

**ADOPTION BEHAVIOUR OF FARMERS
ABOUT TECHNOLOGIES IN FRONT LINE
DEMONSTRATION**

THESIS

**Submitted to
Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola
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**MASTER OF SCIENCE
IN
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(EXTENSION EDUCATION)**

By

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DECLARATION OF STUDENT

I here by declare that the experimental work and its interpretation of the thesis entitled "ADOPTION BEHAVIOUR OF FARMERS ABOUT TECHNOLOGIES IN FRONT LINE DEMONSTRATION" or part thereof has neither been submitted for any other degree or diploma of any University, nor the data have been derived from any thesis / publication of any University or scientific organization. The source of material used and all assistance received during the course of investigation have been duly acknowledged.

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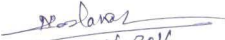
This is to certify that thesis entitled " **ADOPTION BEHAVIOUR OF FARMERS ABOUT TECHNOLOGIES IN FRONT LINE DEMONSTRATION**" submitted in partial fulfilment of the requirement for the degree of "Master of Science in Agriculture (Extension Education)" of Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola is a record of bonafide research work carried out by **Metangale Vaibhao Dilip** under my guidance and supervision.

The subject of the thesis has been approved by the Student's Advisory Committee.

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Date: 27/6 / 2016


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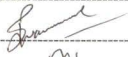
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"There is always in the world a few inspired men whose acceptance is beyond price".

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(D) List of Abbreviations



%	-	per cent
Agri.	-	agriculture
Agril.	-	agricultural
Educ.	-	education
<i>et al.</i>	-	et alia (and others)
Extn.	-	extension
Fig.	-	figure
ha	-	hectare
i.e.	-	that is
J.	-	journal
Res.	-	research
Rs.	-	rupees
Std.	-	standard
Univ.	-	university
viz.,	-	namely
Rly.	-	Railway
PAU	-	Panjab Agricultural University
KVK	-	Krushi vidnyan Kendra
SAU	-	State Agriculture University
APMC	-	Agricultural Price Marketing Cell
FCI	-	Food Corporation of India
MSEE	-	Maharashtra Society of Extension Education



Thesis

Abstract

(F) **THESIS ABSTRACT**

- a. Title of the thesis : "ADOPTION BEHAVIOUR OF FARMERS ABOUT TECHNOLOGIES IN FRONT LINE DEMONSTRATION"
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THESIS ABSTRACT

The study on "ADOPTION BEHAVIOUR OF FARMERS ABOUT TECHNOLOGIES IN FRONT LINE DEMONSTRATION" was conducted in the year 2015- 2016 in Aheri and Mulchera Tahsils of Gadchiroli district and Akola, Balapur and Barshitakli Tahsils of Akola district in Maharashtra state with following specific objectives.

- 1) To study the socio-economics, situational psychological and communication characteristics of farmers.
- 2) To study the adoption behavior of farmers about technologies in Front Line Demonstration.
- 3) To study the relationship between socio-economic, situational, psychological and communication characteristics of farmer with adoption of improved agricultural technologies after front line demonstration.
- 4) To study the constraints faced by the farmers in adoption of improved agricultural practices after seeing front line demonstration.

The sample of study comprised of 150 farmers randomly selected from 17 villages of Akola, Balapur, Barshitakli, Aheri and Mulchera tahsils. The independent variables studied were age, education, land holding, annual income, farming experience, social participation, source of information, risk preferences, extension contact, innovativeness and scientific orientation. The dependent variable under study was adoption behaviour.

The findings revealed that highest number of respondents (64.00%) were in the high level in respect of adoption behaviour followed by medium level which comprised of (36.00%) respondents of adoption behaviour. The socio- economic profile of the farmers revealed that majority of them belong to above 50 years age group, education upto high school level, possess 2.01 to 4.00 hectares of land, had an annual income between Rs. 50001 to 100000, farming experience above 10 years. Majority of farmers (56.66%) were observed in medium level category of use of social participation and 62.66 per cent source of information in medium level, having risk preferences 76.00 percent i.e. in medium level, having extension contact in medium (67.33%) level, innovativeness percentage observed in medium level i.e. 81.33%, scientific orientation ranges between 22 to 26 i.e.76.00%.

Among the selected characteristics the scientific orientation were found to be positively and significantly correlated at 0.05 level of probability with adoption behaviour. Age, education, land holding, annual income, farming experience, social participation, source of information, risk preference, extension contact, innovativeness, knowledge, attitude, adoption

were observed positively significant at 0.01 level of probability with adoption behaviour. The major constraints faced by respondent farmers in sources of information, lack of complete information about various technologies, lack of information about various diseases and pests, Lack of guidance for use of improved technologies and Lack of knowledge about technologies used in FLD.



Chapter - I

Introduction

CHAPTER I

INTRODUCTION

1.1. Background Information

Agriculture is the backbone of Indian economy that has always been a way of life rather than a commercial vocation.

Front Line Demonstration (FLD) is one of the important programmes to evaluate and demonstrate the production potential of the recently released crop cultivars in the farmers' fields. The aim of the front line demonstration is to convey the technical message to farmers that if they use recommended package and practices then the yield of the crop can be easily doubled than their present level. Besides, it enable to build-up confidence of the farmers to adopt the latest technologies and also help to collect valuable feedback to modify the research programme, based-on their field experiences regarding performance of the technologies. This study was therefore designed with the objective of assessing the knowledge and adoption of improved practices by the farmers of the agency area. (A. Srinivas et.al.2014).

Frontline demonstration is the most integrated model of Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola and Krishi Vigyan Kendra, Akola. In agricultural history of India, establishment of Krishi Vigyan Kendra(1974), is second milestone after , establishment of state agricultural universities in the year 1960's. The conceptual foundation of Krishi Vigyan Kendra lies in imparting learning through work experience, training to practicing farmers and the flexible curriculum which was to be in tune with felt needs, natural resources and potential for agricultural growth in that potential area. Dr. PDKV, Akola has assessment and refinement of the latest proven agricultural technology through Front Line Demonstration (FLD) under various agro-climatic regions.

The main purpose of organizing front line demonstrations is to provide new knowledge and develop new skill required for adoption of

new technology and build up desirable scientific attitudes among farmers, farm women, rural youths and other grass root level extension functionaries. Front line demonstrations are to be organized in the field of crop production, livestock production, Horticulture, Fisheries, Agril. Engineering, Home Science and other number of related vocations. The front line demonstrations are based on the principles of "Learning by doing" and "Teaching by doing". It provides experience to the participants in the real life situations on demonstration units. Dr. PDKV, Akola organizes frontline demonstrations under the provision of SRS cereals (sorghum) , Krishi Vigyan Kendra (KVK), Akola and also provide Front Line Demonstrations to the farmers of pulses (pigeon pea).

Despite of its multiple uses, the area under sorghum in India has declined from 18.61 m. ha in 1970 to 6 m. ha in 2014. However, its productivity has increased from 522 kg/ha to 981 kg/ha due to significant improvements made in research and development. There is wide gap between national productivity and yield potential of the improved sorghum technologies developed from the research institutes. The available agricultural technology does not serve the very purpose until it reaches and adopted by its ultimate users the farmers. Technology transfer refers to the spread of new ideas from originating sources to ultimate users [11] (Prasad *et. al.*, 1987) .

The results of frontline demonstrations showed that the yield of sorghum could be increased with the help of innovative technological intervention coupled with the proper management of pest and diseases. High benefit: cost ratio also advocated the economic viability of the demonstration which motivates the farmers towards adoption of interventions demonstrated. Similar results were also reported by others viz., [10] Mukherjee (2003), [9] Mishra *et al.* (2009), [15] Tiwari *et al.* (2003), [14] Tiwari and Saxena (2001) and [5] Haque (2000) in different crops.

India accounts for 33% of the world area and 22% of the world production of pulses. About 90% of the global pigeon pea, 65% of chickpea and 37% of lentil area falls in India, corresponding to 93%, 68% and 32% of the global production, respectively (FAOSTAT, 2012).

The average yield of pulses pigeon pea (1880 kg/ha) were much higher than as compared to average yield of farmers practices pigeon pea (1450 kg/ha). The average percentage increased in the yield over farmer's practices was 29.7 for pigeon pea. The results indicated that the front line demonstrations have given a good impact over the farming community of Narmada district as they were motivated by the new agricultural technologies applied in the FLD plots (Table 1). This finding is in corroboration with the findings of Poonia and pithia (2010).

1.2. Importance and need of the study

One of the important mandates of Indian Council of Agriculture Research (ICAR) is to organize Front Line Demonstrations (FLDs) through State Agricultural Universities (SAU's), ICAR institutes and selected reputed voluntary organizations on various crops to generate production data and feedback information to prove the production potentialities of the newly developed crop production technologies and also to study the factors contributing to higher production. The main objective of Front-Line Demonstrations is to demonstrate newly released crop production and protection technologies and its management practices in the farmers' field under different agro-climatic regions and farming situations. While demonstrating the technologies in the farmers' field, the scientists are required to study the factors contributing higher crop production, field constrains of production and thereby generate production data and feedback information. Frontline Demonstrations are conducted in a block of two or four hectares land in order to have better impact of the demonstrated technologies on the farmers and field level extension functionaries.

The past researchers have indicated that adoption of agricultural innovations is a complex process involving stages from

awareness to satisfaction and finally adoption. A person having awareness about the technology, especially regarding its importance and objectives is likely to show positive behavior and act with greater assurance to achieve desired results, than one who has no idea about the technology generated at research stations and its actual application on the field by farmers.

Dr. PDKV organize front line demonstrations under the provision of SRS cereals, SRS pulses to improve technologies of sorghum, and tur(pigeon pea) respectively. It is expected that the farmers who have seen technology demonstrated through FLD's should adopt the technology on large scale. It is also anticipated that the knowledge and experience gained by these farmers through FLD's should also be transferred to other farmers of farming community in their village and should be convinced for adoption.

The study undertaken to ascertain, the differential effect of cereals, and pulses FLDs organized by Dr. PDKV, Akola and KVK Akola in terms adoption of cereals, and pulses production technology demonstrated through FLD's by demonstrator farmers.

1.3. Objectives of the study

1. To study the socio-economics, situational psychological and communication characteristics of farmers.
2. To study the adoption behavior of farmers about technologies in Front Line Demonstration.
3. To study the relationship between socio-economic, situational, psychological and communication characteristics of farmer with adoption of improved agricultural technologies after front line demonstration.
4. To study the constraints faced by the farmers in adoption of improved agricultural practices after seeing front line demonstration.

1.4. Hypothesis

On the basis of the review of previous research studies, the assumed nature of relationship between variables was worked out. The

following research hypothesis are framed on the various aspects of the study in consistence with the objectives of the study . The hypothesis for the study are setup and are presented in null form (H0) as under-

- 1) There is no significant relationship between selected socio-economical , situational, psychological and communication characteristics of farmers with their extent of knowledge, attitude and adoption towards technologies in front line demonstration.
- 2) There is no significant relationship between selected socio-economical, situational, psychological and communication characteristics of farmers with their overall adoption behavior towards technologies in front line demonstration.

1.5 Scope and limitations of study

The study on adoption behavior about technologies in front line demonstration of farmers. For the demonstration of newly released crop production and protection technologies on the farmers field. And also gave the knowledge about the technologies of front line demonstration and eliminating constraitions.

