

**AN ECONOMIC ANALYSIS OF PRODUCTION AND MARKETING OF
MAIZE IN KANKER DISTRICT OF CHHATTISGARH**

M.Sc. (Ag.) THESIS

by

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INDIRA GANDHI KRISHI VISHWAVIDYALAYA
RAIPUR (C.G.)**

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**AN ECONOMIC ANALYSIS OF PRODUCTION AND MARKETING OF
MAIZE IN KANKER DISTRICT OF CHHATTISGARH**

THESIS

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Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.)

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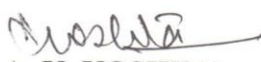
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CERTIFICATE - I

This is to certify that the thesis entitled "AN ECONOMIC ANALYSIS OF PRODUCTION AND MARKETING OF MAIZE IN KANKER DISTRICT OF CHHATTISGARH" submitted in partial fulfilment of the requirements for the degree of "MASTER OF SCIENCE IN AGRICULTURE" of the Indira Gandhi Krishi Vishwavidyalaya, Raipur is a record of the bonafide research work carried out by PRATIMA DHRUV under my guidance and supervision. The subject of the thesis has been approved by the Student's Advisory Committee and the Director of Instructions.


No part of the thesis has been submitted for any other degree or diploma (certificate awarded etc.) 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 her.

Date: 22/07/2014


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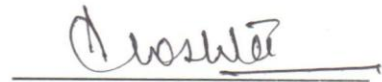
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CONTENTS

CHAPTER	PARTICULARS	PAGE NO.
I	INTRODUCTION	1-4
	1.1 Problems Justification	1-3
	1.2 Objectives	3-4
	1.3 Limitations of the study	4
	1.4 Setup	4
II	REVIEW OF LITERATURE	5-14
III	MATERIALS AND METHODS	15-26
	3.1 Selection of the study area	15
	3.2 Selection of respondents (Maize grower)	5-16
	3.3 Method of Inquiry and collection of data	6
	3.4 Analytical tools	6
	3.4.1 Compound growth rate	7
	3.4.2 Marketable surplus	7
	3.5 Profile of the study area	7-18
	3.5.1 Description of the state sample district	8
	3.5.2 Distribution of land holding	8
	3.5.3 Topography	8-19
	3.5.4 Soil	9-20
	3.5.5 Climate and rainfall	20
	3.5.6 Population distribution	

		20-21
	3.5.7 LAND USE PATTERN	21
	3.5.8 SOURCE OF IRRIGATION	1-22
	3.6 CROPPING PATTERN	3-24
	3.7 LIVESTOCK POPULATION	4-25
	3.8 LIMITATION OF STUDY	6
	RESULTS AND DISCUSSION	7-43
	4.1 GENERAL CHARACTERISTICS OF SAMPLED HOUSEHOLDS	7-33
	4.1.1 Demographical characteristics of sample households	7-29
	4.1.2 Average cropped and operated area sample farms	0
	4.1.3 IRRIGATED AREA BY SOURCE	1
	4.1.4 Cropping pattern	2-33
	4.2 Growth rate in area, production and productivity of maize in study area	4
	4.3 Inputs/material use for cultivation of maize	5-36
	4.4 COSTS AND RETURN OF MAIZE CULTIVATION	36-38
	4.5 ECONOMICS OF MAIZE	39-40
	4.6 Marketable surplus	
	4.7 DISPOSAL PATTERN	42
	SUMMARY, CONCLUSIONS AND SUGGESTIONS FOR THE FUTURE RESEARCH WORK	3-46
	5.1 SUMMARY AND CONCLUSIONS	43-44
	5.2 THE STUDY YIELDED FOLLOWING MAJOR FINDINGS	44-45

	5.3 SUGGESTION FOR FUTURE WORKS	46
	ABSTRACT	47-48
	REFERENCES	49-51
	APPENDICES (I TO II)	52-63

LIST OF TABLES

TABLE NO.	TITLE	PAGE NO.
3.1	NUMBER OF SELECTED HOUSEHOLDS UNDER DIFFERENT CATEGORIES OF FARMS	16
3.2	DISTRIBUTION OF HOLDINGS IN DISTRICT	18
3.3	POPULATION PROFILE OF DISTRICT	21
3.4	Land utilization pattern in Kanker district	22
3.5	Irrigation potential created in Kanker district	23
3.6	CROPPING PATTERN IN KANKER DISTRICT	24
3.7	Livestock population	25
4.1	DEMOGRAPHICAL CHARACTERISTICS OF SAMPLE HOUSEHOLDS	28-29
4.2	Average cropped and operational area of sample households	30
4.3	Source wise irrigated area of sampled households	31
4.4	Cropping pattern and cropping intensity of sample households	33
4.5	Compound growth rate of area, production and productivity of maize in Kanker district and Chhattisgarh state	34
4.6	Inputs/material, human labour and power use for cultivation of m	36
4.7	Costs and return of maize cultivation	37-38
4.8	Economics of maize cultivation under different farms size groups	39
4.9	Per hectare yield, value of output and costs of production quintal of maize	40
4.10	Marketable surplus of maize of sampled household	41
4.11	Disposal pattern of maize of sampled households	42
4.12	Constraints in production and marketing	43

LIST OF MAP

FIG. NO.	Title	PAGE NO.
3.1	Source of irrigation in Kanker district	22-23
I	Map of the Chhattisgarh in India	26-27
II	Map of the Kanker District	26-27
III	Map of block wise of Kanker district	26-27
4.1	Social groups of sampled households	29-30
4.2	Educational background of sampled households	29-30
4.3	Occupation of sampled households	29-30
4.4	Irrigated and non-irrigated area of sample households	30
4.5	Source wise irrigated area of sample farms	31
4.6	Cropping pattern at sampled farms	32-33
4.7	Growth rate of maize in Chhattisgarh state and Kanker district	34
4.8	Cost and return from maize at sampled farms	36-37
4.9	MARKETABLE SURPLUS AT SAMPLED FARMS	41

INTRODUCTION

CHAPTER-I

INTRODUCTION

1 Introduction

1.1 Introduction and justification:-

Maize is one of the most important cereal crops after rice. Maize has many assets for its wide distribution, its husk give protection from birds and rain can be harvested over a long period since it can be left dried in the field until harvesting is convenient, can be stored long, provide numerous useful food products and frequently preferred to sorghum and other millets. In fact it is a major source of starch. Corn starch (maize flour) is a major ingredient in home cooking and in many industrialized food products. Maize is also a major source of cooking oil (corn oil) and of maize gluten. Maize starch can be hydrolyzed and enzymatically treated to produce syrups, particularly high fructose corn syrup, a sweetener; and also fermented and distilled to produce grain alcohol. Grain alcohol from maize is traditionally the source of bourbon whiskey. Maize is sometimes used as the starch source for beer. It is also nutritive for adults of different ages. The green straw is suitable for making silage.

Maize is widely cultivated throughout the world, and a greater weight of maize is produced each year than any other grain. Worldwide production was 960 million tons²⁰¹³⁻¹⁴ more than rice (678 million tons) or wheat (691 million tons) (FICCI). In 2013, over 159 million hectares of maize were planted worldwide with a yield of over 5.5 t/ha. Maize is one of the most important cereals of the world. In terms of world area, India stands next to USA, Brazil, China and Mexico, whereas in production it ranks sixth (Wikipedia). Contributing to 2.4% of world production with almost 5% share in world harvested area. However, the country lags far behind in

productivity – 24.7 quintal/ha against world average of 51.4 quintal/ha. and there is a huge scope for improvement in yield by improving the adoption of hybrids, particularly in traditional maize growing regions. With the growing demand from feed and starch sector, the overall demand for maize is likely to grow at a brisk pace. India has a huge potential to increase its market share and to make its presence felt in the global maize market (Wikipedia).

In India, maize is grown in an area of 8.17 m. ha with a production around 19.33 m. tons and productivity 2414 kg/ha. It ranks next to rice, wheat, sorghum and pearl millet. It is the main staple food in hilly and sub mountain tracts of northern India and consumed all over the country as a fodder and grains. It is extensively grown in Uttar Pradesh, Rajasthan, Madhya Pradesh, Bihar and Karnataka. Largest area of maize is in Karnataka (1.3 m. ha.) followed by Rajasthan (1.1 m. ha.) while the production is highest in Karnataka (4.4 m. tons) followed by Andhra Pradesh (4 m. tons). Productivity is highest in Andhra Pradesh (5.3 t/ha) followed by Tamil Nadu (4.6 t/ha) and Karnataka (3.5 t/ha).

Considerable variation in grain yield is observed in the country depending upon the variety, fertilizer and rainfall pattern. Under irrigated conditions, averages yield of 4.4t/ha in the Indo-Gangatic plains are not uncommon. /in Peninsular India and at higher elevations, a mean yield of 5.0 to 7.0 t/ha has frequently been obtained. Under rainfed conditions with poor yielding varieties, grain yield ranges from 1.0 to 2.0 t/ha. There is sample scope for increasing the productivity. The genetic potential of present hybrids is 7.5 t/ha and the realizable potential is 5 t/ha in comparison to national average of 1.7 t/ha.

Maize in Chhattisgarh is one of major cereal crop as it contributes (102.70 area in thousand hectares which have production 177.82 thousand MT and productivity 1655 kg per hectare in kharif and 30.88 area in thousand hectares which

have production 50.18 thousand MT and productivity 162.49 kg per hectare in rabi) in the year 2012-2013(National conference on rabi and kharif campaign 2011-2012). In Chhattisgarh it is the second important crop after rice because of favorable climatic condition of maize in Chhattisgarh. In Chhattisgarh area, production and productivity was continuously increasing. People of this state uses maize in many purposes many people grow maize for commercial purpose some use to grow it for animal feedings and for personal consumption too. Maize in Chhattisgarh is generally grown in baadies (area behind the house). It is generally grown in all season but kharif is highly suitable for its cultivation in this state.

In Kanker district of Chhattisgarh, maize is preferred by the farmers after rice. There are many reasons that farmers of the Kanker district growing maize, firstly favorable climatic conditions for its cultivation and can be grown in all the seasons but the farmers mainly grow during rabi season. Some of the farmers also growing maize during kharif as well as summer. The area of maize in Kanker district is 10.20 thousand hectares and productivity is nearly 21 q/ha. The production of maize was 31.75 thousand tons during 2011-2012. Although area of maize and its production is continuously increasing in the past of the Kanker district. Therefore, the present study is being undertaken in the district of Kanker.

Maize is highly demandable by people of Chhattisgarh in all the season. Maize captured a very good market in Kanker district which shows that it has a vast scope in future in agriculture field as well as in marketing. Most of the produce are exported to other state from Kanker. It shows that there is good demand of maize from Chhattisgarh to other states too.

1.2 Objectives:

Looking to the view of importance of maize, the present study seeks to attempt the following specific objectives:

1. To estimate the growth rate of area, production and productivity of maize in Kanker district of Chhattisgarh.
2. To work out the costs and return of maize under sample farms of the study area.
3. To find out the marketable surplus and disposal pattern of maize of the sample farms.
4. To find out the constraints in production and marketing of maize and suggest suitable measures to overcome them.

1.3 Limitation:

The study has got following limitation:

1. Compound growth rate has been computed for major crops where more than one hundred hectare acreage has reported in a block.
2. Estimation of cost of inputs used for producing a crop has been made on purchase price prevailing in village in that period. Wage rate for human and bullock labour is also taken account on the basis of current village rate.
3. Prices of products have been included as average price of peak market season prevailing in adjusting market/mandi.

1.4 Setup:

Following Introduction, Review of literatures is presented in Chapter- II, Material and Methods are presented in Chapter-III,Chapter-IV, presented the Result and Discussion. The major outcomes and direction for future are suggested in the last chepter of Summery, Conclusions and Suggestion for Future Research Work.

REVIEW OF LITERATURE



CHEPTER- II

REVEIEW OF LITERARURES

In this chepter, an attempt has been made to review maize literature keeping in view the problem entitled. “An Economic Analysis of Production and Marketing of Maize in Bastar District of Chhattisgarh.” A brief account of the work reported by the past researchers has been discussed under the following heads:

1. Studies on growth rate of area, production and productivity of maize.
2. Marketing of maize crop.
3. Economics of maize crop.

2.1 Studies on growth rate of area, production and productivity of maize

Akhtar *et.al.* (2000) analyzed that maize being an important crop (cereal crop) in Bihar covers 14% of the national area and 15% of the total production having 700kg/ha of the average productivity (1950-98). They carried out in Bihar revealed that a good crop of maize can be taken during winter season. The average grain yield of some of the varieties increased from 35.2q/ha to 52.7q/ha during winter season.

Ofori *et.at.*(2000) found that due to warming and changing climate patterns, maize yield is going to be reduced especially among small holder maize farmers, who may lack the resources to cope with these situations. With the effect of climate change resulting in reduced rainfall amounts and increased soil and plant evapotranspiration, one important goal is to enhance drought resistance in maize and other cereal crops, which would greatly benefit regions with less favorable conditions for agriculture. Solutions must go beyond increasing production as

increasing the nutrient content of the maize is important as well. Also they revealed that breeding of high yielding; high nutrient varieties with limited water use could provide part of the answer. In the tropics and subtropics most maize is grown by small-scale farmers, generally for subsistence as part of agricultural systems that feature several crops and sometimes livestock production. The system often lacks inputs such as fertilizer, improved seed, irrigation and labour. Most of the maize-producing countries in the industrialized world employ labour. Most of the maize-producing countries in the industrialized world employ extensive inputs and highly mechanized crop production systems and hybrid maize seed is commonly used.

Singh (2000) analyzed that nearly $\frac{1}{2}$ of India's maize farmers have not yet adopted improved materials or management of practices. For them special efforts are to be made. Advanced biotechnology provides new avenues for attaining higher productivity levels, stability crop yields and reducing research lags.

Abdulla (2005) found that maize grain in Mozambique smallholder livelihoods showed that maize grain is actively produced in all regions of the country. A majority of rural households produce maize grain primarily for home consumption. This was explicitly shown with the concentration and levels of maize production. In all regions, between 50 and 77 percent of the production of maize grain is concentrated among household who produce but do not sell. The analysis also shows that maize sales are very concentrated. In all regions, between 71 and 77 percent of the volume of maize sales was accounted for by the top 25 percent of sellers, representing only 6 percent of all households in the Center and North, and only 1 percent in the South.

Azra parveen (2013) An attempt has been made to work out the growth rate in area, production and productivity of maize in Surguja district of Chhattisgarh. The

production performance of maize in overall period (2000-2010) was observed positive and significant growth in state of Chhattisgarh, Surguja district have also shows the positive growth rate of The area and production. On an average cost of cultivation per hectare of maize was found Rs. 18340.45 and cost of production per quintal was Rs. 328.46 of main product and Rs. 19.53 of by product. The value of output on an average was found to be Rs. 44352 for main product and Rs. 2549.5 for by product respectively. The yield of maize was observed 52.80 quintal of main product and 50.99 of by product, input-output ratio of maize was observed as 1:2.52.

