“Marketing and Price Behaviour of Garlic in Indore District of Madhya Pradesh”

THESIS

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Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior

In partial fulfillment of the requirements for the Degree of

MASTER OF SCIENCE

In

AGRICULTURE

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by

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College of Agriculture, Indore (M. P.) 2019-20

CERTIFICATE - I

This is to certify that the thesis entitled **"Marketing and price behaviour of garlic in Indore district of Madhya Pradesh"** Submitted in partial fulfillment of the requirements for the Degree of **MASTER OF SCIENCE** in **AGRICULTURAL (ECONOMICS)** of Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior (M. P.) is a record of the bonafide research work carried out by **Mr. PANKAJ SAHARE** under my guidance and supervision. The subject of the thesis has been approved by the Student's Advisory Committee and Director of Instructions.

No part of the thesis has been submitted for any other degree or diploma or has been published. All the assistance and help received during the course of the investigation has been acknowledged by the scholar.

Place- Indore **(Dr. S. K. Jain)**

Date- Chairman of the Advisory Committee

THESIS APPROVED BY THE STUDENT'S ADVISORY COMMITTEE

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CERTIFICATE - II

This is to certify that the thesis entitled **"Marketing and price behaviour of garlic in Indore district of Madhya Pradesh"** Submitted by **Mr. PANKAJ SAHARE** to Rajmata Vijayaraje Scindia Krishi Vishwa
Vidyalaya, Gwalior, in partial fulfillment of the requirements for the degree of

Master of Science in **AGRICULTURE** in the **Department of Agricultural Economics, College of Agriculture, Indore** has been accepted after evaluation, by the External Examiner and approved by the Student's Advisory Committee after an oral examination of the same.

Place- Indore **(Dr. S. K. Jain)**

Date- Chairman of the Advisory Committee

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CHAPTER –I

INTRODUCTION

Garlic (*Allium sativum*) is one of most important bulbous spices and medicinal crop grow commercially. Garlic holds fifth position in the area under cultivation among vegetable crops in India (Khair *et al.* 2009). India stands second in area and third in production of garlic in the world (Panda, 2010).

Garlic is one of the important spice crops of Madhya Pradesh. Thus to assure the availability of garlic throughout the year and to minimize the fluctuation of prices in the market, the advanced techniques of storage of garlic should be practiced .The major losses during the storage of garlic are loss in weight, rotting, sprouting etc. The important factors that affect the shelf life of garlic are-the variety of the garlic, the dose of fertilizer, irrigation, and per harvest treatment, time of harvesting and technique of harvesting (FAO, 2013).

The storage of garlic is done by the traditional methods i.e. in the environmental conditions. Due to this practice, there is no control over the temperature and moisture. Garlic is perishable commodity having very high post harvest losses estimated to the tune of 20-30 per cent (Panda, 2010). Any attempt in loss prevention of perishable commodities directly adds to the productivity. Reduction of postharvest losses through genetic and cultural manipulations has been tried. Further, low cost ventilated storage structures designed by various institutes have been demonstrated to the farmers and traders.

Value added products of garlic has its own value. Garlic is dehydrated for use in curries and soup powders. Dehydrated Garlic is also used in pharmaceutical preparation. Such products are not only cost effective, nutritionally superior and have a long shelf life. Garlic extracts are obtained from aged garlic cloves after their processing.

Garlic cultivation requires a high level of working capital and human labour, that profit margins were good and that price levels were generally stable and concluded that timely and adequate irrigation facilities are essential in raising the profitability of the Garlic crops.

The major constraints in the production of garlic are the fluctuation in the market prices, lack of storage facilities and transportation. Also lack of processing industries is one of limiting factors in the production of garlic.

India's share in the world garlic production stands at a meagre 4.6 per cent. Total export of garlic from India in 2009 -10 has been estimated at 10,750 tonnes (Rs 3,042 Lakh in value). In India, garlic is cultivated under 280.95 thousand hectare with total production of 1617.34 thousand metric tonnes. and productivity of 5.76 tonnes per hectare in 2013-14. Other major importing countries include Bangladesh, Malaysia and Nepal. (Anonymous, 2011)

In Madhya Pradesh, total production was estimated as 424.50 thousand metric tonnes. which is 26.25% of total production of the country with an area under 81.17 thousand hectares and productivity of 5.23 tonnes per hectare (NHRDF, Nashik 2015-16). India's share in the world garlic production stands at a merge 5.27 per cent in 201516. Total export of garlic from India in 2015-16 has been estimated at 4804.47 metric tonnes (1654.81 Lakh in value) (APEDA, 2016). The variation in the output of garlic leads to wide fluctuations in the market prices exposing the growers to more risk; moreover due to its perishable nature, garlic crop requires immediate marketing to ensure quality produce to the consumer and remunerative prices to the growers.

Madhya Pradesh is also leading in garlic production, area and productivity than other states. In Madhya Pradesh major garlic producing district are Ratlam, Ujjain, Dewas, Mandsaur, Dhar and Indore. Now a day's production of garlic in Indore district is increasing significantly. In Indore district, garlic is cultivated in 21709 ha. area and production is 269944 tonnes in year 2017-18 and has contributed 10% of the total production of Madhya Pradesh. (Horticultural Statistics at a Glance 2018, PP 108)

Considering the above facts, the present study entitled "Marketing and Price behavior of Garlic in Indore District of Madhya Pradesh" was undertaken with the following objectives-

1.1 Objective of study:

1. To study the marketing channels and price spread of garlic in the study area.
2. To estimate the productivity and return of garlic in study the area.

3. To study the constraints in production and marketing of garlic and suggestion to overcome them.

1.2 Assumption:

i. The farmers having restrictions for resources and they must to function in resource limitation. ii. It is anticipated that the main objective of the farmers is to maximize profits by using their resources. iii. It is also presumed that farmers having freedom to take any decision related to their farming enterprise. iv. It is assumed that farmers have knowledge of garlic cultivation.

1.3 Limitations:

The most important limitation of this study is that it pertains to the data collected for only season *rabi*. The farmers do not keep any systematic records of their farming practices and have delivered the data according to their recall memory. Hence, there is a chance of certain prejudice to occur in the present study. The study comprises only those reasons which can be controlled by the farmers and subsidize considerably towards the returns and use of resources .There is no reference is made to factors like risk and uncertainty.

CHAPTER - II

Review of Literature

Future is the manifestation of the past. So past research studies would have the way for the future researchers. It also provides a basis of theoretical framework in addition to helping researcher to get an insight into the methods and procedures. Thus a comprehensive review of the literature is an eventual part of any investigation. In view of the above fact, efforts were made to collect the research findings on the subject possessing similar characteristics. Since, there are less research studies on “An economic analysis of garlic production in Ratlam Distirct of Madhya Pradesh” the work done related to the topic either directly or indirectly has been reviewed and presented under the following sub-headings-

1. Marketing channels and price spread of garlic.

Akinpelu *et al.* (2011) studied marketing margin analysis which revealed that spices' marketing in these agro-ecological zones of Nigeria was efficient and profitable. The marketing margin and efficiency of the spices sampled were in the ascending order garlic > monodora > ginger.

Mishra *et al.* (2014) reported that garlic (*Allium sativum* L.) is the most important commercial crops grown all over the world and consumed in various forms. In India, garlic have been under cultivation for the last 5000 years. It is generally used as vegetables, spices or as medicines. India ranks second to China in area and production in garlic. These crops are generally grown throughout the country especially in the states of Maharashtra, Uttar Pradesh, Orissa, Gujarat, Madhya Pradesh, Haryana, Punjab, Rajasthan, Uttaranchal, Jammu and Kashmir, Bihar, Andhra Pradesh and Karnataka.

Sekhar *et al.* (2014). focused the study on the marketing channels prevalent in Garlic trading, price spread and marketing efficiency and the status of export of garlic to different countries from India. India is having 21 important organized assembling wholesale markets. Among these organized wholesale markets, large number of private and unorganized markets is functioning in all the major garlic producing states. These markets handle a significant quantum of garlic bulbs and acts as a wholesale market in those regions and are becoming price takers. One such market functioning

over a long period of time in Tamil Nadu is the Vadugapatti Garlic wholesale Market of Theni District and the other one is Mettupalayam market wherein the Nilgiris Cooperative Marketing Society, Mettupalayam is one of the institution facilitates garlic marketing and supplies to Vadugapatti.

Manoharan and Ramalakshmi (2015) reported that garlic is now cultivated extensively in countries like China, India, Egypt, USA, Russia and Korea. China occupies the first position in garlic cultivation in terms of production, India occupying the second position in production. The average share of India in garlic cultivation in the world in production is 5.08 per cent. In India, Gujarat leads in production. In Tamil Nadu, production had both increasing and decreasing trend during the study period.

Awasthi *et al.* (2017). found negative relationship between price and arrival for garlic in the market of central India. The price of garlic were non stationary and observed higher in the months from November to January across the selected markets. The price series shows the consequences of unit root and were stationary at first difference. Long run equilibrium relationship and co-integration between selected markets was observed. Most of the selected markets showed unidirectional influence on garlic prices of each other and function as a satellite market and assimilate information.

Bayrakli and Gul (2018) reported garlic production places. Turkey according to 2016 data dehydrated garlic planting area has 11,916 hectares. The production amounted to 109,161 tonnes . Kastamonu province as of 2016 in terms of production and acreage of garlic is in first place in Turkey. The Kastamonu's garlic cultivated area share is 20.06% and production share is 22% of Turkey. Gaziantep is the second important garlic producers with 12.9% share of Turkey, Istanbul is third with 11.6%, Aksaray is fourth with 7.5%, Balikesir ranks fifth with 6.1%.

Patidar (2018) conducted studies during the *rabi* season of 2014, to study the different marketing channel of garlic, to analyze the marketing margin, price spread in garlic marketing and to identify barriers and future thrusts in garlic production and marketing. The study was based on data for the year 2013-14 collected from a sample of 60 garlic growers in Ratlam district. The market functionaries in the trading of garlic producer get higher share approaching nearly 97.62 per cent consumer's paid price and also marketing cost, margin and price spread was 2.28 %.

2. Productivity and return of garlic

Samavatean *et al.* (2011) studied the energy balance between the input and the output per unit area for garlic in Humedan province of Iran. In this study, data were collected by administering a questionnaire in face- to face interviews. Results showed that the highest share of energy consumption belongs to chemical fertilizers (41.7%) followed by diesel (13.94%) the results indicated that a total energy input of 40307.89 MJ ha^{-1} was consumed for garlic production. Highest shares of expenses were found to be 45% and 19% for human labor and hired machineries. respectively. Cost analysis revealed that total cost of production for 1 ha garlic production was around 6969.11, Accordingly, the benefit-cost ratio was estimated as 1.36. Using Cobb-Douglas model, energy function was estimated with the coefficient of determination, R2 of (80%), and expenses function was estimated with coefficient of determination, R2 of (83%).

Haque *et al.* (2013). conducted the study in Magura and Faridpur districts during 2008-2009 to analyze the relative profitability, input-output relationship, and constraints to garlic production. Primary data were collected from 100 randomly selected garlic farmers for the study. The gross margin and net return were Tk. 70660 and Tk 56914 per hectare, respectively. The benefit cost ratio was 1.87. The net returns from garlic cultivation were 68%, 59%, and 0.64% higher than mustard, groundnut and cabbage cultivation. Cobb-Douglas production function revealed that human labour, land preparation cost, manure, TSP, irrigation and insecticide had positive effect on the yield of garlic.

Meena *et al.* (2013) found that costs A1 to cost C3 increases with the increase in size of holding and total cost also increased with increase in farm size. Gross income per hectare was the highest in large farmers followed by small and medium farmers respectively. Net income and farm business income per hectare decreased with increase in farm size. The cost benefit ratio was found to be the best on the small size farms followed by the large and medium size farms. The estimation of Garlic is expensive but highly profitable.

Monayem *et al*. (2013) reported that garlic (*Allium sativum* L.) is an important spices crop in Bangladesh. Among the bulb spices, garlic ranks third in terms of area (37072 ha) and production (164392 m. tonnes) and covered 7 per cent of the total area under spices. The average yield of garlic was 4.43 metric tonnes per hectare (BBS, 2010).

Molaei (2014) studied regression analysis for the other dependent variable i.e.

price of garlic on wholesale buyers' center revealed that garlic production cost, market oriented marketing, the cost processing garlic, accessing loans and total frequency of garlic are significantly effective on this variable.

Manoharan and Ramalakshmi (2015) studied Tamil Nadus average share in garlic cultivation in India in production is 0.47 per cent. In Dindigul district, the study area, it s average production of garlic during the study period was 2080 tonnes per hectare. Dindigul district ranks first in production. Dindigul district, the study area has all possibility to increase production if new technologies in agriculture, labour saving and new techniques are used.

