AN ECONOMIC ANALYSIS OF PRODUCTION AND MARKETING OF BANANA IN BILASPUR DISTRICT OF CHHATTISGARH STATE

M. Sc. (Ag.) Thesis

By

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DEPARTMENT OF AGRICULTURAL ECONOMICS

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AN ECONOMIC ANALYSIS OF PRODUCTION AND MARKETING OF BANANA IN BILASPUR DISTRICT OF CHHATTISGARH STATE

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CERTIFICATE – I

This is to certify that the thesis entitled "**An Economic Analysis of Production and Marketing of Banana in Bilaspur District of Chhattisgarh State**" submitted in partial fulfillment of the requirements for the degree of **Master in Sciences in Agricultural Economics** of **Indira Gandhi Krishi Vishwavidyalaya, Raipur**, is a record of the bonafide research work carried out by **Shekhar Kumar,** under my/our guidance and supervision. The subject of the thesis has been approved by the Students 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/published part has been fully acknowledged. All the assistance and help received during the course of the investigations have been duly acknowledged by him/her.

Chairman

Date:

THESIS APPROVED BY THE STUDENT'S ADVISORY COMMITTEE

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Member (Dr. S.K. Verma) _____

Member (Dr. N.K. Chaure) _____

CERTIFICATE –II

This is to certify that the thesis entitled "**An Economic Analysis of Production and Marketing of Banana in Bilaspur District of Chhattisgarh State**" submitted by **Shekhar Kumar** to the Indira Gandhi Krishi Vishwavidyalaya, Raipur in partial fulfillment of the requirements for the degree of **Master of Science** in the Department of **Agricultural Economics** has been approved by the external evaluator and Student's Advisory Committee after oral examination under the chairmanship of head of the Department/Dean.

Date:

Signature of Head of
Department/Dean
Dr. M. R.Chandrakar

Major Advisor ----------

Faculty Dean ----------

Approved/Not approved

Director of Instructions ----------

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LIST OF ABBREVIATIONS

Abbreviations	Description
et al	- Et alii (and others/co-workers)
Viz.	–Namely
q	–Quintal
MT	- Metric Tonnes
Rs.	- Rupees(Indian Currency)
Kg	–kilogram
Fig.	-Figure
NCA	- Net Cropped area
Mt	- million tonnes
CACP	- Commission on Agricultural costs and prices
BCR	- Benefit cost ratio
GI	- Gross income
NI	- National income
HYV	- High yielding varieties
APMC	- Agriculture Produce Marketing Committee
MFC	- Marginal factor cost
MVP	- Marginal value product
NHM	- National horticultural mission

THESIS ABSTRACT

A) Title of thesis	: "An Economic Analysis of Production and Marketing of Banana in Bilaspur District of Chhattisgarh State"
B) Full name of student	: Shekhar Kumar
C) Major subject	: Agricultural economics
D) Name and address of Major advisor	: Dr. Ajay Tegar Department of agricultural economics B.T.C. College of Agriculture and Research Station Bilaspur C.G.
E) Degree to be awarded	: Master of Science in Agriculture (Agricultural Economics)

Signature of the student

Signature of major Advisor

Date: ----------

Signature of Head of the Department

ABSTRACT

The current research was carried out in Bilaspur district of Chhattisgarh state. Two blocks namely Masturi and Bilha were selected for the study. One twenty four farmers were randomly selected from eleven villages on the basis of their land holding size viz. small, medium and large farmers. The major finding of the study concluded that average family size was 4.99 with an overall literacy rate of 95.81 per

cent. Average size of holding was found 4.60 ha and average cropping intensity was 231.73 per cent in the study area. The compound growth rate of banana in Bilaspur district shows non-significant growth in area and production and significant growth in productivity. The compound growth rate of banana in Chhattisgarh state shows significant growth in area and production but non-significant growth in productivity. The average cost of banana cultivation is calculated at 187,274.34 rupees per hectare. The average production cost of bananas per quintal is 240.72 rupees per hectare. The total B:C ratio obtained is 1:1.91. For banana marketing, three marketing channels are observed in the study area i) Channel-I: Producer → Consumer. ii)Channel-II: Producer→Retailer→Consumer.iii)Channel-III: Producer→ Wholesaler→ Retailer→ Consumer. The overall marketable surplus of banana was found 99.52 per cent. The producer's share in consumer's rupee was 97.09 per cent in first channel, 78.37 per cent in second channel and 57.48 in third channels. The marketing efficiency ratio was 34.46 in first channel, 4.62 in second channels and 2.35 in third channels which shows channel-I was more efficient followed by channel-II and channel-III. The major constraints witnessed in production of banana were lack of improved variety of seed, lack of latest technical knowledge and scarcity of labour. The crucial constraints in marketing of banana were lack of processing industry related to banana, dependency on middleman and lack of regulated co-operative market.

From the finding of the study it is being suggested that planting material should be carefully selected with better quality like (G-9) tissue culture variety of banana to maintain proper plant population and to obtain maximum production of banana. Farmers should be more interested in extension activities like demonstration, training program, exhibition program etc. The department of agriculture and horticulture should work for developing new techniques, latest variety of banana and its proper dissemination should be ensured.

शोध सारांश

(अ) शोध का शीर्षक	:	"छत्तीसगढ़ राज्य के बिलासपुर जिले में केले के उत्पादन और विपणन का आर्थिक विश्लेषण"
(ब) छात्र का पूरा नाम	:	शेखर कु मार
(स) प्रमुख विषय	:	कृ षि अर्थशास्त्र
(द) प्रमुख सलाहकार का नाम एवं पता	:	डॉ. अजय टेगर , प्राध्यापक (कृ षि अर्थशास्त्र) बी.टी.सी. कॉलेज ऑफ एग्रीकल्चर एंड रिसर्च स्टेशन बिलासपुर छ. ग.
(इ) प्रदान की जाने वाली उपाधि	:	कृषि में स्नातकोत्तर (कृषि) अर्थशास्त्र

छात्र का हस्ताक्षर

मुख्य सलाहकार का हस्ताक्षर

दिनांक.....

विभागाध्यक्ष का हस्ताक्षर

सारांश

वर्तमान शोध छत्तीसगढ़ राज्य के बिलासपुर जिले में किया गया था। अध्ययन के लिए दो ब्लॉक मस्तूरी और बिल्हा का चयन किया गया था ।ग्यारह गांवों से एक सौ चौबीस किसानों को उनकी भूमि जोत के आकार के आधार परयादृच्छिक रूप से चुना गया था। छोटे, मध्यम और बड़े किसान। अध्ययन के प्रमुख निष्कर्षों ने निष्कर्ष निकाला कि औसत परिवार का आकार 4.99 था जिसमें कुल साक्षरता दर 95.81 प्रतिशत थी । अध्ययन क्षेत्र में जोत का औसत आकार 4.60 हेक्टेयर तथा औसत फसल सघनता 231.73 प्रतिशत पाई गई । बिलासपुर जिले में केले की मिश्रित वृद्धि दर क्षेत्र और उत्पादन में गैर- महत्वपूर्ण वृद्धि और उत्पादकता में महत्वपूर्ण वृद्धि दर्शाती है। छत्तीसगढ़ राज्य में

केले की मिश्रित वृद्धि दर क्षेत्रफल और उत्पादन में उल्लेखनीय वृद्धि दर्शाती है लेकिन उत्पादकता में गैर-महत्वपूर्ण वृद्धि दर्शाती है । केले की खेती की औसत लागत 187274.34 रुपये प्रति हेक्टेयर आंकी गई थी। औसतन प्रति क्विंटल उत्पादन की लागत 240.72 रुपये प्रति हेक्टेयर थी। समग्र बी: सी अनुपात 1:1.91 प्राप्त किया गया था। केले के विपणन के लिए अध्ययन क्षेत्र में तीन विपणन चैनल देखे गए थे i) चैनल- I: निर्माता⟶ उपभोक्ता । ii) चैनल-II: निर्माता⟶ खुदरा विक्रेता⟶ उपभोक्ता iii) चैनल- III: निर्माता⟶ थोकविक्रेता⟶ खुदराविक्रेता⟶ उपभोक्ता। केले का कुल विपणन योग्य अधिशेष 99.52 प्रतिशत पाया गया । उपभोक्ता के रुपये में निर्माता की हिस्सेदारी पहले चैनल में 97.09 प्रतिशत, दूसरे चैनल में 78.37 प्रतिशत और तीसरे चैनल में 57.48 प्रतिशत थी। पहले चैनल में बाज़ार दक्षता अनुपात 34.46, दूसरे चैनल में 4.62 और तीसरे चैनल में 2.35 था, जो दिखाता है कि चैनल- I अधिक कुशल था और उस के बाद चैनल- II और चैनल- III का स्थान था । केले के उत्पादन में देखी गई प्रमुख बाधाएँ उन्नत किस्म के बीज का अभाव, नवीनतम तकनीकी ज्ञान की कमी और श्रम की कमी थी। केले के विपणन में महत्वपूर्ण बाधाएं केले से संबंधित प्रसंस्करण उद्योग की कमी, बिचौलियों पर निर्भरता और विनियमित सहकारी बाजार की कमी थी।

CHAPTER - I
INTRODUCTION

Banana, which is understood through one-of-a-kind names like plant of virtue, fruit of god and apple of paradise, is one of the maximum critical fruit vegetation of India. Banana is a completely famous fruit because of its low fee and excessive nutritive value. It is eaten up in sparkling or cooked shape each as ripe and uncooked fruit. Processed products, which include chips, banana puree, jam, jelly, juice, wine and halva, may be crafted from the fruit. Fiber is used in gadgets like bags, pots and wall hangers. Rope and properly great paper may be organized from banana waste. Banana leaves are used as healthful and hygienic consuming plates

Modern fit to be eaten banana types were developed from the 2 famous species this is Musa accuminata and Musa balbisiana. Today banana is the main tropical fruit within side the international marketplace with the exceedingly prepared and advanced industry. Banana (Musa sp.) is the second one maximum essential fruit crop in India after mango. Banana has a complete 12 months spherical availability, affordability, varietal range, taste, nutritive and medicinal price which makes the banana favorite fruit amongst all training of people. Hi-tech cultivation of the crop is an economically feasible corporation main to boom in productivity, development in produce pleasant and early crop adulthood with the produce commanding top rate price.

Banana (Musa sp.) is grown in a hundred thirty five countries, generally for his or her fruit, and to a lesser quantity to make fiber, banana wine, and banana beer and as decorative plants. The world's biggest manufacturers of bananas in 2017 had been India and China, which collectively accounted for about 38% of overall manufacturing of Banana within side the world

Universally the fare of banana transformed into anticipated at 23.3 million metric ton in 2018. Ecuador transformed into the main exporter of banana in 2018, its representing 24.7 with regards to penny of the overall fares. Belgium, Costa Rica, and Colombia had been the contrary apex banana exporter's US with inside the worldwide. The US is the primary merchant of banana with 18% rate with inside the

worldwide imports.Source:FAO. 2019. Banana Market Review Preliminary Results for 2019

Asia-Pacific leads the banana market with a 61per penny portion of worldwide utilization. Inside Asia-Pacific, India is the biggest maker of bananas on the planet, with a creation of 29.7 million metric tons from a space of 0.84 million hectares. Fares of banana in India address just 0.3 percent of the world fares since the majority of the bananas filled in India are for the homegrown market. Source: FAO. 2020. Banana Market Review 2019.

Based on 2017 figures, the worldwide banana export enterprise generates round 12 billion USD according to year. However, it's miles essential to observe that handiest round 15 percentage of the whole international banana manufacturing is traded within side the worldwide market, the relaxation is fed on locally, most significantly in massive generating international locations inclusive of India, China, and Brazil, and in a few African international locations in which bananas make contributions in large part to people's diets Source: FAO. 2020. Banana Market Review 2017.

The global production of banana is around 102028.17 thousand tons of that India contributes 29.19 per cent. Banana associated plantains are big in concerning one hundred twenty countries. Total annual world production is calculable at eighty six million tons of fruits. India leads the world in banana production with an annual output of concerning 14.2 million tons. Different leading producers are Brazil, Ecuador, China, Philippines, Indonesia, value Rica, Mexico, Asian nation and Colombia. Source: FAO. 2020. Banana Market Review 2019. Rome.

It is developed in India in an exceedingly space of 830.5 thousand ha and absolute creation is around 29,779.91 thousand tons. Principle banana developing states are Tamil Nadu, Maharashtra, Gujarat, Andhra Pradesh and Karnataka. In India banana positions initial afoot and third in region among organic product crops. It represents 13% of the absolute region and thirty three percent of the creation of natural products. Creation is most elevated in geographic region (3924.1 thousand tones) trailed by Tamil Nadu (3543.8 thousand tons). Within India, Maharashtra has the most elevated potency of 65.70 metric tons/ha. Against public traditional of 30.5 tons/ha.Source: National Horticulture Board, India (2019)

The total production of Banana in Chhattisgarh is 602717 metric tons, and total area of Banana fruits in Chhattisgarh is 25791 ha. It is cultivated in almost all the Districts in State. The major Banana growing districts are Bilaspur (2830 ha), Balrampur (2550 ha), Durg (1895 ha), Surajpur (1815 ha), Raigarh (1725 ha), Raipur (1255 ha) and maximum area under banana crop in Bilaspur district with the 2830 ha in the year 2019-20. Source: Directorate Horticulture and Farm Forestry, Bilaspur, Chhattisgarh.

Banana utilization per capita arrived at 18.1 kg in 2017 in India, as per FAO insights. This is 3.55 percent more than in the earlier year. By and large, banana utilization per capita in India arrived at an untouched high of 19.7 kg in 2010 and an unequaled low of 3.91 kg in 1961.

Farmer can earn benefiters income from banana cultivation, but there are numbers of problems and constraints to cultivation of banana like one of most important constraints is perishable nature of banana. Due to perishability it is challenging to selling of banana as soon as possible. Other like climatic factors as low temperature, chilling injury, pest and diseases, source of irrigation, transportation and marketing facilities, risk bearing ability of farmer, marketing knowledge are problematic factor for banana cultivation.

Marketing structure also a more important factor for banana cultivation in India for small farmer it is a very problematic to sell their produce because lack of market facility. In a marketing channel of banana due to lack of market knowledge there are numbers of middleman whose purchase farmers product in low price and sell the product in large market as high price. A

Justification

In India Banana ranks first in production and second ranks in area after mango. In Chhattisgarh banana occupies 2nd rank in both area and production. Bilaspur district occupy maximum area under banana in Chhattisgarh state but it was found that productivity of banana continuously decreases in the Bilaspur district and due to higher coverage area of banana in the study area banana cultivation deserves attention.

Studying the economic analysis of production and marketing of banana in Bilaspur district of Chhattisgarh state felt appropriate. Looking at these facts, the present study is being carried out with the following objectives.

(1) To examine growth rate of area, production and productivity of banana in Bilaspur district and Chhattisgarh State.

(2) To find out cost and return in cultivation of banana in the study area.

(3) To identify important marketing channel for marketing of banana in the study area.

(4) To identify major constraints, opportunities in production and marketing of banana in the study area.

Limitation

Over the span of examination a few hardships were looked in the assortment of information from banana producers. They didn't keep up with any ranch record and supply information based on their memory. Some of ranchers didn't coordinate in giving information in light of misconception in regards to farming duties roof and so forth adequate consideration was taken to gather the information by cross checking with different ranchers, pioneers and soon.

CHAPTER – II
REVIEW OF LITERATURE

2.1 To analyze the growth in area, production and productivity of banana in Bilaspur district and Chhattisgarh State.

V.Saravanapandeeswari, *et al.* (2018) conducted a study on the development pace of region, creation and usefulness of banana development in Theni Area of Tamil Nadu state. The consequences of this review uncovered that the impact of yield (25%) and region (59.40%) had critical commitment in Tamil Nadu state all in all in expanding the creation of banana development just as in Theni locale, the impact of yield (26.08%) and region (39.20%) had huge commitment in the region as entirety. Accordingly, keeping the region as consistent the efficiency of plant yields can be additionally expanded by taking proper creation advances.

M. Kishor Kumar, *et al.* (2013) studied the compound growth rate (CGR) of area, production and productivity of banana in India during the period from 2000-01 to 2010-11.Highest compound growth rate of area observed in Andhra Pradesh (8.42%) and lowest in Maharashtra (1.16%). In the production maximum positive growth noticed in Gujarat (13.37%) and least in Maharashtra (-0.06%).Bihar marked with high compound growth rate in productivity with value of (8.20%) and Maharashtra with lowest value of (-1.21%).

Khedkar Santosh Raghunath (2014) conducted a study in Kolhapur region of Maharashtra state to discover the patterns in region, creation and efficiency of banana in the time of 2003-04 to 2012-13. What's more, tracks down that the ACGR for region, creation and usefulness of banana in Maharashtra were assessed 7.01, 1.04 and - 1.88 percent per annum individually. ACGR for region was discovered positive and large while for creation positive and non-critical and for efficiency it was negative and non-huge, in view of stale development in long term period. In the Kolhapur region the ACGR for region, creation and usefulness of banana were assessed 7.72, 6.08 and - 1.29 percent per annum separately. The ACGR for region and creation was positive and non-significant, however the usefulness was negative and non-critical because of inconstancy in climatic conditions.

R. P. Singh and Nimmy Rani (2013) led a concentrate in Jharkhand state to appraise the development pace of region, creation and usefulness of natural product crops for the time of 2005 to 2010. What's more tracked down the positive development rate for creation in totally (litchi, mango, guava and banana) with the exception of citrus. Development pace of region observed to be great for litchi, mango and guava especially, while negative for banana and citrus. The usefulness was likewise seen to be positive almost 2.56, 2.56, 1.50, 5.21 percent for litchi, mango, guava and banana individually. The concentrate additionally uncovered that changeability in region was most noteworthy in litchi (71%) trailed by mango and banana individually. Essentially inconstancy in usefulness was seen to be most noteworthy in banana.

Chelupuri Laxman (2018) conducted a study in Telangana stateto appraise the patterns in area, production and productivity of Mango, Guava, Banana, Onion and Tomato. The reference period of study was from 1995-2015. The results revealed that area, production and productivity of mango marked significantly increasing trend. Banana and tomato showed increasing trend in area and production but negative trend for productivity. Whereas for Guava, area marked significantly increasing trend but decreasing trend for productivity and production. In case of Onion, increasing trend in area and productivity but there was a negative trend of production was observed.

Gangal, Shivanand M (2020) studied in North Karnataka to evaluate the overall performance of banana pertaining, increase in region and manufacturing, profitability and useful resource use efficiency. The increase charges in region, manufacturing and productiveness have been determined to be better in Bellary district accompanied through Gulbarga and Belgaum districts in North Karnataka. The productiveness of banana become maximum in Gulbarga district accompanied through Bellary and Belgaum districts.

D. Sagar, *et al.* (2019) conducted a study in different districts of Chhattisgarh state and presented predictive model for the area, production and productivity ofmango crop.This study considered the secondary data from 2009-10 to 2013-14 The productivity of mango crops are expected to increase in future as prediction model has been predicted. It was observed that the compound annual growth rate of mango in

terms of productivity was negative even though the area under the cultivation of mango crop and its production was positive.

Kumari, Suman (2019) studied the trend in area, production and productivity of banana crop in Vaishali district of Bihar. Data have been gathered for the duration of 2006- 07 to 2015-16 and divided into sub durations i.e. duration I (2006-07 to 2011-12) and duration II (2011-12 to 2015-16). The region beneath banana accelerated on the price of 0.96 and 0.84 per cent per annum as per duration I and duration II. Growth in productiveness of banana registered an growing trend at some point of duration II however it reduced on the price of -0.75 per cent at some point of duration I. manufacturing of banana will increase on the price of 2.97 and 0.08 per cent as duration I and duration II respectively. The increase in region, manufacturing and productiveness of banana exhibited nearly comparable fashion in region in case of Vaishali district. But manufacturing (-2.13 per cent) and productiveness (-2.54 per cent) reduced at some point of duration II likely due to infestation of viral diseases.

