“Study on Marketing of Bt. Cotton in Khargone District of Madhya Pradesh”

THESIS

Submitted to the

Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior

In partial fulfillment of the requirements for the degree of

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In

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by

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CERTIFICATE - I

This is to certify that the thesis entitled "**Study on Marketing of Bt. Cotton in Khargone District of Madhya Pradesh"** submitted in partial fulfillment of the requirements for the Degree of **Master of Science in Agriculture (Agricultural Economics)** of the RajmataVijayarajeScindiaKrishiVishwaVidyalaya, Gwalior is a record of the bona-fide research work carried out by **Shubham Patel** under my guidance and supervision. The subject of the thesis has been approved by the Student's Advisory Committee and the 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 have been acknowledged by him.

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This is to certify that thesis entitled **"A Study on Marketing of Bt.Cotton in Khargone District of Madhya Pradesh.''** submitted by **SHUBHAM PATEL** to the **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** has been accepted after evaluation by the External Examiner and approved by the Student's Advisory Committee after an Oral Examination on the same.

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Date - **(SHUBHAM PATEL)**

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CHAPTER - I

INTRODUCTION

Cotton (*Gossypium Spp.*), the “White Gold” is one of the most important natural fiber and commercial crop in many contraries. It plays a vital role in trade, employment, industry, economy, and foreign exchange earnings. It is known as “king of fiber” and is an important cash crop of the country. It belongs to the Malvaceae family with four cultivable species i.e. *Gossypium arboreum, Gossypium barbadence, Gossypium hirsutum and Gossypium herbaceous.* Cotton is an important cash crop occupies not only agriculture but also the industrial textiles economy of the contrary.

Whole cotton seed is a source of protein (20%), TDN (87%) and fiber (22%) for livestock (Ely and Guthrie, 2008). Cotton seed oil and meal are two most valuable products of cotton seed. Oil makes up to 16% of the product resulting from crushing cotton seeds in an oil mill. Cotton seeds contain a significant amount of tocopherols, a form of Vitamin-E, which contribute to the long shelf life of cotton seed. (Smith and Creelman, 2001)

In the world, cotton is cultivated is an area of 34.31 million hectare with production 26.15 million metric tonnes. The world’s average yield is about 762 Kg/hectare. (Anonymous 2019-20)

India has the distinction of having the largest area under cotton cultivation which is about 37% of the world’s area under cotton cultivation between 12.5 - 12.6 million hectares. India is one of the second largest producers of kharif cotton in the world accounting for about 23% of the world’s cotton production. In India, the production of cotton is about 6.12 million metric tonnes. The yield was found to be 466 kg/hectare still lower against the world average yield of 762kg/hectare. (Anonymous, 2019-20)

Madhya Pradesh is the sixth largest producer of cotton in India. In Madhya Pradesh area under cotton cultivation was 6.1 lakh hectares with the production of 34 lakh tonnes. The average yield of Madhya Pradesh was 557 kg/hectare. There was four major cotton growing districts in the state among all the khargone district was the largest producer in the state. (Anonymous, 2019-20).

Keeping in view all these facts an effort has been made by performing a special study entitled “Study on Marketing of Bt.Cotton in Khargone District of Madhya Pradesh” will be undertaken with the following specific objectives:

Objectives –

1. To identify the marketing channels in the study area.
2. To estimate the Price spread and Marketing efficiency of Bt.cotton in different channels.
3. To study about major constraints and suggestions for efficient marketing of Bt.cotton.

Assumptions:

1. Resources are limited so farmers have to restrict to operate within the limitation.

2. It is assumed that the farmers are free to take any decision regarding their farming practice.

3. It is also assumed that the prime objective of farmers to optimize i.e., profit maximization and cost minimization.

4. The primary and secondary data collected was limited to study area.

Need and Importance of the study:

The study aimed in knowing the extent of which the bollworm causes significant loss in the Bt.cotton cultivation in the slected area. The discriminate use of pesticides and insecticides due to unawareness among cultivars as well as marketing strategies of pesticide companies have adverse effect on natural enemies, human health and cause environmental pollution which will leads to increase in cost of cultivation and develops resistance in insects against pesticides. It will provide a guideline to understand various marketing practices of Bt.cotton used by the Bt.cotton growing farmers.

The facts and findings of this study would be helpful to determine the problems (drastic decline in yield mainly due to bollworms attack and increase in cost of cultivation at faster rate are uneconomical) faced by the farmers in adoption of recommended Bt.cotton production and marketing technology with their remedial measures. Hence, there is need to develop bollworm resistant varieties to control yield losses caused by bollworm. This study may helpful to administrators, planners and policy makers for formulating a plan and policy for betterment in adoption of Bt.cotton production and marketing technology among the Bt.cotton growers. The findings of the study are based on information presented by the respondents

regarding adoption of Bt.cotton production and marketing technology.

Bt.cotton is the only ray of hope to control bollworm. Thus it was significant that the knowledge of this study could be utilized to serve as a feedback to future research to improve or modify the technology used by farmers and adoption of recommended Bt.cotton marketing strategies in Khargone district should be measured. The investigator was aware of this situation to undertake a small scale study regarding this research work.

Limitations:

1. The study has been confined to only in nine blocks of Khargoan district of Madhya Pradesh state in 2019-20.

2. The generalization based on findings may be applicable to the aforesaid area and other adjoining areas with similar conditions i.e., the collection of primary and secondary data was confined only to the sampled area.

3. The study was limited to recommendation of Bt.cotton production and marketing technology that only covers kharif season of the selected Bt.cotton growers.

4. Farmers fail to keep systematic records of their farming practices that the information provided was based on their memory recall. Thus, there was the possibility of biasness.

5. It is a known fact that the resources are limited. So the extent of the study cannot be large. Hence only those factors are taken into considerations which are under the control of the farmers for the study withtheir contribution in resource utilization and significant returns.

6. Based on time and resource limitations, it would not be possible to cover a fair area for investigation purpose. Due to that only very few numbers just 90 respondents were covered for detailed study leading to various conclusions.

CHAPTER-II

REVIEW OF LITERATURE

In an attempt should be carry out for the research work and it was useful to review the work done on various problems in order to have the guidance to the researchers in respect of the concepts used, method of approach to the problem, analysis and results of the data collected. The reviews were classified into following sub-heads:

1. Marketing channels incurred in the production of Bt. cotton
2. Marketing costs, marketing efficiency, price spread and market marginof various channels
3. Constraints in production and marketing of Bt. Cotton.

Marketing channels incurred in the production of Bt. cotton:

Birla, *et al.* (2014) conducted a study on Marketing of Cotton in Khargone District of Madhya Pradesh. The result of the study showed that the Producer received more net profit in channel IV (3213Rs/Q), channel V (3203 Rs/Q),channel II (3193 Rs/Q), channel III (3193 Rs/Q) and channel I (3163 Rs/Q).Under channel I it was the simplest marketing channel having no involvement of market intermediaries in the marketing of cotton as interaction was directly made between Producers and ultimate consumer, (Mandi) , resulted minimum cost in marketing of cotton,i.e.Rs187 (one hundred eighty seven).

Shekle, *et al* (2016) reveled the Marketing cost, margin and price spread of Bt.cotton in Beed district Maharashtra. It was observed that per quintal marketing cost was higher in channel –I for grade II i.e. Rs. 1050.70 followed by grade I Rs. 1048.56 and Rs. 1020.52 in grade III and Rs. 997.28 for grade I followed by grade II Rs. 991.23 and Rs. 956.20 in grade III in channel-II, respectively. Producers share in consumer's rupee was maximum in channel-II i.e. 76.55 per cent in grade III followed by grade II (75.60%) and for grade I (74.81%), respectively. Regarding price spread in Bt cotton marketing was the highest in channel-II Rs. 6200, 6000 and 5800 for grade I, II, III, respectively and in channel-I Rs. 6100, 6000 and 5800 for grade I, II and III, respectively.

Reddy*, et al.* (2019) conducted a study on Economic Analysis of Price Spread, Producer's Share in Consumer's Rupee and Marketing Efficiency of Cotton in Warangal district of Telangana, producers share in consumer rupee and marketing

efficiency were more in channel I as compared to channel II and channel III respectively The maximum prices of Cotton were observed during the month of February and March. Thus, the sellers prefer these months for selling of Cotton in Warangal market.

Marketing costs, marketing efficiency, price spread and market margin of various channels:

Manan *et al.* (2013) estimated that the marketing margins of major intermediaries involved in the marketing of seed cotton in district Khanewal using primary data. Formal interviews were conducted from representative sample of 80 cotton growers, 40 commission agents and 40 ginners selected using stratified random sampling technique. The findings of the study indicate that village beoparies (traders) earned gross marketing margin of Rs. 72 per maund (40 kg), ne margin of Rs. 26 per maund and 3.37% margin in marketing chain of seed cotton in district Khanewal. Commission agents earned Rs. 35 per maund as gross marketing margin, Rs. 23 per maund as net margin and 1.85% margin in marketing chain. The gross marketing margin of ginner was estimated as Rs. 136 per maund, net margin as Rs. 45 per maund and 6.56% margin in marketing chain.

Srivastava,*et al.* (2015) studied theCosts, margins and price spread of cotton in Nimar valley agro- climatic zone of Madhya Pradesh.It was found that 76.35 per cent of the cotton growers marketed their produce through Channel I, whereas 23.65 per cent sold cotton through Channel II.

Rani and Gupta, (2017) conducted a study to work out the Marketing Channels, Marketing Margins, Costs and Price Spreads: A Case Study of Bathinda District of Punjab. Findings related to marketing costs, margins and price spread revealed that producer got 80 to 82 per cent of the consumer's rupee among alternative marketing channels of cotton crop. The share of the marketing costs was observed to be about 9 to 10 per cent of the consumer's rupee which was very high and needed to be reduced. Similarly, marketing margins also needed to be minimized. The important problems observed in the marketing of cotton were the deferred payments and predominance of prior price agreements with the purchasers.