Kashyap (2016) found that the amount incurred cost A1 variety wise per hectare was on an average Rs. 56735 per hectare in variety Jamnagar followed by Rs. 103517 per hectare in variety G-2 and Rs.63883 per hectare in variety Amletha respectively. It is revealed that the average Cost C3 of garlic for all the varieties was the highest on large size group being Rs.135375 per hectare followed by medium farms Rs.133920 and small farms Rs.128612 respectively. This showed that cost C3 was found to increase with increase in size of holding.

Bayrakli and Gul (2018) reported that Kastamonu is Turkey's highest dry garlic producer. Kastamonu province in 1991, a total of 13,298 tonnes of garlic was produced by making 1,514 hectares of garlic in the field. The cultivation area continued to increase year by year. In 2011, the total dry garlic production reached 19,937 tonnes. In 2013-2014 it decreased by 2,055 hectares. There was a decrease due to drought in 2012, planting area and yield decreased in 2013. From 2014, the cultivated area of garlic has risen to over 2055 hectares, and thus production has increased to 24024 tonnes in 2016. As of 1991-2016 years of dry garlic production share’s 13.9% to 32.7% in Turkey was carried out by Kastamonu. Garlic cultivation areas (hectare) in Turkey Source: TUİK [13]. Garlic production (tonnes) in Turkey Source: TUİK [13]. Kastamonu’s garlic production and harvested area share in Turkey Source: TUİK [13]. Dry garlic production area in Kastamonu province is got stronger in Taşköprü, Merkez and Hanönü districts. Taşköprü district was selected as a research area.

Patidar (2018) conducted an experiment on economic analysis of garlic production in the Ratlam District of Madhya Pradesh. Production data were collected from 60 farmers randomly from three village areas of Ratlam block of Ratlam district of

Madhya Pradesh State. The overall average productivity and gross return of garlic was recorded 136.04 q/ha and 306550 respectively. The farm size group wise productivity of garlic was 140.81q/ha obtained in small size group followed by 142.47q/ha and 124.85q/ha in medium and large size farm, respectively. Gross income obtained in small size group was 315414 followed by 321950 in medium and 282285 minimum in large size group. The lead functional form was the double log function which produced overall R2 of 0.98 followed by 0.96, 0.66 and 0.92 in small, medium and large farm group with an overall average of 0.98. On average, overall sum of elasticity was found to be 0.72 which is less than one whereas it was followed by 0.91 in small, 0.93 and 1.00 in medium and large size group, respectively.

3. Constraint in production and marketing of garlic, suggestion to overcome them.

Haque *et al.* (2013). conducted the study in Magura and Faridpur districts during 20082009 to analyze the constraints to garlic production. Primary data were collected from 100 randomly selected garlic farmers for the study. Non-availability of HYV garlic seed, lack of technical knowledge about improved cultivation practices of garlic, infestation of insects and diseases and low market price were the major problems for garlic cultivation.

Monayem *et al*. (2013) reported garlic (*Allium sativum* L.) is generally cultivated with traditional method. Production of garlic is increasing day by day in Bangladesh. Table 1 revealed that the highest growth in area, production, and yield were registered in Rajshahi division followed by that of Khulna division. But due to increase in population, garlic production of the country does not meet up the domestic demand. There is an acute shortage of garlic in relation to its requirement. Every year, Bangladesh imports big amounts of garlic from neighbouring country and others to meet up the demand of its population.

Meena *et al.* (2018) studied and discussed break even analysis and constraint of garlic. The result of this study indicated that the most serious constraints as perceived by the farmers in garlic production were the high price of garlic seed at time of sowing, high cost of garlic cultivation, unfavorable product price and high cost of irrigation. Selected small, medium and large farmers will not be at loss even if their actual yield of garlic declines by 56.22, 54.27 and 54.18 quintals per hectare

respectively and selected small, medium and large farmers will not be at loss even if their actual price of garlic decline by 986.96, 1005.55 and 1014.77 Rs. per quintals respectively.

CHAPTER - III

MATERIAL AND METHODS

This chapter deals with the research methodology adopted in the selection of block , villages , farms and markets for the present study, under the following heads.

1. Study area
2. Sampling procedure
3. Collection of data and method of enquiry.
4. Analytical tools

3.1. Study Area :-

Garlic is one of the main horticultural crops in the district Indore of Madhya Pradesh where farmers are cultivating with improved farming practices. Hence, Indore District of Madhya Pradesh was taken for the purpose of this study.

3.2. Sampling Procedure:-

Indore block of Indore district was purposively chosen as the study area as, it has the larger area under garlic in the district. A multistage stratified random sampling technique was adopted to select block, villages and the respondents. The details of the sampling techniques at various stages are given as under:

3.2.1 Selection of Block -

Indore district comprises of four blocks i.e. Depalpur, Sanwer, Indore and Mhow. All the four blocks come under Garlic production. In the present study, three stage stratified sampling technique was used. In the first stage Indore block of Indore district was selected on the basis highest area under Garlic crop.

3.2.2 Selection of Village -

In the second stage, a list of garlic growing villages was prepared and among them 5 villages were selected randomly.

3.2.3 Collection of data-

Depending upon the objectives of the study primary data was used. The primary data was collected from selected samples using pretested questionnaire, through survey method. Each selected respondent was approached personally for recording relevant data. The secondary data was collected from Agriculture Department of district and blocks.

3.2.4 Selection of farmers:

In the third stage, a list of garlic growers was prepared for the 5 selected villages in acceding order, according to the size of their holding under garlic crop. The garlic producing farmers were then categorized as small (>2 ha.) ,medium (2 to 4 ha.) and large (above 4 to 10 ha.), based on land holding size of the farmers. 90 farmers from their groups were selected randomly according to proportional allocation technique . Thus, the sample was confined to 90 Garlic farmers from 5 villages. All the sample garlic producers were sold their produce through the forwarding agent in the wholesale market. The actual marketing cost incurred by the sample garlic producers through different channels was considered. The tabular method and percentage analysis was carried out to examine costs, margins and price spread in Indore vegetable mandi. The relevant information regarding the marketing of garlic was obtained from these selected market intermediaries by interviewing personally with the help of pre-tested schedules. The primary data on the relevant aspects specified in objectives were collected from the sample farmers for the reference year 2017-18.

3.2.5 Period of Study:-

Data was collected for the Production year 2017-18 in *rabi* season.

Table 3.1 Number of villages and selected farmers of Indore block.

Name of selected villages	Number of garlic grower			Total	Number of selected farmer			Total
	Small (>2 ha.)	Medium (2 to 4 ha.)	Large (<4 to10 ha.)		Small (>2 ha.)	Medium (2 to 4 ha.)	Large (above 4 to10 ha.)	
Depalpur	62	31	27	120	8	4	3	15
Kampel	63	30	27	120	9	6	6	21
Hatod	50	40	30	120	10	8	6	24
Sawer	48	41	31	120	6	5	4	15
Kharadia	23	45	52	120	3	6	6	15
Total	246	187	167	600	36	29	25	90

Average : The average given in the present study related to the weighted average

$$W.\ M. = \frac{\Sigma WX}{\Sigma W}$$

Where as,

M= Mean

X = variable value.

W = weight of X

3.3.2 Imputed cost :

Include the value of family labour /managerial input of the farmer, rent of owned land and interest on owned fixed capital for which the farmer does not incurred any cash expenses.

ANALYTICAL TOOLS :

3.3.1 Total cost : It are the expenses related to the costs of running a business operations. These are two types, fixed costs and variable costs.

(1) Fixed costs : These costs are related to fixed resources and overhead costs. Rent, interest, depreciation, taxes and wages of the permanent labour constitute fixed costs.

(2) Variable costs : These costs are related to the variable resources and changes with the level of output .

Cost concepts :

3.3.2 Cost items:

The items of cost of cultivation cover both paid out cost (out of pocket expenses cash + kind) and the imputed costs. The items covered under these costs are:

Paid – out costs :

(i) Hired labour (human, animal and machinery).

(ii) Maintenance expenses on owned animals and machinery.

(iii) Expenses on material inputs such as seed (home grown and purchased), fertilizer, manure (owned and purchased), pesticides, and irrigation.

(iv) Depreciation on implements and farm buildings.(such as cattle sheds machine sheds, storage sheds).

(v) Land revenue.

(vi) Rent paid for leased in land.

Cost A_1 : all actual expenses in cash and kind

Cost A_2 : Cost A_1 + rent paid for leased in land.

Cost B_1 : Cost A_2 + interest on value of owned fixed capital assets (excluding land)

Cost B_2 : Cost B_1 + rental value of owned land.

Cost C_1 : Cost B_1 + imputed value of family labour.

Cost C_2 : Cost B_2 + imputed value of family labour.

Cost C_3: Cost C_2 + 10 per cent of cost C_2 to account for managerial input of the farmer.

Cost C_3 is more comprehensive and represents the total cost of cultivation.

It is very important when farming is considered to be strictly commercial preposition.

3.4 PROFITABILITY ASPECTS:-

For the estimation of profitability, the following income measures was used.

(1) Gross income = Market price per quintal * Yield

(2) Net farm income (NFI) = Gross income - cost C_3 (total cost)

(3) Family labour income (FLI) = Gross income - cost B_2

(4) Farm business income (FBI) = Gross income - cost A_1

(5) Benefit cost ratio (B.C ratio) = Gross income/ Gross expenses

3.4.1 Total Production : Total quantity of output produced by a firm for a given quantity of inputs.

Total production = Main product + By product

3.4.2 Gross income : It is the total value of main product and value of by product.

Gross Income = Value of main product + Value of by product

3.4.3 Net income : It is net profit after deduction of all cost items ,variable and fixed gross income.

Net Income = Gross Income – Total Cost

3.4.4 Cost of production (Rs/q) :The expenditure incurred in producing a unit quantity of output is called cost of production.

$$\text{Cost of production (Rs/q)} = \frac{\text{Total cost – value of by product}}{\text{Yield}}$$

3.5 Marketing analysis:- Market functionaries i.e. local traders, wholesaler, retailer and others included in the study.

3.5.1 Marketing channels:- Marketing channel is defined as the path in which the produce travels from producer to the ultimate consumer through the involvement of intermediaries like wholesalers commission agents and the traders.

The three marketing channels were identified during the course of investigation.

a) Channel – I : Producer → Consumer

b) Channel – II: Producer → Wholesaler→Retailer → Consumer **3.5.2 Price spread (%) :**

$$\text{Price spread (\%)} = \frac{\text{Consumer price} - \text{Producer price}}{\text{Consumer price i.e. Producer – consumer}} \times 100$$

Producer – wholesaler – retailer – consumer

3.6 Production constraints :- The different aspect i.e. technological, production and financial constraints was considered to know the overall production constraints faced by the respondents in Garlic grown in study area. Collaboration with other Departments.

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CHAPTER - IV

RESULTS

In this chapter assembled data has been used for examination and accessible in a suitable, and rationally reliable tabular form. This chapter is important since the collected records and facts are deliberated in a rational order that is reliable with the major aims or emphasis of the research problem. This chapter also treat with understanding of the true implication of the evidences presented, in relations of the aim of the study in the form of data. The aim of clarification and simplification is to search for the comprehensive meaning of these responses by connecting them to the other existing knowledge.

For the ease of the study the chapter contains six divisions as below:

1. Socio economic characteristics of garlic growers.
2. Cost of cultivation and productivity of garlic cultivation in study area.
3. Profitability aspect from garlic cultivation.
4. Marketing channels and price spread of garlic marketing in study area.
5. The constraints in production and marketing of garlic and suggestion.

4.1 Socio economic structure of garlic growers:

Socio economic status of garlic growers is one of the factors responsible for level of inputs and technology used at farm level and this makes the managerial power effective in decision making process to get maximum farm profit from their farms. This comprises of personnel characteristics of farmers, structure of family and structure of farm respectively. Hence, it is pertinent to assess the characteristic of the respondents as below.

I. Structure of family:

Structure of farm family consists of size of individual family and characteristics of farmers its self like age, literacy position and family work force etc. It is felt need to have brief information about the sample respondents and their family members, because they are responsible for farm development and decision making in resource use and production pattern which is the main factor to maximize the family income from their farm.

Age and education level of garlic growers:-

The garlic growers generally take the important decision on the farm business with reference to input use, cropping pattern and other farm management practices which are influenced by the level of education and experienced gained by the garlic growers with their length of age. Therefore, it is pertinent to have an idea regarding the age and education level of the garlic growers. The data on supply of garlic cultivators in relation to age and education level has been mentioned in Table 4.1

Table: 4.1 Dispersal of garlic cultivators in accordance with their age and education level in different size of holding. (Average number of person per farm)

Particular	Size of holding			
	Small	Medium	Large	Average
Average Age group (year)	51.46	52.03	52.25	51.91
Education level				
Illiterate	7 (38.89)	16 (40.00)	12 (37.50)	35 (38.89)
Upto primary	5 (27.78)	10 (25.00)	8 (25.00)	23 (25.56)
Upto middle	3 (16.67)	6 (15.00)	4 (12.50)	13 (14.44)
Upto high school & above	3 (16.67)	8 (20.00)	8 (25.00)	19 (21.11)
Total	18 (100.00)	40 (100.00)	32 (100.00)	90 (100.00)

(Data presented in parentheses shows percentage to total)

Age level:

The age factor plays an important role with working long hours and hard work in one way and decision making capacity in another way. Table 4.1 revealed that the

average age of garlic growers was found to be 51.91 years old. The minimum age of garlic grower was found to be 51.46 year in small size of grower and the maximum age of garlic growers was found to be 52.25 years old. respectively.