Marketing of maize crop

Badal and Singh (2001) revealed that there were degree of concentration at the maize markets but there was greater degree of concentration in the wholesale retail than in the retail sub sector. Temporal price relationship showed that price spreads between months were commensurate with storage costs meaning thereby it was basically efficient. However intermarket price relationship showed monthly price differentials for in excess of transfer costs, due probably to certain characteristics of production and marketing making effective response to intermarket price differentials difficult.

Kushwaha and Adanu (2001) revealed that 40% of wholesalers-retailers handled 14.8% of total monthly sales volume, 30% handles 26% of total sales while 10% accounted for 28% of total sales. For retailers 47% of those with monthly sales 33% handled 36% of sales while 7% accounted for 15% of the total volume of monthly sales. Findings indicated maize markets with the wholesaler-retailer sub sector having a greater degree of concentration with a Ginni coefficient of 0.58 compared to that of retailers with a coefficients of 0.5

Babatunde and Oyatoye (2004) analyzed unequal distribution of marketing margin and efficiency across the state coupled with the marketing problems have led to a distorted food market in Kwara state. The distortion in food market resulted in food surplus in some areas and food scarcity in other areas leading to serious implication for the food security situation in the state. To eliminate this problem the construction of good road network and provision of basic market facilities such as secure stalls, storage, processing and packaging facilities required.

Kiran R.Joshi (2006) reported the community based farmers group sold their maize seed to different agrovets and agencies. 33% of the total cost included for seed sheller, drying, storage losses, grading and transportation cost is only Rs 1-1.50/kg for (Beni) market. The cost of maize seed was Rs 11.60/kg in Myagdi. Farmers are more demanding high yielding variety of maize seed. Community based maize seed production program should be implemented in inaccessible areas and minimum support price should be announced for maize seed/ grain growers before planting season.

Kataria,(2010) analysed the constraints in production and marketing of maize in Punjab. The present study was undertaken to examine constraints in the production and marketing of maize in Punjab. A representative sample of 300 maize growers was drawn from the three districts of Punjab by using multi-stage random sampling technique. The findings of the study revealed that the selected maize growers faced constraints as the maize crop specific technology adoption was concerned. The institutional, marketing and socio-economic constraints were found to be impediments in the production of maize. More specifically the sample farmers suffered on account of non-availability of credit, poor marketing facilities, lack of storage facilities, non-availability of seed suitable to the local needs, late sowing of crop etc. The detailed

analysis of the constraints impediment to production and marketing of maize reflect the urgent need for overhauling of the entire marketing system. This in turn helps in the allocation of resources to maize crop in the state like Punjab where groundwater is depleting very fast, needs to be diversified in favour of less water requiring crop like maize.

Navadkar, *et. al.* (2012) the present investigation was attempted to study the resource use structure, to estimate the cost of cultivation and to study the marketing of maize. In all, 90 farmers were selected from Karjat tahsil of Ahmednagar district in western Maharashtra. The data related to the Agricultural year 2008-09 was taken for the present study. The sample farmers were classified into three size groups of holdings i. e. small, medium and large. The Cobb-Douglas type of production function was used for functional analysis. The findings of the study showed that the male and female human labour utilization were 77.19 and 106.45 man days per hectare. The bullock labour utilization was 10.68 pair days. At the overall level, per hectare cost of cultivation of maize (i.e. Cost 'C') was worked out to Rs. 40624.50. The per hectare gross income received from maize was Rs. 42350.00, Rs. 43580.00 and Rs. 43320.00 in small, medium and large size groups, respectively, while it was worked out to Rs.43083.33 at the overall level. In the Channel-I, the marketing cost incurred during the selling of maize was worked out to Rs. 203.28 per quintal at the overall level. The major component of marketing cost was commission charges (50.66 per cent) which is followed by expenditure on packaging charges (25.27 per cent) and transport (19.68 per cent). In the Channel II, the marketing cost incurred during the sale of maize was worked out to Rs. 47.50. The major components of marketing cost were packing (84.63 per cent) and transportation charges (10.74%). The producer's share in consumer's rupee was 78.26 per cent and

73.19 per cent in Karjat and Ahmednagar market, respectively. In Channel I, the marketing efficiency of kharif maize in Ahmednagar market was 1.13 and in Kajat market was 1.11. As regards to the input use level, the inputs used for maize cultivation were far below the recommendations. The gap in the use of manures could be minimized if the maize growers under take the activities such as the practices of green manuring and vermi compost production. The estimates of the production functions indicated that, human labour, manures and nitrogen are the important resource variables responsible for increasing the yield. The use of these variables has to be carefully extended by the maize growers to increase the yield.

Economics of maize crop

Badal and Singh (2001) came to know that adoption of HYVs of maize may be influenced by several factors i.e. socio-economic problem, perception of farmers etc. According to them maize production can be increased by two ways firstly by adopting HYVs (hybrids+composites) and another by expanding of area of winter (Rabi) maize. Their research has shown a yield potential of 4-5 t/ha which is much higher than paddy and wheat. From the research they found that there existed a wide gap between yield levels of HYVs and local varieties of maize due to technology component.

Badal and Singh (2001) showed that if local varieties maize growers just shift from local variety of maize to cultivation of HYVs of maize they can increase their income by 30% of their existing income in kharif and in rabi maize 45% Development of maize based agro industries in the state would help better realize better price of maize to the farmers.

Nyoro,*et.al* (2004) concluded that the main reason for Kenyan's uncompetitiveness in maize is high costs. Mono-crop systems were found to be more

cost effective than intercropped maize. The study also found that those farmers who used more than one land preparation exhibited lower costs of production due to increased productivity. Variations in production cost within production technologies exceeded the variation in production costs across categories. This wide variation in production costs within production category most likely reflects differences in management practices and husbandly skills in the cultivation of maize. In addition, land rental rates are higher than in the neighboring countries, mainly due to speculation that the government will support maize prices in Kenya. Fertilizer application in mono-crop system resulted in higher yield; this was found not to be true in inte.

J.Anupama *et.al.*(2005) reported that the maize cultivation is generally considered less rewarding and therefore the profitability in maize cultivation has been compared with that of its competing crops, i.e. paddy and soybean, to find the true picture. The economics of cultivation of maize and its competing crops. The net return was found more (Rs 6371/ha) in the case of hybrid maize and lowest (Rs 1264/ha) in the traditional maize cultivars. It is clearly evident that net return from the hybrid maize cultivar was more even than that of soybean (Rs 5857/ha) and paddy (Rs4977/ha). However, the traditional and composite cultivars of maize had less net return than their competing crops. The output/input ratio was more in the case of paddy than hybrid maize, which may be due to the high cost of new seed for hybrid maize. In the case of traditional and composite cultivars, the output/input ratio was much lower as compared to that of the competing crops. However, hybrid maize may be preferred to paddy due to not only better returns but also less requirement of water as compared to its competitive crops.

rcropping systems. Decomposition of costs of production shows that the largest portion of costs small-scale farmers is labor, fertilizer and seed costs, while that of large-scale producers is land preparation because of high mechanization.

Cruz (2006) confirmed the hypothesis that South African comparative advantages is rooted in more developed financial market and storage infrastructure rather than costs of maize production. With a decline in real interest rates, results indicate that Mozambique and Tanzania would export maize to the other SA6. Intra-SA6 maize trade intensifies, with a simultaneous decline in trade with the rest of the world. A stochastic version of the model that accounts for year-to-year production variability among SA6 products results similar to the deterministic version.

Chaudhary and Jha (2006) found that maize + turmeric – moong sequence fetched the highest net return (Rs. 10044/ha) closely followed by maize arhar (Rs. 9180/ha) and maize-oat+pea (Rs. 8457/ha). The lowest monetary income was obtained from maize- gram (Rs. 2706/ha) sequence on account of poor-gram yield. This sequence also recorded the higher LUE (Land use Efficiency).

Jaipaul *et. al.* (2008) revealed that the treatment conducting residual farmyard manure & biofertilizers have higher yield and returns as compared to control. The higher yield under the treatment containing residual farmyard was an indication that farmyard applied to crop can significantly contribute to preceding crop. Treatment based on fertilizer recommended have higher yields & returns compared to other treatment. Though the B:C ratio values were not higher than yield target 1.0 tonnes/ha + residual farmyard manure + phosphobacteria + Azobactor treatment . B:C values were low due to low input .

Monlruzzaman, *et.al.*(2009) analyze the cost of production was calculated on total cost, variable cost, and cash cost basis. Variable cost included the cost of human labour, mechanical power, seed, manure, fertilizers, insecticides, irrigation, and machine charge. Human labour cost was the major (25%) among the total cost items. The average costs of maize production were Tk. 44197, Tk.24441 per hectare on total cost, variable cost, and cash cost basis, respectively.

Paudel, P. and Matsuoka, A. (2009) this study analyzes the cost efficiency of maize production in the Chitwan district of Nepal. A survey was conducted on 180 maize farmers representing 12 village development committees (VDCs) including one municipality of the district during 2004-2005. Among various factors, use of manure accounted for the highest share in the production cost followed by labour and tractor costs. The estimates of the parameters revealed that estimated coefficients of the cost of tractors, animal power, labour, fertilizer, manure, seed and maize output gave positive coefficients and were significant at the 5 per cent level. Also, the significant years of schooling of the household head and maize area in the inefficiency model revealed the positive impact of these factors on the cost efficiency of the farms. From the analysis of the scale effect among maize farms, it was revealed that the maize farms experienced an increasing return to scale, that is, the output increased more proportionately than the total production cost.

Onuk E. G.,*et.al.*(2010) analyze the returns on maize yield was 85,425/ha though yield were observed to vary from one farmer to another on the average, while the total variable cost (TVC) of the farmers was 51,481/ha. Gross margin observed was 33,946.82/ha. Fertilizer cost was for 22, 424/ha as part of the total variable cost and cost of agro-chemicals was for N19,242/ha. This implies that farmers in the study area used fertilizer and agro-chemicals intensively. The average rate of returns, which

is a measure of financial success or failure was 0.66. This signified that on average a gross margin of 66kobo was gained for every one naira invested in maize production in the study area.

Tahir and Habib (2012) conducted the study check the trend analysis of area and production for maize in Pakistan. The findings of the study are based on Maize area and production data during the years (1990 to 2011). Four Models of trend analysis were applied. The models were Linear Trend Model, Quadratic Trend Model, Exponential Trend model and S-curve Model. The most appropriate Model for trend analysis of the present study was Quadratic Trend Model. The data was taken from FOA statistics (2010) and Forcosting of the data was done up to 2017. The forecasted area of Maize in Pakistan would be 1031.07, 1034.23, 1036.94, 1039.19, 1040.98 and 1042.32 ha, and the forecasted production of Maize in Pakistan would be 4554.48, 4881.23, 52233.19, 5580.35, 5952.72 and 6340.29 thousands ton respectively for the years 2012, 2013, 2014, 2015, 2016 and 2017.

MATERIALS AND METHODS

CHEPTER- III

MATERIALS AND METHODS

The conceptual and analytical framework used in this study is presented in this chapter. Selection of the study area, method of selection of respondents, collection of data, analytical and profile of study area briefly discussed here.

3.1 Selection of study area

Chhattisgarh state consist three well known zones i.e. Chhattisgarh Plains, Northern hills and Bastar plateau. Out of these three zone namely Bastar plateau was undertaken on the basis of the maximum production of maize than that of other zones of Chhattisgarh. Kanker districts of Bastar plateau have also noticed the higher production of maize than other districts of Baster plateau. Out of seven blocks of Kanker district of Chhattisgarh, Durgkondal and Koailibeda were selected purposively as it represents the similar agro-economic condition of Baster plateau. From Durgkondal block, three villages namely Surangdoh, Kodogaon and Karaki and from koailibeda block three villages namely Donde, Ravindranagar and Satyanandpur were selected randomly.

3.2 Selection of the respondents (Maize growers)

Out of 679 farm families of the sample villages among then 498 were maize growers. Nearly 10 percent maize growers respondents (i.e. 120 farmers) were randomly selected subject to condition that at least 20 respondents should be included in sample from each of the four categories of farms i.e. Marginal (up to 1 ha.), small (>1-2 ha.), medium (>2-4 ha.) and large farmers (above 4 ha.) (table 3.1)

Table 3.1 Number of selected households under different categories of Farms

Particulars	Number of total households	Number of maize growers	Number of selected households
Marginal	193	116	54
Small	245	225	36
Medium	177	123	20
Large	64	34	10
Total	679	498	120

Source: Agricultural block office and Directorate of Research Services, IGKV
Raipur, C.G

3.3 Method of enquiry and collection of data:

For representation of the objectives of study both primary and secondary data were required. The primary data were collected with personal interview method on various objectives of the study. The well design questionnaire or schedule was prepared to covers all the relev out aspects to work out the costs and return of maize cultivation disposal pattern of maize and their marketable surplus; and constraints prevailed in the production of marketing of maize.

In order to compute the growth rate of area, production and productivity of maize of the sample district as well as of the state were collected for the period 2003-04 to 2012-13 from the official records of the office of Deputy Director of Agriculture Kanker.

3.4 Analytical tools:

To work out the status of maize in Kanker district a compound growth rate was computed of area production and productivity of maize for the year 2003-04 to 2012-13. To work out the cost of cultivation the standard method was

applied. To compute the marketable surplus and disposal pattern of maize a simple average and percentage were used.

3.4.1 Compound Growth Rate

The Compound growth rates of area, production and productivity of maize were estimated with the use of following econometric model:

$$Y = AB^t$$

The computed form of the model as under

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

Where,

Y= Area/ production /productivity

A= Constant

B= Regression coefficient

t= time in year

3.4.2 Marketable surplus

In the mathematical equation was used to calculate the marketable surplus and their disposal, which is given below:

$$MS = P - (C + Cf + W + S)$$

Where,

MS – Marketable Surplus

P – Total Production

C – Family Consumption

Cf – Quantity used for cattle feed

W- Quantity use for Wage

S- Quantity kept for seed

3.5 Profile of the study area:

It is essential to understand the status of the study area, so a profile study was carried out on the aspects of study area, description of the state sample distinct, distribution of land holding, topography, soil, climate and rainfall, population distribution, land use pattern, source of irrigation cropping pattern and livestock population.

3.5.1 Discription of the state sample district

Total geographical area of Chhattisgarh is 135195 sq.km. and situated to 17°43' to 24°5' north latitude and 80°15' to 84°20' east longitude. The Chhattisgarh state can be devided in to three district zones i.e., Chhattisgarh plains, Northern hills and Baster plateau. The sample district is Kanker which situated at 20.6-20.24 longitude and 80.48-81.48 latitude. The district is spread in 6443.25 sq km.

3.6.2 Distribution of land holding

The distribution of land holdings according to size falling in each category is given in Table3.2. It reveals that medium farm size was holding 68.02 percent area and it was found to be that maximum followed by small (68.02 Percent), medium, (22.28 Percent) marginal, (8.75 Percent) and large (0.95 percent). Thus, it can be interview that large farmers holding small portion of the land. This finding is contradict farm finding of that large farmers holding major portion of as compared to the other farm size groups.