Constraints in production and marketing of Bt. Cotton:

Dhule (2000) conducted study in Akola Panchayatsamiti in Akola district study on adoption of bio control practices for pest management in cotton by farmers. Majority

of collon grower's possess low level of knowledge regarding bio control practices on pesi management of cotton crop. The important problem cinler hy majority of collon growers in adoption of bio control practices were lack of knowledge about various bio agents, biological control perceived as slow process and lack of detail guidance through extension worker.

Dhand (2001) studied on problems of cotton cultivation in Punjab and hisar reported low extension contact and low mass media exposure collon growers faced problems of its need. American and pink bollworm and colon curl virus. Problems of high cost and non availability of recommended insecticide pesticides, shortage of electricity, high cost of skilled of labour, low support prices and delayed binding during marketing were faced by cotton growers.

David and Sai (2002) carried out the field study in two districts via:Warangal and Khamman of Andhra Pradesh to know the farmers reaction on the cfficacy of Bt cotton. The study revealed that all except two firmers were positive about cultivation of Bt cotton cyen for the coming season. However, about 30 per cent of the farmers said that they would cultivate cotton only if they receive suitable price in the market. None of the farmers opposed for cultivation of Bt cotton on Technical reasons. The reaction of the farmers shows that consideration of yield still the primary concern. Propaganda was the major force in decision making and seed dealers act as effective crop counsellor. It may also be stated that damage to crop due to bollworm was considerably less in Bt cotton than non-Bt cotton further, it was observed that there was not much reduction in pesticides expenditure because Cartiers still do not distinguish between Bt and non- Bt cotton at the time of spraying pesticides. They reported that larici's Were cager to take Bi technology and the overnient should take immediate measures to release Indian varieties of Bt collon so that firmers can enjoy the fruits of the technology at low cost.

Gaddi, *et al. (20*02) observed that the advent of new technology in agriculture, significant improvement in the crop productivity was noticed. However, proper resource mix and appropriate cultural practices become a pre-requisite for the adoption and success of new farm technology. Cotton crop being more capital intensive and it demands more for costly inputs, hence due to better economic conditions, large farmers have taken up timely spraying and application of plant nutrients.

Christain,*et al. (*2004) reported that cotton growing farmers of Vadodara district of

Gujarat had faced the major problems of avulability of training on IPM (100 %) and lack of skilled labours (70%). Similarly, the non - availability of plant production appliances bioagents in time (47.5%) and high cost of plant protection inpuis (38.33) were the other constrainis in the adoption of IPM practices.

Bheemappilti,*et al.* (2004) studied the constraints led by cotton Crisis in Tungabhadra command area and revealed that problems like availability of quality seeds, low yield pucntia.xxepibility of recollidanded hybrids to pests and diseases, quality of produce and high cost of seeds were the major reasons for partial adoption of recommended cotton production technology. The lack of knowledge not sure of timely canal water availability, non-suitability of the recommended practices costly to adopt, no convinced with the recommendations, larger holdings. Labour problem. High quality inputs were the other reasons for partial and non-adoption of recommended praktices like seed rate, chemical seed treatment, spacing, nutrient management, application of pesticides and weedicides and irrigation facilities.

Gujbhiye und Udikeri (2004) conducted a study in Dharwad and Raichur distracts of North Karnataka to identify the implications and to understand the constraints limiting the transfer of technology. The results confirmed that improved cotton production technologies (new hybrids varietes, pest management and improved agro-technologies) have brought significant transformation in cotton scenario of the country. Hence, transfer of technology played pivotal role, which ultimately help in enhancing the production and profitability and also impart stability and sustainability in the agro-ccosystem.

Reddy,*et al*. (2005) evaluated two hybrids MECH-12 Bt and MECH-184 Bt for demonstration purpose along with the check hybrids Bunny/Satya. Trails were conducted al Regional Agricultural Research Station. Acharya NG Ranga Agricultural University (ANGRA) andlow farm Guntur to evaluate the farmers' fields in Kharif 2003 for yield and cost effectiveness. Bollguard hybrid MECH-12 Bt cotton recorded higher yield than MECH-184 Bt. The overall average yield of MECH-12 Bt and MECH-184 were 1231 Kp/acre and 1188 kg/acre is against 1149 kg/acre and 1177 kg/acre of checks, respectively. There was a spraying of 3.8 sprays for control of bollworm in bollguard than the checks. The not return op MECH-12 and MECHIN Bt cotton hybrids were 816/ACTE and 4146/acre respectively. Bollworm farmers realized higher cost benefit ratio than checks.

Adeniji (2007) reported that the study aims at providing insight into the constraints

inhibiting technology adoption behavior of cotton farmers in Kutsina stute, Nigeria. The samples comprise of 250 farmen xlected from Malumaslii. Puntua and Dauduwa in Katsina state Nigeria. Data collected from the respondents were unulysed using descriptive statistics. The results show that the major constraints facing farmers as identified by about 80% are lack of fertilizer, frequency of pre-market opportunities. Others were inadequate knowledge of the production packages and non availability of these technologies. Given the result it was concluded that cotton production in the study area was affected by lots of constraints. It was Suggested that drastic improvement on the conditions of farmers be made through efforts on the constraints identificd.

Rai and Singh (2010) conducted a study in the district of Burwani district of Machya Pradesh which is well known district for the cotton cultivation in the state. In spite of having the econormies enthusiasm, cotton growers were facing a lot of challenges in adoption of technology related to cotton cultivation. The study focused on extent of knowledge and constraints faced by cotton growers. A simple of 120 farmers of 4 villages comprised and their responses were analyzed with relevant tools. Study divulged that majority of farmers belonged to medium socio-economic profile (53.33%). Results indicated that positive association exists between levels of cducation, sire of land holding knowledge of production technology and annual income where as negative association was found between age and type of family.

Ramasundaram (2011) revealed constraints of cotton growers that non availability of canal water on time leading to delay in field preparation, poor germination and pour plough stand, high cotton yields and cropping intensity result in heavy nutrient exhaustion and development of secondary (sulphur) and micro nutrient deficiency, removal of farm residues due to porocity of labour and lack of suitable implements for laund shaping cic and non-availability of short duration, curly and synchronous maturing varieties to realize complete cotton harvest and timely sowing of succeeding wheat crop.

Dhuka,*et al.* (2012) studied that in India farm women serve as the main work force involved in agricultural activities. Hence, it is more necessary to make women farmer able to constantly build and improve their knowledge gain access to new information and knowledge and make use of these. Therefore, increasing access lo relevant knowledge base from multiple sources and its use for socio-economic progress is needed in the context of market oriented agricultural development. Considering the

importance of linkage to knowledge, this study was conducted to identify sources of knowledge, construints and opportunities for creating effective linkage and information flow's amongst farm women. A sample of 500 farm women was selected through stratified random sampling technique. Selected respondents were interviewed personally through pre-tested structured interview schedule. Results revealed that majority of the respudents indicated high to very high level of need for agricultural infornution on improved agricultural technologies. It was also observed that majority of the Women have access to infomal source of information including family member and fellow women. Further, the results revealed that predominant responsibility of women for household tasks, lack of formal education, security concerns and freedom of movement and lack of infrastructure were seen as major serious constraint to access to knowledge and information by the respondents. The results of the study will provide direction which may be of significant for extension agencies, to design appropriate strategies and to back up future planning and enhance the pace of adoption of farm technologies.

Darandale and Bhatt (2013) concluded that, high cost of inputs 193.33%, fluctuations in market rates (90.00%), unavailability of seed at proper time 185.00%, lack of knowledge about plant protection of cotton (82.50%), non-availability of labours 181.66%, high cost of transportation *(*77.50%), lack of technical advice (75.00%), high rates of labours (71.66%), non-availability of timely credits (60.83%). The process of getting cotton crop insurance is complex (59.16%), lack of market facilities (55.83%), difficult to take valid advantage of crop insurance 148.33%, irregular supply of irrigation (39.16%) and irregular supply of electricity 135.83%) were the major constraints faced by cotton growers in management of cotton cultivation in uscending order, respectively.

Sable and Kadam (2013) studied on constraints faced by cotton growers in adaption of integrated pest management. It constrains (91.66%) of respondents reported that insecticides and pesticides are too costly, while 99.66 per cent of respondent reported that seed cost was the high. However, 95.83 and 91.66 per cent respondents expressed about less and lack of knowledge about IPM in sucking pests. The 90.83 per cent of respondents reported that fungicides were too costly. While 10.00 per cent reported problems about non-availability of bio-agents and 66.33 per cent of the respondents expressed lack of knowledge about using sex pheromone trap. About 50.13 and 18.33 per cent of the respondents had reported

the problems such as non-availability of prayers and dusters and lack of knowledge, control of sucking pest, respectively.

Singh and Jena (2013) observed that India's cotton production has increased at a CAGR of 8.5 per cent during the period 2001 to 2010. In fact, India's cotton production has doubled in the last seven years. The increased level of cotton production has helped the country to fulfil almost all of its raw cotton requirements from Quality produced cotton. The Gujarat is leading other states in terms of total cotton production. The state has achieved an increace (CAGR) in production by over 13 per cent, followed by followed by Haryana. Rajasthan and Maharashtra which have realised increased production by about 12 per cent, 9 per cent and over 7 per cent respectively.

Sundermoorthy,*et al.* (2014) studied on price transmission in the cotton-based textile value chain using Johansen multivariate co-integration and error correction model. Although,the above researchers have studied the economics of marketing cost and price spread in different crops on regional basis or in a particular district. An attempt therefore, will be made in the present investigation to study the cost of marketing and price spread in order to find the actual cost incurred by the farmers.