Education level:

Education is associated with direct bearing on the farming as it is viable for a quick and thorough adoption of improved technology. However, it might be depending upon the quality and nature of education and training. Data revealed that on an average (38.89%) garlic growers were illiterate while, remaining (61.11%) garlic growers were literate. Table 4.1 presented the distribution of the garlic growers as per level of education in different size of holding. The data revealed that the higher literacy positions were found to be in case of large farmers (25.00%) followed by (20.00%) in case of medium farmers and (16.67%) in case of small farmers respectively. This shows that higher literacy position was found to increase with increase in size of holding.

Average size of family and work force.

Size of farm family and available work force in a family are considered to be a factor influencing economic status. Family is one unit, which includes the total number of members to cultivate the given operational area. The detail of family has been presented in Table 4.2.

The study shows that the average size of family of garlic cultivators was found to be 6.99 individuals per farm holding. Study discloses that the family size was found to rise with rise in size of farm holding. In this way, in case of small garlic growers the average size of family was found to be 6.27 persons per farm followed by 6.95 persons and 7.76 persons in case of medium and large garlic growers respectively. The distribution of family working force revealed that the average number of active members was found to be 3.49 people per farm. These persons are performing many farm and other activities for earning family income. Study revealed that the higher number of workers were found in large size of holding i.e. 4.2 persons per family followed by 3.53 and 2.84 persons in case of medium and small garlic growers respectively.

Table: 4.2 Distribution of strength and work force in different size of holding. (Average number of person per farm)

Family description	Size of holding			
Strength	**Small**	**Medium**	**Large**	**Average**
Male	1.57	2.31	2.64	2.17
Female	1.45	1.89	2.15	1.83
Children	3.25	2.75	2.97	2.99
Total	6.27	6.95	7.76	6.99
Work force				
Male	1.45	2.05	2.35	1.95
Female	1.39	1.48	1.76	1.54
Total	2.84	3.53	4.11	3.49

Size of land holding:

Size of sample of respondents was allocated 30, 30 and 30 from small, medium and large size farm respectively. Total number of respondents was 90.

Average size of holding in small size of group was 1.55 ha. followed by 3.32 and 5.76 hectares in medium and large size group respectively (Table 4.3). The cultivated area, ranged to 45.37 (97.20%), 97.88 (98.02%) and 167.80 (97.16%) for small farmer, medium and large farmers respectively. The un- cultivated area was found to be 1.30 (2.80%), 1.98 (1.98%) and 4.90 (2.84%) hectare, for small, medium and large size sets separately. The irrigated area was 40.82 (90.07%), 86.12 (87.98%) and 132.35 (78.87%) hectare on small, medium and large size sets separately. And un- irrigated area also varied and was found to be (9.93%), 11.76 (12.02%) and 35.45 (21.13%)hectare for small, medium and large size group respectively.

Table 4.3 The distribution of selected sample of garlic growing farmers, the net cultivated area and regular size of farm land assets under variable size set of sample farms

Particulars	Size group			
	Small	**Medium**	**Large**	**Total/Average**
Number of farmers	36	29	25	90
Total land holding (ha.)	46.61 (100)*	99.86 (100)*	172.70 (100)*	106.39 (100)*
Average size of land holding	1.29	3.44	6.91	3.88
Net cultivated Area	45.37 (97.20)*/(100)	97.88 (98.02)*/(100)	167.80 (97.16)*/(100)	103.67 (97.44)*/(100)
Uncultivated land	1.30 (2.80)	1.98 (1.98)	4.90 (2.84)	2.73 (2.56)
Net sown/cropped area	44.85 (96.21)	95.91 (96.04)	162.90 (94.33)	101.22 (95.14)
Fallow land	0.46 (0.46)	1.98 (1.98)	4.90 (4.90)	2.45 (2.45)
Irrigated area (ha)	40.82 (90.07)	86.12 (87.98)	132.35 (78.87)	86.43 (85.64)
Un-irrigated area(ha)	4.50 (9.93)	11.76 (12.02)	35.45 (21.13)	17.24 (14.36)

(Data presented in parentheses shows percentage to total)

Intensity of Cropping :

Table 4.4 Cropping Intensity of different size group of land holdings on the sample farms (in ha.).

S. No.	Crops	Size group			Overall
		Small	**Medium**	**Large**	
A.	***Kharif***				
1	Soybean	26.73	60.23	115.55	67.50

2	Maize	4.25	9.78	15.23	9.75
3	Urd/Moong/cowpea	5.61	7.55	11.33	8.16
4	Vegetable	4.89	8.61	9.93	7.81
5	Other	3.37	9.74	10.86	7.99
Sub Total		44.85	95.91	162.90	101.22
B.	***Rabi***				
1	Pea	5.87	7.42	12.75	8.68
2	Wheat	12.71	26.25	29.44	22.80
3	Chickpea	3.15	8.36	19.01	10.17
4	Garlic	15.13	36.56	51.90	34.53
6	Other	3.96	7.53	19.25	10.25
Sub Total		40.82	86.12	132.35	86.43
C.	**Summer**				
1	Jowarchari	2.85	5.35	7.65	5.28
2	Vegetables	4.75	7.12	10.45	7.44
Sub Total		7.60	12.47	18.10	12.72
Gross cropped area		93.27	194.50	313.35	200.37
Net cropped area		44.85	95.91	162.90	101.22
Cropping intensity (per cent)		207.96	202.79	192.36	201.04

Table 4.4 shows, average area sown in *kharif* season was 101.22 ha. followed in *rabi* and summer season 86.43 and 12.72 ha. respectively. The intensity of cropping was the highest in small farm (207.96%) followed by 202.79% and 192.36% in medium and large size farm. Average cropping intensity was approaching 201.04% per cent (Table 4.4).

Inputs use in physical units for garlic Cultivation Per hectare:

Table 4.5 Cost of cultivation per hectare of garlic for different size groups

(Rs./ha.)

	Particular	Size of holding			
S.No	**Cost item**	**Small**	**Medium**	**Large**	**Average**
A	**Labour cost**				
1	Value of family labour	8500 (7.82)	7379 (6.75)	5450 (4.81)	7109.67 (6.43)
2	Value of hired human labour	5765 (5.31)	6810 (6.23)	9950 (8.78)	7508.33 (6.79)
4	Value of machine power (H+ O)	4751 (4.37)	5846 (5.34)	6384 (5.63)	5660.33 (5.12)
	Sub total	19766 (18.19)	20685 (18.91)	22329 (19.70)	20926.67 (18.94)
B	**Material Cost**				
1	Value of Seeds	9250 (8.51)	9625 (8.80)	10862 (9.58)	9912.33 (8.97)
2	Value of fertilizer & manure	11785 (10.85)	11709 (10.70)	12734 (11.23)	12076.00 (10.93)
3	Plant protection measures	8150 (7.50)	8565 (7.83)	8975 (7.92)	8563.33 (7.75)
4	Irrigation charges	5410 (4.98)	5475 (5.01)	5535 (4.88)	5473.33 (4.95)
5	Other variable cost	2258 (2.08)	2570 (2.35)	2809 (2.48)	2545.67 (2.30)
6	**Sub total**	38523 (56.88)	39514 (58.34)	42065 (60.21)	40067.56 (58.52)
	Interest on working capital	3497.34 (3.22)	3611.94 (3.30)	3863.64 (3.41)	3660.57 (3.31)
	Total variable cost	61786.34 (56.88)	63810.94 (58.34)	68257.64 (60.21)	64670.12 (58.52)
C	**Fixed cost**				
1	Taxes, land revenue	30.00 (0.03)	30.00 (0.03)	30.00 (0.03)	30.00 (0.03)
2	Rental value of own land	34518.4 (31.77)	33317.63 (30.46)	32639.82 (28.79)	33491.88 (30.30)
	Depreciation	1083 (1)	1026 (0.96)	949 (0.84)	1019.33 (092)

3	Interest on fixed capital	1340.74 (1.23)	1250.88 (1.14)	1186.53 (1.05)	1259.38 (1.14)
	Total fixed cost	36952.14 (3403)	35624.51 (32.57)	34805.35 (30.70)	35800.60 (32.39)
Grant total cost (Cost C_2)		98758.48 (90.91)	99435.45 (90.91)	103062.99 (90.91)	100470.72 (90.91)
Cost C3(Cost C_2 +10% of Cost C_2)		108634.32 (100)	109378.98 (100)	113369.28 (100)	110517.78 (100)

(Data presented in parentheses shows percentage to total)

On the basis of above observation the conclusion is that small size farm invested more, on human labour, bullock labour and fertilizer. Higher allocation on human labour was a result of sufficient availability of family labour. (Table 4.5).

Family labour cost in the form of wage was substantially higher in small size farm Rs. 85000 (maximum) and Rs. 5450 in large size (minimum) and medium size farm Rs. 7379 respectively. Hired human labour cost in the form of wage was substantially higher in large size farm Rs. 9950 (maximum) and Rs. 5765 in small size (minimum) and medium size farm Rs. 6810 respectively. In per cent term, the same pattern was followed as indicated in wage term. Machine labour charge was higher in large size group (6384, maximum) and Rs. 4751 (minimum) small size group. Seed cost was same confirmed for small size group Rs. 9250 followed by Rs.9625 and Rs. 10862 for medium size group and large size group respectively. Manures and fertilizers application was lower in medium size group (Rs. 11709), increasing to Rs. 11785 in small and Rs. 127341(maximum) in large size group with minor variance The same behavior was observed in percent distribution of these inputs among the various sizes. Irrigation charge was Rs. 5410 in small size which increased at the rate of Rs. 5475 in large and medium size group Rs. 5535 respectively. Land revenue state or village panchayat tax was Rs. 30 per ha. for each size group.

Cost of cultivation based on cost concept :

Table 4.6 Cost of garlic production based on cost concepts of different size farms (Rs./ha).

Cost	Size of group			
	Small	**Medium**	**Large**	**Average**

Cost A_1 /(A_2)	53341.80 (51.89)	56487.80 (54.57)	62865.13 (57.90)	57564.91 (54.84)
Cost B_1	56911.80 (55.37)	59767.80 (57.73)	66895.13 (61.61)	61191.58 (58.30)
Cost B_2	84944.86 (82.84)	86732.09 (83.78)	93253.28 (85.89)	88310.01 (84.14)
Cost C_1	65411.80 (63.64)	67146.80 (64.86)	72345.13 (66.63)	68301.24 (65.07)
Cost C_2	93444.86 (90.91)	94111.09 (90.91)	98703.28 (90.91)	95419.68 (90.91)
Cost C_3	102789.35 (100)	103522.20 (100)	108573.61 (100)	104961.65 (100)

(Data presented in parentheses shows percentage to total)

The operational cost known as cost A_1/A_2 accounted for Rs. 53341.80 (51.89% to total cost) in small size afterwards Rs. 56487 (54.57%) in medium size, and Rs. 62865.13 (57.90% of the total cost) in large farm size. CostB_1 accounted for Rs. 56911.80 (55.37% to total cost) in small size afterwards Rs. 59767.80 (57.73%) in medium size, and Rs. 66895.13 (61.61% of the total cost) in large farm size.. The same trend was also observed in the case of cost B_2. The average cost C_1 and C_2 was found to be Rs. 68301.24 (65.07%) and Rs. 95419.68 (90.91%) respectively.

Cost C_2 known as total cost per hectare accounted for Rs. 93444.86, 94111.09 and 98703.28 on small medium and large size groups respectively (Table No. 4.6). As per the basis of above-mentioned discussion, the major factor of cost C_3 (total) and operational cost known as A_1/A_2 of small farm was minimum and when size of farm increased the total cost according to size of farm and the same thing happened in B_1 and B_2. Also Cost C_1 was higher in large size group due to lack of management of labour. Almost the same trend was there in the case of cost C_2. Cost A_1/A_2 was higher in large size group followed by medium and large size group due to involvement of more human labour, machine power, plant protection, irrigation charge associated with depreciation, repairs and interest incurred on various inputs used in this process.

Table 4.7 Production and profitability of garlic cultivation of different size farms.(Rs./ha.)