Table 3.2 Distribution of holdings in district

S.No.	Size of holdings (ha)	Area(ha)	Percent
1	Marginal (up to 1 ha)	49292.37	8.75
2	Small(1-2ha)	125549.77	22.28
3	Medium(2-4ha)	383283.15	68.02
4	Large(above4ha)	5345.13	0.95
	Total	563470.42	100.00

Source: Agricultural block office and Directorate of Research Services, IGKV Raipur, C.G.

3.5.3 Topography

The physical area of Kanker district is heterogeneous and a mix of plains and undulating hills. Most of the land is in between 300 to 600 meters above at sea level and about 80% area of land of the district is plains. These can be divided into two parts-Mahanadi plane and Kotri Plain.

The North east part of Kanker comes under Mahanadi plain. The most part of this plain lie at a height of less than 500 meters above at sea level. The main river of this area is Mahanadi. Hatkul, Chinar, Doodh, Sendoor, Nakti, and Toori are the other rivers of the area. The Kotri plain comes under Bhanupratappur area. The most part of this plain lie at a height of less than 400 meters above sea level. Korti and Valler are the main rivers of this area. The topography of Kanker district is also dotted with multitude of ancient hill regions. These can be divided into the following three groups:

A. Vindhya Hill Group: These hill groups are spread in the south eastern part of Kanker district, where the soil constitutes of six phases of quartile and sand.

B. Archian Hill Groups: 95% of the area of Kanker is covered by Archian Hill Group. In this area Granite and Kneiss rocks are spread over almost all the geographical area of the district.

C. Dharwar Hill Group: This hill group is very crude and broken in shape and form. These hills are spread all over the northern region of the district in the areas close to Sambalpur and Bhanupratappur.

3.5.4 Soil:

The origin of soil in Kanker is from Granite, Kneiss sand and Khedar. Most of the area is covered with red soil. In the higher region of the hilly tract faint colour soil is found while in the river valleys smooth and fertile soil is found. Soil of this district can be divided into four types.

A. Kanhar: This type of soil is black in color and oilish. The capacity of water absorption in this soil is greater and this is very useful in growth of Kharif and Rabi crops in the region. This type of soil is found in the plane of Kotri and Mahanadi regions.

B. Dorsa: This type of soil is medium in nature and it is very much similar to Matasi and Kanhar type soil. This type of soil is found in north east Kanker and Bhanupratappur region.

C. Matasi: This type of soil is found at elevation higher than Kanhar and less than Bhata. This soil is appropriate for rice crop. This type of soil is found in the most of the area of Kanker region.

D. Bhata: Bhata is affected with late rating process and is found in red, yellow colour with mixed shape and condition. This soil is found in uplands of the area. This is appropriate for the cultivation of crops like Kodo, Kulthi, Maize and Kutki.

3.5.5 Climate and rainfall

The climate of the district is of predominantly a “Monsoon type”. The May month is the hottest month and the December month is the coolest month. Annual average rain of the district is 1492 mm, 90% of which fall during the period of June to October. The average annual rainfall over last six years shows that it is highly fluctuating.

Within the district, the Kanker and Charama blocks have a predominantly dry climate, whereas that of Bhanupratappur is of the wet type.

3.5.6 Population distribution

The population of the Kanker district was 6.52 lakh (2001 census) out of which 95.18 percent is rural population and only a 4.82 percent is urban population. The density of population per sq.k.m. is 100.

The decadal growth rate of population of Kanker was 16.84. The total population consists of scheduled caste and scheduled tribe and their percentage was 4.25 and 56.08 percent respectively (Table 3.3)

Table 3.3 Population profile of District

S.NO.	Particulars	Kanker district
1.	Total Population	650,934
	a. Male	324636
	b. Female	326298
	c. Total	650,934
	d. Urban	619549
	e. Rural	313885
2.	Percentage of Urban population to Total population (%)	4.84
3.	Percentage of Rural population to Total population (%)	95.18
4.	Population density per sq. km.	100
5.	Decennial Growth Rate percentage (2001 -20010)	16.88
6.	Percentage of District population to State population	3.12
7.	No. of Literates 2010 (`000 Nos)	
	a. Male	1.04
	b. Female	1.03
8.	Literacy Rates (%)	72.90
	a. Male	82.72
	b. Female	63.25
	c. Total	72.90
9.	Urban literacy rate(%)	85.30
10.	Rural literacy rate(%)	72.28
11.	Schedule Cast population as percentage to total population	4.34
	a. Male	13497
	b. Female	14166
	c. Total	27663
12.	Schedule Tribes population as percentage to total population	56.07
	a. Male	180825
	b. Female	184206
	c. Total	365031
13.	Agricultural labour (%)	24.0
	Total worker (%)	
	Sex Ratio (female / 1000)	1005
	a. Rural	1006
	b. Urban	1010
14	Rainfall (average)	1178.8

Source: Jila sankhyaki Pustika, district head office, statistics Department of Kanker.

3.6.7 Land use pattern

The district having 21.3 percent area under forest., the district has 4.64 percent land not available for cultivation and 4.60 percent under fallow land of the total geographical area of the district. The net and gross cropped area is about 33.28 percent and 33.30 percent respectively of the total geographical area of the district. The cropping intensity is 105.84 percent respectively

Table 3.4: Land utilization pattern in Kanker district

(in ha.)

S.NO	Particulars	Area (hac.)	Percentage of total area
1.	Total geographical area	643374	100.00
2.	Area under forest	137033	21.3
3.	Land under non- agriculture use	29855	4.64
4.	Barren and uncultivated land	19406	3.03
5.	Permanent pasture and grazing land	46221	7.18
6.	Cultivable waste land	24148	3.75
7.	Fallow land (old fallow + current fallow)	27588	4.60
8.	Net cropped area	214122	33.28
9.	Gross cropped area	226634	33.3
10	Double cropped area	12512	35.22
11.	Cropping intensity(%)		105.84
12	Irrigated area	15216	7.11

Source: Agricultural block office of Koilibeda and village Patwari and Directorate of Research services, IGKV, Raipur(C.G.)

3.5.8 Source of Irrigation:

The irrigation scenario of Kanker district is the shown in table 3.4. The table indicates that the kanker district is rain fed-cropping agriculture and their gross irrigated area is only 24925 percent of the total shown area and 33.28 percent of the net area shown comes under the net irrigated area. The major source of irrigation is canals and pond with 28.52 and 11.72 percent, respectively.

Table 3.5: Irrigation potential created in Kanker districts.

S.NO.	Particulars	Number	Irrigated Area (hac.)
1	Canal	17	7109 (28.52)
2	Tube-Well	5256	548 (2.19)
3	Well	3237	605 (2.42)
4	Pond	649	2922 (11.72)
5	Other Sources	-	8805 (35.32)
	Total	9159	24925 (100.00)

Sources: Agricultural block office, village Patwari and Directorate of Research Services, IGKV, Raipur (C.G.)

3.7 Cropping pattern of Kanker district :

Maize and paddy are the major crops of the state with yield of 1730 and 1376.50 kg/ha which is less than the National average of respective crops. Though the productivity level of all food grains in the state is lower than the National average, but the total production of food grains in the state is more than the State's requirement. Other major crops include jwar,.kodo/kutki,ragi, arhar, mung, urd, kulthi, graoundnut, soyabean, till, ramtill, soyabean and arandi also grown in some part of the state.

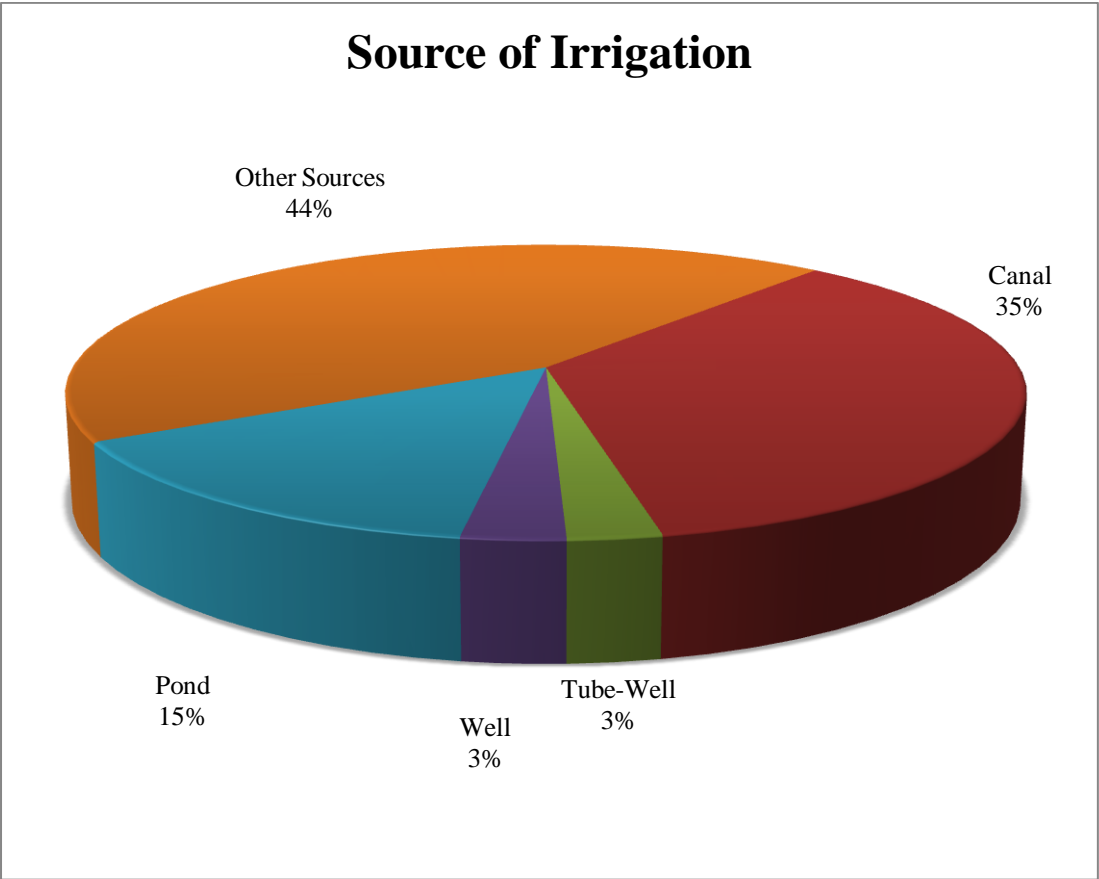


Fig: 3.1 Suorce of irrigation in Kanker district

Table 3.7 Cropping pattern of Kanker district**(in ha)**

S.N.	Major Crop	Area (in hectare)	Production	Productivity
1.	Paddy	168.542	210.39	1376.50
2.	Jwar	0.228	-	-
3.	Maize	11.034	19.09	1730.00
4.	Kodo/kutki/Ragi	5.460	1.35	248.00
	Total serial crop	185.264	231.03	-
5.	Arhar	2.512	3.23	1285.00
6.	Mung	6.098	3.79	621.00
7.	Urd	10.012	5.66	565.00
8.	Kulthi	6.741	2.86	425.00
	Total pulse crop	25.363	15.54	-
9.	Ground nut	0.054	0.07	1315.00
10.	Soyabean	0.040	0.05	1200.00
11.	Til	3.804	1.22	321.00
12.	Ram til	5.527	1.71	310.00
13.	Sunflower	0.010	0.01	1225.00
14.	Arandi	0.090	0.02	215.00
	Total oil crop	9.525	3.08	-
15.	Fruit & Vegetable	10.038	3.36	335.00
	Grand Total	230.190	253.01	-

Source: District statistical booklet (2006), District planning and statistical office, Kanker(C.G.)

3.7 Livestock Population

The livestock population in the Kanker district is presented in table 3.7. It reveals that population of cows and bullocks have contributed 9.73 and 20.09 per cent to total population of livestock and found to be the maximum then that of the other animal population.

Table 3.7: Livestock population

S.No.	Particulars	Kanker	Percent
	Livestock		
1.	Cattle above three years		
	a. Bullock	155253.00	20.09
	b. Cow	75195.00	9.73
	c. He Buffalo	34540.00	4.47
	d. She Buffalo	8386.00	1.08
2.	Cattle up to the age of three Years	42271.00	5.47
3.	Total cattle	273781.00	35.43
4.	Sheep	2715.00	0.35
5.	Goat	137433.00	17.78
6.	Pig	42997.00	5.56
	Total Livestock	772571.00	100.0
	Poultry		
1	Hens	288686	96.50
2	Ducks	10450	3.50
	Total	299136	100.00

Note: Figures in parentheses indicate percentage to total.

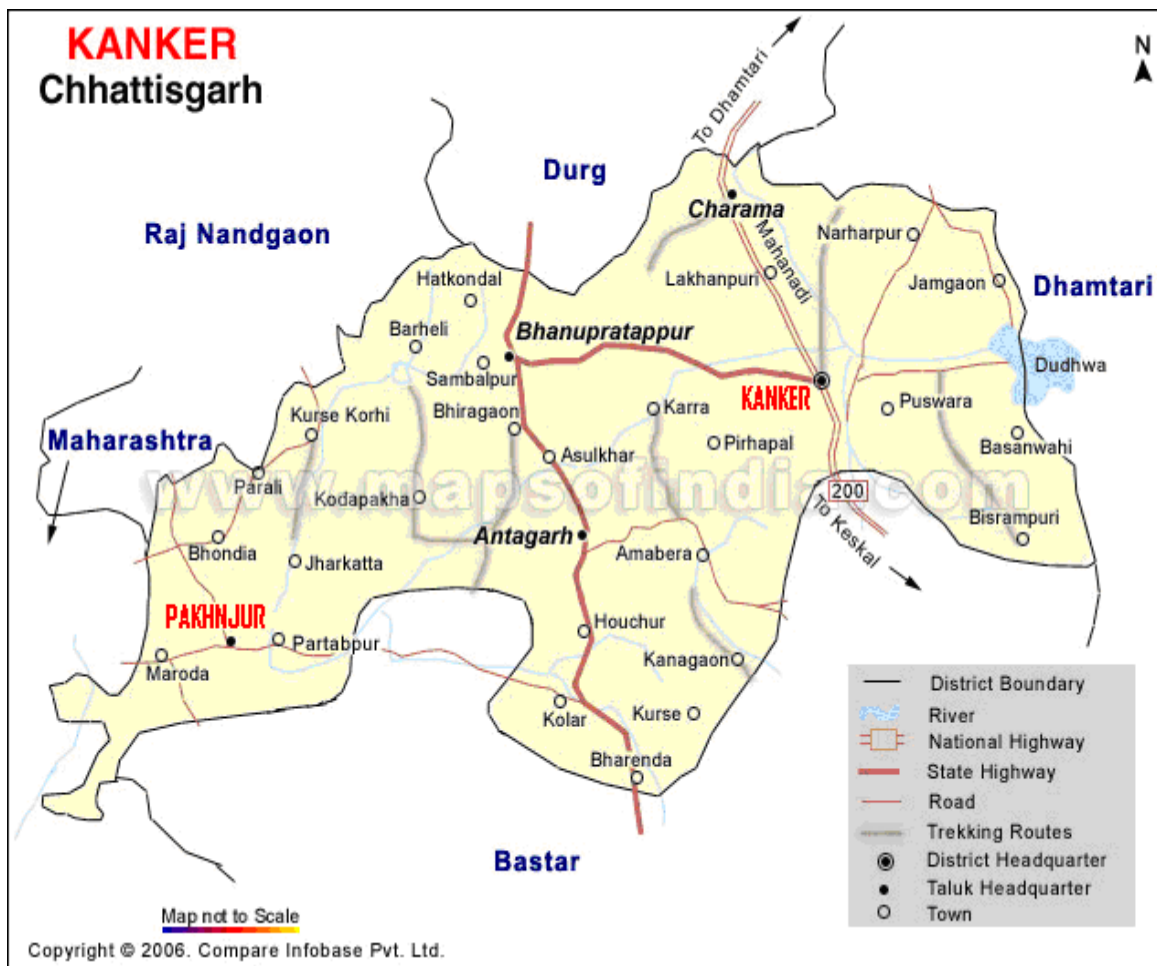
Source: District statistical booklet (2006), District planning and statistical office,
Kanker(C.G.)