The findings of the present study would help to understand the knowledge and adoption level of farmers about technologies in front line demonstration. The present study will provide useful guidance for knowing and understanding various technologies used by farmers of front line demonstration.

The farmers then aware about the useful technologies of front line demonstration like spacing in plant to plant and row to row , irrigation schedule , cropping pattern , other practices, etc. of cereals (Sorghum) and pulses (Pigeon pea). By adopting these various technologies farmers increases yield and improve quality of crops.

The research work would, therefore, be helpful to extension workers in understanding the present state of the knowledge, attitude and adoption of technologies in front line demonstration. The findings will also help in deciding the strategies for popularization of

technologies of front line demonstration. With these points in mind the present investigation was under taken with the following limitations.

1. The findings of the study are based on the opinions expressed by the respondents, hence the objectivity of the data would be limited to real opinion of the respondents.
2. Adoption of technologies in front line demonstration is depend upon the willpower of farmers.

Chapter - II

*Review of
Literature*

CHAPTER II

REVIEW OF LITERATURE

Consulting relevant literature on the topic of study is an essential aspect of research. The researcher has to review the literature at every stage. It is not a one shot exercise but a continuous process. Through review the researcher knows the methods, procedures used and findings of previous research studies. It provides clues and guidelines to the researcher in the process of research.

In the present chapter, the review of previous research studies is presented. While going through the literature, it was noted that very few studies were related with knowledge, attitude and adoption of technologies in front line demonstration. The studies were mostly related to the technologies which is used in front line demonstration. The studies on knowledge, attitude and adoption about technologies in front line demonstration by the farmers having both direct and indirect bearing on the study were, therefore, reviewed and are presented in this chapter under following heads.

2.1. Independent variables

2.2. Dependent variable

2.3. Constrains faced by farmers in adoption of technologies in front line demonstration.

2.4. Conceptual model of research

2.1. Independent variables:

2.1.1. Personal, socio-economic, communication, psychological and situational characteristic of the respondents.

2.1.1.1. Age

Yakub (1985) reported that majority of wheat growers (61%) were observed in medium age group and age of the dry wheat growers noted to be negatively associated with technological gap.

Chand (1999) concluded that average number of arhar growers included in the study belonged to middle age group and significant relationship with dependent variables.

Badodia *et al.* (2002) found that maximum number of chickpea growers belonged to middle age group (36 to 50 years of age) and age of respondents were found positively and highly significantly related with technological gap.

Savita Singhal and Kamala Srinivasan (1990) concluded that majority of the farm women were between 18 to 35 years of age.

Raje (1991) reported that majority of the respondents in all the areas of study were of middle age group, i.e. 36 to 50 years and age was not found significantly correlated with adoption of improved modern and other scientific practices by farmers of all age groups to more or less extent.

Manjunath and Savnaur (1998) revealed that age exhibited non significant relationship with knowledge and adoption of food grain storage structure.

Rashekar (1998) reported that highest numbers of respondents (60.00%) were reported in middle age category in respect of their level of adoption. This was followed by low level category which comprised of (27.34%) respondents while only 12.66 per cent of the respondents were found in high level category and further observed that there was non significant relationship between age of the farmers and their level of adoption of scientific grain storage practices.

2.1.1.2. Education

Yakub (1985) found that majority of wheat cultivation (64.5%) were having primary and middle school education and the relationship between education of respondents and their technological gap was not significant.

Dolli and Sundarswamy (1994) showed that negative and significant relationship between education and technological gap in cultivation of red gram green gram and Bengal gram.

Tayade (1998) revealed that the significant relationship between education and adoption level of soybean growers.

Zade (1998) reported that education was significantly correlated with knowledge and adoption of soybean production technology.

Chand (1999) reported that average number of respondents included in the study had medium level of education as well as family education and it had significant relationship with technological gap in adoption of arhar production technology in Haryana.

Sarambekar *et al.* (1990) concluded that literacy level and preventive measures used for storing grain had association.

Raje (1991) reported that majority of respondents were educated upto high school level in Akola district and upto primary school in Raipur district.

Kadam and Borse (1993) while studying adoption behavior of banana growers observed that education had non significant correlation with the adoption of banana technologies.

2.1.1.3. Land holding

Yakub (1985) revealed that relatively more percent age of respondents (395) were observed in medium farm size group. He observed that farm size of respondents and technological gap related to all practices of dry wheat cultivation found to be significant.

Dolli and Sundarswamy (1994) observed that there is negative relationship between land holding and technological gap in cultivation of pulse crop.

Tayade (1998) observed that more than three fourth (75.47 %) of the respondent with medium land holding reported medium level of adoption.

Zade (1998) reported that land holding established a significant relationship with the knowledge and adoption level of the respondent.

Sudha (1997) concluded that land holding was non significantly related with adoption of scientific grain storage practices

Versha Rathod (2006) concluded that 50 per cent of the respondents were possessing small land holding.

Apurva Goyal (2007) concluded that 50 per cent respondents had land holding between 1 to 2 hectare.

Anonymous (1997) revealed that majority of the respondents had an area upto 1 hectare under rabi sorghum crop followed by 39.17 per cent of respondents having an area between 1.01 to 2.0 hectare under rabi sorghum.

2.1.1.4. Annual income

Sarambekar *et al.* (1990) noted that respondents stored the grain in different medias, regardless of their income.

Girase *et al.* (1991) revealed that there was a significant relationship between annual income and adoption behavior of groundnut farmers.

Raje (1991) reported that income had shown significant relationship with adoption of modern storage practices and there is a increasing trend of adoption according to the range of annual income.

Dharmale (1993) observed significant relationship between annual income of farmers and their adoption of new crops and farming practices.

Dupare (1995) observed significant relationship between annual income of farmers and their adoption of new crops and farming practices.

Thakkar (1996) reported that annual income of half of the families of rural women were of medium level i.e. Rs.6000 to15000.

Sudha (1997) found that annual income of the respondent women had non significant relation with their adoption of scientific grain storage practices.

Rashekar (1998) found that majority of the respondents (70.66%) had annual income at medium level followed by 16.67 and 12.67 percent respondents who were observed in high and low level income group respectively.

2.1.1.5. Farming experience

Kumbhare (1996) concluded that 72.00 per cent of farmers who attended training programme of KVK about improved practices were found in the high category of farming experience.

Ghodeswar (2006) noticed that, more than half (55.00%) of the pomegranate growers had farm experience of 4 to 6 years and 23.34 percent of pomegranate growers had farm experience of 7 years and above while 21.66 percent of them had farm experience up to 4 years of pomegranate cultivation.

Gangurde (2003) found that, the majority of the farmers (41-56%) growing banana had experience of 5 to 8 years in banana cultivation.

Kale (1990) revealed that majority of the respondents had medium farming experience in cotton cultivation.

Mahajan (2000) found that majority of the banana growers (60.00 %) were having 11 to 20 years of experience in banana cultivation, followed by 25.30 per cent having experience up to 10 years in banana cultivation.

Ramshetwad (2001) reported that, majority of the banana growers had experience of 6-10 years.

2.1.1.6. Social participation

Mahalakshmi (2003) indicated that majority (41.67%) of the pulse growers had medium level of social participation followed by low (32.50%) and high (25.83%) levels of social participation.

Tyagi *et al.* (2003) revealed that the technological gap had significant and negative correlation with social participation in socio-economic variable among the small, big and medium paddy farmer.

Thorat, *et al.* (2005) observed that about 71.00 per cent of the farmer have the membership of more than two institutes.

Dhole (2006) indicated that great majority of orange growers (77.33%) had no social participation, only 2.00 per cent of the respondents reported low social participation in any formal or Informal organisation.

Shinde (2006) observed that 45.00 per cent of the respondents from medium level of social participation followed by 43.12 per cent and 11.88 per cent from low and high level of social participation, respectively.

Sewatkar (2008) observed that the majority of trainees were equally distributed and 49.33% in middle and low level of social participation, whereas, few (1.33%) was noted high level of social participation.

Tidke (2012) reported that most of the respondents (76.67%) had no participation in any organization, while 16.67 and 6.67 per cent

respondent were member or office bearer in one and more than one organization.

Kharat (2012) inferred that most of the respondents (44.17%) had not anticipated in any social organizations.

Saide (2012) revealed that 76.00 per cent of the respondents were having medium level of social participation and remaining 17.00 per cent 7.00 per cent of the respondents were low level and high level of social participation respectively.

2.1.1.7. Source of information

Raje (1991) reported that 61.70 per cent, 11.65 per cent and 47.75 per cent of respondents were not getting information about scientific storage practices from any type of information source in all the study area.

Amberkar (1993) reported that source of information was positively and significantly related with knowledge and adoption of leafy and fruit vegetable cultivation practices.

Thakkar (1996) observed that the information source utilization pattern among rural women was found to be of medium category.

Sudha (1997) reported that the majority of the respondents (73.34%) had medium level use of source of information while (23.33% and 5.33%) showed high level and low level use of source of information respectively.

Prasad and Siddaramaiah (2000) in his study revealed that, mass media participation was positively and significantly related with level of adoption of plant protection measures.

2.1.1.8. Risk préférence

Bhosale (2003) found that, more than half (53.33%) of the farmers had medium risk preferences level, whereas, 29.34 percent of

farmer had high risk preference group while only 17.33 percent of farmers had possessed low risk preference.

Subramanyam (2002) revealed that 75.00 per cent of the trained farmers had medium risk preference followed by high (13.34%) and low (11.66%) levels of risk preference.

Bhagyalaxmi *et al.* (2003) revealed that majority of the respondents (70.56%) had medium risk orientation, followed by low (15.56%) and high (13.33%) risk orientation categories.

Suresh (2004) inferred that majority of respondents had medium level of risk orientation, followed by low and high level at the rate of 62.02, 24.58 and 13.34 per cent, respectively.

2.1.1.9. Extension contact

Prasad (1994) observed that 51.00 per cent of farmers had medium extension contact, followed by 32.78 per cent had low and 16.66 per cent had high category of extension contact.

Ramanna *et al.* (2000) revealed that 70 per cent of the respondents had medium level extension agency contact and 30 per cent of the respondents had maximum level extension agency contact.

Sarvanakumar (1996) revealed that majority *i.e.*, 51.67 per cent of the mango growers never contacted Assistant Agricultural Officer. Whereas, 42.50 per cent of the respondents had regular contact with village Administrative Officers and 50.83 per cent contacted agricultural Officers occasionally.

Angadi (1999) in his study on knowledge, adoption and marketing pattern of pomegranate growers in Karnataka found that majority of the respondents *i.e.*, 65.62 per cent had contact with Agricultural Assistant whenever there was a problem, while 62.50 per cent of the

respondents had no contact with Assistant Agricultural Officer. Only 13.12 per cent had contact with Scientists whenever there was a problem.

Kulkarni (1993) reported that greater majority of respondents had medium level extension contact with and it change agent was significantly related with adoption of recommended practices of chilli cultivation.

2.1.1.10. Innovativeness

Babanna (2001) focused that 34.10 per cent farmers were of medium innovative proneness category followed by 33.33 per cent of them having high and 32.66 per cent of them possessed low innovative proneness.

