STUDY ON EXTENT OF ADOPTION OF RECOMMENDED OKRA PRODUCTION TECHNOLOGY AMONG THE FARMERS OF DHAMTARI DISTRICT OF CHHATTISGARH STATE

M.Sc. (Ag.) THESIS

By

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STUDY ON EXTENT OF ADOPTION OF RECOMMENDED OKRA PRODUCTION TECHNOLOGY AMONG THE FARMERS OF DHAMTARI DISTRICT OF CHHATTISGARH STATE

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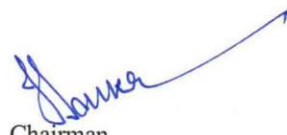**Roll No. 13916**   **ID No. 112106016**
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CERTIFICATE – I

This is to certify that the thesis entitled **"STUDY ON EXTENT OF ADOPTION OF RECOMMENDED OKRA PRODUCTION TECHNOLOGY AMONG THE FARMERS OF DHAMTARI DISTRICT OF CHHATTISGARH STATE"** submitted in partial fulfillment of the requirements for the degree of **"MASTER OF SCIENCE IN AGRICULTURE"** to the Indira Gandhi Krishi Vishwavidyalaya, Raipur, is a record of the bonafide research work carried out by **Shri GIRIRAJ KISHORE** under my guidance and supervision. The subject of the thesis has been approved by Student's Advisory Committee and the Director of Instructions.

No part of the thesis has been submitted for any 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 investigation have been duly acknowledged by him.

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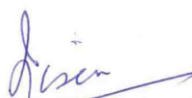Member   Dr. K.K. Shrivastava

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CERTIFICATE – II

This is to certify that thesis entitled **"STUDY ON EXTENT OF ADOPTION OF RECOMMENDED OKRA PRODUCTION TECHNOLOGY AMONG THE FARMERS OF DHAMTARI DISTRICT OF CHHATTISGARH STATE"** submitted by **Shri. GIRIRAJ KISHORE** to the Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) in partial fulfillment of the requirements for the degree of **M.Sc. (Ag.)** in the **Department of Agricultural Extension** has been approved by the external examiner and Student's Advisory Committee after oral examination.

Date: 29 . 11 · 12

EXTERNAL EXAMINER

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CHAPTER-I

INTRODUCTION

Agriculture helps to meet the basic needs of human and their civilization by providing food, clothing, shelters, medicine and recreation. Hence, agriculture is the most important enterprise in the world. It is a productive unit where the free gifts of nature namely land, light, air, temperature and rain water etc., are integrated into single primary unit indispensable for human beings. Secondary productive units namely animals including livestock, birds and insects, feed on these primary units and provide concentrated

Agriculture has been back bone of the Indian economy and accounted for 14.6 per cent of the country's gross domestic product (GDP) in 2009-10 and 10.23 per cent of the total exports. Agriculture sector provided employment to 58.2 per cent of the work force of India.

The total geographical area of India is 328.7 million hectares of which 140.3 million hectares is net sown area, while 193.7 million hectares is the gross cropped area (Anonymous, 2009-10). India is the world's largest producer of vegetable next only to China with an annual production estimated around 50.99 million tonnes from 4.5 million hectares. However, vegetables occupy hardly 2 per cent of the total cropped area of the country which is very low in view of the national need. The production per unit area of various crops grown in India is very less, as compared to developed countries. Due to low agricultural productivity, it becomes very difficult to feed the ever increasing population. Increasing is production and productivity is essential to uplift the socio economical level of poor farmers. The basic challenge before India is to enhance the production of nutritious food in sustainable manner which, besides feeding the country's large population, it can play a major role to

reduced the mal nutrition among the women and children's of rural area. Vegetables being short duration crops, can give six to ten time more yield than any cereals crop in a year and thus, can provide cash money to the rural farmers.

The vegetable being cash crop with nutritional value generate income for the poor households. Higher profits could be achieved by increasing the production of a vegetable crops through out the year by efficient irrigation system used. The production of fruits and vegetables has comparative advantagenious particularly under conditions where arable lands are scarce, labours is abundant and markets are accessible (Lumpkin *et al*., 2005).

The horticulture sector encompasses a wide range of crops *e.g*., fruit crops, vegetables crops, potato and tuber crops, ornamental crops, medicinal and aromatic crops, spices and plantation crops. While the first few Five Year Plans assigned priority to achieving self sufficiency in food grain production, over the years, horticulture has emerged as an indispensable part of agriculture, offering a wide range of choices to the farmers for crop diversification. It also provides ample opportunities for sustaining large number of agro-industries which generate substantial employment opportunities. The horticulture sector contributes about 24.5 per cent of the GDP from about An area of 21 million hectares and contributes over 230 MT to the food basket of the country. India ranks first in the world with 3.5 million tonnes (70% of the total world production) of okra produced from over 0.35 million ha land (FAO STAT 2010).

India is the second largest producer of vegetables and is a leader in the production of peas and okra. Besides, India occupies the second position in the production of brinjal,.cabbage, cauliflower and onion and third position in potato and tomato in the world. Highlighting the virtues of protected cultivation to boost

horticulture productivity, a Rs 30,000 crore (US$ 6.07 billion) outlay has been proposed for bringing at least 10 per cent of the horticulture crop area in India under this high tech cultivation practics in the 12th Five Year Plan (2012-2017).

Indian subcontinent is endowed with favorable climate which permits growing of vegetables throughout the year. Vegetables play an important role in balanced nutrition as they are valuable source of carbohydrates, proteins, vitamins and minerals. The Per capita consumption of the vegetables in India is 160 g per day per person as against recommendation of 300 g per day per person. According to this statistics, we need to produce approximately 0.3 MT of vegetables per day for the present population. The present earning through vegetables export is little bit exceeding to Rs. 300 crores. Nature has endowed our country with vast diversity of land, soil and agro-climatic conditions which enables to produce varied types of vegetable crops. The area and production of vegetables are increasing year after year after the green revolution. There is substantial increase in production and productivity of vegetable crops. Due to growing of improved hybrid varieties and adoption of improved cultivation technologies, India's share in the world production of vegetables is about 7 per cent (Anonymous**,** 1999).

Okra or ladies finger is an important vegetable of the tropical countries and most popular in India, Nigeria, Sudan, Iraq, Pakistan, *etc.* Okra is found in it's wild state on the alluvial banks of the Nile and the Egyptians were the first to cultivate it in the basin of the Nile (12'th century BC). It was propagated then through North Africa to the Mediterranean, the Balkans, and India. It arrived then in the America at Brazil (1658), Dutch Guinea and at New Orleans before extending in the United States and going up to Philadelphia in 1781. Its scientific name is *"Abelmoschus esculentus"* and also *"Hibiscus esculentus"*, it belongs to the family Malvaceae. It is a tropical plant,

which grows best in warmer climates. It's ready to harvest in around 60 days when the blooms begin to open, and is slightly tough. They have to be picked about 4-5 days after flowering in the fall. Okra varies in shades of green and can be smooth or has ribbed surfaces. (Varmudy, 2010)

Area and production of okra in India is 452,000 ha. and 4,803,000 MT. in Nigeria 387,000 ha. and 1,039,000 MT. and in Sudan 21,926 ha. and 223,650 MT. Here the share of India is 67.1 per cent, followed by Nigeria at 15.4 per cent and Sudan at 9.3 per cent. (FAO, 2010). In India, okra is grown throughout except in the mountain regions. The major producers are West Bengal, Bihar, Orissa, Andhra Pradesh and Gujarat. As far as area under okra cultivation in India is concerned, Orissa has an area of 74 thousand ha, West Bengal has an area of 73.1 thousand ha under okra cultivation followed by Gujarat, Andhra Pradesh, Jharkhand and others states. In terms of okra production, it is 0.83 million tonnes in West Bengal, 0.65 million tonnes in Orissa and 0.43 million tonnes in Andhra Pradesh. The average productivity in India is 10.5 tonnes per hectare. The highest productivity is in Andhra Pradesh at 15 tonnes per hectare followed by Jharkhand at 14 tonnes per hectare. The total area under this crop has increased over the years.

We eat food for good growth of our body. The food we eat contains nourishing substances called nutrients. There are five major nutrients, namely carbohydrates, proteins, fats, minerals and vitamins. It has an average nutritive value of 3.21 gm, which is higher than tomato, pumpkin and ashgourd. It contains 27 gm of carbohydrates, 2.2 gm of proteins, 0.29 gm of fat, 90 mg of calcium, 50 mg of phosphorus, 15 mg of iron and 16 mg of vitamin C per 100 gm of edible portion. The seeds contain 18-20 per cent oil and 20-23 per cent crude protein. Soups and stews of okra are popular dishes in India. The seeds, when ripe are sometimes roasted and used

as a substitute for coffee. The roots and stems of okra are used for clarification of sugarcane juice before it is converted into jaggery and brown sugar. The crop is used in the paper industry and fibre is extracted from its stem. Okra is considered by many as a super-vegetable with a lot of nutrition and medicinal benefits. Fibre also helps in stabilising blood sugar. The mucilage not only binds cholesterol but also the bile acid carrying toxins dumped into it by the liver. Its fibre absorbs water and helps to prevent constipation. In fact, its slippery characteristics, which people dislike, facilitates elimination of excess cholesterol and toxins from the body.

There are many medicinal importance of okra; (i) The tender fruit is boiled and administered in fevers, gastric ulcers, catarrh, inflammation of the mucous membrane, difficulty in urination and dysentery. (ii) It is also considered remedy for spermatorrhea (involuntary discharge of the semen), syphilis, gonorrhea, and other disorders of the genitals. (iii) The fruit is also reported to increase sexual potency. (iv) The unripe fruit is eaten for tuberculosis of the lungs. (v) The infusion of the seeds will induce perspiration *etc*.

Okra can be grown in a wide range of soils – sandy loams to clay loams, provided they are well drained and supplied with enough organic matter. Main Okra growing season is Kharif (rainy season) June-July. However, it can be grown in September-October, January- February and also in summer season, where assured irrigation facilities are available (www.indiaagronet.com).

Out of 137.00 lakh hectares geographical area of Chhattisgarh, 43 per cent area comes under cultivation. On the basis of climate and topography the state is divided into three agro climatic zones i.e. Chhattisgarh plains, Northern hills and Bastar Plateau. Horticulture exports has helps the country to earn 14,000 crore tones in the year of 2011-2012. Indian horticulture has crossed of production all time of over 240 million tones in the year of 2011-2012.

The Chhattisgarh state has wide variability of climate and soil which gives good opportunities to the farmers for growing a wide range of horticulture crops such as fruits, vegetable, tuber crops, mushroom, ornamental crops, medicinal and aromatic plants, spices and plantation crops like coconut, cashew nut, *etc*. Horticultural crops are the means of diversification for making agriculture more profitable by optimum utilization of available resources and also creating skilled employment to rural people specially rural women. Changing scenario encourage investment on hi-tech horticultural crop production with micro propagation, drip irrigation, protected cultivation and pest management. As a result to this effect horticultural crop production has moved from confines to commercial ventures which is need of Chhattisgarh state.

In Chhattisgarh, vegetables are grown in area of about 3.34 lack ha with the production of 41,49,042.11 M. tones. Chhattisgarh stands eight rank in okra cultivation in the India. In Chhattisgarh the total area under okra cultivation is about 25233.23 ha. and the production of okra is about 249048.12 MT. with productivity 9.86 MT/ha. hold in 4.78 per cent share of the total production in India. Raipur, Durg, Bilaspur and Dhamtari districts are major okra growing region in Chhattisgarh. (NHB, 2009-10).

The adoption process is the mental process through which an individual passes from first hearing about an innovation to final adoption. As distinguished from adoption the diffusion process is the spread of a new idea from its source of innovation or creation to its ultimate users or adopters. Earlier researchers had shown that majority of the farmers are still lagging behind in the adoption of modern technology. It may be a serious concern for the planners, policymakers, agricultural scientist and extension workers. Therefore it is necessary to assess the level of

knowledge and adoption and also to know the problems or constraints in adopting modern okra production technologies. Keeping this in view, the present research project entitled **"Study on Extent of Adoption of Recommended Okra Production Technology Among The Farmers of Dhamtari District of Chhattisgarh State"**, was under taken.

Several studies have been conducted on vegetable crops to know the knowledge and adoption of recommended cultivation practices but very few research studies have been conducted on okra crop. In this regard the present study was undertaken with the following specific objectives.

1. To study the Socio-personal, Socio-economic, Socio-psychological and Communicational characteristics of Okra growers,

2. To know the level of knowledge about the recommended cultivation technology of Okra by Okra growers,

3. To assess the extent of adoption of recommended cultivation technology of Okra by Okra growers,

4. To analyze the relationship between dependent and independent variables, and

5. To identify the constraints in adoption of Okra production technology and to obtain the suggestions from the Okra growers to overcome the constraints.

Scope and importance of study

Okra farming unlike other crop husbandry requires specialized type of farming techniques and skill. The demand for okra is increasing. Okra fetches good price in a comparatively shorter period of time.

The success of any such enterprise depends upon participation of more farmers in it. Similarly extension workers have to play a more vital role to educate the

farmer to take up okra production on their farms. This change has to be brought about in which the context in the Indian farmer operates and live.

The present study is therefore an attempt to understand the level of adoption and potential characteristics of okra growing farmers. This may help extension personnel in boosting okra production by locating such farmers and providing necessary facilities to them.

Limitation of the study

The study is confined to Dhamtari and Kurud block of Dhamtari district of Chhattisgarh state. As such the inferences drawn can not be generalized. They may be however, applicable to the similar condition.

The present investigation suffered from the limitations of inadequacy of money, time and other resources usually faced by a single student investigator. Limitation of time has set up a barrier for probing into more dimensions of the research. However, considerable care and thought have been exercised in selecting variables, so that all the objectives could be fulfilled.

Physical and functional limitations sighted during the present study are narrated below:

1.   The study area was restricted to only sixteen typical representative villages in Dhamtari and Kurud block of Dhamtari district.

2.   Only few important package of practices had been selected for the study, which was supposed to be more relevant with the high yield.

3.   Only 160 respondents were selected for the investigation from the sixteen selected villages.

4.   The study largely relied on the responses of the farmers according to their memory. They were often reluctant to give precise information on most of the

delicate matters, but they were tackled by establishing a thorough rapport with them.

5.   The study is partly based on official statistics available from different publications of the Govt. of India, Govt. of C.G. etc. It is needless to refer to time lag in the publication of official statistics. However, the available latest statistics have been utilized.

6.   Some scales, measurements and tests were used, but due to variations in rural conditions, the administration had to be done with minor modifications to ensure more reliable and effective results.

Review of Literature

CHAPTER – II
REVIEW OF LITERATURE

In any scientific investigation a comprehensive review of literature is an essential part. Plays important role and it guides the research work for their research work and aquaint themselves with the earlier work done in the related fields. In addition it also provides basis for developing a theoretical framework and deriving hypothesis. In this chapter, relevant literature having direct and indirect relation with the objectives of the present study has been reviewed under the following heads:

2.1 Socio personal characteristics

2.2 Socio-economic characteristics

2.3 Communicational characteristics

2.4 Socio-psychological characteristics

2.5 Constraints in adoption of recommended okra production technology

2.6 Suggestions to overcome the constraints in adoption of recommended okra

production technology

2.1   Socio personal characteristics

2.1.1   Education

Aghav (1997) reported that the maximum number of the vegetable growers (33.33%) were illiterate, followed by 20.00 per cent, 16.66 per cent, 10.65 per cent and 19.36 per cent respondents had primary, secondary, high school and college level education, respectively.

Khare *et al.* (2002) indicated that with regards to socio-personal attributes of vegetable growers belonged to medium to high level of education.

Nagesha (2005) revealed that 33.3 per cent of farmers were educated upto high school.

Farinde *et al.* (2006) found that majority (51.0%) of the okra growers were literates who have access to intermediate farm technology while 49.0% of the respondents did not have any formal education.

Krishnamurthy *et al.* (2008) revealed that most of the vegetable growers were literates (up to 8 to 10 standard).

Pramanik *et al.* (2008) revealed that maximum number of the vegetable growers (40.66%) were illiterate.

Chowdhary and Ray (2010) revealed that the maximum numbers of the vegetable growers (33.33%) were educated up to middle school level, whereas 18.67 per cent were educated up to primary school level.

Gour and Bishnoi (2010) revealed that the majority of the women vegetable growers (60 %) were illiterate.

Lad *et al.* (2010) studied and revealed that 38.33 per cent of okra growers were educated up to higher secondary school level, 23.33 per cent of respondents had taken education up to high school level, 18.35 per cent of respondents were educated up to college level, 8.33 per cent of respondents could read and write only and remaining 3.33 per cent of respondents were illiterate.

Singh *et al.* (2010) revealed that education level of farmers was found to have positive and significant contribution with adoption of improved vegetable cultivation technology.

Ram *et al.* (2010) observed that the majority of the vegetable growers (50.00%)studied up to graduation and above, followed by high school and intermediate (24.7%), middle school (18%), primary school (6.7 %) and 0.6 per cent farmers can read and write only.

2.1.2 Caste

Khare *et al*. (2002) revealed that majority of vegetable growers had belonged to OBC category.

Singh *et al.* (2009) revealed that 46 per cent of contact farmers were of backward cast followed by upper caste (34%).

Chowdhary and Ray (2010) investigated that middle caste was the predominant caste community with 52.67 per cent of the vegetable growers belonging to that community, followed by scheduled caste community with 34.67 per cent.