3.8.Limitation of the study

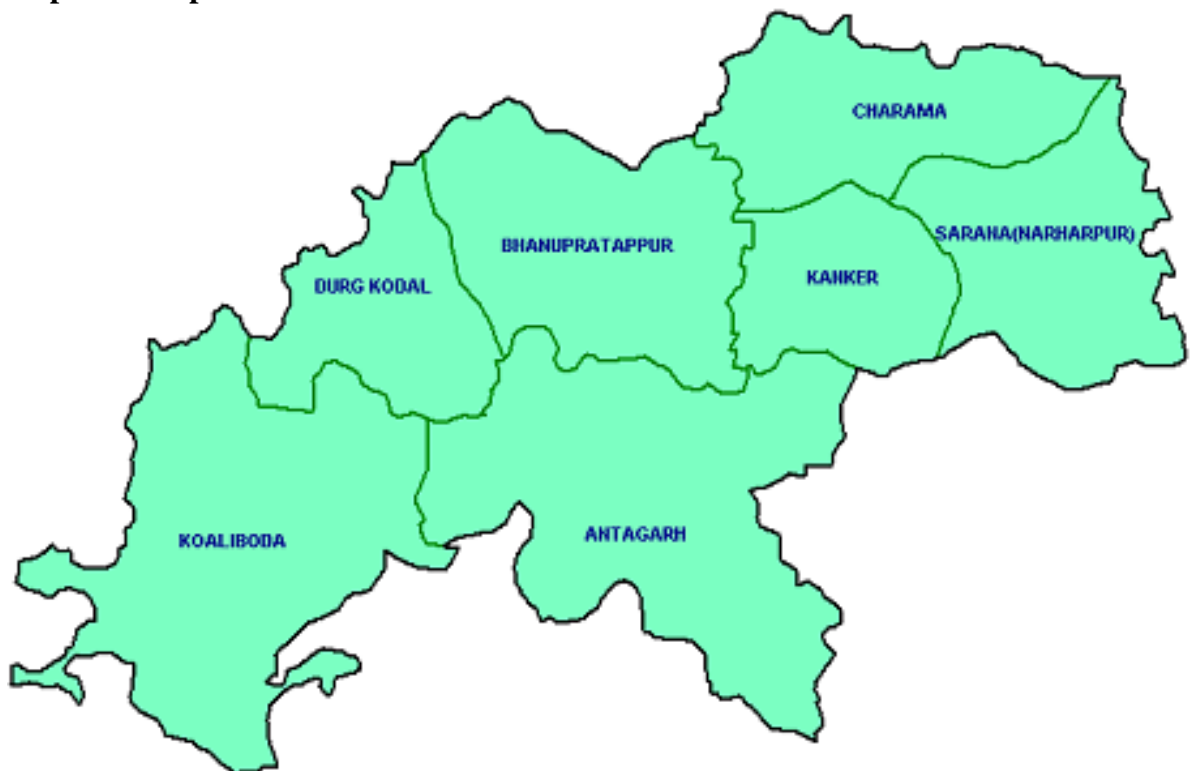
During the course of investigation several difficulties were faced in the collection of data from cultivators. The cultivators generally did not maintain any farm record and supply data on the basis of their memory, which may not be very correct. The illiteracy and traditional culture of the farmers also added to this problem. Some of the farmers did not co-operate in giving data because of some misunderstanding regarding agricultural taxes, ceiling etc. They were biased in giving data toward higher side for the investment and lower side towards productivity. However, sufficient care was taken to collect data by cross checking with the educated neighboring farmers and the other village leaders, Gram Panchayat Sarpanch etc.



Map -I : Map of Chhattisgarh and India



Map –II : Map of Kanker District



Map- III: Map of block wise of Kanker district

RESULTS AND DISCUSSION

CHAPTER-IV

RESULTS AND DISCUSSION

This chapter deals useful finding results with respective to the objectives framed for the study. The present chapter is broadly discussed on the following sub heads:

- 4.1 General characteristics of sample households,
- 4.2 Growth rate of area, production and productivity of maize in study area,
- 4.3 The costs and return of maize under sample farms of the study area,
- 4.4 Marketable surplus and disposal pattern of maize of the sample farms,
- 4.5 Constraints in production and marketing of maize and suggest suitable measures to overcome them.

4.1 General Characteristics of Sample Households

4.1.1 Demographical characteristics of sample households:

The demographical characteristics of the sample households are presented in Table 4.1. It reveals that average family size of sample farmers was found to be 5.56, irrespective to the farm size it varied from 5 to 8 members in a family across the farm size of respondents belong to schedule tribe which was noticed to be nearly 55 per cent. Most of the respondents were registered to be 18-60 years of age group and noticed to be nearly 78.41 per cent. The percentage of literacy was comparatively higher than the state and noticed to be 74.66 percent.

Table 4.1 Demographical characteristics of sample households

S. No	Particulars	Farm Size				Total
		Marginal	Small	Medium	Large	
1.	No. of sample households	54	36	20	10	120
2.	No. of family member	270 (100.0)	174 (100.0)	154 (100.0)	69 (100.0)	667 (100.0)
	Male	141 (52.22)	89 (51.15)	88 (57.14)	39 (56.52)	357 (53.53)
	Female	129 (47.78)	85 (48.85)	66 (42.86)	30 (43.48)	310 (46.47)
	Average family size	5.00	4.83	7.70	6.90	5.56
3.	No. of sample households by caste					
	a) Schedule tribe	34 (62.96)	16 (44.44)	9 (45.00)	7 (70.00)	66 (55.00)
	b) Schedule cast	00 (00.00)	00 (00.00)	00 (00.00)	2 (20.00)	2 (1.67)
	c) Other backward caste	2 (3.71)	2 (5.56)	2 (10.00)	1 (10.00)	7 (5.83)
	d) General	18 (33.33)	18 (50.00)	9 (45.00)	00 (00.00)	45 (37.50)
	Total	54 (100.0)	36 (100.0)	20 (100.0)	10 (100.0)	120 (100.0)
4.	Age of family members					
	a) Up to 18 years	59 (21.85)	21 (12.07)	24 (15.58)	9 (13.04)	186 (27.88)
	b) 18-60	168 (62.22)	140 (80.46)	113 (73.38)	52 (73.36)	523 (78.41)
	c) Above 60 years	43 (15.93)	13 (7.47)	15 (9.74)	8 (11.59)	104 (15.59)
	Total	270 (100.00)	174 (100.00)	154 (100.00)	69 (100.00)	667 (100.00)
5.	Education					

a) Illiterate	69 (25.55)	47 (27.01)	40 (25.97)	13 (18.84)	169 (25.33)
b) Primary	58 (21.48)	31 (17.81)	41 (26.62)	15 (21.73)	145 (21.73)
c) Middle	77 (28.52)	49 (28.16)	35 (22.72)	11 (15.94)	172 (25.78)
d) High school & higher secondary	45 (16.67)	31 (17.81)	32 (20.77)	19 (27.53)	127 (19.04)
e) Above Higher secondary school	21 (7.78)	14 (8.04)	7 (4.54)	11 (15.94)	54 (8.09)
Literacy (%)	74.44	71.83	74.67	81.15	74.66
6. Occupation of working force	202 (74.81)	135 (77.58)	43 (27.92)	39 (56.52)	419 (62.81)
a) Agriculture	199 (98.51)	130 (96.29)	36 (83.72)	27 (69.23)	392 (93.55)
b) Business	00 (00.00)	3 (2.22)	3 (6.97)	5 (12.82)	11 (2.62)
c) Sarvice	3 (1.48)	2 (1.48)	4 (9.30)	7 (17.94)	16 (3.81)
Non-working force	68 (25.19)	39 (28.88)	111 (2.58)	30 (76.92)	248 (59.18)

Note: Figures in the parenthese indicate percentages to the total.

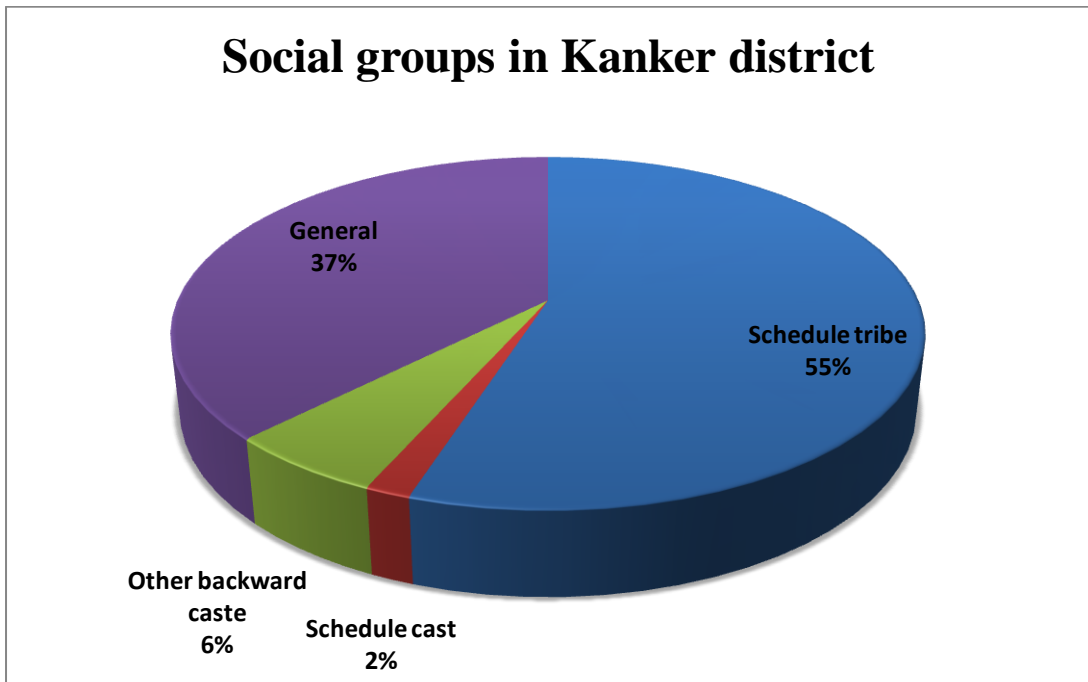


Fig: 4.1 Social groups in Kanker district

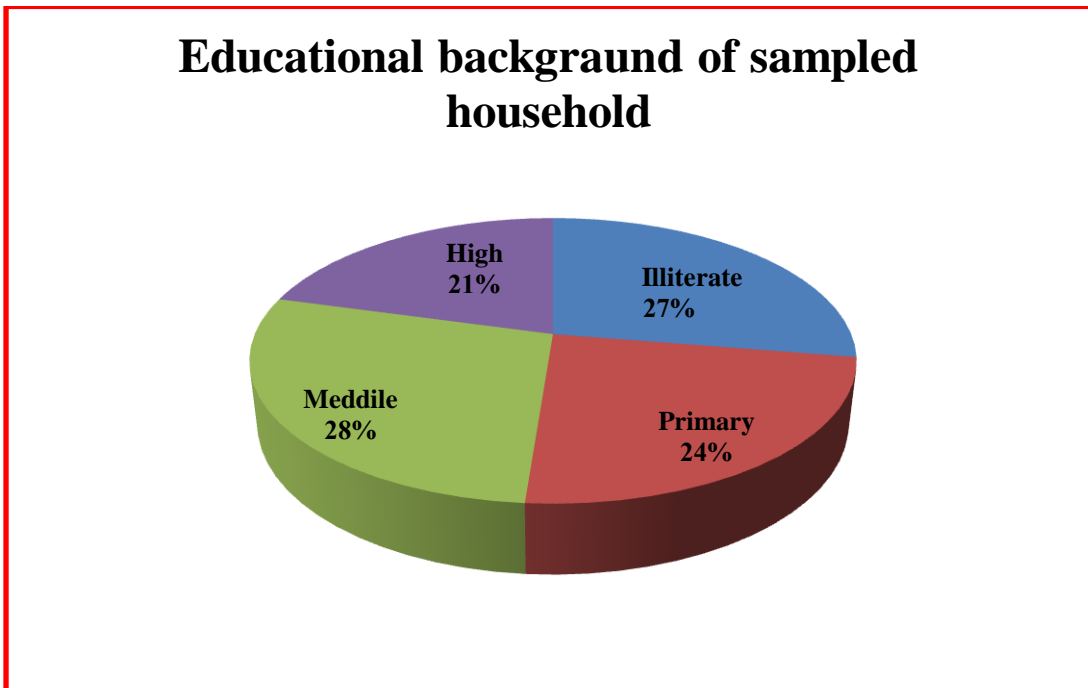
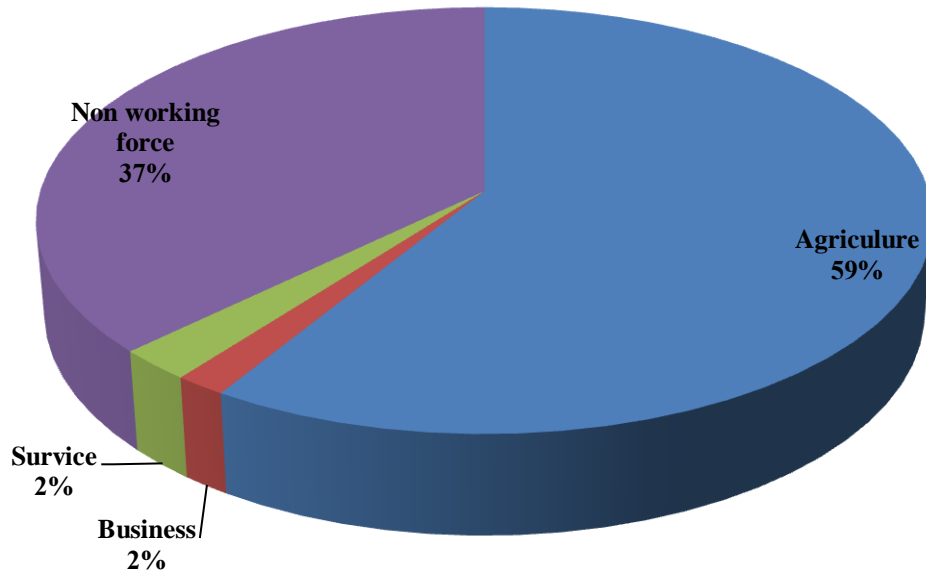


Fig: 4.2 Educational background of sampled household

Occupation of sampled household in Kanker district



Fig; 4.3 Occupation of sample household in Kanker district

4.1.1 Average cropped and operated area at sample farms:

The operated area is estimated by owned area plus lease in and subtracted the lease out area of sample farms. The average cropped area has actual owned area without lease out and is given in Table 4.2. It reveals that average farm size of sample farms was 0.81, 1.62, 2.70 and 6.82 hectares for marginal, small, medium and large farms, respectively. The operated area was found to be 0.76, 1.56, 2.62 and 6.37 hectares under respective farms under study. The area under irrigation was observed 47.99 percent and remaining area (52.01 percent) was observed unirrigated in the Kanker district. Out of the total cropped area, maize occupied the maximum area under marginal farms 93.83 per cent followed by small farms 96.30 medium farms 97.04 and large farms 93.40, respectively. It is important to note that maize was cultivated and manage by small and medium farms instead of large and medium farms.

