ECONOMIC ANALYSIS OF COST AND RETURN OF OFF-SEASON VEGETABLES WITH FOCUS ON POLY HOUSE EFFECT IN JAMMU & KASHMIR

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Background

The mountainous state of Jammu and Kashmir is located mostly in the Himalayan mountains and shares borders with the states of Himachal Pradesh and Punjab. The state has warm valley areas as well as perennially snow-covered peaks. The hilly terrain of Jammu and Kashmir in the north is endowed with a variety of rich climate and topographical conditions. Thus it is famous for tourism, its horticultural production (especially apple) and off-season vegetables. In hilly areas of J&K, knolkhol, peas, tomato, beans, radish etc. are mainly grown in various belts throughout the year as off season vegetables. Off season vegetables are the valuable cash crops of Jammu and Kashmir and are cultivated by the growers in their crop field as well as in polyhouses. Raising of vegetable nursery in polyhouses is very popular in J&K. Generally in Kashmir region, in polyhouses only seedlings are raised and by planting the seedling in the field, the yield is taken in advance than the normal method of direct sowing. As there is huge demand for off-season vegetables, farmers get more price out of their produce. Keeping in view the importance of off season vegetables grown in J&K, the Ministry of Agriculture and Farmers Welfare entrusted this study to Agro Economic Research Centre, H.P. University, Shimla.

Objectives

The main objectives of the study are as under:

- To analyse the trends in area and production of vegetables in the State;
- To examine the costs and returns in various vegetables grown by farmers in the State;
- To assess the marketing costs, margins and price spread in various vegetables in different markets;
- To study the various problems faced by vegetable growers in production and marketing of vegetables in the State.

In addition to the above objectives, the following objectives are specific to off season vegetables in polyhouses.

- To study the costs and returns of off season vegetables in polyhouses;
- To study the marketing system of polyhouse vegetable crops;
- To study the problems faced by polyhouse farmers in the State.

To conduct the study on off season vegetables in the state of Jammu and Kashmir five vegetables viz. tomato, capsicum, Knolkhol, cabbage and cauliflower were selected for cultivation outside polyhouse. A purposive cum multistage stratified random sampling technique was used in the selection of the districts, blocks, villages and finally the vegetable growers. Thus the total sample of selected vegetable growers was 120 for the detailed study of off season vegetables outside polyhouse. For studying the costs, and returns of off season vegetables inside polyhouse, the information/data is taken from the study "An Economic Analysis of Protected Cultivation Under MIDH in J&K" (having a sample of 100 polyhouses) assigned by the Ministry of Agriculture and farmers welfare, GOI to this centre for the same period.

Main Findings

The total area under various vegetables grown in the State during the year 2014-15 was 21140 hectares. There were many vegetables i.e. sag, onion, carrot, garlic turnip, spinach, methi, coriander, leek etc. grown in Kashmir region which all together constitute 65.32 percent share in total area under vegetables. Among main vegetables grown there, highest area was under Knolkhol (13.59%) followed by tomato (8.70%), cauliflower (4.43%), cabbage (3.94%) and capsicum (1.01%). The total production of various vegetables in the State during the year 2014-15 was 505795 MT. The largest production was of knolkhol (14.57%) followed by tomato (9.94%), cauliflower (4.74%), cabbage (4.25%) and capsicum (4%).

The total cost (cost C) of cultivation of tomato, cabbage, cauliflower, capsicum and knolkhol (off season vegetables grown outside polyhouse) were Rs.93167, Rs.88974, Rs.95350, Rs.79191and Rs 89407 per hectare in all the sampled farms. The material cost was the most important component of the total cost C in all the vegetables followed by the labour cost (family & hired) and rental value of owned land. The net return over cost C realized from the cultivation of tomato, cabbage, cauliflower, capsicum and knokhol were Rs.402666, Rs.293601, Rs.420579, Rs.459809 and

Rs.430593 per hectare respectively in all the sampled farms under study. The input-output ratio of capsicum production was also highest (1:6.80) followed by Knolkhol (1:5.82) among all the vegetables in all the sampled farms under study. In the case of tomato, cabbage and cauliflower, input-output ratio was 1:5.32, 1:4.30 and 1:5.41 respectively on all the sampled farms. After capsicum and Knolkhol, cauliflower cultivation was most profitable followed by tomato and cabbage.

In all the sampled farmers, there was no tendency of retaining vegetables for seed and kind wages or gifts and more than 85 percent of the total produce, except cabbage (77.78%), was sold in markets after home consumption and losses. Out of total marketed produce, 76 to 81 percent was sold in local markets, where no middlemen were involved in selling or buying the vegetables and hence the sampled farmers received handsome price for their produce. Only about 20 percent of the total marketed produce was sold in Jammu market, but this was the only market of sampled farmers for which the price spread could be studied.

The cost of marketing borne by vegetable growers for selling their produce in Jammu market worked out to be Rs.368, Rs.332, Rs. 360, Rs.349 and Rs.353 per quintal for tomato, cabbage, cauliflower, capsicum and knolkhol respectively. Transportation cost was the main component of total marketing cost borne by the producer in all the vegetables as this market is far away. The second important component of marketing cost was the cost of commission and market fee. The share of marketing costs in consumer's rupee was maximum in case of cabbage (14.08%) and minimum in capsicum (10.45%). The share of producer in consumer's rupee was 65.89, 65.83, 63.65, 63.61 and 61.22 percent in capsicum, knolkhol, cauliflower, cabbage and tomato respectively. The mashakhor's margins ranged between 0.83 percent in tomato to 0.99 percent each in capsicum and knolkhol. The retailer's margin was highest in tomato (9.47%) and lowest in cabbage (7.97%).

The various problems faced by the vegetable growers (growing vegetables outside polyhouse) were lack of transportation facilities, shortage of packing material and lack of storage facilities. The prices of produce depend mainly on the market conditions, and if the growers do not have proper information regarding market, then

they cannot take the advantage of high prices. The farmers were facing the problems of getting late information, information available for few markets, inadequate information and misleading information. In most of the cases, commission agents quote lower prices than the actual one.

As far as the cultivation of off season vegetables inside polyhouse is concerned, the sampled farmers of the selected areas of J&K raise only nursery inside polyhouses and grow vegetables outside polyhouse which reached the markets earlier making the cultivation of off season vegetables more beneficial outside polyhouse. But the farmers have many problems related to polyhouse construction and inputs availability. Sixty four percent farmers complained about the clearance procedure of subsidy and thirty percent about the long wait for sanctioning of loan. Sixty percent farmers stated the problems in obtaining information about the time and cost schedule etc. of polyhouse construction. Forty four percent farmers were not happy with design of the poly house. Fifty six percent complained about use of inferior material in construction. Seventy percent complained the problem of higher prices of inputs required for raising of seedling in a polyhouse. About fifty six percent reported unavailability of inputs and 74 percent told that the inputs were of low quality.

Policy Implications

It is clear from the above that growing off season vegetables has increased the income of the growers. However, the profitability of these crops still can be improved by taking the following steps.

- Establishment of vegetable processing units in producing areas can improve the profitability by reducing the losses in picking, grading and packing etc., as the well established market at Jammu is very far away. .
- Keeping in view the perishable nature of vegetables and variations in market prices, adequate storage facilities should be developed.
- Arrangements should be made to provide latest information regarding prices and arrivals of the vegetables in Jammu market.

- The emphasis should be given develop infrastructure by improving packing and transportation facilities.

- The polyhouse growers should be provided quality seeds at the reasonable rates so that the productivity of off season vegetables can be increased by using the seedling raised in polyhouses. In order to encourage polyhouse growers to cultivate off season vegetables inside polyhouse, they should be given proper training related to cultural practices i.e. raising nursery and crops, intensity of irrigation, the most appropriate sowing and harvesting time.

- Farmers should be encouraged to establish high tech polyhouses as such polyhouses can produce good quality saplings before their expected time.

CHAPTER–1

Introduction

Background

1.1 The mountainous state of Jammu and Kashmir is located mostly in the Himalayan mountains and shares borders with the states of Himachal Pradesh and Punjab. The state has warm valley areas as well as perennially snow-covered peaks. The hilly terrain of Jammu and Kashmir in the north is endowed with a variety of rich climate and topographical conditions. Thus it is famous for tourism, its horticultural production (especially apple) and off-season vegetables. In hilly areas of J&K, knolkhol, peas, tomato, beans, radish etc. are mainly grown in various belts throughout the year as off season vegetables. Increased demand for vegetables due to tourism and demand in local markets have come as boon for the growers of these hills. The growers of J&K are also now using polyhouses to increase the production of off-season vegetables.

General Features of Agriculture in J. & K.

1.2 Agriculture plays a very prominent role for the development of economy of J & K State. The state has a cultivable area of 8.58 lacs hectares.   Around 70 per cent of the population in the State gets livelihood directly or indirectly from agriculture and allied sectors. As per census 2011, 41 percent (out of main and marginal workers taken together) are engaged in agricultural activities. The State comprises of three regions; namely, Jammu, Kashmir and Ladakh having distinct geographical outlook and agro-climatic zones. Each zone having its own characteristics that largely determines the cropping pattern and productivity of crops. Seed replacement ratio is very low in J & K, still those varieties are used which were developed 30 years ago affecting yield parameters adversely. The production of three major crops paddy, maize and wheat in J & K state is more than 90 percent of the total food-grain production of all crops and rest is shared by other cereals and pulses. Commercial crops are the cash crops and help for invigorating agriculture sector. The State has a cultivable area of 8.58 lacs hectares around 12 percent of gross area sown. The net area sown during 2013-14 was 741 hectares. About 89 percent of the net irrigated area is irrigated through canals

irrigation facility is presently available only to 43 percent of the net area sown. A major constraint to the development of agriculture in J & K is the fact that only 50 percent of the ultimate irrigation potential of the State is harnessed. The share of agriculture and allied activities to GSDP is 17.49 percent as per advanced estimates for 2014-15. The share of the horticulture sector in the agriculture GSDP is about 45 percent. About 94 percent of the operational holders fall in the category of marginal and small farmers, 5 percent in the semi-medium farmers, one percent in the medium farmers and 0.04 percent in the large farmers. The average size of holding size is 0.67 hectares.

Off-Season Vegetables in J & K

1.3 Off season vegetables are the valuable cash crops of Jammu and Kashmir and are cultivated by the growers in their crop field as well as in polyhouses. As there is huge demand for off-season vegetables, farmers get more price out of their produce. Vegetable nursery raising under poly houses is very popular in J&K. Generally in Kashmir region, in polyhouses only seedlings are raised and by planting these seedling in the field, the yield is taken in advance than the normal method of direct sowing. Raising of vegetable nursery in polyhouses has many folds benefits such as easy management, early nursery and protection from biotic and abiotic stress. This technology fetches the higher prices due to marketing of produce in off season. Such production system has extended the growing season of vegetables and also their availability whole the year. The seedlings of cucurbits, tomato, chilli, capsicum, brinjal, cucumber, cabbage, cauliflower and broccoli are grown under plastic cover in the polyhouses.

1.4 The government in Kashmir has taken an initiative to provide polyhouses at subsidized rates to farmers to help them increase vegetable production and also protect their crops from vagaries of fluctuating weather. The initiative has benefited farmers of several villages of Budgam district and the government is expending it to other districts as well. Using polyhouse facilities by the farmers in Kashmir, the early sapling production is leading to a surge in sales of vegetables. Farmers grow saplings in their polyhouses for their kitchen gardens and large acres of land used for commercial purposes. The main off season vegetables grown in the fields in J&K are knolkhol,

peas, tomato, French beans, radish, cauliflower, cabbage and capsicum. However, the off-season vegetable/seed industry in Kashmir received a serious setback due to the turmoil in Kashmir valley over the past few years. As a result of disturbed conditions in the valley the vegetable seed industry is facing number of difficulties.

Review of Literature

An attempt has been made to present a brief resume of work done on costs, returns and marketing of off season vegetables outside and inside polyhouses.

1.5   Singh Ranveer and Sikka, B.K. (1989) conducted a study of hill vegetables in three districts of Himachal Pradesh and found that the returns were comparatively higher is case of vegetables than other field crops. The profitability of cultivation of various vegetables showed that input output ratio was highest in cauliflower followed by tomato, cabbage, peas, beans and capsicum. The share of producer in consumer's rupee was about 49, 46, 43, 38, 34 and 33 percent in peas, cabbage, tomato, cauliflower, capsicum and beans respectively for Delhi market.

1.6   Singh, D.V.(1990) studied the production and marketing of four off-season vegetables namely, peas, tomato, cauliflower and capsicum in Himachal Pradesh. The study revealed that fertilizer application rates were far below the recommended level. Being labour intensive crops, human labour costs formed a significant proportion of total costs for all the vegetables. The cost of production calculated by various cost concepts showed that, except for peas, marketing costs form a significant proportion of total costs. The study also showed that the inputs were not efficiently used.

1.7   Singh Ranveer and Sikka, B.K. (1992) studied the costs, returns and marketing of different vegetables in Shimla, Sirmour and Solan districts of Himachal Pradesh and concluded that requirement of labour and capital was quite high in vegetable crops. Among all the vegetable crops under study both costs and returns were highest in case of cauliflower followed by tomato, capsicum, cabbage, peas and beans. The study also revealed that vegetable crops give higher returns than other field crops and generate more employment opportunities for the farmers of the hilly areas. The share of producer

in consumer's rupee was about 61.29, 48.29 and 46.78 percent in peas, cabbage and cauliflower respectively for Delhi market. The retailer's margin was higher than the whole saler's margins in all the vegetable under study.

1.8   Baba and Mann (2005) analyzed the economics and resource us efficiency of important vegetables during main-season as well as off-season under irrigated conditions of Himachal Pradesh. The study revealed that the net returns of the vegetables were found to be much higher during off-season than that of main-season vegetables, because of favourable market conditions prevailing in the country. The result of Cob- Douglas production function revealed that the expenditure on improved varieties of seed cost has positive impact on net returns. The coefficient of fertilizer expenditure appeared to be negative in case of peas, cauliflower and radish in main-season and cauliflower in off-season, indicating that cost should be minimized and the fertilizers need to be applied as per scientific package and practices. A significantly positive coefficient of irrigation expenditure in case of garlic in both the seasons suggested need for judicious application of irrigation to improve productivity. The study suggested that government should strengthen efforts in this direction by providing irrigation infrastructure in other regions, especially for off-season vegetables.

1.9   Singh Ranveer and Vaidya C.S. (2005) studied the production, marketing, storage and transportation losses of various vegetables in Himachal Pradesh. The losses were highest in cauliflower (17.57%), followed by cabbage (15.23%), tomato (13.74%), capsicum (11.81%) and peas (7.47%).   The study concluded that the pre-harvest cultural practices are crucial for the reduction of post-harvest losses. Harvesting should be done in the early morning or late afternoon and avoid in wet conditions. Proper grading improves the quality and the price in the market. The plastic crates should be preferred over sending vegetables lose or packing in the box as it is economical investment. The package should provide adequate level of ventilation for sending vegetables to far away markets, post-harvest treatments help to reduce the losses in fresh produce. The surplus production may also be absorbed through establishment of processing plants in the region.

1.10   Singh, Ranveer, Vaidya, C.S. and Karol Anshuman (2006) studied the existing demand and supply of various vegetables from Himachal Pradesh and found that demand for cauliflower, cabbage, peas, tomato, capsicum, potato, carrot and broccoli tends to increase in near future. Since these vegetables are off seasonal in nature for the markets, hence Himachal had the major share in the supply of these vegetables. The study analysed the demand pattern for the next 10 year and it was found that the demand of some important vegetables requires more area for their cultivation.

1.11   Baba et al. (2010) analysed the growth of vegetables sector in relation with technology mission, extent and determinants of marketed surplus and price spread of vegetables in the Kashmir Valley. The study revealed that on an average, producers' marketed surplus has been found more than 92 per cent of the total production of selected vegetables. The price spread of vegetables with respect to various marketing channels has indicated that the producers share has an inverse relationship with the number of intermediaries. The net price received by the producer is relatively higher in the channels in which the produce is directly sold to the consumers. Across different vegetables, producers could receive higher absolute net returns in tomato, followed by brinjal and cauliflower in all the channels.

1.12   Vaidya, C.S. and Singh Ranveer (2011) studied the production and marketing of vegetables (tomato and capsicum) under protected cultivation in Himachal Pradesh. It was found that the cost of capsicum cultivation was Rs 41477 per poly house and yielded a net return of Rs. 258 per box with an input-output ratio of 1:2.26. The cost of tomato cultivation was Rs. 35255 per poly house and yielded a net return of Rs. 335 per box with an input-output ratio of 1:3.17. The producer's share in consumer's rupee was 65.79 and 59.74 for capsicum and tomato respectively.

1.13   Brij Bala et. al (2011) studied the costs and returns structure of major off-season vegetables, viz. tomato, cabbage cauliflower and peas in two vegetable-dominated developmental blocks of the district Kullu of H.P. The study revealed that per hectare cost A_1 was highest for tomato, followed by cabbage, cauliflower and lowest for peas, among the selected vegetables. However, per quintal cost of cultivation was found to be highest for peas, followed by cauliflower, tomato and cabbage. Costs on plant protection

measures were the major component of cost A_1 in all the crops followed by expenditure on seed and fertilizers. Vegetables, being the labour-intensive crops, incurred significantly high costs on human labour. Gross returns as well as net returns per hectare were observed to be highest for tomato, followed by cauliflower, cabbage and peas.