Deepthi, B.V. (2015) conducted a study in Karnataka to analyze the trends in area, production and productivity of banana. The result revealed that the positive and significant growth in area, production and productivity of banana was observed, whereas productivity registered a negative and non-significant in Karnataka state as a whole and Kalaburgi district. Area approach and cluster approach schemes of National Horticulture Mission (NHM), being operated by the state government had made a significant impact in increasing area under banana. However, the production growth is mostly lead with little from productivity.

Sharma Amod (2012) studied the developments of area, production and productivity of fruit plants in the Nagaland country. This examine become primarily based totally at the secondary records from 1992–93 to 2011–12. Data had been amassed from numerous authorities guides and internet sites. Compound growth rate, coefficient of variant and instability index become additionally expected. The outcomes of area, productivity and their interplay in the direction of growing manufacturing had been additionally expected withinside the gift examines. The value of coefficients of variant (CV) of area, production and productivity of fruit plants had been much less than 199.55%. The instability indices for area, manufacturing and productiveness for fruit plants withinside the Nagaland country had been fine and

thereby indicating much less hazard for developing main fruit plants with inside the country

2.2To examine cost and returns of banana cultivation in the study area.

Rameshwar Kumar and Toran Lal Nishad (2018) analyzed the cost and returns of banana cultivation in Chhattisgarh state. The study found that the net return over cost C3 (total cost) was found better in small farm accompanied through medium and large farm sized in banana. The average production was 543 q/ha. And gross income receives per ha. Higher in small length group Rs.392000 and decrease in large size group. And additionally discovered internet profits better in small size group Rs.192992 fallowed through medium and large Rs.180225.35 and Rs.170378.93 per hectare. The benefit cost ratio discovered better in small size group as1.96 followed by medium and large as1.89 and 1.84.

M. Rama Krishna, *et al.* (2017) evaluated and provided the costs and returns structure of banana in Kurnool district of Andhra Pradesh. A sample of a hundred and twenty farmers became randomly selected. The farmers have been stratified into Marginal (<1>2 ha) classes on the idea in their size of operational holding. The total cost of cultivation of banana per hectare became Rs. 3, 27, 531.06, Rs. 3, 13, 337.47, Rs. 2, 47, 989.47 and Rs. 3, 21, 323.07 on marginal, small, different and pooled farms respectively. The gross returns have been Rs. 447592.71, Rs. 478306.13 and Rs. 491516.58 and 479795.94 on marginal, small, different and pooled farms respectively indicated direct dating with the farm size.

S. Beulah, *et al.* (2018) analyzed the cost and returns structure of banana cultivation for two groups of farmers namely marginal and small. The study found that the levels of input application were greater for small farmer compared with the marginal farmer producing banana. The more intensive use of energy inputs was done by the small farmers than by the marginal farmers. The net income earned would be comparatively higher even though the small farmers spent more on cultivation of banana crops.

M. S. Kamal, *et al.* (2015) analyzed the cost and returns of banana cultivation, for this purpose, 60 loanee farmers have been decided on from four villages from Bogra district of Bangladesh. The essential findings of this study discovered that

banana cultivation under the institutional loan turned into a profitable business. It turned into predicted that average annual general price of production of banana turned into Tk. 34553.33, at the same time as gross return and net returns of per farm have been Tk. 127533.33 and Tk. 92980.00 respectively. The ordinary benefit cost ratio of banana farming got here out to 3.69

Dr. N. Kathirvel (2007) performed a examine on Karur district of Tamilnadu state. To discover the impact of fixed cost and variable cost on banana production and additionally finds the return to scales of farmers. Primary statistics have been gathered from the five hundred selected respondents a good way to analyses the technical performance of the farmers. The Cobb Douglas function became implemented to locate the impact of constant price and variable price on banana production and additionally to locate the return to scales of farmers. This examine found out that the price of production overall returns etc., aren't favorable to the small farmers.

S Ghimire, *et al.* (2019) assessed the economics of commercial banana cultivation withinside the japanese Chitwan in 2018. For this observe specifically Ratnanagar and Khaireni municipalities have been decided on. A family survey of a hundred banana growers which incorporates 50 from every municipality have been decided on and interviewed for number one data collection. The end result confirmed that, the cost of cultivation of banana per hectare became NRs 455857.80 and common profit became NRs 197853.23 per hectare. The common benefit cost ratio of banana became 1.50. Cobb-Douglas production function evaluation confirmed that hard work cost, equipment fee, contributed extensively to gross income of banana at 1% level of significance.

Naresh Kumar, *et al.* (2020) carried out a examine in Bilaspur district of Chhattisgarh state to estimate cost and returns of banana cultivation. Three blocks had been decided on randomly is Masturi, Belha, and Takhatpur. Five villages had been decided on from every block. So, fifteen villages had been decided on and a hundred and fifty farmers had been interviewed for the examine. The average the cost of cultivation per hectare of banana turned into observed to be Rs.17, 9450.27. The cost of cultivation in case of large farm turned into higher Rs.18, 7063.35 per hectare compared to small Rs.16, 8152.84 per hectare and medium farms Rs.17, 8391.35 per hectare. The average gross income per hectare came to Rs.54, 3585.43. It was Rs.53,

6223.65, Rs.54, 0178.02 and Rs.55, 0781.64 on small, medium and large farmer respectively.

Shyamala Devi, P. (1996) performed the study on Kurnool District of Andhra Pradesh" become undertaken especially to examine the costs and returns, and price spread of banana. The examine protected four villages with eighty farmers had been stratified into size groups i.e. small and large. The total cost of cultivation and gross returns per hectare of banana had been maximum on small farms Rs.48586.65 and Rs.99280.13 as compared to large farms Rs.45705.41 and Rs.98444.08 and the net returns per ha. Was more on large farms Rs.52738.67 than small farms Rs.50693.48. Analysis of benefit-cost ratio revealed that the net returns per rupee of expenditure were better in case of large farms as Rs.1.15 than small farms Rs.1.04.

Nchumthung Murryand, Sanjoy Das (2019) carried out observe in Wokha district of Nagaland, India. And for the observe 60 banana growers had been recognized and interviewed through the multi degree stratified random sampling approach for the observe on the financial analysis and profitability of banana cultivation it was observed that a mean according to hectare general cost of banana cultivation was Rs. 59041.30. The variable price and fixed price shares represent Rs. 55493.83 (93.99%) and Rs. 3547.47 (6.01%) respectively. The annual average gross income was observed to Rs. 157980.33 according to hectare with a mean internet goes back of Rs. 101819.82. The benefit cost ratio over total cost was observed out to be 2.68 that is economically viable enterprise.

M. S. Raman, M. Umanath (2016) carried out a study in the Tiruchirappalli district of Tamilnadu state. One hundred twenty banana producers interviewed from the blocks of Andanallur and Musiri at some stage in 2010-2011. The look at discovered that banana cultivation in Tamil Nadu changed into worthwhile enterprise , the net returns changed into determined to be Rs. 32793.96 and Rs. 37339.70 for Karpooravalli and Poovan banana, respectively. The overall cost of cultivation was Rs.140691.04 for Karpooravalli and Rs.123220.30 for Poovan banana farms. Gross income per hectare changed into the very best for Karpooravalli farms Rs.173485 while in comparison to Poovan farms Rs.160560.

2.3 To find out the marketing pattern of banana in the study area.

B. Naveen, *et al.* (2015) assessed the production and marketing of banana in Chikkaballapur district of Karnataka during the duration of 2012-13. The results discovered that, 3 crucial advertising channels had been diagnosed withinside the study area. The essential players in channel-I had been manufacturer, village level trader, wholesaler, retailer and consumer, in channel-II: manufacturer, village degree trader, retailer, customer while in Channel-III: manufacturer, village level trader, vendor, customer. The percentage of manufacturer withinside the consumer rupee became higher 50.90 per cent in channel-III, in comparison to channel-II 46.80 per cent and channel-I 41.59 per cent. Farmers preferred the channel-I, due to the fact farmers relished (received) the cash immediately after the sale of the produce to village level trader on the farm level itself.

Ashish Patel, *et al.* (2018) studied the production and marketing of Banana in the Bemetara districts of Chhattisgarh. 28 Banana growing villages and 5 banana grower from each village selected randomly from two blocks Saja and Bemetara and categorized them into small, medium and large farmers based on their holding size. The results revealed that there were three marketing channels for the marketing of banana, which are: Channel-I: Producer, Consumer, Channel-II: Producer, Commission agent, Retailer, Consumer, Channel III: Producer, whole seller, Retailer, Consumer.

S. C. Sarode (2009) studied the cultivation of banana was mainly concentrated in Raver and Chopda sub regions (tehsils) in Jalgaon district of Maharashtra state. Therefore these tehsil's having highest acreage under banana plantations were selected purposively for the present investigation. The banana fruits fetches price depending on size in the market. The size of fruit is measured in terms of weight of bunches and number of hands per bunch at the farm level. The bunches are graded according to weight grade A (above 15 kg), grade B (13 - 15 kg), grade C (11 - 13 kg), grade D (9 - 11 kg) and grade E (below 9 kg).

Sangolkar, U. B.(2012) conducted a study in Wardha district of Maharashtra to know the marketing practices, marketing channels, marketing cost, marketing margin and marketing efficiency of banana. A sample of 60 banana growers 30 from each two Tahsils, Seloo and Wardha in 20 villages and 10 marketing intermediaries

were selected for the study. The per quintal total marketing cost was higher Rs.165.65 in channel-II compared to channel-I Rs.138.23 and marketing efficiency under channel-I was 2.22 and for channel-II was 1.93 and from the efficiency index, it could be observed that channel-II was more efficient than channel-I.

Trishnalee Saikia, *et al.* (2018) carried out the study to take a look at marketing pattern of banana in Nagaon district of Assam. Six marketing channels identified withinside the take a look at location and out of the six marketing channels, main part of produces have been offered via channel II (Producer →Pre harvest Contractors cum wholesaler → Distant Wholesaler → Distant Retailers → Consumers) Within the district main marketing channel changed into observed to be channel IV (Producer →Wholesalers → retailers → consumers) wherein 26.53 per cent of the whole produce via way of means of the pattern farms have been routed to the last consumers. Channel V (Producer → Retailers →Consumers) changed into determined to be the maximum efficient channel in marketing with the performance index of 1.764 (following the Shepherds' approach) related to middlemen.

Archit Kumar Nayak, *et al.* (2018) studied the disposal pattern, marketing cost, marketing margins and price spread of banana in Dhamdha block of Durg district of Chhattisgarh state for the year 2017-18. Where three marketing channels have been identified. Channel-I (Producer →wholesaler → retailer → consumer), channel-II (Producer → wholesaler (via commission agent) → retailer → consumer), channel-III (Producer → retailer (through commission agent) →consumer). The producer's proportion in marketing channel III turned into the most due to direct sale through the producer to the retailer via commission agent. The marketing channel I had been determined maximum efficient due to the fact its marketing performance turned into 1.42 compared to 0.96 and 1.36 in marketing channel II and III, respectively.

S.T. Pradeepkumar, *et al.* (2017) assessed the marketing channel of banana, in Trichy district of Tamilnadu state. Two taluks namely Srivaikundam and Alwarthirunagari were selected for the study. 30 farmers [15 farmers of each block] and 20 intermediaries were interviewed through pre tested questionnaires' and surveyed. There were three marketing channel were identified Channel-I (Producer → Pre harvest contractor → Wholesaler → Retailer → Consumer) Channel-II (Producer

→ Commission agent → Wholesaler → Retailer → Consumer) Channel-III (Producer→ Wholesaler → Retailer → Consumer).

A. Sivakumar (2015) made an attempt the study for channel choice, marketing efficiency and price spread in marketing of banana.Three showcasing channels were distinguished from the review Channel-I (Ranchers → Pre-reap workers for hire → Commission Specialists → Wholesalers →Retailers → Customers) Channel-II (Farmers→ Agreeable Social orders → Wholesalers →Retailers → Shoppers) Channel-III (Ranchers →Wholesalers → Retailers → Purchasers) The investigation of value spread uncovers that the value spread is generally more in channel I when contrasted with different channels. The outcomes further uncovered that Channel-III (Ranchers →Wholesalers → Retailers → Shopper) has been considered as the most best channel.

Uma Gowri Mathaiyan, C. Sekaran (2016) conducted a study for economic analysis of value chain of banana in Coimbatore district of Tamil Nadu state. There were eight marketing channels identified in the study area. Transportation cost, cost of grading/sorting, cost of packaging materials were found to be high in Kathali followed by Robusta, Nendran and Poovan variety of banana. The profit margins were found to be higher for wholesaler ranging between Rs.716.15 and Rs.751.33 compared to other intermediary in the banana marketing channel. The marketing efficiency was higher for Nendran in channel 1.

E. Mulyana (2019) conducted a study in South Sumatra, Indonesia to find out the marketing channel of Lady Finger Banana in Arisan Gading Village. The result revealed that Marketing channel-I is the one carried out from the farmers, collectors, wholesalers, retailers to the final consumer. Marketing channel- II is a channel that involves a collecting trader marketing agency and it sells it directly to the retailers without a large trader intermediary. Marketing channel-III is the one that the farmers directly sold to retailers. Retailers on this channel had the process of buying and selling transactions with the farmers the same as that of the collecting traders.

2.4 To identify major constraints in production and marketing of banana and suggest suitable measures to overcome them.

Khusboo Chandrakar, *et al.* (2015) studied the constraints in production and provide chain management of banana in Raipur district of Chhattisgarh state. There were 30 Banana growers were elite and interviewed advisedly from four villages of Raipur district. It absolutely was found that, warmth and problem of electricity, lack of improved varieties for banana cultivation was found as most important constraint faced by the Banana growers. Similarly, lack of process industry, storage, fluctuation of value and regulated selling system was reportable as most vital constraint faced by the farmers throughout offer chain management of banana.

V. Vincy (2016) studied the production and marketing of banana and problems in cultivation and marketing of banana in vilavancode taluk of Kanyakumari District. within the study space majority of the farmers don't seem to be able to get low cost loan facilities to finance the expenditure concerned in banana cultivation. Banana production is seasonal in nature whereas its demand is inelastic. This conjointly affects the worth fixation. there's an oversized variation within the quality of banana that makes their grading and standardization somewhat difficult.

K. U. Mungalpara, *et al.* (2017) studied to find out the problem faced by the banana growers in Bharuch district of South Gujarat. The opinion of the farmers was analyzed by Garrett's ranking technique. The result has shown that the Banana growing farmers opined that fluctuation in terms was the most important problem in production. Regarding marketing constraints, lack of transportation facilities was the most important constraint followed by high marketing cost, lack of market finance, lack of storage facility, grading, low price, absence of market intelligence and delayed payment.

Priyanka Kumari, *et al.* (2018) conducted a study throughout 2017-18 to find out "post-harvest losses at different stages during marketing and constraints in banana cultivation in Vaishali district of Bihar state. The whole post-harvest losses in banana were found to be 2.90% of total farm produce. There have been numerous sources of losses that embrace disease, inefficient harvest techniques, transportation and loading, packing and packaging, as well erratic post-harvest techniques resulting in major losses physically and economically. Total post-harvest loss was estimated fifteen

quintal/hectare quantitatively. Major constraints throughout the study was found to be high cost of fertilizer and less awareness concerning new technologies among totally different farm size cluster followed by a high transportation price was the main marketing constraints.

Krunal D. Gulkari, *et al.* (2017) conducted a study in Anand district of Gujrat state to understand constraints faced by the banana growers in adoption of risk management practices in drip irrigated banana cultivation. Major economic issues faced by the banana growers was, high cost of fuel to use engines for irrigation and high cost of spare elements of drip irrigation system. As way as technological constraints and lack of decent electricity, problem of salty well water and problem in interculturing operations. Whereas, just in case of selling connected constraints were absences of support worth throughout glut within the market, high price of transportation and lack of timely data concerning demand and supply.

Amrendra Kumar Mishra, *et al.* (2019) conducted the study in Fakharpur block of Bahraich district of Uttar Pradesh, to know the constraints faced by Banana growers concerning improved production practices. From this district, 10 villages from one block and twelve banana growers from every village were purposively chosen for the study. The most important constraints faced by respondents were non-handiness of electricity on time, high price of fertilizer, labour potency and alternative constraints round-faced by banana growers like, lack of subsidies for the banana tissue culture plants.

N. Amaladeepan and J. Pushpa (2018) led a concentrate in Thoothukudi region of Tamilnadu state to realize significant limitations looked by banana cultivators underway and promoting of banana. In Thoothukudi region, two squares viz. Srivaikundam and Alwarthirunagiri were chosen. From these 4 town and 120 banana producers were chosen for the study. The outcomes were broke down and deciphered and the significant imperatives looked by them were, non-accessibility of work during development time, deficient water system office, weighty harm by twist, high work wages and change in market cost.

Sarma Bhaskarjyoti, *et al.* (2020) conducted a study in western districts of Assam viz. Bongaogaon, Chirang and Dhubri to find out major constraints faced by banana growers in production and marketing of banana. For this purpose, 90 banana

growers were selected from the three different villages of each district. The study revealed that the problems of credit, incidence of pests and diseases, frequent floods, low prices of output, high prices of inputs, lack of improved planting material etc. were major constraints faced by the farmers. The study suggests addressing the identified problems to make sustainable solutions for the banana growers.

Makwan *et al.* (2005) performed their study in Anand district of Middle Gujarat. To understand the constraints faced by banana growers and for suggest appropriate polices. Anand, Borsad and Anklav talukas had been decided on Then 15 banana developing villages (five from each taluka) had been decided on. Ten banana growers from every of selected village had been decided on for detailed study. The essential constraints faced by respondents had been loss of threat bearing capacity, low price of banana, lack of reliable up to date Information on marketing and lack of garage facilities. The vital pointers advocated with the aid of using the banana growers to overcome their marketing constraints had been: "to determine guide price for banana" "setting up banana base agro-processing industries", "agril. Extension machine should cover marketing of various crops.

K. Kumar (2017) led their study in Kurnool region of Andhra Pradesh to evaluate the imperatives looked by banana producers and for recommend appropriate conclusions for them. Top two mandals in the locale and top two towns in each mandal are chosen as per the region under development of banana.The serious issues looking by the ranchers in showcasing of banana like successive value vacillations, chaotic advertising and absence of transportation offices on need premise. It is recommended to instruct the ranchers with respect to the ideal development file for collect, utilization of mechanical reapers, and appropriate position of organic products during capacity and maturing, better bundling and padding advances to retain shocks during transportation, fortifying of storage spaces and transport offices, empower co-usable advertising and so on, to advance promoting effectiveness of banana in the review region.

CHAPTER-III
MATERIALS AND METHODS

This chapter deals with the methodological procedure adopted for selecting the study area. The detailed methodological framework is described as following sub sections like sampling procedure, collection of data and analytical framework and background of study area.

3.1Sampling procedure:

This section includes selection of district, blocks and villages, selection of respondents. The detailed sampling procedure are presented below

3.1.1 Selection of district

Chhattisgarh state comprises of 28 districts out of which Bilaspur has been chosen purposively in light of having most extreme region under banana with a space of 2830 ha in the year 2019-20.

3.1.2 Selection of blocks

There are four blocks in Bilaspur district namelyBilha, Masturi, Takhatpur and Kota. Out of four blocks two blocks Bilha and Masturi have been selected purposively as having maximum area under banana crop for the study purpose.

3.1.3 Selection of villages

On the basis of higher coverage area and production under the banana crop, 13 villages namely Jairamnagar, Darrighat, Kutela, Kukda, Eramsahi, Malhar, Navagao, from masturi block and Kadar, Kachhar, Khmhardeeh, Udantaal, Seepat, Sendrifrom Bilha block were selected for the study.

3.1.4 Selection of respondents

The farmer grows banana industrially was considered as banana cultivators. Out of 620 farm families in selected villages a sample of 20 per cent respondent's i.e.124 farmers has been selected by using probability proportional to size techniques subject to condition that at least 10 per cent of respondents should be included in sample from each categories of farms. The study considered a classified farmers categories viz. small (1-2 ha), medium (2-4 ha) and large above 4 ha.