Natikar (2001) revealed that, 73.75 per cent of the subscriber farmers belonged to medium innovativeness category followed by low (15.63%) and high (10.62%) innovativeness categories.

Shashidhara (2003) found out that, majority of the farmers belonged to medium innovativeness category (47.50%) followed by low (31.66%) and high (20.83%) innovativeness category, respectively.

Ravichandra Prasad (2002) revealed that majority 67.86 per cent of the On Farm Extension Demonstration beneficiaries had medium level of innovativeness followed by high (17.86 per cent) and low (14.28 per cent) levels of innovativeness. Whereas, in case of non-beneficiaries, 51.78 percent of them had low level of innovativeness followed by medium (35.50%) and high (10.72%) levels of innovativeness, respectively.

Tidke (2012) reported that under psychological characteristics innovativeness was found to be evenly distributed, 40.00 per cent of respondents had been found in medium category of innovativeness whereas, in each category of low and high innovativeness, 30.00 per cent respondent were observed.

Rathod (2013) reported that the innovativeness of the orange growers, majority of respondent (64 per cent) were found in medium level

of innovativeness, while one fourth of orange growers (25.00%) belonged to low level of innovativeness and high level of innovativeness found by 11.00 per cent respondents.

2.1.1.11. Scientific orientation

Malati *et al.* (1989) in a study of value orientation of rural women reported that the women in general have traditional value orientation rather than modern value orientation.

Rashekar (1998) observed that majority of the respondents (62.00%) had medium level of scientific orientation followed by 22.00 and 16.00 per cent respondents who had low and high level of scientific orientation and further he found significant relationship between scientific orientation and level of adoption of scientific grain storage practices by the respondents.

Gogai and Phukan (2000) found that extent of adoption of rice practices by paddy growers goes hand in hand with their level of scientific orientation.

2.2. Dependent variable:

The studies reviewed connected with dependent variable namely adoption behaviour of respondents in terms of knowledge, attitude and adoption of technologies in front line demonstration are as follows.

2.2.1. Knowledge

Dipali and Malati (1986) observed that women had appropriate knowledge about the names of pests of stored grains.

Kulkarni *et al.* (1990) reported that nearly (50.00%) of the respondents were seen in medium knowledge category and only (9.00%) respondents were reported to have low knowledge score.

Verma *et al.* (1991) found that about 66.3 per cent of women had in medium level of knowledge gained while 23.6 per cent showed low level of knowledge gained category.

Rani Kumari and Sinha (1995) in their study of factors associated with knowledge of homemakers noted that only 14 per cent respondents belonged to the high level of knowledge category. Hence concluded that majority of rural women were not well acquainted with innovative or improved practices.

Budihal *et al.* (1996) indicated that farmers were aware of causes of storage losses and attributed mainly to storage pest. It was also noted that 72.75 per cent of farmers stored oilseeds, pulses upto three months whereas, cereals were stored for more period. Commonly used storage structure was gunny bags and majority of the farmers followed traditional methods for storage.

Dahiya and Varma (1996) found that the training resulted in increased knowledge and change of rural women regarding storage of pulses.

2.2.2. Attitude

Verma *et al.* (1991) assessed the attitudinal change among farm women regarding post harvest technology and found that (57.33%) of the women had scientific attitude for post harvest technology.

Vekaria *et al.* (1993) found that majority of the farmers (91.18%) had favorable attitude towards modern agricultural technology followed by 5.39 per cent and 3.43 per cent who had favorable and neutral attitude respectively.

Dahiya *et al.* (1996) from their study on post harvest technology training, it is observed that training under study resulted in change in attitude of rural women regarding the storage of pulses.

Sonika Thakur *et al.* (1996) reported the fact that for all the sub-components of post harvest technology for wheat, rice, pulse, fruits and vegetables there was significant change in attitude at post exposure stage after exposing farm women through slides.

Oladeji and Oyesola (2000) found that majority of the farmers were aware and had favorable attitude towards recommended practices. But they were not using it because of lack of knowledge and skills. A great deal of the farmers said their source of information is parents and fellow farmers.

2.2.3. Adoption

Thakare *et al.* (1988) found that fumigation of food grains with aluminium phosphide tablets was found to be more popular than any other recommended method of protecting stored food commodities among the farmers of Madhya Pradesh

Manimozhi and Lakshmisanta (1993) concluded that the use of polyethylene sheet, fumigation, metal bins and pucca kothi was not made by the marginal and small farmers where as by per cent large families used these methods. Prior to their participation in the training near by 69 per cent of marginal, 55 per cent of small and 41 per cent of large families found to be using metal bins.

Sanni *et al.* (1999) found that the cumulative adoption percentage for agricultural production based technologies, especially use of fertilizer were very high. On the other hand, adoptions of post-harvest technologies such as processing of the cereals were low.

2.3. Constrains faced by the respondents in adoption of technologies in front line demonstration

Bhoite and Dusane (1990) stated unavailability of seed, lack of knowledge about seed treatment, adulteration in seed, high cost of seed were the major constraints.

Dharmale (1993) reported that uncertainty of rainfall was the important situational constraints in cultivation of soybean crop expressed by 94.37 per cent of respondents. Inadequacy of labour during the peak period of crop growth and exorbitant wages of rates of labour as major constraints.

Tayade (1998) observed that low market price for soybean, financial problem, labour problem, high cost of fertilizer, lack of knowledge about plant protection measure against pest and diseases of soybean crop are the main constraints faced by the farmers in adoption of package of improved farm practices.

Zade (1998) stated that constraints with regards to lack of knowledge.

Deshmukh (2006) noticed that majority of the respondents faced the constraints like lack of scientific knowledge about plant protection measures (62.50 per cent), seed material is costly (54.16 per cent), non availability of labours at the time of harvesting (50.00 per cent), lack of knowledge about seed treatment (47.50 per cent) and FYM is more costly (42.50 per cent).

2.4. Conceptual model of research study

During the course of investigation the researcher has to assume some relations among variables and is required to develop a conceptual scheme. A model helps in critical and logical thinking about the research problem. A theoretical model represents the perceived relations among the concepts used in research. Based on the past research studies a conceptual model has been developed for the present study and the same has been depicted in Fig.1.

Independent variables



1. Age
2. Education
3. Land holding
4. Annual income
5. Farming experience
6. Social participation
7. Source of information
8. Risk preferences
9. Extension contact
10. Innovativeness
11. Scientific orientation

Dependent variable



Adoption behaviour



Knowledge

Attitude

Adoption



Fig.1: Conceptual model of research

CHAPTER III

METHODOLOGY

During the course of investigation the researcher has to develop techniques, tools and procedures for his research. The terms and concepts used need to be defined and appropriately measured. Appropriate tools and techniques for collection and analysis of the data are to be applied. The present study "Adoption behaviour of farmers about technologies in front line demonstration" has been undertaken to understand and assess the level of knowledge, attitude and adoption of technologies in front line demonstration by the farmers. The present chapter deals with research methods, procedures and techniques used in the present investigation. The same has been described with relevant details under following subheads-

- 3.1. Research design
- 3.2. Locale of study
- 3.3. Method of sampling and size of sample
- 3.4. Preparation of data collection instruments - the interview schedule
- 3.5. Method of collection of data
- 3.6. Study variables, operational definitions, measurements and categorization
- 3.7. Tabulation and analysis of data

3.1. Research design

The main focus of the study was on assessing the adoption behaviour of farmers in terms of extent of knowledge, attitude and adoption about technologies in front line demonstration. An 'Exploratory Research Design' of social research was, therefore, used in the present investigation, for collecting the pertinent facts from the farmers.

3.2. Locale of study

The present study was conducted in Akola and Gadchiroli district by collecting the list of farmers from SRS (Sorghum), Dr. P.D.K.V. Akola and KVK Akola of Maharashtra state.

3.2.1. Cropping pattern

The main crops grown in the study area in kharif season are Sorghum, Black gram, Tur, Soybean, Green gram. In rabi season Wheat, Gram, sorghum etc are cultivated.

3.3. Method of sampling and size of sample

The present study was conducted in Aheri and Mulchera tahsils of Gadchiroli district of Vidarbha region in Maharashtra state. Out of 2 tahsils, in the district there are 3 villages in Aheri tahsil and 1 in Mulchera tahsil was selected for rabi sorghum cultivation in which Zimela, Nandigaon, Timram and Labhantanda respectively. These area selected for study, because front line demonstrations (FLD) of rabi sorghum was given to these area by SRS sorghum, Dr.P.D.K.V.,Akola. And in Akola district selected tahsils are Akola, Balapur, Barshitakli . Out of these 3 tahsils selected villages for Pigeon pea cultivation are Gaigaon, Kanheri sarap, Katkhed, Morgaon bhakre, Yewata, Pimplkhuta, Hingana, Babhulgaon, Yelwan, Kanshivni, Sonala, Dongargaon, and Sisa.

These area selected for study, because front line demonstrations (FLD) of pigeon pea was given to these area by Krishi Vigyan Kendra (KVK), Akola.

At the second stage, a list of farmers in each selected village was prepared, for the present study according to the name on list that farmer was considered as a respondent. From the list of farmers in selected villages a total sample of 150 farmer respondents were selected by using random sampling method and 'pre-tested schedule of contacting them personally.

The details about the selected villages, total number of farmers and sample of farmers selected from each village is furnished in Table1.

Table-1: Total number of farmers and sample of farmers selected from each village.

Sr. No	Name of villages	Sample of farmers selected
1	Zimela	16
2	Nandigaon	16
3	Timram	28
4	Labhantanda	20
5	Gaigaon	10
6	Kanheri sarap	03
7	Katkhed	09
8	Morgaon bhakre	09
9	Yewata	08
10	Pimpalkhuta	02
11	Hingana	03
12	Babhulgaon	02
13	Yelwan	03
14	Kanshivni	07
15	Sonala	08
16	Dongargaon	05
17	Sisa	01

3.4. Preparation of data collection instrument - the Interview schedule

The Information relevant to the study objectives was to be collected from the farmers. An appropriate data collection tool was, therefore, to be developed and used. An interview schedule was the appropriate tool. An interview schedule consisting questions related to the objectives of the study was, therefore, developed. Initially the schedule was developed in English and was then translated in local language i.e. Marathi. The schedule was designed with relevant questions by referring available literature. The specific scale and questions as per objectives were incorporated in the schedule. The questions in the schedule were worded clearly and was made in a simple manner in order to make it easy for the respondents to understand and reply without any difficulty and express their replies freely and frankly for every direct type of questions where the respondents could answer were 'yes' or 'no'. A confirmatory type of questions, were put in addition to it, so as to see and determine the validity

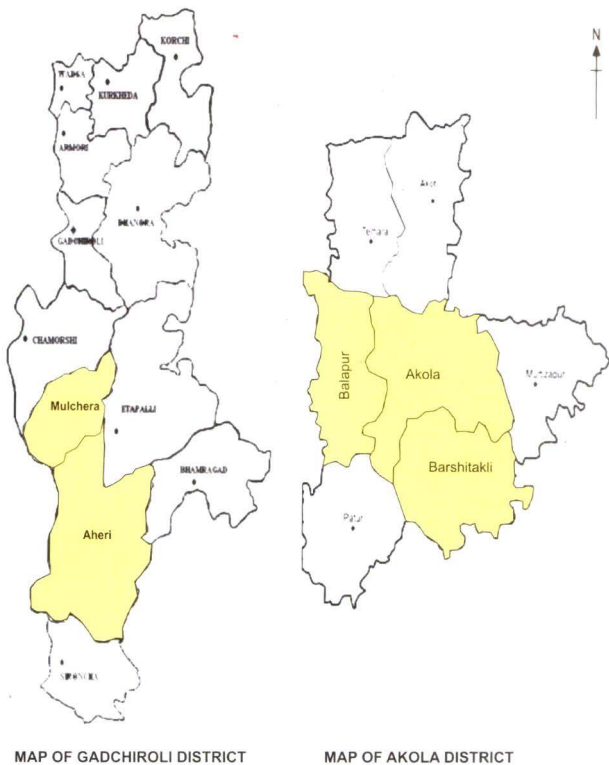


Fig. 2 Map of Gadchiroli and Akola district showing tahsils selected for study

and accuracy of the answer with respect to adoption of technologies in front line demonstration. The schedule was pre tested in the non sample villages by administering schedule to 10 non sample farmers to remove ambiguities, short falls and mistakes if any. As per the experience gained during pre-testing, the language of some of the questions was suitably worded and was made more understandable and schedule was then finalized.

