	Acreage under Tomato	Expenditure on seeds	Cost of seeds per acre	Expenditure on fertilizer and pesticides	Cost of Fertilizer per acre	Expenditure on Labour	Labour charges per acre	Total direct expenses	Direct expenses of cultivation per acre
1.	Small	63.5	8735	138	16030	252	13795	217	38560	607
2.	Semi - medium	108	14165	131	30560	283	22690	210	67415	624
3.	Medium	118.5	12770	108	25650	216	25910	219	64230	543
4.	Large	140.25	15540	111	35940	256	27010	193	78490	560
5.	Overall	430.25	51210	119	108180	251	89405	208	248795	579

Table XI

## DETAILS OF DISTRIBUTION OF COST OF PRODUCTION OF BRINJAL

(in rupees)

S.No.	Farm Groups	Acreage under Brinjal	Expenditure on seeds.	Cost of seeds per acre	Expenditure on fertilizers and pesticides	Cost on Fertilizers and pesticides per acre	Expenditure on labour	Labour charges per acre	Total direct expenses	Direct Expenses of Cultivation per acre
1.	Small	4.5	1005	223	1950	433	1355	301	4310	957
2.	Semi - medium	17	2475	146	10150	598	7800	459	20925	1202
3.	Medium	20	2045	102	8470	423.7	8370	419	18886	945
4.	Large	20.5	5470	185	11850	402	7200	244	24520	831
5.	Overall	71	10995	155	32420	457	24725	348	68140	960

Table XIX

TOTAL COSTS, REVENUE AND RETURNS ON VEGETABLE  
CROPS

(in rupees)

S.No.	Farm Groups	Acreage	Marketed surplus (in kgs.)	Cost of cultivation	Cost of Marketing	Total cost	Total Revenue	Profit
Tomato								
1.	Small	63.5	118615	58430(93)	11860(7)	70190	161775	91480
2.	Semi-Medium	108	274685	104640(76)	32595(23)	137230	292005	154770
3.	Medium	118.5	203860	94170(76)	29880(24)	124050	237290	113235
4.	Large	140.25	216035	121310(76)	36640(26)	157960	309815	151855
	Overall	430.25	813195	378560(77)	110980(23)	489540	1000880	511340
Brinjal								
1.	Small	45	42635	7305(91)	4264(9)	11570	45805	34240
2.	Semi-medium	17	96980	34100(63)	17358(37)	51520	148705	97190
3.	Medium	20	136415	30695(63)	18120(37)	48815	121000	72185
4.	Large	29.5	238590	43160(58)	31560(42)	74720	190440	118230
	Overall	71	514620	115320(62)	71300(38)	186625	506450	319825

Table XX

## PER ACREAGE COSTS, REVENUES AND RETURNS ON VEGETABLE CROPS - FARM GROUP WISE

S.No.	Farm Group	Cost per Acre		Gross Revenue per acre	Profit per acre
		In Cultivation	In Marketing		
Tomato					
1.	Small	920	185	2550	1440
2.	Semi-medium	910	300	2700	1430
3.	Medium	795	250	2000	960
4.	Large	865	260	2010	1080
	Overall	880	260	2330	1190
Brinjal					
1.	Small	1620	950	2700	7610
2.	Semi-medium	2010	1020	8750	5760
3.	Medium	1535	906	6050	3610
4.	Large	1460	1070	6470	2940
	Overall	1624	1004	7130	4505

F.Note : 't' values on returns from tomato crop, 2.156 significant at 1 per cent level.

: 't' value on return from brinjal crop, 3.36 significant at 5 per cent level.