1.14   Singh Ranveer et.al.(2011) examined the marketing efficiency under traditional marketing channel (TMC) vis-à-vis emerging marketing channel (EMC) in marketing of tomato, a major vegetable crop in Himachal Pradesh. It was found that in this vegetable total marketing cost was higher (Rs.750/qtl.) in TMC. The marketing margins of various agents operating in the trade of tomato were also higher in TMC (Rs.298/qtl.) as compared to EMC (Rs.258/qtls.). Marketing efficiency was 1.95 in case of EMC and 0.50 in TMC. The study suggested that there should be the promotion of other alternative marketing channels as direct marketing to consumers, retail chains, farmers markets, contract farming etc.

1.15   Singh, S.P. (2012) studied the off-season tomato production in north western Himalayas under changing climate and found that off-season cultivation of tomato is becoming difficult due to erratic climatic conditions being faced during its growth period in the hills. Protected cultivation though costly can be adapted to mitigate the climate change. Growing tomato in naturally ventilated polyhouse with fan pad system and shading net is widely being used in mid hills of Western Himalayas. Though fully climate controlled polyhouses can be made which will make the year round cultivation of tomato feasible but the cost of the construction and operation of such polyhouses is very high which makes them un-economical therefore more emphasis is given only on the cultivation of tomato in partial climate controlled naturally ventilated polyhouses

1.16   Mishra et al. (2014) have carried out the economic analysis of marketing of major vegetables in Varanasi district of Uttar Pradesh India. The study revealed that among the organized supply chain i.e. channel (Producer-Retailer-Consumer), the cost incurred per kg of vegetables was much lower than the cost incurred in the traditional channel (Producer-Commission Agent/Adhatia-Retailer-Consumer). At the same time organized channel was found to be smallest price spread. Hence organized channel was found more efficient as compared to unorganized channel.

1.17   Tuteja U. and Subhash Chandra (2014) examined the impact of Emerging Marketing Channel (EMC), Reliance Fresh on agricultural marketing in Haryana in terms of returns, price spread and marketing efficiency vis-à-vis Traditional Marketing Channel (TMC). Results revealed that gross and net returns from selling the crops to Reliance Fresh were found to be higher than TMC. Producers received 49 and 44 per cent share of the consumer's rupee for tomato and 44 and 42 per cent share for muskmelon by disposing off produce through TMC and EMC respectively and marketing efficiency was observed to be better under the Emerging Marketing Channel.

1.18   Singh et al. (2015) studied the marketing efficiency of vegetable cultivation in Manipur and revealed that marketing efficiency is inversely related with the length of the channel. The marketing efficiency of vegetables (tomato and cabbage) in Manipur is significantly affected by marketing costs, marketing margins, open market price, volume of produce handled and cost of transport. The channel 'farmers – retailers – consumers' showed highest efficiency in vegetable marketing. A farmer's market model should be developed, particularly for vegetables with basic infrastructure such as storage, weight, drinking water, and electricity. This system successfully integrates producers with consumers/retailers, and eliminates middlemen, cuts marketing costs and provides good market infrastructure and environment.

1.19 Priscilla L. and Singh, S.P. (2015) investigated economics of vegetable production in Manipur. The result revealed that both the cost of cultivation and cost of production was found to be highest in the case of peas followed by cauliflower and cabbage. The cost incurred on human labour was found to be major cost component in the cultivation of all three vegetables. The net return was found to be highest in case of cauliflower followed by pea and cabbage cultivation. High cost of seeds and unavailability of good quality seeds were cited as the major constraints faced by the vegetable growers.

1.20 The review of literature given above indicates that the studies of off season vegetables are generally confined either to the analysis of off season vegetables in polyhouse or outside polyhouse. The present study deals with both type of cultivation of off season vegetables.

Objectives

1.21   The main objectives of the study are as under:

- To analyse the trends in area and production of vegetables in the State;
- To examine the costs and returns in various vegetables grown by farmers in the State;
- To assess the marketing costs, margins and price spread in various vegetables in different markets;
- To study the various problems faced by vegetable growers in production and marketing of vegetables in the State.

1.22 In addition to the above objectives, the following objectives are specific to off season vegetables in polyhouses.

- To study the costs and returns of off season vegetables in polyhouses;
- To study the marketing system of polyhouse vegetable crops;
- To study the problems faced by polyhouse farmers in the State.

Organization of the Report

1.23 This report is divided into nine chapters. In the introductory chapter, that is the current chapter, some background information, literature survey, objectives of the study and the plan of the study are given. The second chapter presents the detailed information on the methodology adopted in the selection of the sample, analytical tools etc. The third chapter analyses the trends in area and production of vegetables grown in the State. The profile of the sampled vegetable growers is given in fourth chapter. Analysis of the costs of cultivation and returns from vegetables, input-output ratio in vegetable production forms the subject matter of fifth chapter. Chapter sixth is concerned with production and marketing of vegetables. Marketing functions, channels, and price spread are also described in this chapter. The chapter seven is analogous to chapters five and six with special focus given to vegetables grown in polyhouses. The problems in production and marketing of vegetables grown inside and outside polyhouses are discussed in eighth chapter and chapter nine concludes the study with policy implications.

CHAPTER-2

Methodology

2.1 This chapter contains the methodology followed for selection of the study area, selection of sample, collection of data and analytical techniques used in this study. The study, based on both primary and secondary data collected from various sources, is conducted in the state of Jammu and Kashmir. The study is limited to five main off-season vegetable crops, namely Knolkhol, tomato, cauliflower, cabbage and capsicum outside polyhouse. During the field survey, it was found that the polyhouse farmers of the selected areas were growing only seedlings inside polyhouse. By planting seedlings in the field, the yield is taken in advance than the normal method of direct sowing.

Outside Polyhouse Cultivation

2.2 A purposive cum multistage stratified random sampling technique was used for the selection of final sample to conduct the study in the state of Jammu and Kashmir. The State has three regions; namely, Jammu, Kashmir and Ladakh. The topography and climate of two regions, Kashmir and Ladakh is the same as that of other hilly states under this study like Himachal Pradesh. Therefore, these two regions, comprising of twelve districts, were purposively selected for the study from Jammu and Kashmir. The secondary data on area, production and productivity of vegetable crops grown in two selected regions was collected from the Directorate of Agriculture , Kashmir Division, Govt. of J&K. On the basis this data, two districts namely; Anantnag and Budgam, having highest area under vegetables, were selected from the selected regions. From each of these districts, one development block; that is, Anantnag from Anantnag and Chadoosa from Budgam, was selected on the same basis. From these development blocks, two large villages growing vegetables were identified with the help of the local officials of the department of agriculture. From each selected village, a sample of 60 farmers was selected randomly. Thus the total sample of selected vegetable growers was 120 for the detailed study of off season vegetables outside polyhouse. The details of the districts, blocks and villages selected for the study are given in the Table 2.1.

Table 2.1. Selection of Area

District	Block	Village
Anantnag	Anantnag	Bangider
Budgam	Chadoosa	Bujam

Classification

2.3 The selected farmers were grouped into three categories according to their land holding i.e. marginal (upto1ha.), small (1to 2ha.) and medium (above 2 ha.). Accordingly there were 120 marginal farms in all the areas of J&K. under study.

Table 2.2. Classification of Sampled Farms According to their Size of Land Holding

(No.)

Category	Districts		All
	Anantnag	Budgam	
Marginal (up to 1 ha.)	60(50.00)	60(50.00)	120(100)
Small (1-2 ha.)	-	-	-
Medium above 2 ha.)	-	-	-
Total	60(50.00)	60(50.00)	120(100)

Note. Figures in parenthesis denote percentages

Collection of Data

2.4 The field data for this study was collected by survey method on a pre-tested well designed questionnaires/schedule by personal interview. The required information regarding demographic profile, land holding, cropping pattern, source of irrigation, area and production of vegetables, the input application and cultivation practices followed in raising the vegetables, marketing details like grading, packing, transport and other expenses were collected from the selected vegetable growers. In general, eighty percent produce of the selected households was sold in local markets and the rest in the far away market Jammu. Therefore, detailed information's regarding market charges, methods of sale etc. were collected from this market. The reference period of the study is Agriculture year 2015-16.

Analysis of Data and Computation of Cost of Cultivation

2.5 The tabular analysis was mainly used for calculating cost of cultivation, return from vegetables, utilization pattern of vegetables produced, marketed surplus, prices etc. For estimating the cost of cultivation of vegetables the standard cost concepts were used in this study:

Cost A_1

2.6 This includes all the variable costs like value of hired human labour, value of bullock labour (hired and owned), hired machinery charges, value of owned machine labour, value of seed (both farm produced and purchased), value of insecticides and pesticides, value of manure (owned and purchased), value of fertilizer, depreciation of implements and farm building, irrigation charges, land revenue, taxes, interest on working capital and miscellaneous expenses (i.e. artisan etc.).

Working Capital

2.7 Working capital includes the costs of human labour (hired), bullock labour, manure, fertilizer, seed/seedlings, insecticides & pesticides and sticks. The interest will be charged at the rate of 12% per annum for a period of 3 months on the working capital as a simple interest.

Depreciation of implements and farm building

2.8   The depreciation is worked out on the basis of straight line method. Using this method, the yearly depreciation is computed by dividing the purchased value of an item with its expected life span. Thus, annual depreciation = purchased value / life span. If any item has a scrap value after its usefulness has expired then the annual depreciation is given by (purchased value – scrap value)/ life span.

2.9   In case more than one crop is grown on a farm it is very important to determine cost incurred on various items as are used on individual crops. While correct assessment of crop specific costs are impossible, reasonably good estimates of costs can be obtained by following the standard procedures of allocation of joint costs.

Cost A_2, Cost B & Cost C

2.10 The Cost A_2 is the sum of Cost A_1 &b Rent paid for leased in land; whereas Cost B = A_2+ imputed rental value of owned land(less land revenue paid thereon)+ imputed interest on owned fixed capital(excluding land) and Cost C= Cost B+ imputed value of family labour.

Fixed Capital

2.11   The fixed capital includes farm buildings (excluding land), farm machineries, tools and equipments, livestock (only drought animals) etc. The interest on this cost is also calculated as in the case of working capital.

Production Efficiency

2.12   To determine the production efficiency of various vegetables the input-output ratios are calculated as follows:

Input-output ratio= Gross output in Rs. per ha./ Total input cost in Rs. Per ha.

Inside Polyhouse Cultivation

2.13 For studying the costs, and returns of off season vegetables inside polyhouse, the information/data is taken from the study "An Economic Analysis of Protected Cultivation Under MIDH in J&K" (having a sample of 100 polyhouses) assigned by the Ministry of Agriculture and Farmers Welfare, GOI to this centre for the same period. All the polyhouses fall in one category, i.e. small (upto 250m^2).

Limitations of the Study

2.14   Since the study is conducted in hilly areas which have different agro-climatic conditions from plains, the findings of the study may not be applicable to plains even for vegetable production where operational conditions are much more different from hilly areas. The data and information reported in this study is gathered from various sources and the findings of the study are based on unrecorded data pertaining to input use, production, marketing and sale price from growers who knowingly or unknowingly do not come out with actual facts. In spite of taking due care in compiling this report, the contained information may vary due to any change in any of the relevant factors e.g. agro-climatic conditions, farm management, diseases, pests, low production, market prices etc. and the actual results may differ substantially from those presented in the study.

CHAPTER–3

Area, Production and Productivity of Vegetable Crops

3.1 In this chapter, an attempt has been made to study the area, production and productivity of vegetable crops cultivated in the state of Jammu and Kashmir with special reference to five main off-season vegetable crops selected for the study. District-wise analysis on the area, production and productivity of vegetables is also given in this chapter.

Area under Vegetables

3.2 The area under vegetables grown in the selected regions during 2014-15 is presented in Table 3.1. It can be seen from the table that out of total area of 21140 hectares in vegetables, the area under main vegetables was highest in the case of knolkhol (13.59%) followed by tomato (8.70%), cauliflower (4.43%), cabbage (3.94%) and capsicum (1.01%). The rest of the share was of other vegetables. Budgam is the leading district in growing all the main vegetables accounting 15.22, 13.23, 16.79,17.09, 14.15 and 15.36 percent of the total area under tomato, knolkhol, cabbage, cauliflower and capsicum respectively in the State with 15.14 percent share of total area under all vegetables in the State. The district Anantnag is second with 12.13 percent share of total area under all vegetables in the State.

Production of Vegetables

3.3 The production of various vegetables of the selected regions during the year 2014-15 is presented in Table 3.2. The table shows that out of total production of 505795 MT in the main vegetables the largest production was of Knolkhol (14.57%) followed by tomato (9.94%), cauliflower (4.74%), cabbage (4.25%) and capsicum (4%). The largest proportion(15.40%) of total vegetable production is of Budgam district followed by Anantnag, Baramulla, Kupwara, Pulwawa, Kulgam and Srinagar contributing 12.10, 12, 11.35, 11.25, 10.10 and 9.69 percent respectively of the total vegetable production in the State.

Table 3.1. District-wise Area Under Different Vegetables During 2014-15

(Percentages)

Districts	Vegetables						
	Tomato	Cabbage	Cauliflower	Capsicum	Knolkhol	Other vege-tables	Total Area (ha.)
Anantnag	(8.97) {12.50}	(4.29) {13.19}	(4.87) {13.35}	(4.29) {12.97}	(12.86) {11.49}	(64.72) {12.21}	2565 {12.13}
Bandipora	(8.91) {7.06}	(2.06) {3.60}	(2.06) {3.21}	(3.43) {5.90}	(15.77) {8.00}	(67.76) {7.15}	1458 {6.90}
Baramulla	(8.90) {12.23}	(4.35) {13.19}	(5.14) {13.89}	(3.95) {11.79}	(14.63) {12.88}	(63.02) {11.54}	2528 {11.96}
Budgam	(8.75) {15.22}	(4.37) {16.79}	(5.00) {17.09}	(3.75) {14.15}	(11.87) {13.23}	(66.26) {15.36}	3201 {15.14}
Gandubal	(6.85) {4.08}	(2.28) {3.00}	(3.20) {3.74}	(3.65) {4.72}	(15.98) {6.09}	(68.03) {5.40}	1095 {5.18}
Kulgam	(9.42) {10.87}	(3.53) {9.00}	(4.24) {9.62}	(4.24) {10.61}	(14.12) {10.44}	(64.45) {9.91}	2124 {10.05}
Kupwara	(8.80) {11.41}	(4.61) {13.19}	(5.24) {13.35}	(4.19) {11.79}	(12.99) {10.79}	(64.17) {11.09}	2386) {11.29}
Pulwama	(9.44) {11.96}	(3.86) {10.79}	(3.86) {9.62}	(4.72) {12.97}	(13.73) {11.14}	(64.39) {10.87}	2331 {11.03}
Shopian	(7.08) {3.26}	(2.95) {3.00}	(2.95) {2.67}	(2.60) {2.59}	(10.63) {3.13}	(76.39) {4.69}	847 {4.01}
Srinagar	(9.36) {10.33}	(3.20) {7.79}	(3.45) {7.48}	(4.44) {10.61}	(15.77) {11.14}	(63.78) {9.37}	2029 {9.60}
Kargil	(3.59) {0.60}	(9.15) {3.36}	(9.48) {3.10}	(2.94) {1.06}	(8.17) {0.87}	(78.10) {1.73}	306 {1.45}
Leh	(3.33) {0.49}	(9.63) {3.12}	(10.00) {2.88}	(2.59) {0.83}	(8.51) {0.80}	(68.52) {1.34}	270 {1.28}
Total Area (ha.)	(8.70) 1840	(3.94) 834	(4.43) 936	(1.01) 848	(13.59) 2873	(65.32) 13809	21140

Source: Directorate of Agriculture, Kashmir, Govt. of J&K.

Note. Figures in ( ) represent percentage share of area of a vegetable in total area under all vegetables in a district.

Figures in { } represent percentage share of a vegetable in total area under that vegetable in the State.