Sings *et al*. (2010) revealed that, caste were found to be positive but non-significantly correlated with the adoption of vegetable cultivation technology.

Suman (2011) revealed that majority (81.50%) of the farmers were belonged to general category.

2.1.3 Family size

Khare *et al.* (2002) observed that majority of vegetable growers had small family size.

Krishnamurthy *et al.* (2008) revealed that most of the vegetable growers were having small sized families (one to six members).

Chowdhary and Ray (2010) revealed that the small families (up to 4 members) constituted a majority among the respondents with 54.67 per cent, followed by the medium family (5-8 members) with 40 per cent of vegetable growers.

Ram *et al.* (2010) observed that majority (64.7%) of the farmers were belonged to small families.

Sings *et al*. (2010) revealed that, family size was found to be positive but non-significantly correlated with the adoption of vegetable cultivation technology.

Mazumder *et al*. (2011) revealed that the family size were significantly associated with the adoption for delineating the adoption behavior of the winter vegetable growers.

2.1.4   Social participation

Shashidhara (2006) indicated that more than fifty per cent of the respondents were members of co-operative society (51.87%), followed by youth club (19.38%), gram panchyat (6.88%) and taluk panchyat (1.88%). Only 18.88 per cent of them were office bearers of village panchyat.

Lad *et al.* (2010) observed that most (58.33 per cent) of okra growers were having medium level of social participation, followed by 27.50 per cent of the respondents had low level of social participation and only 5.00 per cent of them were having high level of social participation and remaining 9.16 per cent of them had no social participation.

Sings *et al*. (2010) revealed that, social participation was found to be positive but non-significantly correlated with the adoption of vegetable cultivation technology.

Mazumder *et al*. (2011) revealed that the social participation were significantly associated with the adoption.

2.2   Socio-economic characteristics

2.2.1   Land holding

Aghav (1997) reported that the majority of the vegetable growers (75.92%) had below 2 hectares of land, 12.65 per cent of the respondents had 2 to 8 hectares of land, while 11.43 per cent of the respondents possessed above 8 hectares of land.

Jassi *et al*. (1998) reported that the majority of the farmers (50.00 %) had small size of land holding, followed by 32.00 per cent of the respondents with

medium size of land holding and only 18.00 per cent of the farmers were having large size of land holding for horticulture and vegetable crops.

Kadam (2002) noticed that the majority of the farm women (40.00%) had small size of land holding for post harvest technology of vegetable.

Khare *et al.* (2002) observed that majority of vegetable growers had small size of land holding.

Farinde *et al.* (2006) revealed that majority of okra growers had farm size of 3.64 acres with standard deviation of 2.58 acres.

Singh *et al.* (2009) noted that under land holding traits 50.00 per cent belonged to small category.

Chowdhary and Ray (2010) investigated that the majority of the vegetable growers (92.00%) held operational land holding whose size was up to 1 hectare, 7.33 per cent of the respondents had operational land holding whose sizes varied from 1.01-2 hectare.

Gour and Bishnoi (2010) revealed that majority of the women farmers of vegetable (53.75%) had farm size below one acre.

Lad *et al.* (2010) showed that the maximum number of the okra growers (44.66%) were from medium land holding category, followed by 29.16 per cent of the respondents who were from small land holders and 24.18 per cent of them were big land holders.

Ram *et al.* (2010) revealed that the majority of the vegetable growers (95.33%) were having vegetable holding between 0-2.5 ha followed by 4.67 per cent respondents with more than 2.5-5 ha land.

2.2.2   Occupation

Nagesha (2005) found that majority of vegetable seed producing farmers (55.0%) were dependent only on agriculture.

Singh *et al.* (2009) evident from the all of the farmers (100%) have agriculture as their main occupation.

Chowdhury and Ray (2010) observed that none of the total of 150 numbers of vegetable growers had agriculture as their secondary occupation.

Gour and Bishnoi (2010) observed that the majority of the farmers (90%) had only agriculture occupation and maximum were women vegetable growers (10.00 %).

Rahim and Nataraju (2011) observed that the occupation of fathers of majority of the students in general (60 %) had farming followed by business (15.00 %). Among different campuses of GKVK College, 60 per cent of students of Mandya college and 50 per cent of fathers of Shimoga college students had farming occupation followed by 40.00 per cent of fathers of students of Shimoga college.

Suman (2011) revealed that majority (99%) of the farmers had agriculture as their main occupation.

2.2.3 Annual income

Aghav (1997) revealed that the majority of the vegetable growers (62.68%) had annual income up to Rs. 36,000/-, followed by 20.00 per cent and 17.32 per cent respondents who had annual income between Rs. 36,000/- to 47,000/- and more than Rs. 74,000/- respectively.

Kadam (2002) noticed that the most of the farm women (56.67%) had low category of annual income.

Nagesha (2005) revealed that 70 per cent of vegetable seed producing farmers were from medium income group.

Chowdhary and Ray (2010) revealed that majority of the vegetable growers who nearly constituted 56.00 per cent of the total number of respondents were earning a meager family income of Rs.2000/- only or less per month, followed by 28.00 per

cent of the respondents whose families earned Rs.2001/- to Rs. 3000/- only per month.

Lad *et al.* (2010) It is observed that 57.5 per cent of the okra growers were having medium income level against that 26.66 per cent of the respondents had high level of annual income were as 15.83 per cent of them were in low income category.

Ram *et al.* (2010) found that 62 per cent, 29.3 per cent and 8.67 per cent of the respondents had annual average income Rs. 20,000-90,000 (medium category), below Rs.10,000 (low category) and Rs. 20,000 above (high category) of the vegetable growers.

Singh *et al.* (2010) noticed that annual income from vegetable was significantly correlated with adoption.

2.2.4   Credit Acquisition

Baloch *et al.* (2006) revealed that 54 per cent of the farmers interviewed needed loan for purchase of fertilizers and insecticides etc.

Dhruw (2008) indicated that the majority of the respondents (50%) had taken loan from nationalized bank.

Patel (2008) indicated that the majority of the respondents (89.33%) had acquired short term credit, 41.00 per cent respondent's utilized cooperative society as the source of credit and majority of respondents (82.09%) believed that the availability of credit was very easy and quick.

Nwaliej and Ajayi (2009) evident from that all (100.0%) of the PFs had personal/savings as their main source of credit/finance while 22.5% had their source of credit/finance from friends/relatives. 42 percent had source of credit/finance from Esusu Clubs. On the other hand, majority (77.5%) of the NPFs regarded personal/

savings as their main source of credit/finance About 23 and 18% of them sourced their credit/finance from friends/relatives and Esusu clubs, respectively.

2.3 Communicational characteristics

2.3.1 Source of information

Shivamurthy and Girija (2002) Results revealed that the farmers favoured television, radio, newspaper and fellow farmers as major sources of information compared to other sources.

Kalita *et al*. (2005) found that utilization of sources of information showed the highest positive correlation to adoption behavior of vegetable growers.

Shashidhara (2006) revealed that 43.12 per cent of the respondents regularly participated in krishimela. Followed by a meager percentage of respondents participated regularly in demonstrations (6.25%), training progrmmes (5.52%), agriculture tours (2.50%) and field days.

Krishnamurthy *et al*. (2008) revealed that around two third of the farmers (67.50%) exhibited medium to high level of radio listening behavior. Majority of farmers showed medium to high level of televiewing behavior (70%)

Gour and Bishnoi (2010) revealed that women farmers often used personal locality channels *viz.* progressive farmers and their friend to receive knowledge regarding vegetable production technology.

2.3.2 Contact with extension agencies

Antwal *et al*. (1991) found that 77.77 per cent of the rural women were unable to have personal contact with extension workers about training needs, worked on similar topic

Chaudhari *et al*. (1991) noted that 52.80 per cent and 46.93 per cent of the peasant women had low and medium extension contact about training needs.

Umadevi (1992) observed that almost equal per cent of rural farm women (35.43%) were under medium and low categories of extension contact, while 29.17 per cent were under high category of extension contact about impact of training and extension contact.

Nagesha (2005) indicated that majority (61.7%) of farmers belonged to medium extension contact category

Abd-Elrazig (2008) revealed that only 24 per cent of the farmers claimed that they met with the extension personnel during the season and 12 per cent of them were trained in vegetable IPM through Farmers Field Schools (FFSs).

Lad *et al.* (2010) evident that majority of the okra growers had medium level of extension contact (70.83%) and 21.66 per cent of the respondents were having low level of extension contact and remaining 7.5 per cent of them had high level of extension contact.

Sings *et al*. (2010) revealed that, extension contact was found to be positive but non-significantly correlated with the adoption of vegetable cultivation technology.

Yavanapriya *et al.* (2011) showed that the maximum number of the farm women (42.50%) were having medium extension contact, followed by 30.80 and 26.70 per cent of respondents belong to high and low extension contact in participation in farm filed school.

2.4   Socio-psychological characteristics

2.4.1   Knowledge about recommended okra production technology

Basavaprabhu *et al.* (1997) reported that 44.44 per cent vegetable growers had medium level of knowledge while 31.12 per cent and 24.44 per cent respondents had high and low level of knowledge, respectively.

Aghav (1997) reported that 48.72 per cent of the vegetable growers had medium level of knowledge while 23.31 per cent respondents had low level of knowledge and 27.33 per cent and 18.00 per cent of the respondents had low and high level of knowledge, respectively.

Singh *et al*. (2005) observed that 94 per cent of the okra growers had recommended sowing rate was used. More than 25% of the respondents had given first irrigation as recommended; some supplied less or more irrigation.

Babu *et al*. (2007) revealed that 52.22% of the respondents had a medium level of knowledge while 47.78% had a high level of knowledge about vegetable marketing.

Rao *et al.* (2007) revealed that 31 per cent of the vegetable growers had high level of knowledge, 44% had medium and 24 per cent of the respondents had low level of knowledge with regard to IPM practices.

Lad *et al*. (2010) findings revealed that majority (92.50 per cent) of the respondents adopted ridges and furrow method of irrigation. About 91.66 per cent and 86.66 per cent of the respondents had applied irrigations as per recommendation and applied protective irrigations, respectively. 90.00 per cent of them had adopted proper time of harvesting of okra crop, while 80.83 per cent of the respondents followed recommended climatic conditions for okra crop.

2.4.2. Extent of adoption of recommended okra production technology

Lomate (1977) stated that 15.38 per cent vegetable growers were high adopter while as 18.47 per cent and 16.47 per cent of them were observed in medium and low level adoption category, respectively.

Waghmare (1983) found that 34.00 per cent, 36.00 per cent and 30.66 per cent respondents were in high adoption level category in respect of use of planting

material, fertilizer and protection measures respectively. Whereas 48.00, 42.00 and 34.00 per cent respondents were located in medium adoption level of same

Bhople and Ambarkar (1996) stated that majority of leafy (61.60%) and fruity (75.00%) vegetables growers adopted improved practices at medium extent, while high level of adoption was found in case of 16.67 per cent leafy and 11.67 per cent fruity vegetable growers.

Aghav (1997) reported that more than half of the respondents (55.35%) had medium adoption level of recommended practices of vegetable technology, while 24.65 per cent and 20.00 per cent of them were from low and high level of adoption, respectively.

Kadam *et al*. (1998) observed that less then two third i.e. 65 per cent of adopters had medium extent of adoption, while 21.00 per cent of them had low and 14.00 per cent had high extent of adoption of improved varieties of vegetable growers.

Krishnamurthy *et al.* (2008) found taht the vegetable growere adopted improved varieties and irrigation management and they neglected improved practices in nursery raising and pest management.

2.5   Constraints in adoption of recommended okra production technology

Singh *et al.* (2005) revealed that scarcity of labour was identified by 83.33 per cent of the respondents as the main constraint in okra production.

Nagesha (2005) revealed that majority of the vegetable seed producing farmers (100%) were facing problem of high incidence of pest and diseases.

Khan, M.A.K.N.U.Z. (2007) found major constraints in vegetable production were lack of capital, credit availability and lack of marketing facilities.

Krishnamurthy *et al.* (2008) revealed that vegetable growers were faced major technical constraints in irrigation and pest management. High cost of inputs was the major economic constraint and marketing constraints were storage and lack of processing unit.

Singh *et al*. (2011) noted majority of the farmers expressed that lack of control measures for weed, high cost of pesticide and fertilizer, lack of marketing, impure seeds and chemical, timely labour availability as the major reasons for non-adoption of improved technologies and also significant correlation between extension contact and knowledge and adoption of improved technology was found.

2.6 Suggestions to overcome the constraints in adoption of recommended okra production technology

Khare *et al.* (2002) revealed that majority of vegetable growers is suggested that a good marketing orientation, medium level of aspiration and had their favourable attitude towards vegetable cultivation.

Nagesha (2005) observed that about 44.1 per cent of vegetable seed producing farmers suggested for adopting integrated pest management and integrated nutrient management.

Singh *et al.* (2005) revealed that the majority of the respondents (68.67%) suggested that new cultivars resistant to diseases and insects should be developed.

Babu *et al*. (2007) suggested that relevant training will definitely improve the knowledge levels of the vegetable growers.

Chowdhury and Ray (2010) stated that extension agencies should be made more efficient to acquaint the farmers for the recent developments in the plant protection measures and IPM techniques in the vegetable cultivation. The extension agencies both public sector and private sector should focus their campaign on

educating the vegetable growers on the number of different chemical groups of the pesticides used, frequency of the pesticide use, quantity of the pesticides use and the strength of the different pesticides to be used and the Economic Threshold Level (ETL) of the attacking pests in the vegetable cultivation.

Singh *et al.* (2011) suggested that there is a need to strengthen communication methods like TV and radio by extending the duration of farm programs and providing specialized training to the growers. Research efforts should be strengthened to develop multiple disease, pest and weed-resistant varieties and direct supply of these varieties to farmers. It is observed that cooperative farming may solve the problem of small farmers in respect to post-harvest management and value-addition.

Research Methodology

CHAPTER III

RESEARCH METHODOLOGY

The chapter deals with description of procedure followed for carrying out the investigation. It contains the tools and techniques employed for data collection, the sampling procedure adopted as well as the devices used for analysis of data are also explained. The present investigation "study on extent of adoption of recommended okra production technology among the farmers of Dhamtari district of Chhattisgarh state" was conducted during the year 2011-12. The detailed description of the methods and procedures of investigation used during the entire course of study are presented under the following heads:

3.1   Location of study.

3.2   Sample and sampling procedure.

3.3   Independent and dependent variables.

3.4   Operationalization of independent variables and its measurement.

3.5   Operationalization of dependent variable and its measurement.

3.6   Constraints faced by the okra growers in adoption of recommended okra production technology.

3.7   Suggestions given by the okra growers for minimizing the constraints.

3.8   Type of data.

3.9   Developing the interview schedule.

3.10   Method of data collection.

3.11   Data processing and statistical framework used for analysis of data.

3.1   Location of the study

The study was conducted in one purposively selected district of Chhattisgarh state namely "Dhamtari". Dhamtari district is situated in the fertile plains of

Chhattisgarh region between 20042' N latitude and 81°33' E longitude. The total area of the Dhamtari district is 2029 Sq. km. and 305 meter above the mean sea level. The district is surrounded by district Raipur in north, district Kanker and Baster in south part, Orissa state in east and district Durg as well as Kanker in west.

Mahanadi is the principal river of the district and one of the major river in central India originated in the hills of Sihawa of this district and flows in the direction of east in to the Bay of Bengal. The chief crop of this region is paddy and also vegetable crops are grown in the banks of river.

The Ravishankar sagar dam located in the district irrigates about 57000 hactare of land and also acts as a main supply unit of safe drinking water resources for state capital Raipur as well as supply to Bhilai steel plant lies at 20 km. away from the district capital.

3.2   Sample and sampling procedure

3.2.1   Selection of block

Out of total four blocks in Dhamtari District two blocks namely Dhamtari and Kurud were selected purposively for the present study.

3.2.2   Selection of village

Out of total 143 villages in Dhamtari block and 138 villages in Kurud block, 16 villages (10 villages from Dhamtari block and 6 villages from Kurud block) were selected purposively for the present study.

3.2.3   Selection of respondents

From each selected village a representative sample of 30 per cent farmers were selected randomly from total okra grower. In this way total 160 farmers were considered for the present study.