Particulars	Size group			
	Small	Medium	Large	Average

Main product (q/ha)	112.56	108.35	106.55	109.15
Price of per quintal	1840.00	1845.00	1838.00	1841.00
Gross income	207110.40	199905.75	195838.90	200951.29
Net farm income	108634.33	109378.99	113369.29	110517.79
Family labour income	83253.54	75053.66	64895.62	74400.61
Farm business income	114856.60	105297.95	95283.77	105145.71
Total cost	98476.07	90526.76	82469.61	90433.50
Benefit cost ratio	1:1.91	1:1.83	1:1.73	1:1.82

Returns of garlic production :

The productivity of garlic in terms of yield per hectare in small size group 112.56 q/ha (maximum) followed by 108.35 q/ha and 106.55 q/ha (minimum) in medium and large size farm, respectively. Gross income a sum of yield multiplied by unit price of garlic had also denoted in the same pattern as followed in productivity. In small size group, the obtained gross income was Rs. 207110.40, medium size group the gross income was Rs.199905.75 and Rs. 195838.90 least in large size. The average yield and gross monetary profit of study area of garlic noted 109.15 q/ha and Rs. 200951.29 respectively.

Table 4.8 Return of garlic production over cost concept of different size farms.

(Rs./ha.)

S. No.	Cost	Size of group			
		Small	Medium	Large	Average
1	Cost A_1 /(A_2)	114856.60 (68.29)	105297.95 (65.04)	95283.77 (60.35)	105145.71 (64.62)

2	Cost B_1	111286.60 (66.16)	102017.95 (63.06)	91253.77 (57.70)	101519.04 (62.39)
3	Cost B_2	83253.54 (49.50)	75053.66 (46.39)	64895.62 (41.03)	74400.61 (45.73)
4	Cost C_1	102786.60 (61.11)	94638.95 (58.50)	85803.77 (54.60)	94409.38 (58.02)
5	Cost C_2	74753.54 (44.44)	67674.66 (41.83)	59445.62 (37.59)	67290.94 (41.36)
6	Cost C_3	65409.05 (38.89)	58263.55 (36.01)	49575.29 (31.35)	57748.97 (35.49)
	Gross income (Rs/ha)	168198.40 (100)	161785.75 (100)	158148.90 (100)	162710.62 (100)

(Data presented in parentheses shows percentage to total)

On the basis of various costs as observed in input wise cost Table as per their cost concept, net return per hectare over cost A_1 recorded in the order of Rs. 114856.60 for small size subsequently Rs. 105297.95 in medium size and Rs. 95283.77 in large size separately. Similarly, net return for cost B_1 was in the order of Rs. 111286.60, 102017.95 and Rs. 91253.77 in small, medium and large group. Net return for cost B_2 in small, medium and large size group was Rs. 83253.54, Rs. 75053.66 and Rs. 64895.62 respectively. The net return over cost C_1 was Rs. 102786.60, Rs. 94638.95 and Rs. 85803.77 in small, medium and large size groups respectively. In case of the net return over. Cost C_2 it was Rs. 74753.54 in small size group, Rs.67674.66 and Rs.59445.62 in large size group. The net return over cost C_3 known as net farm income determines the profitability status of crop recorded in small size Rs. 168198.40 followed by Rs. 161785.75 in medium size and Rs. 158148.90 in large size group respectively.

On the basis of above discussion the conclusion is that net return over cost A_1/A_2 and net return on cost C_3 was comparatively higher in small size farm. Reverse to that, production cost per quintal was minimum in large size farm followed by medium and small size group. (The additional bonus point that went in the favour of small size group was higher benefit cost ratio in medium size farm indicate that inspire of financial crisis and other constraints this category of farm organized and managed its farm operation

effectively compared to large size farms in the cultivation of garlic crop). Involvement of higher human labour in this category indicates that under the situation of zero opportunity, cost of family labour was appreciably utilized in this category with this intention that in cash payment term it required nothing except food and shelter which was a fixed liability of garlic growers.

Marketing cost and price spread of various agencies in the marketing of garlic in Channel-I:

It was the simplest marketing channel having no involvement of market intermediaries in the trading of garlic marketing as interaction was directly made between producer and ultimate consumer. It resulted minimum cost in marketing of garlic incurred on producer. The share of producer in consumer's paid price was maximum as approaching nearly 96.74 percent and price spread was found to

3.26% (Table 4.9).

Table 4.9 Average costs and price spread of various agencies in the marketing of garlic per quintal through Channel- I:

S. No.	Particulars/ Market functionaries	Amount (Rs./ha)
1	Marketing costs at producer level	
	Transportation	15
	Loading, unloading & weighing	15
	Beg	30
	Sub total	60
	Producer net price	1781
	Consumer paid price/producer sale price	1841
2.	**Producer's share in consumer's rupee (%)**	**96.74%**
3.	**Price Spread**	**3.26%**

Channel II:

In this channel between producer and ultimate consumer, there was an involvement of wholesaler and retailer. The function of wholesaler and retailer which plays the part in searching and creation of demand of consumer, charge their margin and cost incurred on various activities rendered by them. Due to these functions and involvement of marketing cost and returns, margins expanded the difference in price received by producer and price paid by ultimate consumer. Thus resulted in the decrease of producer share up to 85.17 percent in consumer's paid price and also price spread 14.83% which was very high (Table No. 4.10).

On the basis of foregoing discussion of marketing cost and margins conclusion is that as the marketing functionaries reduced the share of the producer in consumer paid price on one side and on the other size increased the consumer's paid price indicating that share of producer price tend to decline as per increase in the number of marketing functionaries and compelled the consumers to pay higher prices for the same quantity of garlic without any relief.

Table 4.10 Costs and price spread borne by various agencies in the marketing of garlic per quintal through channel-II.

S. No.	Particulars/ Market functionaries	Amount (Rs./ha)
1	**Cost incurred by producer**	
	Transportation	15
	Loading, unloading & weighing	15
	Two gunny beg	30
	Sub total	60
	Producer net price	1781
	Producer's sale price/retailer's paid price	1841
2	**Cost incurred by wholesaler**	
	Weighing, loading and unloading	10
	Two gunny bags	25
	Transportation	10

	Sub total	45
	wholesaler margin	50
	wholesaler ‘s sale price/retailer’s paid price	1936
3.	**Costs incurred by retailer**	
	Weighing, loading and unloading	10
	Transportation	20
	Sub total	30
	Retailer margin	125
	Retailer’s sale price/consumer’s paid price	2091
4	**Producer’s share in consumer rupee (%)**	**85.17**
5.	**Price Spread**	**14.83%**

Comparative statement of percentage share of different marketing agencies garlic marketing:

The relative declaration based on the comment on channel –I and II on common platform shows that when we’re was no involvement of market functionaries in the dealing of garlic cultivator get maximum share oncoming nearly

96.74 percent consumer’s paid expense on one side and delivered a main in the part of final consumer who secured the same quantity of at lesser price (Rs. 1781) compare to that participation of dealer in channel II not only reduced the share of manufacturer in consumer’s paid expense but also increased that price of same quantity of garlic as paid by ultimate consumer was Rs. 1841.

In channel –II the involvement of wholesaler and retailer further expended per unit price of garlic because of incriminating of their margins and actual cost gained in the trading of this service. Here on one side the share of producer in consumer’s paid price tend to decline up to 85.17 per cent and reverse to that expanded the consumer’s paid price up to Rs. 2091 (Table 4.11).

As per the above virtual statement assumption is drawn that when there is participation of more number of marketing representatives in the vending of garlic marketing tend to reduce the producer's portion in ultimate consumer's paid amount one side and enforced the ultimate consumers to recompense greater price for the same amount of garlic as a concern of acquiring of numerous costs and margins improved by market representatives for their rendered amenities in the swapping of this commodity.

Table 4.11: Comparative statement of percentage share of different marketing agencies in garlic marketing.

S. No.	Particulars	Channel- I	Channel-II
1	Producer's share	96.74	85.17
2	Producer's cost	3.26	2.86
3	Wholesaler's shares	-	2.39
4	Wholesaler's cost	-	2.15
5	Retailer's share	-	1.43
6	Retailer's cost	-	5.97
7	Price spread	3.26	14.83
	Total	1841 (100)	2498 (100)

Comparative statement of different marketing channels and their marketing efficiency

The efficacy of marketing signified here that when there was no representatives between the communication of grower and consumer the market efficiency was maximum which tend to drop as per rise of number of marketing representatives and facilities rendered by them containing their particular margin (Table 4.12)

The marketing efficiency also indicates that if there is creation of utility in a consumer's good in the form of place, time, and form utility its higher degree may be more appreciable as it converted the raw material nearly to more useable form for consumer but without increasing such utilities the expansion of cost and margins of market agencies incurred in the trading of commodities will definitely reduce the efficiency of that commodity in market.

The channel involve the different agencies

Channel –I	Producer to consumer
Channel –II	Producer to wholesaler to consumer

Table 4.12: Comparison of different marketing channels in garlic marketing

S. No.	Particulars	Value of the good (Rs/ha)	Total marketing cost (Rs)	Price spread	Final value of the good (Rs/q)
1	Channel –I	1781	60	3.26	1841
2	Channel –II	1781	310	14.83	2498

4.7. Constraints in garlic production under condition:

As mentioned earlier that productivity of garlic in area under study found to low, which could be because of several reasons containing poor agricultural practices. low input application, inefficient management in resources use, poor technological performance, lime period of each practices and to climatic hazards etc.

The lesser area under garlic cultivation could be mostly because of socio economic condition of farmers, absence of marketing services and low output of garlic etc Such limitations should be taken under consideration, so that not only the cultivation area under garlic can be increased quickly, but also to make maximum income to the producers through increase productivity Some of the restrictions faced by garlic producers are presented in table 4 13.

Table 4.13: Production constraints identified by the sample farmers on different size of holdings.

S. No.	Socio Economic constraints	Number of respondents			
		Small 30	Number Medium 30	Large 30	Overall 90 (Rank
1.	Lack of irrigation facilities	24 (80.00)	30 (100.00)	13 (43.33)	67 (74.44) (II)
2.	Lack of credit facilities	20 (66.66)	23 (76.66)	13 (43.33)	56 (62.22) (III)
3.	Traditional belief	18 (60.00)	21 (70.00)	13 (43.33)	52 (57.77) (V)
4.	High cost of inputs	30 (100.00)	28 (93.33)	19 (63.33)	77 (85.55) (I)
5.	Lack of knowledge about recommended dose of inputs	20 (66.66)	21 (70.00)	13 (43.33)	54 (60.00) (IV)
6.	Lack of knowledge about recommended practices	21 (70.00)	17 (56.66)	12 (40.00)	50 (55.55) (VI)
7.	Non availability of inputs in time	10 (33.33)	24 (80.00)	11 (36.66)	45 (50.00) (VII)
8.	Non interested to high investment	19 (63.33)	17 (56.66)	8 (26.66)	44 (48.88) (VIII)
9.	Low price received of out put	28 (93.33)	10 (33.33)	4 (13.33)	42 (46.66) (IX)
10.	Unavailability of proper market	25 (83.33)	8 (26.66)	4 (13.33)	37 (41.11) (X)

(Figure In parentheses show percentage to total number of respondents in their own category.)

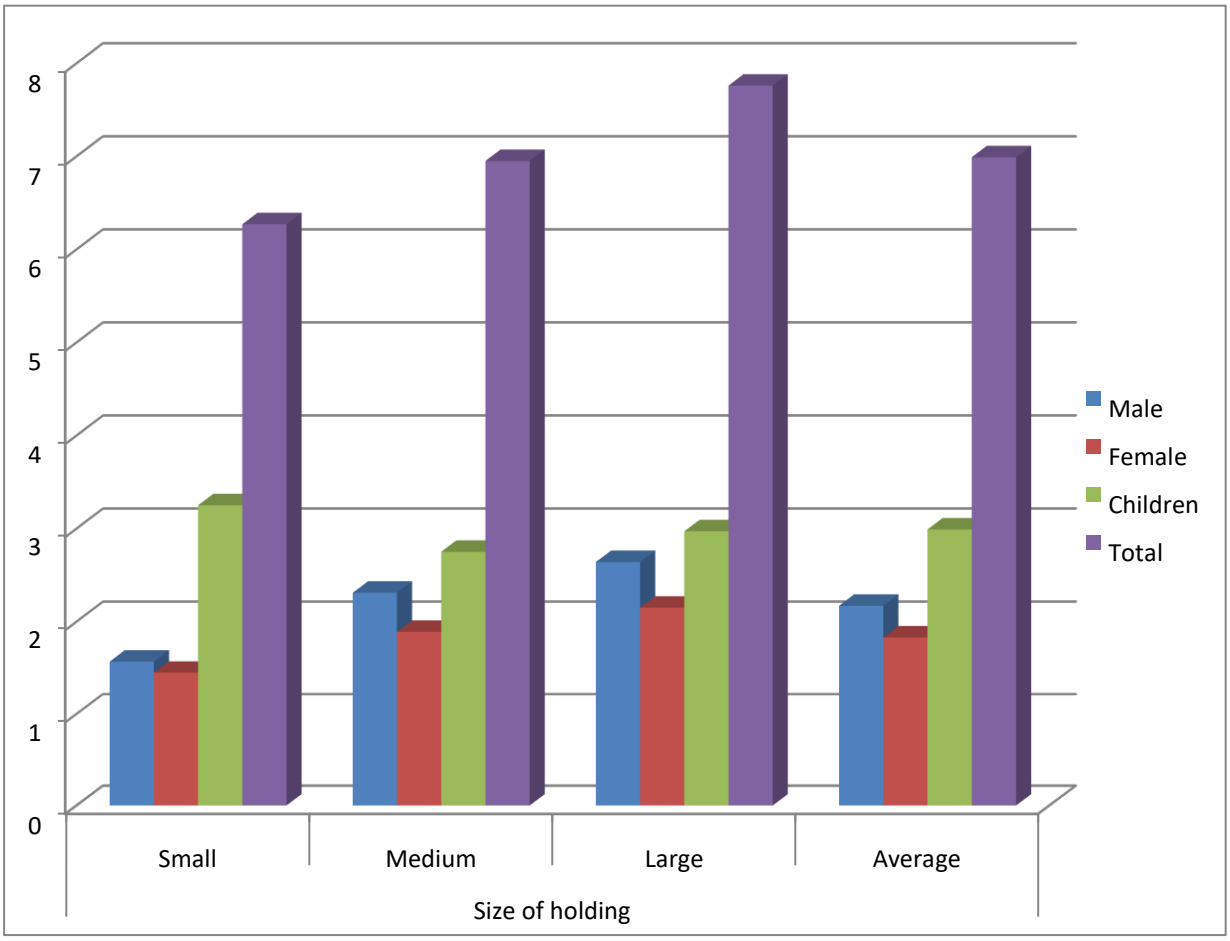

Fig 4.1 Average number of person per farm in different size of holding.