The first part of the interview schedule was related to general information and characteristics of the farmers namely age, education, land holding, annual income, farming experience, social participation, Source of information, risk preferences, extension contact, innovativeness, scientific orientation . Questions connected with knowledge, attitude and adoption about technologies in front line demonstration and the problems faced by them in adoption of the technologies in front line demonstration were included in second part of schedule.

3.5. Method of data collection

- 1) The list of farmers will be obtained from the offices of Dr. PDKV, Akola and KVK, Akola to select the sample. The sample will comprise of about 150 farmers and the information will be collected with the help of pre-tested schedule by contacting them personally.

From the selected villages the list of farmers who cultivated sorghum and pigeon pea was obtained from the SRS (Sorghum), Dr. PDKV, Akola and KVK Akola respectively total 150 respondents were selected for the purpose of study by using random sampling method and respondents were interviewed personally and individually in their respective villages. The interview schedule prepared for the purpose of study was used to record the research data.

3.6. Study variables, operational definitions, measurements and categorization

Based on the review of available literature, considering relevancy and opinion of the experts in the field of Extension Education, Agronomy and Agricultural statistics the variables were selected for the

study. The first set consisted of independent variables and the second one the dependent variables.

3.6.1. Variables and their measurements

The variables selected for the study and the procedure used for their measurement is presented in Table 2.

Table 2. Variables and their empirical measures

Sr. No.	Variables	Measurements
1	INDEPENDENT VARIABLES	
1	Age	The completed years of age was considered as individuals age score
2	Education	A numerical score of one was assigned to each standard of formal schooling passed.
3	Land holding	Number of hectares of land possessed by an individual respondent.
4	Annual income	Total annual income in rupees was considered as score of individual respondent.
5	Farming experience	The number of years working experience of respondent on farm.
6	Social participation	A numerical score of 1 was assigned for the membership in informal organization, whereas a score of 2 was assigned for the office bearer in informal organization. Similarly a score of 3 was assigned for the membership in formal organization, where as a score of 4 was assigned for the office bearer in the formal organization.
7	Source of information	It was measured with the help of scientific orientation scale developed by Supe (1969) .
8	Risk preferences	It was measured by scale developed by Supe (1969).
9	Extension contact	It was measured in terms of number of contacts by the respondent with extension workers and its frequency i.e. always, sometime and never by assigning the score 2, 1 and 0 respectively.
10	Innovativeness	It was measured by scale developed by Singh (1972).
11	Scientific orientation	It was measured with the help of scientific orientation scale developed

		by Supe (1969) .
II	DEPENDENT VARIABLE	
1	Adoption behaviour	The adoption behaviour was conceptualized as the sum total of the scores of knowledge, attitude and adoption. Kamble (2001)
i	Knowledge	A teacher made knowledge test comprising of items related to technologies in front line demonstration was developed.
ii	Attitude	The scale developed by Raje (1991) was used
iii	Adoption	Adoption index was developed

3.6.2. Operational definitions of selected variables

Operational definitions indicating the activities involved in measuring the variables, the procedure of scoring and categorization of both the independent and dependent variables have been described in this section.

3.6.2.1. Independent variables:

1. Age

Age was operationally defined as the chronological age of the respondent in completed years at the time of interview. The completed years of age was considered as individual's age score. Then the respondents were grouped under following three age categories.

Sr. No.	Age levels	Score range
I	Young	Upto 35
li	Middle	36 to50
lii	Old	Above 50

2. Education

Education referred to the amount of formal schooling completed by the respondent. Zero score for illiterate and a numerical score of one was assigned for each standard of formal schooling passed by the farmers. Following categories were formed by classifying the respondents on the basis of their education score.

Sr. No.	Education levels	Standards
I	Illiterate	No formal schooling
li	Primary school	1 st to 4 th
lii	Middle School	5 th to 7 th
lv	High School	8 th to 10 th
V	College	Above 10 th

3. Land holding

Land holding referred to the total land in hectares possessed by an individual head of the family for cultivation of crops. Number of hectares of land possessed was considered as such as score of individual respondent and were categorized under following groups as per government norms.

Sr. No.	Land holding level	Land holding range
I	Marginal	Upto 1.00 ha.
li	Small	1.01 to 2.00 ha.
lii	Semi medium	2.01 to 4.00 ha.
lv	Medium	4.01 to 10.00 ha.
V	Large	Above 10.00 ha.

4. Annual income

Annual income referred to the total annual income of the respondents family in rupees derived from all sources. Total annual income of a respondents family was considered as score of individual respondent and was categorized on equal interval basis in to five different income categories as under.

Sr. No.	Score Range
1	Up to 50000
2	50001 to 100000
3	100001 to 150000
4	150001 to 200000
5	Above 200000

5. Farming experience

It has been defined as duration in years of an individual respondent who is engaged in the cultivation of land. It will be measured in terms of number of years working experience of respondent on farm. The categorization was made on the basis of minimum and maximum scores by calculating SD and mean.

Sr. No.	Categories	Years
1	Low	Upto 5 years
2	Medium	6 to 10 years
3	High	Above 10 years

Mean=20.17

SD= 8.95

6. Social participation

Social participation has been operationally defined as the participation of farmers in formal and informal organizations. A numerical score of 1 was assigned for the membership in informal organization, whereas a score of 2 was assigned for the office bearer in informal organization. Similarly a score of 3 was assigned for the membership in formal organization, where as a score of 4 was assigned for the office bearer in the formal organization. On the basis of minimum and maximum score of participation, the farmers was categorized on the basis of mean and standard deviation viz., Low (below mean - SD), Medium (mean +/- SD) and High (above mean + SD).

Sr. No.	Categories	Score range
1	Low	Upto 1
2	Medium	2 to 3
3	High	4 and above

Mean=2.62

S.D.=1.82

7. Sources of information

It is the operationally defined as the sources used by the respondents for seeking technical information and guidance about technologies in front line demonstration. Scoring was done on the basis of their response to the sources of information. A score of 2 to regular, 1 to occasional and zero for never responses for seeking the information. Thus, total score for each individual was calculated and this will be considered as individual score for information. On the basis of mean and standard deviation, the respondents will be categorized into three groups viz. low, medium and high.

Sr. No.	Category	Score range
1	Low	Upto 6.97
2	Medium	6.98 - 12.07
3	High	Above 12.07

Mean=15.63

S.D.=2.56

8. Risk preference

It is defined as the degree to which a respondents is oriented toward risk and uncertainly and has the courage to face the problem in the scale developed by Supe (1969) was used to measure the risk preference of respondents towards the new technologies of Front Line Demonstration. There was six statements. Out of the six statements in the scale, statement 1 and 5 will be negative and remaining 2, 3, 4 and 6 will be positive. The responses of respondents was rated on five point continuums namely, strongly agree, agree undecided, disagree, and strongly disagree. The

scoring was done on the basis of the responses of an individual respondent. The positive statements will be assigned the score 5, 4, 3, 2 and 1 for strongly agree, agree, undecided, disagree and strongly disagree response categories respectively. Reverse scoring was done for negative statements. Scores earned on all the six statements of scale by each individual respondent was summed up and this sum total indicated the risk preference score of that respondents.

On the basis of mean and standard deviation ($\bar{X} \pm \text{ISD}$) the respondents will be categorized into following categories.

Sr. No.	Risk preference	Score range
1	Low	Below 17.99
2	Medium	17.99 to 21.85
3	High	Above 21.85

Mean=17.41

S.D.=2.36

9. Extension contact

It is defined as the degree to which the contact of respondents with change agent such as Gramsevak, officer and scientist etc. for obtaining information of farming.

It was measured in terms of number of frequency of contact with extension personnel. For measurement of extension contact schedule was developed. It was measured always, sometime and never by assigning score 2, 1 and 0 respectively. On the basis of total obtained score of each respondent, they was be categorized on the basis of mean and standard deviation viz., Low (below mean - SD), Medium (mean +/- SD) and High (above mean + SD).

Sr. No.	Categories	Score Range
1	Low	Upto 21.68
2	Medium	21.69 to 26.71
3	High	Above 26.72

Mean=19.52

S.D.=5.92

10. Innovativeness

It is the degree to which an individual adopts new ideas relatively earlier than others in his social system (Rogers and Svenning, 1969). It is operationally defined as the degree to which a respondent adopts new ideas relatively earlier than others in his social system.

The scale developed by Singh (1972) was used to measure innovativeness. There were six statements in scale, out of which statement No. 1, 4 and 5 was positive and remaining i.e. 2, 3 and 6 was negative. The responses were collected on three point continuum viz, agree, undecided and disagree. The positive statements were assigned the score of 3, 2 and 1 for responses category namely agree, undecided and disagree, respectively. Reverse scoring was done for negative statements on basis of mean and standard deviation, the respondents were categorized into three groups viz, low, medium, high.

Sr. No.	Categories	Score range
1.	Low	Upto 10
2.	Medium	11 to 14
3.	High	Above 15

Mean=15.12

S.D.=2.14

11. Scientific orientation

It is operationally defined as the degree to which an individual is oriented towards the use of scientific method in enterprise. It was measured with the help of scientific orientation scale developed by Supe and Singh (1969) with slight modification. The scientific orientation scale includes six statements with five response categories as 'strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree'. The score 5,4,3,2 and 1 was given respectively for positive statement. In case of negative statement, reverse scoring procedure was followed. The summation of scores obtained by the respondent for all six statements indicated his scientific orientation score.

Sr. No.	Categories	Score range
1	Low	Upto 18
2	Medium	19 – 22
3	High	Above 22

Mean=23.52

S.D.=2.61

Total score obtained by each respondent will be worked out. The respondents was categorized on the basis of mean and standard deviation viz., Low (below mean - SD), Medium (mean +/- SD) and High (above mean + SD).

3.6.2.2. Dependent variable:

A dependent variable i.e. adoption behaviour of respondents was studied in terms of their knowledge, attitude towards technologies in front line demonstration and its adoption.