Table 3.2. District-wise Production of Different Vegetables During 2014-15

(Percentages)

Districts	Vegetables						
	Tomato	Cabbage	Cauliflower	Capsicum	Knolkhol	Other vege-tables	Total Pro. (MT)
Anantnag	(10.33) {12.58}	(4.64) {13.19}	(5.23) {13.35}	(4.28) {12.94}	(14.02) {11.64}	(61.50) {11.91}	61209 {12.10}
Bandipora	(10.25) {7.03}	(2.24) {3.60}	(2.23) {3.21}	(3.45) {5.88}	(16.94) {7.83}	(64.89) {7.08}	34495 {6.82}
Baramulla	(10.08) {12.17}	(4.68) {13.19}	(5.48) {13.88}	(3.92) {11.77}	(15.67) {12.90}	(60.16) {11.55}	60676 {12.00}
Budgam	(9.92) {15.37}	(4.64) {16.79}	(5.30) {17.20}	(3.70) {14.24}	(12.92) {13.66}	(63.53) {15.66}	77921 {15.40}
Gandubal	(7.89) {4.06}	(2.49) {3.00}	(3.46) {3.74}	(3.68) {4.71}	(17.25) {6.06}	(65.22) {5.34}	25865 {5.11}
Kulgam	(10.65) {10.82}	(3.79) {9.00}	(4.51) {9.61}	(4.19) {10.59}	(15.15) {10.50}	(61.70) {9.97}	51071 {10.10}
Kupwara	(9.95) {11.36}	(4.94) {13.19}	(5.58) {13.35}	(4.15) {11.77}	(13.83) {10.77}	(61.55) {11.17}	57387 {11.35}
Pulwama	(10.59) {11.99}	(4.08) {10.79}	(4.05) {9.61}	(4.64) {13.05}	(14.62) {11.29}	(62.02) {11.17}	56909 {11.25}
Shopian	(8.55) {3.25}	(3.38) {3.00}	(3.35) {2.67}	(2.74) {2.59}	(11.94) {3.09}	(70.04) {4.23}	19077 {3.77}
Srinagar	(10.54) {10.28}	(3.42) {7.79}	(3.65) {7.48}	(4.37) {10.59}	(16.97) {11.29}	(54.92) {8.52}	49025 {9.69}
Kargil	(4.39) {0.59}	(10.61) {3.35}	(10.74) {3.05}	(3.14) {1.06}	(9.37) {0.86}	(61.74) {1.33}	6806 {1.34}
Leh	(4.58) {0.49}	(12.53) {3.12}	(12.70) {2.84}	(3.11) {0.82}	-	(67.07) {1.14}	5354 {1.06}
Total Production (MT)	(9.94) 50273	(4.25) 21517	(4.74) 23971	(4.00) 20228	(14.57) 73694	(62.50) 316110	505795

Source: Directorate of Agriculture, Kashmir, Govt. of J&K.

Note. Figures in ( ) represent percentage share of production of a vegetable in total production under all vegetables in a district.

Figures in { } represent percentage share of a vegetable in total productiona under that vegetable in the State.

Productivity of Vegetable Crops

3.4 The yield of various vegetables grown in the districts of the selected regions during the year 2014-15 is given in Table 3.3. This table reveals that in case of tomato, the yield was maximum (276 qtls./ha.) in district Budgam followed by 275qtls./ha. in Anatnag. Ther average productivity of tomato was 273 qtls./ha. The highest productivity

Table 3.3.   District-wise Productivity of Vegetables During 2014-15

(Qtls./Ha.)

Districts	Vegetables						
	Tomato	Cabbage	Cauliflower	Capsicum	Knolkhol	Other veg.	Total
Anantnag	275	258	256	238	260	227	239
Bandipora	272	258	256	238	254	227	237
Baramulla	272	258	256	238	257	229	240
Budgam	276	258	258	240	265	233	243
Gandubal	272	258	256	238	255	226	236
Kulgam	272	258	256	238	258	230	240
Kupwara	272	258	256	238	256	231	241
Pulwama	274	258	256	240	260	235	244
Shopian	272	258	256	238	253	214	225
Srinagar	272	258	256	238	260	231	242
Kargil	272	258	252	238	255	206	222
Leh	272	258	252	239	0	202	198
Total	273 (280)	258 (260)	256 (256)	239 (245)	257 (260)	229 -	239 -

Note. Figures in parenthesis denote productivity of vegetables on sampled farms

of Knolhol was 265 qtls./ha. in Budgam, district which is near to the average productivity of 257 qtls./ha. The average productivity of cabbage was observed to be highest (258 qtls./ha.) among all the vegetables. It can also be seen from the table that the district

wise variation in productivity of all the main five vegetables is very less. That is, the productivity of all these vegetables remained all most same throughout the region.

3.5 The data of area and production of vegetables was not available from the year 2005-06 to 2013-14 for Kashmir region.

CHAPTER-4

Socio-Economic Profile of Selected Vegetable Growers

4.1 Information about the socio-economic variables of the selected vegetable growers of the study areas reveals the conditions under which they function. The land utilization, cropping pattern etc will give the extent of area the farmers have put under actual use. In this chapter an attempt has been made to study the socio-economic characteristics of vegetable growers of two selected districts viz. Anantnag and Budgam of Jammu and Kashmir.

Age, Occupation and Literacy of the Head

4.2 Age and occupation of the head of the family of sampled households is given in Table 4.1(a) and literacy in Table 4.1 (b). Seventy eight percent heads of the family were in the age group of 41-60 years followed by the age group of above 60 years (18%) and 20-40 years (3%). Almost same pattern was observed in both the districts under study. The occupation of all the sampled family heads was reported to be agriculture. Table 4.1 (b) reveals that sixty eight percent of the people are literate. Area wise, it was found that the literacy was higher in Budgam area (83%) as compared to Anantnag area (53%). The percentage of the educated persons up to the level of primary and metric was 55 and 13 percent respectively. There was no graduate among the heads of the family.

Demographic Profile

4.3 Demographic features of sampled vegetable cultivators are given in Table 4.2 (a-c). These tables reveal that in Anantnag 35, 37 and 28 percent were males, females and children respectively whereas this proportion was 30, 33 and 37 percent in Budgam area. Overall the proportions of males, females and children were 33, 35 and 32 percent respectively and the average family size was 8.12 persons. Average family size was almost same in both the districts. On the whole the proportions of male and female workers, in total workers, were 47.37 and 52.63 respectively. In both the districts the

proportion of female workers was more as compared to male workers but female workers were reported not to be working as agriculture and non-agriculture labour in both the districts. Overall the proportion of males in agriculture and non-agriculture labour (in total workers) was 11.58 and 5.96 respectively in all the sampled households

Table 4.1. (a)   Age and Occupation of the Head of the Family

(Percentages)

Category	Age of the head				Occupation			
	20-40 yrs.	41-60 yrs.	Above 61 yrs.	Total	Agri.	Non-agri.	Any other	Total
Anantnag								
Marginal	-	76.67	23.33	100	100	-	-	100
Small	-	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-	-
All	-	76.67	23.33	100	100	-	-	100
Budgam								
Marginal	6.67	80.00	13.33	100	100	-	-	100
Small	-	-	-	-	-	-	-	
Medium	-		-	-	-	-	-	
All	6.67	80.00	13.33	100	100	-	-	100
Overall								
Marginal	3.33	78.33	18.34	100.0	100	-	-	100
Small	-	-	-	-	-	-	-	
Medium	-	-	-	-	-	-	-	
All	3.33	78.33	18.34	100.	100	-	-	100

Table 4.1 (b) Literacy of the Head of the Family

(Percentages)

Category	Literacy				
	Illi.	Primary	Matric	Graduate & above	Total
Shimla					
Marginal	46.67	53.33	-	-	100
Small	-	-	-	-	-
Medium	-	-	-	-	-
All	46.67	53.33	-	-	100
Mandi					
Marginal	16.67	56.67	26.66	-	100
Small	-	-	-	-	-
Medium	-	-	-	-	-
All	16.67	56.67	26.66	-	100
Overall					
Marginal	31.67	55.00	13.23	-	100
Small	-	-	-	-	-
Medium	-	-	-	-	-
All	31.67	55.00	13.23	-	100

Table 4.2. (a) Demographic Profile of Sampled Farmers of District Anantnag

(Percentages)

Particulates	Marginal	Small	Medium	All
Male	35.20	-	-	35.20
Female	37.20	-	-	37.20
Children	27.60	-	-	27.60
Total	100.0	-	-	100.0
Avg. Family size	8.33	-	-	8.33
Workers (16-60 yrs.)		-	-	
Male	48.32	-	-	48.32
Female	51.68	-	-	51.68
Total	100.0	-	-	100.0
Occupation	-	-	-	-
Agri. labour	-	-	-	-
Male	22.15	-	-	22.15
Female	-	-	-	-
Non-agri. labour	-	-	-	-
Male	-	-	-	-
Female	-	-	-	-

Table 4.2. (b) Demographic Profile of Sampled Farmers of District Budgam

(Percentages)

Particulates	Marginal	Small	Medium	All
Male	29.58	-	-	29.58
Female	33.34	-	-	33.34
Children	37.08	-	-	37.08
Total	100	-	-	100
Avg. Family size	8.00	-	-	8.00
Workers (16-60 yrs.)		-	-	
Male	46.32	-	-	46.32
Female	53.68	-	-	53.68
Total	100	-	-	100
Occupation	-	-	-	-
Agri. labour	-	-	-	-
Male	-	-	-	-
Female	-	-	-	-
Non-agri. labour	-	-	-	-
Male	12.50	-	-	12.50
Female	-	-	-	-

Table 4.2. (c) Demographic Profile of All Sampled Farmers

(Percentages)

Particulates	Marginal	Small	Medium	All
Male	32.45	-	-	32.45
Female	35.31	-	-	35.31
Children	32.24	-	-	32.24
Total	100.0	-	-	100.0
Avg. Family size	8.12	-	-	8.12
Workers (16-60 yrs.)			-	-
Male	47.37	-	-	47.37
Female	52.63	-	-	52.63
Total	-	-	-	-
Occupation	-	-	-	-
Agri. labour	-	-	-	-
Male	11.58	-	-	11.58
Female	-	-	-	-
Non-agri. labour	-	-	-	-
Male	5.96	-	-	5.96
Female	-	-	-	-

Social Classification

4.4 The caste-wise distribution of sampled households is given in Table 4.3, which shows that all the households fall in general category.

Table 4.3. Social Classification of Sampled Farmers

(Percentages)

Particulars	Marginal	Small	Medium	Total
Anantnag				
SC	-	-	-	-
ST	-	-	-	-
OBC	-	-	-	-
General	100	-	-	100
Total	100	-	-	100
Budgam				
SC	-	-		
ST	-	-	-	-
OBC	-	-	-	-
General	100	-	-	100
Total	100	-	-	100
Overall				
SC	-	-	-	-
ST	-	-	-	-
OBC	-	-	-	-
General	100	-	-	100
Total	100	-	-	100

Farm size and Utilization Pattern

4.5 The average size of land holding of sampled farmers was observed to be 0.18 and 0.25 ha. in Anantnag and Budgam areas respectively and 0.22 ha. as a whole. Area wise the average holding size was higher in Budgam district. All the land was reported to be the cultivated land (field crops) in both the areas under study (Table 4.4).

Table 4.4.   Proportion of Various Type of Land Owned by Sampled Farmers

(Percentages)

District	Total land owned			Cultivated land		Orchard		Ghasni (Grass land)	Barren	Fallow land	Others
	Irri.	Un-irri.	Total	Field crops							
				Irri.	Un-irri.	Irri.	Un-irri				
Anantnag											
Marginal	100	-	100 (0.18)	100	-	-	-	-	-	-	-
Small	-	-	-	-	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-	-	-	-	-
All	100	-	100 (0.18)	100	-	-	-	-	-	-	-
Budgam											
Marginal	100	-	100 (0.25)	100	-	-	-	-	-	-	-
Small	-	-	-	-	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-	-	-	-	-
All	100	-	100 (0.25)	100	-	-	-	-	-	-	-
Overall											
Marginal	100	-	100 (0.22)	100	-	-	-	-	-	-	-
Small	-	-	-	-	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-	-	-	-	-
All	100	-	100 (0.22)	100	-	-	-	-	-	-	-

Note.   Figures in parenthesis denote area in ha. /farm

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Leased in and Leased out Land

4.6 The leased in and leased out land system was not prevailing in the sampled households under study (Table 4.5).

Table 4.5. Distribution of Leased in and Leased out Land of Sampled Farmers

(Area in ha. Per farm)

Category	Total land owned		Leased in (+)		Leased out (-)		Net operated	
	Irri	Un-irri	Irri	Un-irri	Irri	Un-irri	Irri	Un-irri
Anantnag								
Marginal	0.18	-	-	-	-	-	0.18	-
Small	-	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-	-
All	0.18	-	-	-	-	-	0.18	-
Budgam								
Marginal	0.25	-	-	-	-	-	0.25	-
Small								
Medium								
All	0.25	-	-	-	-	-	0.25	-
Overall								
Marginal	0.22	-	-	-	-	-	0.22	-
Small	-	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-	-
All	0.22	-	-	-	-	-	0.22	-

Source of Water for Irrigation

4.7 In the sampled farmers of Anantnag and Budgam areas the source of water for irrigation was the kuhl and the average distance from the irrigation source to farms was 0.750 and 0.530 km. respectively. Overall the average distance was 0.640 km. (Table 4.6).

Source of Water for Drinking

4.8 Tap water was the source of drinking water in both the areas under study. The sampled farmers have not to go to far away to get drinking water (Table 4.7). upon The natural sources of drinking water are also within one Km.

Table 4.6. Average Distance of the Source of Water for Irrigation of Sampled Farmers

(In Km.)

Categories	Source				
	Canal	**Tube well**	**Tank**	**Kuhl**	**Others**
Anantnag					
Marginal	-	-	-	0.750	-
Small	-	-	-	-	-
Medium	-	-	-	-	-
All	-	-	-	-	-
Budgam					
Marginal	-	-	-	0.530	-
Small	-	-	-	-	-
Medium	-	-	-	-	-
All	-	-	-	-	-
Overall					
Marginal	-	-	-	0.640	-
Small	-	-	-	-	-
Medium	-	-	-	-	-
All	-	-	-	-	-

Table 4.7. Average Distance of the Source of Drinking Water of Sampled Farmers

(In Km.)

Category	Source		
	Natural	**Tap water**	**Others**
Anantnag			
Marginal	0.6	0.04	-
Small	-	-	-
Medium	-	-	-
All	-	-	-
Badgam			
Marginal	0.6	0.04	-
Small	-	-	-
Medium	-	-	-
All	-	-	-
Overall			
Marginal	0.6	0.04	-
Small	-	-	-
Medium	-	-	-
All	-	-	-

Cropping Pattern

4.8 The total area devoted to various crops (excluding vegetables) grown in the sampled farms of Anantnag and Budgam area is given in Table 4.8. The table shows that wheat and paddy were the crops only grown by the sampled farmers of Budgam area and out of gross cropped area the percentage was 50 for each crop giving the cropping intensity 200 percent.

Table 4.8. Cropping Pattern of Sampled Farmers (Excluding Vegetables)

(Percentages)

Category	Crops								Gross cropped area (ha.)	Cropping intensity with fruits (%)	Cropping intensity without fruits (%)
	Maize	Paddy	Wheat	Barley	Potato	Pulses	fruits	Others			
Anantnag											
Marginal	-	-	-	-	-	-	-	-	-	-	-
Small	-	-	-	-	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-	-	-	-	-
All	-	-	-	-	-	-	-	-	-	-	-
Budgam											
Marginal	50.00	50.00	-	-	-	-	-	-	1.20	200	200
Small	-	-	-	-	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-	-	-	-	-
All	50.00	50.00	-	-	-	-	-	-	1.20	200	200
Overall											
Marginal	50.00	50.00	-	-	-	-	-	-	1.20	200	200
Small	-	-	-	-	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-	-	-	-	-
All	50.00	50.00	-	-	-	-	-	-	1.20	200	200

Productivity of Crops

4.9 The productivity of paddy and wheat crops is given in Table 4.9. The productivity of paddy and wheat was 40 and 32 quintals per hectare respectively in the Budgam district.

Table 4.9.   Productivity of Various Crops Grown by Sampled Farmers

(Excluding Vegetables)   (Qtls./Ha.)

Category	Crops							
	Maize	Paddy	wheat	Barley	Potato	Pulses	Fruits	Others
Anantnag								
Marginal	-	-	-	-	-	-	-	-
Small	-	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-	-
All	-	-	-	-	-	-	-	-
Budgam								
Marginal	-	40	32	-	-	-	-	-
Small	-	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-	-
All	-	40	32	-	-	-	-	-
Overall								
Marginal	-	40	32	-	-	-	-	-
Small	-	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-	-
All	-	40	32	-	-	-	-	-

Area Under Off-season Vegetables Among the Sampled Farmers

4.10 The main crops grown by the sampled farmers of Anantnag and Budgam areas were tomato, cabbage, cauliflower, capsicum and knolkhol. The area under these crops and the proportion of the area of different crops (in total area) is given in Table 4.10. The cropping pattern of vegetables indicates that the sampled farmers of Budgam area are cultivating vegetable crops in more area in comparison to that in Anantnag. Among the various off-season vegetables grown by the sampled farmers, cabbage and cauliflower were the main vegetables followed by knolkhol, tomato and capsicum. The proportionate area under cabbage and cauliflower was higher in Anantnag area where the proportionate area under tomato, capsicum and knolkhol was higher in Budgam area as clear from the Table 4.10.   Overall, maximum area was under cabbage (37.77%) followed by cauliflower (37.44%), knolkhol (12.97%), tomato (6.24%) and capsicum (5.58%).

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Table 4.10. Area Under Different Vegetables Among Sampled Farmers

(Ha.)

Category	Vegetables						
	Tomato	Peas	Cabbage	Cauliflower	Capsicum	Knolkhol	All
Anantnag							
Marginal	0.80 (3.79)	-	10.08 (47.73)	9.20 (43.56)	-	1.04 (4.92)	21.12 (100)
Small	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-
All	0.80 (3.79)	-	10.08 (47.73)	9.20 (43.56)	-	1.04 (4.92)	21.12 (100)
Budgam							
Marginal	2.24 (8.12)	-	8.32 (30.14)	9.04 (32.75)	2.72 (9.86)	5.28 (19.13)	27.60 (100)
Small	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-
All	2.24 (8.12)	-	8.32 (30.14)	9.04 (32.75)	2.72 (9.86)	5.28 (19.13)	27.60 (100)
Overall							
Marginal	3.04 (6.24)	-	18.40 (37.77)	18.24 (37.44)	2.72 (5.58)	6.32 (12.97)	48.72 (100)
Small	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-
All	3.04 (6.24)	-	18.40 (37.77)	18.24 (37.44)	2.72 (5.58)	6.32 (12.97)	48.72 (100)

Note. Figures in parentheses denote percentages.