Table 4.3 Average cropped and operated area of sample households

(ha/farm)

S. NO.	Particular	Farm size				
		Marginal	Small	Medium	Large	Overall
1	Owned land	0.81	1.62	2.7	6.82	2.98
2	Land for agriculture use	0.76 (93.83)	1.56 (96.30)	2.62 (97.04)	6.37 (93.40)	2.82 (94.63)
3	Land for non-agriculture use	0.05 (6.17)	0.06 (3.70)	0.08 (2.96)	0.45 (6.60)	0.16 (5.37)
	Total cultivated area	0.76	1.56	2.62	6.37	2.82
4	Irrigated area	0.37 (33.00)	0.675 (41.66)	0.78 (49.63)	3.29 (48.24)	1.43 (47.99)
5	Un-irrigated area	0.39 (67.00)	0.925 (58.34)	1.36 (50.37)	3.08 (51.76)	1.55 (52.01)

Note: Figers in the parenthes indicate percentages to the total.

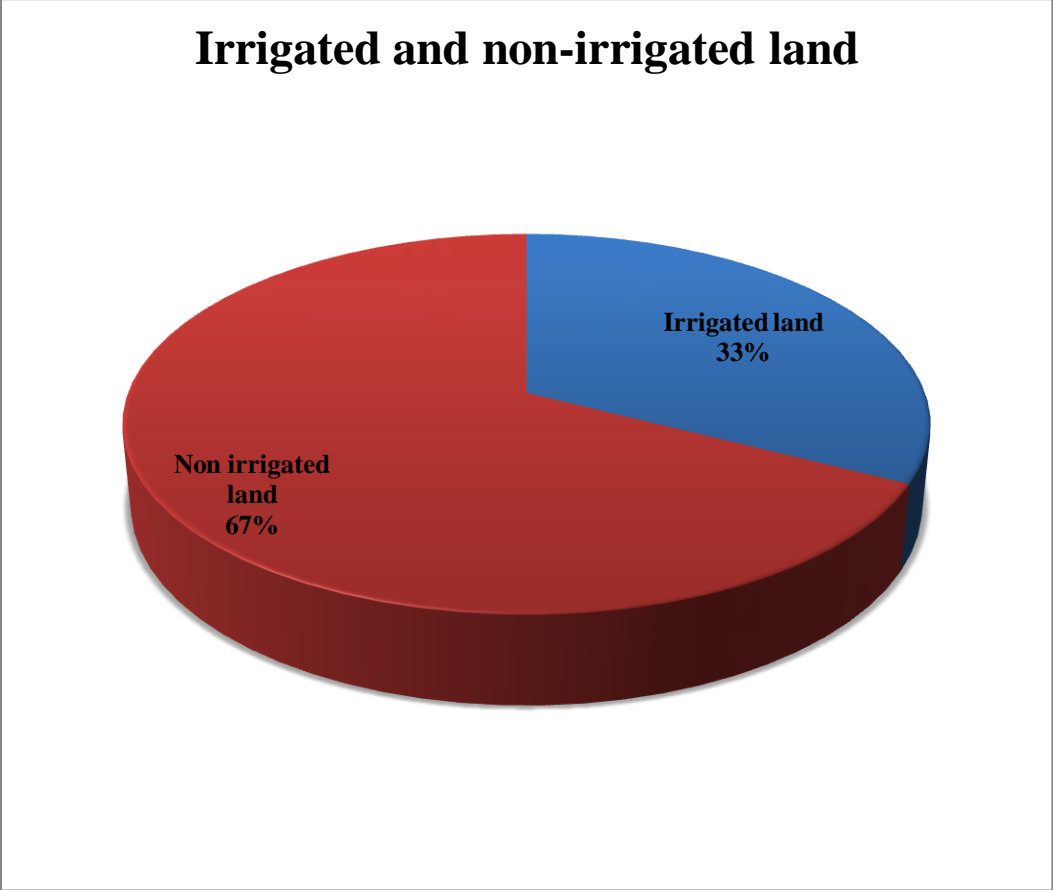


Fig:4.4 Irrigated and non-irrigated land of Kanker district

4.1.2 Irrigated area by irrigation different source:

Maize is cultivated under assured irrigation especially in rabi season, it is therefore, important to understand the percentage area of sample farm under assured irrigation sources. Table 4.3 reveals that canal was the main source of irrigation to maize and shared the more than 27.87 percent irrigation to the irrigated area on overall basis. Few farmers having tube-well irrigation source (31.23 percent) due to their field are situated nearer to river found 25.08 percent area under irrigation of Kanker district.

Table 4.3 Source wise irrigated area of sampled households (ha/farm)

S. No.	Particular	Farm size of holdings				Overall
		Marginal	Small	Medium	Large	
1	Tank	0.02 (5.41)	0.06 (8.96)	0.06 (7.69)	0.3 (13.10)	0.06 (9.01)
2	Canal	0.21 (56.76)	0.23 (34.33)	0.06 (7.69)	0.22 (9.61)	0.19 (27.870)
3	Tube-well	0.1 (27.027)	0.15 (22.38)	0.06 (7.69)	1.38 (60.26)	0.22 (31.23)
4	River	0.01 (2.70)	0.18 (26.87)	0.54 (69.23)	0.29 (12.66)	0.17 (25.08)
5	Well	0.03 (8.11)	0.05 (7.46)	0.06 (7.69)	0.1 (4.37)	0.05 (6.80)
	Total irrigated area	0.37 (100.00)	0.67 (100.00)	0.78 (100.00)	2.29 (100.00)	0.69 (100.00)

Note: Figures in parentheses show their per cent of total irrigated area.

Source wise irrigated area of Kanker District

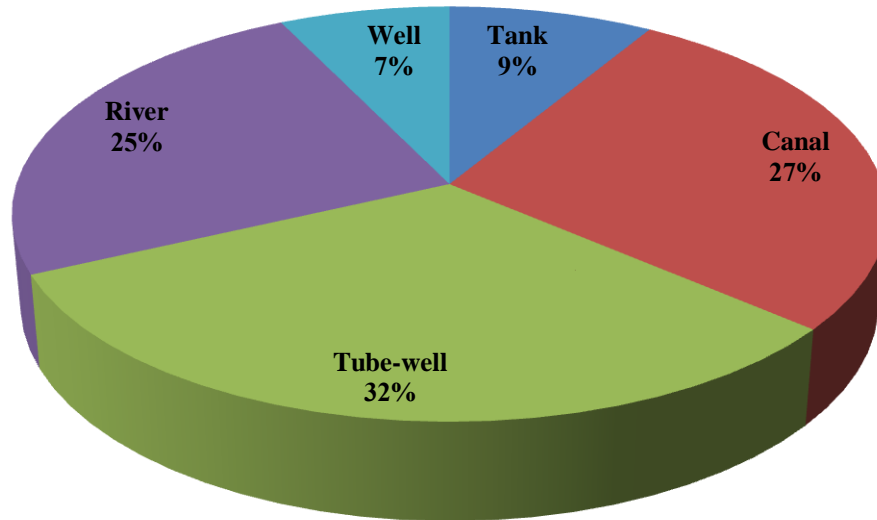


Fig 4.5 Source wise irrigated area of Kanker district

4.1.3 Cropping pattern at sample farms:

Cropping pattern of the sample households of different farm size groups is given in the Table 4.4. It can be seen from the table that paddy occupied highest area being 64.17 percent to total cropped area. As regards different size groups, the area under remunerative crops showed an increasing trend with the increase in the size of farms because of the fact that large farmers were putting more area under rabi crops like vegetables. The average cropping intensity in the study area was observed to as 132.53 percent. It is interesting to see that the average cropping intensity was higher for medium farms as compared to others farms. Cropping intensity is an important economic indicator to measure the efficiency of a farm. The cropping intensity can be increased if additional irrigation facilities are created in the sampled villages. Since the study area quite high rainfall, rainwater management provides potential opportunities; watershed and small tanks work may be under taken to utilize the rainwater.

Table 4.4: Cropping pattern and cropping intensity of sample households**(ha/farm)**

S. No.	Crops	Marginal	Small	Medium	Large	Overall
A.	Kharif					
1	Paddy	0.42 (55.26)	1.14 (73.08)	1.59 (60.46)	3.23 (65.92)	1.54 (64.17)
2	Maize	0.10 (13.16)	0.11 (7.05)	0.55 (20.91)	0.89 (18.16)	90.39 (14.69)
3	Urd	0.06 (7.89)	0.09 (5.77)	0.15 (5.70)	0.25 (5.10)	0.11 (6.01)
4	Til	0.07 (9.21)	0.08 (5.13)	0.14 (5.32)	0.23 (4.69)	00.09 (5.90)
5	Ragi	0.06 (7.89)	0.07 (4.49)	0.09 (3.42)	0.11 (2.24)	0.08 (4.35)
6	Vegetables	0.05 (6.58)	0.07 (4.49)	0.11 (4.18)	0.19 (3.88)	0.11 (4.68)
	Sub total	0.76 (100.00)	1.56 (100.00)	2.63 (100.00)	4.90 (100.00)	2.24 (100.00)
B	Rabi					
1	Maize	0.53 (94.64)	0.9 (91.84)	1.11 (92.50)	1.58 (91.86)	1.03 (92.72)
2	Vegetables	0.03 (5.36)	0.08 (8.16)	0.09 (7.50)	0.14 (8.14)	0.09 (7.21)
	sub total	0.56 (100.00)	0.98 (100.00)	1.20 (100.00)	1.72 (100.00)	1.12 (100.00)
	Summer					
1	Vegetables	0.03 (100.00)	0.08 (100.00)	0.1 (100.00)	0.07 (100.00)	0.05 (100.00)
	Sub total	0.03 (100.00)	0.08 (100.00)	0.1 (100.00)	0.07 (100.00)	0.05 (100.00)
D	Gross Cropped area (A+B+C)	1.34	2.62	3.93	6.69	3.26
E	Net cultivated area	0.76	1.56	2.63	4.90	2.46
F	Cropping intensity	176.32	167.95	149.43	136.53	132.53

Note: Figers in the parentheses indicate percentage to the total cropped area.

Cropping pattern at sampled farms in Kanker district

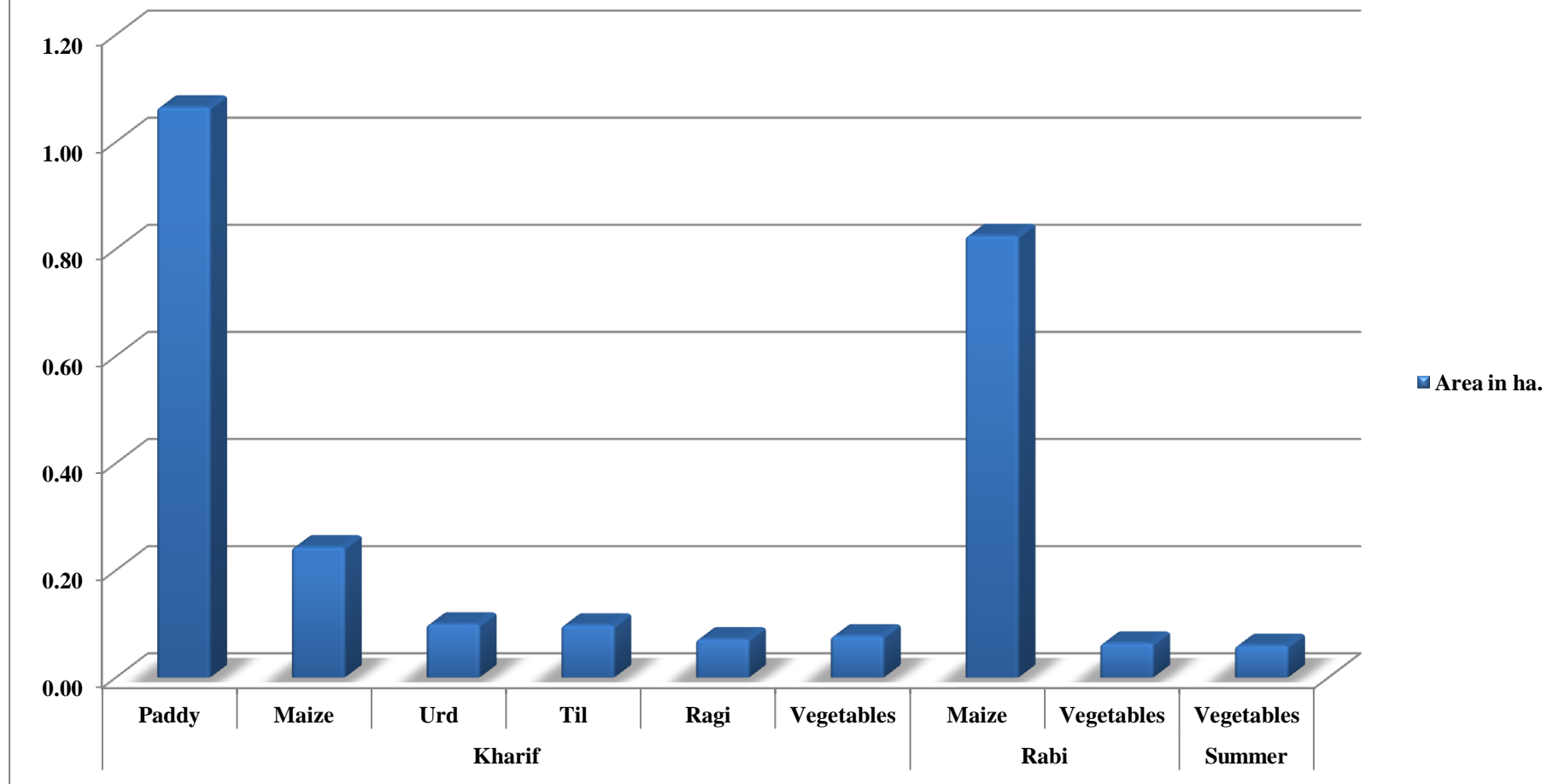


Fig 4.6 Cropping pattern at sampled farms in Kanker district

4.2 Growth rate in Area, Production and Productivity of Maize

The detail insight picture of maize was understood through estimation of compound growth rate of area, production and productivity of maize over the period of 2003-04 and 2012-13, which is presented in Table 4.5. The significant growth of area, production and productivity of maize was observed in Chhattisgarh state as well as in sample district Kanker during the period of study. It was found to be 0.029 and 0.004 per cent growth in area of maize in the State and Kanker district in year 2002-03 to year 2012-13, which was significant at 1 percent and significant at 5 percent probability level. However, significant growth in production was 0.05 and 0.017 per cent for the state and Kanker district, respectively. While productivity was found 0.081 and 0.013 percent of the state and Kanker district respectively.