1. Knowledge

Operationally knowledge has been defined as the body of understood information possessed by respondents about technologies in front line demonstration. A teacher made knowledge test was developed to measure the knowledge of the respondents. It was measured on two point continuum i.e. yes or no answer. The raw score of knowledge was converted into knowledge index by using following formula.

$$\text{Knowledge index} = \frac{\text{Knowledge score obtained by respondent}}{\text{Obtainable knowledge score}} \times 100$$

On the basis Knowledge index score the respondents was categorized with help of equal interval method as follows

Sr. No.	Categories	Index range
1	Low	Up to 33.33
2	Medium	33.34 to 66.66
3	High	Above 66.67

2. Attitude

In the present study attitude was operationally defined as a extent of positive or negative reaction of the respondents towards the technologies in Front Line Demonstration. To measure the attitude, the scale developed by Raje (1991) was used. There were total 12 statements related to the improved technologies. The statement number 2, 3, 4, 5, 7, 8, 9, 10, 11 was positive, whereas statement number 1, 6 and 12 was negative. The responses of farmers were elicited to each statement on a five point continuum viz. strongly agree, Agree, Undecided, Disagree, and strongly disagree. the responses to positive statement was assigned the scores of 5, 4, 3, 2, 1 where as reverse scoring i.e. 1, 2, 3, 4, 5 was followed for negative responses. The sum of scores of all the 12 statements indicated the attitude score of the individual farmers towards technologies in Front Line Demonstration.

The maximum score obtained by an individual could be 60 and the minimum score was 12. The score of each respondent on all the statements was added together and taken as attitude score of each individual which was then converted into Attitude Index, with help of following formula.

$$\text{Attitude index} = \frac{\text{Attitude score actually obtained by the respondents}}{\text{Maximum obtainable attitude score by the respondents}} \times 100$$

The respondents were then categorized in three categories on the basis of equal interval.

Sr. No.	Categories	Score range
1	Unfavourable	Upto 33.33
2	Favourable	33.34 – 66.66
3	High Favourable	Above 66.67

3. Adoption

Adoption in present study refers to the degree of actual use of improved technologies in front line demonstration by farmers.

For measurement of adoption quantitatively, technologies in front line demonstration such as spacing between plant to plant and row to row, irrigation schedule, fertilizer application, other practices was considered for this purpose. The score was given in three point continuums such as 2, 1 and 0 for complete adoption, partial adoption and no adoption respectively. The adoption score was converted into adoption index with the help of formula as below.

$$\text{Adoption index} = \frac{\text{Adoption score actually obtained by the respondents}}{\text{Maximum obtainable adoption score by the respondents}} \times 100$$

Considering the adoption indices the respondents were categorized into following categories on equal interval basis.

Sr. No.	Categories	Index range
1	Low	Up to 33.33
2	Medium	33.34 to 66.66
3	High	Above 66.67

4. Adoption behaviour

The adoption behaviour was conceptualized as the sum total of the scores of knowledge, attitude and adoption towards technologies in front line demonstration of respondents. The adoption behaviour index was calculated finally as on the basis of an average of knowledge, attitude and adoption indices by using formula as given below:

$$\text{Adoption behaviour index} = \frac{\text{Knowledge index} + \text{Attitude index} + \text{Adoption index}}{3}$$

Lastly, on the basis of adoption behavior index of individual respondents they were categorized in to three categories on equal interval basis as under.

Sr. No	Adoption behavior levels	Index range
I	Low	Upto 33.33
ii	Medium	33.34 -66.67
iii	High	Above 66.67

3.7. Tabulation and analysis of data

The data collected through personal interview were carefully examined for completeness and correctness. Both qualitative and quantitative classes were formed. In case of some variables, the classes were formed arbitrarily while in case of some variables accepted standard classification was adopted and in still others, the equal interval, mean± standard deviation method was use for classification. Then collected information was tabulated and the frequencies and percentages of the respondents in each category were worked out.

Following statistical techniques were used in the present study for analysis of data.

1. Arithmetic mean (\bar{x})
2. Standard deviation ($\bar{\sigma}$)
3. Coefficient of correlation (r)

i) Coefficient of correlation

The relational analysis comprised of computing relationship between the selected independent variables viz., age, education, land holding, annual income, farming experience, social participation, source of information, risk preferences, extension contact, innovativeness, scientific orientation towards technologies in front line demonstration with the dependent variable adoption behavior separately in terms of knowledge, attitude and adoption. The data were analyzed on computer at Computer Center, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The coefficients of correlation (r) were worked out to find out the relationship of independent variables with dependent variables.

The significance of calculated coefficient of correlation (r) was tested against the table value of ' r ' at $(n-2)$ degrees of freedom. The relationship was considered to be significant if the calculated value of ' r ' was greater than the table value at either 0.01 or 0.05 level of probability.

The coefficient of correlation equation fitted was

Where,

$$r = \frac{\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{[N \Sigma X^2 - (\Sigma X)^2][N \Sigma Y^2 - (\Sigma Y)^2]}}$$

r	=	Coefficient of correlation Σ
ΣX	=	Sum of the score of variable X
ΣY	=	Sum of the score of variable Y
ΣXY	=	Sum of products of 'X' and 'Y' variables
ΣX^2	=	Sum of the square of 'X' variable
ΣY^2	=	Sum of the square of 'Y' variable
N	=	Total number of respondents

Chapter – IV
Socio-Economic
Status

CHAPTER IV

SOCIO-ECONOMIC STATUS

The finding of any field research study in agriculture at the micro level cannot be generalized at the national level. However, finding of each study can be taken for granted as relevant for those areas having similar condition with regards to other factors. The finding therefore, must follow a clean mention about the socio-economic features of study area to facilitate better understanding of the observation and also to apply same in other areas with similar features. The present chapter is therefore devoted to discuss in brief some of the socio-economic features of Akola district, just to facilitate comparison and to get better idea of the economy.

Maharashtra state has six revenue divisions viz., Mumbai, Pune, Nasik, Aurangabad, Amravati and Nagpur. Vidarbha area includes Amravati and Nagpur revenue division comprising eleven districts viz., Buldana, Akola, Washim, Yavatmal, Wardha, Nagpur, Bhandara, Gondia, Chandrapur and Gadchiroli. Washim and Gondia are newly formed districts bifurcating Akola and Bhandara districts respectively. Nagpur division includes Bhandara, Gondia, Chandrapur, Gadchiroli and Wardha are the eastern district of Vidarbha. The western districts are Buldana, Akola, Amravati, Yavatmal and Washim. The western districts are known for its cotton crop and the eastern region is for good quality of rice. Vidarbha as a whole contributes cotton, rice, jowar, millets, oilseeds, soybean, citrus, forest timber etc.

The present study is confined to of Gadchiroli district of Eastern Vidarbha and Akola district of Western Vidarbha. The agro-climatic conditions differ from place and even in close vicinity also.

4.1 Location of district:

Gadchiroli and Akola district falls in Vidarbha region of Maharashtra. While Gadchiroli district comprises of 12 tehsils. It lies between 18.43' and 21.50' north latitudes and 79.45' and 80.53 east

latitude. It covers area of 190282 ha. Gadchiroli district is surrounded by Chandrapur district, Gondia district and Bhandara district. And Akola district comprises of 7 tahsils. It lies between $20^{\circ} 17'$ and $21^{\circ} 18'$ north latitudes and $76^{\circ} 17'$ and $77^{\circ} 14'$ east latitudes. It covers area of 540481 ha. Akola district is surrounded by Amravati district in North, part of Amravati district and Yavatmal district in the East, Washim and Yavatmal district to the South and Buldhana district toward West.

4.2 Topography and soil

The entire Gadchiroli district is included in the drainage basin of Godavari river. Vainganga Khore is one of the particular area in this district. Gadchiroli, Armori, Chamorshi, Aheri and Sironcha talukas are covered under this area. The major area of the district is having undulating topography on large scale. Except a narrow strip along Godavari and Pranhita rivers. Gadchiroli district is divided into 12 tahsils for smooth administration. The soil of the district lithologically consist of metamorphic rocks of Archaean and Proterozoic age. The predominant soil cover in the district is clay, clay-gravel, sandy loam, deep black soil, reddish & yellowish brown soils on hill slopes, brown & gray soils of plains and laterite & lateritic soil. And in Akola, northern part of the Akola district lies in Purna valley which itself is a part of Tapi river basin. River Purna has formed fertile basin in Akola, Balapur and Murtizapur tehsils of Akola. Akola district is divided into 7 tehsils for smooth administration. The district ranks fourth in respect of size and fifth in respect of population among the eleven districts of Vidarbha regions of Maharashtra. The soil of the district is basically derived from volcanic trap rock and it is quite fertile. It is classified into categories as coarse soil found in south, medium black soil in the plain and deep black soil found in river valley.

4.3 Climate and rainfall

Being away from the sea, the Gadchiroli district have extreme climate. The weather during winter is too cool, while in summer it is too hot. The average minimum and maximum temperature extremities observed throughout the year was 5°C and 46.3°C , respectively. Gadchiroli district

falls in assured rainfall zone of Maharashtra state, maximum rainfall received in this district and create flood condition to rivers, having on an average rainfall between 1100 to 1200 mm.

In Akola district, being away from the sea, the Akola district have extreme climate. The weather during winter is too cool, while in summer it is too hot. The average minimum and maximum temperature extremities observed throughout the year was 10⁰ C and 46.5⁰ C, respectively. Akola district falls in assured rainfall zone of Maharashtra state having on an average rainfall between 750 to 1000 mm.

4.4 Land use pattern

The details of land use pattern of Gadchiroli district are presented in Table 3.

Table 3 : Land use pattern in Gadchiroli district.

Sr. No.	Particular	Area (Sq.Km.)
1.	Total geographical area	14412.0 Sq.Km.
2.	Area under forest	11694.0 Sq.Km.
3.	Inhabited Area	1028.0 Sq.Km (6.89 %)
4.	Agriculture Area	1960.0 Sq.Km (13.14 %)
5.	Industrial Area	2.0 Sq.Km (0.02%)
6.	Forest Cover	11694.0 Sq.Km (78.40%)
7.	Wastelands	231.0 Sq.Km (1.55%)
8.	Drought Prone Area	Nil

(Source: Official website of Gadchiroli District)

The details of land use pattern of Akola district are presented in Table 4.

Table 4 : Land use pattern in Akola district.

Sr. No.	Particular	Area (ha)
1.	Total geographical area	540481
2.	Area under forest	36414
3.	Barren and uncultivable land	18280
4.	Permanent pastures and other grazing land	5292
5.	Land under miscellaneous tree crops and grooves not included in net area sown	8098
6.	Cultivable waste land	5958
7.	Land put under non-agricultural use	5801
8.	Current fallow	7911
9.	Other Fallow	5262
10.	Net sown area	447331
11.	Area sown more than once	37086
12.	Gross cropped area	484417
13.	Cropping intensity (%)	108.29

(Source: District Socio-economic Review, 2009-10)

4.5 Cropping pattern

The usual cropping is determined by large number of factors. The most important factors are climate, soil, topography, customs and distance to market (Table 5).