Table 3.1 Distribution of sample banana growers in selected villages

S.No.	Name of villages	Small	Medium	Large	Total	Total no. of households
(Masturi)						
1	Jairamnagar	03	04	05	12	60
2	Darrighat	02	05	03	10	52
3	Kutela	01	04	02	07	33
4	Kukda	02	03	03	08	42
5	Eramsahi	02	05	03	09	48
6	Malhar	04	04	06	15	72
7	Navagao	03	03	03	09	43
(Bilha)						
8	Kadar	01	03	02	06	28
9	Kachhar	02	03	03	08	42
10	Khmhardeeh	03	04	02	09	45
11	Udantaal	02	03	02	07	35
12	Seepat	03	04	04	11	54
13	Sendri	04	03	06	13	66
	Total	32	48	44	124	620

3.2 Collection of data

3.2.1 Primary data- Primary data has been collected from selected and categorized banana growers into small, medium and large. Data were collected through personal interview method with the help of pre tested questionnaires.

3.2.2 Secondary data- The secondary data has been collected through different government offices such as Department of Agriculture, Department of Horticulture, Department of Economics and Statistics, Government of Chhattisgarh and through all other authentic sources.

3.3 Analytical framework

The data were analyzed using a basic tabular approach to meet the requirements of the study's specific objectives. The findings were presented using appropriate analytical and statistical methods to figure out averages, percentages, ratios, indices etc. The cost and returns of the banana were calculated using standard farm management tools.

3.3.1 Compound Growth Rate (CGR)

To analyze the pattern of growth in area, production and productivity of banana crops in study area, Compound Growth Rate (CGR) was computed with the following formula.

Compound growth Rate-

$$Y = A\ Bt$$

Taking log on both sides

$$\text{Log } Y = \log A + t \log B$$

Assuming,

$$\text{Log } Y = y$$

$$\text{Log } A = a$$

$$\text{Log } B = b$$

We get, $y = a + bt$

Where,

$t = 1, 2, 3 \ldots\ldots\ldots n$

y = area/production/productivity of crops.

After regression between y and t

We have value of a and b

Where,

a = Constant

b= regression coefficient

As, $b = 1 + r$

Hence,

$r = b - 1$

Therefore,

r = (Anti-log of b-1) ×100

Where,

r = Compound growth rate

3.3.2 Estimation of cost and return of banana crop in the study area

The cost and returns of banana crop were estimated on the basis of per hectare. The cost and return were estimated with the help of cost concept given by Commission on Agricultural Costs and Price (CACP). The detailed cost concept used in present study is as below.

Cost concept

This approach 'cost concept' of farm costing is widely used in India. To work out the cost of cultivation standard method of cost of cultivation employed by

Commission on Agricultural Costs and Price (CACP), Directorate of Economics and Statistics, Government of India was adopted. The cost of production of banana has been presented in terms of Cost A1, Cost A2, Cost B1, Cost B2, Cost C1, Cost C2 and Cost C3. Various costs have been worked out by applying following method

Cost A1: All actual expenses in cash and kind incurred in production. Consist of following items of costs.

- Value of hired human labor
- Imputed value of owned bullock labor
- Value of hired bullock labor
- Charged of hired machinery
- Value of owned machinery
- Imputed value of owned machinery
- Imputed value of owned seed
- Value of fertilizers
- Value of insecticide and fungicide
- Imputed value of manures
- Value of irrigation
- Land revenue, chess and other taxes
- Depreciation on farm implement
- Interest on working capital

Cost A2= Cost A1+ Rent paid for leased-in-land

Cost B1= A1+ Interest on value of owned fixed capital (excluding land)

Cost B2= B1+ Rental Value of owned land and rent paid for leased land

Cost C1= B1+imputed value of family labour

Cost C2= B2+ imputed value of family labour

Cost C3= C2+ managerial cost of 10% of cost C2 on account of managerial function performed by farmer

3.3.3 Cost of production per quintal

It refers to total input cost divided by output value and then multiplying by the respective price of main and by-product.

3.3.4 Income measures

(a)Gross income

Gross income = Net income + cost C

(b) Net income

Net income = Gross income – cost C

(c) Benefit cost ratio

(BCR) = Net profit / Total cost

Valuation of Costs

1) Human labour

Human labour incorporates both family and recruited work. The employed works were esteemed at the real wages paid to the work. Family work was assessed at the compensation rates winning in the town for employed work.

2) Machine power

The recruited machine work assessed by genuine wages paid. If there should arise an occurrence of claimed machine work, the assessment was done at the rate winning in the towns for recruited machine work.

3) Planting material

The establishing material for example tissue culture banana is bought from the market. The expense of plant is determined based on actual cost in the market.

4) Fertilizer

Manure like DAP (di ammonium phosphate), urea, murate of potash are charged at the real cost in addition to transportation cost.

5)Manures

The expense of homestead yard excrement created on the ranch was assessed at the rates winning in the town. If there should be an occurrence of bought excrement the expenses was accounted dependent on real cost paid for the reason.

6) Irrigation charges

Use on defensive water system was accounted dependent on real sum spend on the support and working of oil motor or electric-siphon. Furthermore, human work put in for water system is considered as water system charges.

7) Plant protection chemical charges

This incorporates all genuine costs of insect sprays, pesticides, fungicides utilized and employing charges of machines.

8) Rental value of land

For the own properties assessed based on winning rates in the town for indistinguishable sorts of land or based on reaction got from village farmers.

9) Land revenue

This thing of cost incorporates land income and other important cesses which were really paid by the cultivators. For among the harvests followed based on proportionate region under crops and their length.

10) Interest on working capital

This was charged at the pace of 6% per annum for half of harvest period.

11) Interest on fixed capital

It was determined at the pace of 12% per annum for the yield time frame.

12) Depreciation

It addresses the worth by which a farm asset diminished in the worth as aftereffects of cause other than change in everyday cost of the thing. Straight line strategy was utilized for computing the depreceation.

$$\text{Depreciation} = \frac{\text{Purchasedvalue of assets-Junk value}}{\text{No ofuseful years of life (Expected life)}}$$

3.3.5 Marketing pattern

Marketing cost

Marketing cost includes the grading, packaging, transportation charges, octroi charges, commission charges, Hamali and weighing charges etc. the cost actually paid by selected growers for marketing of produce was considered and analyzed.

$C = C_f + C_m 1 + C_m 2 \ldots\ldots\ldots C_m n$

Where,

C= Total marketing cost

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

$C_m i$ = Cost incurred by its middleman in the process of buying and selling the product.

Market margin

Margin of intermediary refers to the difference between the total receipts obtained and the total payments made by him during his transaction. In the present study, margin of an intermediary included the profit or loss earned by him.

$$\mathbf{MT = \sum(Si - Pi)/Qi}$$

Where,

MT = Total marketing margin.

Si = Sell value of the product of i^{th}firm.

Pi = Purchase value of the product of i^{th} firm.

Qi = Quantity of product handled by i^{th} firm.

Producer's share in the consumer's rupee

This refers to the producer's net price expressed as percentage of the retailer's sale price of the produce.

$$\textbf{Producers share in consumer's rupee} = \frac{\text{Producer's price}}{\text{Consumer's price}} X\ 100$$

Price spread

This refers to the difference between consumer's price and producer's price for a unit of the commodity. Price spread in this study thus included the total cost of marketing and the profit or loss to the intermediaries into the process of moving the produce from farmer to consumer.

Price spread = Consumers price – Price received by producer

$$\mathbf{PS = C_p - P_f}$$

Where,

PS = Price spread

$\mathbf{C_p}$ = Consumers price

$\mathbf{P_f}$ = Price received by farmer

Marketing efficiency (ME)

The marketing efficiency has been calculated by using the shepherd's formula

ME = Consumer's price / (MC+ MM)

Where,

ME = Marketing efficiency

MC = Total marketing cost

MM = Net marketing margin

3.4 General profile of study area

3.4.1 Background of the study area

The study was directed in Bilaspur district of Chhattisgarh state. Bilaspur district was established in year 1861 and followed by Bilaspur muncipality in year 1867. Bilaspur district isn't just popular in Chhattisgarh state yet additionally in India because of its remarkable attributes like rice quality, Kosa industry and its social foundation. Bilaspur district has a significant commitment in the naming "Dhan Ka Katora" for the whole Chhattisgarh area.

3.4.2 Situation of the district

In Chhattisgarh state Bilaspur region goes under the Chhattisgarh Plain Region. Bilaspur region is arranged between 21.47° to 23.8° north scopes and 81.14° to 83.15° east longitude. Bilaspur Region is encircled by Koria district in the north, Anuppur district of Madhya Pradesh, Mungeli and, Baloda Bazar-Bhatpara district in the south and Korba and Janjgir-Champa district in the east.

3.4.3 Climate

The climate of Bilaspur district is sub-tropical, semi-parched, mainland and storm type. Consequently, it has blistering summers, cool winters and little stormy season. The colder time of year season begins towards the last 50 per cent of November and stretches out till about the center of Spring followed by summer, which proceeds till about the finish of June when most extreme temperature comes to up to 45 degree Celsius and residue twisters are normal. After it, southwest rainstorm shows up. The blustery season stays between Julys to September. The post rainstorm months October and November comprise a momentary period from storm to winter season. The environment is great for horticulture advancement, especially for paddy, wheat, heartbeats and vegetable harvests. Restricted blustery season, great and sound environment is appropriate for mechanical improvement too. The environment is wonderful and gentle in the colder time of year (least temperature 10 °C, 50 °F). There are medium downpours in the rainstorm season. The summers are generally sweltering and dry, with most extreme temperature 45°C+, 113 °F.

3.4.4 Soil and Topography

In Bilaspur district four sorts of soil are seen according to US soil scientific categorization which is displayed in Table 3.2. The Vertisols are generally found in south and southeastern pieces of the area. They range from dark/red to profound dark tone and are practically impermeable when soaked. They are tacky in wet season and are extremely hard in dry season. The ultisol sorts of soil are found in east and northern pieces of the locale and are red to yellow in shading. This tone is achieved mostly because of amassing of iron oxide, which is profoundly insoluble in water. Inceptisols soils involve generally slope inclines and are found along the western limit of the locale. Alfisol soils are fruitful drained soils found in sticky regions where every year dropping leaves structure a thick humus layer. Thisdirt's cover most extreme region in the northern and focal pieces of the district. Overall one might say that the district is covered by red seriously soils, red sandy soils, lateritic soils, red and yellow soils and dark soils.

Table 3.2 Major soils in Bilaspur district

S.No.	US soil taxonomy	Indian equivalents
1	Vertisol	Deep black soil
		Medium black soil
2	Ultisol	Lateritic soil
		Red and yellow soil
3	Inceptisol	Shallow black soil
4	Alfisol	Red gravelly soil
		Red sandy soil

Source: Directorate of Agriculture, Chhattisgarh, 2019-20

3.4.5 Rainfall

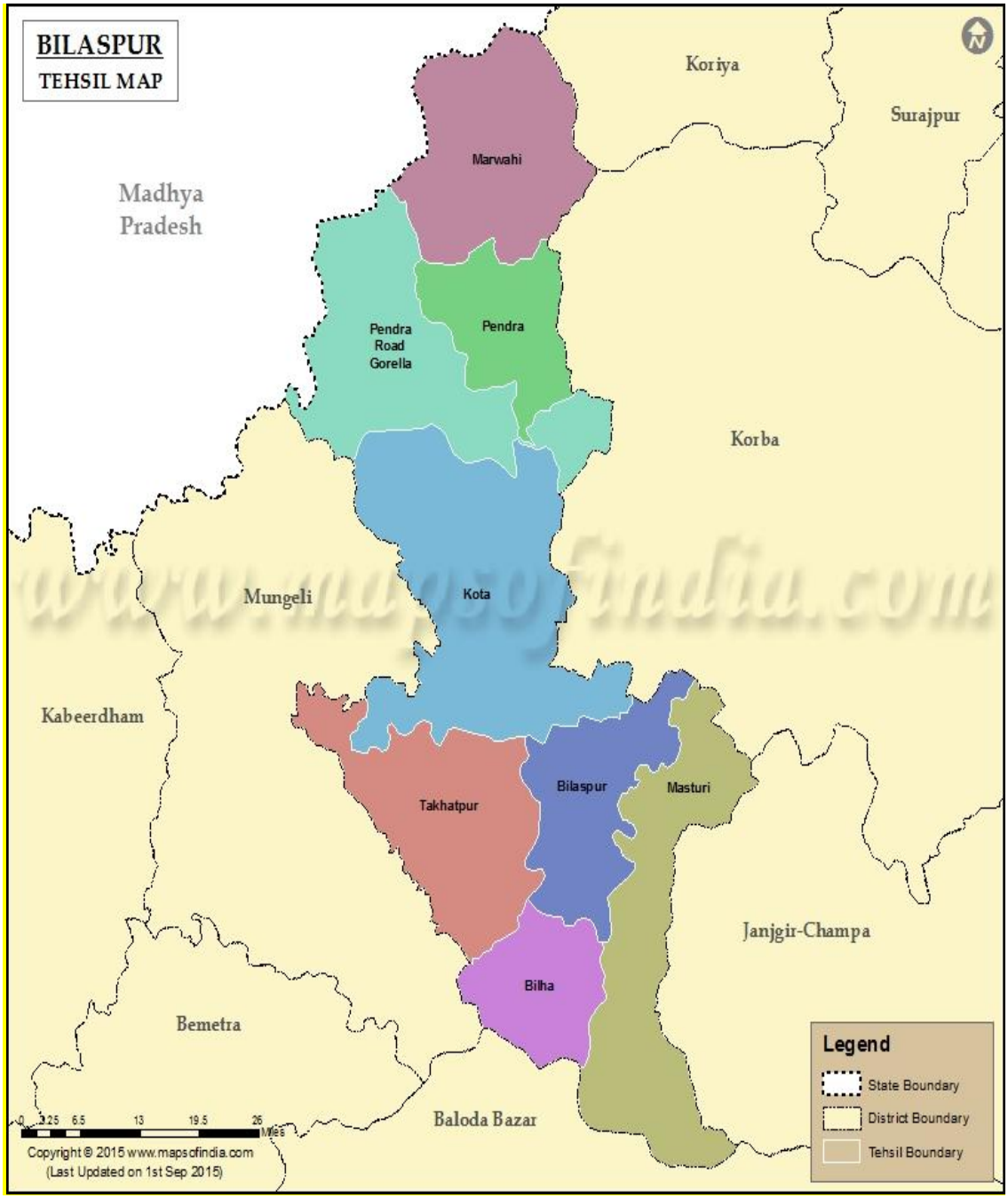
Annual precipitation of the district is around 58 centimeter. Precipitation is unevenly disseminated and diminishes structure south cast to southwest. Rainy season begins from July to September. Around 80 per cent of the all-out precipitation is gotten during this period. Some measure of precipitation is gotten from western aggravations during winter season.

3.4.6 Rivers and Drainage System

The significant river of Bilaspur district is Arpa. The river begins in Khodri Khongsara of Pendra sub division and is the largest river in the district and is around 100 kilometer long. Other significant rivers of the region are as Leelagar and Maniyari.

Map I- Map of Chhattisgarh

Map II - Map of Bilaspur district



Map III - Map of Bilha and Masturi block

3.4.7 Demographics and Administration of Bilaspur district

Bilaspur district have total population 1655502. Out of total population 20.76 per cent population comes under schedule caste and 14.73 per cent of population comes under the schedule tribes. The literacy rate mentioned in Bilaspur was 74.46 per cent. Total no. of villages in Bilaspur district was 708 and the population density in Bilaspur district was 463 per square kilometers and other demographic details are presented in the table 3.3.

Table 3.3 Demographics and Administration of Bilaspur district

S.No.	General information	Details
1	Number of tehsils	05
2	Number of blocks	04
3	Municipal corporation	01
4	Municipalities	02
5	Nagar panchayat	04
6	Gram panchayat	483
7	Number of villages	708
8	Total population	1625502
9	Rural population	1043356 (64.19%)
10	Urban population	582146 (35.81%)
11	SC Population	337420 (20.76%)
12	ST Population	233615 (14.37%)
13	Literacy rate	74.46%
14	Sex ratio	964
15	Child sex ratio	951
16	Number of households	355376
17	Work participation rate	42.34
18	Area (square kilometer)	3508.48
19	Population density (square kilometer)	463

Source: District census handbook, Bilaspur 2011.

3.4.8 Source of irrigation

The different sources of irrigation in the Bilaspur district are sown in the table 3.4. The table clearly shows that maximum area under irrigation in Bilaspur district covered by canal that was 60.81 per cent followed bytube well 32.69 per cent, open wells 2.49 per cent and ponds 3.79 per cent other source is very limited with 0.22 per cent and other detailed information given in the table 3.4.

Table 3.4Source of irrigation in Bilaspur district

S. No.	Source of irrigation	Area (ha)	Percentage
1	Canal	64841	60.81
2	Tube well	34855	32.69
3	Open well	2659	2.49
4	Pond	4038	3.79
5	Others	232	0.22
	Total	106625	100.00

Source: Directorate of Agriculture, Bilaspur (2019-20)

3.4.9 Land use pattern

The district has total geographical area of 581849 ha. In Bilaspur district most of the area comes under the plain land in which mostly loamy and sandy loam type of soil can be seen. 218436 ha land comes under the forest land. The land under the non-agricultural use was only 31128 ha. The total gross cropped area in Bilaspur district was 291360 ha. Net sown in the Bilaspur district was 232816 ha and the cropping intensity was 125% and other detailed information is presented in the table 3.5.

Table 3.5 Land use pattern of Bilaspur district

S.No.	Land use pattern	Area (ha)
1	Geographical area	581849
2	Area under forest	218436
3	Cultivable barren land	16504
5	Land under non-agriculture use	31128
6	Permanent pastures	48037
7	Land under misc. trees , crops and grooves	0.46
8	Barren and uncultivable land	10390
9	Current fallows	13742
10	Total fallows	10738
11	Net sown area	232816
12	Are sown more than once	58544
13	Gross cropped area	291360
14	Cropping intensity	125%

Source: Directorate of Economics and Statistics Chhattisgarh 2019-20

3.4.10 Distribution of land holdings in Bilaspur district

The distribution of land holding in Bilaspur district is presented in table 3.6.The table shows that maximum number of land holdings comes under marginal farms with 69.74 per cent followed by small, medium and large farms with the 18.19, 8.94 and 3.12 per cent respectively this shows an decreasing trends with increase in size of land holdings. Maximum area of land holding comes under the marginal farms followed by small, medium and large farms it shows also a decreasing trends with increase in farm size. Average size of land holding increasing with increase in farm size.

Table 3.6 Distribution of land holdings in Bilaspur district

S.No.	Size of holdings	No. of holdings	Area of holdings (ha)	Average size of holdings
1	Marginal	185791 (69.74)	74056.01 (29.19)	0.40
2	Small	48464 (18.19)	67115.89 (26.45)	1.38
3	Medium	23820 (8.94)	62448.90 (24.61)	2.62
4	Large	8313 (3.12)	50110.47 (19.75)	6.03
	Total	266388 (100)	253731.27 (100)	2.61

Source: District Statistical book, Bilaspur 2019-20

Note: Figure in parenthesis is percentage to total.

3.4.11 Cropping pattern of Bilaspur district

Cropping pattern of Bilaspur district is presented in table 3.7. The table represent that paddy, wheat, maize and Jowar are most popular crops grown in Bilaspur district in which paddy covers maximum area under cereals crop with 94.18 per cent. Musterd have maximum area under oilseed crops with 44.09 per cent followed by linseed, groundnut and til. Gram, tur and urd are major growing crops in pulses. Tomato, cabbage and Brinjal covered maximum under vegetables in Bilaspur district.