Productivity of Vegetable Crops

4.11 The yield of various vegetables grown on the farms of selected cultivators of Anantnag and Budgam area is presented in Table 4.11. District-wise, there was not much difference in the yield of vegetables. The productivity of cauliflower was observed to be slightly higher (257 qtls/ha.) in Budgam area as compared to Anantnag area (255 quintals/ha.). The productivity of cabbage was 265 and 255 quintals per hectare in Anantnag and Budgam areas respectively. Overall, the productivity was higher for tomato crop (280qtls/ha.) followed by cabbage and knolkhol each (260 qtls./ha.), cauliflower (256 qtls./ha.) and capsicum (245 qtls./ha.).

Table 4.11. Yield of Different Vegetables Grown by Sampled Farmers

(Qtls./Ha.)

Category	Tomato	Peas	Cabbage	Cauliflower	Capsicum	Knolkhol	All
				Vegetables			
				Anantnag			
Marginal	280	-	265	255	-	260	-
Small	-	-	-	-	-	-	-
Medium	-	-		-	-	-	-
Total	280	-	265	255	-	260	-
				Budgam			
Marginal	280	-	255	257	245	260	-
Small	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-
Total	280	-	255	257	245	260	-
				Overall			
Marginal	280	-	260	256	245	260	-
Small	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-
Total	280	-	260	256	245	260	-

Off-Season Vegetable Crop Rotation

4.12   The off-season vegetables crop rotation in the sampled farms of Anantnag and Budgam district can be seen in Tables 4.12 (a &b).

Table 4.12. (a) Off Season Vegetables Crop Rotation in District Anantnag

Vegetable	Irrigated		Un irrigated	
	Sowing/Planting	Harvesting	Sowing/Planting	Harvesting
Tomato	Feb, April, June	May, June	-	-
Peas	-	-	-	-
Cabbage	March, Sept. Oct.	June, July		
Cauliflower	April	June		
Capsicum	March	May		
Knolkhol	-	-	-	-

Table 4.12. (b) Off Season Vegetables Crop Rotation in District Budgam

Vegetable	Irrigated		Un irrigated	
	Sowing/Planting	**Harvesting**	**Sowing/Planting**	**Harvesting**
Tomato	Feb. April, June	May, June, July		
Peas	-	-	-	-
Cabbage	April	June		
Cauliflower	April	June		
Capsicum	March	May		
Knolkhol	-	-	-	-

Credit Structure of Sampled Farmers

4.13 The sampled vegetable growers were reported to be taking no loan for vegetable cultivation.

CHAPTER-5

Costs and Returns of Off-Season Vegetables

5.1   The main off-season vegetables grown by the sampled farmers of Jammu and Kashmir were tomato, cabbage, cauliflower, capsicum and knolkhol.   The cost of cultivation of different vegetables grown by the sampled farmers of district Anantnag, Budgam and all the sampled farmers are given from Tables 5.1 to 5.7. It is pertinent to note here that was only one category i.e. marginal, of sampled farmers growing off-season vegetables and so there will not be any comparison between categories.

Cost of Cultivation of Vegetable Crops

5.2   Cost of cultivation of vegetable crops includes expenses on human and bullock labour used, material costs (i.e. seed, manure, fertilizer, chemicals etc.), depreciation on implements, machinery and farm building, land revenue, rental value of land and interest on working and fixed capital.   The value of family human and bullock labour used in particular crop has been estimated on the basis of the wage rate paid/payable to the hired labour for the purpose.   All these costs are worked out in value terms (i.e. in rupees).

Cost of Cultivation of Tomato

5.3 The total cost (cost C) of cultivation of tomato among the sampled farmers of district Anantnag and Budgam is presented in Tables 5.1(a-c). The Tables show that the total cost of cultivation of tomato was Rs.91840, Rs.93641 and Rs.93167 per hectare in Anantnag, Budgam and overall respectively. In material cost (cost of seed/seedling, manure, fertilizer, insecticides and pesticides and sticks), the cost of manure was the major item accounting for 17.69 and 16.29 percent of the total cost followed by the cost of insecticides and pesticides (7.62% and 7.34%) seed/seedling (6.58% and 6.35%) fertilizer (5.06% and 4.89%) and sticks (1.47% and 1.25%) used for the support of tomato plants in Anantnag and Budgam districts respectively. The cost of hired human labour was observed to be more as compared to the other labour costs i.e. family labour and bullock labour. Rental value of land was the another important cost component

which was nearly 27 percent of the total cost in both the districts. The proportion of remaining cost components (depreciation, land revenue and interest on working and fixed capital) in total cost was about 3 percent.

Table 5.1. (a)   Cost of Cultivation of Tomato Among Sampled Farmers of District Anantnag

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	12250	0	0	12250	13.34	0	0	13.34
b. Bullock Labour	4700	0	0	4700	5.12	0	0	5.12
c.Seed/Seedlings	6045	0	0	6045	6.58	0	0	6.58
d.Manure	16250	0	0	16250	17.69	0	0	17.69
e.Fertilizer	4650	0	0	4650	5.06	0	0	5.06
f.Insecticides and pesticides	7000	0	0	7000	7.62	0	0	7.62
g.Sticks	1350	0	0	1350	1.47	0	0	1.47
h.Depreciation (Implements and farm building)	256	0	0	256	0.28	0	0	0.28
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1567	0	0	1567	1.71	0	0	1.71
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A_1)	54083	0	0	54083	58.89	0	0	58.89
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A_2 (Cost A_1+l)	54083	0	0	54083	58.89	0	0	58.89
m.Rental value of owned land	25450	0	0	25450	27.71	0	0	27.71
n.Interest on fixed capital (excluding land)	1057	0	0	1057	1.15	0	0	1.15
Cost B (Cost A_2+m+n)	80590	0	0	80590	87.75	0	0	87.75
o.Imputed value of family labour	11250	0	0	11250	12.25	0	0	12.25
Cost C (Cost B+o)	91840	0	0	91840	100	0	0	100

Table 5.1. (b) Cost of Cultivation of Tomato Among Sampled Farmers of District Budgam

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	13550	0	0	13550	14.47	0	0	14.47
b. Bullock Labour	4570	0	0	4570	4.88	0	0	4.88
c.Seed/Seedlings	5950	0	0	5950	6.35	0	0	6.35
d.Manure	15250	0	0	15250	16.29	0	0	16.29
e.Fertilizer	4575	0	0	4575	4.89	0	0	4.89
f.Insecticides and pesticides	6870	0	0	6870	7.34	0	0	7.34
g.Sticks	1170	0	0	1170	1.25	0	0	1.25
h.Depreciation (Implements and farm building)	253	0	0	253	0.27	0	0	0.27
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1558	0	0	1558	1.66	0	0	1.66
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A_1)	53761	0	0	53761	57.41	0	0	57.41
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A_2 (Cost A_1+l)	53761	0	0	53761	57.41	0	0	57.41
m.Rental value of owned land	25975	0	0	25975	27.74	0	0	27.74
n.Interest on fixed capital (excluding land)	1130	0	0	1130	1.21	0	0	1.21
Cost B (Cost A_2+m+n)	80866	0	0	80866	86.36	0	0	86.36
o.Imputed value of family labour	12775	0	0	12775	13.64	0	0	13.64
Cost C (Cost B+o)	93641	0	0	93641	100	0	0	100

Table 5.1. (c)   Cost of Cultivation of Tomato Among all Sampled Farmers

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	13208	0	0	13208	14.18	0	0	14.18
b. Bullock Labour	4604	0	0	4604	4.94	0	0	4.94
c.Seed/Seedlings	5975	0	0	5975	6.41	0	0	6.41
d.Manure	15513	0	0	15513	16.65	0	0	16.65
e.Fertilizer	4595	0	0	4595	4.93	0	0	4.93
f.Insecticides and pesticides	6904	0	0	6904	7.41	0	0	7.41
g.Sticks	1217	0	0	1217	1.31	0	0	1.31
h.Depreciation (Implements and farm building)	254	0	0	254	0.27	0	0	0.27
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1561	0	0	1561	1.67	0	0	1.67
k.Miscellaneous expenditure (Machinery,water,elect . Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A_1)	53846	0	0	53846	57.79	0	0	57.79
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A_2 (Cost A_1+l)	53846	0	0	53846	57.79	0	0	57.79
m.Rental value of owned land	25837	0	0	25837	27.73	0	0	27.73
n.Interest on fixed capital (excluding land)	1111	0	0	1111	1.19	0	0	1.19
Cost B (Cost A_2+m+n)	80793	0	0	80793	86.72	0	0	86.72
o.Imputed value of family labour	12374	0	0	12374	13.28	0	0	13.28
Cost C (Cost B+o)	93167	0	0	93167	100	0	0	100

5.4 No sampled farmer was growing peas in both the districts. Therefore, for uniformity with other studies, Table **5.2(a-c) and other tables** corresponding to peas are not included in this study.

Cost of Cultivation of Cabbage

5.5 The total cost of cultivation of cabbage of the sampled farmers in Anantnag area is presented in Table 5.3(a). The table reveals that the total cost of cultivation of cabbage was Rs.88668 per hectare. Labour cost, material cost and rental value of land were the major cost components accounting for 31.68, 36.85 and 28.45 percent of the total cost. In labour cost, the proportion of the bullock labour was 5.58 percent of the total cost. In material cost expenses on manure were observed be about 18 percent of the cost C. The share of other components seed, fertilizer and insecticides & pesticides was about 6 percent each of the total cost.   The proportion of depreciation, land revenue and interest on working capital was only 3 percent of the total cost.

5.6 Table 5.3(b) presents the various cost components of cabbage cultivation among the sampled farmers of Budgam area. The table depicts that cost C of cabbage was Rs.89344 per hectare. The cost trend was almost same as in Anantnag area. But the farmers were observed to be using more hired labour (14.04%) as compared to family labour in this area.   In material cost, manure was the major component constituting 16.62 percent of the total cost.

5.7 Area wise analysis reveal that cost C was higher Budgam as compare to Anantnag district. This was mainly due to the more expenses on labour by the sampled farmers of this district. Overall, the total cost of cultivation of cabbage was Rs.88974 per hectare. In material cost the share of manure was 17.31 percent of the total cost followed by the share of seed/seedlings (6.51%), fertilizer (6.34%) and insecticides & pesticides (6.33%). The proportion of hired human labour was more i.e. 13.50 percent as compare to family labour (12.34%). The farmers were spending 5.59 percent on bullock labour. The proportion of rental value of land was 28.71 percent.   The remaining cost components constituted 3 percent of the total cost (Table 5.3(c)).

Table 5.3. (a) Cost of Cultivation of Cabbage Among Sampled Farmers of District Anantnag

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	11570	0	0	11570	13.05	0	0	13.05
b. Bullock Labour	4947	0	0	4947	5.58	0	0	5.58
c.Seed/Seedlings	5769	0	0	5769	6.51	0	0	6.51
d.Manure	15850	0	0	15850	17.88	0	0	17.88
e.Fertilizer	5375	0	0	5375	6.06	0	0	6.06
f.Insecticides and pesticides	5675	0	0	5675	6.40	0	0	6.40
g.Sticks	0	0	0	0	0	0	0	0
h.Depreciation (Implements and farm building)	196	0	0	196	0.22	0	0	0.22
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1476	0	0	1476	1.66	0	0	1.66
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A$_1$)	50873	0	0	50873	57.37	0	0	57.37
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A$_2$ (Cost A$_1$+l)	50873	0	0	50873	57.37	0	0	57.37
m.Rental value of owned land	25230	0	0	25230	28.45	0	0	28.45
n.Interest on fixed capital (excluding land)	990	0	0	990	1.12	0	0	1.12
Cost B (Cost A$_2$+m+n)	77093	0	0	77093	86.95	0	0	86.95
o.Imputed value of family labour	11575	0	0	11575	13.05	0	0	13.05
Cost C (Cost B+o)	88668	0	0	88668	100	0	0	100

Table 5.3. (b)   Cost of Cultivation of Cabbage Among Sampled Farmers of

District Budgam

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	12540	0	0	12540	14.04	0	0	14.04
b. Bullock Labour	5248	0	0	5248	5.87	0	0	5.87
c.Seed/Seedlings	5830	0	0	5830	6.53	0	0	6.53
d.Manure	14850	0	0	14850	16.62	0	0	16.62
e.Fertilizer	5965	0	0	5965	6.68	0	0	6.68
f.Insecticides and pesticides	5575	0	0	5575	6.24	0	0	6.24
g.Sticks	0	0	0	0	0	0	0	0
h.Depreciation (Implements and farm building)	216	0	0	216	0.24	0	0	0.24
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1500	0	0	1500	1.68	0	0	1.68
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A_1)	51739	0	0	51739	57.91	0	0	57.91
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A_2 (Cost A_1+l)	51739	0	0	51739	57.91	0	0	57.91
m.Rental value of owned land	25930	0	0	25930	29.02	0	0	29.02
n.Interest on fixed capital (excluding land)	1025	0	0	1025	1.15	0	0	1.15
Cost B (Cost A_2+m+n)	78694	0	0	78694	88.08	0	0	88.08
o.Imputed value of family labour	10650	0	0	10650	11.92	0	0	11.92
Cost C (Cost B+o)	89344	0	0	89344	100	0	0	100

Table 5.3. (c)   Cost of Cultivation of Cabbage Among all Sampled Farmers

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	12009	0	0	12009	13.50	0	0	13.50
b. Bullock Labour	5083	0	0	5083	5.71	0	0	5.71
c.Seed/Seedlings	5797	0	0	5797	6.51	0	0	6.51
d.Manure	15398	0	0	15398	17.31	0	0	17.31
e.Fertilizer	5642	0	0	5642	6.34	0	0	6.34
f.Insecticides and pesticides	5630	0	0	5630	6.33	0	0	6.33
g.Sticks	0	0	0	0	0	0	0	0
h.Depreciation (Implements and farm building)	205	0	0	205	0.23	0	0	0.23
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1487	0	0	1487	1.67	0	0	1.67
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A_1)	51265	0	0	51265	57.62	0	0	57.62
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A_2 (Cost A_1+l)	51265	0	0	51265	57.62	0	0	57.62
m.Rental value of owned land	25547	0	0	25547	28.71	0	0	28.71
n.Interest on fixed capital (excluding land)	1006	0	0	1006	1.13	0	0	1.13
Cost B (Cost A_2+m+n)	77817	0	0	77817	87.46	0	0	87.46
o.Imputed value of family labour	11157	0	0	11157	12.54	0	0	12.54
Cost C (Cost B+o)	88974	0	0	88974	100	0	0	100

Cost of Cultivation of Cauliflower

5.8 Expenses incurred on various items in cultivation of cauliflower among the sampled farmers of Anantnag district is given in Table 5.4(a). The table shows that the total cost of cultivation of cauliflower was Rs.95905 per hectare. About 70 percent of the total cost of cultivation was shared by labour (human and bulllck) and material cost in cultivation of cauliflower. The proportion of rental value of land was 26.64 percent of the total cost. The other cost components accounting 6.21 percent depreciation, 0.02 percent land revenue, 1.78 and 1.09 percent interest on working and fixed capital respectively.

5.9 The total cost of cultivation of cauliflower was Rs.94786 per hectare in the case of Budgam district Table 5.4(b). In material cost, about 17 percent of the total cost was incurred on the manure and about 7 percent each on seed, fertilizer and insecticides & pesticides. The expenses on hired labour were more (12.43%) as compared to family labour (11.13%) and bullock labour (4.85%). The proportion of rental value of land was 27.43 percent of the total cost. The remaining cost components depreciation, land revenue, interest on working and fixed capital constituted 3 percent of the total cost of cultivation.

5.10 On the whole, cost C was Rs.95350 for hectare in the case of this crop (Table 5.4(c)). The sampled farmers were observed to be using more hired human labour (12.21%) followed by family labour (10.97%) and bullock labour (4.77%). In material cost, the expenses on manure were 20.28 percent. The value of seed/seedlings into total cost was about 8 percent. The share of fertilizer and insecticides & pesticides was about 7 percent each of the total cost. The proportion of rental value of land into total cost was also significant i.e. 27.03 percent. The remaining cost components constituted only about 3 percent of the total cost.