Kamble (2016) reported that the major problems in production of Bt Cotton viz., abnormal distribution of rainfall, high cost of seed fertilizers and pesticide, more labour requirement for sowing, non-availability of labour at peak period, time consuming methods and low price of produce and lack of technical knowledge, etc.

The reviews were related to constraints forced by Bt.cotton growers in production as well as marketing. Most of the revicw showed the major constraints were lack of knowledge, high cost of seeds, and shortage of labour at time of harvesting, attack of pests and diseases and delivery system for supply of input.

CHAPTER - III

RESEARCH METHODOLOGY

In this chapter the methodology used in the study are discussed in depth along with the research method. The research methodology and research design used on the scientific and statistical scheme is determined mainly by material and procedure. This research design is divided into sections which are as follows:

1. The study area
2. Sampling procedure
3. Nature and collection of data
4. Period of study
5. Analytical tools

Location and topography:

Khargon district lies in the central part of Madhya Pradesh. The Khargone division is well connected by roads and railway and this district forms the part of Malwa plateau and Vindhyan hill range with an undulating topography. Khargon district is primarily an agricultural district occupying the Narmada basin valley, having predominantly an agricultural economy. Agriculture is the main occupation of the people in the district. Wheat, maize, sorghum, millet, arhar, moong, urad, groundnut, soybean, castor, mustard, cotton and sugarcane are the major crops sown in the district.

Selection of the study area:

Khargone district of Madhya Pradesh has been selected for the purpose of this study because cotton was found to be the main commercial crop in the area**.** Bt. cotton is the major crop of the Khargone district, which accounts for more acreage of total sown area of the district in Madhya Pradesh where growers are cultivating with the various farming practices and methods. Hence,Khargone District of Madhya Pradesh was taken for the purpose of this study.

Sampling procedure:

For the study, multistage sampling technique was used for drawing the sample for the study.

Selection of block:

Khargone district comprises of 9 blocks i.e. Khargone, Kasrawad, Maheshwar, Barwaha, Gogoan, Bhikangoan, Jhirnya, Bhagwanpura and Segoan. In this stage Barwaha block of Khargone district was selected purposively due to large area under cotton crop.

Selection of villages:

In the second stage, a list of major cotton growing villages of the selected block was prepared. From this list 5 villages was selected randomly.

Selection of respondents:

In the third stage, selection of respondents from selected 5villages were carried out. List of 410 cotton growers were obtained from KVK Khargone out of these 90 cotton producer were taken for ongoing study i.e. (i) Small farmer (< 2.0 ha), (ii) Medium farmer (2.0-4.0 ha) and (iii) Large size farmer (> 4.0 ha) for the study. Thus the sample was confined to 90 vegetable growers from 5 villages.

Table 3.1: Allocation of farmers: All the selected Bt cotton growers have been allocated as follows:

S. no.	Category of farmers	Frequency	Number of farmers
1	Small (<2ha.)	182	40
2	Medium (2-4ha.)	141	31
3	Large (>4ha.)	87	19
4	Total	410	90

Therefore, 40 small farmers, 31 medium-sized farmers and 19 large farmers had been eventually considered for the study.

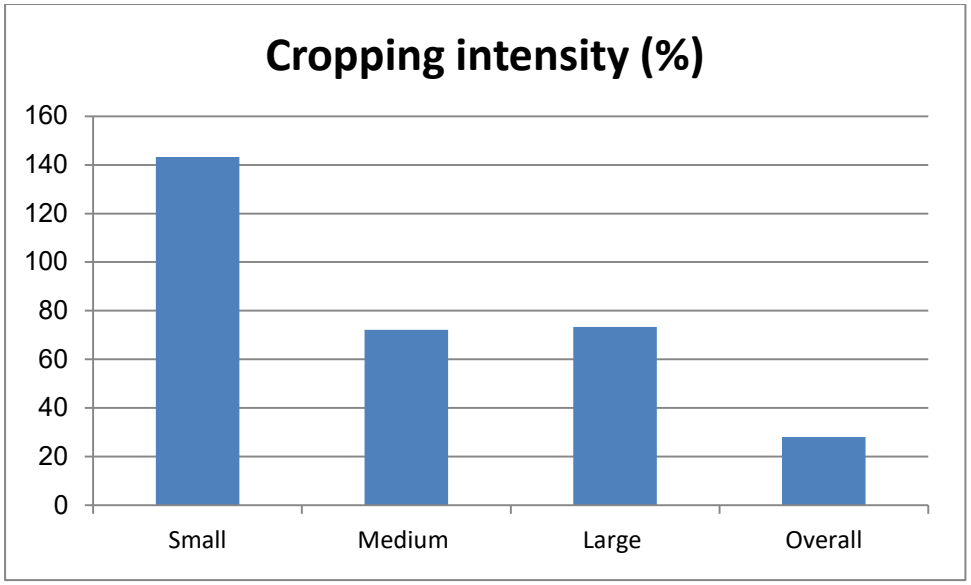

Fig. 1. Llocation of farmers

Data collection:

Depending upon the objective of the study primary data was used. The primary data was collected from selected respondents using pre tested questionnaire, through survey method. Each selected respondent was approached personally for recording relevant data. Secondary data was collected from The Cotton Corporation of India Ltd.

Period of study: The data was collected for the Agricultural year 2019 – 20**.**

Analytical tool –

1.Marketing channels:

There are two marketing channels were identified during the investigation.

I. Channel – I: Producer →Ginner→Cotton Mill →Wholesalers →Retailer→Consumer.

II. Channel – II: Producer →Ginner →Wholesaler→Retailer→Consumer

2.Marketing cost:

Actual expenses incurred during the marketing process:

Marketing cost (MC)= $C_F + C_{m1} + C_{m2} +.....+ C_{mi}$

Where,C_F= Cost paid by the producer from the time the produce leaves the farm till he sells it.

$C_{m1} + C_{m2} +.....+ C_{mi}$= Cost paid by the middleman 1 to i^{th} in the process of buying

and selling the product.

3.Marketing margin:

Margin refers to the difference between the price paid and received by a specific marketing agency/and functionary

$$\text{Market margin} \quad (P_{mi}) = \frac{[p_{Ri} - (P_{Pi} + C_{mi})]}{P_{Pi}} \times 100$$

Where,P_{mi}= Percentage margin of i^{th} middleman, P_{Ri}= Total value of receipt per unit (sale price)

P_{Pi} = Purchase unit of goods per unit(purchase price),C_{mi} = Cost incurred on marketing per unit.

The margin includes profit to the middleman and returns to the storage, interest on capital, overheads and establishment expenditure.

Net profit received by different intermediaries during marketing process.

Marketing margin of village merchant = selling price of village merchant – (purchasing price of village merchant+ cost incurred by village merchant).

Marketing margin of traders = selling price of traders – (purchasing price of traders + cost incurred by traders).

4.Price spread:

It is the difference between price paid by consumer and price received by producer.

Ps = Price paid by consumer – Price received by producer.

The price spread consists of the marketing costs and margins which ultimately determine the producer's share in the price paid by the consumer.

Producer share in consumer rupee:

$$P_s = \left(\frac{\mathbf{P_f}}{\mathbf{P_r}}\right) \times 100$$

Where,P_s = producer's share

P_f = Price received by the farmer, P_r = Retail price paid by the consumer's

5.Marketing efficiency:

Marketing efficiency is the ratio of market output (satisfaction) to marketing input (cost of the resource used in the marketing). An increase in this ratio represents improved efficiency and a decrease denotes reduce efficiency.

The marketing efficiency of different channels of marketing will estimated by using Acharya's formula as mentioned below:

ME $= \frac{\mathbf{RP}}{(\mathbf{MC}+\mathbf{MM})-\mathbf{1}}$ (RP = FP + MC + MM)

Where,ME = Index of marketing efficiency,RP = Price paid by the consumer

FP=Price received by the farmer (Rs/q), MC = Total marketing costs (Rs/q)

MM = Total marketing margin (Rs/q)

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

Problems in production and marketing of Bt. Cotton:- The different aspect i.e. technological production and Marketing constraints were considered to know the overall problems faced by the respondents in cotton production in study area. They were presented with help of percentages.

CHAPTER – IV

RESULT

The economy of a farming firm mostly depends upon properly developed farm infrastructure as a base for creation of sufficient surplus fund to employe various input factor under the sound management and effective organization being the ultimate objective of producer. The scientific cultivation supported with adopted recommended package of practices which influences the farm income as a resultant of efficient marketing the conjugation of these two important elements if are properly handled provides higher return otherwise keep the producer in loss.

In this chapter primarily, micro level analysis of general information of Bt. cotton growers has been done. As per objective an attempt has been made to analyze the comprehensive study of marketing of cotton production in different size of holdings in Khargone district. Hence, the study represents the picture of possible marketing cost, margin,price spread and efficiencyfrom per unit area. As regards to marketing cost concerned, all costs incurred in the marketing process of cotton wereconsidered in the study. The constraints faced by the Bt. Cottonproducers were equally important in study because Bt. cotton was the important commercial crop that needs capital and there was scarcity of capital with farmers in general.

Finally, the primary data collected for study has been analyzed and the results of the study have been presented under following headings:

4.1 Socio - economic status of sample respondents

4.2 Marketing channels of Bt.Cotton

4.3Marketing Cost, marketing margins and price spread of Bt. cotton.

4.4 Market efficiency of various channels in the marketing of Bt. cotton.

4.5 To identify the constraints faced by farmers in Bt. cotton production and marketing.

4.1 General information of respondents or Sample profile:

The data collected from sample holding have been analyzed and presented in the following pages to speak about general characteristics of the sample respondents.