Table 3.7 Cropping pattern of Bilaspur district

S.No.	Particulars	Area	Percentage
A	**Cereals crop**		
1	Paddy	219766	94.18
2	Wheat	8231	3.53
3	Maize	3013	1.29
4	Jowar	356	0.15
	Total cereals	233352	100.00
B	**Oilseed crop**		
1	Til	648	15.84
2	Linseed	1746	42.67
3	Ground nut	1007	24.61
4	Musterd	1804	44.09
5	Soyabean	205	0.05
	Total oilseed	4092	100.00
C	**Pulse crop**		
1	Gram	2578	6.10
2	Tur	2308	5.46
3	Urd	1634	3.86
4	Total pulses	42292	100.00
D	**Vegetables**		
1	Tomato	1194	19.91
2	Cabbage	1043	17.39
3	Brinjal	768	12.81
	Total vegetables	5997	100.00

Note: Figure in parenthesis indicates percentage to total.

Source: District Statistical Office, Bilaspur (C.G.), 2019-20

CHAPTER - IV

RESULTS AND DISCUSSION

This chapter introduces and explores the qualitative evolution of various production and marketing aspects of banana, using farm level data obtained from sample farmers in the study area and market functionaries engaged in production and marketing activities. This chapter also evaluated the trends in area, production and productivity of banana in Bilaspur district and Chhattisgarh state. These data is subject to numerous statistical instruments and techniques to obtain relevant results.For convenience, present chapter has been widely discourse under the following subheads:

4.1 Socio- Economic profile of sample households.
4.2 Growth rate of area, production and productivity of banana in Bilaspur district and Chhattisgarh state.
4.3 Economics of crop production of banana.
4.4 Marketing pattern of banana.
4.5 Constraints in production and marketing of banana.

4.1 Socio- Economic profile of sample households

4.1.1 General Characteristics of sample households in the study area

The general characteristics of sample households presented in table 4.1. There are 124 sample farmers selected for study purpose. Which were divided into small, medium and large categories of farmers. Under these classes 32, 48 and 44 farmers come in small, medium and large categories of farmers respectively. From the table, it is observed that the average family size is 4.99 of all sample farmers in the study area. The data shows that the social groups of other backward class is more than general categories of farmers followed by schedule tribes and schedule caste i.e. 45.16, 24.20, 18.54, and 12.10 percent respectively. The occupation of sample households belongs mainly to agriculture that is 69.36 per cent followed by services that is 14.52 per cent, business 11.82 per cent and agricultural labour 4.30 percent.The study reveals that most of the population belongs to young age i.e. 18-40 years who are 59.03 per cent followed by 40-60 years age with 15.48 per cent.

Table 4.1 General attributes of sample households in the study area

S.No.	Particulars	Size Groups			Overall
		Small	Medium	Large	
1	Total number of households	32 (100)	48 (100)	44 (100)	124 (100)
2. Social Groups					
a	General	08 (25.00)	12 (25.00)	10 (22.72)	30 (24.20)
b	Other backward caste	14 (43.75)	20 (41.66)	22 (50.00)	56 (45.16)
c	Schedule tribes	06 (18.75)	09 (18.75)	08 (18.18)	23 (18.54)
d	Schedule caste	04 (12.50)	07 (14.58)	04 (9.10)	15 (12.10)
3. Family Members					
a	Male	90 (56.07)	140 (58.33)	121 (54.50)	351 (51.61)
b	Female	68 (43.03)	100 (41.67)	101 (45.60)	269 (43.39)
c	Total family members	158 (100)	240 (100)	222 (100)	620 (100)
d	Average family size	4.93	5.00	5.05	4.99
4. Age Group					
a	Up to 18 year	35 (22.16)	45 (18.75)	38 (17.12)	118 (19.04)
b	18-40 years	83 (52.53)	144 (60.00)	139 (62.61)	366 (59.03)
c	40-60 years	29 (18.35)	36 (15.00)	31 (13.96)	96 (15.48)
d	Above 60 years	11 (6.96)	15 (6.25)	14 (6.31)	40 (6.45)

5. Occupation					
a	Agriculture	82 (73.21)	108 (78.26)	68 (55.74)	258 (69.36)
b	Agriculture labour	16 (14.29)	0 (0.00)	0 (0.00)	16 (4.30)
c	Service	14 (12.50)	14 (10.15)	26 (21.31)	54 (14.52)
d	Business	0 (0.00)	16 (11.59)	28 (22.95)	44 (11.82)
	Total	112 (100)	138 (100)	122 (100)	372 (100)

Note: Figures in parentheses are percentage to total.

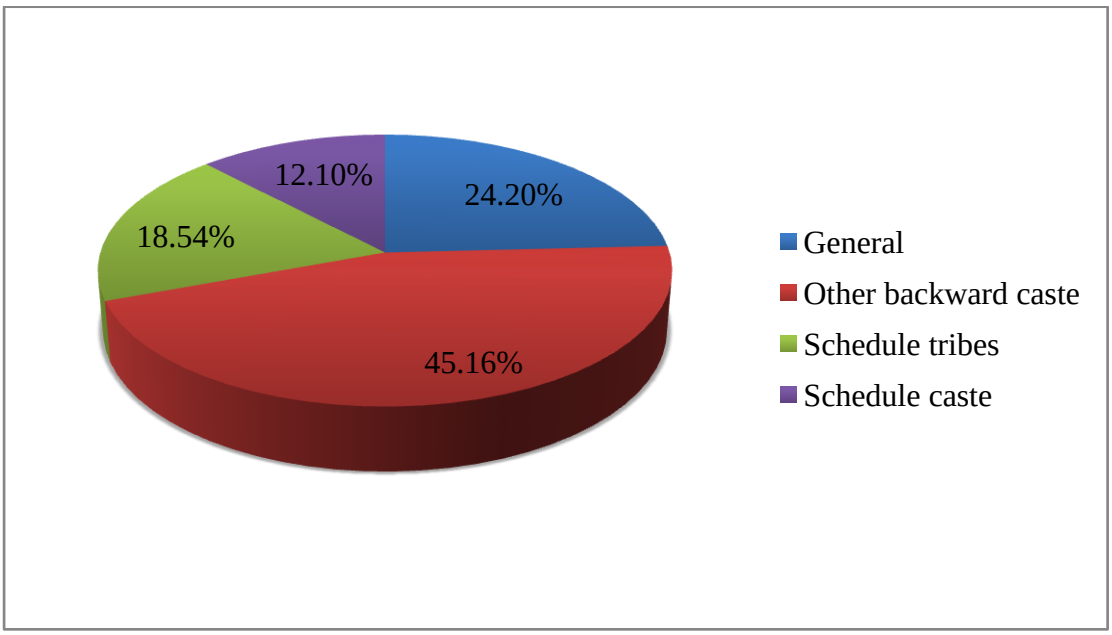


Fig: 4.1 Social status of sample households in the study area

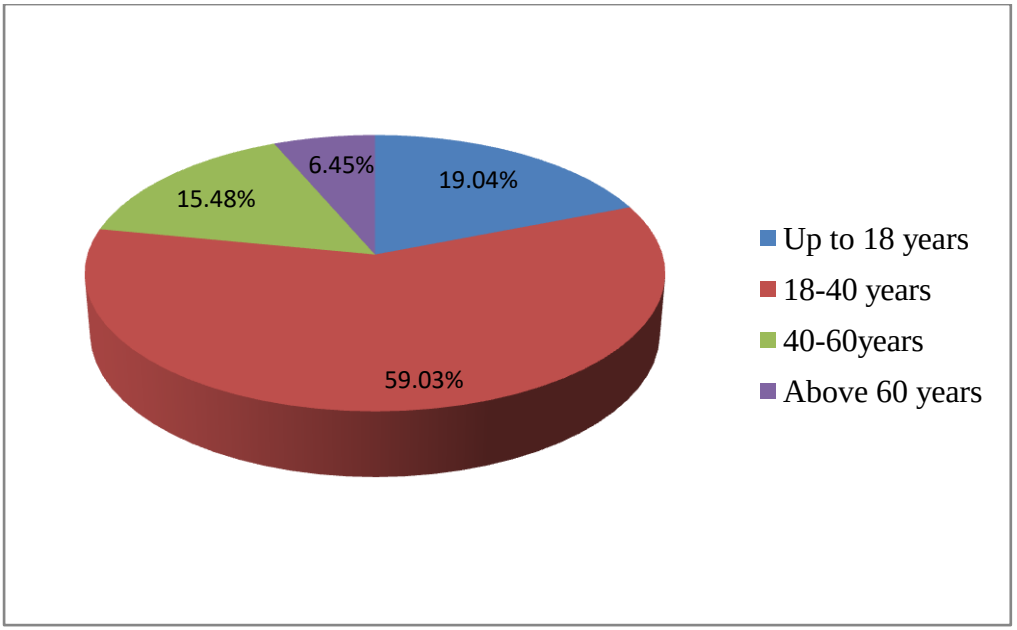


Fig: 4.2 Age group of sample households in the study area

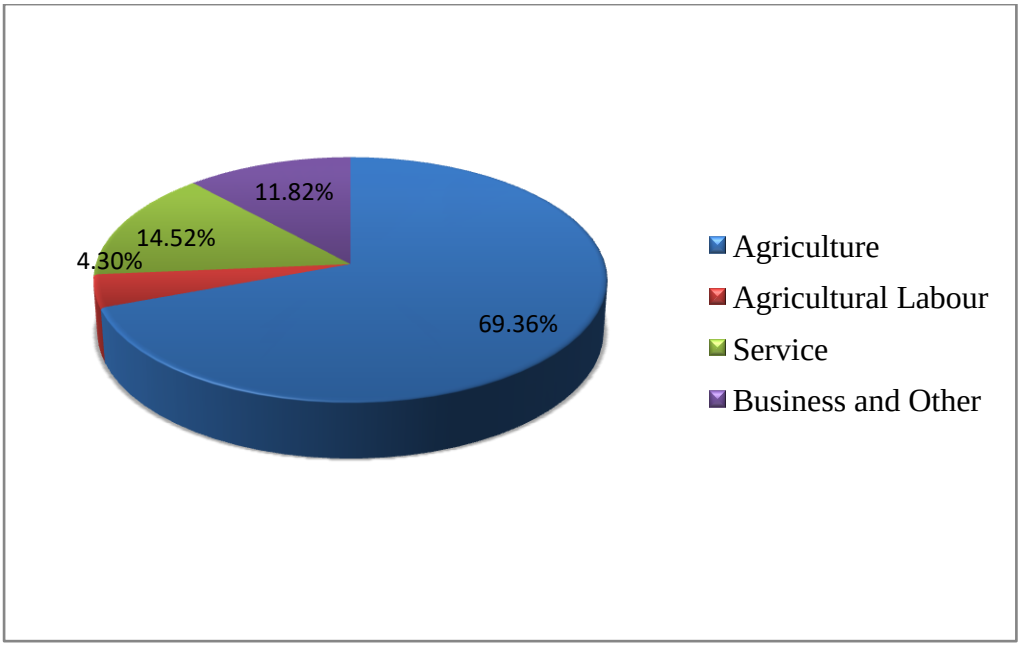


Fig: 4.3 Occupation status of sample households in the study area

4.1.2 Educational status of sample households in the study area

Educational status of sample households is presented in this Table4.2.It has been observed that there is high literacy percentage among sample households which is 95.81 per cent on an average basis. It has also been observed that 27.90 per cent, 29.20 percent, 28.71 per cent and 10.00 per cent of sample households obtained primary, middle, higher and graduation level education respectively. Education status was found higher in case of large categories farmers because they can afford better schooling and higher education as compare to medium and small farmers. Overall the table represents a very good literacy rate in the study area.

Table 4.2 Educational status of sample households in the study area (n = 124)

S.No.	Particulars	Small	Medium	Large	Overall
a	Illiterate	05 (3.16)	17 (7.09)	04 (1.80)	26 (4.19)
b	Primary school	65 (41.14)	80 (33.33)	28 (12.61)	173 (27.90)
c	Middle school	48 (30.38)	69 (28.75)	64 (28.83)	181 (29.20)
d	Higher secondary	32 (20.26)	54 (22.50)	92 (41.44)	178 (28.71)
e	Graduate/Post graduate	08 (5.06)	20 (8.33)	34 (15.32)	62 (10.00)
f	Total	158 (100)	240 (100)	222 (100)	620 (100)
g	Literacy	(96.84)	(92.91)	(98.20)	(95.81)

Note: Figures in parentheses are percentage to total.

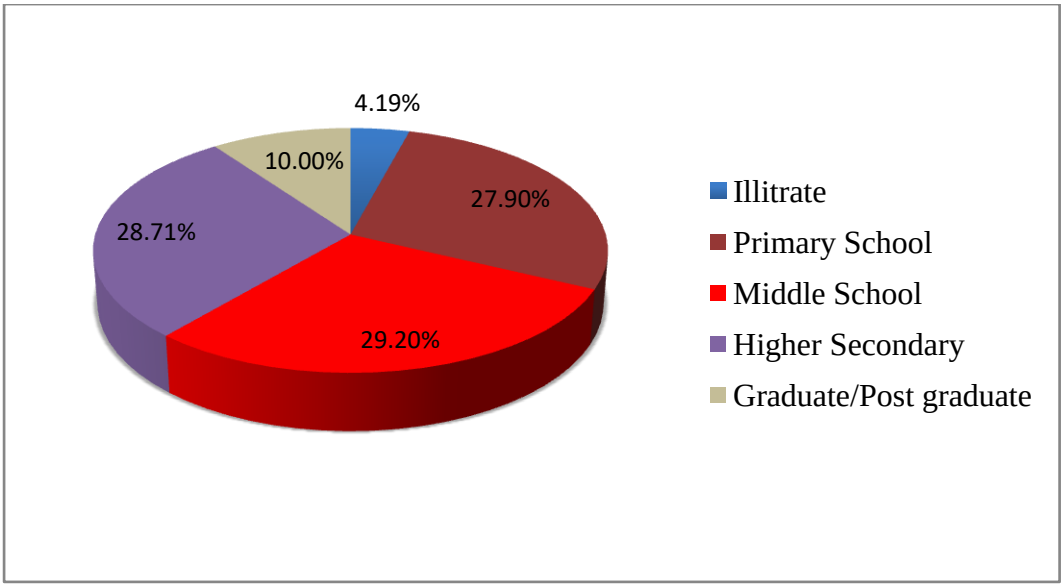


Fig: 4.4Educational status of sample households in the study area

4.1.3 Land use pattern of sample households in the study area

The table 4.3 represents the land use pattern of sample households in the study area, from the table it can be observed that the total owned land of small, medium and large categories of farmers were 1.71,3.68 and 8.40 ha respectively and overall owned land was 4.60 ha on an average basis, the overall irrigated land was 4.12 ha by different source of irrigation and overall unirrigated land was 0.48 ha on an average. The study reveals that large farmers have more irrigation land as 92.14 per cent followed by medium with 91.30 per cent on an average.

Table 4.3 Land use pattern of sample households in the study area (ha/farm)

S.No.	Particulars	Small	Medium	Large	Overall
a	Total owned land	1.71 (100)	3.68 (100)	8.40 (100)	4.60 (100)
b	Total cultivated land	1.71 (100)	3.68 (100)	8.40 (100)	4.60 (100)
c	Total irrigated land	1.26 (73.69)	3.36 (91.30)	7.74 (92.14)	4.12 (85.71)
d	Total unirrigated land	0.45 (26.31)	0.32 (8.70)	0.66 (7.86)	0.48 (14.29)

Note: Figures in parentheses are percentage to total.

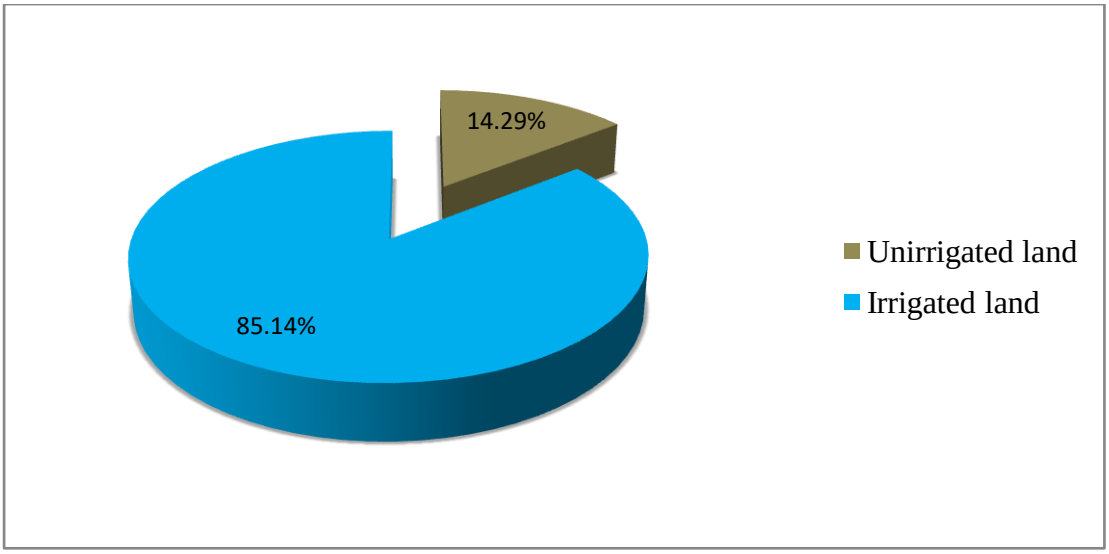


Fig: 4.5 Irrigation status of sample households in the study area

4.1.4 Sources of irrigation

Table 4.4 shows the division wise irrigation areas at the sample farms in the study area, and it reveals that much of the area under irrigation is provided by tube well as 66.50 per cent and supplemented by canal as 24.75 per cent and other sources as 8.75 per cent.

Table 4.4 Different sources of irrigation at sample households in the study area (ha/farm)

S.No.	Particulars	Total Irrigated land	Tube well	Canal	Other
1	Small	1.26 (100)	0.88 (69.84)	0.21 (16.67)	0.17 (13.49)
2	Medium	3.36 (100)	2.50 (74.40)	0.65 (19.35)	0.21 (6.25)
3	Large	7.74 (100)	4.86 (62.79)	2.20 (28.42)	0.68 (8.78)
4	Overall	4.12 (100)	2.74 (66.50)	1.02 (24.75)	0.36 (8.75)

Note: Figures in parentheses are percentage to total.

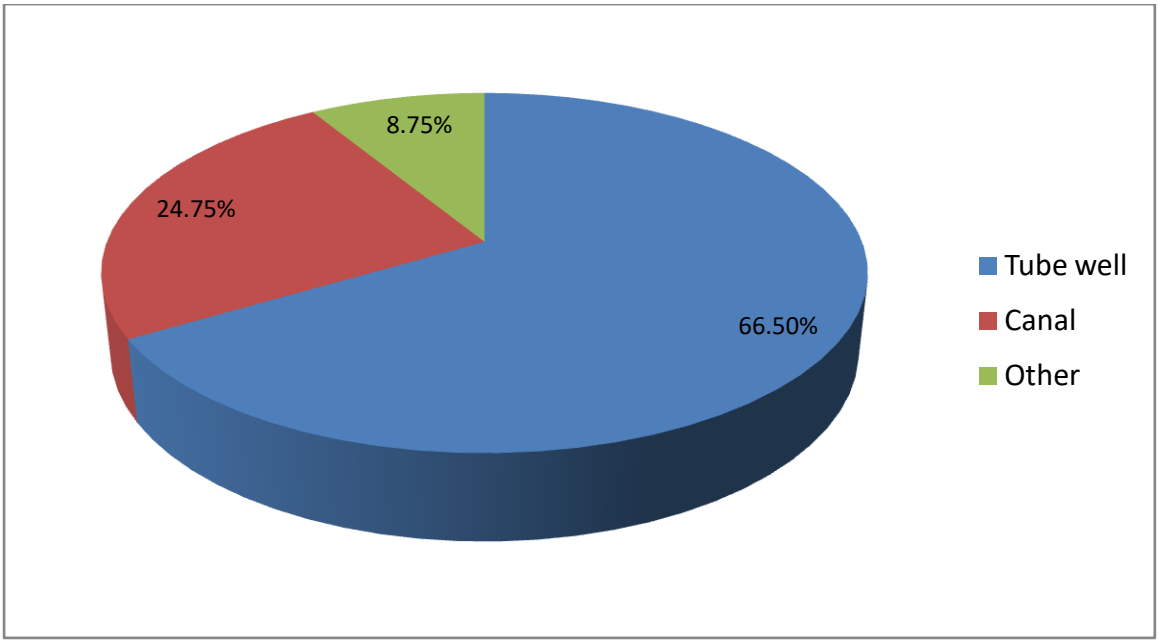


Fig: 4.6 Different sources of irrigation at sample households in the study area

4.1.5 Cropping pattern of sample households

Cropping pattern of sample households is presented in the table 4.5. The table reveals that the cropped area in Kharif season is higher as 100 per cent followed by Rabi as 8.91 per cent and Zaid as 42.60 per cent. In kharif paddy on an average occupied the largest area as 38.70 percent, followed by banana 26.31 per cent, maize 13.24 per cent, pigeon pea 9.56 per cent, chilly 6.53 percent and tomato 5.66 per cent. In Rabi season banana has largest occupied area with 29.59 percent followed by the wheat, chickpea, tomato and cabbage i.e. 30.80 per cent, 20.05 per cent, 9.05 per cent and 10.51 per cent respectively. Banana crop average occupied a maximum area 61.23 percent in summer season followed by other guard crop which is 38.77 percent. The overall gross cropped area and net cultivated area was observed 3.99 ha and 1.71 ha respectively. The cropping intensity was higher because of more irrigated area and perennial nature of banana crop. It has been estimated the overall cropping intensity as 231.73 per cent on an average basis and it indicate declining trend with increasing in farm size.