INDIA

CHHATTISGARH

N

DHAMTARI DISTRICT

DHAMTARI BLOCK

DHAMTARI

KURUD BLOCK

KURUD

INDEX

STATE BOUNDARY
DISTRICT BOUNDARY
BLOCK BOUNDARY
DISTRICT H.Q.
BLOCK H.Q.
RAILWAY LINE
SELECTED VILLAGE
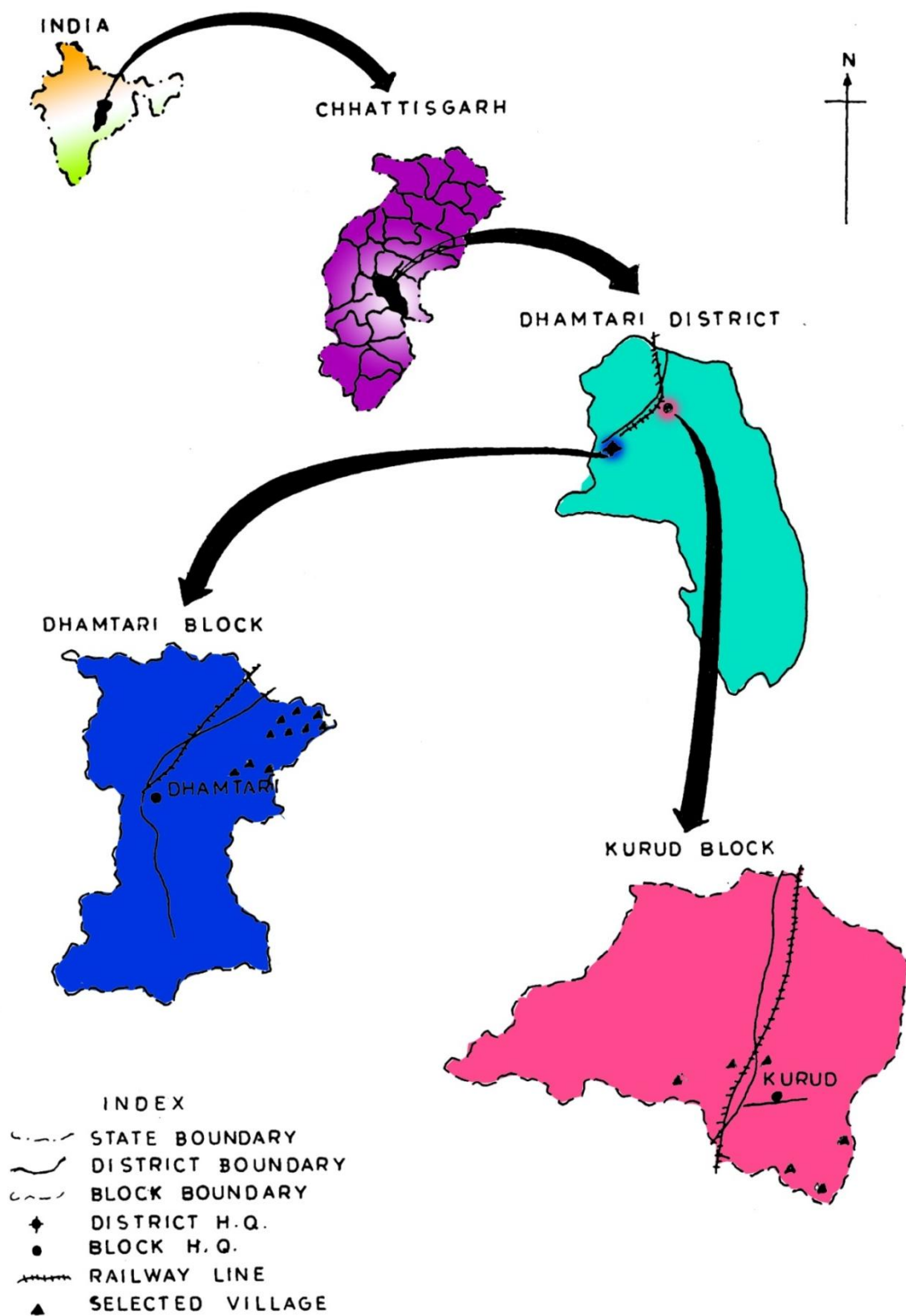
Researcher obtaining the information from the respondents

Researcher obtaining the information from the respondents

Table 3.1: Details about selected study area and number of respondents

S.No.	Name of village	Total okra growers	Per cent	Farmers
1.	Jhiriya	63	30	19
2.	Devri	20	30	6
3.	Semra	40	30	12
4.	Jhura nawagaon	20	30	6
5.	Boda chhapar	20	30	6
6.	Barna	40	30	12
7.	Sivni	50	30	15
8.	Bharari	20	30	6
9.	Darri	23	30	7
10.	Sarang puri	33	30	10
11.	Jora tarai	47	30	14
12.	Sindhavri	30	30	9
13.	Mandroud	20	30	6
14.	Rakhi	30	30	9
15.	Chorbhatti	27	30	8
16.	Charmudia	50	30	15
Total		533		160

3.3 Independent and dependent variables

3.3.1 Independent variables

Socio-personal characteristics	Socio-economic characteristics	Communicational characteristics	Socio-psychological characteristics
❖ Education ❖ Caste ❖ Family size ❖ Social participation	❖ Land holding ❖ Occupation ❖ Annual income ❖ Credit acquisition	❖ Source of information ❖ Contact with extension agencies	❖ Knowledge about recommended okra production technology

3.3.2 Dependent variable

❖ Extent of adoption of recommended Okra production technology

3.4 Operationalization of independent variables and their measurement

3.4.1 Socio-personal characteristics

3.4.1.1 Education

The reading and writing ability acquired by the respondents were considered as their education status and it was categorized as under:

Categories	Score
➢ Illiterate	0
➢ Primary school (1st to 5th)	1
➢ Middle school (6th to 8th)	2
➢ High School (9th to 10th)	3
➢ Higher Secondary School (11th to 12th)	4
➢ College and above	5

3.4.1.2 Caste

The caste of respondents was categorized as follows:

Categories	Score
➢ Scheduled Tribe (ST)	1
➢ Scheduled Caste (SC)	2
➢ Other Backward Class (OBC)	3
➢ General	4

3.4.1.3 Family size

The number of members living in the respondent's family were considered as size of family of the respondents. They were categorized as follows:

Categories	Score
Small (Up to 4 members)	1
Medium (5 to 10 members)	2
Large (> 10 members)	3

3.4.1.4 Social participation

The term social participation in this study refers to the degree of involvement of the respondents in formal/informal organization as a member of executive office

bearer or both. A social participation score was computed for each respondent on the basis of his membership and position in various formal/informal organizations and categorized into following subheads:

Categories	Score
No member in any organization	0
Member of one organization	1
Member of more than one organization	2
Executive/office bearer in any organization	3

3.4.2 Socio-economic characteristics of the respondents

3.4.2.1 land holding

It was operationally defined as the actual land holding of the respondents at the time of investigation. The categorization of the respondents were done under the following subheads:

Categories	Score
Marginal (up to 1 ha)	1
Small (1.1 to 2 ha)	2
Medium (2.1 to 4 ha)	3
Big (above 4 ha)	4

3.4.2.2 Occupation

The data collected from the respondents about their occupation were categorized into 6 groups and measured with scores assigned as under:

Categories	Score
Agriculture (okra cultivation)	1
Agriculture (okra cultivation)+ labour	2
Agriculture (okra cultivation)+ service	3
Agriculture (okra cultivation)+ service + animal husbandry	4
Agriculture (okra cultivation)+ service + animal husbandry +business	5
Agriculture (okra cultivation) + other	6

3.4.2.3 Annual income

In this study, total annual income from all the available sources of the respondents were obtained and categorized under the following heads:

Categories	Score
Low (Less than Rs 50,000)	1
Medium (Rs 50,001 to 1,00,000)	2
High (Rs 1,00,001 to 1,50,000)	3
Very high (More than Rs 1,50,000)	4

3.4.2.4 Credit acquisition

The availability of credit needed to purchase the required inputs may influence the extent of adoption of the farmers. The adoption of improved agricultural technology requires more investment of capital in farming to purchase the inputs like fertilizers, pesticides, improved seed, implements *etc*. Sources of credit were identified including cooperative society, nationalized banks, moneylenders, friends, neighbours, relatives *etc*. and each source was given equal weightage and the availability of credit identified by farmers were then measured by the following scores.

Categories	Score
Not acquired	0
Acquired	1
Period of credit	
Short-term	1
Medium-term	2
Long-term	3
Availability of credit	
Acquired with difficulty	1
Acquired easily	2

3.4.3 Communicational characteristics of the respondents

3.4.3.1 Source of information

A set of 14 information sources were identified including personal, group and mass media *etc*. and each source was given equal weightage and categorised according to the use of information sources.

The responses of respondents regarding use of information sources were obtained into three point continuum as under.

Category	Score
No use	0
Occasional use	1
Frequent use	2

The respondents were grouped into three categories according to use of information sources by using following equation:

S.O.I. = Mean ($\overline{X}$) ± S.D. (Standard Deviation)

Categories	
Low level of use of information sources	$(< \overline{X} - \text{S.D.})$
Medium level of use of information sources	(in between $\overline{X} \pm \text{S.D.}$)
High level of use of information sources	$(> \overline{X} + \text{S.D.})$

3.4.3.2 Contacts with extension agencies

This was operationally defined as the "frequency in which a respondents comes in contact with extension agents i.e. RAEO's, ADO's, subject matter specialist (SMS) and Agricultural scientist within a specific period of time". The extent of contact was measured into four categories viz., never, twice or thrice in a year, once in a month, weekly and daily with a score 0, 1, 2, 3 and 4 respectively.

The respondents were grouped into three categories of extension contact by using following equation:

Extension Contact Index = Mean ($\overline{X}$) ± S.D. (Standard Deviation)

Categories	
Low level of extension contact	$(< \overline{X} - S.D.)$
Medium level of extension contact	(in between $\overline{X} \pm S.D.$)
High level of extension contact	$(> \overline{X} + S.D.)$

3.4.4 Socio-psychological characteristics of the respondents

3.4.4.1 Level of knowledge about recommended okra production technology

English and English (1961) defined knowledge, as a body of understandable information possessed by an individual or by culture.

Rogers (1983) stated that knowledge is of three types namely awareness knowledge, how to knowledge and principle knowledge. In the present study awareness knowledge was studied and the study was confined, to the technical information possessed by the respondents about recommended okra production technology. The same was measured by constructing a teacher made knowledge scale.

The knowledge test consisted of items called questions covering all the package of practices of okra production technology. The set of questions developed was discussed with the subject matter specialists from different disciplines who were members of advisory committee. in this way Total 20 questions were finalized.

A teacher made scale was developed to measure the knowledge level of farmers regarding selected technologies recommended for okra crop, and was used with some modifications. The responses of respondents regarding knowledge were obtained into three point continuum as under.

Categories	Score
Incomplete knowledge	0
Partial knowledge	1
Complete knowledge	2

The knowledge index was worked as follows:

$$KI = \frac{O}{S} \times 100$$

Where,

KI = Knowledge index

O = Sum of knowledge score actually obtained by the respondents

S = Maximum possible obtainable knowledge score by the respondents

Further, the respondents were classified in to three categories by using following equation:

K.I. = Mean ($\overline{X}$) ± S.D. (Standard Deviation)

Categories	
Low level of knowledge	$(< \overline{X} - \text{S.D.})$
Medium level of knowledge	$(\text{in between } \overline{X} \pm \text{S.D.})$
High level of knowledge	$(> \overline{X} + \text{S.D.})$

3.5   Operationalization of dependent variable and its measurement

3.5.1 Extent of adoption regarding recommended okra production technology by okra growers.

It is mental process through which an individual passes from hearing about an innovation to final adoption (Rogers, 1995).

It was operationalized as the degree of the use of recommended practices. Adoption refers to the extent of use of recommended farming practices of okra production by okra growers. Extent of adoption of respondents about practices in okra cultivation was measured by undertaking the recommended package of practices for obtaining higher production of okra released by Indira Gandhi Krishi Vishwavidyalaya, Raipur.

To measure extent of adoption, recommended important practices were listed and responses for each of the practices were obtained into three point scale as under:

Categories	Score
Not adopted	0
Partially adopted	1
Fully adopted	2

The farmer's extent of adoption was ascertained in terms of selected practices of okra production technologies adopted. The adoption index was worked out as follows:

$$AI = \frac{O}{S} \text{ x } 100$$

Where,

AI = Adoption index

O = Sum of adoption score actually obtained by the respondents

S = Maximum possible obtainable adoption score by the respondents

The respondents were classified into three categories by using following equation:

A.I. = Mean ($\overline{X}$) ± S.D. (Standard Deviation)

Categories	
Low level of adoption	$(< \overline{X} - S.D.)$
Medium level of adoption	(in between $\overline{X} \pm S.D.$)
High level of adoption	$(> \overline{X} + S.D.)$

3.6 Constraints faced by okra growers in adoption of recommended okra production technology

To measure the constraints faced by the okra growers in adoption of recommended okra production technology, simple ranking technique was applied, each farmer was asked to mention his constraints in adoption of recommended okra production technology in order to degree of difficulties.

3.7   Suggestions given by the okra growers for minimizing the constraints

Considering the constraints faced by the okra growers regarding adoption of okra production technology and to overcome the same in adoption of okra production technology successfully, farmers were asked to give their valuable suggestions. The suggestions offered were summed up and ranked on the basis of number and per cent of farmers who reported for the respective suggestions.

3.8   Type of data

The data pertaining to selected characteristics regarding socio-personal, socio-economic, psychological, communicational, adoption, constraints perceived in terms of adoption and suggestions of respondents were collected as per objectives of the study as primary data. The official information's and records were also consulted from the concerning departments as secondary data.

3.9   Developing the interview schedule

The interview schedule was designed on the basis of objectives, independent and dependent variables for present investigation. To facilitate the respondents, the interview schedule was framed in "Hindi". Each question was thoroughly examined and discussed with the experts before preparing the interview schedule. Adequate precautions and care were taken into consideration to formulate the questions in a manner that they were well understood by the respondents and would find it easier to respond.

On the basis of experience gained in pre-testing, the necessary modifications and suggestions were incorporated before giving a final touch to interview schedule. The prepared interview schedule was used in the study area for collecting the data.

3.9.1 Validity

Validity refers to "the degree to which the data collection instruments measures what it is supposed to measure rather than something else". following steps was taken to maximize the validity of interview schedule used for the study:

1. The interview schedule was thoroughly discussed with the scientists and their suggestions were incorporated.

2. Pre-testing of interview schedule provided an additional check for improving the instrument.

3. The relevancy of each question in terms of objectives of study, their logical order and wording of each question were checked carefully.

3.9.2   Reliability

Reliability of an interview schedule refers to "its consistency or stability in obtaining information from respondents".

The test-retest method of estimating reliability of an interview schedule was followed in this study. Thirty respondents of the study area were randomly selected and were re-interviewed after 2 to 3 weeks using the same interview schedule followed at the time of first interview. Since almost same responses were observed, the reliability of the interview schedule was ensured.

3.10   Method of data collection

Respondents were interviewed through personal interview technique. Prior to interview, respondents were taken into confidence by revealing the actual purpose of the study and also full care was taken to develop good rapport with them. They were assured that the information given by them would be kept confidential. The interview was conducted in the most formal and friendly atmosphere without any complications.

3.11   Data processing and statistical framework used for analysis

The data collected during the course of investigation was tabulated into the coding sheet and then appropriate analysis of data was made according to objectives as suggested by Cochran and Cox (1957). The statistics applied were percentage,

frequency, mean, standard deviation, coefficient of correlation, multiple regression *etc*. The analysis was carried out with help of Computer Section of IGKV, Raipur.

3.11.1 Frequency and percentage

Frequency and percentage were used for making simple comparison.

3.11.2 Mean and standard deviation

3.11.2.1 Mean

Mean of sample was calculated by using the following equation:

$$\overline{X} = \frac{\sum X}{n}$$

Where,

$\overline{x}$ = Mean of the variable

$\sum x$ = Sum of score (observation) of variable

n = Total number of respondents

3.11.2.2   Standard deviation

Standard deviation was calculated by using following equation.

$$SD = \sqrt{\frac{\sqrt{\sum x^2 - (\sum x)^2}}{n(n-1)}}$$

Where,

SD = Standard deviation

x = Deviation obtained from mean

n = Number of observations

3.11.3 Pearson's coefficient of correlation

This technique was used to find out the relationship between two variables. The equation used was as follows:

$$r = \frac{n \sum xy - \sum x \sum y}{\sqrt{\{n \sum x^2 - (\sum x)^2\} \cdot \{n \sum y^2 - (\sum y)^2\}}}$$

Where,

r = Correlation coefficient

x = Score of independent variable

y = Score of dependent variable

n = Number of observation

3.11.4 Multiple regressions

This technique was used to know the partial and complete influence of independent variables on dependent variable. For the present study linear model of regression equation was used which is as follows:

$Y_1 = a + b_1x_1 + b_2x_2 + \ldots\ldots + b_nx_n$

Where,

Y_1 = Dependent variable

$x_1\ldots.x_n$ = Independent variables

a = Constant value

$b_1\ldots.b_n$ = the regression coefficient for respective independent variables

Results and Discussion

CHAPTER IV

RESULTS AND DISCUSSION

The chapter deals with presentation, analysis and discussion of the data. The data collected for the study were classified, tabulated, analyzed, presented, interpreted and discussed in a systematic way in accordance with the objectives of the study.

The facts and findings of the study are presented and discussed under the following heads:

4.1   Independent variables

    4.1.1   Socio-personal characteristics of the respondents

    4.1.2   Socio-economic characteristics of the respondents

    4.1.3   Communicational characteristics of the respondents

    4.1.4   Socio-psychological characteristics of the respondents

4.2   Dependent variable

4.2.1   To assess the extent of adoption of recommended cultivation technology of okra by okra growers.

4.3   Correlation and multiple regression analysis of independent variables with adoption of recommended okra production technology by okra growers.

4.4   Constraints faced by the okra growers in adoption of recommended okra production technology.

4.5   Suggestions offered by the okra growers for solving the constraints faced by them in adoption of recommended okra production technology.

4.1 Independent variables

4.1.1 Socio-personal characteristics of the respondents

Education, caste, family size and social participation were considered as socio-personal characteristics of the respondents. The distribution of the respondents according to these characteristics are summarized and presented in Table 4.1.