Table 5 : Cropping pattern of Gadchiroli district

Sr. No.	Types of Crops	Area (ha)
1.	Rice	140801
2.	Wheat	997
3.	Sorghum	9927
4.	Maize	2996

5.	Bhadli	172
6.	Other cereals	853
	Total Cereals	155746
6.	Gram	10383
7.	Tur	1617
8.	Mung	3390
9.	Udid	2582
	Kulthi	3330
	Matth	79
	Wal	651
	Pea	53
10.	Other Pulses	7535
	Total Pulses	29620
	Total food grains	185366
11.	Sugarcane	0
12.	Cotton	116
	Total Fibre crops	116
13.	Soyabean	1773
14.	Sunflower	88
15.	Groundnut	364
	Sesamum	1905
	Linseed	2352
16.	Other oilseeds	401
	Total oilseeds	6883
	Mango	351
	Other fruits	43
	Total fruits	394
	Total vegetables	1003
	Gross cropped area	349508

(Source: District Socio-economic Review, 2006-07)

Table 6: Cropping pattern of Akola district

Sr. No.	Crop	Area (ha)
1.	Wheat	18871
2.	Kharifjowar	84922
3.	Bajra	1210
4.	Maize	2451
5.	Other cereals.	21
	Total cereals.	107475
6.	Gram	20087
7.	Tur	25634
8.	Mung	43334
9.	Udid	14082
10.	Other Pulses	1038
	Total Pulses	104175
	Total food grains	211650
11.	Sugarcane	335
12.	Cotton	192994
	Total Fibre crops	193329
13.	Soyabean	40613
14.	Sunflower	3550
15.	Groundnut	1332
16.	Other oilseeds	8497
	Total oilseeds	53992
17.	Total fruits and Vegetables	6924
18.	Other crops	15598
	Gross cropped area	481493

(Source: District Socio-economic Review, 2009-10)

4.6 Crop season and crop rotation

There are two important crop season i.e. *Kharif* and *Rabi* where as in summer season land generally remains fallow and preparatory tillage operations are under taken.

Rice, Cotton, jowar are important crops grown in *Kharif* season on large scale. Tur, mung, udid, are also grown in *Kharif* on large scale. Soybean crop is grown by the farmers on large area. Wheat and gram are important *Rabi* crops grown in the area. Linseed, sunflower, safflower, some spices and vegetable, fruit crop are also grown in *Rabi* season wherever the sources of irrigation is mostly through well, canal and river. The manners in which crop rotation are commonly followed is presented in Table 6.

Table 7: Crop season and crop rotation of Gadchiroli District

Sr. No.	Kharif	Rabi
1	Rice	-
2	Cotton + tur + jowar	-
3	Soybean	Gram
4	Soybean + tur	Wheat
5	Jowar	Gram
6	Cotton+ mung / udid	Safflower / wheat
7	Cotton + tur	Safflower
8	Cotton+ tur + jowar +mung	Sunflower
9	Mung	Safflower
10	Cotton + mung	-

Table 8 : Crop season and crop rotation of Akola District

Sr. No.	Kharif	Rabi
1	Cotton	-
2	Cotton + tur + jowar	-
3	Soybean	Gram
4	Soybean + tur	Wheat
5	Jowar	Gram
6	Cotton+ mung / udid	Safflower / wheat
7	Cotton + tur	Safflower
8	Cotton+ tur + jowar +mung	Sunflower
9	Mung	Safflower
10	Cotton + mung	-

4.7 Input supply

Agricultural inputs like seed, manure, fertilizers, insecticides, pesticides etc. are required by the farmers are made available to them through number of agricultural service centers established at district level and block level.

Maharashtra State Seed Corporation Ltd., Dr. PDKV, Akola and other private seed companies supply the quality seeds to the farmers. The farm inputs are made available to the farmers by co-operative societies and nationalize banks functioning at block level, panchayat samiti also provide inputs to the farmers. Co-operative society supply input against the loan sanctioned by the District Central Co-operation Bank to individual cultivator.

4.8 Markets

For the marketing of agricultural produce, agricultural produce market committees are functioning in the district. All tehsils having facilities of regulated markets functioning in the district. These sub-markets are connected with roads and having facilities of banking, electricity etc.

CHAPTER V

RESULTS AND DISCUSSION

This chapter deals with the results of the present investigation entitled "Adoption behaviour of farmers about technologies in front line demonstration". The efforts have been made to establish relationship between personal, socio-economic, communication, psychological and situational characteristics of the respondents of front line demonstration as independent variables and knowledge, attitude, adoption of technologies by respondents of their adoption behaviour. The problems faced by respondents in adoption of technologies of front line demonstration have also been identified by taking the response of the respondents. The results have been presented under the following sub-heads.

5.1 Characteristics of the farmers

5.2 Knowledge about the technologies of front line demonstration

5.3 Attitude towards the technologies of front line demonstration

5.4 Adoption of technologies of front line demonstration

5.5 Adoption behaviour about technologies in front line demonstration

5.6 Constraints faced by farmers in adoption

5.7 Relational analysis

5.8 Empirical model

5.1 characteristics of the farmers

The personal, socio economic, communication, psychological and situational characteristics of farmers was studied as independent variables. The distribution of respondents on these characteristics is presented and described below.

5.1.1 Personal, socio-economic, communication, psychological and situational characteristics.

The study of personal, socio-economic situational, communicational and psychological characteristics were made with reference to age, education, land holding, annual income, farming

experience, social participation, source of information, risk preferences, extension contact, innovativeness, scientific orientation. The distribution of respondent on this characteristics has been presented in this part.

5.1.1.1 Age

Age refers to the chronological age of an individual respondent expressed in complete years and age as such considered. The following categories formed for classifying the respondents of front line demonstration on the basis of their age in following Table 9.

Table 9. Distribution of the respondents according to their age levels

Sr. No.	Age (years)	Respondents(n=150)	
		Frequency	Percentage
1.	Young (Upto 35 year)	27	18
2.	Middle (36 to 50 year)	59	39.33
3.	Old (above 50 year)	64	42.66
	Total	150	100.00

The age wise distribution of the respondents in table 6 shown that 42.66 percent respondents were talk in the old age group of above 50 years. This was followed by 39.33 percent respondent belonging to the middle age category of 36 to 50 years, only 18 percent respondents were observed to be in young age group of upto 35 years of age. Thus it may be inferred that the respondents in study area were mostly belonging to old age group of above 50 years of age.

It is inferred that the respondents were mostly old aged. These findings were similar to the findings of Khobragade (2000).

5.1.1.2 Education

Education builds the ability of an individual to seek knowledge, understand and adopt things efficiently. It widens the scope of thinking and practice. The categorization of respondent of front line demonstration according to education has been done and is presented in Table 10.

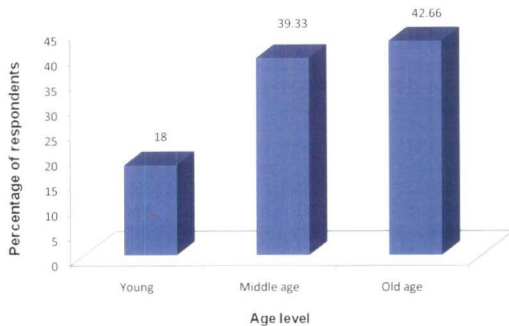


Fig.3.Distribution of the respondents according to their age level

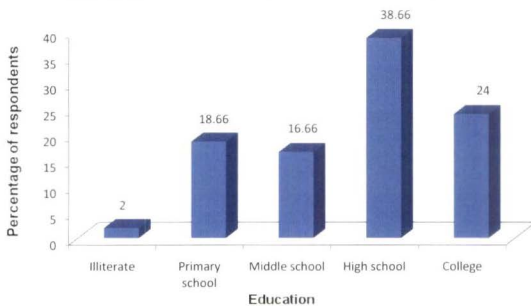


Fig.4.Distribution of respondents according to their education

Table 10. Distribution of respondents according to their education

Sr. No	Education	Respondents (n=150)	
		Frequency	Percentage
1	Illiterate	3	2
2	Primary school	28	18.66
3	Middle school	25	16.66
4	High school	58	38.66
5	College	36	24
	Total	150	100.00

The data in Table show that 38.66 percent of the respondents were educated up to high school level, followed by 24 percent respondents who had college level education. Further, it was found that 18.66 percent of the respondents were educated up to primary school level and 16.66 percent of the respondent who had middle school level education. A very few 2 percent respondents had not attend any school i.e. illiterate.

Thus, it can be concluded from the above findings that most of the respondents were educated up to high school level followed by college level education.

Similar results were obtained by Raje (1991) and Rashekar (1998).

5.1.1.3 Land holding

The data with regards to the distribution of respondents according to their land holding have been presented in Table 11.

Table 11. Disibution of the respondents according to their land holding levels

Sr. No.	Land holding	Respondent (n=150)	
		frequency	Percentage
1	Marginal (Up to 1.00)	17	11.33
2	Small (1.01 to 2.00)	45	30.00
3	Semi-medium (2.01 to 4.00)	68	45.33
4	Medium (4.01 to 10.00)	20	13.33
5	Large (Above 10.00)	00	00.00
	Total	150	100

It is observed from the distribution in table 8 that above nearly half of the respondents (45.33) had semi medium size of land holdings (2.01-4.00 hectares) with their families. It was followed by 30 percent of the respondents who belonged to category of small land holding possessing land between 1.01-2.00 hectares. The medium land holding of between 4.01-10.00 hectares were found to have been possessed by 13.33 percent of the respondents. Not respondents found were belonging to the families of large land holding s.

Thus, it may be inferred that majority of the respondents had semi medium size of land holding having land between 2.01 to 4 hectares.

Varsha Rathod (2006) and Apurva Goyal (2007) reported contradictory results as majority of respondents were observed in semi medium size of land holdings category.

5.1.1.4 Annual Income

The data with regards to the distribution of respondents according to their annual income have been presented In Table 12.

Table 12. Distribution of the respondents according to their annual Income levels

Sr. No.	Annual income (Rs.)	Respondents (n=150)	
		frequency	Percentage
1	Up to 50,000	31	20.66
2	50,001 to 1,00,000	83	55.33
3	1,00,001 to 1,50,000	13	8.66
4	1,50,001 to 2,00,000	15	10.00
5	Above 2,00,000	8	5.33
	Total	150	100.00

From the distribution of the respondents according to annual income in Table 9, it may be proposed that the respondents in higher proportion (55.33%) had annual income above Rs.50,001-1,00000 followed by 20.66 per cent respondents had annual income in between upto Rs 50,000 and between Rs. 1,50,001 to 2,00000 the percentage of the respondents having annual income were found to be 10per cent, followed by 8.66 and 5.33 had annual income Rs. 1,00001 to 1,50,000 and above 2,00000, respectively.

Therefore, it was concluded that majority of the respondents (55.33%) possessed annual income Rs. 50,001 to Rs. 1,00,000. Jadhav (2008) and Jaybhave (2014) had also reported similar results which are observed in the present study.

5.1.1.5 Farming experience

It refers to the duration in year of an individual respondent who is engaged in cultivation of land. Farming experience of the respondent of front line demonstration represented in the Table 13.