Table 4.5 Cropping pattern of sample households in the study area.(ha/farm)

S.No.	Crop	Small	Medium	Large	Overall
A.	Kharif				
1	Paddy	0.62 (36.26)	1.90 (51.63)	2.81 (33.45)	1.78 (38.70)
2	Maize	0.21 (12.28)	0.29 (7.88)	1.34 (15.95)	0.61 (13.24)
3	Tomato	0.13 (7.60)	0.12 (3.26)	0.55 (6.55)	0.26 (5.66)
4	Chilly	0.11 (6.43)	0.12 (3.26)	0.66 (7.86)	0.30 (6.53)
5	Pigeon pea	0.14 (8.19)	0.19 (5.16)	1.00 (11.90)	0.44 (9.56)
6	Banana	0.50 (29.24)	1.06 (28.80)	2.04 (24.29)	1.21 (26.31)
	Total	1.71 (100)	3.68 (100)	8.40 (100)	4.60 (100)
B	Rabi				
1	Wheat	0.43 (28.48)	1.43 (42.43)	1.94 (26.18)	1.26 (30.80)
2	Gram	0.31 (20.53)	0.61 (18.10)	1.54 (20.18)	0.82 (20.05)
3	Tomato	0.13 (8.61)	0.13 (3.86)	0.87 (11.74)	0.37 (9.05)
4	Cabbage	0.14 (9.27)	0.14 (4.15)	1.01 (13.63)	0.43 (10.51)
5	Banana	0.50 (33.11)	1.06 (31.46)	2.05 (27.67)	1.21 (29.59)
	Total	1.51 (100)	3.37 (100)	7.41 (100)	4.09 (100)
C	Zaid				
1	Banana	0.50	1.06	2.05	1.20

		(64.93)	(70.20)	(56.63)	(61.23)
2	Other	0.27 (35.07)	0.45 (29.80)	1.57 (43.37)	0.76 (38.77)
	Total	0.77 (100)	1.51 (100)	3.62 (100)	1.96 (100)
	Gross cropped area(A+B+C)	3.99	8.56	19.43	10.66
	Net cultivated area	1.71	3.68	8.40	4.60
	Cropping intensity (%)	233.33	232.60	231.30	231.73

Note: Figures in parentheses are percentage to total.

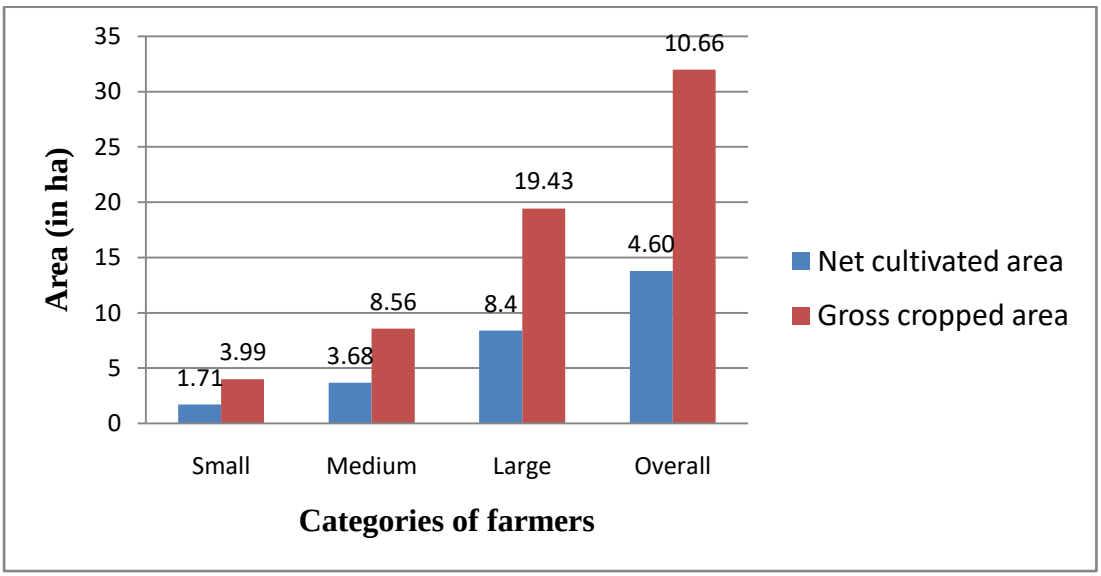


Fig: 4.7 Net cropped area and Gross cropped area of different crops in the study area

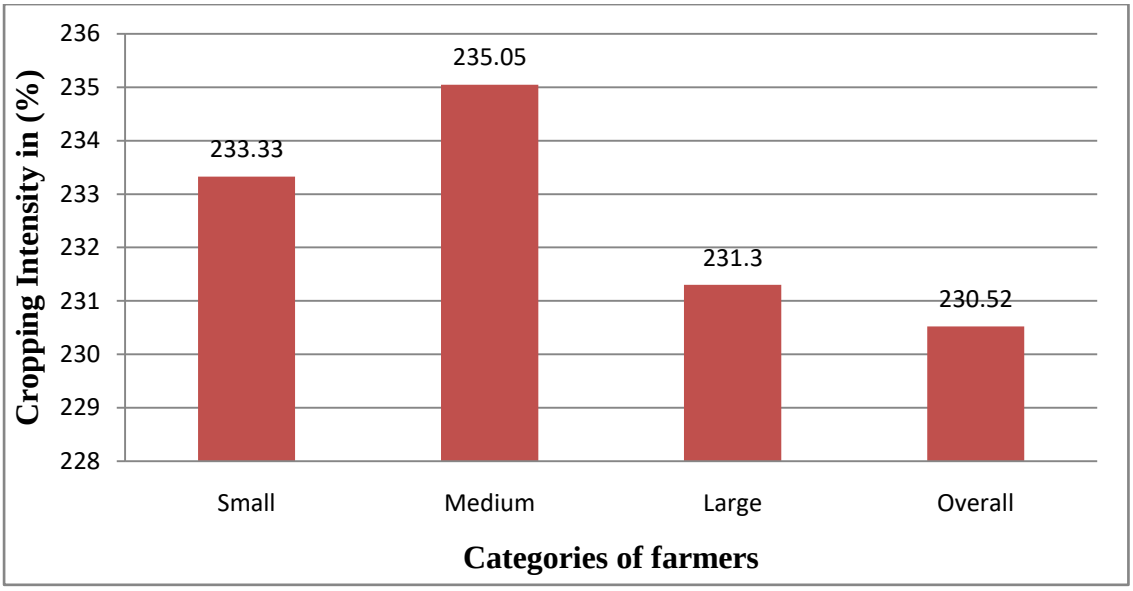


Fig: 4.8 Cropping Intensity of different farms in the study area

4.2 Compound growth rate of area, production and productivity of banana

The compound growth rate of area, production, productivity of banana in Bilaspur and Chhattisgarh state has been presented in table 4.7. The compound growth rate of banana has been calculated from the secondary data collected for 10 years from 2010-11 to 2019-20.

4.2.1 Compound growth rate of area, production and productivity of banana in Bilaspur district.

The area, production and productivity of banana (2010-11 to 2019-20) are presented in the table4.6. It reveals that the area under banana crop increases from 2100 ha in 210-11 to 2830 ha in 2019-20. Therefore the compound growth rate has showed non-significant growth in area with the 3.32 per cent. The production of banana decreases in first year from 52500 Mt in 2010-11 to 43480.50 Mt in 2011-12 but from 2011-12 to 2019-20 production continuous increases from 43480.50 Mt to 50844 Mt which resist also non-significant compound growth rate of 0.76 per cent. It was observed that the productivity decreases from 25 kg/ha in 2010-11 to 18.22 kg/ha but in 2014-15 it is increases to 18.62 kg/ha and in 2015-16 productivity again decreases to 18.20 kg/ha and from 2016-17 to 2019-20 productivity was constant as 17.96 kg/ha and it shows negatively significant compound growth rate of -2.48 per cent. Table 4.6 and fig:4.9 to 4.11 Clearly indicates the banana crop in Bilaspur

district of Chhattisgarh state showed in increasing trend in area and production and negatively trends in productivity.

Table 4.6 Area, Production and Productivity of banana in Bilaspur district

S. No.	Year	Area (ha)	Production (Mt)	Productivity (Mt/ha)
1	2010-11	2100.00	52500.00	25.00
2	2011-12	2193.50	43480.50	19.82
3	2012-13	2259.00	44133.00	19.54
4	2013-14	2425.00	44178.00	18.22
5	2014-15	2450.00	45633.00	18.62
6	2015-16	2550.00	46398.00	18.20
7	2016-17	2659.00	47772.00	17.96
8	2017-18	2689.00	48311.00	17.96
9	2018-19	2729.00	49029.00	17.96
10	2019-20	2830.00	50844.00	17.96

Source- Directorate of Horticulture, District- Bilaspur (Chhattisgarh)

Table 4.7 Compound growth rate of area, production and productivity of banana in Bilaspur district

Particulars (%)	Area (%)	Production (%)	Productivity
Compound growth rate	3.32	0.76	-2.48
	(1.40)	(0.30)	(0.01) **

***** Denote 1% level of significance

****** Denote 5% level of significance

Ns denotes non- significance

Figures in brackets show the p-value

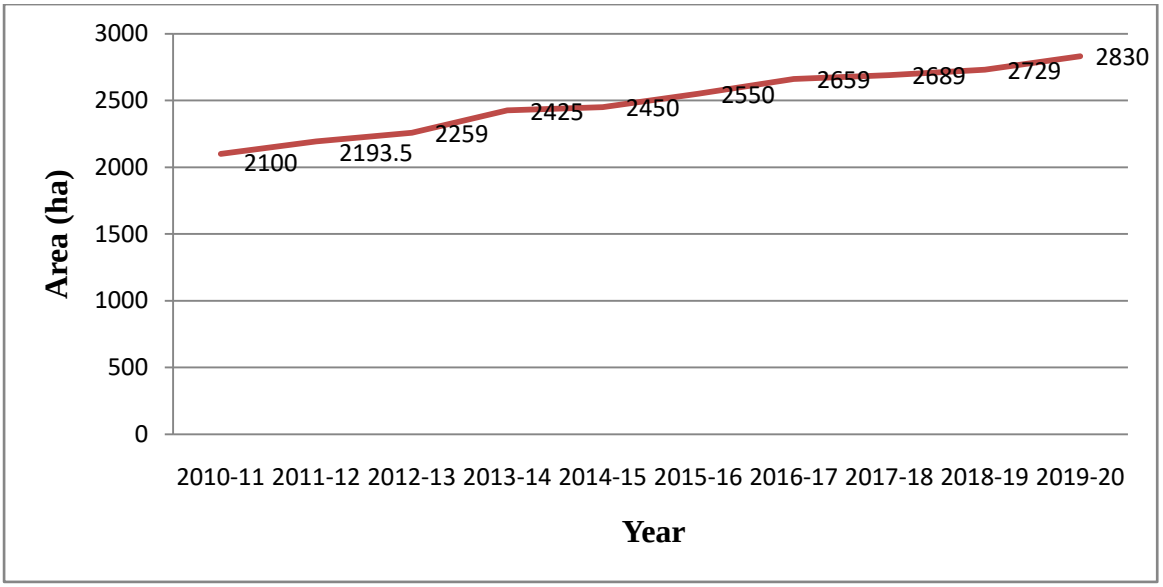


Fig: 4.9 Trend in area of banana in Bilaspur district

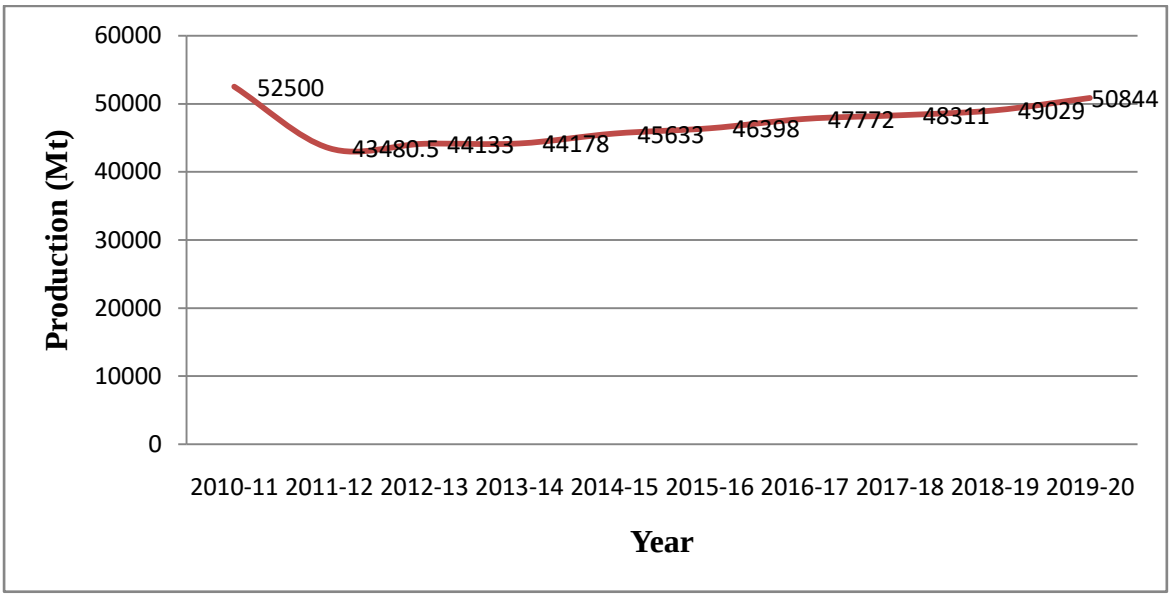


Fig: 4.10 Trend in production of banana in Bilaspur district

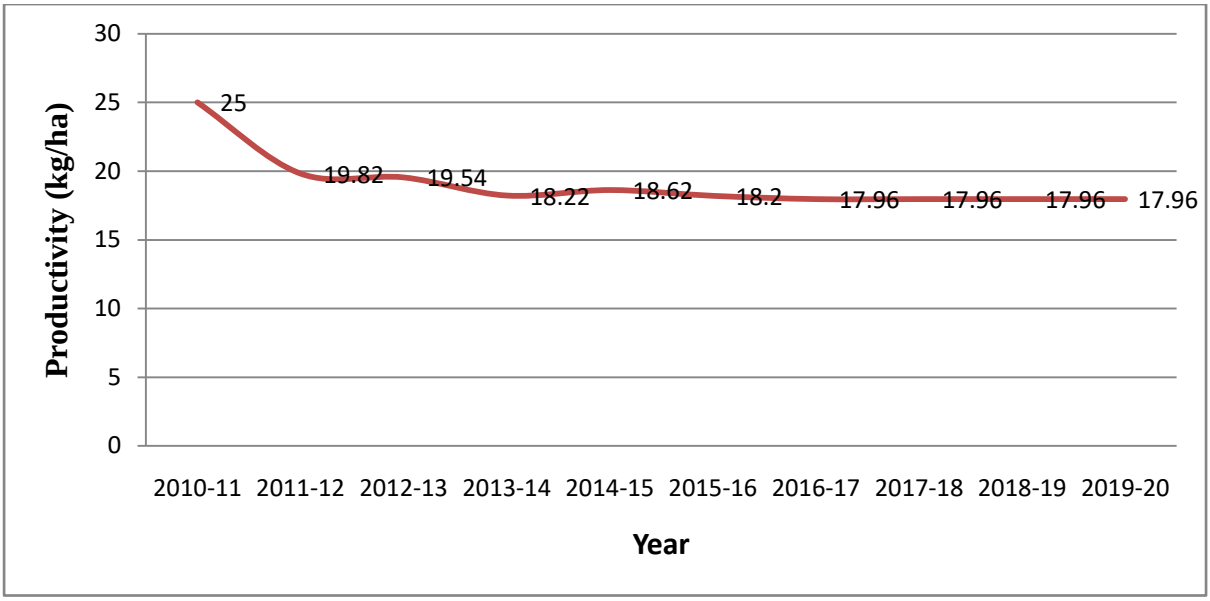


Fig: 4.11 Trend in productivity of banana in Bilaspur district

4.2.2 Compound growth rate of area, production and productivity of banana in Chhattisgarh state

The area, production and productivity of banana from the year 2010-11 to 2019-20are presented in Table 4.8. It shows that the area under banana crop increases from 14800.50 to 25791.00 ha from the year 2010-11 to 2019-20 respectively. Therefore the compound growth rate of area has showed positively significant growth with 6.92 per cent. The production of banana was also increases with 351436.52 to 602713.00 Mt from 2010-11 to 2019-20 respectively. Therefore the compound growth rate of production has showed positively significant growth with the 6.98 per cent. It was observed that productivity fluctuate increasing and decreasing year after year therefore the compound growth rate of productivity of banana has showed non-significant growth with the 0.05 per cent.