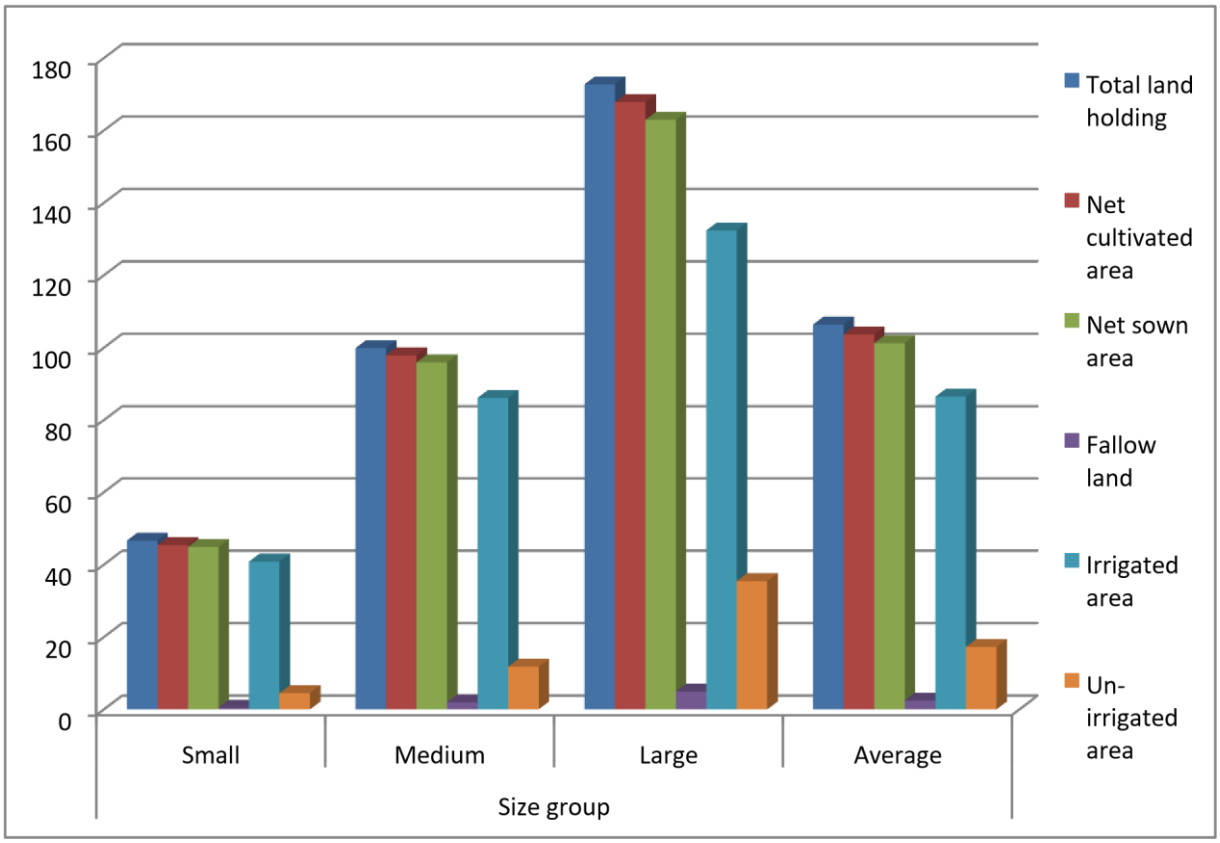

Fig 4.2 The distribution of selected sample of garlic growing farmers, average size of land holdings, the net cultivated area irrigated area and fallow land under different size group of sample farms.

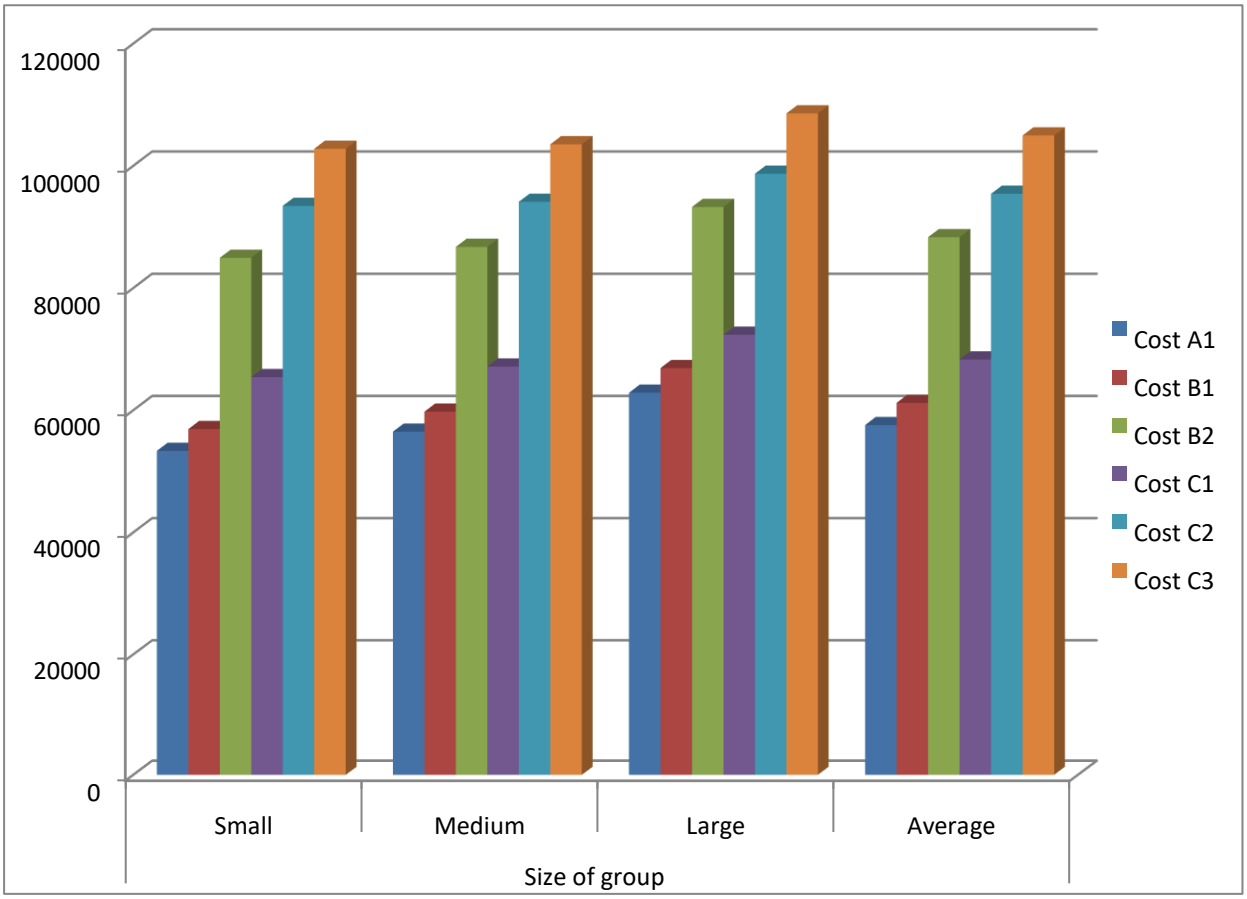

Fig 4.3 Cost of garlic production based on cost concepts of different size farms.

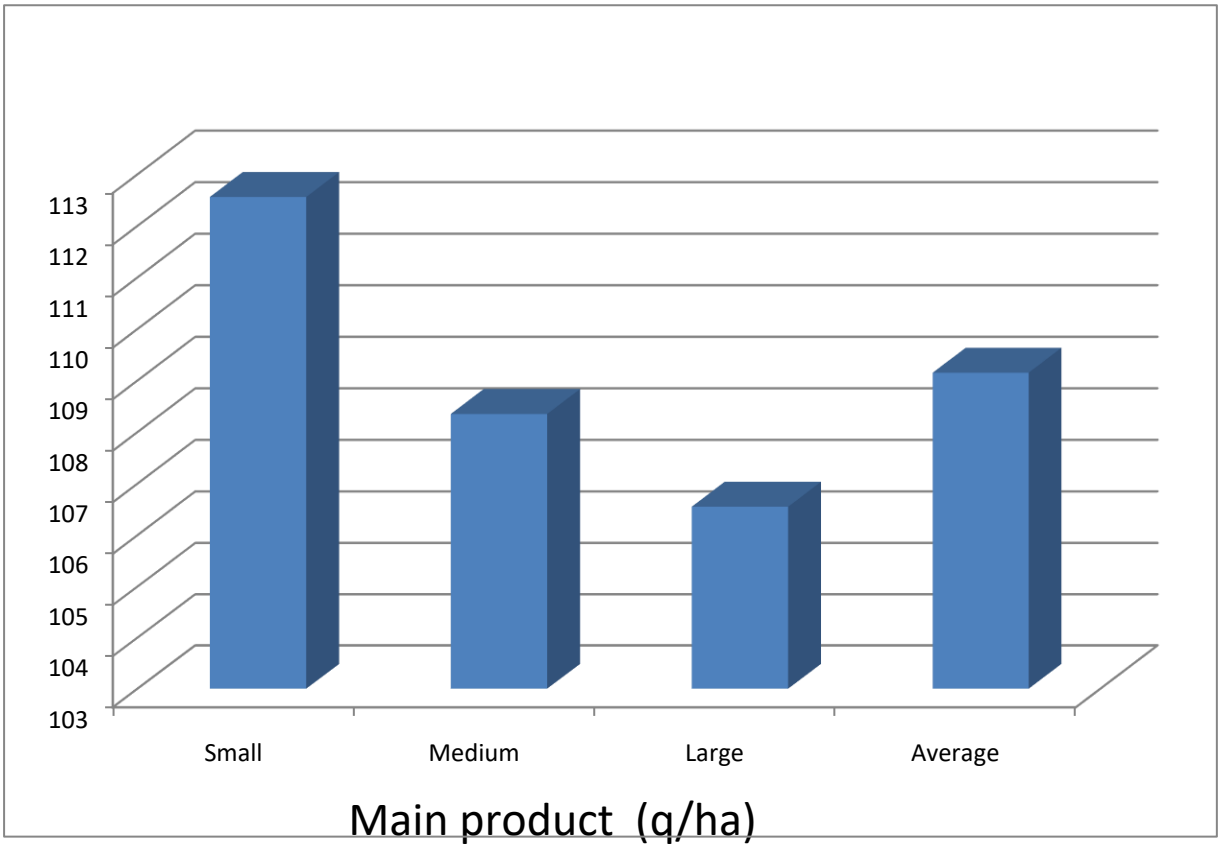

Fig 4.4 Production of garlic cultivation of different size farms.