Table 4.5 Compound growth rate of area, production and productivity of maize in Kanker district and Chhattisgarh state.

Particular	CGR (%)		
	Area	Production	Productivity
Chhattisgarh State	0.043*	0.017**	-0.081
Kanker District	0.029*	0.05*	0.013**

Note: * Denotes the significant level at 1% of probability level at t distribution

** Denotes the significant level at 5% of probability level at t distribution

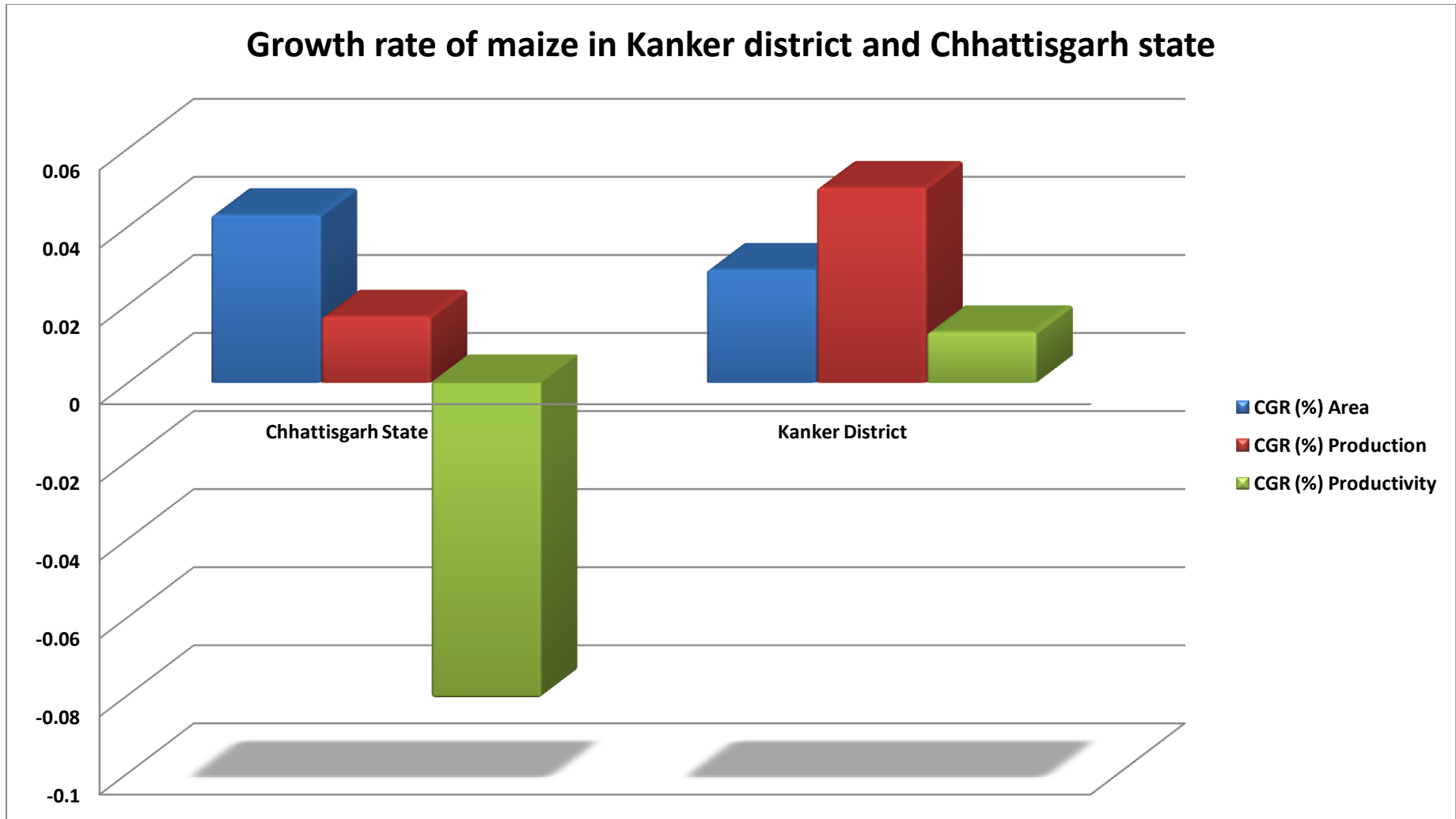


Fig 4.7 Growth rate of maize in Kanker district and Chhattisgarh state

4.3 Inputs/material use for cultivation of maize

Inputs/material use for cultivation of maize is important to understand that how much inputs/material use deviated from the standard package of practices for cultivation of maize and same is given in Table 4.6. It is observed from the empirical findings that farmers of the study area did not follow the recommended package of practices for maize cultivation and being obtained poor yield, which was 25 per cent less yield of maize as the recommendation on over all basis. The sample farmers are applying the seed from 13.58 to 52.40 q/ha. The application of manure & FYM was increasing as per the farm size and noticed to 5.68 to 18 q/ha as it was close to the recommendation for application of FYM to maize cultivation. The application of Urea, DAP and potash was found to be 5.19, 5.19 and 0.87 q/ha. The study area having sever incidence of insects, which damage the crop so badly. Thus farmers were applying the insecticides upto the 2.30kg/ha.of chloropyriphose 20 Ec .

The number of irrigation for maize cultivation was recommended from 1-2 at different crop growth stage and it was noticed that all the farmers of different farm size applied the required number of irrigation except marginal farmers. The human labour required for maize cultivation was 150-200 days/ha, which was found among medium and large farms. At farm level, nearly 1-2 pair bullock days/ha and 4.86 machine hours/ha was registered on overall basis. It is important that bullock power was the serious problem and most of operations were performed by medium and large farmers through machine power.

Thus, it could be concluded that farmers were obtained poor yield of maize as per the recommendation although applying upto the approximation of inputs/material for cultivation of maize. It has found that farmers did not know timely operations of practices for maize cultivation.

Table 4.6: Inputs/material, human labour and power use for cultivation of maize:-

Particular	Marginal	Small	Medium	Large	Overall
A. Yield (q/ha)	34.05	39.13	45.15	55.41	46.41
B. Material					
Seed (kg/ha)	13.58	21.83	34.85	62.40	67.94
Manure & FYM (q/ha)	5.68	9.87	14.47	18.00	117.35
Fertilizer (q/ha)					
1. Urea	0.65	1.14	2.02	3.80	5.19
2. DAP	0.38	0.61	1.05	1.90	5.19
3. Potash	0.22	0.33	0.59	1.14	0.87
C.Plant protection (kg/ha)					
1. Insecticide	2.5	2.75	2.80	3.15	2.72
Total Irrigation (in ha)	4	5	6	8	5.75
D. Human labour(days/ha)					
Family labour	67.68	70.75	51.78	46.65	59.21
Hired labour	20.53	33.34	70.54	90.49	53.72
Total human labour	88.21	104.19	122.04	137.14	112.90
E. Power use					
Bullock labour (days/ha)	2.00	2.00	-	-	2.00
Machine power (hours/ha)	3.08	3.63	5.88	6.88	4.86

Note: Figers in the parenthes indicate of the total.

4.6 Costs and return of maize cultivation

Costs and return of maize cultivation is essential to understand that how much cost incurred for different inputs and whether farmers are receiving the profit or not. It is therefore, a costs and return of maize cultivation was estimated in Rs/ha, which is given in Table 4.7. It reveals that irrespective to the farm size of holdings, the total cost of cultivation of maize of sample farms was Rs 17510.08 per hectare and the share of materials input was maximum and found to be 38.39 per cent followed by human labour cost 27.58 per cent, fixed cost on land revenue and interest on working capital 1.53 per cent and power use cost 32.49 per cent, respectively. Among the

materials imputed seed and fertilizer was noticed to be the major cost. While in human labour cost, input value of family labour cost was shared comparatively more than that of hired labour cost. The share of machine power was more in maize cultivation than that of bullock power use. The interest on working capital to the total fixed cost was comparatively more than land rent. fixed cost was found to be constant with respect to the farm size of holdings under sample farms.

Thus, it could be concluded that total cost of cultivation was increasing with regards to farm size holding due to bigger farmers could incurred more expenditure on the material inputs.

The total cost of cultivation of maize was increasing with respect to farm size of holdings and found to be maximum under large farms Rs 20605.85 per hectare and minimum at marginal farms Rs13305.10 per hectare. It is important to note that material inputs cost and human labour cost was increasing with respect to the farm size while costs on power use.

**Table 4.7 Cost and return of different inputs of maize cultivation sample farms:s
(Rs./ha)**

Particular	Marginal	Small	Medium	Large	Overall
A. Material cost					
Seed	1939.81 (14.58)	2704.00 (17.91)	3420.00 (19.85)	4748.00 (23.04)	2402.95 (13.72)
Fertilizer	1308.00 (9.83)	2351.97 (15.58)	2871.02 (16.67)	3366.00 (16.33)	2874.24 (16.41)
Plant protection	315.38 (2.37)	613.71 (4.06)	850.50 (4.94)	1170.95 (5.68)	837.63 (4.78)
Irrigation charges	496.78 (3.73)	570.37 (3.78)	645.87 (3.75)	718.44 (3.49)	607.87 (3.47)
Total material cost	4059.97 (30.51)	6240.05 (41.33)	7787.39 (45.21)	10003.39 (48.54)	6722.69 (38.39)

B. Human labour cost					
Family labour	3386.11 (25.44)	2054.75 (13.61)	1324.39 (7.69)	694.03 (3.36)	1889.82 (10.79)
Hired labour	884.24 (6.64)	1187.58 (7.86)	2490.92 (14.46)	3594.26 (17.44)	2939.25 (16.79)
Total human labour cost	4270.35 (32.09)	3242.33 (21.47)	3815.31 (19.34)	4288.29 (20.81)	4829.07 (27.58)
C. Power use cost					
ssBullock labour	750.52 (51.18)	550.58 (35.94)	-	-	524.02 (30.89)
Machine power	715.92 (48.82)	981.41 (64.06)	1445.87 (100.00)	2447.24 (100.00)	1172.61 (69.11)
Total power use cost	1466.44 (11.02)	1531.99 (10.15)	1445.87 (8.39)	2447.24 (11.88)	1696.63 (9.69)
D Variable cost					
Sowing	525.10 (15.90)	689.21 (17.90)	721.53 (17.31)	856.00 (18.80)	697.96 (17.48)
Weeding	950.00 (28.77)	1065.00 (27.66)	1175.00 (28.19)	1280.00 (28.12)	1242.50 (31.12)
Harvesting	1496.00 (45.31)	1688.72 (43.86)	1786.94 (42.88)	1855.88 (40.76)	1606.89 (40.24)
Threshing	330.76 (10.02)	407.40 (10.58)	484.04 (11.61)	560.68 (12.32)	445.72 (11.16)
Total variable cost	3301.86 (24.82)	3850.33 (25.50)	4167.51 (24.19)	4552.56 (22.09)	3993.07 (22.80)
Land revenue	10.00 (0.03)	10.00 (0.03)	10.00 (0.03)	10.00 (0.03)	10.00 (0.03)
Interest on working capital	196.48 (1.48)	222.97 (1.48)	258.24 (1.48)	304.37 (1.48)	258.62 (1.48)
Total fixed cost	206.48 (1.55)	232.97 (1.54)	268.24 (1.56)	314.37 (1.52)	268.62 (1.53)
Total	13305.10 (100.00)	15097.67 (100.00)	17226.08 (100.00)	20605.85 (100.00)	17510.08 (100.00)

Note: Figers in the parenthes indicate percentages to the total.

4.6 Economics of maize

The economics of maize cultivation has been understood by considering the economic parameters *viz*: yield of maize, cost of cultivation, gross return, net return, cost of production, input-output ratio, which is presented in Table 4.8. It has been observed from empirical findings that net return over total cost of cultivation of maize was Rs. 17510.08 per hectare, irrespective to the farm size holding and it was vary from Rs.13305.10 to Rs.17510.08 per hectare for marginal to large farms size. It is being observed that returns to scale was operating in maize cultivation. The per quintal cost of production was found to be 390.75, 385.83, 381.53 and 371.88 for marginal, small, medium, and large farms size, respectively. While input-output ratio showing increasing trend with respect to farm size.

Table 4.8: Economics of maize cultivation under different farms size groups

(Rs. /ha)

S. No.	Particulars	Farm Size				
		Marginal	Small	Medium	Large	Overall
1.	Yield (q/ha)	34.05	39.13	45.15	55.41	46.41
2.	Cost of cultivation (Rs/ha)	13305.10	15097.67	17226.08	20605.85	17510.08
3.	Gross return (Rs/ha)	42797.30	48936.67	56213.08	68365.25	57948.28
4.	Net return (Rs/ha)	29492.20	33839.00	38987.00	47759.40	40438.20
5.	Cost of production (Rs/ctl)	390.75	385.83	381.53	371.88	377.29
6.	Input -Output ratio	1:2.38	1:2.42	1:2.45	1:2.52	1:2.46

Note : Figures in the parentheses indicate particular to the table.

Yield, value of output and cost of production per quintal

The yield value of output per hectare and cost of production per quintal of maize on the sample farms have been worked out in table 4.9. Table reveals average

yield per hectare of maize came to 46.41 quintals of main product and 33.27 quintal of by-product on the sample farms.

The cost of production per quintal, on an average, was worked out to 377.29 Rs/ql. for main product. The average value of output per hectare came to Ra. 41769 and 1330.00 for by main and by products. The higher value of output on large farms was associated with the higher expenditure incurred on modern farm inputs.