Table 4.8 Area, Production and Productivity of banana in Chhattisgarh state

S.No.	Year	Area (ha)	Production (Mt)	Productivity (Mt/ha)
1	2010-11	14800.50	351436.52	23.74
2	2011-12	16403.50	381656.50	23.27
3	2012-13	18677.00	413400.00	22.14
4	2013-14	20792.00	498814.00	23.99

5	2014-15	23870.00	564434.00	23.64
6	2015-16	25762.00	587421.00	22.80
7	2016-17	26322.00	611263.00	23.22
8	2017-18	27102.00	637148.00	23.50
9	2018-19	26662.00	627303.00	23.53
10	2019-20	25791.00	602713.00	23.34

Source- Directorate of Horticulture, (Chhattisgarh)

Table 4.9 Compound growth rate of area, production and productivity of banana in Chhattisgarh state

Particulars	Area (%)	Production (%)	Productivity (%)
Compound growth rate	6.92	6.98	0.05
	(0.0002) *	(0.0002) *	(0.84)

***** Denote 1% level of significance

****** Denote 5% level of significance

Ns denotes non- significance

Figures in brackets show the p-value

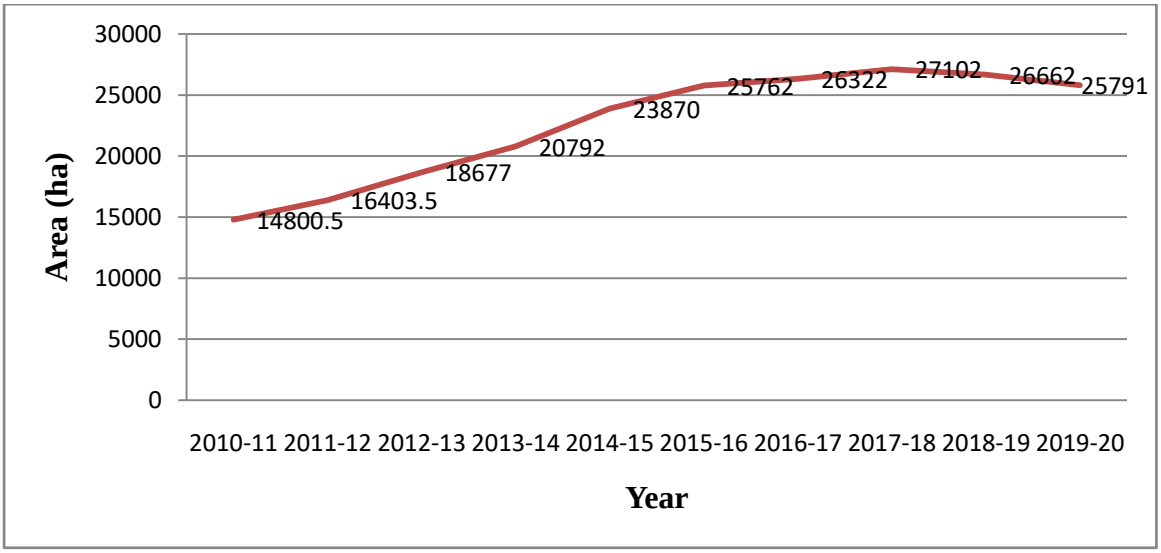


Fig: 4.12 Trend in area of banana in Chhattisgarh state

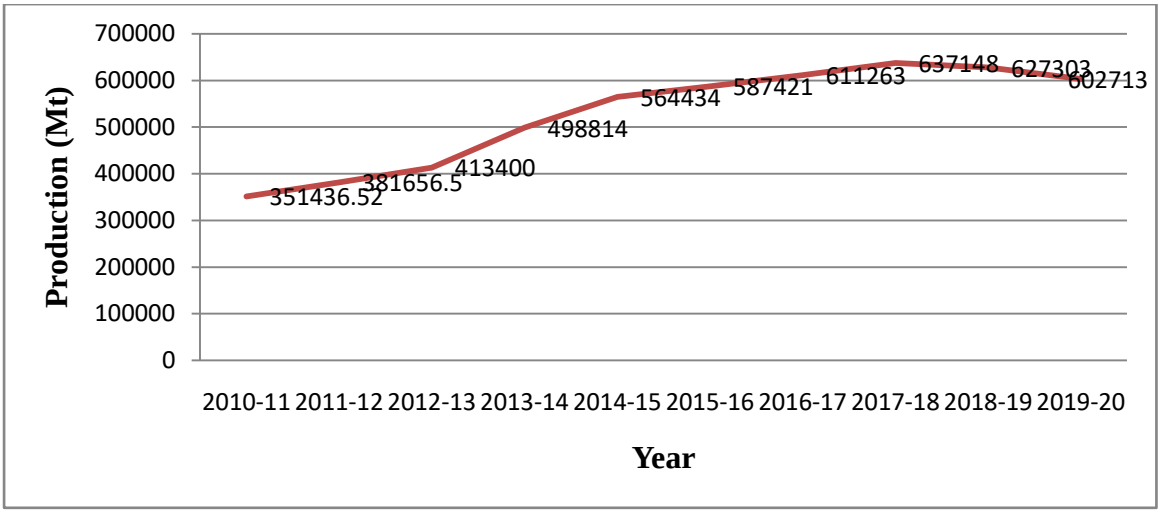


Fig: 4.13 Trend in production of banana in Chhattisgarh state

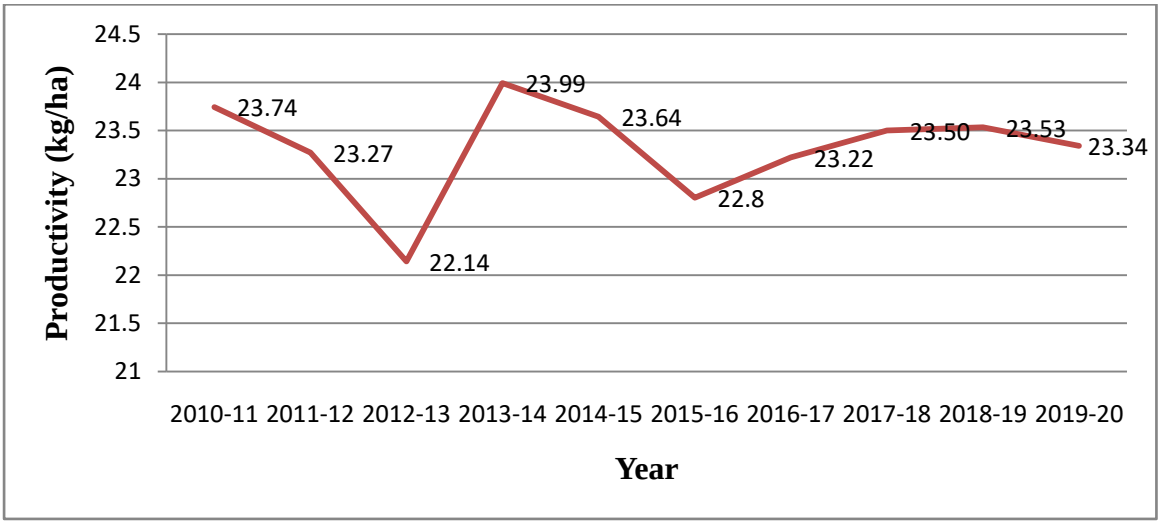


Fig: 4.14 Trend in productivity of banana in Chhattisgarh state

4.3 Economics of banana

Cost studies in agriculture provide an important part of information and knowledge essential for the formulation and evolution of economic policies both at micro and macro levels. The cost structures help the farmers in making use of costly inputs efficiently and thereby they can try to secure optimum level of production and income. Therefore, the cost of banana cultivation has been workout per hectare basis at different categories of farmers as follows.

4.3.1 Cost of cultivation of banana

The cost of cultivation of banana is demonstrated in the Table 4.10. From the table it is observed that the average cost of cultivation of sample farmers was Rs.174098.47 for small categories of farmers Rs.186412.41 for medium categories of farmers and Rs.201312.15 in case of large categories of farmers. The higher cost of cultivation found on large categories of farmers as compare to small and medium categories of farmers because large categories of farmers incurred extra charges on fertilizer, planting material, plant protection chemicals and hired labour.It is also observed that cost of banana cultivation has an increasing trend with the increasing farm size.

The overall cost of cultivation is observed as Rs.187274.47. From the table it is clear that under cost of cultivation the maximum cost shared by planting material which is Rs.47119.00 i.e. 25.16 per cent of total cost on an average basis. The same cost varies from Rs.44125 for small farmer to Rs.51182 for the large farmer. The total labour cost family plus hired is shared Rs.35537.95 i.e. 18.93 per cent to total cost of cultivation. The hired labour cost found maximum as is Rs.27323.78 on average basis. The large farmers incurred maximum hired labour costs which is Rs.30932.77 followed by medium and small farmers which are Rs.27802.73 and Rs.23235.84 respectively.

Fertilizers and manure cost were Rs.24863.73 and Rs.11471.34 respectively on an average basis.The fertilizer cost ranges from Rs.22276.73 at small farmer to Rs.27636.55 at large farmer and manure cost varies from Rs.10826.41 for small farmer to Rs.12026.89 for large farmers. Plant protection chemicals cost wasRs.9288.08 on an average basis. The cost of plant protection chemicals and

herbicides were incurred Rs.8901.88, Rs.9236.81, and Rs.9725.55 in case of small, medium and large categories of farmers respectively. The study found that plant protection chemicals and herbicides costs are increased with the increasing farm size and the same trends is also observed in case of fertilizer and manure cost. In banana cultivation propping is an important operation which costRs.11356.48 on an average basis that shares 6.07 per cent to total cost. The cost of machine charge is Rs.82445.07 on an average basis. Interest on working capital cost Rs.4421.58 on an average basis. The land revenue is observed 12 rupees which is same for all sizes of land holding of sample farmers which a farmers.

Depreciation, rental value of owned land and interest on fixed capital show increasing trends with increasing farm size which are Rs.591.95, Rs.23728.51 and Rs.3041.55 per ha on an average basis respectively.

Table 4.10 Cost of cultivation of banana at sample farms in the study area (Rs/ha)

S.No.	Particulars	Small	Medium	Large	Overall
Variable cost (A)					
1	Family labour	11745.28 (6.74)	8318.35 (4.46)	4578.89 (2.28)	8214.17 (4.34)
2	Hired human labour	23235.84 (13.35)	27802.73 (14.90)	30932.77 (15.37)	27323.78 (14.59)
3	Machine charge	6504.15 (3.73)	7642.18 (4.10)	10588.88 (5.26)	8245.07 (4.40)
4	Planting materials	44125.78 (25.35)	46049.22 (24.70)	51182.00 (25.42)	47119.00 (25.16)
5	Manure	10826.41 (6.22)	11560.74 (6.20)	12026.89 (5.97)	11471.34 (6.13)
6	Fertilizer	22276.73 (12.79)	24677.92 (13.03)	27636.55 (13.74)	24863.73 (13.29)
7	Plant protection chemicals and herbicides	8901.88 (5.12)	9236.81 (4.94)	9725.55 (4.83)	9288.08 (4.96)
8	Irrigation	6754.71	7600.17	8801.11	7718.66

		(3.88)	(4.07)	(4.37)	(4.13)
9	Propping	10528.30 (6.04)	11493.36 (6.17)	12047.78 (5.98)	11356.48 (6.07)
10	Interest on working capital	3994.62 (2.30)	4381.89 (2.35)	4888.25 (2.43)	4421.58 (2.36)
	Total variable cost (a)	148893.73 (85.52)	158763.42 (85.17)	172408.69 (85.64)	160021.94 (85.45)
Fixed cost (B)					
11	Land revenue	12 (0.00)	12 (0.00)	12 (0.00)	12 (0.00)
12	Depreciation on implements	415.5 (0.24)	610.15 (0.32)	750.21 (0.37)	591.95 (0.32)
13	Rental value of owned land	22076.73 (12.68)	24064.45 (12.90)	25044.44 (12.44)	23728.51 (12.68)
14	Interest on fixed capital	2700.50 (1.55)	2962.39 (1.59)	3096.80 (1.54)	2919.90 (1.56)
	Total fixed cost (b)	25204.73 (14.48)	27649.00 (14.83)	28903.45 (14.36)	27252.39 (14.55)
	Total cost (a+b)	174098.47 (100)	186412.41 (100)	201312.15 (100)	187274.34 (100)

Note: Figures in parentheses are percentage to total.

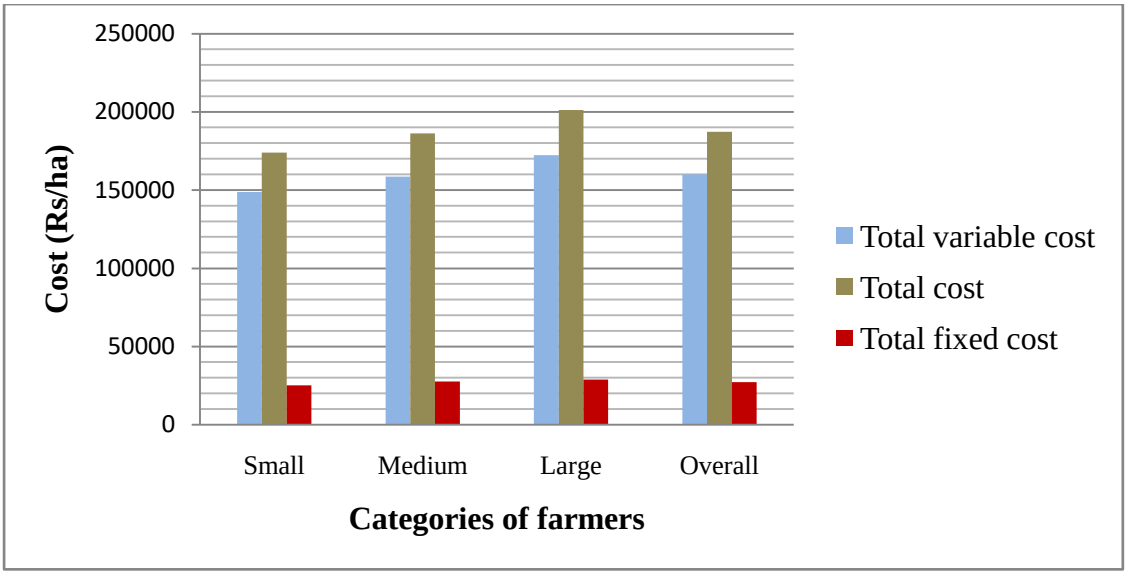


Fig: 4.15 Total variable cost, Total fixed cost and Total cost of Banana at sample farms in the study area

4.3.2 Different cost on the basis of cost concept at sample farms in the study area

Different cost on the basis of cost concept at sample farms in the study area is presented in the Table 4.11. The overall amount of various costof cultivation components. It is clearly visible from the above table that maximum cost can be seen at cost C3 which was Rs.206001.77 followed by cost C2, B2, C1, B1 and A1, A2 with the amount of Rs.187274.34, 179060.16, 163545.80, 155331.62 and 152411.72 respectively. Cost A2 was as same as cost A1 because no rent paid for leased in land. Total both maximum and minimum cost was higher in case of large farms followed by medium and small farms. Maximum cost can be observed at cost C3 which includes cost C2 plus 10% of cost C2 on account of managerial function performed by farmer and the minimum cost can be observed at cost A1 which includes all actual expenses. It shows the increasing trends with the increasing in farms size.

Table 4.11 Cost of cultivation of banana as per cost concept at sample farm in the study area. (Rs/ha)

S.No.	Cost	Size of land holdings			
		Small	Medium	Large	Overall
1	Cost A_1	137575.95	151067.20	168592.01	152411.72
2	Cost A_2	137575.95	151067.20	168592.01	152411.72
3	Cost B_1	140276.45	154029.60	171688.81	155331.62
4	Cost B_2	162353.18	178094.05	196733.25	179060.16
5	Cost C_1	152021.74	162347.96	176267.70	163545.80
6	Cost C_2	174098.47	186412.41	201312.15	187274.34
7	Cost C_3	191508.31	205053.65	221443.35	206001.77

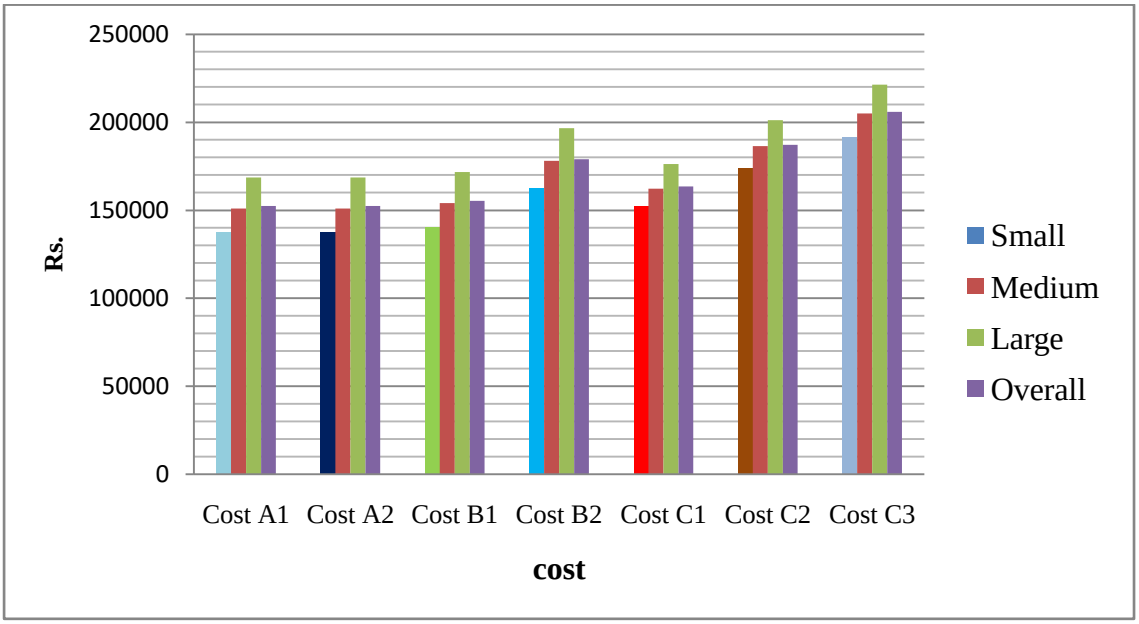


Fig: 4.16 Cost concept of banana cultivation as per cost concept of sample households in the study area

4.3.3 Yield, cost and return of banana at the sample farms in the study area

The table 4.12 represents yield and return of banana. The average yield per hectare was maximum in case of large farm which was 796.08 q followed by medium farm 776.00 q and small farms 760.02 q the overall yield was observed 777.36 q on an average basis. The average price of banana was 700 Rs. for all categories of banana farmers. The maximum cost of cultivation occurred in large farms which was Rs. 201312.15 followed by medium and small farms as Rs.186412.41 and Rs.174098.47 per ha respectively. Therefore the cost of production per quintal observed minimum in case of small farms which was Rs. 229.07 followed by medium farms Rs. 240.22andlarge farms Rs.252.88.This resulted because of large farm size could more expend in inputs applications, and use of outside labour rather than family labour, which ultimately increased cost of production.

Gross income can be seen higher in case of large farms which Rs.557256 followed by medium and small farms with the Rs. of 543200 and Rs.532014 respectively. The net return has been observed maximum in case of small farms which is Rs. 357915.53 followed by medium farms Rs. 356787.59 and minimum in case of large farms with the Rs. 355943.85, which resulted because of more amount of cost C in large farm and minimum in small farms.

The Benefit Cost ratio wasmaximum for small farms with 1:2.06 followed by medium farms with 1:1.92 and minimum in case of large farms with 1:1.77. Increased return from input can be seen in case of small farms is maximum due to increased productivity aroused due to minimum cost incurred. Also in small farms, family labours are more active and farm operations more efficiently, whereas medium and large farms contribution of family labour decreases with increases farm size and more hired labour are to be employed from outside.