Education builds the ability of an individual to seek knowledge, understand and utilize things better, hence assessment of respondent's educational attainment was essential. When we discuss the data presented in Table 4.1, we found that 26.88 per cent of the respondents were educated up to middle school level, followed by 22.50 per cent were educated up to primary school level, 20.62 per cent of the respondents were educated up to high school level, 14.38 per cent respondents had education up to higher secondary level, 11.25 per cent of the respondents were illiterate, whereas, 4.33 per cent were educated up to college and above. Finally result clearly indicates that majority of the respondents were having education up to middle school level (Fig.4.1). This finding is in conformity to the findings reported by Kanwar *et al*. (2009) and Chowdhary and Ray (2010).

As regards to caste, majority of the respondents (84.37%) were belonged to other backward class, followed by 8.75 per cent, 5.62 per cent and only 1.26 per cent of the respondents belonged to scheduled tribe, schedule caste and general caste, respectively. It can be concluded from above findings that the majority of the respondent belonged to other backward class (Fig.4.2). This finding is supported to the findings reported by Singh *et al.* (2009).

Table 4.1: Distribution of the respondents according to their socio-personal characteristics

(n = 160)

S.No.	Characteristics	Frequency	Percent
1	**Education**		
	➢ Illiterate	18	11.25
	➢ Primary school	36	22.50
	➢ Middle school	43	26.88
	➢ High school	33	20.62
	➢ Higher Secondary	23	14.38
	➢ College and above	7	4.37
2.	**Caste**		
	➢ Schedule tribes	14	8.75
	➢ Schedule caste	9	5.62
	➢ Other backward class	135	84.37
	➢ General	2	1.26
3.	**Family size**		
	➢ Small (up to 4 members)	35	21.87
	➢ Medium (5 to 10 members)	106	66.25
	➢ Big (> 10 members)	19	11.88
4.	**Social participation**		
	➢ No membership	104	65.00
	➢ Membership in one organization	20	12.50
	➢ Membership in more than one organization	30	18.75
	➢ Executive / office bearer	6	3.75

In case of family size it can be revealed that the majority of the respondents (66.25%) had medium size of family (5 to 10 members), followed by 21.87 per cent with small size of family (up to 4 members). Rest 11.88 per cent of the respondents had belonged to big size of family (more than 10 members) (Fig.4.3). These findings are supported by Khalache *et al.* (2008) and Walke *et al.* (2009).
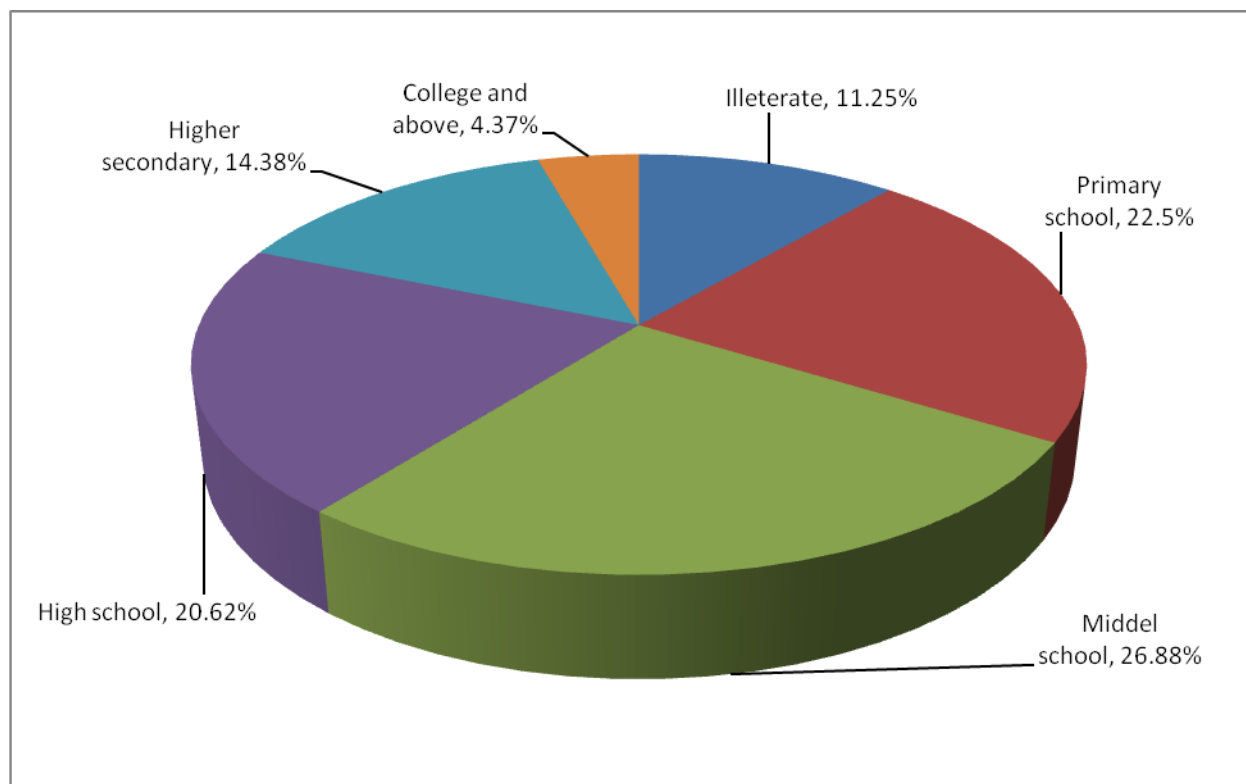
Fig: 4.1 Distribution of respondents according to their education
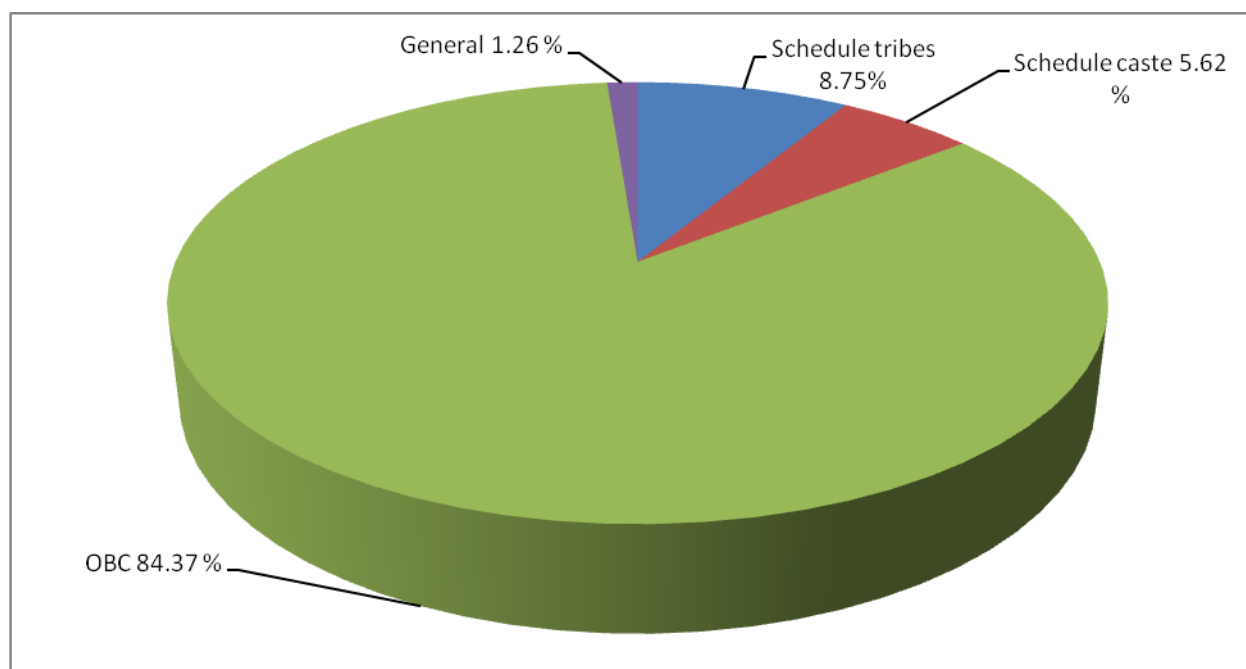
Fig: 4.2 Distribution of respondents according to their caste
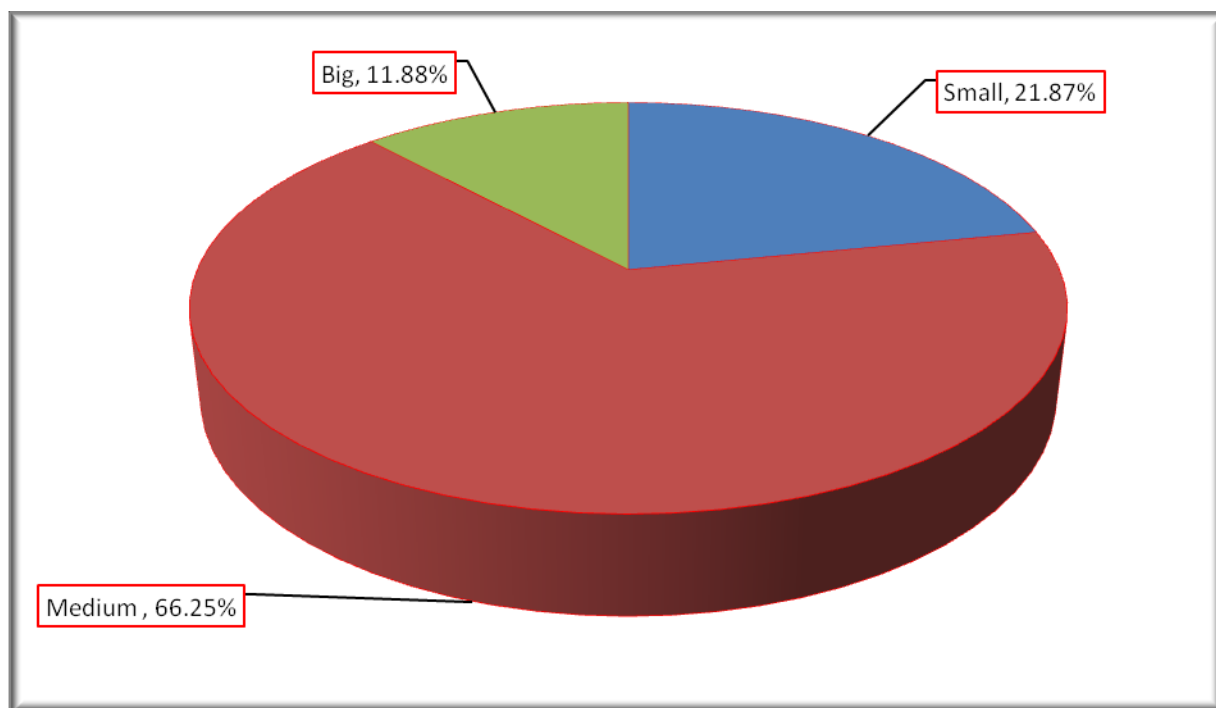
Fig: 4.3 Distribution of respondents according to their family size
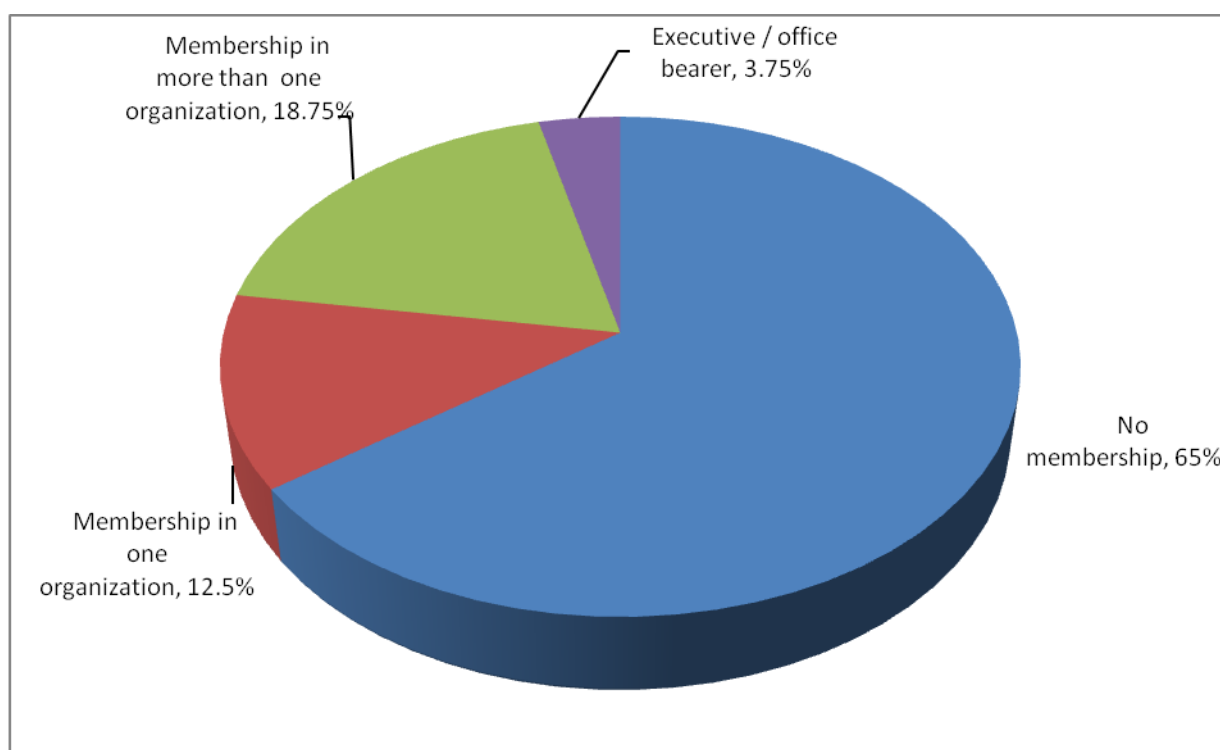
Fig: 4.4 Distribution of respondents according to their social participation

Social participation gives an idea about the respondent's participation in social activities. As regard to social participation, majority of the respondents (65.00%) had no membership in any organization, followed by 18.75 per cent of respondents who were having membership in more than one organizations. There were 12.50 per cent of the respondents who had membership in one organization and only 3.75 per cent of the respondents belonged to executive/office bearer category (Table 4.1 & Fig. 4.4). This finding is in conformity to the findings reported by Patel (2008) Kumar (2010).

4.1.2 Socio-economic characteristics of the respondents

The independent variables i.e. land holding, occupation, annual income and credit acquisition were considered as socio-economic characteristics of the respondents.

4.1.2.1 Land holding

It is apparent from the Table 4.2 and Fig. 4.5 that, majority of the respondents (44.37%) had marginal size of land holding (less than 1 ha), followed by 36.25 per cent respondent belong to small size of land holding (1 to 2 ha), whereas, 13.12 per cent of the respondents were having medium size of land holding (2.1 to 4 ha) and only 6.26 per cent of the respondents belonged to large size of land holding (above 4 ha). This finding is in conformity to the findings reported by Gour and Bishnoi (2010) and Chowdhary and Ray (2010).

Table 4.2: Distribution of respondents according to their land holding

(n = 160)

S. No.	Size of land holding	Frequency	Per cent
1.	Marginal (less than 1 ha)	71	44.37
2.	Small (1 to 2 ha)	58	36.25
3.	Medium (2.1 to 4 ha)	21	13.12
4.	Large (above 4 ha)	10	6.26
	Total	**160**	**100.00**

4.1.2.2 Occupation

Regarding the distribution of the respondents according to their occupation, the Table 4.3 indicates that, the majority of the respondents (45.62%) were involved in agriculture (okra cultivation), followed by agriculture (okra cultivation) + labour (32.52%), agriculture (okra cultivation) + other (8.12%), agriculture (okra cultivation) + service + animal husbandry (5.62%), agriculture (okra cultivation) + service (4.37%) and 3.75 per cent of the respondents were involved in agriculture (okra cultivation) + service + animal husbandry +business. It can be concluded that, the majority of the respondents were involved in agriculture (okra cultivation).

Table 4.3: Distribution of respondents according to their occupations

(n=160)

S.No.	Occupation	Frequency	Percent
1.	Agriculture (okra cultivation)	73	45.62
2.	Agriculture (okra cultivation)+ labour	52	32.52
3.	Agriculture (okra cultivation)+ Service	7	4.37
4.	Agriculture (okra cultivation)+ Service + animal husbandry	9	5.62
5.	Agriculture (okra cultivation)+ Service + animal husbandry +business	6	3.75
6.	Agriculture (okra cultivation)+ other	13	8.12
	Total	**160**	**100.00**

4.1.2.3 Annual income

Annual income of family helps to project the overall economic position and it is an indicator of the economic stability of the family. The distribution of the respondents according to their annual income is presented in Table 4.4 and Fig.4.6 which shows that 40.62 per cent of the respondents had their annual income between Rs. 50,001 to Rs. 1,00,000, whereas, 38.12 per cent of the respondents had annual

income less than Rs. 50,000, while, 12.5 per cent respondents reported their annual income were more than Rs. 1,50,000 and only 8.76 per cent of the respondents were having annual income between Rs. 1,00,001 to Rs. 1,50,000 (Fig. 4.6). Similar findings were also reported by Sasane *et al*. 2010.