Table: 4.9: Per hectare yield, value of output and cost of production per quintal of maize

(Rs. /ha.)

S. No	Particular	Farm size				
		Marginal	Small	Medium	Large	Average
1	Input cost (Rs. /ha.)	13305.10	15097.67	17226.08	20605.85	17510.08
2	Yield (qtl. /ha.)					
	a. Main product	34.05	39.13	45.15	55.41	46.41
	b. By product	28.82	34.45	41.20	52.74	33.27
3	Price (Rs. /qtl.) Main product	900.00	900.00	900.00	900.00	900.00
	Price (Rs. /qtl.) By product	40.00	40.00	40.00	40.00	40.00
4	Value of production (Rs. /ha.)					
	a. Main product	30645.00	35217.00	40635.00	49869.00	41769.00
	b. By product	1152.80	1378.00	1648.00	2109.60	1330.80
5	Total value of production (Rs. /ha.)	31797.80	36595.00	42283.00	51978.60	43099.80
6	Cost of production (Rs. /qtl.)					
	a. Main product	390.75	385.83	381.53	371.88	377.29
7	Net return (Rs. /ha.)	17339.90	20119.33	23408.92	29263.15	24258.92
8	Net return (Rs. /qtl.)	12152.30	13719.67	15578.08	18496.25	16179.28

Note : Figures in the parentheses indicate particular to the table.

Cost and returns from maize at sampled farms

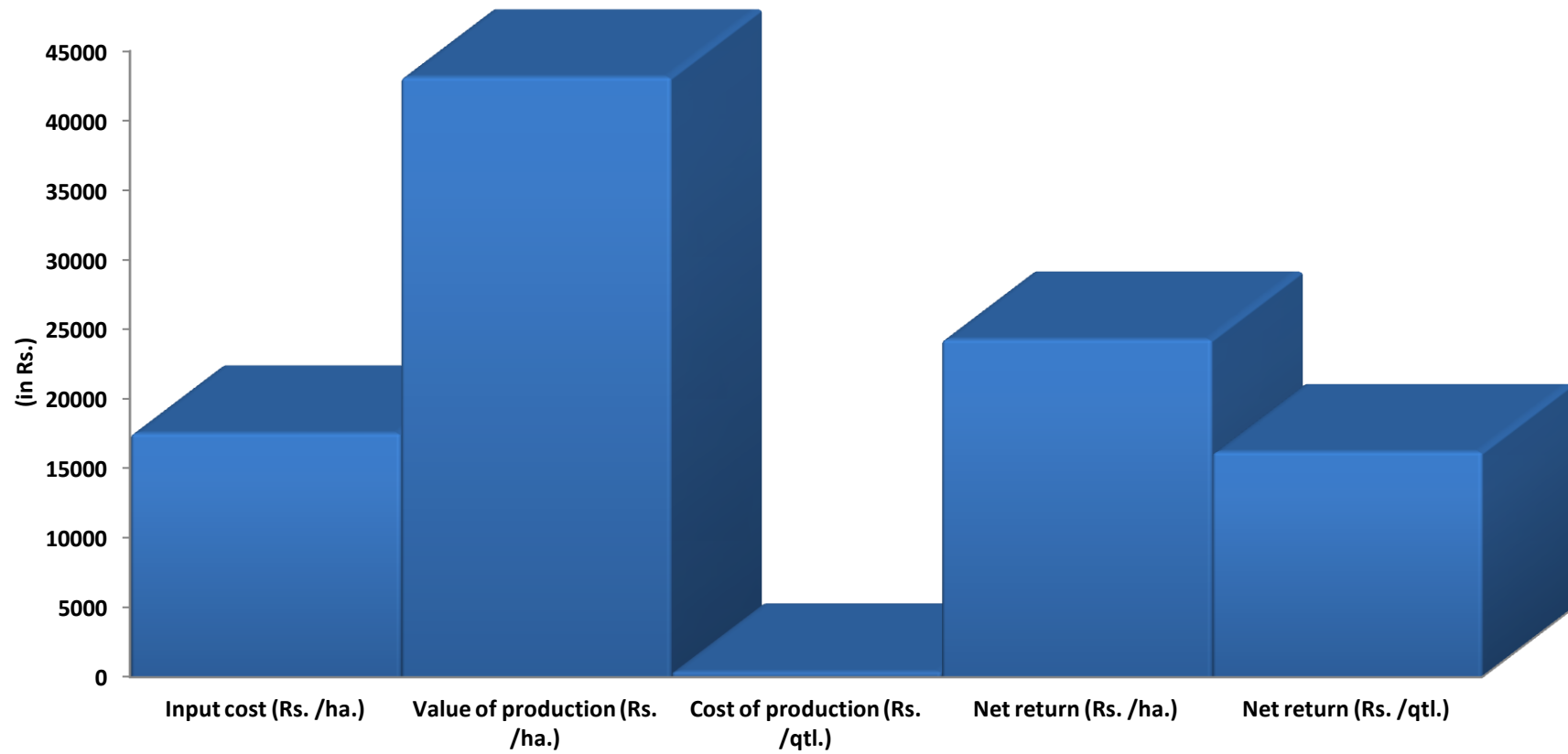


Fig 4.8 cost and return from maize at sampled farms

4.6 Marketable surplus:

Table 4.10 clearly reveals that the marketable surplus of maize being 16.98 quintals. It was observed from the table that higher quantum of marketable surplus of maize at large size group of farms and it was decreasing as farm sizes decreases. In case of consumption it is observed that marginal farmers consumes maximum percent of production observed as 37.91 percent and minimum was observed in case of large farmers that is 14.89 percent.

Table 4.10: Marketable surplus of Maize of sampled household

S.NO	Particulars	Farm size				
		Marginal	Small	Medium	Large	Overall
1.	Total quantity produced (qty)	9.02 (100.00)	26.81 (100.00)	60.52 (100.00)	75.88 (100.00)	35.50 (100.00)
2.	Quantity retained for seed	0.00	0.00	0.00	0.00	0.00
3.	Quantity paid for wages	2.34 (25.94)	8.32 (31.03)	17.91 (29.59)	21.81 (28.74)	10.31 (29.04)
4.	Consumption	3.42 (37.91)	7.22 (26.93)	14.00 (23.13)	11.30 (14.89)	8.21 (23.13)
5.	Total quantity utilized	5.76 (63.86)	15.54 (57.96)	31.91 (52.73)	33.11 (43.63)	18.52 (52.17)
6.	Marketable surplus	3.26 (36.14)	11.27 (42.04)	28.61 (47.27)	42.77 (56.36)	16.98 (47.83)

Note: Figures in the parentheses indicate particular to the table.

Marketable surplus at sampled farms

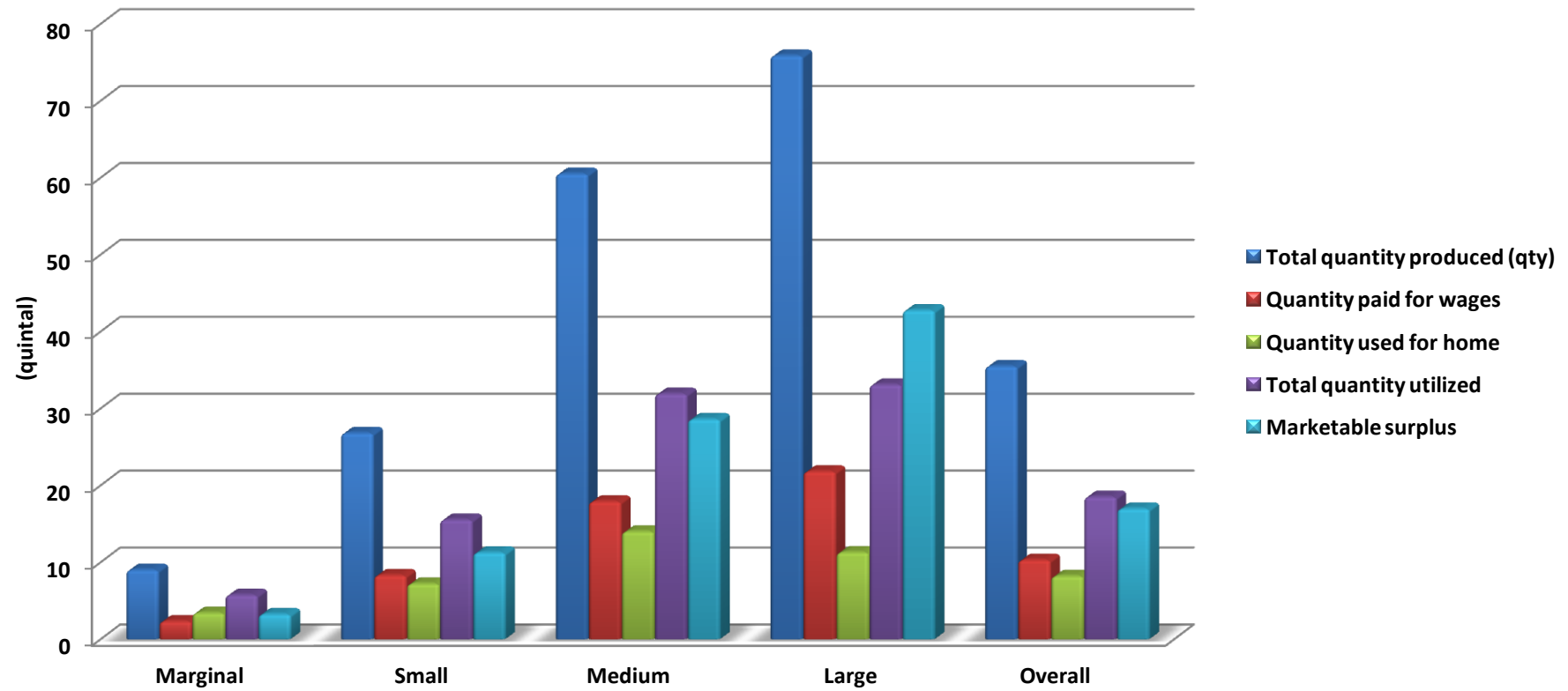


Fig 4.10 Marketable surplus at sampled farms

4.8 Disposal Pattern

Produce of the farmers are disposed to market directly through agents. From the table 4.11 it was revealed that higher quantity (62.22 percent of the produce is disposed in to market through the agents and rest were sold to local market(37.78 percent) by the producers.

Table 4.11: Disposal pattern of maize of sampled households (in quintals)

S.No.	Particulars	Farm Size				
		Marginal	Small	Medium	Large	Overall
1.	Marketable surplus	2.21 (100.00)	5.64 (100.00)	25.15 (100.00)	35.41 (100.00)	16.41 (100.00)
2.	Disposed to agents	0.93 (42.08)	4.34 (76.95)	18.75 (74.55)	26.32 (74.33)	10.21 (62.22)
3.	Disposed to local markets	1.28 (57.92)	1.30 (23.05)	6.40 (25.45)	9.09 (25.67)	6.20 (37.78)

Note: Figures in the parentheses indicate percentages to the total marketable surplus.

4.9 Constraints in production and marketing

The constraints narrated by the respondents selected practices are presented in Table 4.12. Major constraints pertaining to cultivation of maize were unavailability of ,higher price of inputs (65.83 percent) and lack of good quality of hybrid seed (64.16 percent), increasing wage rate of human labour (64.16 percent). Other constraints are lack of timely available of seed (63.33 percent), lack of regulated and co-oprative market (54.16percent) and lack of technical knowledge (35.00 percent) has perceived by the maize growers in the district.

Table 4.12: Farmers perception on constraints in marketing of maize

S.No.	Particulars	No. of farmers	Percent
1.	Lack of timely available of seed	76	63.33
2.	Lack of transportation	62	51.66
3.	Lack of regulated and cooperative market	65	54.16
4.	Lack of storage facilities	53	44.16
5.	Lack of awareness about market news and intelligence	37	30.83
6.	Lack of post harvest management	65	54.16
7.	Lack of Soil testing facility	54	45.00
8.	Lack of good quality of hybrid seeds	77	64.16
9.	Lack of resources	49	40.83
10.	Lack of technical knowledge	42	35.00
11.	Lack of higher prices of inputs	79	65.83
12.	Increasing wage rate of human labour	77	64.16

Note: Figures in the parentheses indicate percentages to the total of constraints.

SUMMARY AND CONCLUSIONS

CHAPTER-V
SUMMARY, CONCLUSIONS AND SUGGESTIONS
FOR FUTURE RESEARCH WORK

5.1 Summary and Conclusions

Maize is one of the most important cereal crop after rice. Maize has many assets for its wide distribution: its husk give protection from birds and rain can be harvested over a long period since it can be left dried in the field until harvesting is convenient, can be stored long, provide numerous useful food products and frequently preferred to sorghum and other millets. Infect it is the main cereal crop for monsoon season in areas. It is grown both for grain and forage. Maize is a major source of starch. Cornstarch (maize flour) is a major ingredient in home cooking and in many industrialized food products. Maize is also a major source of cooking oil (corn oil) and of maize gluten. Maize starch can be hydrolyzed and enzymatic ally treated to produce syrups, particularly high fructose corn syrup, a sweetener; and also fermented and distilled to produce grain alcohol. Grain alcohol from maize is traditionally the source of bourbon whiskey. Maize is sometimes used as the starch source for beer. It is also nutritive for adults of different ages. The green straw is suitable for making silage.

Chhattisgarh comprises of three agro economical zones:- Chhattisgarh plain and middle Northern hills and Bastar plateaue in the south. The larger area of production of maize is middle Northern hills.Northern hills of Chhattisgarh predominantly by tribal who have conserved numbers of maize varieties. Keeping in view of economic importance of maize in the study area , the present enquiry related to its production and marketing pattern of maize in the study area, , the present enquiry related to its production and marketing pattern will be proposed to undertaken in district Kanker of Chhattisgarh.

The present study is an attempt in this direction with following specific objectives:-

1. To estimate the growth rate of area, production and productivity of maize in Kanker districts of Chhattisgarh.
2. To work out the costs and return of maize under sample farms of the study area.
3. To examine the marketable surplus and disposal pattern of maize.
4. To find out the constraints in production and marketing of maize and suggest suitable measures to overcome them.

Out of seven Blocks of Kanker district of Chhattisgarh, Durgkondal block and Koilibeda block was selected purposively as it represent more or less similar agro-socio-economic condition of the district. Primary data was collected from selected maize growers. Data was collected through personal interview method with the help of pre-tested questionnaires. The secondary data was collected from scan through reviews and literature and published sources of district head quarter, different department like Agricultural Block Office etc. The details enquiry was done for the year 2012-2013. To work out the status of maize in district trend analysis was done. The standard method of cost of cultivation was adopted for cost and return .To calculate marketable surplus, average and percentage statistical tools were used.