Table 5.4. (a) Cost of Cultivation of Cauliflower Among Sampled Farmers of District Anantnag

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	11500	0	0	11500	11.99	0	0	11.99
b. Bullock Labour	4500	0	0	4500	4.69	0	0	4.69
c.Seed/Seedlings	7450	0	0	7450	7.77	0	0	7.77
d.Manure	20650	0	0	20650	21.53	0	0	21.53
e.Fertilizer	6665	0	0	6665	6.95	0	0	6.95
f.Insecticides and pesticides	6250	0	0	6250	6.52	0	0	6.52
g.Sticks	0	0	0	0	0	0	0	0
h.Depreciation (Implements and farm building)	200	0	0	200	0.21	0	0	0.21
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1710	0	0	1710	1.78	0	0	1.78
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A$_1$)	58940	0	0	58940	61.46	0	0	61.46
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A$_2$ (Cost A$_1$+l)	58940	0	0	58940	61.46	0	0	61.46
m.Rental value of owned land	25550	0	0	25550	26.64	0	0	26.64
n.Interest on fixed capital (excluding land)	1045	0	0	1045	1.09	0	0	1.09
Cost B (Cost A$_2$+m+n)	85535	0	0	85535	89.19	0	0	89.19
o.Imputed value of family labour	10370	0	0	10370	10.81	0	0	10.81
Cost C (Cost B+o)	95905	0	0	95905	100	0	0	100

Table 5.4. (b) Cost of Cultivation of Cauliflower Among Sampled Farmers of District Budgam

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	11780	0	0	11780	12.43	0	0	12.43
b. Bullock Labour	4600	0	0	4600	4.85	0	0	4.85
c.Seed/Seedlings	7150	0	0	7150	7.54	0	0	7.54
d.Manure	18000	0	0	18000	18.99	0	0	18.99
e.Fertilizer	6800	0	0	6800	7.17	0	0	7.17
f.Insecticides and pesticides	6950	0	0	6950	7.33	0	0	7.33
g.Sticks	0	0	0	0	0	0	0	0
h.Depreciation (Implements and farm building)	196	0	0	196	0.21	0	0	0.21
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1658	0	0	1658	1.75	0	0	1.75
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A_1)	57149	0	0	57149	60.29	0	0	60.29
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A_2 (Cost A_1+l)	57149	0	0	57149	60.29	0	0	60.29
m.Rental value of owned land	26000	0	0	26000	27.43	0	0	27.43
n.Interest on fixed capital (excluding land)	1087	0	0	1087	1.15	0	0	1.15
Cost B (Cost A_2+m+n)	84236	0	0	84236	88.87	0	0	88.87
o.Imputed value of family labour	10550	0	0	10550	11.13	0	0	11.13
Cost C (Cost B+o)	94786	0	0	94786	100	0	0	100

Table 5.4. (c) Cost of Cultivation of Cauliflower Among all Sampled Farmers

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	11639	0	0	11639	12.21	0	0	12.21
b. Bullock Labour	4550	0	0	4550	4.77	0	0	4.77
c.Seed/Seedlings	7301	0	0	7301	7.66	0	0	7.66
d.Manure	19337	0	0	19337	20.28	0	0	20.28
e.Fertilizer	6732	0	0	6732	7.06	0	0	7.06
f.Insecticides and pesticides	6597	0	0	6597	6.92	0	0	6.92
g.Sticks	0	0	0	0	0	0	0	0
h.Depreciation (Implements and farm building)	198	0	0	198	0.21	0	0	0.21
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1684	0	0	1684	1.77	0	0	1.77
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A_1)	58052	0	0	58052	60.88	0	0	60.88
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A_2 (Cost A_1+l)	58052	0	0	58052	60.88	0	0	60.88
m.Rental value of owned land	25773	0	0	25773	27.03	0	0	27.03
n.Interest on fixed capital (excluding land)	1066	0	0	1066	1.12	0	0	1.12
Cost B (Cost A_2+m+n)	84891	0	0	84891	89.03	0	0	89.03
o.Imputed value of family labour	10459	0	0	10459	10.97	0	0	10.97
Cost C (Cost B+o)	95350	0	0	95350	100	0	0	100

Cost of Cultivation of Capsicum

5.11   The cultivation of capsicum was observed only among the sampled farmers of Budgam district. The cost structure of capsicum is given in Table 5.5(b). From this table it can be seen that the total cost of the cultivation of capsicum was Rs.79191 per hectare.   In total cost, the share of hired human labour was more (14.52%) as

compared to family labour (13.23%) and bullock labour (5.30%). Among material costs the contribution of seed/seedling, manure, fertilizer and insecticides-pesticides was 6, 11.36, 7.54 and about 7 percent of the total cost of cultivation respectively. The other important component of cost in capsicum cultivation was rental value of owned land constituting about 32 percent of the total cost. The remaining items of the cost of cultivation of capsicum were depreciation (0.28%), land revenue (0.02%) interest on working capital (1.55%) and interest on fixed capital (1.34%).

Table 5.5. (a) Cost of Cultivation of Capsicum Among Sampled Farmers of District Anantnag

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	0	0	0	0	0	0	0	0
b. Bullock Labour	0	0	0	0	0	0	0	0
c.Seed/Seedlings	0	0	0	0	0	0	0	0
d.Manure	0	0	0	0	0	0	0	0
e.Fertilizer	0	0	0	0	0	0	0	0
f.Insecticides and pesticides	0	0	0	0	0	0	0	0
g.Sticks	0	0	0	0	0	0	0	0
h.Depreciation (Implements and farm building)	0	0	0	0	0	0	0	0
i.Land Revenue and taxes	0	0	0	0	0	0	0	0
j.Interest on working capital	0	0	0	0	0	0	0	0
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A_1)	0	0	0	0	0	0	0	0
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A_2 (Cost A_1+l)	0	0	0	0	0	0	0	0
m.Rental value of owned land	0	0	0	0	0	0	0	0
n.Interest on fixed capital (excluding land)	0	0	0	0	0	0	0	0
Cost B (Cost A_2+m+n)	0	0	0	0	0	0	0	0
o.Imputed value of family labour	0	0	0	0	0	0	0	0
Cost C (Cost B+o)	0	0	0	0	0	0	0	0

Table 5.5. (b) Cost of Cultivation of Capsicum Among Sampled Farmers of District Budgam

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	11500	0	0	11500	14.52	0	0	14.52
b. Bullock Labour	4200	0	0	4200	5.30	0	0	5.30
c.Seed/Seedlings	4750	0	0	4750	6.00	0	0	6.00
d.Manure	9000	0	0	9000	11.36	0	0	11.36
e.Fertilizer	5970	0	0	5970	7.54	0	0	7.54
f.Insecticides and pesticides	5530	0	0	5530	6.98	0	0	6.98
g.Sticks	0	0	0	0	0	0	0	0
h.Depreciation (Implements and farm building)	220	0	0	220	0.28	0	0	0.28
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1228	0	0	1228	1.55	0	0	1.55
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A_1)	42413	0	0	42413	53.56	0	0	53.56
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A_2 (Cost A_1+l)	42413	0	0	42413	53.56	0	0	53.56
m.Rental value of owned land	25240	0	0	25240	31.87	0	0	31.87
n.Interest on fixed capital (excluding land)	1058	0	0	1058	1.34	0	0	1.34
Cost B (Cost A_2+m+n)	68711	0	0	68711	86.77	0	0	86.77
o.Imputed value of family labour	10480	0	0	10480	13.23	0	0	13.23
Cost C (Cost B+o)	79191	0	0	79191	100.0	0	0	100.0

Table 5.5. (c)   Cost of Cultivation of Capsicum Among all Sampled Farmers

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	11500	0	0	11500	14.52	0	0	14.52
b. Bullock Labour	4200	0	0	4200	5.30	0	0	5.30
c.Seed/Seedlings	4750	0	0	4750	6.00	0	0	6.00
d.Manure	9000	0	0	9000	11.36	0	0	11.36
e.Fertilizer	5970	0	0	5970	7.54	0	0	7.54
f.Insecticides and pesticides	5530	0	0	5530	6.98	0	0	6.98
g.Sticks	0	0	0	0	0	0	0	0
h.Depreciation (Implements and farm building)	220	0	0	220	0.28	0	0	0.28
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1228	0	0	1228	1.55	0	0	1.55
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A_1)	42413	0	0	42413	53.56	0	0	53.56
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A_2 (Cost A_1+l)	42413	0	0	42413	53.56	0	0	53.56
m.Rental value of owned land	25240	0	0	25240	31.87	0	0	31.87
n.Interest on fixed capital (excluding land)	1058	0	0	1058	1.34	0	0	1.34
Cost B (Cost A_2+m+n)	68711	0	0	68711	86.77	0	0	86.77
o.Imputed value of family labour	10480	0	0	10480	13.23	0	0	13.23
Cost C (Cost B+o)	79191	0	0	79191	100.0	0	0	100.0

Cost of Cultivation of Knolkhol

5.12 Knolkhol is an annual vegetable, and is low, stout cultivar of cabbage. Knolkhol can be eaten raw as well as cooked. The commercial cultivation of knolkhol is very limited J&K is the main production state of knolkhol in India . The fleshy edible proration

is an enlargement of the stem, which develops entirely above ground and is used as a vegetable. This vegetable contains many B-complex vitamins.

5.13 The cost of cultivation of the crop knolkhol in districts Anantnag and Budgam is presented in Table 5.7(a-c). The table 5.7(a) reveals that out of total cost of cultivation (Rs.88059/ha.) of this crop 33.34 percent was shared by the human and bullock labour. The other major cost component is the cost of material accounting for 35.87 percent of the total cost. Expenses on manure were 14.62 percent of the total cost. The proportion of rental value of land was 27.65 percent of the total cost. The remaining items of the cost of cultivation of knolkhol accounted for about 3 percent of the total cost.

 5.14 The table 5.7(b) depicts that the total cost of cultivation of knolkhol in Budgam was Rs.89673 per hectare. About 70 percent of the expenses were observed to be incurred on labour and material used for the cultivation of this crop. In material cost, the share of manure was maximum i.e. 14 percent followed by about 7 percent each seed/seedlings and insecticides/pesticides. The fertilizer used in the cultivation of this crop accounted for 6 percent. Another important item of the cost C was rental value of land constituted 28 percent of the total cost.

  5.15 Area wise there is not much difference in the per hectare cost of cultivation of Knolkhol.   On the whole, the total cost of cultivation of Knolkhol was Rs.89407 per hectare (Table 5.7(c)). Out of total cost, the share of family labour was 14.76% as against 13.83 percent of hired human labour. The bullock labour accounted for 5.52 percent of the total cost. The proportion of seed/seedlings, manure, fertilizer and insecticides/pesticides was percent of the total cost. The share of rental value of owned land into total cost was about 28 and 3 percent respectively.

Table 5.6. (a) Cost of Cultivation of Knolkhol Among Sampled Farmers of District Anantnag

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	11550	0	0	11550	13.12	0	0	13.12
b. Bullock Labour	4850	0	0	4850	5.51	0	0	5.51
c.Seed/Seedlings	6570	0	0	6570	7.46	0	0	7.46
d.Manure	12870	0	0	12870	14.62	0	0	14.62
e.Fertilizer	5575	0	0	5575	6.33	0	0	6.33
f.Insecticides and pesticides	6570	0	0	6570	7.46	0	0	7.46
g.Sticks	0	0	0	0	0	0	0	0
h.Depreciation (Implements and farm building)	230	0	0	230	0.26	0	0	0.26
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1440	0	0	1440	1.64	0	0	1.64
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A_1)	49670	0	0	49670	56.41	0	0	56.41
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A_2 (Cost A_1+l)	49670	0	0	49670	56.41	0	0	56.41
m.Rental value of owned land	24350	0	0	24350	27.65	0	0	27.65
n.Interest on fixed capital (excluding land)	1089	0	0	1089	1.24	0	0	1.24
Cost B (Cost A_2+m+n)	75109	0	0	75109	85.29	0	0	85.29
o.Imputed value of family labour	12950	0	0	12950	14.71	0	0	14.71
Cost C (Cost B+o)	88059	0	0	88059	100.0	0	0	100.0

Table 5.6. (b) Cost of Cultivation of Knolkhol Among Sampled Farmers of District Budgam

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	12525	0	0	12525	13.97	0	0	13.97
b. Bullock Labour	4950	0	0	4950	5.52	0	0	5.52
c.Seed/Seedlings	6460	0	0	6460	7.20	0	0	7.20
d.Manure	12550	0	0	12550	14.00	0	0	14.00
e.Fertilizer	5670	0	0	5670	6.32	0	0	6.32
f.Insecticides and pesticides	6435	0	0	6435	7.18	0	0	7.18
g.Sticks	0	0	0	0	0	0	0	0
h.Depreciation (Implements and farm building)	250	0	0	250	0.28	0	0	0.28
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1458	0	0	1458	1.63	0	0	1.63
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A_1)	50313	0	0	50313	56.11	0	0	56.11
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A_2 (Cost A_1+l)	50313	0	0	50313	56.11	0	0	56.11
m.Rental value of owned land	24990	0	0	24990	27.87	0	0	27.87
n.Interest on fixed capital (excluding land)	1120	0	0	1120	1.25	0	0	1.25
Cost B (Cost A_2+m+n)	76423	0	0	76423	85.22	0	0	85.22
o.Imputed value of family labour	13250	0	0	13250	14.78	0	0	14.78
Cost C (Cost B+o)	89673	0	0	89673	100.0	0	0	100.0

Table 5.6. (c)   Cost of Cultivation of Knolkhol Among all Sampled Farmers

Cost Components	Value in (Rs./ha.)				Percentage			
	Marginal	Small	Medium	All	Marginal	Small	Medium	All
a.Human Labour (Hired)	12365	0	0	12365	13.83	0	0	13.83
b. Bullock Labour	4934	0	0	4934	5.52	0	0	5.52
c.Seed/Seedlings	6478	0	0	6478	7.25	0	0	7.25
d.Manure	12602	0	0	12602	14.10	0	0	14.10
e.Fertilizer	5654	0	0	5654	6.32	0	0	6.32
f.Insecticides and pesticides	6457	0	0	6457	7.22	0	0	7.22
g.Sticks	0	0	0	0	0	0	0	0
h.Depreciation (Implements and farm building)	247	0	0	247	0.28	0	0	0.28
i.Land Revenue and taxes	15	0	0	15	0.02	0	0	0.02
j.Interest on working capital	1455	0	0	1455	1.63	0	0	1.63
k.Miscellaneous expenditure (Machinery,water,elect. Charges etc.)	0	0	0	0	0	0	0	0
Total (Cost A$_1$)	50207	0	0	50207	56.16	0	0	56.16
l.Rent paid for leased in land	0	0	0	0	0	0	0	0
Cost A$_2$ (Cost A$_1$+l)	50207	0	0	50207	56.16	0	0	56.16
m.Rental value of owned land	24885	0	0	24885	27.83	0	0	27.83
n.Interest on fixed capital (excluding land)	1115	0	0	1115	1.25	0	0	1.25
Cost B (Cost A$_2$+m+n)	76207	0	0	76207	85.24	0	0	85.24
o.Imputed value of family labour	13201	0	0	13201	14.76	0	0	14.76
Cost C (Cost B+o)	89407	0	0	89407	100	0	0	100

Input-Output Analysis

5.16   The input-output analysis is important as it gives the idea whether the produce is economically viable or not. In the first part of this section gross as well as net returns from the production of off season vegetables are discussed and in the later input-output ratios are worked out, using gross returns and cost C.

Returns from Cultivation of Vegetable Crops

5.17 Firstly, the gross as well as net returns from the production of selected five off season vegetables on sampled farms of selected areas of J&K are presented.

Returns from Cultivation of Tomato

5.18 The gross and net returns realised by the sampled farmers from tomato cultivation (only marginal category) in district Anantnag and Budgam are presented in Table 5.7(a).The table shows that gross and net returns from the cultivation of tomato was Rs.504000 per hectare in Anantnag area. The net return over total cost (cost C) was Rs.412160 per hectare. Similarly the gross returns and net returns (over cost C) were Rs.490000 and Rs.396359 per hectare for the sampled farms of Budgam area. Overall, the gross and net returns were observed to be Rs.495833 and Rs.402666 per hectare respectively. Area wise comparison shows that returns were comparatively more in Anantnag area.

Returns from Cultivation of Cabbage

5.19   The gross and net returns from cabbage cultivation are given in Table 5.7(c). The table reveals that gross and net returns were Rs.398214 and Rs.309546 (over cost C) per hectare respectively in Anantnag area. Similarly gross and net returns were Rs.384375 and Rs.295031 per hectare among the sampled farmers of Budgam area. Overall, the gross and net returns were observed to be Rs.397788 and Rs.309099 per hectare. Area wise, there was not much difference in the net returns.