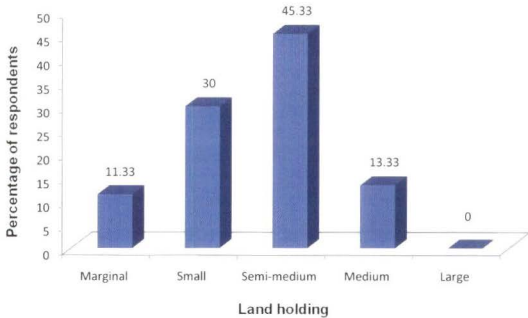


Fig.5.Distribution of respondents according to their land holding

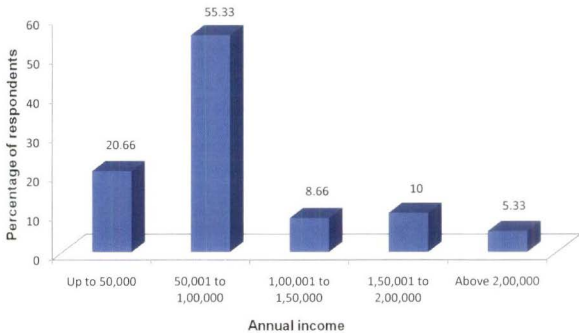


Fig.6.Distribution of respondents according to their annual income

Table 13. Distribution of the respondents according to their farming experience

Sr. No.	Farming experience	Respondents (n=150)	
		Number	Percentage
1.	Low (upto 5 years)	6	4
2.	Medium (6 to 10 years)	28	18.66
3.	High (above 10 years)	116	77.33
	Total	150	100.00

The distribution of respondents according to their experience in farming indicated that more than 1/2 of the farmers had high level of farming experience i.e. above 10 years followed by medium and low level (18.66%)and(4%) respectively.

The findings of the present study are in to with the findings of Kumbhare (1996) who reported that majority of farmers were found in the high category of farming experience.

5.1.1.6 Social participation

It refers to the participation of farmers in formal and informal organizations. The participation of respondents of front line demonstration in social organization has been shown in following Table 14.

Table 14. Distribution of the respondents according to their social participation

Sr. No.	Social participation	Respondents (n=150)	
		Number	Percentage
1.	Low (upto 1)	44	29.33
2.	Medium (2 to 4)	85	56.66
3.	High (above 5)	21	14
	Total	150	100.00

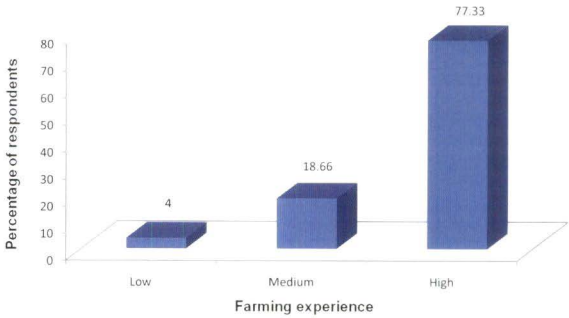


Fig.7.Distribution of respondents according to their farming experience

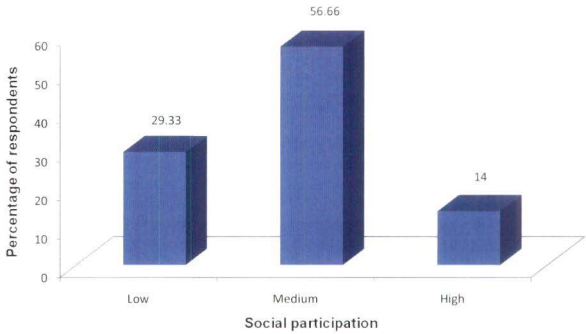


Fig.8.Distribution of respondents according to their social participation

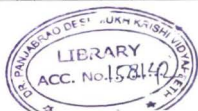
It is seen from the distribution Table 4 that the 56.66 per cent respondents had medium level of social participation, followed by 29.33 per cent and 14 per cent respondents having low and high level of social participation respectively. It may be said that majority of the respondents had medium level of social participation (56.66).

The results are similar to Vijay kumar and Gaikawad (2008) and Hemlata Sewatkar (2008) who found that majority of the respondents in medium level of social participation.

5.1.1.7 Sources of information

Table 15: Distribution of the respondents according to their source wise frequency of use of sources of information

S.N	Sources	Frequency of contacts		
		Always No %	Sometime No %	Never No %
A) Personal Cosmopolite				
1	Gram Sevak	75 (50%)	30 (20%)	45 (30%)
2	Agril. officer	40 (26.66%)	30 (20%)	80 (53.33%)
3	Block division officer	30 (20%)	50 (33.33%)	80 (53.33%)
4	SAU scientists	15 (10%)	22 (14.66%)	113 (75.33%)
B) Personal localite				
1	Local leader	50 (33.33%)	60 (40%)	40 (26.66%)
2	Friends	73 (48.66%)	42 (28%)	35 (23.33%)
3	Krishi kendra	55 (36.66%)	80 (53.33%)	15 (10%)
C) Mass Media				
1	Radio	17 (11.33%)	58 (38.66%)	75 (50%)
2	Television	90 (60%)	33 (22%)	27 (18%)
3	Newspapers	25 (16.66%)	40 (26.66%)	85 (56.66%)
4	Agril. Magazine	26 (17.33%)	30 (20%)	94 (62.66%)
5	Agril. Exhibition	35 (23.33%)	45 (30%)	70 (46.66%)



It refers to the operationally as the source used by the respondents for seeking technical information and guidance about technologies in front line demonstration. The information sources not only provide information but they do provide some guidance along with information. The distribution of respondents on the basis of frequency of use of sources of information about technologies in front line demonstration is presented in table 11.

The data given in Table 11 reveals that amongst the mass media sources of information higher percentage (60%) of respondent of front line demonstration always used television in the village as sources of information about technologies in front line demonstration. However, in the personal cosmopolite higher percentage (50%) of respondents always used Gramnsevak as sources of information. And in personal localite sometime used krishi Kendra and local leader i.e. (53.33%) and (40%) respectively.

Table 16. Distribution of the respondents according to sources of information

Sr. No.	Sources of information	Respondents (n=150)	
		Number	Percentage
4.	Low (upto 13)	39	26
5.	Medium (14 to 18)	94	62.66
6.	High (above 18)	17	11.33
	Total	150	100.00

The data, in table 12 indicates that above 62.66 of the respondent were exposed to various sources of information to a medium level. As much as 26 percent of the respondents found to have used various sources of information for acquisition of information to a low level. However, 11.33 percent of respondents had observed in high category of sources of information used.

It may be inferred that the majority of the respondents of front line demonstration about various source of information for obtaining information about front line demonstration in medium level category.

The present findings are supported by the observations of Thakkar (1996) who found that the majority of utilized source of information to a moderate level.

5.1.1.8 Risk Preference

It refers to the degree to which a respondent is oriented towards risk and uncertainly and has courage to face the problem. The data with regards to the distribution of respondents of front line demonstration according to their risk preference have been presented in Table 17.

Table 17. Distribution of respondents according to their risk preference

Sr. No.	Category	Respondents n=150	
		Frequency	Percentage
1	Low (upto 15)	27	18
2	Medium (16 to 20)	114	76
3	High (above 20)	9	6
	Total	150	100.00

It is seen from Table 15, that majority of respondents (76%) were observed in medium level of risk preference followed by 18 per cent had low level of risk preference and 6 per cent of respondents were high level of risk preference.

Thus, it is concluded that majority of the respondents were in medium category of risk preference.

Thus, it is concluded that majority of the respondents were in medium category of risk preference. The findings were in line with the findings of Bhagyalaxmi *et al.* (2003).

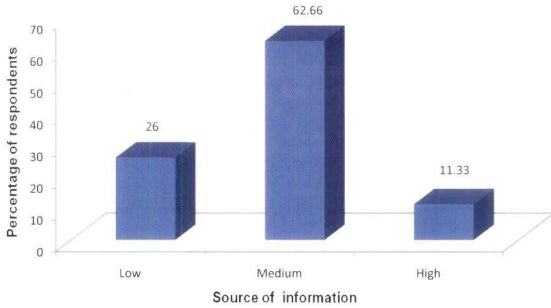


Fig.9.Distribution of respondents according to their source of information

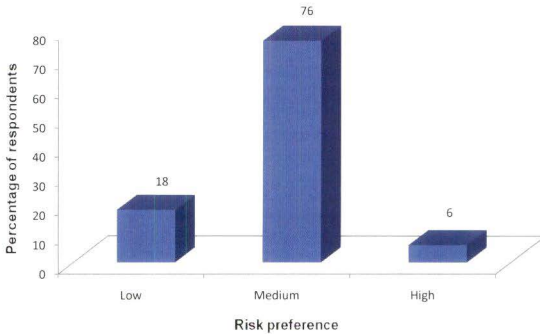


Fig.10.Distribution of respondents according to their risk preference

5.1.1.9 Extension contact

It refers to the degree to which the contact of respondents with change agent such as gramsevak, agriculture officer and scientists etc. for obtaining information of farming. It will be observed in following Table 18.

Table18: Distribution of the respondents according to their extension contact with different sources

Sr. No.	Sources of extension contact	Frequency of contact					
		Always	%	Some time	%	Never	%
A	Local sources						
1	Sarpanch	89	59.33	31	20.66	30	20
2	Friend/ Relatives	67	44.66	18	12	65	43.33
3	Neighbours	30	20	50	33.33	80	53.33
4	Progressive farmers	35	23.33	38	25.33	77	51.33
B	Institutional sources						
1	Gramsevak	47	31.33	32	21.33	71	47.33
2	Agriculture assistant	37	24.66	35	23.33	78	52
3	Extension officer	40	26.66	30	20	80	53.33
4	Taluka agri. officer	25	16.66	45	30	80	53.33
5	Agri. University/ KVK scientist	05	3.33	15	10	130	86.66
C	Mass media						
1	Radio	35	23.33	45	30	70	46.66
2	Television	85	56.66	38	25.33	27	18
3	Newspaper	29	19.33	60	40	61	40.66
4	Mobile	88	58.66	30	20	32	21.33
5	Agri. Magazines	17	11.33	32	21.33	101	67.33
6	Agri. Exhibition	42	28	30	20	78	52

Extension contact presented in the Table 14, indicated that the majority of the selected farmers always contacted with Sarpanch (59.33%), mobile (58.66%) and television (56.66%) following to this above

farmers (40%) kept sometimes contact with Newspaper (33.33%) with neighbours and (30%) with taluka agri. Officer and radio respectively.

Thus this study concludes that majority of the farmers having medium extension contact with various sources. Overall extension contacts of the selected farmers have been also analyzed and presented in Table 19 as follows.

Table19. Distribution of respondents according to their extension contact

Sr. No.	Extension contact	Respondents (n=150)	
		Number	Percentage
1.	Low (upto 13)	23	15.33
2.	Medium (14 to 25)	101	67.33
3.	High (above 25)	26	17.33
	Total	150	100.00

It is observed from Table 19 that a great majority of the respondents (67.33) were having medium level of extension contact, while 17.33 per cent respondents were having high level of extension contact and 15.33 per cent respondents found to be in low level of extension contact.

Thus, it could be concluded that majority of the respondents were having medium level of extension contact.

Similar findings were observed by Prasad (1994) and stated that more than half of the respondents had medium extension contact.

5.1.1.10 Innovativeness

It refers to the degree to which an individual adopts new ideas relatively earlier than others in his social system. The distribution of the respondents according to their innovativeness was shown in Table 20.