Table 4.12 Yield, cost and return of banana at the sample farms in the study area. (Rs/ha)

S.No.	Particulars	Small	Medium	Large	Overall
1	Main yield (q/ha)	760.02	776.00	796.08	777.36
2	Price (Rs/q)	700	700	700	700
3	Gross income	532014	543200	557256	544156.66
4	Cost of production(Rs/q)	229.07	240.22	252.88	240.72
5	Cost of cultivation (Rs./ha)	174098.47	186412.41	201312.15	187274.34
6	Net income	357915.53	356787.59	355943.85	356882.32
7	B:C Ratio	1:2.06	1:1.92	1:1.77	1:1.91

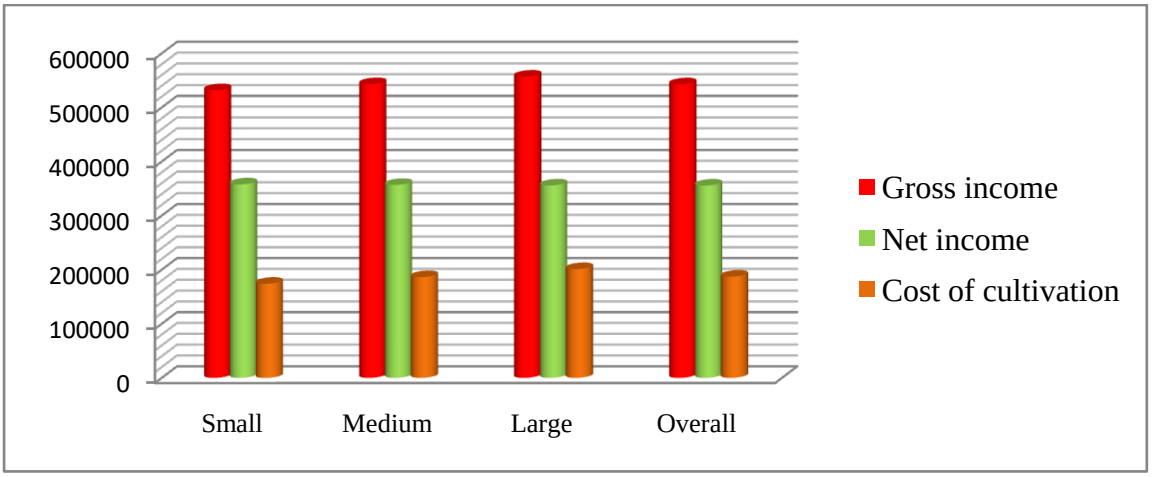


Fig: 4.17 Gross income, Net income and Cost of Cultivation of banana at sample farms in the study area

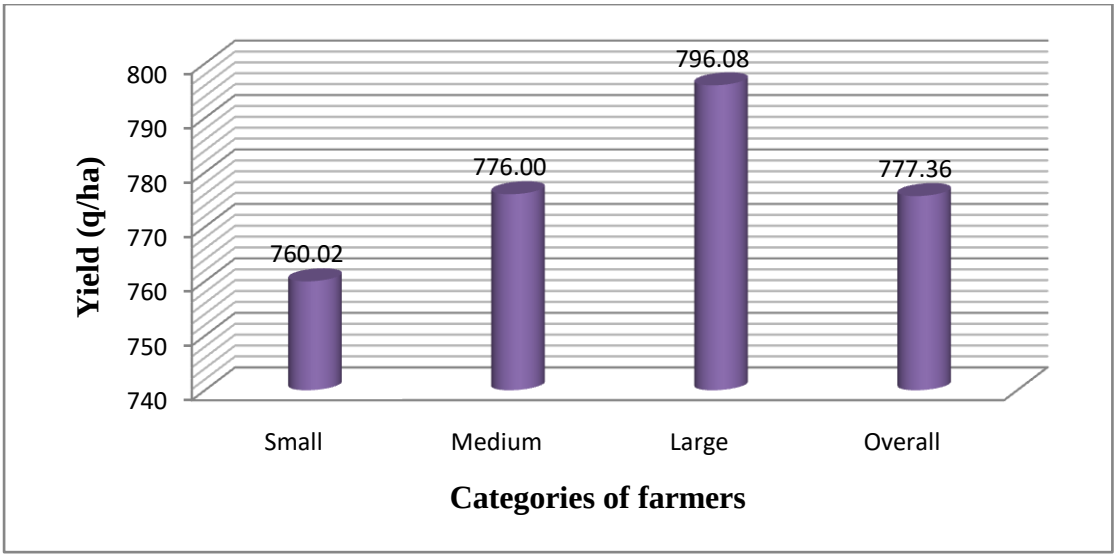


Fig: 4.18 Yield of banana at sample farms in the study area

4.3.4 Income over different cost at sampled farms in the study area

Income over different cost has been also calculated for the sample farms in the Table 4.13.Income over cost A1 maximum in small farms with Rs.394438.05 followed by medium farms with the Rs. 392132.80 and minimum in case of large farms with Rs. 388663.99 which shows decreasing trend with increasing farm size. Income over cost A2 was same as income over cost A1 which shows similar trends. Income over cost B1 was Rs.391737.55, Rs.389170.40 and Rs.385567.19 in case of small, medium and large farms respectively. Income over cost B2 was Rs.369660.82, Rs.365105.95 and Rs. 360522.75 in case of small, medium and large farms respectively. Income over cost C1 is maximum in case of large farms with Rs.380988.30 followed by medium farms with Rs.380852.04 and minimum in case of small farms with Rs.379992.26. income over cost C2 is observed maximum in case of small farms with Rs. 357915.53 followed by medium farms with Rs. 356787.59 and minimum in case of large farms with Rs. 355913.85. Income over cost C3 amounted Rs. 340505.69, Rs.338146.35 and Rs.335812.65 in case small, medium and large farms which shows a decreasing trends with increasing farm size. The overall income over cost A1,A2, B1, B2, C1, C2, C3 shows decreasing trends with increasing farm size.

Table 4.13 Income over different cost at sample farms in the study area(Rs/ha)

S.No.	Cost	Income over different costs			
		Small	Medium	Large	Overall
1	Income over cost A1	394438.05	392132.80	388663.99	390624.94
2	Income over cost A2	394438.05	392132.80	388663.99	390624.94
3	Income over cost B1	391737.55	389170.40	385567.19	387705.04
4	Income over cost B2	369660.82	365105.95	360522.75	363976.50
5	Income over cost C1	379992.26	380852.04	380988.30	379490.86
6	Income over cost C2	357915.53	356787.59	355913.85	355762.32
7	Income over cost C3	340505.69	338146.35	335812.65	337034.95

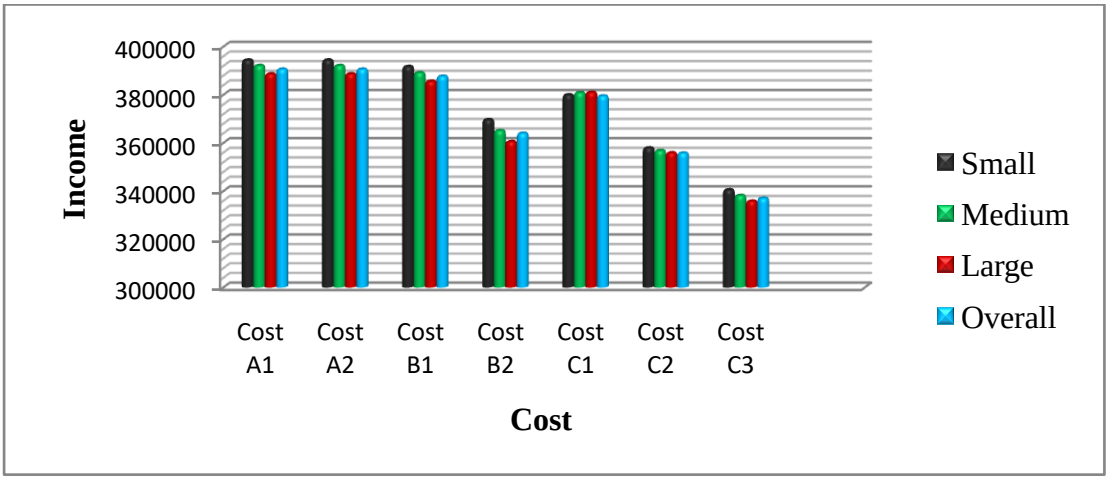


Fig: 4.19 Income over different cost at sample farms in the study area

4.4 Marketing of banana

4.4.1 Marketable surplus of banana at sample farm in the study area

Banana crop is perishable in nature they cannot be kept at household level for longer period without losses. The shortage of infrastructure is another reason that forces farmers to sell their produce on market directly after harvest.

The marketable surplus of banana from different sample farms has been worked out, and presented in Table 4.14. The study found that the marketable surpluses highest in large farms was highest with 757.02 q/farm followed by medium farm with 772.20 q/farm and minimum in case of small farms with 791.58 q/farm.

Home consumption was also higher in large farm with 4.50 q/farm followed by medium farm with 3.80 q/farm and also minimum in case of small farm with 3.00 q/farm. The overall marketable surplus was 773.60 q/farm on an average basis.

Table 4.14 Marketable surplus of banana at sample farms in the study area (q/farm)

S.No.	Farm size	Total production	Home consumption	Marketable surplus
1	Small	760.02 (100)	3.00 (0.40)	757.02 (99.60)
2	Medium	776.00 (100)	3.80 (0.49)	772.20 (99.51)
3	Large	796.08 (100)	4.50 (0.56)	791.58 (99.44)
4	Overall	777.36 (100)	3.76 (0.48)	773.60 (99.52)

Note: Figures in parentheses are percentage to total.

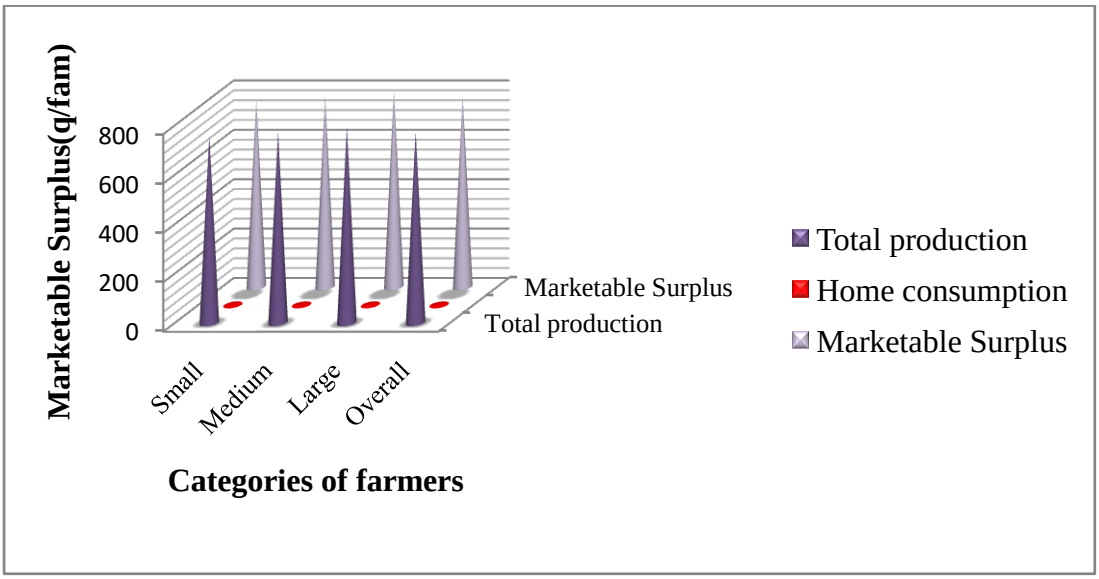


Fig: 4.20 Marketable surplus of banana of sample farmers in the study area

4.4.2 Marketing channels of banana at sample farms in the study area

Banana moves from producers to different marketing intermediaries until it reaches the consumer. It is important to find out the numerous marketing platforms

used during the present analysis of banana marketing. It has been observed that essential intermediaries were in the marketing of banana and further observed three marketing channels.

Channel I: Producer→ Consumer

Channel II: Producer→ Retailer→ Consumer

Channel III: Producer→ Wholesaler→ Retailer→ Consumer

4.4.3 Channel wise marketing cost of banana in the study area

Channel wise total marketing cost of banana at sample farms, evaluated and demonstrated in the table 4.15. For the channel-I total marketing cost was Rs.20.31 for channel-II total marketing cost was in Rs. 55.80 estimated in which 60.64 per cent cost was incurred by the producer and 39.36 per cent cost was incurred by the retailer. For channel-III total cost estimated as Rs. 153.04 per quintal in which 63.03 per cent of cost incurred by producer, 16.17 per cent of cost incurred by the wholesaler and 20.80 per cent of cost incurred by retailer. The study found that among three channels the maximum cost was fall on at transportation cost, and the cost is increasing in all three channels as channel become wider.

Table 4.15 Channel wise marketing cost of banana in the study area(Rs/q)

S.No.	Particulars	Overall		
		Channel-I	**Channel-II**	**Channel-III**
A. Marketing cost incurred by producer				
1	Loading	5.48 (26.98)	5.22 (9.36)	4.89 (3.20)
2	Weighing charges	2.92 (14.38)	3.00 (5.38)	3.15 (2.06)
3	Unloading	4.25 (20.93)	5.72 (10.25)	7.56 (4.94)
4	Commission	-	-	50.55 (33.04)
5	Transportation	7.66 (37.71)	15.02 (26.91)	20.11 (13.14)

6	Other charges	-	4.88 (8.74)	10.20 (6.66)
	Total	20.31 (100)	33.84 (60.64)	96.46 (63.03)
B. Marketing cost incurred by wholesaler				
1	Hamali			6.48 (4.24)
2	Weighing charges			3.50 (2.29)
3	Market cess fund			14.76 (9.64)
	Total			24.74 (16.17)
C. Marketing cost incurred by retailer				
1	Transportation		10.76 (19.29)	18.56 (12.13)
2	Weighing charges		3.20 (5.73)	3.50 (2.29)
3	Loading		4.50 (8.07)	4.48 (2.92)
4	Unloading		3.50 (6.27)	5.30 (3.46)
	Total		21.96 (39.36)	31.84 (20.80)
	Total cost of marketing	20.31 (100)	55.80 (100)	153.04 (100)

Note: Figures in parentheses are percentage to total.

4.4.4 Price spread in different channels of banana in the study area

The channel wise price distribution in banana marketing has been worked out and the same detail is presented in the Table 4.16.

It is observed from the table, the net price received by producer was Rs 679.69, Rs 666.16 and Rs 603.54 for the channel I, II and III respectively. Price spread was

maximum in channel-III as Rs.446.41 followed by channel-II as Rs.184.29 and channel-I as Rs.20.31. This is due to fact that as the market chain increases price spread also increases. The price paid by consumer was maximum in channel-III as Rs.1050.15, followed by channel-II as Rs.850.45 and channel-I as Rs.700.00.The producer's share in consumer's rupee was highest in channel-I (97.09%), followed by channel-II (78.37%) and channel-I (57.48%).

It is observed from the table 4.16 that, the variation was seen in price received by farmer in different channels. This is because of variation in market margin and cost of marketing in different channels. As number of middleman increased in marketing process, producer's share in consumer's rupee has decreased.

Table 4.16 Price spread in different channels of banana in the study area (Rs/q)

S.No.	Particulars	Overall		
		Channel-I	Channel-II	Channel-III
1. Producer				
A	Producer sell price	700 (100)	700 (82.35)	700 (66.66)
B	Cost incurred by producer	20.31 (2.90)	33.84 (3.98)	96.46 (9.19)
C	Net price received by producer	679.69 (97.10)	666.16 (78.37)	603.54 (57.48)
2. wholesaler				
A	Wholesaler purchase price	-	-	700
B	Marketing cost incurred	-	-	24.74 (2.36)
C	Wholesaler sale price	-	-	910.00
D	Market margin	-	-	185.26 (17.64)
3. retailer				
A	Retailer purchase price	-	700	910.00
B	Marketing cost incurred	-	21.96	31.84

			(2.58)	(3.04)
C	Retailer sale price	-	850.45	1050.15
D	Market margin	-	128.04 (15.06)	108.16 (10.30)
4. Consumer				
A	Price paid by consumer	700 (100)	850.45 (100)	1050.15 (100)
B	Price spread	20.31	184.29	446.41
C	MC+MM	20.31	183.84	446.46
D	Producer's share in consumer's rupee (%)	97.09	78.37	57.48

Note: Figures in parentheses are percentage to total.

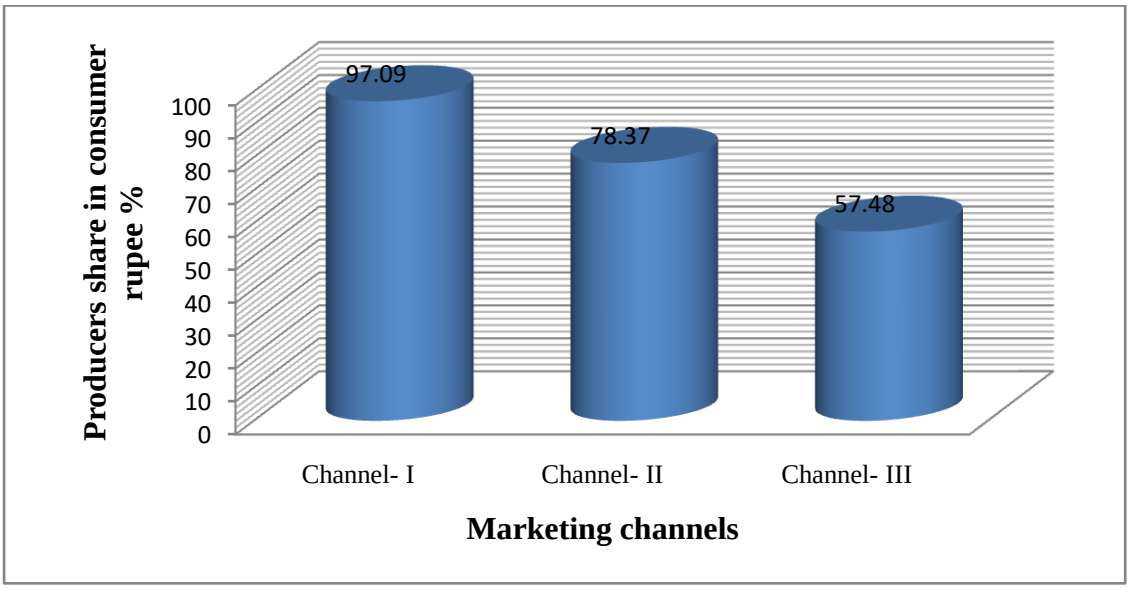


Fig:4.21 Producer's share in consumer's rupee of banana

4.4.5 Marketing efficiency in different marketing channels of banana in the study area

The Shepherd's method was followed for measuring the marketing efficiency of each channel for different grades. The results of marketing efficiency are presented in table 4.17

Table reveals that channel-I (34.46) was more efficient than channel-II (4.62) and channel-III (2.35) respectively. The study found that marketing channels more efficient thus channel-I was the most effective platform in banana marketing.

Table 4.17 Marketing efficiency in different marketing channels of banana in the study area

S.No.	Particulars	Channel-I	Channel-II	Channel-III
1	Net priced received by producer	679.69	666.16	603.54
2	Total marketing cost	20.31	55.80	153.04
3	Total marketing margin	-	128.04	293.42
4	mc+mm	20.31	183.84	446.46
5	Price paid by consumer	700	850.45	1050.15
6	Marketing efficiency ratio	34.46	4.62	2.35

4.5 Constraints in production and marketing of banana

Various problems in production and marketing of banana faced by sample banana grower wereanalyzed trough their opinion about various problems. The policy makers and departments are doing their best to solve the banana grower's problems, but further efforts are needed to resolve the main issue relevant to banana farming according to respondents.The problems that faced in banana production and marketing are shown in Table 4.18.

4.5.1 Problem related to production of banana in the study area

As per the Table 4.18 the first major problem faced by banana growers in the study area was lack of improved variety of planting material which is necessary to get a higher production of crop and this problem has been seen by 80.64 per cent of sample banana growers. Another problem which was reported by 73.38 % of sampled banana growers was lack of latest technical it is also an important problem because due to lack of latest technical knowledge a farmer can't get higher production and productivity of banana.

Scarcity of labour was one of the problems which has been there as 64.51 per cent of banana growers labour problems mostly happen with the large farmers due to large size of land holding which takes more labour requirements. Wind was major constraints at sample farm in banana production due to high wind pressure plant cannot survive and plants needs staking also bad weather condition like frost creates problems in banana cultivation therefore weather hazards problems suffers as 62.90 per cent of sample farmers. Irrigation is the important practice in banana cultivation and also other many practices affected due to power cut reported by 58.06 per cent of farmers. Problems of pest and diseases and sufficient water are other problems in banana cultivation which was affected by 50 per cent and 40.32 per cent of sample banana growers respectively and very few no. of sample banana growers affected by the lack of machinery problem which is about 38.70 per cent.

Table 4.18 Problems faced by sample farmers in production of banana in the study area

S.No.	Problems	Small	Medium	Large	Overall	Rank
1	Lack of improved variety of seed	32 (100)	38 (79.16)	35 (79.54)	100 (80.64)	I
2	Lack of latest technical knowledge	25 (78.12)	36 (75)	30 (68.18)	91 (73.38)	II
3	Scarcity of labour	15 (46.87)	31 (64.58)	34 (77.27)	80 (64.51)	III
4	Problem of pest and diseases	16 (50)	26 (54.16)	20 (45.45)	62 (50)	VI
5	Problems of sufficiency of water	20 (62.5)	16 (33.33)	14 (31.81)	50 (40.32)	VII
6	Crop damage due to weather hazards	18 (56.25)	32 (66.66)	28 (63.63)	78 (62.90)	IV
7	Lack of machinery	26 (81.25)	12 (25)	10 (22.72)	48 (38.70)	VIII
8	Problems of power cut	22 (68.75)	26 (54.16)	24 (54.54)	72 (58.06)	V

Note: Figures in parentheses are percentage to total.