4.1. Family composition

Table: 4.1 Average family size and kind of family on sample farm

Size of group	Family Size			Total	Average family Size	Type of family		
	Male	Female	Children			Individual	Joint	Total
Small	91 (40.81)	89 (39.91)	43 (19.28)	223 (100)	5.58	33 (82.50)	7 (17.50)	40 (100)
Medium	81 (41.75)	80 (41.24)	33 (17.01)	194 (100)	6.26	21 (67.74)	10 (32.26)	31 (100)
Large	73 (43.71)	69 (41.32)	25 (14.97)	167 (100)	8.79	15 (78.95)	4 (21.05)	19 (100)
Over all	245 (41.95)	238 (40.75)	101 (17.29)	584 (100)	6.49	69 (76.67)	21 (23.33)	90 (100)

(Figures in brackets indicate percentage to the total)

As per shown in Table 4.1 total family members was 584 comprising 90 farmers. Average family size respectively, 5.58 lowest in small size of farm and medium farmer family was 6.26 and highest in case of large size of farm 8.79. Hence, average size of family of selected sample farmers is 6.49. Thus, positive relation with family size and farm size was observed on sample farm because increase of farm sizes that result in increase of family size.

Family type of sample respondents under different size groups are presented in the Table 4.1 which revealed that individual family system on sample farms was dominating in small size (82.50%) followed by large farm size (78.95%) and medium farm size (67.74%) respectively. On the other hand, joint family system was found to be maximum in case of medium size of farm 32.26 % followed by large farm by (21.05%) and small size of farm (17.50%) respectively in study area. Overall 76.67 per cent household families were living individual type while 23.33 per cent living in joint type of family structure.

4.2 Age and caste of the respondent in study area:

Table: 4.2 Age and caste of the sample respondents

Size of group	Age group		Total	Type of family				
	18 to 40	Above 40		SC	ST	OBC	GEN	Total
Small	23	17	40	6	11	19	4	40

	(57.50)	(42.50)	(100)	(15.00)	(27.50)	(47.50)	(10.00)	(100)
Medium	10 (32.26)	21 (67.74)	31 (100)	3 (9.68)	7 (22.58)	16 (51.61)	5.00 (16.13)	31 (100)
Large	4 (21.05)	15 (78.95)	19 (100)	1 (5.26)	2 (10.53)	10 (52.63)	6 (31.58)	19 (100)
Over all	37 (41.11)	53 (58.89)	90 (100)	10 (11.11)	20 (22.22)	45 (50.00)	15 (16.67)	90 (100)

(Figures in brackets indicate percentage to the total)

Table 4.2 gives the general information regarding age and caste of sample respondents. The table revealed that age of the respondents ranged from 18 to 40 and above 40 years in different farm of sample respondents. In case of small farmer, maximum farmer's age was found to be 57.50 per cent under 18 to 40 year age group while 42.50 per cent farmers were found in above 40 year age group. In case of medium farmer's age was found to be 32.26 per cent under 18 to 40 year age group while 67.74 per cent farmers were found in above 40 year age group. In case of large farmer's age was found to be 21.05 per cent under 18 to 40 year age group while 78.95 per cent farmers were found in above 40 year age group. Thus, overall majority of the sample farmers belonged to 58.89 per cent and 41.11 per cent respectively, above 40 year age group and 18-40 year age group. In case of caste, maximum respondents (50.00% of the total) belonged to other back ward class followed by schedule tribes (22.22 per cent), general caste (16.67%) and (11.11%) minimum respondents were schedule castes.

4.3 Literacy level

Education is one of the important component for the building confidence and habit of scientific thinking and action for solving emerging problems. The knowledge on the education levels of family members play crucial role in understanding of new methods of production. Keeping in view the importance of education, literacy level of sample households was worked out and same have presented in (Table 4.3)

Table: 4.3 Level of education of sample respondents.

Size of group	Education level					
	Illiterate	**Primary**	**Middle**	**HSSC**	**Graduate and above**	**Total**
Small	3 (7.50)	4 (10.00)	13 (32.50)	14 (35.00)	6 (15.00)	40 (100)
Medium	4 (12.90)	5 (16.13)	7 (22.58)	11 (35.48)	4 (12.90)	31 (100)
Large	2 (10.52)	3 (15.79)	5 (26.32)	6 (31.58)	3 (15.79)	19 (100)
Over all	9 (10.00)	12 (13.33)	25 (27.78)	31 (34.44)	13 (14.44)	90 (100)

(Figures in brackets indicate percentage to the total)

As shown in Table 4.3 number of educated households and size of group were positively related which was normal phenomenon in this state. The illiterate on sample respondent was found to be maximum in case of medium size farmer 12.90 per cent followed by large size of respondent (10.52%) and small farmer (7.50% lowest) respectively. Literacy was found to be the highest in case of small groups 92.50 per cent followed by large groups (89.48%) and medium groups (87.09%) respectively. Overall education level was found to be higher secondary school 34.44 per cent followed by middle school (27.78%), graduate & above (14.44%), primary school (13.33%) and illiterate (10.00%) qualify in study area.

4.4 Occupation of the Bt. Cotton producers:

Table: 4.4 Occupation of sample respondents:

Size of group	Farming occupation		
	Main	**Secondary**	**Total**
Small	38 (95.00)	2 (5.00)	40 (100)
Medium	28 (90.32)	3 (9.68)	31 (100)
Large	16 (84.21)	3 (15.79)	19 (100)
Over all	82 (91.11)	8 (8.89)	90 (100)

(Figures in brackets indicate percentage to the total)

As per in Table 4.4 shown farming occupational of respondents, the maximum main farming occupation was found to be small group 95.00 per cent followed by medium groups (90.32%) and large groups (84.21%) respectively. And maximum number of farming as secondary occupation was found to be large group 15.79 per cent followed by medium group (9.68%) and lowest in small group (5.00%) respectively. Hence, overall main farming occupation adopted was 91.11 per cent and secondary farming occupation adopted was 8.89 per cent in study area.

4.5 Pattern of land holding:

Table 4.5 Distribution of selected sample of Bt.Cottongrowing farmers, the net cultivated area and total size of land holdings under different size group of sample farms:

Particulars	Size group			
	Small	**Medium**	**Large**	**Total**
Number of farmers	40	31	19	90
Total land holding (ha.)	73.20	91.35	133.56	298.11
Average size of land holding	1.83	2.95	7.03	11.81
Net cultivated Area	1.76	3.02	6.19	10.97

	(16.04)	(27.53)	(56.43)	(100)
Uncultivated land	0.07 (18.92)	0.13 (35.14)	0.17 (45.95)	0.37 (100)
Net irrigated area	1.58 (17.08)	2.55 (27.57)	5.12 (55.35)	9.25 (100)
Un- irrigated area	0.18 (10.47)	0.47 (27.33)	1.07 (62.21)	1.72 (100)
Gross cropped area	2.52	2.18	4.54	3.08
Cropping intensity (%)	143.18	72.18	73.34	28.07

(Figures in brackets indicate percentage to the total)

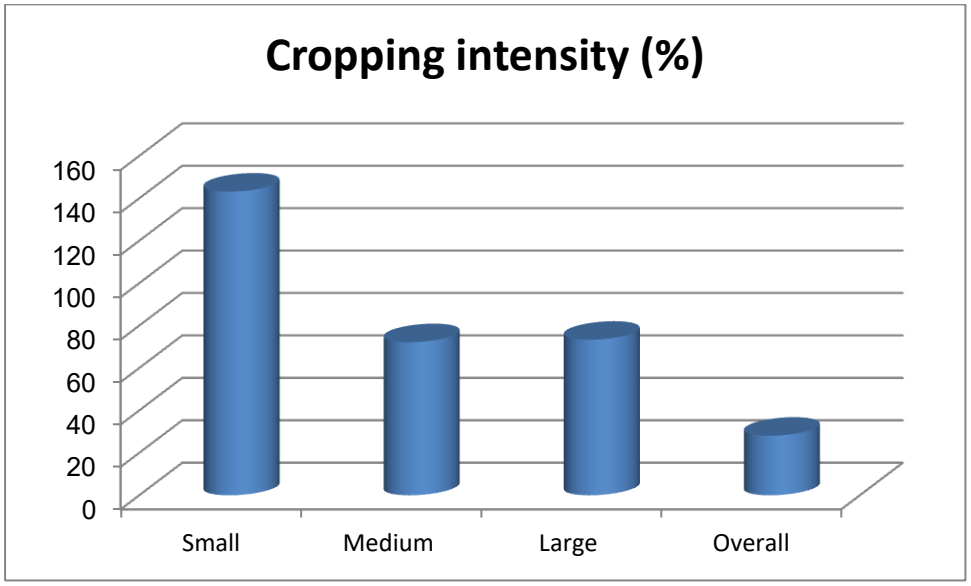

Fig. 2. Cropping intensity of Bt. Cotton growers

As shown in Table 4.5, sample of farmers were allocated 40, 31 and 19 from small, medium and large size farm respectively. Total number of farmers was 90. Total land holding was found to be large farm 133.56 hectare in large farm followed by medium (91.35 ha) and small (73.20 ha) farm respectively. Average size of land holding was found to be 7.03 hectare in case of large size group followed by medium (2.95 ha) and small size group (1.83 ha) respectively. Net cultivated area was found to be large size group 56.43 per cent followed by small (16.04%) and medium (27.53%) respectively.