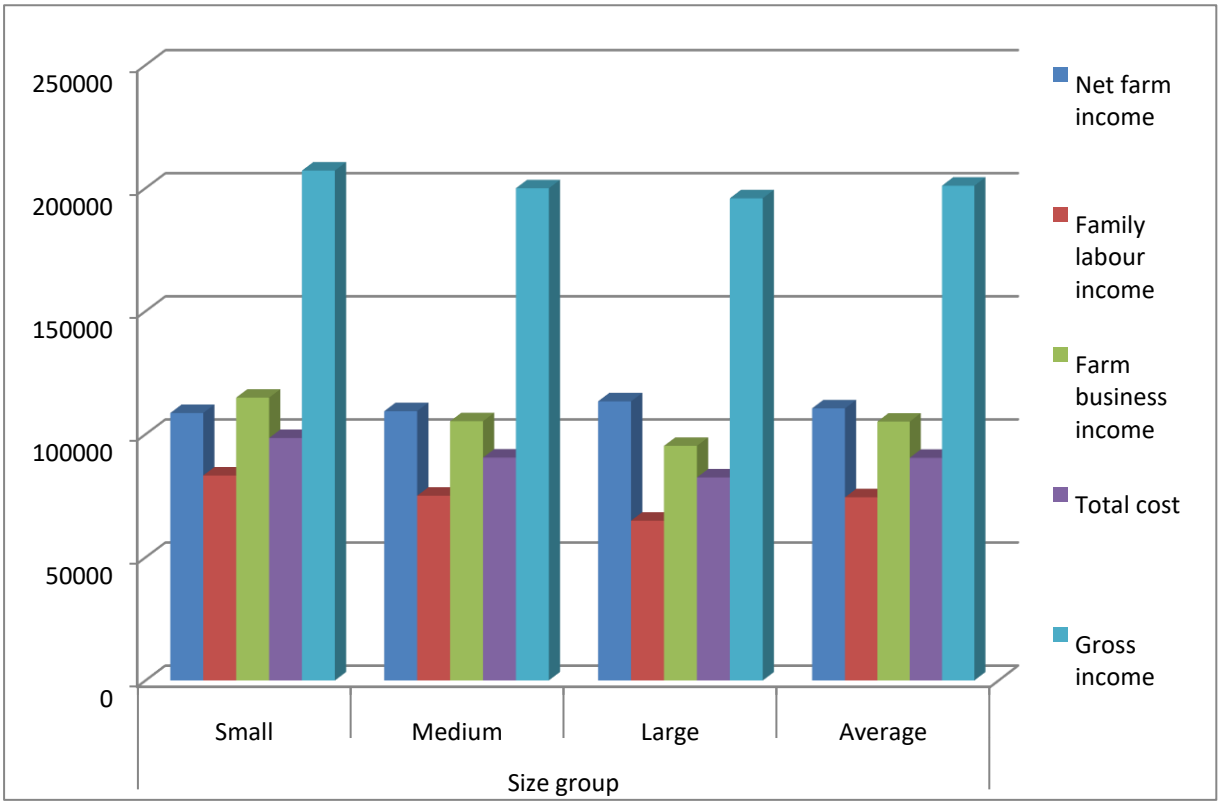

Fig 4.5 Profitability of garlic cultivation of different size farms.

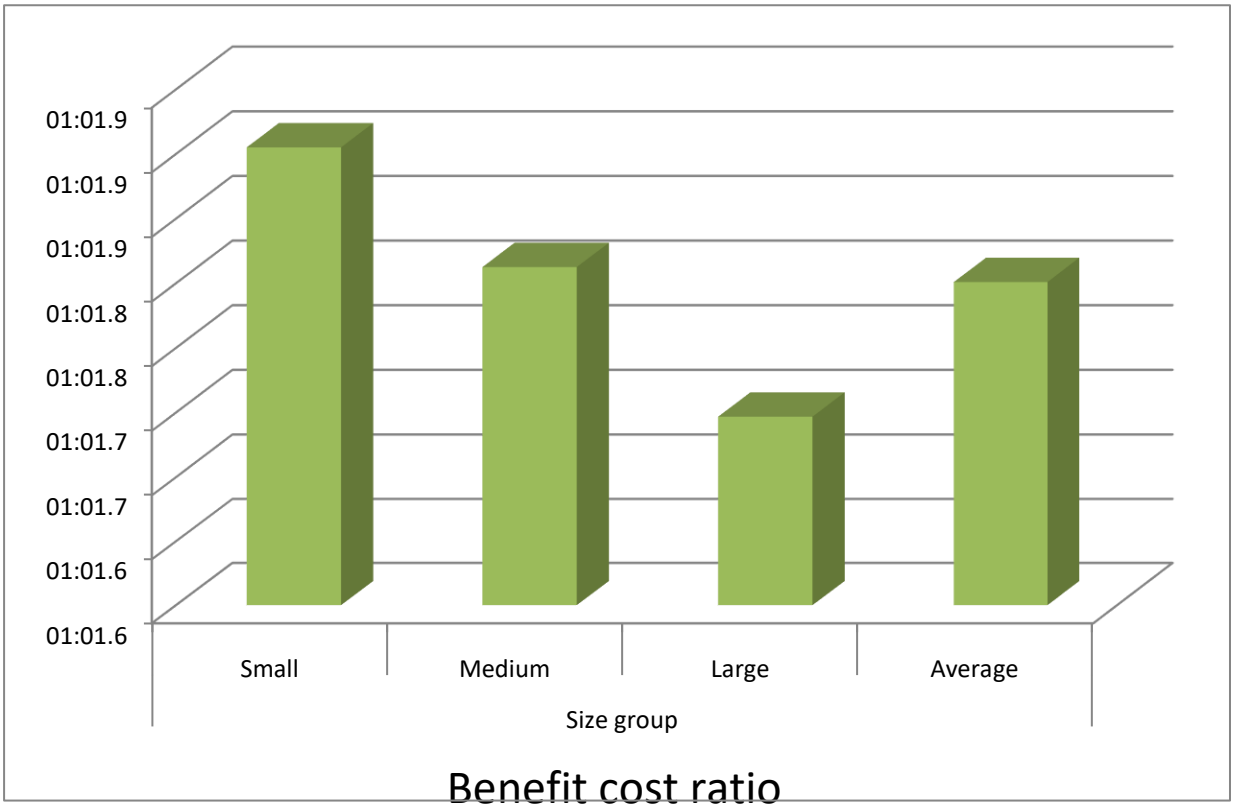

Fig 4.6 Benefit-cost ratio of garlic production of different size farms.

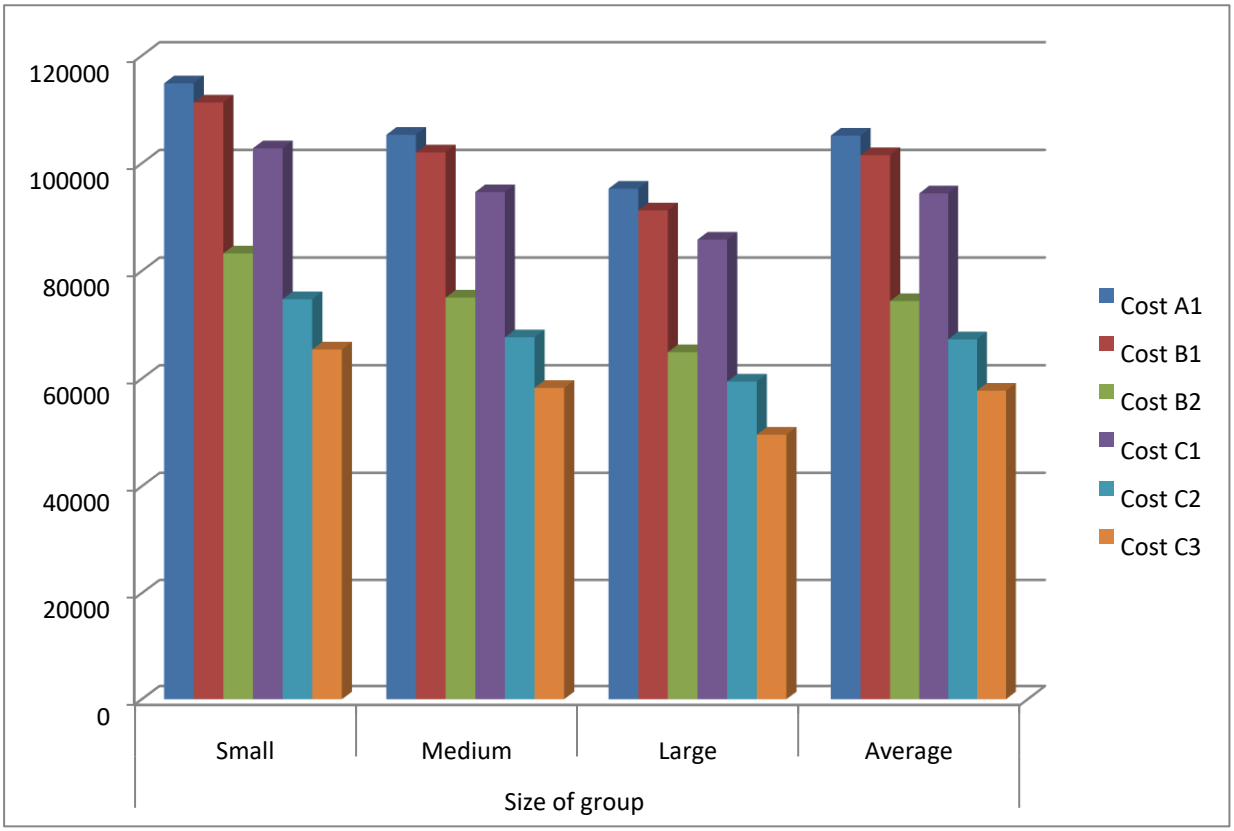

Fig 4.7 Return of garlic production over cost concept of different size farms.

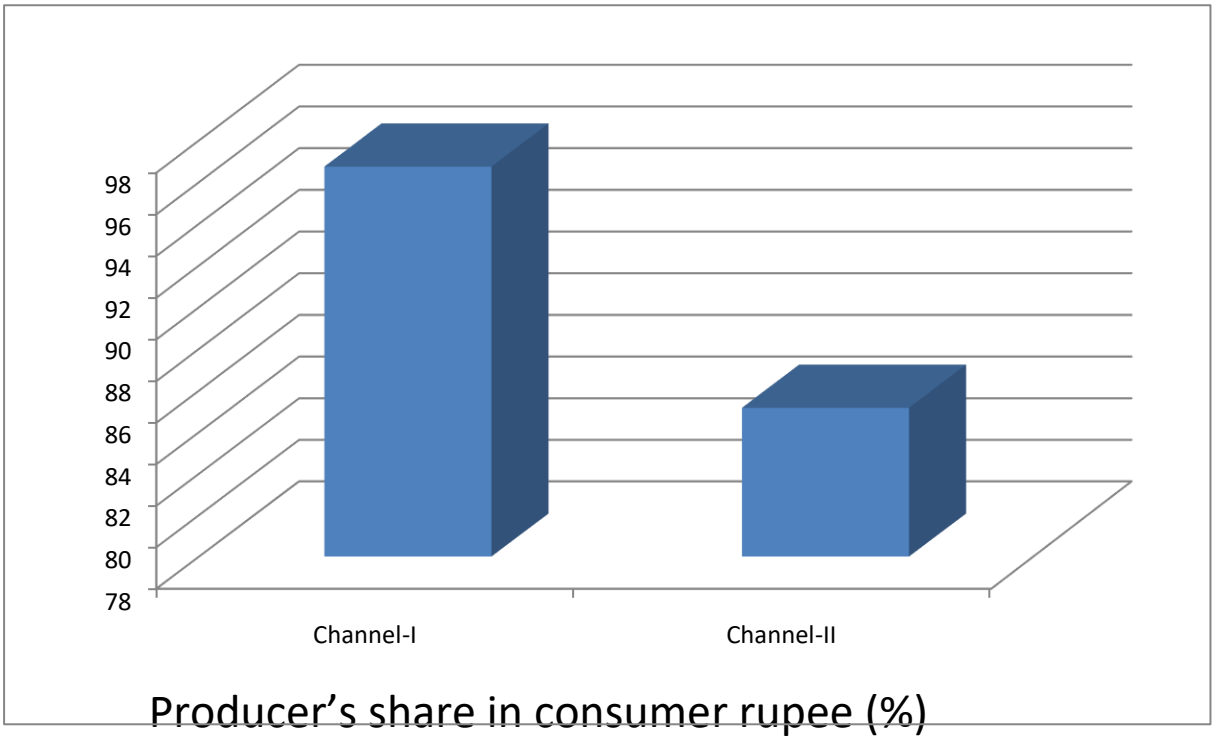

Fig 4.8 Producer's share in consumer rupee in the marketing of garlic per quintal through channel- I and channel-II.