Table 5.7.(a)   Input-Output Analysis in Tomato Production

(Rs./hectare)

Particulars	Marginal	Small	Medium	Overall
Anantnag				
Cost A_1	54083	0	0	54083
Cost A_2	54083	0	0	54083
Cost B	80590	0	0	80590
Cost C	91840	0	0	91840
Gross returns	504000	0	0	504000
Net returns over				
Cost A_1	449917	0	0	449917
Cost A_2	449917	0	0	449917
Cost B	423410	0	0	423410
Cost C	412160	0	0	412160
Budgam				
Cost A_1	53761	0	0	53761
Cost A_2	53761	0	0	53761
Cost B	80866	0	0	80866
Cost C	93641	0	0	93641
Gross returns	490000	0	0	490000
Net returns over				
Cost A_1	436239	0	0	436239
Cost A_2	436239	0	0	436239
Cost B	409134	0	0	409134
Cost C	396359	0	0	396359
Overall				
Cost A_1	73846	0	0	73846
Cost A_2	73846	0	0	73846
Cost B	80793	0	0	80793
Cost C	93167	0	0	93167
Gross returns	495833	0	0	495833
Net returns over				
Cost A_1	421987	0	0	421987
Cost A_2	421987	0	0	421987
Cost B	415040	0	0	415040
Cost C	402666	0	0	402666

Table 5.7(c).   Input-Output Analysis in Cabbage Production

(Rs./hectare)

Particulars	Marginal	Small	Medium	Overall
Anantnag				
Cost A_1	50873	0	0	50873
Cost A_2	50873	0	0	50873
Cost B	77093	0	0	77093
Cost C	88668	0	0	88668
Gross returns	398214	0	0	398214
Net returns over				
Cost A_1	347341	0	0	347341
Cost A_2	347341	0	0	347341
Cost B	321121	0	0	321121
Cost C	309546	0	0	309546
Budgam				
Cost A_1	51739	0	0	51739
Cost A_2	51739	0	0	51739
Cost B	78694	0	0	78694
Cost C	89344	0	0	89344
Gross returns	384375	0	0	384375
Net returns over				
Cost A_1	332636	0	0	332636
Cost A_2	332636	0	0	332636
Cost B	305681	0	0	305681
Cost C	295031	0	0	295031
Overall				
Cost A_1	51265	0	0	51265
Cost A_2	51265	0	0	51265
Cost B	77817	0	0	77817
Cost C	88974	0	0	88974
Gross returns	382575	0	0	382575
Net returns over				
Cost A_1	331310	0	0	331310
Cost A_2	331310	0	0	331310
Cost B	304758	0	0	304758
Cost C	293601	0	0	293601

Returns from Cultivation of Cauliflower

5.20   The gross and net returns from cauliflower cultivation are presented in Table 5.7(d). It can be seen from the table that gross return from this crop was Rs.510000 per hectare in Anantnag area and the net return over cost C realised by the sampled farmers of this area was Rs.414095 per hectare. In Budgam area the gross and net returns were Rs.515385 and Rs.420599 per hectare respectively. Overall, the gross and net returns were observed to be Rs.510547 and Rs.414756 per hectare

respectively. Area wise there was not much difference is the net returns but these were relatively higher in Budgam district as compared to Anantnag district due to the same trend in productivity in these districts.

Table 5.7(d). Input-Output Analysis in Cauliflower Production

(Rs./hectare)

Particulars	Marginal	Small	Medium	Overall
Anantnag				
Cost A$_1$	58940	0	0	58940
Cost A$_2$	58940	0	0	58940
Cost B	85535	0	0	85535
Cost C	95905	0	0	95905
Gross returns	510000	0	0	510000
Net returns over				
Cost A$_1$	451060	0	0	451060
Cost A$_2$	451060	0	0	451060
Cost B	424465	0	0	424465
Cost C	414095	0	0	414095
Budgam				
Cost A$_1$	57149	0	0	57149
Cost A$_2$	57149	0	0	57149
Cost B	84236	0	0	84236
Cost C	94786	0	0	94786
Gross returns	515385	0	0	515385
Net returns over				
Cost A$_1$	458236	0	0	458236
Cost A$_2$	458236	0	0	458236
Cost B	431149	0	0	431149
Cost C	420599	0	0	420599
Overall				
Cost A$_1$	58052	0	0	58052
Cost A$_2$	58052	0	0	58052
Cost B	84891	0	0	84891
Cost C	95350	0	0	95350
Gross returns	515929	0	0	515929
Net returns over				
Cost A$_1$	457877	0	0	457877
Cost A$_2$	457877	0	0	457877
Cost B	431038	0	0	431038
Cost C	420579	0	0	420579

Returns from Cultivation of Capsicum

5.21   The cultivation of capsicum was observed only among the sampled farmers of Budgam district. The gross and net returns from capsicum cultivation of this district are

presented in Table 5.7(e) which reveals that the gross and net returns (over cost C) were Rs.539000 and Rs.459809 per hectare respectively among the sampled farmers of Budgam area.

Table 5.7(e).   Input-Output Analysis in Capsicum Production

(Rs./hectare)

Particulars	Marginal	Small	Medium	Overall
Anantnag				
Cost A_1	0	0	0	0
Cost A_2	0	0	0	0
Cost B	0	0	0	0
Cost C	0	0	0	0
Gross returns	0	0	0	0
Net returns over				
Cost A_1	0	0	0	0
Cost A_2	0	0	0	0
Cost B	0	0	0	0
Cost C	0	0	0	0
Budgam				
Cost A_1	42413	0	0	42413
Cost A_2	42413	0	0	42413
Cost B	68711	0	0	68711
Cost C	79191	0	0	79191
Gross returns	539000	0	0	539000
Net returns over				
Cost A_1	496587	0	0	496587
Cost A_2	496587	0	0	496587
Cost B	470289	0	0	470289
Cost C	459809	0	0	459809
Overall				
Cost A_1	42413	0	0	42413
Cost A_2	42413	0	0	42413
Cost B	68711	0	0	68711
Cost C	79191	0	0	79191
Gross returns	539000	0	0	539000
Net returns over				
Cost A_1	496587	0	0	496587
Cost A_2	496587	0	0	496587
Cost B	470289	0	0	470289
Cost C	459809	0	0	459809

Returns from Cultivation of Knolkhol

5.22 The gross and net returns from knolkhol cultivation are present in Table 5.7(f). It can be seen from the table that gross returns were same i.e. Rs.520000 per hectare in

Table 5.7. (f)   Input-Output Analysis in Knolkhol Production

(Rs./hectare)

Particulars	Marginal	Small	Medium	Overall
Anantnag				
Cost A_1	49670	0	0	49670
Cost A_2	49670	0	0	49670
Cost B	75109	0	0	75109
Cost C	88059	0	0	88059
Gross returns	520000	0	0	520000
Net returns over				
Cost A_1	470330	0	0	470330
Cost A_2	470330	0	0	470330
Cost B	444891	0	0	444891
Cost C	431941	0	0	431941
Budgam				
Cost A_1	50313	0	0	50313
Cost A_2	50313	0	0	50313
Cost B	76423	0	0	76423
Cost C	89673	0	0	89673
Gross returns	520000	0	0	520000
Net returns over				
Cost A_1	469687	0	0	469687
Cost A_2	469687	0	0	469687
Cost B	443577	0	0	443577
Cost C	430327	0	0	430327
Overall				
Cost A_1	50207	0	0	50207
Cost A_2	50207	0	0	50207
Cost B	76207	0	0	76207
Cost C	89407	0	0	89407
Gross returns	520000	0	0	520000
Net returns over				
Cost A_1	469793	0	0	469793
Cost A_2	469793	0	0	469793
Cost B	443793	0	0	443793
Cost C	430593	0	0	430593

Anantnag and Budgam areas. Similarly there was not a significant difference in the net returns also. The net returns were Rs.431941 and Rs.430327 per hectare among the sampled farmers of Anantnag and Budgam respectively. Overall the net return was observed to be Rs.430593 per hectare.

5.23 Vegetable wise net returns were maximum in the case of capsicum (Rs.459809/ha.) followed by the net returns from knolkhol (Rs.430593/ha.) cauliflower (Rs.414756/ha.), tomato (Rs.402666/ha.) and cabbage (Rs.309099/ha.).

Input-Output Ratio

5.24   To examine the production efficiency of various vegetables input output ratio for different size of farms in Anantnag and Budgam areas have been worked out and are presented in Table 5.8. It is the ratio of output to inputs used in the production process, i.e. output per unit of input. The figures in the table represent gross returns over cost C for per rupee investment on selected off season vegetables.

5.25 The input-output ratio of tomato production was more 1:5.49 in the sampled farms of Anantnag as compared to Budgam area 1:5.23 giving the overall ratio 1: 5.32. In the case of cabbage, input-output ratio was 1:4.49, 1:4.30 and 1:4.29 for Anantnag, Budgam and all respectively whereas for cauliflower this was. 1:5.31, 1:5.43 and 1:5.41 for Anantnag, Budgam and all respectively.

5.26 The input-output ratio for the crop capsicum worked out to be 1:6.80 in Budgam area and this crop was not grown in Anantnag area. The input-output ratio in knolkhol production was almost same in both the areas under study and worked out to be 1: 5.90, 1:5.79 and 1:5.81 for Anantnag, Budgam and all respectively.

5.27 In overall, it can be concluded that capsicum cultivation was more profitable followed by knolkhol, cauliflower, tomato and cabbage.

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Table 5.8. Input-Output Ratio in Various Vegetables Production Among Sampled Farmers

Category	Vegetables					
	Tomato	Peas	Cabbage	Cauliflower	Capsicum	Knolkhol
Anantnag						
Marginal	5.49		4.49	5.31		5.90
Small						
Medium						
Total	5.49		4.49	5.31		5.90
Budgam						
Marginal	5.23		4.30	5.44	6.81	5.80
Small						
Medium						
Total	5.23		4.30	5.44	6.81	5.80
Overall						
Marginal	5.32		4.30	5.41	6.80	5.82
Small						
Medium						
Total	5.32		4.30	5.41	6.80	5.82

CHAPTER-6

Marketing of Off-Season Vegetables

6.1   Analysis of the costs and returns of any farm produce (vegetables in this study) is very important to assess the profitability/economic viability of the crops, but at the same time it is equally important to analyse how and how much of the produce is utilized and marketed. In this chapter, an attempt has been made to analyse the production and utilization of vegetables produced and markets where marketable surplus was sold including price spread and market margins.

Production and Utilization of Vegetables

6.2   Any vegetable produced by the farmers is retained by them for home consumption, to meet their seed requirement and payment of wages in kind & gift. Also some quantity of produce goes waste in the form of losses. During the production of vegetable crops, insects, pests, diseases, hailing etc. damage the vegetables and reduce the yield. After meeting the above requirements and losses balance of the produce is marketed in different markets. The per farm production of vegetables and the proportion of the produce retained for different purposes by the sampled households under study are given in Tables 6.1(a-f).The tendency of retaining vegetables for seed and kind wages or gifts was not observed in the sampled farmers under study.

Production and Utilization of Tomato

6.3 The Table 6.1(a) shows that tomato production per farm among the sampled farmers of Budgam was higher (44.80 qtls.) as compared to Anantnag (22.40 qtls.) due to larger area under tomato cultivation in Budgam. On the whole , the production of tomato per farm was 35.47 quintals and the proportion of tomato retained for home consumption was 1.39 percent The proportion of tomato as home consumption and losses was more in the sampled farmers of Anantnag area as compared to Budgam area. About 95 percent of the total produce was sold and 3.71 percent was lost before it reaches markets.

Table 6.1. (a) Utilization Pattern of Tomato Among Sampled Farmers

						(Percentages)
Category	Total production (Qtls./farm)	Home consumption	Given as wages in kind	Retained for seed	Losses	Marketed
Anantnag						
Marginal	22.40	2.14	0	0	6.52	91.34
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	22.40	2.14	0	0	6.52	91.34
Budgam						
Marginal	44.80	1.12	0	0	2.71	96.17
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	44.80	1.12	0	0	2.71	96.17
Overall						
Marginal	35.47	1.39	0	0	3.71	94.90
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	35.47	1.39	0	0	3.71	94.90

Production and Utilization of Cabbage

6.4   In the case of cabbage also the production per farm was higher (55.84 qtls.) among the sampled farmers of Budgam than Anantnag area (44.60 qtls.) The proportion of the cabbage retained for family consumption was more (19.51%) in Badgaon as compared to Anantnag (8.38%) whereas the losses were more in the case of the sampled farmers of Anantnag. Overall, the quantity of cabbage retained for home consumption was 13.30 percent. The remaining 8.92 and 77.78 percent of the total production (48.96 qtls./farm) were losses and marketed surplus respectively (Table 6.1(c)).

Production and Utilization of Cauliflower

6.5   It can be seen from the table 6.1(d) that the cauliflower production per farm was 40.45, 64.78 and 49.77 quintals among the sampled farmers of Anantnag, Budgam and overall respectively. On the whole, about 86 percent of the produce was sold in the markets, 6.80 percent retained for family consumption and 7.23 percent was lost. The

Table 6.1. (c) Utilization Pattern of Cabbage Among Sampled Farmers

(Percentages)

Category	Total production (Qtls./farm)	Home consumption	Given as wages in kind	Retained for seed	Losses	Marketed
Anantnag						
Marginal	44.60	8.37	0	0	10.16	81.46
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	44.60	8.37	0	0	10.16	81.46
Budgam						
Marginal	55.84	19.51	0	0	7.35	73.14
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	55.84	19.51	0	0	7.35	73.14
Overall						
Marginal	48.96	13.30	0	0	8.92	77.78
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	48.96	13.30	0	0	8.92	77.78

Table 6.1. (d) Utilization Pattern of Cauliflower Among Sampled Farmers

(Percentages)

Category	Total production (Qtls./farm)	Home consumption	Given as wages in kind	Retained for seed	Losses	Marketed
Anantnag						
Marginal	40.45	8.35	0	0	9.97	81.67
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	40.45	8.35	0	0	9.97	81.67
Budgam						
Marginal	64.78	5.23	0	0	4.46	90.31
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	64.78	5.23	0	0	4.46	90.31
Overall						
Marginal	49.77	6.80	0	0	7.23	85.98
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	49.77	6.80	0	0	7.23	85.98

percentage of losses and retained for home consumption was higher in Anantnag area as compared to Badgaon area.

Production and Utilization of Capsicum

6.6 The average per farm production of capsicum among sampled farmers of Budgam is given in Table 6.1(e). The table reveals that production of cauliflower per farm was 37.02 quintals out of which 2.10 percent was retained for home consumption, 2.85 percent were the losses and remaining 95.5 percent was sold in markets.

Table 6.1. (e)   Utilization Pattern of Capsicum Among Sampled Farmers

(Percentages)

Category	Total production (Qtls./farm)	Home consumption	Given as wages in kind	Retained for seed	Losses	Marketed
Anantnag						
Marginal	0	0	0	0	0	0
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	0	0	0	0	0	0
Budgam						
Marginal	37.02	2.10	0	0	2.85	95.05
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	37.02	2.10	0	0	2.85	95.05
Overall						
Marginal	37.02	2.10	0	0	2.85	95.05
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	37.02	2.10	0	0	2.85	95.05

Production and Utilization of Knolkhol

6.7 In the case of knolkhol, the production per farm was higher (68.64qtls.) in Budgam as compare to Anantnag (33.80 qtls.). This is again due to relatively larger area under this crop in the sampled farms of Budgam. The proportion of home consumption and losses was relatively higher in the sampled farmers of Anantnag area, whereas the

proportion of sold produce was more in the sampled farmers of Budgam. Overall, the production of knolkhol per farm was 58.69 quintals, out of which 92.51 percent was the marketed surplus with 4.63 percent losses and 2.86 percent retained for home consumption (Table 6.1(f)).

Table 6.1. (f) Utilization Pattern of Knolkhol Among Sampled Farmers

(Percentages)

Category	Total production (Qtls./farm)	Home consumption	Given as wages in kind	Retained for seed	Losses	Marketed
Anantnag						
Marginal	33.80	10.35	0	0	7.40	82.25
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	33.80	10.35	0	0	7.40	82.25
Budgam						
Marginal	68.64	1.38	0	0	4.08	94.54
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	68.64	1.38	0	0	4.08	94.54
Overall						
Marginal	58.69	2.86	0	0	4.63	92.51
Small	0	0	0	0	0	0
Medium	0	0	0	0	0	0
All	58.69	2.86	0	0	4.63	92.51

6.8 The above analysis shows that in all the vegetables more than 90 percent of the total produce was sold in markets after home consumption and losses except cauliflower (86%) and cabbage (78%). The tendency of retaining vegetables for seed and kind wages or gifts was not observed in the sampled farmers under study.