Un-cultivated area was found to be 35.14 per cent in medium size group followed by small (18.92%) and large (45.95%) respectively. Net irrigation area was found to be maximum in case of large size of farm 55.35 per cent followed by medium (27.57%) and small (17.08%) while un-irrigation area was found to be maximum in case of

large size of farm 62.21 per cent followed by medium (27.33%) and small (10.47%) respectively.Gross cropped area was found to be maximum 4.54 in large size farm followed by 2.52 and 2.18 in case of small and medium size of farms respectively. The cropping intensity was found to be highest i.e. 143.18% in small group whereas 72.18% and 73.34% in medium and large groups respectively.

4.6Marketing channels, marketing costs, price spread and marketing efficiency:

Marketing channels of Bt.Cotton: Marketing channels stated that how producer passes through different marketing agencies from producer till it reaches to the consumer. It is essential to point out different marketing channels used in Bt. cotton marketing during study. Followings were different marketing channels observed during the study.

Channel-I : Producer - Ginner- Cotton Mill – Wholesaler – Retailer - Consumer

Channel-II : Producer - Ginner – wholesaler – Retailer - Consumer

The detailed channel wise information on the quantity of produce sold through different channels by the Bt. cotton growers is presented in Table 4.7.

Marketing of Bt.Cotton: The climatic variation in India helps to produce a variety of cash crops. Many a times the production of these conditions full it of effective demand. The marketing of the farm produce is equally important from the farmers' point of view. The return to producer depends largely on the way in which these operations were performed. It is strongly applicable to agricultural produce. At most care is required to be taken while making it for marketing. The harvesting of Bt. cotton should be done at proper stage of maturity without affecting quality.

Table 4.6Distribution of marketing cost, margin, price spread, producers share in consumer rupee (%) and marketing efficiency in marketing channels-I & II (q/ha):

Channel-I: Producer – Ginner – Cotton Mill – Wholesaler – Retailer – Consumer
Channel-II: Producer – Ginner –Wholesaler – Retailer – Consumer

S.No.	Particulars	Channel-I	Channel-II
1.	**Net Price of Producer**	4840	4700
	Marketing cost at producer level	-	-
	Transportation cost	20 (0.30)	20 (0.29)
	Packing cost	5 (0.07)	5 (0.07)
	Packing material cost	7.5 (0.11)	7.5 (0.11)
	Market fee	8 (0.12)	8 (0.12)
	Loading & unloading charges	10 (0.14)	10 (0.15)
	Weighing charges	5 (0.07)	5 (0.07)
	Miscellaneous charges	2 (0.03)	2 (0.03)
	Total cost	57.5 (0.85)	57.5 (0.86)
	Net price received by producer	4782.5	4642.5 (69.55)

		(71.39)	
2.	**Saling price of ginner**	5386.5 (80.41)	5246.5 (78.60)
	Marketing cost at ginner level	-	-
	Packing cost	6 (0.08)	6 (0.09)
	Market fee	23 (0.34)	23 (0.34)
	Loading & unloading charges	7 (0.10)	7 (0.10)
	Miscellaneous charges	3.75 (0.05)	3.75 (0.05)
	Ginner margin	564.25 (8.42)	564.25 (8.45)
	Total cost	39.75 (0.59)	39.75 (0.60)
3.	**Saling price cotton mill**	5990.5 (77.20)	-
	Marketing cost at cotton mill level	-	-
	Loading & unloading charges	5 (0.07)	-
	Packing cost	15.5 (0.23)	-
	Market fee	9 (0.13)	-
	Miscellaneous charges	2.5 (0.03)	-
	Total cost	32 (0.48)	-
	Margin of cotton mill	357 (5.33)	-
4.	**Saling price wholesaler**	6754(88.60)	6010(88.56)
	Marketing cost at wholesaler level	-	-
	Weighing charges	6 (0.09)	6 (0.9)
	Loading & unloading charges	10 (0.14)	10 (0.15)
	Town / city charges	23 (0.34)	23 (0.34)
	Carriage up to shop	12 (0.17)	12 (0.18)
	Miscellaneous charges	2.5 (0.03)	2.5 (0.04)
	Wholesaler margin	710 (10.59)	710 (10.64)
	Total cost	53.5 (0.79)	53.5 (0.80)
5.	**Saling price of wholesaler to retailer**	6698.5 (89.74)	6613(100)
	Marketing cost at wholesale level	-	-
	Weighing charges	5 (0.07)	5 (0.07)
	Loading & unloading charges	8 (0.12)	8 (0.12)
	Town / city charges	16 (0.24)	16 (0.24)
	Carriage up to shop	15.5 (0.23)	15.5 (0.23)
6.	**Saling price of retailer to consumer**	6743 (100)	6354 (100)
	Price spread	1916 (28.60)	2032.5 (30.45)
	Consumers paid price	6698.5 (100)	6675 (100)
	Producers share in consumer rupee (%)	72.25	70.41
	Marketing efficiency (%)	1.96	2.29

(Figures in parentheses are the percentage to the total)

Table 4.7Comparison of total marketing cost, total marketing margin, price spread, producers share in consumer rupee (%) and marketing efficiency in different channels:

S.No.	Particulars	Channel-I	Channel-II
1.	Total marketing cost	230.5	198.5
2.	Total marketing margin	1631.25	1274.25
3.	Price spread	1903	1654

4.	Producer's share in consumer rupee (%)	70.92	73.06
5.	Marketing efficiency	2.62	3.31

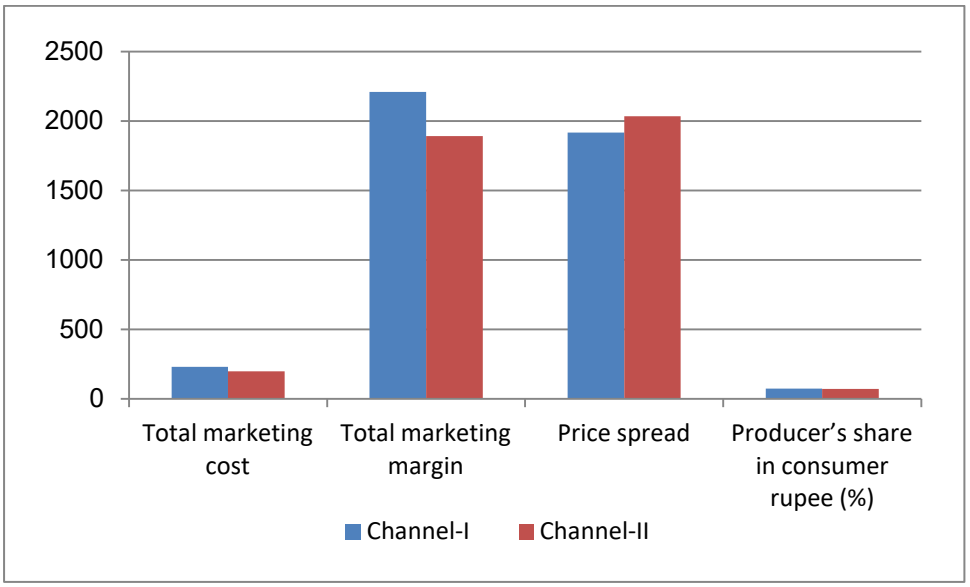

Fig. 3. Marketing cost, marketing margin, price spread and producers share in consumer rupee (%) in different marketing channels.

It can be seen from the table 4.7 that, the per quintal cost of marketing of Bt. cotton of Channel-I ((Producer - Ginner- Cotton Mill – Wholesaler – Retailer - Consumer) and Channel-II (Producer - Ginner-– Wholesaler – Retailer - Consumer) were Rs. 230.50 and 198.50 respectively. Thus, per quintal cost of marketing was highest in Channel I (Producer - Ginner - Cotton mill– Wholesaler – Retailer - Consumer). Among the marketing cost labour charges and transport charges were the major items and contributed highest share in the total cost of marketing. Transport charges are contributed maximum cost in Channel-I.

Price spread is the difference between the price paid by the processor and price received by the producer. This consists of marketing costs and margins of the different channels. The costs and margins of agency in different channels were worked out and details are presented in Table 4.7.It is observed from the table, the net price received by the producer was 4782.50 and 4642.50 in Channel-I and Channel-II, respectively. Price spread was maximum in Channel-I (1916), followed by Channel-II (2032.50). This is due to fact that as the market chain increases price spread also increases. The price paid by consumer was highest in Channel-I followed by Channel-II.

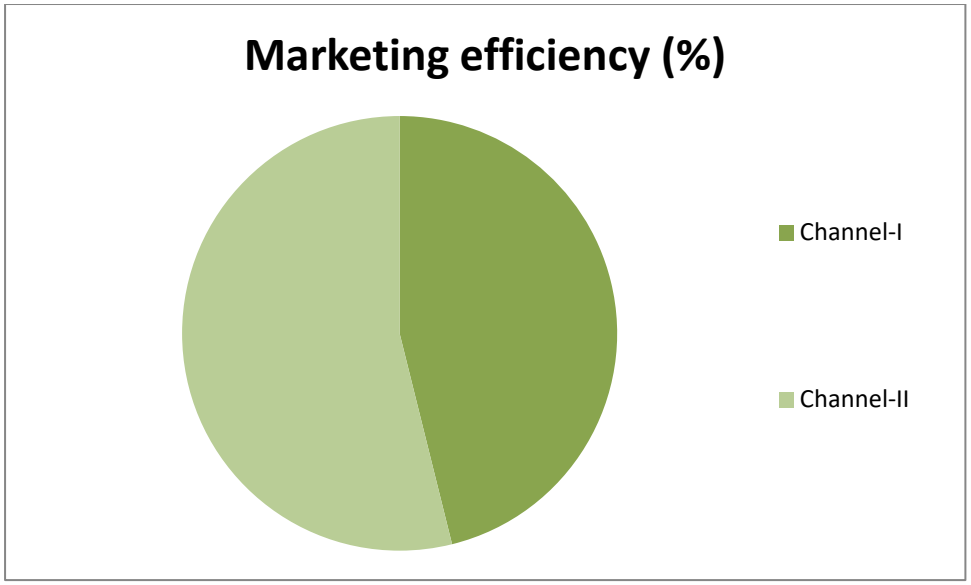

Fig. 4. Marketing Efficiency of Bt. Cotton growers in different marketing channels.