Table 4.4: Distribution of respondents according to their annual income

(n=160)

S. No.	Annual income	Frequency	Per cent
1.	Low (Less than Rs. 50,000)	61	38.12
2.	Medium (Rs. 50,001 to Rs. 1,00,000)	65	40.62
3.	High (Rs. 1,00,001 to Rs. 1,50,000)	14	8.76
4.	Very high (More than Rs. 1,50,000)	20	12.5
	Total	**160**	**100.00**
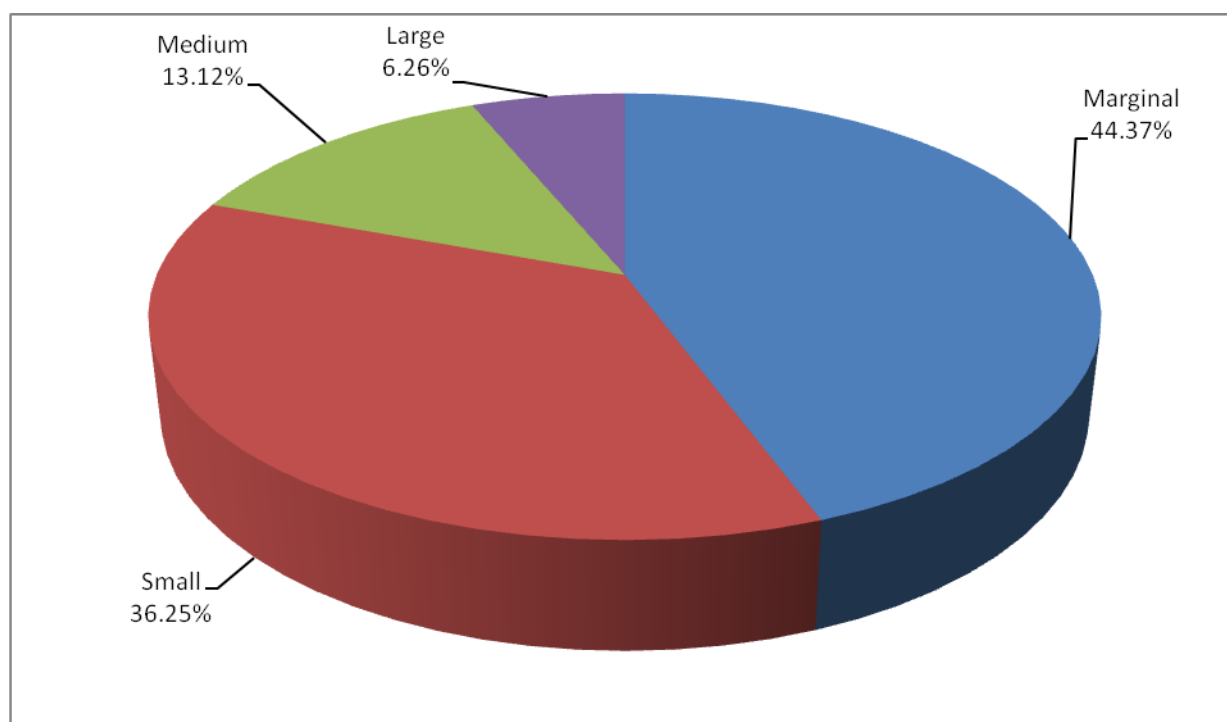
Fig: 4.5 Distribution of respondents according to their land holding
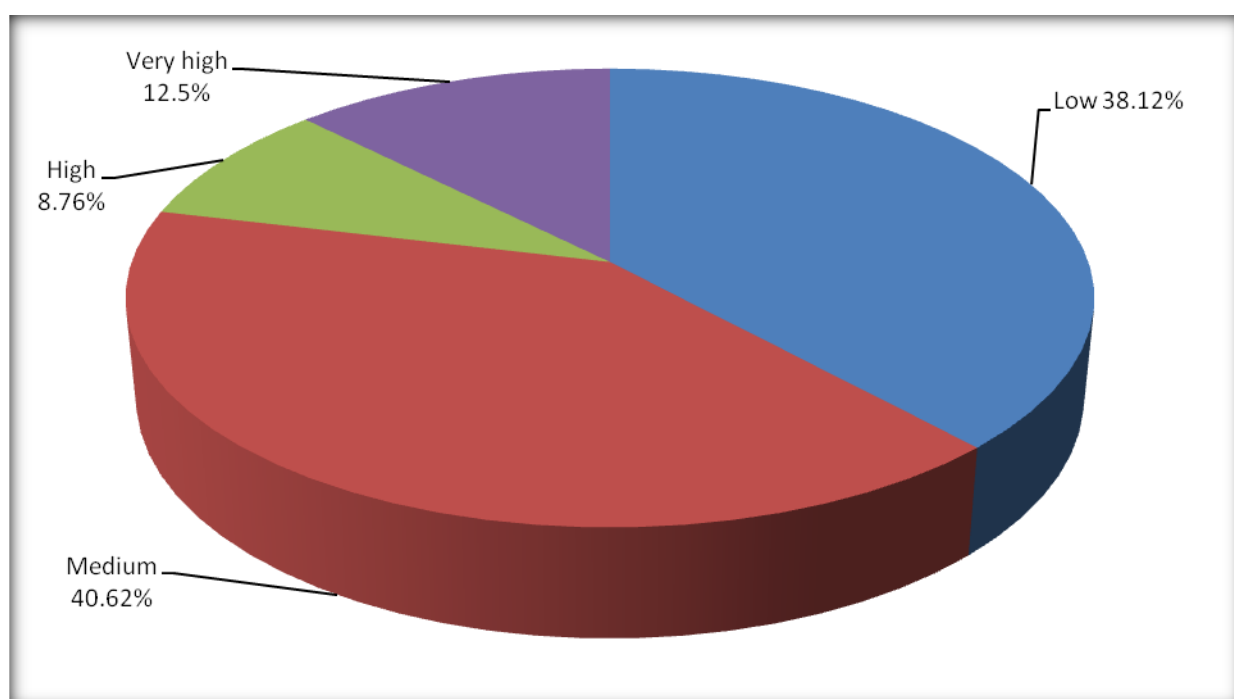
Fig: 4.6 Distribution of respondents according to their annual income

4.1.2.4 Credit acquisition

The data as presented in Table 4.5 reveals that 28.12 per cent of the respondents did not acquired the credit and 71.88 per cent of the respondents had acquired the credit. Out of the total credit acquiring respondents (total 115), majority of the respondents (50.43%) had availed short term credit, followed by 49.57 per cent of the respondents had availed mid-term credit and none of the respondent had acquired long term credit.

In case of sources of credit, majority of the respondents (36.52%) had acquired credit from the co-operative societies, followed by 33.04 per cent of respondents availed credit from nationalized banks, 21.75 per cent of the respondents had acquired credit from money lenders, while, remaining 8.69 per cent of respondents were acquired credit from friends, neighbours, relatives and others.

Table 4.5: Distribution of respondents according to their credit acquisition

(n=160)

S. No.	Particulars	Frequency*	Per cent
1.	**Credit acquisition**		
	➢ Not acquired	45	28.12
	➢ Acquired	115	71.88
2.	**Duration of credit (n=115)**		
	➢ Short term	58	50.43
	➢ Mid term	57	49.57
	➢ Long term	0	0.00
3.	**Source of credit (n=115)**		
	➢ Co-operative society	42	36.52
	➢ National bank	38	33.04
	➢ Money lenders	25	21.75
	➢ Friends/neighbours/relatives/ others	10	8.69
4.	**Availability of credit (n=115)**		
	➢ Difficult	12	10.43
	➢ Easy	103	89.57

*Frequency based on multiple responses

As regard to availability of credit, majority of the respondents (89.57%) had acquired credit easily, whereas, 10.43 per cent of the respondents had faced difficulties while, acquiring credit. This finding is in conformity to the findings reported by Patel (2008) and Mukim (2004).

4.1.3 Communicational characteristics of the respondents

4.1.3.1 Sources of information

The sources of information are the means of seeking information, knowledge and guidance about any particular innovation. The information sources not only provide information but also try to acquaint the farmers with the information. The frequencies of use of various sources of information for obtaining the information about okra production technology by the respondents are given in Table 4.6 and Fig. 4.7. It reveals that, amongst the information sources, majority of the respondents (36.88%) used frequently krishi sewa kendra, followed by 24.38 per cent of the respondents contacted with progressive farmers and 13.75 per cent of the respondents contacted neighbor/friends/relatives for regularly seeking information regarding okra cultivation practices. Similarly table further shows that 68.12 per cent of the respondents had often contacted with progressive farmers, followed by neighbor/friends/relatives (55.00%), krishi sewa kendra (Input dealer) (55.00%), T.V. (51.87%) and newspaper (29.38%) for obtaining information regarding okra cultivation practices.

The data given in figure 4.9 shows that majority (92.40%) of the respondents used progressive farmers as source of information for obtaining recommended okra production technology, followed by 91.88 per cent, 68.75 per cent and 53.75 per cent of the respondents reported that they used neighbours/fraratives, krishi sewa Kendra and T.V. as their source of information, respectively. It is also reveals that

majority (94.38%) of the respondents had never contacted agriculture college for seeking new information, followed by 85.62 per cent, 83.12 per cent and 81.26 per cent respondents never contacted with krishi vigyan kendrs, village panchayat and kisan mela, respectively .

Table 4.6: Distribution of respondents according to their use of information sources

(n=160)

S. No.	Source of information	Frequent use F/ (%)	Often use F/ (%)	Never use F/ (%)
1.	Neighbor/Friends/Relatives	22 (13.75)	88 (55.00)	50 (31.25)
2.	Progressive farmers	39 (24.38)	109 (68.12)	12 (7.50)
3.	RAEOs	9 (5.62)	68 (42.5)	83 (51.88)
4.	Krishi Sewa Kendra (Input dealers)	59 (36.88)	88 (55.00)	13 (8.12)
5.	Radio	1 (0.62)	34 (21.26)	125 (78.12)
6.	T.V.	3 (1.88)	83 (51.87)	74 (46.25)
7.	Newspaper	10 (6.25)	47 (29.38)	103 (64.37)
8.	Village Panchayat	1 (0.62)	26 (16.26)	133 (83.12)
9.	Village leader	4 (2.50)	31 (19.38)	125 (78.12)
10.	Krishi Vigyan Kendra	1 (0.62)	22 (13.76)	137 (85.62)
11.	Kisan call centre	0 (0.00)	36 (22.5)	124 (77.5)
12.	Kisan Mela	1 (0.62)	29 (18.12)	130 (81.26)
13.	Agriculture college	0 (0.00)	9 (5.62)	151 (94.38)

F- Frequency   %- Per cent
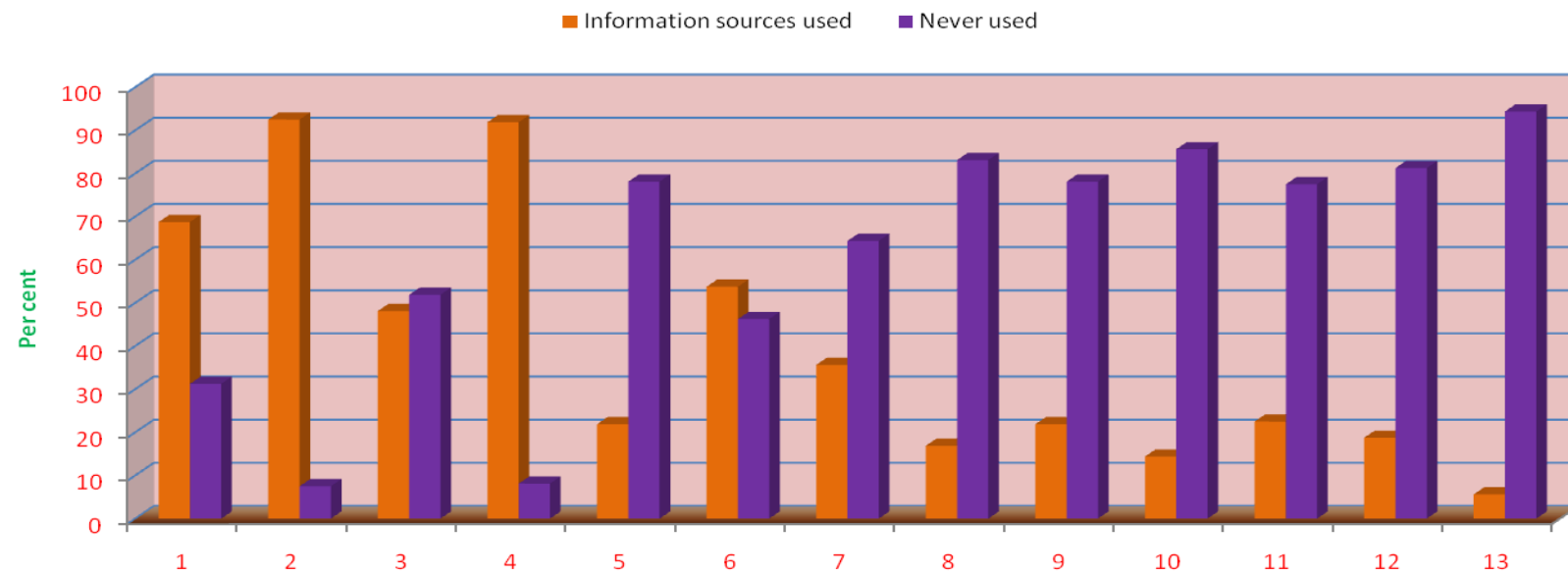
Fig. 4.7 Source of information utilized by the respondents

1. Neighbor/Friends/Relatives
2. Progressive farmers
3. RAEOs
4. Krishi Sewa Kendra (Input dealer)
5. Radio

6. T.V.
7. Newspaper
8. Village Panchyat
9. Village Leader
10. Krishi Vigyan Kendra

11. Kisan Call Center
12. Kisan Mela
13. Agriculture College

Overall use of information sources

The distribution of respondents according to level of use of information sources are shown in Table 4.7 and Fig. 4.8.

The data reveals that majority of the respondents (70.62%) had medium level of exposure to various sources of information for seeking information about okra production technology, followed by 15.00 per cent and 14.38 per cent of the respondents were found to have high level and low level exposure of use of information, respectively.

Table 4.7: Distribution of respondents according to overall use of information sources

(n=160)

S.No.	Source of information	Frequency	Per cent
1.	Low (below 4 score)	23	14.38
2.	Medium (4-9 score)	113	70.62
3.	High (above 9 score)	24	15.00
	Total	**160**	**100.00**

$\overline{X}$= 6.25   S.D. = 2.84

4.1.3.2 Contact with extension personnel

The result in Table 4.8 indicates the contact of respondents with extension personnel. Majority of the respondents (33.13%) acquired information once in a month and 11.25 per cent of the respondents obtained information weekly from Rural Agriculture Extension Officer, whereas, 4.38 per cent contacted with Agriculture Scientist and 4.37 per cent contacted with Rural Agriculture Extension Officer 2-3 times in a year. As for as contact with SMS is concerned respondents reported that they were rarely contacted with SMS for seeking information regarding okra production technology.
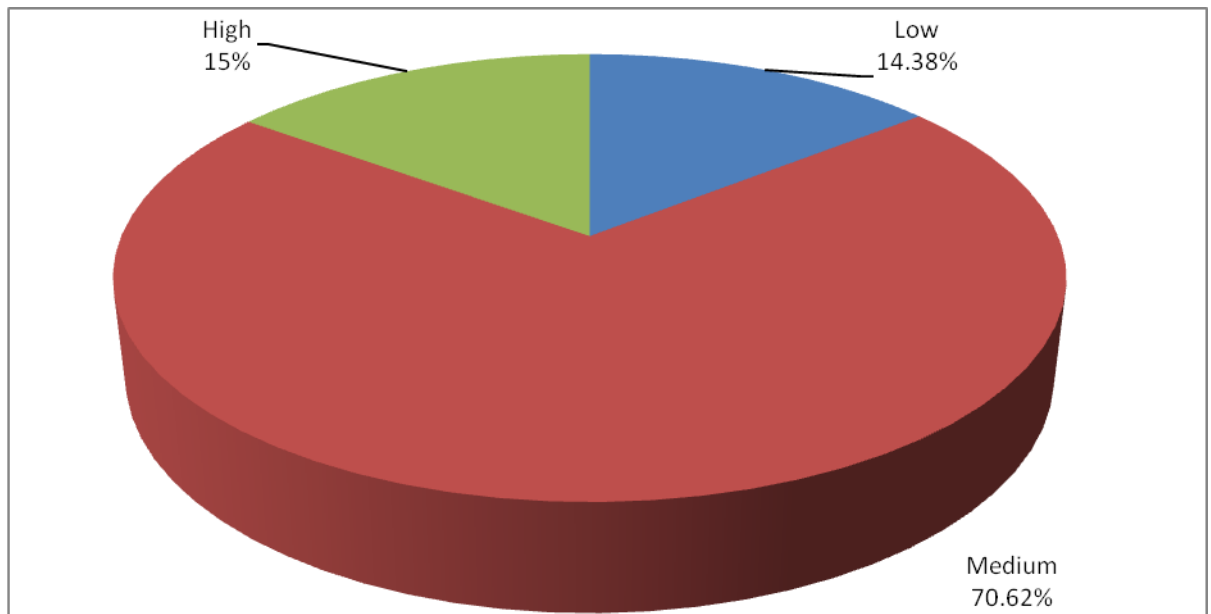
Fig. 4.8 Respondents categories according to overall use of information sources
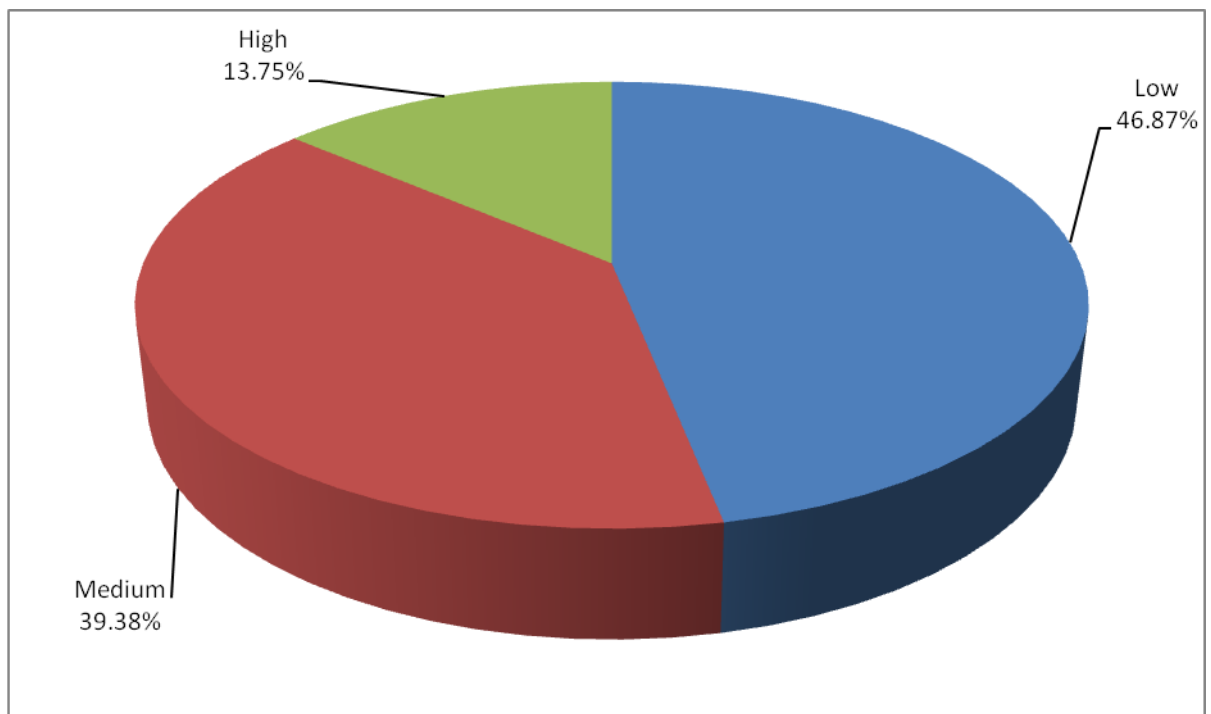
Fig. 4.9 Respondents categories according to their overall contact with

extension personnel

Table 4.8: **Distribution of respondents according to their extent of contact with extension personnel**