Losses in Vegetables

6.9 The vegetable crops differ from the other food crops with respect to certain characteristics like moisture content, texture, unit size etc. which makes them highly perishable resulting in losses. The losses start just from the field level due to attack of various insect, pest and diseases, which damage the vegetables and ultimately affect

Table 6.2 (a)   Losses in Vegetables up to Market on Sampled Farms

(Qtls./farm)

Particulars	Farm Size			
	Marginal	**Small**	**Medium**	**All**
Tomato				
-Due to natural calamities	0.93	0	0	0.93
-.At the time of picking/assembling	0.25	0	0	0.25
-Grading and packing	0.14	0	0	0.14
-.Field to road head	0	0	0	0
-.Road head to market	0	0	0	0
-Total losses	1.21	0	0	1.21
Peas				
-Due to natural calamities	0	0	0	0
-.At the time of picking/assembling	0	0	0	0
-Grading and packing	0	0	0	0
-.Field to road head	0	0	0	0
-.Road head to market	0	0	0	0
-Total losses	0	0	0	0
Cabbage				
-Due to natural calamities	2.80	0	0	2.80
-.At the time of picking/assembling	1.04	0	0	1.04
-Grading and packing	0.52	0	0	0.52
-.Field to road head	0	0	0	0
-.Road head to market	0	0	0	0
-Total losses	4.36	0	0	4.36
Cauliflower				
-Due to natural calamities	2.55	0	0	2.55
-.At the time of picking/assembling	0.62	0	0	0.62
-Grading and packing	0.43	0	0	0.43
-.Field to road head	0	0	0	0
-.Road head to market	0	0	0	0
-Total losses	3.60	0	0	3.60
Capsicum				
-Due to natural calamities	0.70	0	0	0.70
-.At the time of picking/assembling	0.31	0	0	0.31
-Grading and packing	0.05	0	0	0.05
-.Field to road head	0	0	0	0
-.Road head to market	0	0	0	0
-Total losses	1.06	0	0	1.06
Knolkhol				
-Due to natural calamities	1.95	0	0	1.95
-.At the time of picking/assembling	0.47	0	0	0.47
-Grading and packing	0.38	0	0	0.38
-.Field to road head	0.14	0	0	0.14
-.Road head to market	0	0	0	0
-Total losses	1.32	0	0	1.32

Table   6.2 (b)   Losses in Vegetables up to Market on Sampled Farms

(Percent to total production)

Particulars	Farm Size			
	Marginal	**Small**	**Medium**	**All**
Tomato				
-Due to natural calamities	2.63	0	0	2.63
-.At the time of picking/assembling	0.69	0	0	0.69
-Grading and packing	0.39	0	0	0.39
-.Field to road head	0	0	0	0
-.Road head to market	0	0	0	0
-Total losses	3.71	0	0	3.71
Peas				
-Due to natural calamities	0	0	0	0
-.At the time of picking/assembling	0	0	0	0
-Grading and packing	0	0	0	0
-.Field to road head	0	0	0	0
-.Road head to market	0	0	0	0
-Total losses	0	0	0	0
Cabbage				
-Due to natural calamities	5.72	0	0	5.72
-.At the time of picking/assembling	2.13	0	0	2.13
-Grading and packing	1.06	0	0	1.06
-.Field to road head	0	0	0	0
-.Road head to market	0	0	0	0
-Total losses	8.92	0	0	8.92
Cauliflower				
-Due to natural calamities	5.12	0	0	5.12
-.At the time of picking/assembling	1.25	0	0	1.25
-Grading and packing	0.86	0	0	0.86
-.Field to road head	0	0	0	0
-.Road head to market	0	0	0	0
-Total losses	7.23	0	0	7.23
Capsicum				
-Due to natural calamities	1.89	0	0	1.89
-.At the time of picking/assembling	0.83	0	0	0.83
-Grading and packing	0.14	0	0	0.14
-.Field to road head	0	0	0	0
-.Road head to market	0	0	0	0
-Total losses	2.85	0	0	2.85
Knolkhol				
-Due to natural calamities	3.10	0	0	3.10
-.At the time of picking/assembling	0.91	0	0	0.91
-Grading and packing	0.61	0	0	0.61
-.Field to road head	0	0	0	0
-.Road head to market	0	0	0	0
-Total losses	4.63	0	0	4.63

the yield. The producer has also to bear the losses at the time of grading and end-route transportation. The percentages of losses in respect of all five vegetables are given above in Tables 6.2(a, c-f). Now in next two tables, the extent of losses at various levels viz field, picking/assembling, grading, packing and transportation are evaluated on all the sampled farms.

6.10   The extent of losses at various levels in tomato, cabbage, cauliflower, capsicum and knolkhol are worked out and given in Tables 6.2 (a&b). In vegetables the losses were in the range of 1.21 to 4.36 quintal per farm. Losses due to natural calamities were 2.63, 5.72, 5.12, 1.89 and 3.10 percent for tomato, cabbage, cauliflower, capsicum and knolkhol respectively in the respective total production of these vegetables. At the time of picking/assembling, the losses varied from 0.83 to 2.13 percent. The losses during grading and packing were worked out to be maximum (1.06%) for cabbage and minimum for (0.14%) for capsicum. No losses were observed during transportation of the produce i.e. from field to road head and road head to market.

Markets for Vegetable Crops

6.11   The quantity of produce actually marketed depends upon the marketable surplus, immediate need for cash, price trend, nature of crops and availability of the storage facilities etc. It was observed during the field survey that the sampled farmers of Anantnag and Budgam areas sold their maximum produce in local markets/local users directly, generally the farmers need not to go to the distant markets for selling their produce as their farms are situated near to towns having huge demand of their produce. In this way middlemen are eliminated and the farmers get more price out of their produce. Only about 20 percent of the produce was sold in a distant market Jammu. The proportions of different vegetables sold in Jammu market are given in Tables 6.3 (a, c-f).

Table 6.3. (a)   Quantity of Tomato Marketed to Different Markets by Sampled Farmers

(Qtls./farm)

Category	Total marketed	Marketed in the village	Marketed in local markets	Marketed in market Jammu
Anantnag				
Marginal	20.76 (100.0)	0	16.37 (80.00)	4.09 (20.00)
Small	0	0	0	0
Medium	0	0	0	0
All	20.76 (100.0)	0	16.37 (80.00)	4.09 (20.00)
Budgam				
Marginal	43.09 (100.0)	0	34.04 (79.00)	9.05 (21.00)
Small	0	0	0	0
Medium	0	0	0	0
All	43.09 (100.0)	0	34.04 (79.00)	9.05 (21.00)
Overall				
Marginal	33.66 (100.0)	0	26.68 (79.25)	6.98 (20.75)
Small	0	0	0	0
Medium	0	0	0	0
All	33.66 (100.0)	0	26.68 (79.25)	6.98 (20.75)

Note.   Figures in parentheses denote percentages.

6.12   Overall, 79.25 percent (out of total tomato marketed) was sold in the local markets and 20.75 percent in Jammu market by all the sampled farmers under study. The same pattern was observed in the sampled farmers of both the areas (Table 6.(a)).

6.13 In the case of cabbage (Table 6.3(c)) 77.60 and 22.40% of the marketable surplus was sold in the local and Jammu market respectively by all the sampled farmers under study.   Area wise the percentage of the produce sold in the local markets was higher (80%) in Budgam area as compared to Anantnag area (76%).

Table 6.3. (c)   Quantity of Cabbage Marketed to Different Markets by Sampled Farmers

(Qtls./farm)

Category	Total marketed	Marketed in the village	Marketed in local markets	Marketed in market Jammu
Anantnag				
Marginal	36.33 (100.0)	0	27.61 (75.99)	8.72 (24.01)
Small	0	0	0	0
Medium	0	0	0	0
All	36.33 (100.0)	0	27.61 (75.99)	8.72 (24.01)
Budgam				
Marginal	40.84 (100.0)	0	32.63 (79.90)	8.21 (20.10)
Small	0	0	0	0
Medium	0	0	0	0
All	40.84 (100.0)	0	32.63 (79.90)	8.21 (20.10)
Overall				
Marginal	38.08 (100.0)	0	8.53 (77.60)	29.55 (22.40)
Small	0	0	0	0
Medium	0	0	0	0
All	38.08 (100.0)	0	8.53 (77.60)	29.55 (22.40)

Note.   Figures in parentheses denote percentages.

6.14   The proportion of marketable surplus of cauliflower sold in different markets is presented in Table 6.3(d) and shows that 81.37 percent of the marketable surplus was sold in the local markets and 18.63 percent in the Jammu market. More or less same trend was observed in the sampled farmers of both the areas under study.

6.15   The Table.6.3(e) reveals that out of total capsicum sold, 76 percent was sold in the local markets and 24 percent in Jammu market by the sampled farmers of Budgam area as capsicum was grown only by the sampled farmers of Budgam area.

Table 6.3. (d)   Quantity of Cauliflower Marketed to Different Markets by Sampled Farmers

(Qtls./farm)

Category	Total marketed	Marketed in the village	Marketed in local markets	Marketed in market Jammu
Anantnag				
Marginal	33.03 (100.0)	0	26.42 (79.98)	6.60 (20.02)
Small	0	0	0	0
Medium	0	0	0	0
All	33.03 (100.0)	0	26.42 (79.98)	6.60 (20.02)
Budgam				
Marginal	58.50 (100.0)	0	48.33 (82.62)	10.17 (17.38)
Small	0	0	0	0
Medium	0	0	0	0
All	58.50 (100.0)	0	48.33 (82.62)	10.17 (17.38)
Overall				
Marginal	42.79 (100.0)	0	34.82 (81.37)	7.97 (18.63)
Small	0	0	0	0
Medium	0	0	0	0
All	42.79 (100.0)	0	34.82 (81.37)	7.97 (18.63)

Note. Figures in parentheses denote percentages.

Table 6.3. (e)   Quantity of Capsicum Marketed to Different Markets by Sampled Farmers

(Qtls./farm)

Category	Total marketed	Marketed in the village	Marketed in local markets	Marketed in market Jammu
Anantnag				
Marginal	0	0	0	0
Small	0	0	0	0
Medium	0	0	0	0
All	0	0	0	0
Budgam				
Marginal	35.18 (100.0)	0	26.74 (76.00)	8.44 (24.00)
Small	0	0	0	0
Medium	0	0	0	0
All	35.18 (100.0)	0	26.74 (76.00)	8.44 (24.00)
Overall				
Marginal	35.18 (100.0)	0	26.74 (76.00)	8.44 (24.00)
Small	0	0	0	0
Medium	0	0	0	0
All	35.18 (100.0)	0	26.74 (76.00)	8.44 (24.00)

Note.   Figures in parentheses denote percentages.

6.16   It can be seen from the Table 6.3(f) that 78 percent of the marketed knolkhol was sold in local market and 22 percent in Jammu market by the sampled farmers of both the areas i.e. Budgam and Anantnag.

6.17   The Tables 6.3(a, c-f) show that in all the vegetables, out of total marketed produce 76 to 81 percent was sold in local markets, that is, directly to consumers or   to wholesalers in nearby Sabzi Mandis. Only about 20 percent of the total marketed produce was sold in Jammu market, but this is the only market of sampled farmers for which the price spread can be studied.

Table 6.3. (f)   Quantity of Kholkhol Marketed to Different Markets by Sampled Farmer

(Qtls./farm)

Category	Total marketed	Marketed in the village	Marketed in local markets	Marketed in market Jammu
Anantnag				
Marginal	27.81 (100.0)	0	21.69 (78.00)	6.12 (22.00)
Small	0	0	0	0
Medium	0		0	0
All	27.81 (100.0)	0	21.69 (78.00)	6.12 (22.00)
Budgam				
Marginal	64.89 (100.0)	0	50.62 (78.00)	14.28 (22.00)
Small	0	0	0	0
Medium	0	0	0	0
All	64.89 (100.0)	0	50.62 (78.00)	14.28 (22.00)
Overall				
Marginal	54.29 (100.0)	0	42.35 (78.00)	11.94 (22.00)
Small	0	0	0	0
Medium	0	0	0	0
All	54.29 (100.0)	0	42.35 (78.00)	11.94 (22.00)

Note.   Figures in parentheses denote percentages.

Producers' Share and Marketing Margin

6.18   In the marketing of agricultural commodities, the difference between the price paid by consumer and the price received by the producer for an equivalent quantity of farm produce is often known as price spread. Sometimes, this is termed as marketing margins. Marketing is basically the process of movement of goods from producer to consumer at the desired time, place and form. In this process the vegetables has to pass through more than one hand, except when it is directly sold at consumer by the producer (a rare phenomenon).   In this chain various agencies like growers, wholesalers, retailers etc. are engaged. This chain of intermediaries/functionaries is called the marketing channel. Channel through which the various vegetables produced in sampled farms reach the final consumer is the following:

Producer – Wholesaler – Commission Agent/Mashakhor – Retailer – Consumer.

6.19   In the marketing of agricultural commodities, the difference between the price paid by consumer and the price received by the producer for an equivalent quantity of farm produce is often known as price spread. Sometimes, this is termed as marketing margins. The total margin includes: the cost involved in moving the product and profit of the various market functionaries involved in moving the produce from the initial point of production till it reaches the ultimate consumer. The difference between the prices received by the growers and price paid by the consumer for vegetables is composed of cost of marketing and rendering market services such as assembling, grading, transporting, wholesaling, retailing the margins of the intermediaries and the market charges, taxes, etc. In order to increase the operational efficiency and minimise the cost and understanding the nature and extent of marketing margins, the study of cost and price spread is essential.

6.20 The Table 6.4(a) shows the marketing costs and margin for tomato, cabbage, cauliflower, capsicum and knolkhol sold in Jammu market.   It can be seen from this table that the cost of marketing borne by vegetable growers for selling their produce in Jammu market worked out to be Rs.368, Rs.332, Rs.360, Rs.349 and Rs.353 per quintal for tomato, cabbage, cauliflower, capsicum and knolkhol. Transportation cost was the main component of total marketing cost borne by the producer in all the vegetables as this market is far away. The second important component of marketing cost was the cost of commission and market fee.

6.21   Producer's share in consumer's rupee and proportion of various costs and margins in various vegetables sold at Jammu are given in Table 6.4(b). This tables shows that the share of marketing costs in consumer's rupee was maximum in case of cabbage (14.08%) and minimum in capsicum (10.45%). The share of producer in consumer's rupee was 65.89, 65.83, 63.65, 63.61 and 61.22 percent in capsicum, knolkhol, cauliflower, cabbage and tomato respectively. The mashakhor's margins ranged between 0.83 percent in tomato to 0.99 percent each in capsicum and knolkhol. The retailer's margin was highest in tomato (9.47%) and lowest in cabbage (7.97%).

Table 6.4 (a)   Producers' s Share and Marketing Margin in Marketing of Vegetables

(For Jammu Market)

Channel: Producer – Wholesaler – Commission Agent/Mashakhor – Retailer - Consumer
(Rs./Qtls.)

Particulars	Tomato	Peas	Cabbage	Cauliflower	Capsicum	Knolkhol
1.Net price received by growers	1771	-	1500	2000	2200	2000
2.Expenses incurred by growers						
i)Assembling, packing and grading	75	-	65	70	60	65
ii)Packing material	5	-	18	16	6	17
iii)Carriage upto road head	15	-	14	15	15	14
iv)Transportation upto market	145	-	145	145	145	145
v)Loading/unloading	10	-	10	10	10	10
vi)Commission & market fee	106	-	68	90	99	90
vii)State tax, octrio etc.	2	-	2	2	2	2
viii) Miscellaneous	10	-	10	12	12	10
Sub-Total	368	-	332	360	349	353
3. Wholesale price	2139	-	1832	2360	2549	2353
4. Expenses incurred by commission agent/mashakhors						
a)Carriage, handling etc.	55	-	53	52	52	53
b)Market fee & commission	204	-	150	200	231	200
Sub-Total	259	-	203	252	283	253
5.Mashakhors' margin	24	-	23	27	33	30
6. Mashakhors' sale price	2422	-	2058	2639	2865	2636
7.Retailers' Expenses						
- Carriage & handling charges	20	-	22	23	20	22
- Retailer losses	177	-	90	200	162	120
Sub-total	197	-	112	223	182	142
8.Retailers' margin	274	-	188	280	292	260
9.Consumers' price	2893	-	2358	3142	3339	3038

Table 6.4 (b) Producers' s Share and Marketing Margin in Marketing of Vegetables (For Jammu Market)

(Percentages)

Particulars	Tomato	Peas	Cabbage	Cauliflower	Capsicum	Knolkhol
1.Net price received by growers	61.22	-	63.61	63.65	65.89	65.83
2.Expenses incurred by growers						
i)Assembling, packing and grading	2.59	-	2.76	2.23	1.80	2.14
ii)Packing material	0.17	-	0.76	0.51	0.18	0.56
iii)Carriage upto road head	0.52	-	0.59	0.48	0.45	0.46
iv)Transportation upto market	5.01	-	6.15	4.61	4.34	4.77
v)Loading/unloading	0.35	-	0.42	0.32	0.30	0.33
vi)Commission & market fee	3.66	-	2.88	2.86	2.96	2.96
vii)State tax, octrio etc.	0.07	-	0.08	0.06	0.06	0.07
viii) Miscellaneous	0.35	-	0.42	0.38	0.36	0.33
Sub-Total	12.72	-	14.08	11.46	10.45	11.62
3. Wholesale price	73.94	-	77.69	75.11	76.34	77.45
4. Expenses incurred by commission agent/mashakhors						
a)Carriage, handling etc.	1.90	-	2.25	1.65	1.56	1.74
b)Market fee & commission	7.05	-	6.36	6.37	6.92	6.58
Sub-Total	8.95	-	8.61	8.02	8.48	8.33
5.Mashakhors' margin	0.83	-	0.98	0.86	0.99	0.99
6. Mashakhors' sale price	83.72	-	87.28	83.99	85.80	86.77
7.Retailers' Expenses						
- Carriage & handling charges	0.69	-	0.93	0.73	0.60	0.72
- Retailer losses	6.12	-	3.82	6.37	4.85	3.95
Sub-total	6.81	-	4.75	7.10	5.45	4.67
8.Retailers' margin	9.47	-	7.97	8.91	8.75	8.56
9.Consumers' price	100.0	-	100.0	100.0	100	100

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CHAPTER-7

Off-Season Vegetables in Polyhouses

7.1   The State of J&K has three regions; namely, Jammu, Kashmir and Ladakh. The topography and climate of two regions, Kashmir and Ladakh is the same as that of other hilly states under the study like Himachal Pradesh. Therefore, these two regions, comprising of twelve districts, were purposively selected for the study from Jammu and Kashmir and two districts were selected on the basis of highest number of polyhouses (Table 7.1). As is evident from the table, all the polyhouse farmers of the region were

Table 7.1. Present Status of Off-Season Vegetable Production in Kashmir Division-2015

Sr. No.	District	No. of Polyhouses	Area under Polyhouses (raising seedling) ha.	Area covered ha.	Production MT
1.	Anantnag	330	1.32	26.40	733.90
2.	Baramulla	460	1.84	36.80	1008.30
3.	Bandipora	165	0.66	13.20	367.00
4.	Budgam	630	2.52	50.40	1562.40
5.	Ganderbal	132	0.53	10.56	293.60
6.	Kulgam	158	0.63	12.64	351.40
7.	Kupwara	340	1.36	27.20	756.20
8.	Pulwama	412	1.65	32.96	988.80
9.	Shopian	124	0.49	9.92	275.80
10.	Srinagar	530	2.12	42.40	129.32
11.	Leh	160	0.64	12.80	355.80
12.	Kargil	134	0.54	10.80	298.00
Total		3575	14.30	286.08	7120.52

Source: Directorate Of Agriculture , Kashmir, Govt. of J&K

raising only nursery inside the poly houses (3575) and the nursery raised inside these polyhouses was planted in the area of 286.08 ha. with production of off season

vegetables of 7120 MT. During the field survey (in the selected districts of Budgam and Srinagar) also, it was found that the sampled polyhouse farmers were raising only nursery inside polyhouses. Hence no off season vegetables were grown inside polyhouses.