Marketing efficiency was worked out by using modified method as suggested by Acharya and Agrawal. From the table 4.7, it was seen that, the marketing efficiency will maximum for Channcl-II (3.31) followed by Channel-I (2.62), respectively. Channel-I was the most popular but Channel-II was the efficient channel in marketing of Bt. cotton.

4.8Constraints faced by Bt. cotton growers in production and marketing

The Bt. cotton crop is more sensitive to bollworms and diseases. It also requires proper cultivation operations like preparatory tillage, weeding and application of proper fertilizers, pesticides and manures etc. for better productivity.

It is always expected that marketing system must be efficient to provide necessary environment for greater agricultural production through price incentives to producer at one hand and supply of quality products of fair prices to the consumer on the other.

At the time of survey, questions were asked to the simple cultivato's to understand the problem faced by them in production and marketing of Bt. cotton. The information obtained on the problems of Bt. cotton in production and marketing at the cultivator's level has been confirmed in Table 4.8 and 4.9.

1. Constraints in production

The information regarding various problems faced by the cultivators growing of Bt. cotton presented in table 4.8. It was seen from the table that, at the overall level abnormal distribution of rainfall and unavailability of irrigation sources were reported

by 71.11 and 58.90 per cent respectively. Problems regarding expensive and high labour requirement, costly insecticides and pesticides, lack of awareness of irrigation technology and non-availability of credit in time which were reported by 56.67, 53.33, 10.00 and 24.44 per cent respectively.

Among the different size group holding sume trends observed in small, medium and large size group holding. It indicates that most of the problems faced by sample farmers in cultivation of Bt. cotton decreases with increasing size of holdings.

Table 4.8 Constraints in production of Bt. cotton

S. No	Particulars	Size group				
		Small (N=30)	Medium (N=30)	Large (N=30)	Overall (N=90)	Rank
1.	Abnormal distribution of rainfall	25 (83.33)	21 (70.00)	18 (60.00)	64 (71.11)	I
2.	High price of insecticide and pesticide	23 (76.67)	15 (50.00)	10 (33.33)	48 (53.33)	IV
3.	Non-availability of sufficient institutional credit	8 (26.67)	6 (20.00)	8 (26.67)	22 (24.44)	VII
4.	Expensive and more labour required	17 (56.67)	15 (50.00)	19 (63.33)	51 (56.67)	III
5.	High cost of fertilizers	11 (36.67)	21 (70.00)	10 (33.33)	42 (46.67)	V
6.	Unavailability of irrigation sources	21 (70.00)	17 (56.67)	15 (50.00)	53 (58.90)	II
7.	Lack of awareness of irrigation technology	13 (43.33)	18 (60.00)	5 (16.67)	36 (40.00)	VI
8.	Total	30 (100)	30 (100)	30 (100)	90 (100)	

(Figures in parentheses are the percentage to the total)

2. Constraints in marketing

In the present context, the development of agriculture does not merely depend on increasing the agriculture production and productivity but also on the promotion of better and well organised marketing system. The efficient system promotes the production as well as increases economic returns of the farmer. The important

problems faced by the sample cultivators in marketing of cotton were given in Table 4.9.

Table 4.9Constraints in marketing of Bt. cotton

S.No.	Type of Problems	Size group				
		Small (N=30)	Medium (N=30)	Large (N=30)	Total (N=90)	Rank
1.	High transportation charges	17 (56.67)	14 (46.67)	12 (40.00)	43 (47.78)	V
2.	High wage rate at peak period	26.00 (86.67)	22.00 (73.33)	19 (63.33)	67 (74.44)	II
3.	Delay in cash payment	22 (73.33)	17 (56.67)	23 (76.67)	62 (68.89)	IV
4.	Lack of efficient marketing information system	26.00 (86.67)	22.00 (73.33)	24.00 (80.00)	72 (80.00)	I
5.	Unpredictable fluctuations in the prices	12 (40.00)	8 (26.67)	5 (16.67)	25 (27.78)	VI
6.	Low prices	21.00 (70.00)	18.00 (60.00)	23.00 (76.67)	62 (68.89)	III
	Total	30 (100)	30 (100)	30 (100)	90 (100)	

(Figures in brackets are the percentage to the total)

It was observed that about 80 per cent producer's opinioned that therewas lack of marketing information system among them. The prices were always quoted on lower side and wide fluctuations in the prices. The important problem reported was the high wage rate at peak period by 74.44 per cent farmers. The other problems reported were delay in cash payment and low prices which was reported by 68.89 per cent at overall level.

In order to solve and overcome these problems, in production and marketing of Bt. cotton it was suggested that adequale efforts need to be made by Bt. seed companies and public sectors officials to effective practices and effective marketing system to be followed for cultivation of Bt. cotton.

4.9 Suggestions of Bt. cotton growers over Constraints

Bt. cotton growers' suggestions were measured as frequency and percentage, which were described in Table 4.10.

Table 4.10 Suggestions of Bt. cotton growers

S. No.	Suggestion	Frequency	Percent	Rank
1	Dissemination market information through mass media	86	95.55	I
2	Imput at low rate	70	77.77	II
3	Transport facility at low rate	65	72.22	III
4	Law commission charge	57	63.33	IV
5	Adoption of improved agricultural technique and practices	48	53.33	V

Bt. cotton majority growers suggested that market information be disseminated quickly through mass media. Suggested Bt. cotton farmers, low-rate transport facility, storage Inputs at low rates, adoption of improved farming techniques and practices and low commission charges, i.e. 95.55 percent, 77.77 per cent, 72.22 per cent, 63.33 per cent, 53.33 per cent respectively.

CHAPTER-V
DISCUSION

In this chapter, in order to draw broad conclusions of the study, to make the research results purposeful and effective the inference were drawn is known as the presentation of the facts and findings. Therefore, it is essential that the results are presented clearly and meaningfully as per the objectives of the study. This study was carried out in Khargone district of Madhya Pradesh to explain the 'Study on Marketing of Bt.Cotton in Khargone District of Madhya Pradesh'. The main objectives of study were to identify the marketing channels in the study area, to estimate the prise spread and marketing efficiencywith the market margin and marketing cost of Bt.cotton in different marketing channels and also to study about major constraints and suggestions for efficient marketing of Bt.cotton in study area. With the great attention towards these objectives was conducted in Khargone district. Many studies also found in other aspects that the area of cotton cultivation in Madhya Pradesh was 6.1 lakh hectares with the production of 34 lakh tonnes and average yield was 557 kilogram per hectare.

Socio-economic status of maize grower in study area:

As shown, average family size respectively was 5.58 per cent lowest in small size of farm and medium farmer family 6.26 per cent and highest in case of large size of farm 8.79 per cent. Overall size of family of selected sample farmers was 6.49 per cent. Thus, positive relation with family size and farm size was observed on sample farm because increase of farm sizes that result increase of family size.The above data revealed that individual family system on sample farms was dominating in small size (82.50%) followed by large farm size (78.95%) and medium (67.74%) of group respectively. On the other hand, joint family system was found to be maximum in case of medium size of farm 32.26 followed by large farm by (21.05%) and small size of farm (17.50%) respectively in study area. Overall 76.67 per cent household families were living individual type while 23.33 per cent were living in joint type of family structure. Overall majority of the sample farmers belonged to 58.89 per cent and 41.11 per cent respectively, above 40 year age group and 18-40 year age group Regarding caste, maximum respondents (50% of the total) belonged to other back

ward class followed by schedule tribes (22.22%), general caste (16.67%) and (11.11%) minimum respondents were schedule castes.. Overall education level was found respectively, 10 per cent illiterate, 13.33 per cent primary school, 14.44 per cent graduate & above, 27.78 per cent middle school and 34.44 per cent higher secondary school passed in study area.Overall main occupation adopted 91.11 per cent and secondary occupation adopted 8.89 per cent in study area.

Cotton, the “White Gold” is one of the most important natural fiber crops and plays a vital role in trade, employment,industry,economy, and foreign exchange earning.It is known as “king of fiber” and is an important cash crop of the country. Cotton seed oil and meal are two most valuable products of cotton seed. Cotton seeds contain a significant amount of tocopherols, a form of Vitamin-E, which contribute to the long shelf life of cotton seed. (Smith and Creelman, 2001)India has the distinction of having the largest area under cotton cultivation and one of the largest producers of cotton in the world. Madhya Pradesh is the sixth largest producer of cotton in India.

Number of sampled farmers was allocated 40, 31 and 19 from small, medium and large size farm respectively. Total number of farmers was 90. Total land holding was found to be large farm 133.56 hectare in large farm followed by medium (91.35 ha) and small (73.20 ha) farm respectively. Average size of land holding was found to be 7.03 hectare in case of large size group followed by medium (2.95 ha) and small size group (1.83 ha) respectively. Net cultivated area was found to be large size group 56.43 per cent followed by small (16.04%) and medium (27.53%) respectively. Un-cultivated area was found to be 35.14 per cent in medium size group followed by small (18.92%) and large (45.95%) respectively. Net irrigation area was found to be maximum in case of large size of farm 55.35 per cent followed by medium (27.57%) and small (17.08%) while un-irrigation area was found to be maximum in case of large size of farm 62.21 per cent followed by medium (27.33%) and small (10.47%) respectively.Gross cropped area was found to be maximum 4.54 in large size farm followed by 2.52 and 2.18 in case of small and medium size of farms respectively. The cropping intensity was found to be highest i.e. 143.18% in small group whereas 72.18% and 73.34% in medium and large groups respectively.