(n=160)

S.No.	Extension personnel	Extent of contact				
		Daily f (%)	Weekly f (%)	Monthly f (%)	Yearly 2-3 times f (%)	No contact f (%)
1.	Rural Agriculture Extension Officer	0 (0.00)	18 (11.25)	53 (33.13)	7 (4.37)	82 (51.25)
2.	Agriculture Development Officer	0 (0.00)	0 (0.0)	4 (2.50)	5 (3.12)	151 (94.38)
3.	Agriculture Scientist	0 (0.00)	1 (0.62)	1 (0.62)	7 (4.38)	151 (94.38)
4.	Subject Matter Specialist	0 (0.00)	0 (0.0)	2 (1.25)	3 (1.88)	155 (96.87)
5.	Other	0 (0.00)	3 (1.88)	21 (13.12)	1 (0.62)	135 (84.38)

Overall contact with extension personnel

The result in Table 4.9 and Fig. 4.9 indicates overall contact with extension personnel, it reveals that majority of the respondents (46.87%) had low level of contact with extension personnel, followed by 39.38 per cent and 13.75 per cent of the respondents had medium level and high level of contact with extension personnel, respectively. This finding is supported to the findings reported by Chaudhari *et al*. (1991).

Table 4.9: **Distribution of respondents according to overall contact with extension personnel**

(n= 160)

S.No.	Categories	Frequency	Per cent
1.	Low (up to 5 score)	75	46.87
2.	Medium 6-8 score)	63	39.38
3.	High (above 8 score)	22	13.75
	Total	**160**	**100.00**

$\overline{X}$= 6.56   S.D.= 1.83

4.1.4   Socio-psychological characteristics of the respondents

4.1.4.1 Practice wise level of knowledge regarding okra production technology

The data given in Fig. 4.10 reveals the practice wise level of knowledge regarding okra production technology. It clearly indicates that the majority of the respondents (83.12%) had high level of knowledge regarding number of seed per pit, followed by high knowledge about seed rate (65.62%), planting distance (58.12%), harvesting (53.12%), duration of irrigation (52.5%), selection of land and selection of improved variety (43.75%), insect control (37.5%) and preparation of land (36.88%).

Same graph shows that, 80.00 per cent of the respondents had medium knowledge about use of fertilizers followed by preparation of land (61.87%), selection of land (56.25%), disease control (56.25%), weed control (55.62%), use of manure (55.00%), insect control (55.00%) and use of micronutrient (51.87%).

It also interpreted from the graph that majority of the respondents had low level of knowledge regarding seed treatment (48.12%) followed by use of manure (36.25%), weed control (21.88%), use of micronutrient (13.75%), disease control (11.25%), selection of improved variety (7.50%), insect control (7.50%) and various other cultivation practices given in graph.
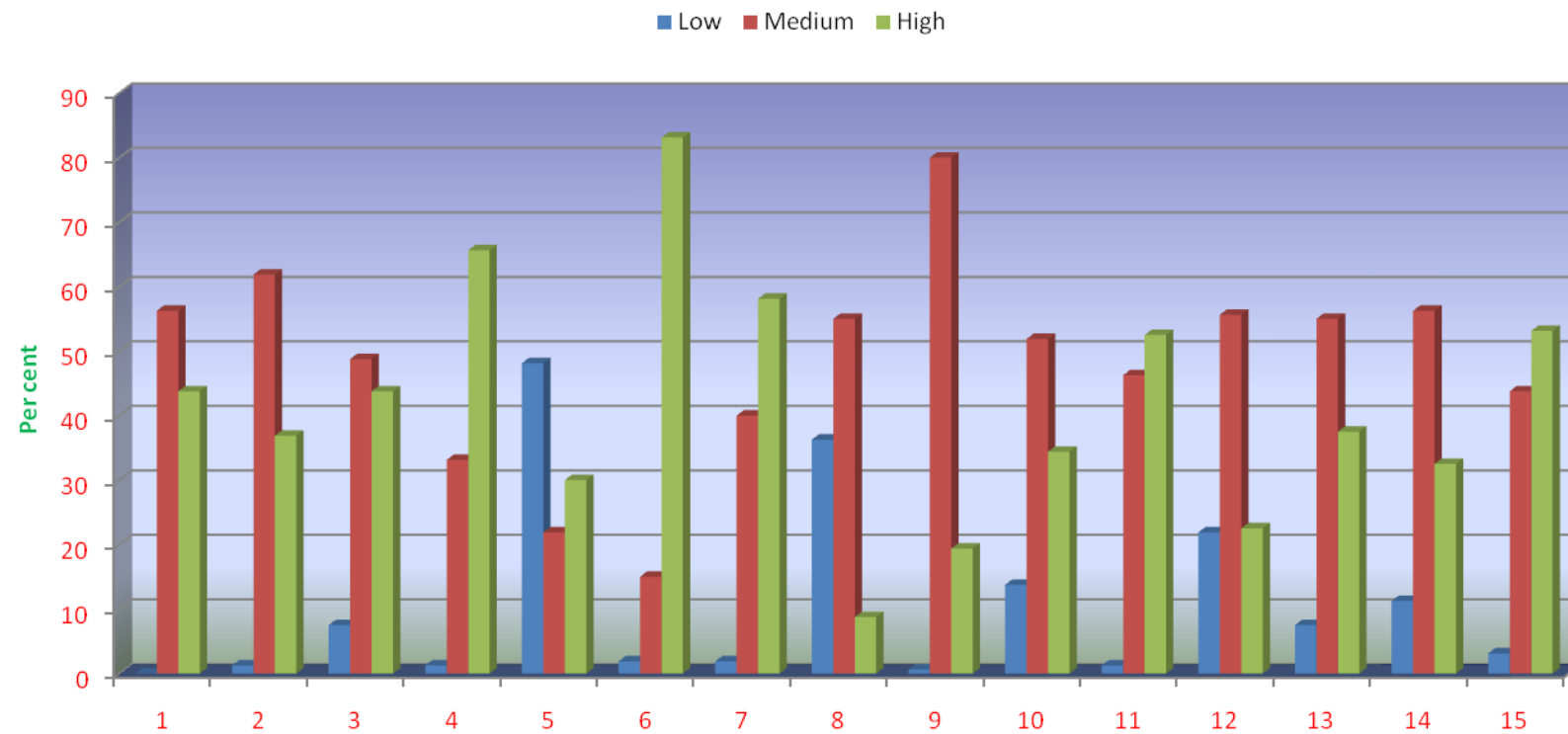
Fig. 4.10 Practice wise level of knowledge regarding okra production technology among the respondents

1.Selection of land
2.Preparation of land
3.Selection of improved variety
4.Seed rate

5.Seed treatment
6.Number of seed per pit
7.Planting distance
8.Use of manure

9.Use of fertilizer
10.Use of micronutrient
11.Duration of irrigation
12.Weed control

13.Insect control
14.Disease control
15 Harvesting

4.1.4.2 The overall level of knowledge of the respondents about recommended okra production technology

The data presented in Table 4.10 indicates the level of knowledge of the respondents about recommended okra production technology. Majority of the respondents (70.62%) had medium level of knowledge. Whereas, 15.00 per cent and 14.38 per cent of the respondents were having low and high level of knowledge about recommended okra production technology, respectively. Similar findings were also reported by Waman *et al*. (1996) and Basavaprabhu *et al.* (1997).

Table 4.10: **Distribution of respondents according to their overall level of knowledge about recommended okra production technology**

(n =160)

S.No.	Level of knowledge	Frequency	Per cent
1.	Low (below 28 score)	24	15.00
2.	Medium (28 to 43 score)	113	70.62
3.	High (above 43 score)	23	14.38
	Total	**160**	**100.00**
	$\overline{X}$= 35.23		S.D=7.60

4.2 Dependent variable

4.2.1 Practice wise level of adoption of recommended okra cultivation technology

The data presented graphically in fig. 4.11 shows that, among the selected practices of okra cultivation technology, majority of the respondents (59.38%) had high level of adoption about number of seed per pit, followed by selection of land and planting distance (28.75%), seed rate (26.26%), duration of irrigation (25.62%), selection of improved variety (25.00%), preparation of land (23.75%) and harvesting (21.25%).

Fig. 4.11 Practice wise extent of adoption regarding okra production technology among the respondents

1. Selection of land	6. Number of seed per pit	11.Duration of irrigation
2. Preparation of land	7. Planting distance	12.Weed control
3. Selection of improved variety	8.Use of manure	13.Insect control
4. Seed rate	9. Use of fertilizer	14.Disease control
5. Seed treatment	10.Use of micronutrient	15.Harvesting

It was found that majority (90.62%) of respondents had medium level of adoption about use of fertilizers, followed by preparation of land (75.00), seed rate and duration of irrigation (73.12%), insect control, selection of land (71.25%), harvesting (66.88%), disease control (65.00%), planting distance (60.00%) and use of micronutrient (51.88%).

It also reveals from the graph that, majority of the respondents (73.12%) had low level of adoption of seed treatment, use of manure (67.5%), weed control (44.38%), use of micronutrients (30.62%), disease control (15.00%), harvesting (11.87%), planting distance (11.25%) and selection of improved variety (10.00%).

4.2.2 Overall level of adoption of recommended cultivation technology of okra by okra growers

Overall extent of adoption is given in Table 4.13. Out of total respondents, majority (62.50%) of them had medium level of adoption about recommended okra production technology. Whereas, 20.62 and 16.88 per cent of them had low and high level of adoption, respectively. This finding is in conformity to the findings reported by Aghav (1997), Waman and Patil (1998) and Badhe, *et al.* (2011).

Table 4.11: **Distribution of respondents according to their overall level of adoption of recommended cultivation technology of okra by okra growers**

(n=160)

S. No.	Extent of adoption	Frequency	Per cent
1.	Low (up to 20 score)	33	20.62
2.	Medium (21 to 30 score)	100	62.50
3.	High (above 30 score)	27	16.88
	Total	**160**	**100.00**

$\overline{X}$=25.34   S.D. =5.50

4.3   Correlation and multiple regression analysis of independent variables with adoption of recommended okra production technology

To determine the relationship between selected independent variables and adoption of recommended okra production technology, the correlation analysis was worked out and result are presented in Table 4.12.

The results reveals that the variable occupation and credit acquisition were found to have non significant relationship with adoption at 0.05 per cent level of probability. While, caste was found negatively and significantly related with adoption at 0.05 per cent level of significance and land holding was found positively and significantly correlated with adoption at 0.05 per cent level of significance.

Table 4.12:   Correlation and multiple regression analysis of independent variables with the adoption of recommended okra production technology

S.No.	Independent variable	Coefficient correlation	Regression coefficient	
			"b" value	"t" value
1.	Education	0.525**	0.150*	1.982
2.	Caste	-0.170*	-1.069*	-2.459
3.	Family size	0.284**	0.098	0.989
4.	Social participation	0.260**	-0.292	-1.183
5.	Land holding	0.167*	0.004	0.012
6.	Occupation	-0.017	0.008	0.058
7.	Annual income	0.202**	0.102*	2.110
8.	Credit acquisition	-0.110	0.518	0.866
9.	Knowledge about recommended okra production technology	0.792**	0.500**	10.92
10.	Sources of information	0.488**	0.210	1.779
11.	Extension contact	0.521**	0.401*	2.234

** Significant at 0.01 level of probability R^2 0.6828907
* Significant at 0.05 level of probability   F value of R = 28.9741

However, the variables education, family size, social participation, annual income, knowledge, sources of information and extension contact were positively and significantly correlated with adoption at 0.01 per cent level of significance. The positively significant relationship shows that, with increase in these variables the adoption of the recommended okra production technology by respondents will increase.

Multiple regression analysis was also worked out to determine the contribution and production ability of independent variables on level of adoption of the respondents and results are presented in Table 4.12.

The data reveals that out of the 11 selected variables knowledge about recommended okra production technology showed highly significant and positive contribution towards adoption about recommended okra production technology at 0.01 per cent level of significance. While, education, annual income and extension contact had significant and positive contribution towards adoption at 0.05 per cent level of significance. The remaining 6 variables viz. family size, social participation, land holding, occupation, credit acquisition and source of information had non significant contribution towards adoption.

It is evident from the significant 't' value of the variables that if there is one unit increasing in education, cast, annual income, knowledge and extension contact there would have been 0.150, -1.069, 0.102, 0.500 and 0.401 unit increasing, respectively, in adoption of recommended okra production technology. The R square value of 0.6828907 indicates that all the 11 independent variable jointly contributed towards adoption of recommended okra production technology to the extent of 68.00 per cent.

4.4   Constraints faced by okra growers in adoption of recommended okra production technology

Multiple responses were taken to ascertain the constraints faced by the okra growers in adoption of recommended okra production technology. Various problems faced by the respondents are presented in Table 4.13.

Table 4.13:   Constraints faced by okra growers in adoption of recommended okra   production technology

S.No.	Constraints	Frequency*	Percent
1.	Low market price	25	18.75
2.	Financial problem	40	25.00
3.	Low level of social participation	50	28.75
4.	Lack of knowledge about identification of symptoms, control measure of insects and proper dose of insecticides	46	31.25
5.	Problems of high cost of insecticides and fertilizers	56	35.00
6.	Non availability of fertilizer at proper time	34	21.25
7.	Non availability of extension officers at proper time	41	25.62
8.	More attack of insects and diseases	80	50.00
9.	Lack of information at proper time	39	24.37
10.	Inadequate credit facilities for okra growers	24	15.00
11.	Lack of agricultural labour at proper time	35	21.87
12.	Unavailability of improved seed	64	40.00
13.	Requirement of more labour for harvesting	53	33.12
14.	Lack of awareness about soil testing	36	22.50

*Frequency based on Multiple Responses

So far as the constraints faced by the okra growers in adoption of recommended okra production technology are concerned, it was found that the majority of the respondents (50.00%) reported more attack of insects and diseases in okra crop as the most important constraints, followed by unavailability of improved

seed (40.00%), problems of high cost of insecticides and fertilizers (35.00%), requirement of more labour for harvesting (33.12%), lack of knowledge about identification of symptoms, control measure of insects and proper dose of insecticides (31.25%), low level of social participation (28.75%), non availability of extension officers at proper time (25.62%), financial problem (25.00%), lack of information at proper time (24.37%), lack of awareness about soil testing (22.5%), lack of agricultural labour at proper time (21.87%), non availability of fertilizer at proper time (21.25%), low market price (18.75%) and inadequate credit for okra growers (15.00%).

4.5   Suggestions offered by the okra growers for minimizing the constraints faced by them during the adoption of recommended okra production technology

The data presented in Table 4.14 indicates that majority of the respondents (58.75%) suggested that adequate information should be conveyed at right time by field level extension officers or extension agencies, followed by 41.87 per cent respondents were given suggestion that inputs like improved seeds, fertilizer, pesticides *etc* should be made available at subsidized rate on proper time at village level, whereas, 34.37 per cent, 28.25 per cent and 26.87 per cent of the respondents were suggested that FLD and other demonstrations should be conducted on farmers field, Institutional loan should be provided in low interest rate & timely and regular training programme should be organized about various practices of okra cultivation, respectively.