4.5.2 Problems related to marketing of banana in the study area

Problem related to marketing of banana in the study area is presented in the table 4.19. As per the Table it is reported that all categories of farmers faced a problem of lack of processing industries and cold storage because of perishable nature of banana. Due to bulk production of banana, dependency on middleman is major problems as faced by the 83.06 per cent of sample farmers. To get a maximum price of product 70.96 per cent of sampled banana growers needed regulated and cooperative marketing. It is necessary to get touch with market information as problem faced by the 62.90 per cent of sample farmers. Due to perishable nature of banana its takes transportation problem to which 61.29 per cent of farmers and very few sample banana growers 49.19 per cent faced the problems of less numbers of buyer in the market, in the marketing of banana.

Table 4.19 Problem faced by sample farmers in marketing of banana in the study area

S.No.	Problems	Small	Medium	Large	Overall	Rank
1	Lack of processing industries related to banana	32 (100)	48 (100)	44 (100)	124 (100)	I
2	Lack of regulated and co-operative market	25 (78.12)	35 (72.91)	28 (63.63)	88 (70.96)	III
3	Dependence on middle man	24 (75)	41 (85.41)	38 (86.36)	103 (83.06)	II
4	Lack of awareness about market information	28 (87.5)	30 (62.5)	20 (45.45)	78 (62.90)	IV
5	Perishability and transportation problems	16 (50)	26 (54.16)	34 (77.27)	76 (61.29)	V
6	Less no. of buyers available in market	12 (37.5)	22 (45.83)	27 (61.36)	61 (49.19)	VI

Note: Figures in parentheses are percentage to total.

CHAPTER - V
SUMMARY AND CONCULSIONS

Banana is an extremely famous natural fruit because of its cheap price and good nutritional advantages. Modern edible banana varieties evolved from two popular banana varieties, Musa accuminata and Musa balbisiana. Banana (Musa sp.) is India's second largest fruit crop after mangoes. Bananas are available all year round, with reasonable prices, a wide variety of varieties, taste, nutrition value, making bananas the popular fruit among all circles of people.

Global banana exports in 2018 are estimated at 23.3 million tons. Ecuador was the largest banana exporter in 2018. The global production of bananas is approximately 1020817 million tons, of which India accounts for 29.19%. India's banana production ranks first in the world, as an annually outcome of approximately 14.2 million tons. Other major producing nations are Brazil, Ecuador, China, the Philippines, Indonesia, Costa Rica, Mexico, Thailand and Colombia. India’s banana planting area is 830,500 ha, and the overall output is about 29,779,100 tons. The primary banana developing states are Tamil Nadu, Maharashtra, Gujarat, Andhra Pradesh and Karnataka.

Total production of banana in Chhattisgarh is 602,717 metric tons, and the total banana fruit area in Chhattisgarh is 25,791 hectares. The main banana-growing areas are Bilaspur, Balrampur, Durg, Surajpur, Raigarh and Raipur. Therefore, the current plan for the economic development of banana production and sales in the Bilaspur district of Chhattisgarh is planned. Analyze and research. The basic research objectives are as follows

Objectives:

(1) To examine growth rate of area, production and productivity of banana in Bilaspur district and Chhattisgarh State.

(2) To find out cost and return in cultivation of banana in the study area.

(3) To identify important marketing channel for marketing of banana in the study area.

(4) To identify major constraints, opportunities in production and marketing of banana in the study area.

Bilaspur district was selected for the study based on higher coverage area in Chhattisgarh state. Two blocks namely Masturi and Bilha were selected for the study on the basis of higher coverage area. 124 respondents were selected for the study form 13 villages. Primary data has been collected from the survey of sample households through close to home meeting with the assistance of pre tried surveys and secondary data were collected from different government office such as department of agriculture, department of horticulture, department of economics and statistics, government of Chhattisgarh and through all other authentic sources.

To work out the pattern in area, production and productivity of banana in Bilaspur district and Chhattisgarh state, compound growth rates were estimated. To work out the cost and return of banana cultivation standard cost of cultivation formula were used given by Commission on Agriculture Cost and Prices. Different marketing tools were computed to analyze the marketing pattern of banana in the study area. Major constraints were analyzed faced by banana growers with the help of pre tested questionnaires.

Conclusion:

The average size of family was 4.99 with the 95.81 per cent of average literacy rate in the study area.

The average cropping intensity was 230.52 per cent in the study area.

The average land area of the respondents was 13.79 hectares.

The total cultivated area of small, medium and large farms in the study area is 1.71 hectares, 3.68 hectares and 8.40 hectares, respectively.

In Chhattisgarh, the compound growth rate of banana area and production is positively significant, and banana productivity is positive but not significant.

In the Bilaspur, the compound growth rate of banana area and production was positive and non-significant, and banana productivity was negatively significant.

The average cost of banana cultivation per hectare for small, medium and large farms in the study area was 174098.47, 186412.41 and 201312.15 rupees, respectively. As the scale of the farm expands, the cost of planting bananas per hectare is on the rise.

The gross yield of banana become determined 760.02, 776.00 and 796.08 q/ha for small, medium and large classes of farms respectively withinside the examine region. Yield of banana suggests growing developments with growth in farm size.

The gross income of banana become determined Rs.532014, 543200 and 557256 for small, medium and large farms respectively. Gross income suggests growing developments with growth in farm size.

The net income become determined Rs.357915.53, 356787.59 and 355943.85 for small, medium and large classes of farmers respectively. Net income suggests decline developments with growth in farm size.

The B:C ratio become determined 1:2.06, 1:1.92 and 1:1.77 for the small, medium and large classes of farmers respectively.

Three marketing channel have been determined withinside the examine region for the marketing of banana that is Channel I: Producer → Consumer, Channel II: Producer

→ Retailer → Consumer, Channel III: Producer → Wholesaler → Retailer → Consumer.

The total marketing cost become determined 20.31 Rs, 55.80 Rs and 153.04 Rs for channel I, II and III respectively.

The price spread was found Rs 20.31, 184.29 and 446.41 for channel I, II and III respectively in the study area. Price spread was found higher in channel III.

The producer share in consumer rupee was found 97.09 Rs, 78.37 Rs and 57.48 Rs for I, II, and III marketing channel respectively in the study area.

The marketing efficiency ratio become determined 34.46, 4.62 and 2.35 for I, II and III marketing channel respectively withinside the examine region which suggests channel I become extra green observed with the aid of using channel II and channel III.

Major constraints related to production of banana were lack of improved variety of seed, lack of latest technical knowledge, scarcity of labour, problems of pest and diseases, problems of sufficiency of water, weather problems, lack of machinery and problems of power cut in the study area.

Major constraints related to marketing of banana were lack of processing industries related to banana, lack of regulated and cooperative market, dependency on middleman, lack of awareness about market information, perishability and transportation problems and less number of buyers in market in the study area.

Suggestions for future work:

Planting material selected should be carefully with better quality like (G-9) tissue culture variety of banana to maintain proper plant population and to obtain maximum production of banana.

Disease and pest resistant varieties should be grown, and there should be information about regular doses of fertilizers.

Farmers should be more interested in extension activities like demonstration, training program, exhibition program etc.

Farmers should be knowledge about efficient use of input and resources so as to gain maximum output with minimum cost.

Farmers should knowledge about better package and practices of banana cultivation so as to get better productivity of banana.

Efficient marketing needed most for banana crop in the study area.

Proper acknowledgement of marketing information is needed for marketing of this crop so as to farmers can sell their product with better price.

The department of agriculture and horticulture should work for developing new techniques, latest variety of banana and its proper dissemination should be ensured.

CHAPTER – VI

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APPENDIX-A

DEPARTMENT OF AGRICULTURAL ECONOMICS

INDIRA GANDHI KRISHI VISHWAVIDYALYA RAIPUR CHHATTISGARH

"AN ECONOMIC ANALYSIS OF PRODUCTION AND MARKETING OF BANANA IN BILASPUR DISTRICT OF CHHATTISGARH STATE"

Advisor – Dr. Ajay Tegar

HOUSEHOLD SCHEDULE

A. General information

1. Name of respondents_____

2. Age (year) _____ 3. Caste (Gen./SC/ST/OBC) _____

4. Village _____5. Post _____6. Tehsil _____

7. District_____8. Distance from market (km) _____

9. Date of interview _____ 10. Education _____

B. Details of the family

Sr. No.	Name of family member	Relation To Head	Sex M/F	Age	Education	Employment			Income		
						Farm	Off farm	Non Farm	Farm	Off farm	Non farm

* 1= illiterate, 2 = Primary, 3 = High school, 4 = Graduate, 5= Post Graduate

C. Details of Land Holding

Particular	Area	Agriculture		Sourceof Irrigation	Soil Type	Land quality
		Irrig.	Unirrig.			
Respondents						
Owned						
Leased in						
Leased out						

- 1= Poor, 2= Average, 3= Good, 4=Very good

D. Cropping Pattern

Sr.No	Season	Area	Variety		Production (quintal)	Value (Rs.)
			Tradition	Modern		
	Kharif					
1						
2						
3						
	Rabi					
1						
2						
3						
	Zaid					
1						
2						
3						
	Total cropped Area					

F. Source of Irrigation

S.No	Source of irrigation	Area (ha)	Irrigation charges (Rs).
1	Tank		
2	Canal		
3	Tube well		
4	Well		
5	Bore well		
6	Other		
	Total		

A. Cost of cultivation.

Crop _____ Variety _____

Area _____ (Irrigated / unirrigated).

S.No	Operation	Family human labour (days)	Hired human labour (days)	Bullock power	Machine power	Total expenditure on particular operation
1	Field Preparation					
2	Sowing					
3	Application of					

	Manure					
4	Application of Fertilizer					
5	Inter-culture practices					
6	Irrigation					
7	Plant Protection practices					
8	Threshing& winnowing					
9	Transportation					
10	Miscellaneous					
11	Total					

M = Male, F= Female, T = Total O= Family labour, H= Hired labour, R= Rate per unit (Rs.)

Wage rate of male labour _____ Rs/day

Wage Rate of female labour _____ Rs/day.

B. Input Cost

S.No	Input	Owned (Kg)	Purchased (Kg)	Sold (Kg)	Rate(Rs)/ unit	Total value (Rs)
1	Seed					
	A					
	B					
2	FYM					
3	Fertilizers					
	A					
	B					
	C					
4	Plant protection Chemicals					
	A					
	B					
	C					
Total						

C. Irrigation charges _____

D. Interest on working capital _____

E. Fixed cost

a) Rental value of land / leased in land (Rs.): _____

b) Land revenue (Rs.): _____

c) Interest on fixed capital: _____

d) Depreciation: _____

F. Family consumption

G. Quantity kept for used

a. Seed
b. Wage
c. Other

H. Marketing Cost

S.N.	**Particulars**	**Amount**
1	Quantity to be sold	
2	Whom to be sold (type of agency)	
3	Where it is sold (name of market)	
4	Price (rs. /qt.)	
5	Means of transportation	
6	Distance from field to market	
7	Transportation cost (rs. /qt.)	
8	Market/Mandy fee (rs.)	
9	Loading and unloading charges	
10	Commission charges	
11	Labor engaged in selling process	
12	If self-involve in selling than charges for shop/place	
13	Other miscellaneous expenses	

Constraints in production of banana:

1. Lack of knowledge about the crop-Y/N If No, why?
   a. Less advertisement of crops
   b. Farmers distrust about profits
   c. No interaction with Agricultural extension worker
   d. Any other specify
2. Lack of improved and high yielding varieties Y/N If yes, then?
   a. Non availability of seed
   b. Poor knowledge of technology

c. Traditional farmer practices

d. Any other specify

3. Lack of recommended package practices of the crop in the region-Y/N If Yes, why?

a. No such type of recommendation

b. Not frequent visit of Agricultural extension workers

c. Does not proper interest of farmers

4. Lack of resources i.e., Money, implements etc.-Y/N If Yes, then how you managing money?

a. From bank

b. From relatives

c. From traders

d. Other sources

5. Lack of irrigation water –Y/N If Yes, then how you irrigate your crop?

a. With own irrigation

b. Crop depends on rains

c. Other

6. Lack of labour –Y/N IF Yes, then in which operation

a. Weeding/thinning

b. Any other specify

7. Lack of nutrient in soil and lack of sufficient soil testing facilities-Y/N, If yes, then how you come to know the nutrient requirement of plant?

a. Indicator plant

b. Soil health card

C. By other sources

8. Lack of credit availability Y/N

9. Constraints

a. Animal threat

b. Other

Constraints in marketing of banana:

1. Low demand of final product–Y/N

2. Lack of transportation facilities and road from village to market-Y/N

3. Whether you face problem because the quantity is small-Y/N If yes, then What

steps you have taken to pool your produce?

a. Use quality seed
b. Use fertilizer and micronutrients
c. Soil testing for the cultivation of suitable crop
d. Use advanced technologies

4. Lack of regulated market and cooperative market-Y/N
5. Lack of sufficient number of processing unit-Y/N
6. Lack of storage facilities in growing area-Y/N
7. Whether you like store your produce in storage to get high price? -Y/N
8. Lack of support price. Y/N
9. How the support price will affect the production of crop Y/N

a. To change in cropping pattern
b. For short duration
c. any other

10. Lack of awareness about market news and intelligence-Y/N
11. What media do you have for marketing news?

a. Newspaper
b. Internet
b. Television
c. Other (specify)

12 .Lack of credit availability Y/N

Wholesaler/Retailer Survey

1. Name of wholesaler/retailer …….
2. Name of market …….
3. Date of interview ……
4. Purchase through i) commission agent …….
   ii) Direct from farmer ……

Quantity of purchase

S. N.	Name of variety	Quantity purchased (qt)	Price paid (rs/qt)
1			
2			
total			

Quantity sold

S.N.	Name of variety	Quantity sale (qt)	Price received (rs/qt)
1			
2			
total			

Marketing cost

S.N.	Particular	Amount
1	Selling price	
2	Distance from marketing place	
3	Means of transportation	
4	Transportation cost	
5	Mondi fees	
6	Loading and unloading charges	
7	Commission charges	
8	Other expenses	
9	Other marketing expenses	
I	License fee (rs/yr.)	
Ii	Maintenance expenditure	
Iii	Expenditure on stationary	
Iv	Rent on shop/ month	
v	Capital invest and interest rate	

APPENDIX-B

NAME OF SAMPLE HOUSEHOLDS

S.No.	Name	Village	S.No.	Name	Village
1	Rajesh Gupta	Jairamnagar	66	Dheerendra Maravi	Eramsahi
2	Basant Yadav	Jairamnagar	67	Chinta Jaiswal	Eramsahi
3	Mohan Prajapati	Jairamnagar	68	Munna Yadav	Eramsahi
4	Samru Yadav	Jairamnagar	69	Daulat Yadav	Eramsahi
5	Vinod Patel	Jairamnagar	70	Limha Jaiswal	Eramsahi
6	Bhagwat Patel	Jairamnagar	71	Badri Sahu	Eramsahi
7	Sudheer Kashyap	Jairamnagar	72	Hari Kishun	Eramsahi
8	Golu Sahu	Jairamnagar	73	Mangal Maravi	Eramsahi
9	Ashok Yadav	Jairamnagar	74	Chamru Kumhar	Eramsahi
10	Parmod Dheevar	Jairamnagar	75	Babulal Yadav	Navagao
11	Rajkumar Dheevar	Jairamnagar	76	Jethuram Rathore	Navagao
12	Punnilal Yadav	Jairamnagar	77	Phalit Yadav	Navagao
13	Gangaram Suryavanshi	Darrighat	78	Rajesh Yadav	Navagao
14	Ghanshyam Sahu	Darrighat	79	Mohan Rathore	Navagao
15	Sandeep Patel	Darrighat	80	Dinesh Nagesh	Navagao
16	Suresh Kaushik	Darrighat	81	Ajeet Nagesh	Navagao
17	Amrit Patel	Darrighat	82	Deelip Nagesh	Navagao
18	Sagar Kaiwart	Darrighat	83	Dukhi Raj	Navagao
19	Amit Yadav	Darrighat	84	Billu Yadav	Malhar
20	Bhihari Yadav	Darrighat	85	Narayan Jaiswal	Malhar
21	Tirith Kol	Darrighat	86	Parmeshwar Kol	Malhar
22	Dukhi Ram Yadav	Darrighat	87	Biilu Yadav	Malhar
23	Santosh Yadav	Kutela	88	Ravishankar Jaiswal	Malhar
24	Dukhva Yadav	Kutela	89	Dhani Ram Jaiswal	Malhar
25	Kamal Singh Paikra	Kutela	90	Ramdular	Malhar
26	JanakRam Yadav	Kutela	91	Bishore Singh	Malhar
27	Shiv Kumar Dhanvar	Kutela	92	Rampratap	Malhar
28	Narendra Rajput	Kutela	93	Dukalu	Malhar
29	Parmeshvar	Kutela	94	Sukhram Giri	Malhar
30	Anuj Ram	Kukda	95	Aaju Ram	Malhar
31	Suresh Yadav	Kukda	96	Kamal Singh	Malhar
32	Vishal Varma	Kukda	97	Harshad singh	Malhar
33	Phagun Ram	Kukda	98	Laxman Yadav	Malhar
34	Jivandas Manikpuri	Kukda	99	Jagra Paikra	Kachhar
35	Rameshvar Kaiwart	Kukda	100	KamluYadav	Kachhar
37	Munna Singh Urao	Kukda	101	Ramu Jaiswal	Sendri
38	Arapan Singh	Kukda	102	Balli Yadav	Sendri
39	Bablu Dhruv	Khmhardeeh	103	Mohan Pradhan	Sendri
40	Solo Yadav	Khmhardeeh	104	Devdat Varma	Sendri
41	Ramballi Jaiswal	Khmhardeeh	105	Manharan Shrivas	Sendri
42	Veerbhadra Jingh	Khmhardeeh	106	Rajkumar Sen	Sendri
43	Sonbhadra	Khmhardeeh	107	Gorelal Dhruv	Sendri

44	Ravi Kashyap	Khmhardeeh	108	Raj Dhruv	Sendri
45	Ishvar Kashyap	Khmhardeeh	109	Binjhvar singh	Sendri
46	Deelep Kumhar	Khmhardeeh	110	Rajkumar Nirmalkar	Sendri
47	Tulsi Sahu	Khmhardeeh	111	Hem kumar	Sendri
48	Ramtheku	Udantaal	112	Chandrakant Paikra	Sendri
49	Jaggu Yadav	Udantaal	113	Raghuram Singh	Sendri
50	Krishnkanta Sahu	Udantaal	114	MadanYadav	seepat
51	Achhu Jaiswal	Udantaal	115	Deenananth Paikra	Seepat
52	Sukhnandan Kumhar	Udantaal	116	Shailisten Ekka	Seepat
53	Chaitu Sahu	Udantaal	117	Hariprasad Agrahari	Seepat
54	Amar Singh Maravi	Udantaal	118	Jayprakash Patle	Seepat
55	Somnanth Paikra	Kadar	119	Vibhuti Narayan Mishra	Seepat
56	Murat Singh thakur	Kadar	120	Hemprasad Sahu	Seepat
57	Satrohan Dhurav	Kadar	121	Rajendra Thakur	Seepat
58	Bhagelu Kol	Kadar	122	Jagdish Keawat	seepat
59	Ramnarayan Kol	Kadar	123	Chandram Kewat	Seepat
60	Mani Chauhan	Seepat	124	Chintamani Patel	Seepat
61	Seva Das Manikpuri	Kachhar			
62	Goverdhan Prasad	Kachhar			
63	Rajaram Patel	Kachhar			
64	Shiv Prasad Patel	Kachhar			
65	Devrnarayan	Kachhar			

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Yours Sincerely,

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