Market efficiency of various Channels in the Bt.cotton marketing:

Channel-I : (Producer - Ginner- Cotton Mill – Wholesaler – Retailer - Consumer)

Channel-II : (Producer - Ginner– Wholesaler – Retailer - Consumer)

It could be seen that there are two marketing channels in Bt. cotton marketing. It was observed that the total level of marketing channel-II (Producer - Ginner- Cotton Mill – Wholesaler – Retailer - Consumer) was the most preferred channel through which 70.41 per cent of the total produce was marketed followed by (Channel-I: (Producer - Ginner- Cotton Mill – Wholesaler – Retailer - Consumer) through which 72.25 per cent of the total produce was marketed.

From the table 4.7 that, the per quintal cost of marketing of Bt. cotton of Channel-I (Producer - Ginner- Cotton Mill – Wholesaler – Retailer - Consumer) and Channel-II (Producer - Ginner-– Wholesaler – Retailer - Consumer) were Rs. 230.50 and 198.50 respectively. Thus, per quintal cost of marketing was highest in Channel II (Producer - Ginner – Wholesaler – Retailer - Consumer). Among the marketing cost labour charges and transport charges were the major items and contributed highest share in the total cost of marketing. Transport charges are contributed maximum cost in Channel-II.

Price spread is the difference between the price paid by the processor and price received by the producer. This consists of marketing costs and margins of the different channels. The costs and margins of agency in different channels were worked out and details are presented in Table 4.7. It is observed from the table, the net price received by the producer was 4782.50 and 4642.50 in Channel-I and Channel-II, respectively. Price spread was maximum in Channel-I (1916), followed by Channel-II (2032.50). This is due to fact that as the market chain increases price spread also increases. The price paid by consumer was highest in Channel-I followed by Channel-II.

Marketing efficiency was worked out by using modified method as suggested by Acharya and Agrawal. From the table 4.7, it was seen that, the marketing efficiency will maximum for Channcl-II (2.29) followed by Channel-I (1.96), respectively. Channel-I was the most popular but Channel-II was the efficient channel in marketing of Bt. cotton.

Constraints faced by Bt. cotton growers in production and marketing

The information regarding various problems faced by the cultivators growing of Bt. cotton presented in table 4.9 . It was seen from the table that, at the overall level abnormal distribution of rainfall and unavailability of irrigation sources were reported by 71.11 and 58.90 per cent respectively. Problems regarding expensive and high labour requirement, costly insecticides and pesticides, lack of awareness of irrigation

technology and non-availability of credit in time which were reported by 56.67, 53.33, 10.00 and 24.44 per cent respectively.

The important problems faced by the sample cultivators in marketing of cotton were observed that about 80 per cent producer's opinioned that therewas lack of marketing information system among them. The prices were always quoted on lower side and wide fluctuations in the prices. The important problem reported was the high wage rate at peak period by 74.44 per cent farmers. The other problems reported were delay in cash payment and low prices which was reported by 68.89 per cent at overall level.

CHAPTER-VI

SUMMARY AND CONCLUSION

The main aim of present investigation was to “Study onMarketing of Bt.Cotton in Khargone District of Madhya Pradesh", was undertaken with following specific objectives:

1. To identify the marketing channels in the study area.
2. To estimate the price spread and marketing efficiency of Bt.cotton in different channels.
3. To study about major constraints and suggestions for efficient marketing of Bt.cotton.

The study was based on the data collected from 90 farm families by survey method for the year 2019-20. From Barwaha block of Khargone district 5 villages were selected purposively on the basis of maximum area under Bt.cotton crop for the present study.

The farmers selected from each village were further classified into small, medium and large farmers on the basis of operational holdings as small farmers (up to 1ha), medium farmers (1-2 ha) and large farmers (more than 2 ha). The data was analyzed in the tabular form with the help of percentages and averages to work out marketing costs, margins, efficiency and price spread. Marketing cost for each channel of Bt.cotton farmers were calculated separately analysed was employed to fulfill the objectives of the present investigation. Besides, in order to know the feedback of cotton growers regarding Bt.cotton cultivation all cultivators were interviewed by survey method. The summary of findings obtained from the present investigation is summarized as below:

Summary:

Cotton, the “White Gold” is one of the most important natural fiber crops and plays a vital role in trade, employment,industry,economy, and foreign exchange earning.It is known as “king of fiber” and is an important cash crop of the country. Whole cotton seed is a source of protein (20%), TDN (87%) and fiber (22%) for live stock (Ely and Guthrie, 2008). Cotton seed oil and meal are two most valuable products of cotton seed. Oil makes up to 16% of the product resulting from crushing cotton seeds in an oil mill. Cotton seeds contain a significant amount of tocopherols, a form of Vitamin-E, which contribute to the long shelf life of cotton seed. (Smith and Creelman, 2001)

In the world, cotton is cultivated is an area of 34.31 million hectare with production 26.15 million metric tonnes. The world's averageyield is about 762 Kg/hectare. (Anonymous 2019-20) India has the distinction of having the largest area under cotton cultivation which is about 37% of the world's area under cotton cultivation between 12.5 - 12.6 million hectares. India is one of the largest producers of cotton in the world accounting for about 23% of the world's cotton production. In India, the production of cotton is about 6.12 million metric tonnes. The yield per kg hectare which is presently 466 kg/hectare is still lower against the world average yield of 762kg/hectare. (Anonymous, 2019-20)

Madhya Pradesh is the sixth largest producer of cotton in India. In Madhya Pradesh area under cotton cultivation was 6.1 lakh hectares with the production of 34 lakh tonnes. The average yield of Madhya Pradesh is 557 kg/hectare. There are four major cotton growing districts in the state among all the districts Khargone is the largest producer in the state. (Anonymous, 2019-20) Keeping in view all these facts, an investigation entitled "Study on Marketing of Bt.Cotton in Khargone District of Madhya Pradesh" will be undertaken with the following specific objectives:

Objectives –

1. To identify the marketing channels in the study area**.**
2. To estimate the Price spread and Marketing efficiency of Bt.cotton in different channels
3. To study about major constraints and suggestions for efficient marketing of Bt.cotton

Technical programme of work:

Selection of the study area:

Khargone district of Madhya Pradesh has been selected for the purpose of this study because cotton is found to be the main commercial crop in the area

Sampling procedure:

For the study, multistage sampling technique was used for drawing the sample for the study.

Selection of block:

Khargone district comprises of 9 blocks i.e. Khargone, Kasrawad, Maheshwar, Barwaha, Gogoan, Bhikangoan, Jhirnya, Bhagwanpura and Segoan. In this stage

Barwaha block of Khargone district was selected purposively due to large area under cotton crop.

Selection of villages:

In the second stage, a list of major cotton growing villages of the selected block was prepared. From this list 5 villages was selected randomly.

Selection of respondents:

In the third stage, selection of respondents from selected 5villages were carried out. List of 410 cotton growers were obtained from KVK Khargone out of these 90 cotton producer were taken for ongoing study.

Data collection:

Depending upon the objective of the study primary data was used. The primary data was collected from selected respondents using pre tested questionnaire, through survey method. Each selected respondent was approached personally for recording relevant data. Secondary data was collected from The Cotton Corporation of India Ltd.

Period of study: The data was collected for the Agricultural year 2019 – 20**.**

Analytical tool –

1.Marketing channels:

There are two marketing channels were identified during the investigation.

I. Channel – I: Producer →Ginner→Cotton Mill →Wholesalers →Retailer→Consumer.

II. Channel – II: Producer →Ginner →Wholesaler→Retailer→Consumer

2.Marketing cost:

Actual expenses incurred during the marketing process:

Marketing cost (MC)= $C_F + C_{m1} + C_{m2} +.....+ C_{mi}$

Where,C_F= Cost paid by the producer from the time the produce leaves the farm till he sells it.

$C_{m1} + C_{m2} +.....+ C_{mi}$= Cost paid by the middleman 1 to i^{th} in the process of buying and selling the product.

3.Marketing margin:

Margin refers to the difference between the price paid and received by a specific marketing agency/and functionary

$$\text{Market margin} \quad (P_{mi}) = \frac{[p_{Ri} - (P_{Pi} + C_{mi})]}{P_{Pi}} \times 100$$

Where,P_{mi}= Percentage margin of i^{th} middleman, P_{Ri}= Total value of receipt per unit (sale price)

P_{Pi} = Purchase unit of goods per unit(purchase price),C_{mi} = Cost incurred on marketing per unit.

The margin includes profit to the middleman and returns to the storage, interest on capital, overheads and establishment expenditure.

Net profit received by different intermediaries during marketing process.

Marketing margin of village merchant = selling price of village merchant – (purchasing price of village merchant+ cost incurred by village merchant).

Marketing margin of traders = selling price of traders – (purchasing price of traders + cost incurred by traders).

4.Price spread:

It is the difference between price paid by consumer and price received by producer.

Ps = Price paid by consumer – Price received by producer.

The price spread consists of the marketing costs and margins which ultimately determine the producer's share in the price paid by the consumer.

Producer share in consumer rupee:

$$P_s = \left(\frac{\mathbf{P_f}}{\mathbf{P_r}}\right) \times 100$$

Where,P_s = producer's share

P_f = Price received by the farmer, P_r = Retail price paid by the consumer's

5.Marketing efficiency:

Marketing efficiency is the ratio of market output (satisfaction) to marketing input (cost of the resource used in the marketing). An increase in this ratio represents improved efficiency and a decrease denotes reduce efficiency.