Table 4.14: Suggestion of okra growers for minimizing the constraints faced by them during the adoption of recommended okra production technology

S.No.	Suggestion	Frequency*	Percent
1.	Regular training programme should be organized about various practices (i.e. selection of seed, Seed treatment, use of proper doses of fertilizer, fungicide, insecticide *etc*.) of okra cultivation.	43	26.87
2.	Institutional loan should be provided in low interest rate and timely	42	28.25
3.	Adequate information should be conveyed at right time by field level extension officers or extension agencies	94	58.75
4.	Inputs like improved seeds, fertilizer, pesticides *etc* should be made available at subsidized rate on proper time at village level	67	41.87
5.	FLD and other demonstration should be conducted at farmers field about okra production technology.	55	34.37
6.	Suitable resistant varieties should be made available	16	10
7.	Vegetable market should be in nearest city from the village	19	11
8.	Soil testing facility should be made available at block level	23	14.37

*Frequency based on Multiple Responses

Summary, Conclusion And Suggestions for Future Research Work

CHAPTER-V

SUMMARY, CONCLUSION AND SUGGESTIONS FOR FUTURE RESEARCH WORK

The main purpose of this chapter is to summaries the results to state the conclusions on the basis of the foregoing analysis and to indicate some of their implications for actions.

In order to maximize crop production the best use of available land has to be made and improved method of crop management needs to be put into practice. Indian economy depends upon the adoption and diffusion of modern agricultural technology. It has also been realized that modernization in agriculture is possible only through high standard of know how and professionalism of rural change agent. The important work of this agent is to educate the farming community about recent development in agricultural technology and also work as a facilitator in the adoption of improved technology.

Bhendi, Ladies Finger or okra as it variously called, is one of the most popular tropical vegetables that is realished by all sections of the people. The young tender pods are cooked in curries and used in various other dishes. Despite being attacked by several pests, farmers prefer the vegetables as it is a ready market all round the year. One of the main factors that limit bhendi production is the dreaded yellow vein mosaic virus that is characterized by the leaf veins becoming yellow presenting a mosaic like appearance. Later the fruit also turn and are reduced in size that do not fetch a price in the market.

Okra is the most important crop, occupies approximately 43200 hectare area with the production of 4,538,000 MT and productivity of 10.5 MT/ha. in India. In

C.G., okra is sown in an area of 25233.23 hectare with the total production of 249048.12 MT. and productivity of 9.869 (Directorate of horticulture CG. 2010-11)

Now a day, there are so many researches conducted and technology generated on okra crop at the agricultural universities and research station but the productivity of okra is very low due to more disease attack and poor transfer of technology from the site of its development to points of its utilization. Therefore, with a view to assess the factors affecting adoption of okra production technology, the present study entitled **"Study on extent of adoption of recommended okra production technology among the farmers of Dhamtari district of Chhattisgarh state"** was undertaken during 2011-12 with the following specific objective.

6. To study the Socio-personal, Socio-economic, Socio-psychological and Communicational characteristics of Okra growers,

7. To know the level of knowledge about the recommended cultivation technology of Okra by Okra growers,

8. To assess the extent of adoption of recommended cultivation technology of Okra by Okra growers,

9. To analyze the relationship between dependent and independent variables, and

10. To identify the constraints in adoption of Okra production technology and to obtain the suggestions from the Okra growers to overcome the constraints.

The study was conducted in one purposively selected district of Chhattisgarh state namely "Dhamtari", with a view to know the profile of **okra growers and knowledge and adoption of recommended practices of okra production technology.** Dhamtari and Kurud blocks of Dhamtari district was purposively selected for the present investigation because it has considerable area under okra crop.

The data were collected through personal interview with the help of well prepared structured interview schedule and were analyzed by using different appropriate methods. The major findings of the study are summarized under following subheadings.

Independent variables

As regards to socio-personal characteristics it was found that majority of the respondents were educated up to middle school level, belonged to other backward caste, medium family size (5 to 10 members) and had no membership in any organization indicating very poor social participation.

The study found that, majority of the respondents had marginal size of land holding (less than 1 ha) and were involved in Agriculture (okra cultivation) as the principal occupation with an annual income between Rs. 50,001 to Rs.1,00,000. When credit acquisition was analyzed it was found that majority of the respondents had acquired short term credit from co-operative societies and believed that the availability of credit was very easy and quick.

In respect of the frequencies of use of various sources of information it was found that, amongst the information sources, majority of the respondents (36.88%) used frequently krishi sewa kendra, followed by 24.38 per cent of the respondents contacted with progressive farmers and 13.75 per cent of the respondents contacted neighbor/friends/relatives for regularly seeking information regarding okra cultivation practices.

Similarly 68.12 per cent of the respondents had often contacted with progressive farmers, followed by neighbor/friends/relatives (55.00%), krishi sewa kendra (Input dealer) (55.00%), T.V. (51.87%) and newspaper (29.38%) for obtaining information regarding okra cultivation practices. It was also revealed that

majority (94.38%) of the respondents had never contacted agriculture college for seeking new information.

The findings revealed that majority of the respondents had medium level of exposure to various source of information for obtaining the information about okra production technology.

Majority of the respondents (33.13%) acquired information once in a month and 11.25 per cent of respondents obtained information weekly from rural agriculture extension officer, whereas, 4.38 per cent contacted with agriculture scientist and 4.37 per cent contacted with rural agriculture extension officer 2-3 times in a year. They were rarely contacted with SMS for seeking information regarding okra production technology. The findings revealed that the majority of the respondents had low level of extension contact about recommended okra production technology.

In case of practice wise level of knowledge of respondents regarding okra production, it was found that the majority of the respondents had high level of knowledge regarding number of seed per pit, followed by high knowledge about seed rate, planting distance, marketing and duration of irrigation. Whereas, respondents reported medium knowledge about use of fertilizers, preparation of land, selection of land, disease control, weed control, use of manure, insect control and use of micronutrient. Similarly majority of the respondents were having low level of knowledge regarding seed treatment and weed control

Dependent variable

As regards to the practice wise level of adoption it was found that majority of the respondents (59.38%) had high level of adoption regarding number of seed per pit, followed by selection of land and planting distance (28.75%), seed rate (26.26%) and duration of irrigation (25.62%). While, under medium level of adoption category, it

was found that majority (90.62%) of respondents had medium level of adoption about use of fertilizers, followed by preparation of land (75.00), seed rate and duration of irrigation (73.12%) and insect control & selection of land (71.25%). Also majority of the respondents (73.12%) had low level of adoption of seed treatment, use of manure (67.5%), weed control (44.38%), use of micronutrients (30.62%) and disease control (15.00%).

In respect of the correlation analysis, the variables occupation and credit acquisition were found to have non significant relationship with adoption, caste was found negatively and significantly related with adoption, while, land holding was found positively and significantly related with adoption at 0.05 per cent level of significance. However, the variables education, size of family, social participation, annual income, knowledge, source of information and extension contact were found positively and significantly correlated with adoption at 0.01 per cent level of significance.

Regarding multiple regression analysis, it was revealed that out of the 11 variables under study only knowledge about recommended okra production technology had showed highly significant and positive contribution towards adoption at 0.01 per cent level of significance. While, education, caste, annual income, and extension contact had significant and positive contribution towards adoption at 0.05 per cent level of significance.

The constraints encountered by the farmers in adoption of recommended okra production technology were as more attack of insects and diseases in okra crop (50.00%), unavailability of improved seed (40.00%), high cost of insecticides, pesticides and fertilizers (35.00%), requirement of more labour for harvesting (33.12%), lack of knowledge about identification of symptoms, control measure of

insects and proper dose of insecticides (31.25%), low level of education (28.37%), lack of technical knowledge (26.87%), non availability of extension officers at proper time (25.62%), financial problem (25.00%) and lack of information at proper time (24.37%).

Therefore to overcome all these constraints various suggestions were given by the okra growers that adequate information should be conveyed at right time by field level extension workers or extension agencies (58.75%), inputs like improved seed, fertilizers, pesticide, *etc*. should be available at subsidized rate on proper time at village level (41.87%). FLD and other demonstration should be conducted at farmers field about okra production technology (34.37%), institutional loan should be provided in low interest rate and timely (28.25%), regular training programme should be organized about various practices (i.e. selection of seed, seed treatment, use of proper doses of fertilizer, fungicide, insecticide, *etc*.) of okra cultivation (26.87%), soil testing facility should be made available at block level (14.37%). It was also suggested that, vegetable market should be in nearest city from the village (11.00%).

Conclusion

On the basis of the study it can be concluded that majority of the respondents were found educated up to middle school level having marginal size of land holding and agriculture as the main occupation. Slightly more than half of the okra growers had no membership in any organization indicating very poor social participation on their part. The commonly used sources of information were kisan sewa kendra (Input dealer), progressive farmers, neighbors/friends/relatives, *etc*.

The findings of the study revealed that the majority of the okra growers had medium level of knowledge regarding recommended okra production technology. The respondents were found to have low level of adoption in practices like seed treatment,

use of manure, weed control, use of micro nutrient and disease control. Overall it was observed that most of the respondents had medium level of adoption of recommended okra production technology. Variables like education, size of family, social participation, annual income, sources of information, extension contact and knowledge about okra production technology were found to have positive and highly significant correlation with adoption of recommended okra production technology. Similarly multiple regression analysis, only four variables i.e. education, annual income, extension contact and knowledge about okra production technology were significantly contributed in extent of adoption of okra production technology. Results low to medium level of adoption among the respondents indicates that the okra growers did not well aware about recommended okra production technology and at the same time they were slow to adopt recommended okra production technology. It is necessary to convince the okra growers with the help of various extension teaching methods like kisan mela, exhibition, film show, group discussion and organization of demonstrations on improved technologies of okra crop in the village with the help of field level extension workers and other developmental organization.

More attack of insect and disease and unavailability of reliable seed were reported the major constraints faced by farmers. These constraints can be minimized by providing knowledge by extension worker for insect and disease control and also Government should undertake supply of genuine or certified seed material through agriculture university or other Government institute at proper time and at cheaper rate.

Suggestion for future research work

On the basis of the results obtained from the study and the experience gained on completion of the investigation it is suggested that

1. Similar study should be conducted in various crops to know the constraints in adoption of recommended cultivation practices, so that appropriate plan may be prepared to disseminate improved agricultural information up to the farmers.

2. As the numbers of independent variables were limited in the present research work a future study may be planned with more and different independent variables to know their contribution in extent of adoption of recommended okra production technology.

3. The study was limited to only 16 villages and 2 blocks of Dhamtari district of Chhattisgarh state. Hence, a detailed study covering more blocks and district may be conducted in order to generalize the recommendation for the entire state of Chhattisgarh.

4. The role of sources of information in extent of adoption of okra growers may be investigated in detail in order to make reliable suggestion for entire state.

STUDY ON EXTENT OF ADOPTION OF RECOMMENDED OKRA PRODUCTION TECHNOLOGY AMONG THE FARMERS OF DHAMTARI DISTRICT OF CHHATTISGARH STATE

by
Giriraj Kishore
ABSTRACT

The present investigation was carried out during the year 2011-12 in 16 selected villages of Dhamtari and Kurud blocks of Dhamtari district of Chhattisgarh state. A total of 160 okra grower farmers were selected and interviewed to collect the primary data on the basis of objectives and variables of the study. Further the data were tabulated and analyzed statistically to draw appropriate conclusions. It was found that most of the okra growers were educated up to middle school level, belonged to other backward class, medium family size and majority (65.00%) of them had no membership in any organization. Most of the okra growers had marginal size of land holding (less than 1 ha) and were involved in agriculture (okra cultivation) as the principal occupation with an annual income between Rs. 50,001 to Rs.1,00,000. When credit acquisition was analyzed, it was found that majority (50.43%) of the respondents had acquired short term credit from co-operative societies as their main source of credit and believed that the availability of credit was very easy and quick.

Majority of the respondents had medium level of exposure to various sources of information for acquiring the information about okra production technology amongst the information sources, majority (92.50%) of the respondents used to progressive farmers followed by contacted krishi sewa kendra (Input dealer) (91.88%) for regularly seeking information about okra cultivation practices. Whereas, majority of the respondents acquired information ones in a month from rural agriculture extension officer. However, overall low level of contact with extension personnel were observed among the respondents.

In case of practice wise level of knowledge of respondents regarding okra production it was found that majority (83.12%) of the respondents had high level of knowledge regarding number of seed per pit followed by high knowledge about seed rate (65.62%), planting distance (58.12%), harvesting (53.12%) and duration of irrigation (52.50%). The overall level of knowledge of the respondents about recommended okra production technology was medium. As regards practice wise level of adoption, it was found that majority of the respondents had high extent of adoption of number of seed per pit followed by use of fertilizer and preparation of land. So far as to overall level of adoption is concerned, majority of them had medium level of adoption regarding recommended okra production technology.

In respect of the correlation analysis, the variables occupation and credit acquisition were found to have non significant relationship with adoption, caste was found negatively and significantly related with adoption, while, land holding was found positively and significantly related with adoption at 0.05 per cent level of significance. However, the variables education, size of family, social participation, annual income, knowledge, source of information and extension contact were found

positively and significantly correlated with adoption at 0.01 per cent level of significance. Regarding multiple regression analysis it was revealed that out of the 11 variables under study, only knowledge about recommended okra production technology had showed highly significant and positive contribution towards adoption at 0.01 per cent level of significance. While, education, caste, annual income, and extension contact had significant and positive contribution towards adoption at 0.05 per cent level of significance.

As far as constraints faced by the okra growers in adoption of recommended okra production technology are concerned, it was found that the majority of the respondents reported more attack of insects and diseases in okra crop as the most important constraint, followed by unavailability of improved seed, problems of high cost of insecticides and fertilizers, requirement of more labour for harvesting and lack of knowledge about identification of symptoms, control measure of insects and proper dose of insecticides. To overcome the above constraints majority (58.75%) of the respondents were given suggestion that adequate information should be conveyed at right time by field level extension officer or extension agencies followed by 41.87 per cent were given suggestion that inputs like improved seeds, fertilizers, pesticides, *etc.* should be made available at subsidized rate on proper time at village level, whereas, 34.37 per cent of the respondents were suggested that the okra growers may be motivated by persistent efforts of extension personnel through demonstrations of okra production technology.

Place: Raipur
Date: 11/09/2012

Dr. J.D. Sarkar
Chairman
Advisory committee

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Appendices

"छत्तीसगढ़ राज्य के धमतरी जिले के किसानों द्वारा अनुशंसित भिण्डी उत्पादन तकनीकी के अंगीकरण पर अध्ययन"

<u>साक्षात्कार अनुसूची</u>

परामर्शदाता :   शोधकर्ता का नाम

डाँ. जे. डी. सरकार   **गिरिराज किशोर**
प्रोफेसर एवं हेड कृषि विस्तार विभाग   एम.एस.सी. (कृषि) अंतिम
इं.गां.कृ.वि., रायपुर   कृषि विस्तार विभाग,
                                            इं.गां.कृ.वि.वि. रायपुर (छ.ग.)

1. कृषक का नाम :   ………………………………   2.ग्राम : …………………………………

3. विकास खण्ड :   ………………………………   4. जिला : ………………………………

5. कृषक की उम्र :   …………… वर्ष

6. शिक्षा का स्तर

      i)   अशिक्षित   [   ]

      ii)   प्रायमरी   [   ]

      iii)   मिडिल   [   ]

      iv)   हाई स्कूल   [   ]

      v)   हायर सेकेण्डरी   [   ]

      vi)   स्नातक व अधिक   [   ]

7. जाति

      i)   अनुसूचित जनजाति   [   ]

      ii)   अनुसूचित जाति   [   ]

      iii)   अन्य पिछड़ी जाति   [   ]

      iv)   सामान्य   [   ]

8. आपके परिवार के कुल सदस्यों की संख्या –

          महिला………… पुरुष………… बच्चे………… योग……………

9. कृपया आप अपने ग्राम में कार्यरत संस्थाओं एवं उसमें अपनी सहभागिता के बारे में निम्न जानकारी दीजिए –

क्र. सं.	संस्थायें	भागीदारी (हॉ / नहीं)	सदस्य	पदाधिकारी
1.	ग्राम पंचायत			
2.	सहकारी समिति			
3.	युवा मण्डल			
4.	सांस्कृतिक मण्डल			
5.	स्कूल समिति			
6.	अन्य 1......................... 2......................... 3.........................			

10. आपके पास कुल कितनी भूमि है ?

कुल भूमि .... (एकड़ / हे.)

अ.   सीमांत कृषक (1.0 तक) हे.   ☐

ब.   लघु कृषक (1.0 से 2.0) हे.   ☐

स.   मध्यम कृषक (2.0 से 4.0) हे.   ☐

द.   बड़ा कृषक (4.0 से अधिक) हे.   ☐

11. आपका मुख्य व्यवसाय क्या है ?

1   कृषि (भिण्डी की खेती)   ☐

2.   कृषि (भिण्डी की खेती) + मजदूरी   ☐

3.   कृषि (भिण्डी की खेती) + नौकरी   ☐

4.   कृषि (भिण्डी की खेती) + नौकरी + पशुपालन   ☐

5.   कृषि (भिण्डी की खेती) + नौकरी + पशुपालन + व्यवसाय   ☐

6.   कृषि (भिण्डी की खेती) + अन्य   ☐

12. आपकी विभिन्न स्रोतो से कुल वार्षिक आय कितनी है ?