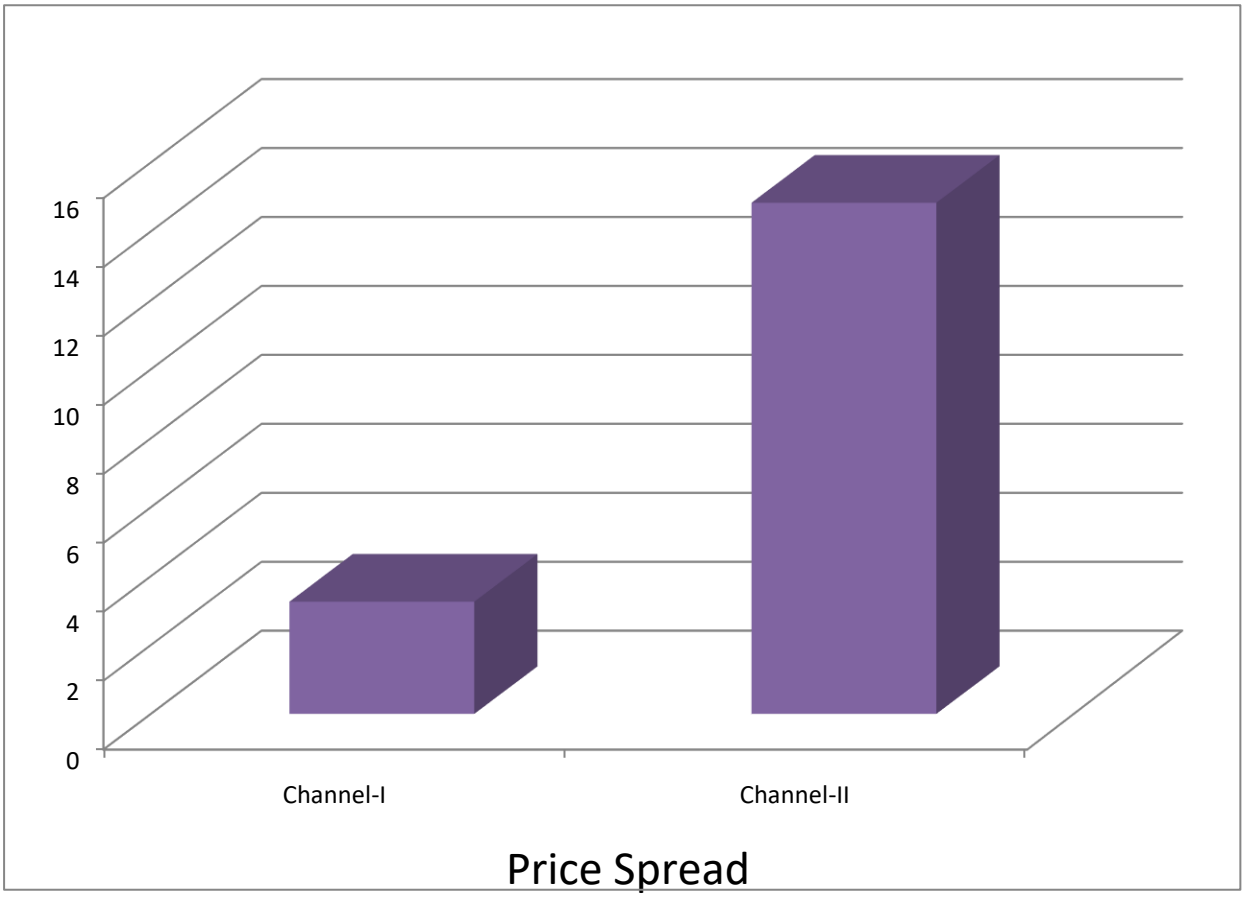

Fig 4.9 Price spread in the marketing of garlic per quintal through channel- I and channel-II.

CHAPTER - V

DISCUSSION

Garlic is one of the major spice crops and it required much more capital in comparison in production of other cash. In general there are scarcities of resources with the farmers. Hence, requirements a cautious supervision of assets before assigning the area under this crop Farmer who is interested to go for this enterprise should be well aware with different types of information about this enterprise like what is the total cost of cultivation of garlic crop? What is the operational cost? How much the gross and net returns they will get from this enterprise? What is the cost benefit ratio of this enterprise and what is the labour requirement for this crop? Before going to take this enterprise If farmers have such valued evidence then they can assign a practicable area under this crop and can attain a desired profit from this enterprise In this sense, this study will help to farmers by making available all the information through which they not only increase the cropping intensity of their farms but also improved the socio-economic conditions.

After analysis of data in the chapter of result the fact and findings of result is here by discussed as under:

Age and education are assumed to have a direct bearing on the farming as it enables a quick decision regarding resources management, adoption of improved technology and other production process It, however, be depending upon the quality and nature of education and experience the respondent found to on an average age of about 51.91 years. The study also indicated that about 38.89 per cent of respondents found to illiterate and maximum respondent got up to school level of education Majority of the respondents engaged in agricultural activities.

On an average farm, it is 3.55 hectare The average land holding found to 1.55, 3.32 and 5.76 hectare for small. medium and large size group respectively. The average area under garlic crop found to 1.15 hectare to gross cropped area 200.37 ha.. The total irrigated area through all sources is 86.43 hectare.

Kharif crops dominate the cropping pattern of area. Wheat and gram is major *rabi* crop grown in the area The garlic crop accounted for on an average area 1.15

hectare per farm It may conclude that garlic is the predominant cereal growing in rabi season garlic is being raised year after year since it is commercial crop of this tract.

The patterns of utilization of resources by the farmers also indicate the level of production and application of resources. Beside this it also reflect the level of technological adoption on the farm. It observed that human labour and bullock labour utilization in garlic cultivation found to more than machine labour. Similarly, family labour utilization is more than hired labour. Mostly medium and large size farmers utilized hired labour. Improved technology i.e. Improved variety of seed. manure, fertilizer, plant protection and irrigation are the basic material resources used for garlic production The distribution patterns of these inputs show no any specific trend between different sizes of holding.

More adoption of high yielding varieties is not enough to raise agricultural production unless, input like fertilizers, plant protection measures and irrigation are used at desirable level The study clearly indicates that though, farmers used these improved technologies and improved inputs, but they are not using properly or the uses of inputs are not found judicially as per recommendation. Thus, it is a suggested that the pattern of input use should changed considerably according to different size of holdings.

The yield level found highest (112.56 q./ha) in case of small farmers followed by 108.35 q and 106.55 q. per hectare on medium and large farm respectively. Thus, it may be concluded that the higher level of yield shows better management efficiency of input by these groups.

The cost of cultivation of garlic crop has been estimated on the basis of cost A1, B1. B2 and cost C1 The purpose of working out of these costs is to compare the profitability of crop on the basis of direct costs and imputed costs incurred in different size of holdings For the purpose of crop planning and to know the resources use efficiency the direct cost i e cost A1 has more relevance, result indicated that average per -hectare cost A1 work-out to Rs 57564.91 per hectare. Total cost of cultivation (i.e. cost C3) of garlic crop per hectare found to Rs 104961.65.

The cost structure of garlic cultivation on different size group of farms showed that the total cost A_1 as well as cost B_1, B_2 and C, found to maximum on large farm In other hand, the costs of cultivation A_1, B_1, B_2, C_1, C_2 and C_3 found to lowest on small farm respectively. It is evident from the data that the small and medium farmers had realized greater gross returns than overall average figure Likely, in case of net return also large farmers got highest than entire average figure shows the efficiency of this group. Among these farms, the difference in net return, which is actual real profit of farm, found to highest on large farms followed by medium and small group.

The different level of income computed in the result revealed better performance of garlic cultivation by small and medium size groups in comparison to small size group.

On the basis of above discussion the conclusion is that net return over cost A_1/A_2 and net return on cost C_3 was comparatively higher in small size farm. Reverse to that, production cost per quintal was minimum in large size farm followed by medium and small size group. The additional bonus point gone in the favours of small size group was higher benefit cost ratio in medium size farm indicate that inspire of financial crisis and other constraints this category of farm organized and managed its farm operation effectively compared to large size farms in the cultivation of garlic crop. Involvement of higher human labour in this category indicates that under the situation of zero opportunity cost of family labour was appreciably utilized in this category with this intension that in cash payment term it required nothing except food and shelter which was a fixed liability of garlic growers.

Marketing cost and price spread of various agencies in the marketing of garlic in Channel-I and II:

It was the simplest marketing channel having no involvement of market intermediaries in the trading of garlic marketing as interaction was directly made between producer and ultimate consumer. It resulted minimum cost in marketing of garlic incurred on producer. The share of producer in consumer's paid price was maximum as approaching nearly 96.74 percent and price spread was found to 3.26%. In channel-II, between producer and ultimate consumer there was an involvement of wholesaler and retailer. The function of wholesaler and retailer which plays the part in searching and creation of demand of consumer charge their margin and cost incurred

on various activities rendered by them. Due to these functions and involvement of marketing cost and returns margins expanded the difference in price received by producer and price paid by ultimate consumer. Thus resulted in the decrease of producer share up to 85.17 percent in consumer's paid price and also price spread 14.83% was vary high.

The study showed that in the study area there exist various factors as constraints in production such as costs and returns, credit, traditional attitudes. Knowledge, input availability and other factors. Due to affect of these causes a large proportion of the farmers do not applying adequate doses of inputs. or they are not applying these inputs in proper way. The high cost of inputs has been the main constraints reported by the large number of farmers It is evident from the study that a large section of the farmers do not fully familiar with the recommended dose of inputs and practices too. This constraints need to be adequately awareness by extension workers. Directly lack of irrigation also is responsible for not using the input adequately. The produce must be marketed to assure a remunerative price to farmers but due to fluctuation in price of produce generally farmers do not interested for high expenditure for costly inputs. So farmers should assured to get remunerative price of their produce after the harvesting of crop.

CHAPTER –VI

SUMMARY, CONCLUSION AND SUGGESTION OF FURTHER WORK

Summary: -

Garlic

(*Allium sativum*) is one of most important bulbous spices and medicinal crop grow commercially. Garlic holds fifth position in the area under cultivation among vegetable crops in India. India stands second in area and third in production of garlic in the world.

In India garlic is grown under 280.95 thousand hectare with total production potential of 1617.34 thousand MT and productivity of 5.76 tonnes per hectare. The main garlic producing states in India are Madhya Pradesh, Rajasthan, Gujarat, Uttar Pradesh, Assam, Punjab, West Bangal, Haryana, Maharashtra, Orissa, Karnataka, Tamil Nadu, Bihar etc. Madhya Pradesh ranks first in garlic producing State in India. Madhya Pradesh is also leading in garlic production, area and productivity than other* state. In Madhya Pradesh major garlic garlic producing district are Ratlam,

Ujjain, Dewas, Mandsaur, Dhar and Indore. Now a day's production of garlic in Indore districtis increasing significantly. In Indore district, garlic is cultivated in 21709 ha. area and production is 269944 tonnes in year 2017-18 and its contributed 10% total production of Madhya Pradesh.

Therefore, keeping the above facts in view the present investigation has been proposed with the following objective;

1.1 Objective of study:

4. To study the marketing channels and price spread of garlic in the study area.
5. To estimate the productivity and return of garlic in study the area.
6. To study the constraint in production and marketing of garlic and suggestion to overcome them.

Technical programme of work:-

Garlic is one of the main horticultural crops in the district Indore of Madhya Pradesh where farmers are cultivating with the practices and improved farming practices.
Hence, Indore District of Madhya Pradesh was taken for the purpose of this study.

Sampling Procedure:-

Indore block of Indore district was purposively chosen as the study area as, it has the larger area under garlic in the district. A multitasking stratified random sampling procedure was accepted to select the block, villages and the respondents, market and different functionaries involved in garlic marketing in Indore district. The details of the sampling techniques at various stages are given as under:

According to the purposes of the study both primary and secondary records were used. The primary data was taken from nominated defendants using pre-tested survey schedule through review method. Secondary data concerning the production, area, and yield etc was taken from the Dept of Agriculture and Dept of Statistics. The study was accompanied during the year 2017-18.

Constraints prevailing in the way of cultivation of garlic crop were enumerated according to their importance as given by the respondents.

Conclusion: -

From the foregoing result and discussion it could be concluded as under:

The important decisions in the farm business with reference to input use. extent of inputs, nature of production, cropping pattern and other managerial verdicts are usually taken by the producers and their family. Hence, it is appropriate to have an idea about the age and education level of the producers, which are affecting the quality and decision The data on distribution of producers according to age and education level revealed that the majority of the producers found to the average age of about 40 years The illiterate respondents found to on an average 38.89 per cent The maximum respondents found educated up to school level. The study also revealed that the highest proportion of working population in all the size of holding found to engaged in agricultural activities This is due to maximum annual work availability in agricultural pursuit.

The cropping pattern of sample holdings reflects towards the crops and cropping sequences grown in the area Study revealed that commercial including garlic is one of the main crop among commercial spices crop growing in area on 34.53 hectare out of 86.43 hectare area under rabi crop.

The pattern of utilization of resources by the farmers shows the degree of resources management, their choice, collection and decision-making. In addition to the above mentioned, it also designates the level of expertise implemented by the growers in farming. Labour (Human, bullock, and machine) consumption, seed. manures, fertilizers, plant protection procedures and irrigation are the elementary resources used being deliberated in the present study. Study shown that almost. higher number of producers has accepted cultivation of developed varieties of garlic .The seed rate capacity found to variation i e the use of seed quantity increased with the increased in the size of holding on per farm

A study of economics of farming, as cash crop, is essential to find out their viability in order to select best substitute resources, production practices and scale of cultivation etc. Secondly, it gives an estimate of the amount, the farmers will require for cultivating as per size of crop area with different level of technological adoption It is well identified information that usefulness of crop production depends upon the cost of cultivation, yield and their associated expenses in the market.