CHAPTER-8

Problems Faced by Vegetable Growers

8.1 In this chapter, an attempt has been made to study the problems of vegetable growers in two sections. First section deals with the problems in raising nursery inside polyhouse and the second section with the problems in growing vegetables outside polyhouse.

8.1   Problems in Raising Nursery Inside Polyhouse

8.2 As far as the cultivation of off season vegetables is concerned, the sampled farmers of the selected areas of J&K raise only nursery inside polyhouses and grow vegetables outside polyhouse. But the farmers have many problems related to polyhouse construction and inputs availability. Majority of farmers faced more than one problem in all the aspects and hence, analysis of multiple responses has been used for this purpose.

Problems Faced in Construction of Polyhouse

8.3   The polyhouse growers of the selected areas were asked about the problems they faced related to construction schedule information, loans/subsidy clearance,

Table 8.1.1. Problems Faced in Construction of Polyhouse

(Multiple Response%)

Type of Problem	Category			Overall
	Small	**Medium**	**Large**	
Information not given clearly	60.00	-	-	60.00
Design	44.00	-	-	44.00
Long wait for loan clearance	30.00	-	-	30.00
Long wait for subsidy	64.00	-	-	64.00
construction	56.00	-	-	56.00

construction material etc. Sixty four percent complained about the clearance procedure of subsidy and thirty percent about the long wait for sanctioning of loan. Sixty percent farmers stated the problems in obtaining information about the time and cost schedule etc. of polyhouse construction. Forty four percent farmers were not happy with design of the polyhouse. Fifty six percent complained about use of inferior material in construction.

Problems Faced in Input Availability

8.4   Various problems like unavailability, higher prices and low quality of inputs were faced by the growers. Seventy percent complained the problem of higher prices of inputs required for raising of seedling in a polyhouse. About fifty six percent reported unavailability of inputs and 74 percent told that the inputs were of low quality.

Table 8.1.2. Problems Faced in Input Availability

(Multiple Responses in %)

Type of problem	Category			Overall
	Small	**Medium**	**Large**	
Unavailability	56.00	-	-	56.00
Higher prices	76.00	-	-	76.00
Low quality	74.00	-	-	74.00

8.2 Problems in Growing Off-Season Vegetables Outside Polyhouse

8.5   The marginal farmers of Anantnag and Budgam areas were enquired about the problems faced by them with respect to transportation, storage, packing material, market intelligences and malpractices and are presented in Table 8.2.1 to Table 8.2.5.

Problems in Availability of Transport

8.6   Majority of the growers (78%) reported that the facilities regarding transportation were not available in time and 75 percent were of the opinion that the transportations charges were high. These problems were faced by more farmers in Budgam area than in Anantnag area.   Twenty five percent of the total sampled farmers reported no problem in this regard (Table 8.2.1).

Table 8.2.1. Problems in Availability of Transport Faced by Sampled Farmers

(Multiple response %)

Particulars	Not available in time	Higher charges	Any other	No problem
Anantnag				
Marginal	60.00	73.73	-	33.33
Small	-	-	-	-
Medium	-	-	-	-
All	60.00	73.73	-	33.33
Budgam				
Marginal	90.00	83.33	-	16.67
Small	-	-	-	-
Medium	-	-	-	-
All	90.00	83.33	-	16.67
Overall				
Marginal	75.00	78.33	-	25.00
Small	-	-	-	-
Medium	-	-	-	-
All	75.00	78.33	-	25.00

Problems of Packing Material

8.7   Various problems like shortage of packing material, high prices of these, non-availability in time are faced by the growers and are presented in Table 8.2.2. More than 86 percent of the sampled vegetable growers quoted the problems of high prices of packing material of vegetables whereas 70 percent stated the problem of shortage of packing material. Only 13 percent reported that the packing material was not available in time. The problems of shortage and high prices of packing material were more in

Anantnag area than Budgam area, whereas the problem of packing material not available in time was more in Budgam area as compared to area. Anantnag.

Table 8.2.2.   Problems of Packing Material Faced by Sampled Farmers

(Multiple response %)

Particulars	Shortage	High price	Not available in time	No problem
Anantnag				
Marginal	73.33	90.00	10.00	-
Small	-	-	-	-
Medium	-	-	-	-
All	73.33	90.00	10.00	-
Budgam				
Marginal	66.67	83.33	16.67	-
Small	-	-	-	-
Medium	-	-	-	-
All	66.67	83.33	16.67	-
Overall				
Marginal	70.00	86.67	13.33	-
Small	-	-	-	-
Medium	-	-	-	-
All	70.00	86.67	13.33	-

Storage Problems

8.8   Majority of the vegetable growers (88%) reported that they have no storage facility. About 47 percent of the sampled growers quoted the problem of inadequate storage facility (Table 8,2.3).

Problems of Market Intelligence

8.9 Market intelligence is more important from the producer's point of view because this gives them an idea about the prevailing price of the produce in the market. Problems in this regard have been classified into late information, available for a few markets only, inadequate information and misleading information.   Majority (76.67%) of the farmers reported that they get inadequate information regarding markets while 53 percent of the vegetable growers were of the view that the information received was misleading.   More than 61 percent opined that they get market information, but it is for a few markets.   About 47 percent quoted that generally they got late information

regarding the prices announced. The above stated problems were more in Anantnag area as compared to Budgam area (Table 8.2.4).

Table 8.2.3.   Problems of Storage Facility Faced by Sampled Farmers

<div align="right">

(Multiple response %)

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Particulars	No storage facility available	Inadequate storage facility	No problem
Anantnag			
Marginal	90.00	50.00	-
Small	-	-	-
Medium	-	-	-
All	90.00	50.00	-
Budgam			
Marginal	86.67	43.33	-
Small	-	-	-
Medium	-	-	-
All	86.67	43.33	-
Overall			
Marginal	88.33	46.67	-
Small	-	-	-
Medium	-	-	-
All	88.33	46.67	-

Table 8.2.4.   Problems of Market Intelligence Faced by Sampled Farmers

<div align="right">

(Multiple response %)

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Particulars	Late information	Available for few markets	Inadequate information	Misleading information	No problem
Anantnag					
Marginal	50.00	66.67	80.00	60.00	
Small	-	-	-	-	
Medium	-	-	-	-	
All	50.00	66.67	80.00	60.00	
Budgam					
Marginal	43.33	56.67	73.33	46.67	
Small	-	-	-	-	
Medium	-	-	-	-	
All	43.33	56.67	73.33	46.67	
Overall					
Marginal	46.67	61.67	76.67	53.33	
Small	-	-	-	-	
Medium	-	-	-	-	
All	46.67	61.67	76.67	53.33	

Problems of Malpractices

8.10   The Table 8.2.5 presents the problems related to malpractices. Forty five percent of the growers stated that commission agents deduct more charges. This problem was observed more in Anantnag area (50%) than Budgam area (40%). Thirty three percent each reported that payment is often paid in instalments and the charges are taken more than once.   More than 41 percent were of the opinion that the commission agents deduct undue charges and about 37 percent said that commission agents quote lower prices than the actual one. The problems of multiplicity of charges, undue deduction and quote less price than actual prices were observed to be more in Budgam area as compared to Anantnag area.

Table 8.2.5.   Problems of Mal-Practices in Market Faced by Sampled Farmers

(Multiple response %)

Particulars	Deduct more charges	Part payment	Late payment	Multiplicity of charges	Undue deductions	Quote less prices than actual prices	No problem
Anantnag							
Marginal	50.00	33.33	23.33	30.00	40.00	33.33	-
Small	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-
All	50.00	33.33	23.33	30.00	40.00	33.33	-
Budgam							
Marginal	40.00	33.33	23.23	36.67	43.33	40.00	-
Small	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-
All	40.00	33.33	23.23	36.67	43.33	40.00	-
Overall							
Marginal	45.00	33.33	23.33	33.33	41.67	36.67	-
Small	-	-	-	-	-	-	-
Medium	-	-	-	-	-	-	-
All	45.00	33.33	23.33	33.33	41.67	36.67	-

CHAPTER-9

Conclusions and Policy Implications

9.1   The mountainous state of Jammu and Kashmir is located mostly in the Himalayan mountains and shares borders with the states of Himachal Pradesh and Punjab. The state has warm valley areas as well as perennially snow-covered peaks. The hilly terrain of Jammu and Kashmir in the north is endowed with a variety of rich climate and topographical conditions. Thus it is famous for tourism, its horticultural production (especially apple) and off-season vegetables. In hilly areas of J&K, knolkhol, peas, tomato, beans, radish etc. are mainly grown in various belts throughout the year as off season vegetables. Off season vegetables are the valuable cash crops of Jammu and Kashmir and are cultivated by the growers in their crop field as well as in polyhouses. Vegetable nursery raising under poly houses is very popular in J&K. Generally in Kashmir region, in polyhouses only seedlings are raised and by planting these seedlings in the field, the yield is taken in advance than the normal method of direct sowing. As there is huge demand for off-season vegetables, farmers get more price out of their produce.

Main Findings

9.2 The total area under various vegetables grown in the State during the year 2014-15 was 21140 hectares. There were many vegetables i.e. sag, onion, carrot, garlic turnip, spinach, methi, coriander, leek etc. grown in Kashmir region which all together constitute 65.32 percent share in total area under vegetables. Among main vegetables grown there, highest area was under Knolkhol (13.59%) followed by tomato (8.70%), cauliflower (4.43%), cabbage (3.94%) and capsicum (1.01%). The total production of various vegetables in the State during the year 2014-15 was 505795 MT. The largest production was of knolkhol (14.57%) followed by tomato (9.94%), cauliflower (4.74%), cabbage (4.25%) and capsicum (4%).

9.3   The total cost (cost C) of cultivation of tomato, cabbage, cauliflower, capsicum and knolkhol (off season vegetables grown outside polyhouse) were Rs.93167, Rs.88974,

Rs.95350, Rs.79191and Rs 89407 per hectare in all the sampled farms. The material cost was the most important component of the total cost C in all the vegetables followed by the labour cost (family & hired) and rental value of owned land. The net return over cost C realized from the cultivation of tomato, cabbage, cauliflower, capsicum and knokhol were Rs.402666, Rs.293601, Rs.420579, Rs.459809 and Rs.430593 per hectare respectively in all the sampled farms under study. The input-output ratio   of capsicum production was also highest (1:6.80) followed by Knolkhol (1:5.82) among all the vegetables in all the sampled farms under study. In the case of tomato, cabbage and cauliflower, input-output ratio was 1:5.32, 1:4.30 and 1:5.41 respectively on all the sampled farms. After capsicum and Knolkhol, cauliflower cultivation was most profitable followed by tomato and cabbage.

9.4   In all the sampled farmers, there was no tendency of retaining vegetables for seed and kind wages or gifts and more than 85 percent of the total produce, except cabbage (77.78%), was sold in markets after home consumption and losses. Out of total marketed produce, 76 to 81 percent was sold in local markets, where no middlemen were involved in selling or buying the vegetables and hence the sampled farmers received handsome price for their produce. Only about 20 percent of the total marketed produce was sold in Jammu market, but this was the only market of sampled farmers for which the price spread could be studied.

9.5   The cost of marketing borne by vegetable growers for selling their produce in Jammu market worked out to be Rs.368, Rs.332, Rs. 360, Rs.349 and Rs.353 per quintal for tomato, cabbage, cauliflower, capsicum and knolkhol respectively. Transportation cost was the main component of total marketing cost borne by the producer in all the vegetables as this market is far away.   The second important component of marketing cost was the cost of commission and market fee. The share of marketing costs in consumer's rupee was maximum in case of cabbage (14.08%) and minimum in capsicum (10.45%).   The share of producer in consumer's rupee was 65.89, 65.83, 63.65, 63.61 and 61.22 percent in capsicum, knolkhol, cauliflower, cabbage and tomato respectively. The mashakhor's margins ranged between 0.83

percent in tomato to 0.99 percent each in capsicum and knolkhol. The retailer's margin was highest in tomato (9.47%) and lowest in cabbage (7.97%).

9.6   The various problems faced by the vegetable growers (growing vegetables outside polyhouse) were lack of transportation facilities, shortage of packing material and lack of storage facilities. The prices of produce depend mainly on the market conditions, and if the growers do not have proper information regarding market, then they cannot take the advantage of high prices. The farmers were facing the problems of getting late information, information available for few markets, inadequate information and misleading information. In most of the cases, commission agents quote lower prices than the actual one.

9.7   As far as the cultivation of off season vegetables inside polyhouse is concerned, the sampled farmers of the selected areas of J&K raise only nursery inside polyhouses and grow vegetables outside polyhouse which reached the markets earlier making the cultivation of off season vegetables more beneficial outside polyhouse. But they face many problems related to polyhouse construction and inputs availability. Sixty four percent farmers complained about the clearance procedure of subsidy and thirty percent about the long wait for sanctioning of loan. Sixty percent farmers stated the problems in obtaining information about the time and cost schedule etc. of polyhouse construction. Forty four percent farmers were not happy with design of the poly house. Fifty six percent complained about use of inferior material in construction. Seventy percent complained the problem of higher prices of inputs required for raising of seedling in a polyhouse. About fifty six percent reported unavailability of inputs and 74 percent told that the inputs were of low quality.

Policy Implications

9.8 It is clear from the above that growing off season vegetables has increased the income of the growers. However, the profitability of these crops still can be improved by taking the following steps.

- Establishment of vegetable processing units in producing areas can improve the profitability by reducing the losses in picking, grading and packing etc., as the well established market at Jammu is very far away. .

- Keeping in view the perishable nature of vegetables and variations in market prices, adequate storage facilities should be developed.

- Arrangements should be made to provide latest information regarding prices and arrivals of the vegetables in Jammu market.

- The emphasis should be given develop infrastructure by improving packing and transportation facilities.

- The polyhouse growers should be provided quality seeds in time and at the reasonable rates so that the productivity of off season vegetables can be increased by using the seedling raised in polyhouses. In order to encourage polyhouse growers to cultivate off season vegetables inside polyhouse, they should be given proper training related to cultural practices i.e. raising nursery and crops, intensity of irrigation, the most appropriate sowing and harvesting time.

- Farmers should be encouraged to establish high tech polyhouses as such polyhouses can produce good quality saplings before their expected time.

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Reviewer comments

1. **Title of the draft report examined:**
   Economic Analysis of Cost and Return of Off-Season Vegetables with Focus on Poly House Effect in Jammu & Kashmir

2. **Date of assignment receipt to the reviewer:** 20.02. 2017

3. **Date of dispatch of the comments: March 14, 2017**

4. **Comments on the objectives of the study:** The objectives of the study are adequate to justify the title of the study.

5. **Comments on methodology , analysis, organization, presentation, *etc*. :**
   The study has been undertaken as per the stated objectives and methodology. Few more observations are furnished herewith for consideration of the authors in the interest of the study.

   i. Number of sample households using poly houses may be indicated somewhere in the methodology (Chapter II) along with percentage figure.

   ii. In chapter III, Table-3.1 and 3.2, should also reflect the absolute figures of area and production against the selected vegetables. Further, the state total figures against those vegetables can also be incorporated to get a vivid picture of the state vegetables scenario. The State average productivity may also be indicated in Tabe-3.3 to have a clearer understanding; Table-3.4 & 3.5 may be omitted as the data on relevant parameters are not available.

   iii. Table 4.13 in Chapter IV may be dropped.

   iv. To intercept the "Poly house effect" few more explanation could have been added in the remaining Chapters, reason being that the study is on working out the costs & returns and ploy house involves handsome amount of costs.

   v. Rechecking of the text is suggested for correction of typographical errors.

6. **Overall view on the acceptability of the report**
   The main objectives of study have been well addressed. The report can be accepted subject to modifications of the issues raised in this para.

Action Taken Report

1. **Date of receipt of comments:** 14.03. 2017.

2. **Date of dispatch of final report:** March 27, 2017.

Action taken on methodology, analysis, organization, presentation *etc*. :

i.   No action required (Chapter II) as there is only one category.
ii.   In chapter III, Table-3.1 & Table- 3.2, the absolute figures on area and production, of vegetables of State total are given now in last row and last column, the rest can be computed from these.
iii.   In Table-3.3, the state average productivity of vegetables on the sampled farms is also included.
iv.   Table-3.4 & 3.5 are omitted as the data on relevant parameters are not available.
v.   Table 4.13 in Chapter IV is dropped.
vi.   The vegetables are not grown inside ployhouse in the sampled area. The farmers were raising only seedling inside polyhouse.
vii.   The editing of the manuscript has been done.