The marketing efficiency of different channels of marketing will estimated by using Acharya's formula as mentioned below:

$$\mathbf{ME} = \frac{\mathbf{RP}}{(\mathbf{MC}+\mathbf{MM})-\mathbf{1}} \qquad (RP = FP + MC + MM)$$

Where,ME = Index of marketing efficiency,RP = Price paid by the consumer

FP=Price received by the farmer (Rs/q), MC = Total marketing costs (Rs/q)

MM = Total marketing margin (Rs/q)

Conclusions:

The present investigation was intended to depict the picture of Bt.cotton growing enterprise in Khargone district. The enterprise assumed an important place in economy of the contary under study. The forgoing discussion on various aspects of study leads to draw the following conclusions:

1. Average family members were 584 comprising 90 families. Average family size respectively, 5.58 lowest in small size of farm and medium farmer family is 6.26 and highest in case of large size of farm 8.79. Hence, average size of family of selected sample farmers was 6.49.
2. Individual family system on sample farms was dominating in small size (82.50%) followed by large farm size (78.95%) and medium (67.74%) of group respectively. On the other hand, joint family system was found to be maximum in case of medium size of farm 32.26 followed by large farm by (21.05%) and small size of farm (17.50%) respectively in study area. Overall 76.67 per cent household families were living individual type while 23.33 per cent were living in joint type of family structure.
3. Overall majority of the sample farmers belonged to 58.89 per cent and 41.11 per cent respectively, above 40 year age group and 18-40 year age group.
4. Regarding caste, maximum respondents (50% of the total) belonged to other back ward class followed by schedule tribes (22.22%), general caste (16.67%) and (11.11%) minimum respondents were schedule castes.
5. Overall education level was found respectively, 10 per cent illiterate, 13.33 per cent primary school, 14.44 per cent graduate & above, 27.78 per cent middle school and 34.44 per cent higher secondary school passed in study area.
6. Overall main occupation adopted 91.11 per cent and secondary occupation adopted 8.89 per cent in study area
7. The per quintal marketing cost of Bt.cotton in Channel-I and Channel-II was Rs. 230.50and 198.50. The major items of marketing cost were labour charges, storage, weighing charges and transportation charges.
8. The marketing efficiency of channel-I was 2.62 per cent and marketing efficiency of channel-II was 3.31 %.
9. The major marketing problems faced by the cultivators were abnormal distribution of rainfall, high cost of inputs, problems of price variation in market and

lack of technology knowledge were the major constraints faced by cultivators in production and marketing of Bt. cotton.

10. Abnormal distribution of rainfall, unavailability of irigation sources, lack of an efficient marketing information system, high wage rate at peak period, fluctuation in price of produce and lack of technological knowledge were the major constraints faced by cultivators in marketing or Bt.Cotton.

Suggestions:

For further development of Bt.cotton production and criteria for removal of constraints, the following suggestions may be considered:

1. The following suggestions could be emerged from the present study. Extension agencies should create awareness among Bt.cotton growers for efficient and timely use of their resources in order to incrcase the yield of Bt.cotton.
2. Adequate efforts need to be made by seed companics and public sector officials lo propagate effective practices to be followed for cultivating Bt. cotton.
3. Improved seeds provide higher return and productivity that's why it is taken into use according to requirement of the growers.
4. Though maximum number of farmer growing are improved variety of Bt.cotton but proper dose of nutrition and fertilizers is needed which is lacking in respect of proper utilization as recommended for higher yield. So, farmers are suggested to make judicious use of resources in production to get optimum profit from Bt.cotton cultivation.
5. The price of improved inputs required for Bt.cotton cultivation has many fold decades and hence, the cost of marketing 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 Bt.cotton growers in the area. The price has to be remunerative enough to earn a legitimate profit by supporting reduction in their cost of marketing by subsidizing the inputs like fertilizer, quality seeds and plant protection materials etc. From above discussion it is clear that emphasis should be given on resources availability and their economic use.
6. It has been seen that the farmers tends to follow the conventional method of cultivation, do not apply appropriate and sufficient inputs and practices. This often

results in lower yield. Hence utmost importance should be given to transfer of technology in Bt.cotton cultivation. The farmers do not have faith in what is being told to them but when they will see the farmers using/adopting scientific ways they will believe in these never means and follow them leaving behind the conventional ones. Majority of the farmers in the Khargone region do not have access to Agro-compatibility. Moreover there is a need to reduce the cultivation cost and other allied practices by using improved farm implements required for various field preparations.

7. Farmers have difficulty in purchasing the input services at reasonable price, to overcome this there is need to be built Input Supply Centers (ISC) at food grain mandi level.

8. It is also observed during the study that the farmers lack link between research station, extension workers and progressive farmers. Hence, the research extension system should become more demand-driven and responsible to overcome farmer's problems in improvement of Bt.cotton cultivation in the area. There needs to be close interaction between farmers, extension officials and research system in diagnosing the problems of farmers in Bt.cotton cultivation.

9. The attention should be paid by the Bt.Cotton development agencies and extension workers on the constraints faced by the Bt.cotton growers in adoption of improved Bt.cotton production and marketing technology. These constraints need to be highlighted and dealt with the concerned authorities and departments so that the constraints can be removed.

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APPENDICES

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Gwalior

Title of Research Problem:
Study on Marketing of Bt.Cotton in Khargone District of Madhya Pradesh

INTERVIEW SCHEDULE

Name of Guide
Dr. P.K. Malviya

Name of Investigator
Shubham Patel

(1) General Information of the respondents:

Name of farmer .....
Father's name .....
Age .....
Caste .....
Education .....
Village .....
Block .....
District .....

(2) Family detail

S.no.	Name of family member	Relationship with respondent	M/F	Age	Education	Occupation	
						Main	Secondary

(3) Land and Land use Pattern:

Total Land holding .....(ha)
Net cultivated area .....(ha)
Uncultivated area .....(ha)
Net irrigated area .....(ha)
Un – irrigated area .....(ha)
Gross cropped area .....(ha)

(4) Cropping Pattern:

Kharif season

S. No.	Crop	Area
Total		

Rabi Season

S. No.	Crop	Area
total		

(5) Detail about Marketing cost, Marketing margin and Price spread

S.No.	Particulars	Channel-I	Channel-II
1.	**Producer sale price to consumer**		
	Marketing cost at producer level		-
	Transportation cost		
	Packing cost		
	Packing material cost		
	Market fee		
	Loading & unloading charges		
	Weighing charges		
	Miscellaneous charges		
	Total cost		
	Net price received by producer		
2.	**Sale price of producer to ginner**		
	Marketing cost at ginner level		
	Packing cost		
	Market fee		
	Loading & unloading charges		

	Miscellaneous charges		
	Ginner margin		
	Total cost		
3.	**Sale price of ginner to cotton mill**		
	Marketing cost at cotton mill level		
	Loading & unloading charges		
	Packing cost		
	Market fee		
	Miscellaneous charges		
	Total cost		
	Margin of cotton mill		
4.	**Sale price of cotton mill to wholesaler**		
	Marketing cost at wholesaler level		
	Weighing charges		
	Loading & unloading charges		
	Town / city charges		
	Carriage up to shop		
	Miscellaneous charges		
	Wholesaler margin		
	Total cost		
5.	**Sale price of wholesaler to retailer**		
	Marketing cost at wholesale level		
	Weighing charges		
	Loading & unloading charges		
	Town / city charges		
	Carriage up to shop		
6.	**Sale price of retailer to consumer**		

(6) General Information of Bt.Cotton marketing

1. Is there fixed Market available for Bt.Cotton ? Yes/No
2. Whether the transport facility is available in time? Yes/No
3. What are the Transport modes..... Bullock cart/ truck / tempo
4. Where produce was sold? Sanawad / Badwah / Khargone
5. Is there need of commission agent? Yes/No
6. Is there any losses during transportation? Yes/No
7. Are you taken loan from commission agent? Yes/No
8. Whether Bt.Cotton get suitable rate? Yes/No
9. In which month, there was maximum rate for produce? .....

(6)Constraints in Production of Bt.Cotton

S. No.	Particulars	Yes/No
01	Abnormal distribution of rain	
02	High rate of insecticide and pesticide	
03	Non-availability of sufficient institutional credit	
04	Expensive and more labour required	
05	High cost of fertilizers	
06	Unavailability of irrigation sources	
07	Lack of awareness of irrigation technology	
08		

(7) Constraints in Marketing of Bt.Cotton

S. No.	Types of Problem	Yes/No
01	High transportation charges	
02	High wage rate at peak period	
03	Delay in cash Payment	
04	Lack of efficient marketing information system	
05	Unpredictable fluctuations in the prices	
06	Low prices	

VITA

The author of this thesis Mr. Shubham Patel S/o Rameshwar Patel was born on 28 October 1997 at Khargone district of Madhya Pradesh. He completed Primary & Middle Education from Rahadkot, Khargone. He passed High School from Prabhat Convent H.S. School Bediya, Khargone in the year 2007 with 89.83 per cent, and Higher Secondary Examination from Divya Convent H.S. School, Indore in the year 2015 with 78.80 per cent.

He was admitted in College of Agriculture, Indore in 2015 and completed his B.Sc (Ag.) in the year 2019 achieving 7.33 OGPA. After completing graduation he got admitted in College of Agriculture, Indore (M.P.) and successfully completed the degree of M.Sc. (Ag.) with specialization in " Agricultural Economics" and Partial fulfillment of the requirement for the award of the same,

He was allotted with an interesting problem **"Study on Marketing of Bt.Cotton in Khargone District of Madhya Pradesh"** For thesis work, which was duly completed by him and presented in this thesis.

He is submitting the thesis after completing the course with 7.90 OGPA out of 10.00 point scale.

Date: …../…./…….

Place ……..

SHUBHAM PATEL