The study yielded following major findings

1. Average cropping intensity was observed 132.53 percent in the study area.
2. The average holding size was 1.86 ha.
3. In the production performance of maize in Kanker district was found almost increasing trend.
4. On an average cost of cultivation per hectare of maize was calculated Rs. 17510.08 per hectare. The cost of cultivation per hectare showed rising trend with the rise in farm size.

5. On an average the family labour cost and hired labour cost for the production of maize per hectare was observed Rs.1889.82 and Rs.2939.25
6. On an average input-output ratio in maize was 1:2.46
7. On an average the output value of maize was observed Rs.41769.00 per hectare.
8. On an average yield of maize was observed 46.41 quintals for main product and 33.27 quintals for by product.
9. On an average marketable surplus in maize was worked out 48.00 percent.
10. On an average the quantity of produce disposed to market through agents (merchants) were 62.22 percent and produce disposed to local market was 37.78 percent.
11. The major constraint pertaining to cultivation of maize were unavailability of good quality of insecticides and pesticides followed by higher prices of inputs.
12. The major constraint of maize in marketing was dependency on agents followed by small marketable surplus.

5.2 Suggestion for future research works:

1. Establishment of farmer's cooperative societies and sale society will not solve money problem of small and medium farmers but also reduce the role to commission agents.
2. To improve the production and marketing of maize an immediate steps should be taken to regulate the market in the study area and main market yards
3. Suitable extension services regarding new technology of production disposal and extension workers should extend utilization of maize without any delay and other agencies involved in the extension, communication in their respective zones.
4. In maize growing area, processing plant should be started so that farmer get employment opportunity and increase the area of crop for fulfillment of demand in industries.
5. Processors may establish a contract with farmers for couple of years to procure farmers produce. This will help in reducing uncertainty in raw material supply for processor and price risk of farmers.

ABSTRACT



**AN ECONOMIC ANALYSIS OF PRODUCTION AND MARKETING OF MAIZE IN
KANKER DISTRICT OF CHHATTISGARH**

By

PRATIMA DHRUV

ABSTRACT

Maize is one of the most important cereal crop after rice. Maize has many assets for its wide distribution, its husk give protection from birds and rain can be harvested over a long period since it can be left dried in the field until harvesting is convenient, can be stored long, provide numerous useful food products and frequently preferred to sorghum and other millets. The study was undertaken to fulfill the following objectives:

1. To estimate the growth rate in area production and productivity of maize in Kanker district of Chhattisgarh.
2. To work out the costs and return of maize under sample farms of the study area.
3. To find out the marketable surplus and disposal pattern of maize of the sample farms.
4. To find out the constraints in production and marketing of maize and suggest suitable measures to overcome them.

The present study was conducted in the Kanker districts of Chhattisgarh. Hundred twenty farmers were selected randomly from six villages namely Surangdoh, Kodogaon, Karaki, Donde, Ravindranagar and Satyanandpur and were categorized in to marginal, small, medium and large farmers based on their holding size. The primary data were collected for the year 2013-14. The major findings of this study revealed that the average size of farm was worked out to be 5.56 hectares, overall on an average cropping intensity was observed to be 132.35 per cent. On an average the cost of cultivation per hectare of maize was found to be Rs. 17510.08. Overall on an average the cost of production, per quintal was estimated as Rs. 377.29. Cost of production of all the selected maize shows decreasing trend with increasing in the farm size whereas, cost of cultivation, increases with in

intensity was observed to be 132.35 per cent. On an average the cost of cultivation per hectare of maize was found to be Rs. 17510.08. Overall on an average the cost of production, per quintal was estimated as Rs. 377.29. Cost of production of all the selected maize shows decreasing trend with increasing in the farm size whereas, cost of cultivation, increases with in the farm size. Overall on an average the input-output ratio was 1:2.46 on the sampled farms. Average marketable surplus in maize was estimated as 47.83 per cent respectively. The major constraints pertaining to cultivation of maize was problems of decreasing yield due to growing the crop regularly in same field and lack of irrigation. Extension agencies should provide information on new varieties and package of practices as well as procedures of standardization and grading of produce will helps to the farmers to take heir benefits of maize cultivation in the district. Study suggested that the co-operative societies is needed in the area to performed the better making of maize crop which will not only help active the better price but also helps to improve the field in the district .

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Kharif						
Sub total							
Rabi						
Sub total							
Summer or Zaid						
Sub total							
Grand total							

F. (1.) Farm House:-

S.N.	Items	No.	Year of construction	Present value (Rs.)	Expenditure on Annual Repair(Rs.)
	Farm buildings (a) Pacca (b.) Semi pacca (c.) kutcha				

2. Livestock inventory:-

S.N.	Items	No.	Purchaed value (Rs.)	Time of purchasing	Present value (Rs.)
1.	Animals				
	(a.)Cow				
	(b.)Bullock				
	(c.)Calf				
	(d.)Buffeloes				
2.	Heifer				
	(a.)Poultres				
	(b.)Fisheries				
	(c.) Goateries				
	(d.)Piggeries				
3.Farm inventory	Equipment	No.	Present value (Rs.)	Year of purchasing	
1.	Tractor				
2.	Tube well				
3.	Bullock cart				
4.	Pump set				
5.	Chaff cutter				
6.	Plough				
7.	Sprayer/duster				
8.	Others				

G. Cost of cultivation:-

Crop -----

Variety -----

Area ----- (irrigated / un -irrigated) -----

(1.) Labour cost

S.N.	operation	Family human labour (days)	Hired human labour (days)	Bullock power	Machine power	Total expenditure on particular operation

		M	F	T	M	R	F	R	T	O	H	R	O	H	R	
1.	Pre sowing irrigation															
2.	Field preparation a. ploughing b. planking															
3.	Application of manure & fertilizer a. appli. of fym b. appli. of ferti.															
4.	Sowing															
5.	Intercultural															
6.	Irrigation															
7.	Plant protection															
8.	Harvesting															
9.	Transportation from field to threshing place															
10.	Threshing and winnowing															
11.	Transportation from field to home															
12.	Miscellaneous															
	Total															

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

B) Input cost -

S.N.	Input	Quantity	Rate (Rs.)/unit	Total value (Rs.)
------	-------	----------	-----------------	-------------------

1.	Seed a. b.			
2.	FYM/Compost			
3.	Fertilizer a. b. c.			
4.	Plant protection chemicals a. b. c.			
5.	Others			
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.) -----

Production-

Particular	Quantity produced (qt.)	Quantity for wage payment to labour	Consumption	Retained for seed	Sold (Rs./qt.)	Value (Rs.)
Main product Crop						
By product a.						
b.						
Total						

• **Constraints in production of crop:**

1. Are you aware about the latest technical knowledge of the crop -?
Y/N

If yes, then from where you obtained it- ?

- a. Television
- b. Radio
- c. Krishi diary
- d. Friends
- e. Farmers fair
- f. IGKV/University

If no, then what the reason is for not obtained -?

- a. Not frequent visit of RAEO
 - b. Not frequent visit of KVK scientist
 - c. Not my visit to farmers fair
 - d. Not my visit to research station
 - e. Any other
-

2. Do you know the recommended dose of different chemical fertilizer in this crop -?
Y/N

If yes, then

- a. What is the recommended dose
- b. What dose you apply

If no, why

- a. No, such type of recommendation are available
 - b. Not frequent visit of extension workers
 - c. Unavailability of chemical fertilizer during the crop period
 - d. Any other constrains
-

3 Are there sufficient soil testing facilities in your areas -?
Y/N

If yes, then how you come to know the nutrient requirement of plant-?

- a.

4. Have you sufficient irrigation water for the crop -?
Y/N

If no, then how you irrigate your crop -?

- a. Hired irrigation water
 - b. Completely depends on rains
 - c. Any others
-

5. Have you problem of availability of labour during the crop season -?
Y/N

If yes, then in which operation

- a. Weeding
- b. Thinning
- c. Harvesting
- d. Any other specify

.....

6. Have you sufficient fund to purchase different inputs for crop cultivation -?
Y/N

If no, then how you managing money for inputs

- a. From bank @ rate
- b. From relatives @ rate.....
- c. From traders/commission agent/village merchant @ rate
- d. Any others

.....@ rate

7. Do you face any problem in financing from the financial institution -?
Y/N

If yes, then what are those problems -?

- a. Complicated procedure
- b. Long procedure
- c. Any other specify

.....

8. Are you aware about the crop insurance of crop -?
Y/N

If yes, then

- a. From where you get knowledge of crop insurance
- b. Are you under crop insurance scheme?
- c. Have you claim for crop failure during past year?
- d. What you suggest to improve the system

.....

9. Have you any problem to get machines on hire basis -?
Y/N

If yes, then

- a. Which machine do you want on hire basis?
.....
- b. Is this machine is available in village?
.....
- c. How much rent you pay for this machine?
.....
- d. What is your suggestion to overcome this problem?

.....
.....

10. Whether you face problem of power cut and low voltage during the crop season? Y/N

If yes, then how you manage this problem?

- a. By hiring generator
- b. By purchasing generator
- c. What is your suggestion to reduce this problem?

.....
● **Constraints in marketing of crop:**

1. Are you satisfied with the price received?
Y/N

If no, then what should be done

- a. Sale after grading
- b. Sale during slack season
- c. Increase the support price
- d. Any other

.....
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 in this situation?

- a. Sharing the cost of transportation
- b. Sale to the village trader/kochia in order to reduce the time and cost
- c. Sale to village retailer in small quantity
- d. Sale to the nearest PACS
- e. Any other

.....
4. Lack of regulated market and co-operative market
Y/N

5. Whether you visit regulated market regularly -

If no, then give the reason for not going to the regulated market

- a. Small quantity of produce
- b. Time and distance constraints
- c. Availability of kochia in village level
- d. Lack of awareness about regulated market
- e. Any other

.....
If yes, then what is problem in regulated market?

- a. Delay in purchasing
- b. Weighing default
- c. Lack of sufficient market yard/platform to put the produce
- d. Delay in payment
- e. High marketing charges

6. Lack of storage facilities in growing area -?
Y/N

If yes, then how you manage the produce ?

- a. Store in own storage structure
- b. Sale just after harvesting
- c. Any other

.....
.....

7. Will the support price affect the production of crop?
Y/N

If yes, then how

- a. Increase the area allocation under crop
- b. Which crop will substitute by wheat if price increase of wheat
- c. Optimum level of input use for crop

8. What media do you have for marketing news?

- a. News paper
- b. Radio
- c. Television
- d. Other (specify)

APPENDIX –II
NAME OF SAMPLE HOUSEHOLDS

S. No.	Name of respondent	Village	S. No.	Name of respondent	Village
	Marginal	Donde	33.	Madho	Karaki
1.	Raghunath	Karaki	34.	Nagasuram	Donde
2.	Chandan	Ravindranagar	35.	Manish	Karaki
3.	sanjit mandal	Ravindranagar	36.	Waderam	Kodogaon
4.	Ratan Rai	Karaki	37.	Bisram	Karaki
5.	Ramesh	Surangdoh	38.	Rupobai	Satyanandpu
6.	Faguram	karaki	39.	Malti	Satyanandpu
7.	Shivbati	Donde	40.	Dhanraj	Donde
8.	Mamta	Ravindranagar	41.	Paluram	Satyanandpu
9.	Ranjan sarkar	Ravindranagar	42.	Nepal	Donde
10.	Kusum	Ravindranagar	43.	Narottam	Satyanandpu
11.	Omi mistri	Ravindranagar	44.	Sudharani	Satyanandpu
12.	Shivanand	Ravindranagar	45.	Bilas	Kodogaon
13.	Khirodrai	Ravindranagar	46.	Rasuram	Kodogaon
14.	Bhagwati	Ravindranagar	47.	Birsingh	Satyanandpu
15.	Asim	Ravindranagar	48.	savita	Satyanandpu
16.	Vishveshwar	Surangdoh	49.	Samresh	Satyanandpu
17.	tijuram	Surangdoh	50.	Aarti	Satyanandpu
18.	Ramesh nag	Surangdoh	51.	Govind	Satyanandpu
19.	Premisigh	Surangdoh	52.	Naresh	Satyanandpu
20.	Narendra	Surangdoh	53.	Sanjay	Satyanandpu
21.	Ravindra	Surangdoh	54.	Mangal	Surangdoh
22.	Ramesh kumar	Surangdoh		Small	
23.	maniram	kodogaon	1	Manuram	Donde
24.	Subhansingh	kodogaon	2	Bansiram	Kodogaon
25.	Brijlal	kodogaon	3	Jainuram	Kodogaon
26.	Jagannath	kodogaon	4	Birjhu	Karaki
27.	Somji	kodogaon	5	Jaisingh	Karaki
28.	Bisaruram	kodogaon	6	Mangluram	Surangdoh
29.	Navaluram	Satyanandpur	7	Sdaram	Karaki
30.	Vishwjit	Ravindranagar	8	Snau	ravindranaga
31.	Ratanrai	Donde	9	Aamobai	ravindranaga
32.	Bhuneshwari	Donde	10	Manarobai	Surangdoh
S. No.					
11	Manoranjan	Donde	12.	Ramprasad	Donde
12	Jyotsana	Karaka	13.	Skkuram	Donde
13	Satyendra	kodogaon	14.	Umabai	Donde
14	Mangiya	Karaka	15.	Mankuram	Donde
15	Ramesh poddar	Satyanandpur	16.	Rajen	Donde

16	Subhash	Satyanandpur	17.	Somari	Kodogaon
17	Samar paik	Donde	18.	Mangiya	Surangdoh
18	Shyamlal	Satyanandpur	19.	Ramesh poddar	Ravindranag
19	Budhram	Donde	20.	Subhash	Ravindranag
20	Itwaru	Satyanandpur	.	Large	
21	Hariram	Satyanandpur	1	Jailal	Kodogaon
22	Shanmbhu	kodogaon	2	Sahdev	Surangdoh
23	Manindra	kodogaon	3	Jhitkuram	Surangdoh
24	Shibupad	Satyanandpur	4	Latkhor	Donde
25	Kamalsingh	Satyanandpur	5	Gauribai	Donde
26	Hirmani	Satyanandpur	6	Shivram	Satyanandpu
27	Vishnu	Satyanandpur	7	Amarsingh	Ravindranag
28	Pushpa	Satyanandpur	8	Manikram	Kodogaon
29	Aayaturam	Satyanandpur	9	Sukhram	Surangdoh
30	Januram	Surangdoh	10	Prakash	Karaki
31	Kiriram	Donde			
32	Nohar singh	Karaki			
33	Parmila	Kodogaon			
34	Jwarani	Satyanandpur			
35	Shubhash	Donde			
36	Manhar	Donde			
	Medium				
1	Kalipad	styanandpur			
2	Shyamsingh	Donde			
3	Vasudev	Satyanandpur			
4	Kamala	Satyanandpur			
5	Gnesh	Surangdoh			
6	Lahuram	Surangdoh			
7	Sukhauram	Kodogaon			
8	Sukhdev	Karaki			
9	Sagarobai	Kodogaon			
10	Saniram	Karaki			
11	Rajani	Surangdoh			