क्र. सं.	व्यवसाय	वार्षिक आय (रूपये)
1.	कृषि (भिण्डी की खेती)	
2.	कृषि (भिण्डी की खेती) + मजदूरी	
3.	कृषि (भिण्डी की खेती) + नौकरी	
4.	कृषि (भिण्डी की खेती) + नौकरी + पशुपालन	
5.	कृषि (भिण्डी की खेती) + नौकरी + पशुपालन + व्यवसाय	
6.	कृषि (भिण्डी की खेती) + अन्य 1............................ 2............................ 3............................	
कुल वार्षिक आय (रूपये में)		

13. क्या आपने भिण्डी के उत्पादन के लिये ऋण लिया है ? (हाँ / नही) यदि हाँ तो बताइये किन स्त्रोतों से ऋण प्राप्त किया है –

क्र. सं.	स्रोत	ऋण प्राप्त होता है (हाँ / नही)	ऋण अवधि	ब्याज दर	ऋण उपलब्धता	
					सरलता से	कठिनाई से
1.	सहकारी संस्था					
2.	राष्ट्रीयकृत बैंक					
3.	साहूकार					
4.	मित्र					
5.	पड़ोसी					
6.	रिश्तेदार					
7.	अन्य 1. .... 2. .... 3					

4. आप अनुशंसित भिण्डी उत्पादन तकनीकी के ज्ञान के बारे मे निम्न जानकारी देवें –

क्रम.	भिण्डी की अनुशंसित उत्पादन तकनीक	ज्ञान का स्तर		
		पूर्ण	आंशिक	निरंक
01	क्या आपको भिण्डी उत्पादन के लिये ऊपयुक्त भूमि की जानकारी है ? (हॉ / नही) यदि हॉ तो विवरण दें –			
02	क्या आपको भिण्डी उत्पादन के लिये उपयुक्त भूमि की तैयारी के बारें में जानकारी है ? (हॉ / नही) यदि हॉ तो विवरण दें –			
03	क्या आपको भिण्डी की अनुशंसित संकर व उन्नत किस्मो की जानकारी है ? (हॉ / नहीं) यदि हॉ तो विवरण दें – किस्म औसत उपज 1. .... 2. .... 3.			
04	क्या आपको भिण्डी की फसल में प्रति एकड़ उपज की जानकारी हैं ? (हॉ / नहीं) यदि हॉ तो विवरण दें –			
05	क्या आपको भिण्डी में उपस्थित पोषक तत्वो के बारे है ? (हॉ / नहीं) यदि हॉ तो विवरण दें –			
06	क्या आपको भिण्डी उत्पादन हेतु अनुशंसित बीज दर के बारे मे जानकारी है ? (हॉ / नही) यदि हॉ तो विवरण दें खरीफ .... कि.ग्रा / एकड़ ग्रीष्म .... कि.ग्रा / एकड़			
07	क्या आपको भिण्डी उत्पादन हेतु बीजोपचार की जानकारी है ? (हॉ / नहीं) यदि हॉ तो विवरण दें – बीज दवाई का नाम दवाई की मात्रा			
08	क्या आपको भिण्डी कि अधिक साखा देने वाली किस्मो की जानकारी है ? (हॉ / नही) यदि हॉ तो विवरण दें – 1 .... 2			

09	क्या आपको जानकारी है कि भिण्डी के कौन कौन सी किस्मो के पौधे लम्बाई मे छोटे एंव बड़े होते है ?(हॉ / नही) यदि हॉ तो विवरण दें बड़े पौधे छोटे पौधे			
10	क्या आपको भिण्डी के बड़े एवं छोटे फल वाली किस्मो की जानकारी है ? (हॉ / नही) यदि हॉ तो विवरण दें – बड़े फल छोटे फल			
11	क्या आपको जानकारी है कि भिण्डी के कौन कौन सी किस्मे ज्यादा उपज देती हैं ? (हॉ / नहीं) यदि हॉ तो विवरण दें – किस्म उपज / एकड़			
12	क्या आपको जानकारी है कि भिण्डी की पहली तुड़ाई बीज बोने के कितने दिनो बाद करनी चाहीए ? (हॉ / नहीं) यदि हॉ तो विवरण दें –			
13	क्या आपको जानकारी है कि भिण्डी के दो तुड़ाई के मध्य कितने दिनो का अंतर रखना चाहीए ? (हॉ / नहीं) यदि हॉ तो विवरण दें किस्म अंतराल (दिन)			
14	क्या आपको भिण्डी के ऐसे किस्मो के बारे मे जानकारी हैं जिनके फल चिकने / गहरे हरे/रोयें दार होते हैं? (हॉ / नहीं) यदि हॉ तो विवरण दें – किस्म गुण			
15.	क्या आपको भिण्डी के बीज की बुवाई के लिये उपयुक्त समय की जानकारी है ? (हॉ / नहीं) यदि हॉ तो विवरण दें – अ. जून – जुलाई .... ब. फरवरी– मार्च			

16.	क्या आपको भिण्डी के बीज बुवाई में प्रति कुड़े बीज की संख्या के बारें में जानकारी है ? (हॉ/नही) यदि हॉ तो विवरण दें –			
17.	क्या आपको भिण्डी बीज बुवाई पद्धति में पौधे से पौधे एवं कतार से कतार की दूरी की जानकारी हैं ? (हॉ/नहीं) यदि हॉ तो विवरण दें – कतार से कतार पौधे से पौधे खरीफ .... ग्रीष्म			
18.	क्या आपको भिण्डी उत्पादन के लिये अनुशंसित खाद की मात्रा की जानकारी है ? (हॉ/नही) यदि हॉ तो विवरण दें – गोबर खाद केंचुआ खाद(कि.ग्रा/एकड़) 1. .... 2. .... 3.			
19.	क्या आपको भिण्डी उत्पादन के लिये अनुशंसित उर्वरक की मात्रा के उपयोग की जानकारी है ? (हॉ/नहीं) यदि हॉ तो विवरण दें – उर्वरक (कि.ग्रा/एकड) नत्रजन फास्फोरस पोटाश 1. .... 2. .... 3.			
20.	क्या आपको भिण्डी उत्पादन के लिये आवष्यक सूक्ष्म पोषक तत्वों की मात्रा के उपयोग की जानकारी है ?(हॉ/नही) यदि हॉ तो विवरण दें – .... सूक्ष्म पोषक तत्व मात्रा कि.गा./एकड़ $ZnSo_4$ .... M_gSo_4			
21.	क्या आपको भिण्डी उत्पादन के लिये सिंचाई के अन्तर की जानकारी हैं ? (हॉ/नहीं) यदि हॉ तो विवरण दें –			
22.	क्या आपको भिण्डी के साथ ली जाने वाली अन्तर्वर्ती फसलों की जानकारी हैं ? (हॉ/नहीं) यदि हॉ तो विवरण दें –			

23.	क्या आपको भिण्डी उत्पादन में खरपतवारों की पहचान एवं नियंत्रण विधि के बारें में जानकारी है? (हॉं/नहीं) यदि हॉं तो विवरण दें – खरपतवार का नाम दवा मात्रा			
24.	क्या आपको भिण्डी की फसल को नुकसान पहुँचाने वाले कीटों की पहचान एवं उनके रोकथाम के बारे में जानकारी हैं? (हॉं/नहीं) यदि हॉं तो विवरण दें – कीट दवाई का नाम मात्रा/एकड़			
25.	क्या आपको भिण्डी में लगने वाले रोगों के पहचान एवं उनके रोकथाम के बारे में जानकारी है? (हॉं/नहीं) यदि हॉं तो विवरण दें रोग दवाई का नाम मात्रा/एकड़			
26.	क्या आपको भिण्डी में लगने वाली पीतशिरा मोजेक विषाणु रोग की जानकारी है? (हॉं/नहीं) यदि हॉं तो विवरण दें			
27.	क्या आपको भिण्डी उत्पादन मे कीट एवं रोगो के नियंत्रण के लिये दवाई डालने के अंतराल के बारे मे जानकारी है ? (हॉं/नहीं) यदि हॉं तो विवरण दें			
28.	क्या आपको भिण्डी उत्पादन में तुड़ाई की अवस्था के बारें में जानकारी हैं ? (हॉं/नहीं) यदि हॉं तो विवरण दें –			
29.	क्या आप जानते है बाजारो मे भिण्डी की अधिक कीमत कौन से महिने/समय में प्राप्त होती हैं ? (हॉं/नहीं) यदि हॉं तो विवरण दे			

15. आपको भिण्डी उत्पादन की अनुषंसित तकनीकी संबंधी जानकारी किन स्त्रोतों से प्राप्त होती हैं ?

क्रं.म.	स्त्रोत	अंतराल		
		हमेशा	कभी – कभी	कभी नहीं
1.	पड़ोसी / मित्र / रिश्तेदार			
2.	उन्नत कृषक			
3.	ग्राम सेवक			
4.	कृषि सेवा केन्द्र			
5.	रेडियों			
6.	टी.वी			
7.	अखबार			
8.	पंचायत समिति			
9.	ग्रामीण नेता			
10.	कृषि विज्ञान केन्द्र			
11.	किसान काल सेंटर			
12.	किसान मेला			
13.	कृषि विश्वविद्यालय			
14.	अन्य ………………………………………… …………………………………………			

16. क्या आप भिण्डी उत्पादन की तकनीकी से संबंधित जानकारी के लिये कृषि विस्तार कार्यकर्ताओं/अधिकारियों से संपर्क करते हैं ? (हॉं / नहीं)

यदि हॉं तो कृपया निम्नलिखित जानकारी दीजिए –

क्र.	कृषि विस्तार कार्यकर्ता	संपर्क का अंतराल				
		प्रतिदिन	सप्ताह में एक बार	माह में एक बार	वर्ष में 2–3 बार	कभी नहीं
1.	ग्रामीण कृषि विस्तार अधिकारी					
2.	कृषि विकास अधिकारी					
3.	कृषि वैज्ञानिक					
4.	विषय वस्तु विषेषज्ञ					
5.	अन्य 1. ………………………… 2. ………………………… 3. …………………………					

17. आप अनुशंसित भिण्डी उत्पादन तकनीकी के अंगीकरण का विवरण देवें –

क्र.	भिण्डी की अनुशंसित उत्पादन तकनीक	अंगीकरण का स्तर		
		पूर्ण	आंशिक	निरंक
01	क्या आप भिण्डी को उपयुक्त भूमि में लगाते हैं? (हॉ/नही) यदि हॉ तो विवरण दें –			
02	क्या आपने भिण्डी उत्पादन के लिये उपयुक्त भूमि की तैयारी का उपयोग किया है ? (हॉ/नही) यदि हॉ तो विवरण दें –			
03	क्या आपने अनुशंसित भिण्डी उत्पादन तकनीकी के अंतर्गत संकर व उन्नत किस्मो को अपनाया हैं? (हॉ/नहीं) यदि हॉ तो विवरण दें– किस्म उपज/एकड़ अवधि संकर .... उन्नत			
04	क्या आपने भिण्डी उत्पादन हेतु बीज की अनुशंसित मात्रा का उपयोग किया ? (हॉ/नहीं) यदि हॉ तो विवरण दें– किस्म बीज दर			
05	क्या आपने अनुशंसित भिण्डी उत्पादन मे बीजोपचार का उपयोग किया हैं ? (हॉ/नहीं) यदि हॉ तो विवरण दें– दवाई मात्रा			
06.	क्या आपने भिण्डी कि अधिक साखा देने वाली किस्मो को लगाया हैं ? (हॉ/नही) यदि हॉ तो विवरण दें – 1 .... 2			
07.	क्या आपने भिण्डी के बड़े एवं छोटे पौधे वाली किस्मो को लगाया हैं ? (हॉ/नही) यदि हॉ तो विवरण दें बड़े पौधे छोटे पौधे			

08.	क्या आपने भिण्डी के बड़े अथवा छोटे फल वाली किस्मो को लगाया है ? (हाँ / नही) यदि हाँ तो विवरण दें – बड़े फल छोटे फल ………………………… ………………………… ………………………… …………………………			
09.	क्या आपने भिण्डी की उस किस्म को लगाई है जो ज्यादा उपज देती है ? (हाँ / नहीं) यदि हाँ तो विवरण दें – किस्म उपज / एकड़ ………………………… ………………………… ………………………… …………………………			
10	क्या आप भिण्डी की पहली तुड़ाई अनुशंसित दिनो मे करते है ? (हाँ / नहीं) यदि हाँ तो विवरण दें ……………………………………………………………… ………………………………………………………………			
11.	क्या आपने भिण्डी के दो तुड़ाई के मध्य अनुशंसित दिनो का अंतर रखते हैं ? (हाँ / नहीं) यदि हाँ तो विवरण दें किस्म अंतर (दिन) ………………………… ………………………… ………………………… ………………………… ………………………… …………………………			
12.	क्या आपने भिण्डी के उस किस्म को लगाया हैं जिनके फल चिकने / गहरे हरे / रोयें दार होते हैं ? (हाँ / नहीं) यदि हाँ तो विवरण दें किस्म गुण ……………………… ………………………… ……………………… ………………………… ……………………… …………………………			
13	क्या आपने अनुशंसित भिण्डी उत्पादन मे बीज बुवाई हेतु अनुशंसित समय का उपयोग किया ? (हाँ / नहीं) यदि हाँ तो विवरण दें– ………………………………………………………… ………………………………………………………… …………………………………………………………			
14	क्या आपने भिण्डी के बीज के बुवाई पद्धति मे प्रति कुड़े बीज की संख्या को अपनाया ? (हाँ / नहीं) यदि हाँ तो विवरण दें– …………………………………………………………… …………………………………………………………			

15	क्या आपने अनुशंसित भिण्डी उत्पादन हेतु बीज बुवाई पद्धति में पौधें से पौधे एवं कतार से कतार की दूरी को अपनाया ? (हॉ / नहीं) यदि हॉ तो विवरण दें– पौधे से पौधे कतार से कतार ……………………… ……………………… ……………………… ……………………… ……………………… ………………………			
16	क्या आपने भिण्डी उत्पादन के लिये अनुषंसित खाद की मात्रा का उपयोग किया? (हॉ / नहीं)यदि हॉ तो विवरण दें – खाद का नाम कि.ग्रा. / एकड़ गोबर की खाद ………………… जैव उर्वरक ………………… केंचुआ खाद …………………			
17	क्या आपने भिण्डी उत्पादन के लिये अनुषंसित उर्वरक की मात्रा का उपयोग किया ? (हॉ / नहीं) यदि हॉ तो विवरण दें– उर्वरक का नाम कि.ग्रा. / एकड़ यूरिया ……………………… एस.एस.पी. ……………………… एम.ओ.पी ………………………			
18	क्या आपने भिण्डी उत्पादन के लिये आवष्यक सूक्ष्म पोषक तत्वों का उपयोग किया ? (हॉ / नहीं) यदि हॉ तो विवरण दें– सूक्ष्म पोषक तत्व कि.ग्रा. / एकड़ …………………… …………………… …………………… ……………………			
19	क्या आपने भिण्डी उत्पादन के लिये अनुशंसित सिंचाई के अन्तर को अपनाया है ? (हॉ / नहीं) यदि हॉ तो विवरण दें ……………………………………………… ……………………………………………… ………………………………………………			
20	क्या आपने भिण्डी उत्पादन के साथ ली जाने वाली अनुशंसित अन्तर्वर्ती फसलें लगाई हैं ? (हॉ / नहीं) यदि हॉ तो विवरण दें – ……………………………………………… ……………………………………………… ………………………………………………			
21	क्या आपने भिण्डी उत्पादन में खरपतवारो को पहचान कर उनके नियंत्रण विधि को अपनाया ? (हॉ / नहीं) यदि हॉ तो विवरण दें – …………………………………………… ………… ……………………………………………… खरपतवार का नाम दवा मात्रा ………………… ………… ………… ………………… ………… …………			
22	क्या आपने भिण्डी की फसल को नुकसान पहुंचाने वाले कीटों के पहचान एवं उनके रोकथाम के उपायों को			

	अपनाया है ? (हाँ / नहीं) यदि हाँ तो विवरण दें – .... कीट दवा का नाम मात्रा			
23	क्या आपने भिण्डी में लगने वाले रोगों के पहचान एवं उनके रोकथाम के उपायों को अपनाया है? (हाँ / नहीं) यदि हाँ तो विवरण दें – .... रोग दवा मात्रा			
24	क्या आपने पीतशिरा मोजेक विषाणु रोग के पहचान एवं उनके रोकथाम के उपायों को अपनाया है ? (हाँ / नहीं) यदि हाँ तो विवरण दें –			
25	क्या आपने भिण्डी उत्पादन मे कीट एवं रोगो के नियंत्रण के लिये दवाई डालने के अंतराल को अपनाया है ? (हाँ / नहीं) यदि हाँ तो विवरण दें			
26	क्या आप भिण्डी की तुड़ाई उपयुक्त समय पर करते है ? (हाँ / नहीं) यदि हाँ तो विवरण दें –			
27	क्या आप भिण्डी उत्पादन मे ऐसे समय को अपनाते है जिसमे भिण्डी का अधिक मुल्य मिलता है ? (हाँ / नहीं) यदि हाँ तो विवरण दे			

19. आपको भिण्डी की अनुशंसित उत्पादन तकनीक को अपनाने में किन–किन समस्याओं का सामना करना पड़ा कृपया जानकारी देवें

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20. कृपया भिण्डी की अनुशंसित उत्पादन तकनीक को अपनाने में आनेवाली समस्याओं को दूर करने के लिए अपने सुझाव दीजिए ।

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