The cost arrangement of cultivation on variable size groups of farms is represented in this study. It is also revealed that the average operational cost i.e cost A1 found to maximum on large mass group being Rs 62865.13 per hectare and the minimum on small farms (Rs.53341.80 /ha). In respect of cost B1, the average prices differ from Rs 66895.13 on large farm to Rs 56911.80 on small farm separately. The study represents that on an average the cost of cultivation/hectare of produce found to Rs 68301.24, as cost C1. It is fascinating to note that the cost concept cost A, B and C revealed a certain trend with variable size of holding. But it is confirmed that the cost per unit area found to maximum on large farms and minimum on small farms separately.

Yield in quintals. gross monetary values, net monetary returns are the implements used for calculating the economics of cultivation of any crop. For this objective, the efficiency of crop per hectare at variable profitability on different size of holding The mediocre productivity of crop on sample farm land holding occured 109.15 quintal per hectare The whole average gross returns per hectare of this crop found to Rs. 200951.29. The net income from production also calculated as per cost concept

The data revealed that the average net income over cost A1, found to Rs. 105145.71 per hectare followed by Rs. 101519.04, Rs. 74400.61 and Rs. 94409.38 for cost B1, B2, and CI respectively

The productivity found to higher on small size farm because of the efficient use of inputs by these groups In this manner, the highest yield per hectare received by small farmers and it decrease in case of medium and large farm group respectively The large farmers obtained lowest yield per hectare e. 106.55 quintal per hectare. The highest per hectare gross return from production (Rs.207110.40) found on small size group.

As mentioned earlier that productivity of in area under study is very low, which could be because of different reasons containing irregular plant stand, low efficiency of input application and abnormal precipitation etc. The failure to enhance the cultivation area under garlic could be mostly caused by poor marketing amenities and lesser output efficiency also such limitations should be considered so that not only garlic cultivation area can be increased speedily, but also to produce good monetary to the producers.

Several constraints barring the sustainable production of the traditional or local practices of crop in the area, these are related to resources management faults and stresses of abiotic and biotic nature. Most of the producers (85.55 per cent) stated the maximum values of developed inputs in market. Thus, they are not providing sufficient quantity of these inputs. Producers want supported supply of inputs, as it is the first advice by most of the farmers this imprints is more in respect of small and medium farmers. The inputs like developed seed, fertilizer and insecticides etc are important for higher yield, which are not adequately and properly applied. Low price of output and conventional farming is risky hence mostly farmers found to not interested high investment.

The absence of assets and inaccessibility of appropriate market are next in significant requirements detailed by most extreme respondents of this difficult This inclination is likewise more if there should be an occurrence of little to medium ranchers Short-term credit is basic particularly to little and medium ranchers to

embrace the unproved innovation and apply the correct portion of sources of info and so forth

Suggestion for further work

For additional advancement of the cultivating region farming business, asset use effectiveness in development of garlic and standards for expulsion of limitations, following proposals might be thought of doing.

1. Though greatest number of ranchers developed the high yielding assortment of garlic however legitimate treatment and water system found to ailing in regard of appropriate usage as prescribed to get better return. So ranchers are proposed to prudent utilization of compost and water system underway undertaking to get ideal benefit from garlic development.
2. The result of the study showed that adoption of new agricultural technology has lagged far behind. The crop productivity could be increased in the area through the increased use of improved inputs and practices. For this purpose required amount should be financed by the financing agencies because farmers are found to scarcity of funds.
3. The prices of improved inputs required for garlic cultivation has many fold over a decade and hence the cost of production in general has increased. On the contrary the price of output not only fluctuated over years, but also did not rise in tune with increase in the factor price. The national policy is to encourage condiments production, the purpose cannot be achieved without fair and remunerative price and adequate incentive to the garlic growers in the area. The price has to be remunerative enough to earn a legitimate profit Alternatively, the small farmers could also be encourage to augment to get maximum profit, by supporting reduce their cost of cultivation by subsidizing the inputs like fertilizer, quality seed and plant protection materials etc. From above discussion it is clear that emphasis should be given on resources availability and their economic use.
4. The prime importance should be given to transfer of technology in garlic cultivation because generally farmers follow their own conventional method of cultivation or not applying proper. adequate inputs and practices, resulting into lower yield They have lost faith in what is said but they have faith when they see with their own eyes, similarly farmer's follow apart from seed, fertilizer, plant protection and irrigation

practices by conventional methods and those who use scientific methods do not follow in proper time and as per recommendations. Hence, result of recommended technology is very necessary to demonstrate to

the farmers. Agro-compatibility etc. have not reached to the majority of the farmers in the region, use of improved farm implements for various field preparations to reduce the cost of cultivation and other practices are also need to be made popular among the farm community of the area. The overall aim should to trained farmers in the crop production techniques under existing economic and other requisite condition to the extent so as to improve productivity of garlic crop.

CHAPTER –VII

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COLLEGE OF AGRICULTURE, INDORE (M.P.)

Department of Agricultural Economics

QUESTIONNAIRE

Name of the student : Pankaj Sahare

Year of data collection : 2018- 19

Title : " Marketing and Price Behavior of Garlic in Indore District of M.P."

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1. General information of the cultivator :

(a) Name of cultivator.....

(b) Village .....

(c) Age.....

(d) Education .....

(e) Total land holding ..... (ha.)

(f) No of land fragments ..... (ha.)

(g) Cultivated area ..... (ha.)

(h) Irrigated area ..... (ha.)

(i) Waste land ..... (ha.) (j) Source of irrigation .....

(k) Area under vegetable and Orchard ..... (ha.)

(l) Area under Potato

..... (ha) (m)Land revenue paid Rs. in year .....

(n) Land leased out ..... ha. Rent ..... Rs./year

(o) Land leased in ..... ha. Rent paid ..... Rs./year

2. Details of family members :

Sr. No.	Name of the person	Age	Gender	Edu.	Relationship	Occupation	
						Main	Subsidiary

3. Land utilization pattern :

S.No.	Total Land (Ha.)	Cultivable		Fallow land (Ha.)	Value of land	Land revenue and taxes
		Irrigated	Un- irrigated			

4. Characteristics of Soil :

S. No.	Particulars	Characteristics
1.	Soil texture	Sandy/ loam/ clay/ other/ (specify)
2.	Soil type	Alluvia]/ Red/ Black/other/ (specify)
3.	Topography	Upland/ Mid land/ Low land

4.	Depth of soil	Shallow (<50 c.m.), Medium (50-100 c.m.), Deep(> I00 c.m.)

5. Source of irrigation :

S.No.	**Source of irrigation**
I.	Canal
2.	Open well
3.	Tube well
4.	Farm Pond
5.	River
6.	Other(Specify)

6. Information about form assets:

S. No.	**Particulars**	**Year of purchase / construction**	**Quantity**	**Value in Rs.**
1.	Land			
2.	Farm income			

3.	Storehouse			
4.	Farm shed			
5.	Pump house			
6.	Tube well / well			
7.	Pump electronic. V/s diesel			
8.	Pipe line and implements			

Bullock operated implements:

1.	Plough			

2.	Harrow			
3.	Bari / Duggan / triffan			
4.	Pata / cultivator			
5.	Bullock cart			
6.	Seed drill			
7.	Others			
Tractor operated implements: -				

1.	Tractor			
2.	Cultivator			
3.	Seed drill			
4.	M.B. plough			
5.	Trolley			
6.	Harrow			
7.	Miscellaneous			

Hand operated im plements				
1.	Spade			
2.	Khurpi			
3.	Yojna / rope etc.			
Other implements:				
1.	Power thresher			
2.	Winnower			

3.	Chaff cutter			
4.	Milk machines			
5.	Others			

7. Information about cost of cultivation:

Variety ..... area (ha) .....

Operational labour (Days)

S. No.	Practices	Hu man labour				Bullock labour		Machine labour	
		Male		Female		Owned	Hired	Owned	Hired
		F	H	F	H				

1.	Nursery preparation								
2.	Field preparation								
	a) ploughing I) II)								
	b) Harrowing I) II)								
	c) Levelling								
	d) Land treatment								
	e) Planting /Sowing								
3.	Irrigation								

	a) pre Sowing no. b) post Sowing no.								
4.	Supervision								
5.	Earthing								
6.	Digging								
7.	Harvesting / Transportation								

8. Information about cost of cultivation :

Variety ..... area (ha) ..... (A) Operational labour (Rs.)

S. No.	Practices	Human labour		Bullock labour		Machine labour	
		Male	Female	Owned	Hired	Owned	Hired

		F	H	F	H				
1.	Nursery preparation								
2.	Field preparation								
	a) ploughing I) II)								
	b) Harrowing I) II)								
	c) Levelling								
	d) Land treatment								
	e) Planting /Sowing								

3.	Irrigation								
	a) pre Sowing no. b) post Sowing no.								
4.	Supervision								
5.	Earthing								
6.	Digging								
7.	Harvesting / Transportation								

(B) Material used:

S. No.	**Material**	**Price per unit**	**Material used**	
			Qty.	**Cost**

1.	Seed			
2.	Seed treatment			
3.	Fertilizer and manure (i) Manure (ii) N. (iii) p (iv) K (v) micro nutrients			
4.	Weed control (Intercultural) (a) Chemical name (b) Human (c) Mechanical			
5.	Plant protection (a) Insecticide used No. of spray (b) Fungicides used No. of spray			

9. Cost incurred in marketing (PHM non adopters)

Particulars	**Channel I**	**Channel II**
Marketing cost		
Cost of gunny bags		
Loading and transportation charges		
Unloading charges		
Loss, wastage and spoilage		
Wholesaler's share		

10. Cost incurred in marketing (PHM adopters)

S.No.	**Type of PHM**	**Channel I**	**Channel II**
1.	Cleaning		
2.	Sorting		
3.	Grading		
4.	Weighing		
5.	Seed Germination		
6.	Packaging		

7.	Storage		
8.	Transportation		
9.	Loss, wastage and spoilage		

11. Output :

Quantity	**Price**

12. Cost and margins:

S. No.	**Name of functionary**	**Rs./q**	**Percentage**
1.	**Net price received by producer**		
I.	Expenses incurred by producer		
II.	Transportation		
III.	Loading/unloading		

IV.	Taxes / commission		
2.	**Purchase price of village merchant (paid to producer)**		
I.	Expense incurred by village merchant		
II.	Commission		
III.	Losses		

IV.	Auction Charges		
V.	Loading/ weighting		
V.	Market fee		
VI.	Miscellaneous		
3.	**Purchase price of Co-operative society (Paid to producer)**		
I.	Expense incurred by Co-operative society		

II.	Loading/ unloading & transportation		
III.	Margin		
IV.	Miscellaneous		
4.	**Purchase price of Processor or agent (paid to producer)**		
I.	Expense incurred by processor or agent		

II.	Loading/ unloading & transportation		
III.	Margin		
IV.	Miscellaneous		
5.	**Purchase price of wholesaler (K.U. Mandi) (paid to producer)**		
I.	Expense incurred by wholesaler		
II.	Loading/ unloading & transportation		

III.	Margin		
IV.	Miscellaneous		
6.	**Purchase price of retailer**		
I.	Expense incurred by retailer		
II.	Loading/ unloading & transportation		
III.	Margin		
IV.	Miscellaneous		

13. Constraints in production of garlic

Sr. No.	Constraints	Yes/No
A.	**Natural causes**	
1.	Low fertility of soil	

2.	Unfavorable climate	
3.	Uncertainity of rains	
4.	Damage due to insect pest	
B.	**Social Cause**	
1.	Unavailability of labour at time	
2.	Low working capacity of labour	

3.	Family problems	
4.	Not proper management of family labour	
C.	**Economic causes**	
1.	Economic poverty	
2.	Do not purchase recommended inputs due to high cost	
3.	Unavailability of irrigation	

4.	Do not done agronomical practices proper and at the time	
D.	**Technological causes**	
1.	Lack of technological knowledge	
2.	Unavailability of technical suggestions and guidance	
3.	Unavailability of training and demonstration	
4.	Costly improved technology	
E.	**Institutional infrastructure causes**	
1.	Unavailability of inputs at time	
2.	Unavailability of proper marketing system	
3.	Unavailability of proper learning system	
4.	Unavailability of proper storage system	

VITA

The author of the thesis Mr. Pankaj Sahare S/O Mahadeo Sahare was born on 31st May, 1993 at Pandhurna, Chhindwara (M.P.). He passed High School Examination in the year 2009 from Govt. H. S. School, Mordongri with 46.33 percent of marks. He passed Higher Secondary Examination in the year 2011 from Govt. H. S. School, Mordongri with 70.2 percent of marks.

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