Table 20. Distribution of the respondents according to their level of innovativeness

Sr. No.	Innovativeness	Respondents (n=150)	
		Number	Percentage
1.	Low (upto14)	16	10.66
2.	Medium (15to16)	122	81.33
3.	High (above16)	12	8.00
	Total	150	100.00

It is apparent from the distribution in Table 16 that majority of the respondents (81.33 %) were included in the category of medium innovativeness. Comparatively a small percentage of the respondents had low (10.66 %) innovativeness category and very few (8.00 %) of the respondents were included in the high innovativeness category. Thus it was found that higher percentage of the respondents had medium level of innovativeness.

Thus, it was found that higher percentage of the respondents had medium level of innovativeness. Similar types of finding were observed by Kharat (2012).

5.1.1.11 Scientific orientation

Scientific orientation shows the inclination of an individual towards modern and scientific ways of thinking and acting. It is indicative of willingness of an individual towards the use of recent technological and scientific advances. Table gives the distribution of the respondents as per their scientific orientation levels.

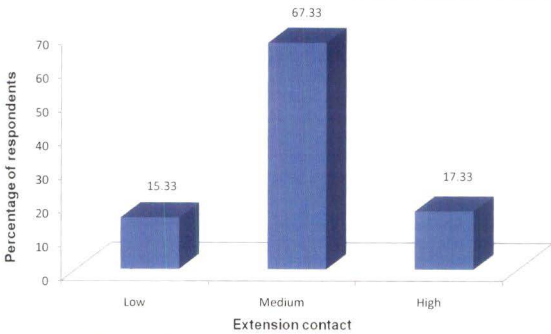


Fig.11.Distribution of respondents according to their extension contact

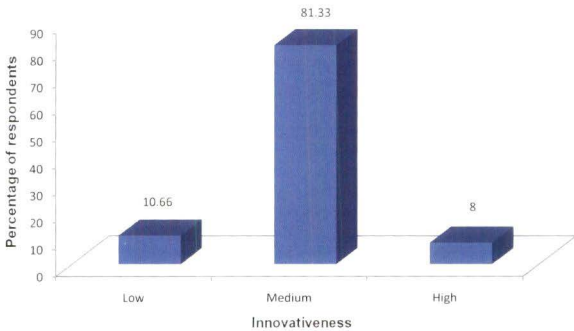


Fig.12.Distribution of respondents according to their innovativeness

Table 21. Distribution of the respondents according to their Scientific orientation levels.

Sr. No	Scientific orientation	respondent (n=150)	
		Frequency	Percentage
1	Low (upto 21)	30	20
2	Medium (22 to 26)	114	76
3	High (above 26)	6	4
	Total	150	100.00

Majority of respondents (76%) were in medium category of scientific orientation 20 per cent were in low and 4 per cent were in high category of scientific orientation.

The findings of present study are line with Sarangkar (2001) who reported that majority of the respondents had medium level of scientific orientation towards Dr. PDKV recommendations about cotton technology.

Dependent Variable.

The dependent variable i.e. adoption behavior of farmers about technologies in front line demonstration was studied in terms of its dimensions i.e. farmers knowledge about technologies in front line demonstration, attitude towards it and adoption about technologies in front line demonstration.

5.2 knowledge about technologies in front line demonstration

The knowledge refers to the actual awareness of the respondent about technologies in front line demonstration.

It is expected that the respondent should know the technologies in front line demonstration. The distribution of the respondents on their categories i.e. low, medium and high is depicted in following table.

The data in Table 17 shows that great majority of farmers had knowledge about use of Thresher at the time of threshing (92.85%), Harvesting according to physical maturity (88.57%), Seed rate of BDN-2 and BSMR-736 (88.57%), and variety BSMR-736 (85.71%).

Table 22: Distribution of the respondents according to their Knowledge about pigeon pea cultivation regarding to technologies in front line demonstration

Sr. No.	Recommended Package Of Practices Of Pigeon pea Cultivation	Response on having Knowledge n=70	
		Yes (1)	No (0)
A	Soil		
1	Soil : (medium to heavy) good water percolation capacity	50 (71.42%)	20 (28.57%)
B	Recommended varieties		
a)	Hybrid varieties		
1	AKPH-4201	40 (57.14%)	30 (42.85%)
2	AKPH-2022	45 (64.28%)	25 (35.71%)
b)	Improved varieties		
1	TAT-10	40 (57.14%)	30 (42.85%)
2	ICPL-87	50 (71.42%)	20 (28.57%)
3	AKT-8811	45 (64.28%)	25 (35.71%)
4	BDN-2	40 (57.14%)	30 (42.85%)
5	PKV-TARA	52 (74.28%)	18 (25.71%)
6	BSMR-853	55 (78.57%)	15 (21.42%)
7	BSMR-736	60 (85.71%)	10 (14.28%)
8	C-11	37 (52.85%)	33 (47.14%)
9	ICPL-87119(AASHA)	53 (75.71%)	17 (24.28%)
C	Seed and Seed Treatment		
	Seed (Improved varieties)		
1	TAT-10, ICPL-87 – 40 to 45 kg	55 (78.57%)	15 (21.42%)
2	AKT-8811 – 25 to 30 kg	50 (71.42%)	20 (28.57%)
3	BDN-2, BSMR-736 – 12 to 15 kg	62 (88.57%)	08 (11.42%)
4	C-11, ICPL-87119(AASHA) – 12 to 15 kg	50 (71.42%)	20 (28.57%)

	Seed(Hybrid varieties)		
1	AKPH-4201 – 5 to 7 kg	60 (85.71%)	10 (14.28%)
2	AKPH-2022 – 3 to 4 kg	45 (64.28%)	25 (35.71%)
	Seed Treatment		
	Rhizobium and PSB seed treatment also Trichoderma seed treatment.	30 (42.85%)	40 (57.14%)
D	Sowing		
1	Sowing time-(first week of july)	36 (51.42%)	34 (48.57%)
2	Sowing across the slope	35 (50%)	35 (50%)
3	By the use of seed drill	58 (82.85%)	12 (17.14%)
4	For Hybrid varieties – space between two lines 60-75 cms. and for improved varieties 25-30 cms.	55 (78.57%)	15 (21.42%)
5	For Hybrid varieties – space between two crops 20-30 cms. and for improved varieties 20-30 cms.	44 (62.85%)	26 (37.14%)
E	Irrigation		
1	4-5 irrigations	45 (64.28%)	25 (35.71%)
F	Fertilizer management		
1	Recommended dose (NPK-25:50:20)	33 (47.14%)	37 (52.85%)
2	Sulphur application 20 kg per hec. If required.	22 (31.42)	48 (68.57)
G	Plant protection		
A)	Names of important insects		
1	Helicoverpa armigera	47 (67.14%)	23 (32.85%)
2	Plume moth	38 (54.28%)	32 (45.71%)
3	Tur pod fly	29 (41.42%)	41 (58.57%)
4	Pod bug	20 (28.57%)	50 (71.42%)
5	Leaf folder	48 (68.57%)	22 (31.42%)
H	Important diseases		
1	Fusarium Wilt	55 (78.57%)	15 (21.42%)
2	Sterility mosaic	40 (57.14%)	30 (42.85%)

3	Phytophthora blight	36 (51.42%)	34 (48.57%)
Insect control measurement			
a) Insect control			
1	Helicoverpa armigera: (chloropyrifos 20% EC 25 ml/ profenofos 50% EC 25ml.	42 (60%)	28 (40%)
2	Plume moth: (Quinolphos 25% EC 16 ml /phenthoate 50%EC 14ml	28 (40%)	42 (60%)
3	Tur pod fly: (Quinolphos 25% EC 16 ml/ phenthoate 50%EC 14ml per 10 lit water.	33 (47.14%)	37 (52.85%)
4	Pod bug: (Quinolphos 25% EC 16 ml/Fozelon 35%EC 20 ml/ phenthoate 50%EC 10ml per 10 lit water.	45 (64.28%)	25 (21.42%)
5	Leaf folder: (Quinolphos 25% EC 16 ml/ Fozelon 35%EC 20 ml or phenthoate 50%EC 14ml per 10 lit water.	51 (72.85%)	19 (27.14%)
Disease management			
1	Fusarium Wilt: (Disease resistant varieties – c-11, ICPL-7119, BSMR- 736. Before sowing Thiram 3gm and Trichoderma 4gm per kg of seed , seed treatment required.	37 (52.85%)	33 (47.14%)
2	Sterility mosaic: (Disease resistant varieties – BSMR-853, BSMR- 736, AASHA , PKV- TARA)	42 (60%)	28 (40%)
3	Phytophthora blight : (Disease affected stem and crop burning required.)	38 (54.28%)	32 (45.71%)
I	Harvesting: According to physical maturity.	62 (88.57%)	08 (11.42%)
J Threshing:			
1	By the use of Thresher	65 (92.85%)	05 (7.14%)
2	Others	42 (60%)	28 (40%)

The data in Table 18 shows that great majority of farmers had knowledge about recommended variety PKV-Kranti (90%), recommended seed rate of sorghum (83.75%), Intercultural operation i.e. weeding (81.25%), aphids and jassids (77.5%), and thinning operation (77.5%).

Table 23. Distribution of respondents according to knowledge about Sorghum regarding to technologies in front line demonstration

Sr. No.	Recommended Package Of Practices Of Sorghum Cultivation	Response on having Knowledge n=80	
		Yes (1)	No (0)
A	Soil		
1	Soil : (medium to heavy) good water percolation capacity	50 (62.5%)	30 (37.5%)
B	Preparatory Tillage		
1	Harrowing : (3 to 4)	55 (68.75%)	25 (31.25%)
2	Is their Necessary of stubbles burning	52 (65%)	28 (35%)
3	Recommended fertilizer doses(FYM/ Compost 10 to 15 cartloads per ha.)	49 (61.25%)	31 (38.75%)
4	FYM mix in soil by the harrow.	45 (56.25%)	35 (43.75%)
C	Recommended varieties		
a)	Hybrid varieties		
1	CSH-15R	55 (68.75%)	25 (31.25%)
2	CSH-19R	50 (62.5%)	30 (37.5%)
b)	Improved varieties		
1	PKV KRANTI	72 (90%)	08 (10%)
2	SPV-504	43 (53.75%)	37 (46.25%)
3	CSV-14R	34 (42.5%)	46 (57.5%)
4	CSV-18R	53 (66.25%)	27 (33.75%)
5	SPV-1359(PHULE YASHODA)	58 (72.5%)	22 (27.5)
c)	Local varieties		
1	Maldandi-35-1	62 (77.5%)	18 (22.5%)

2	Ringani	54 (67.5%)	26 (32.5%)
D	Seed and Seed Treatment		
	Seed		
1	7.5 to 10 kg per ha. Required for sowing	67 (83.75%)	13 (16.25%)
	Seed Treatment		
	Thiram 3 gm or thiram 2gm +carbendazim 1gm per 1 kg of seed required.	43 (53.75%)	37 (46.25%)
E	Sowing		
1	Sowing time-(25sept- 15 octo)	59 (73.75%)	21 (26.25%)
2	Sowing across the slope	38 (47.5%)	42 (52.5%)
3	By the use of double seed drill	46 (57.5%)	34 (42.5%)
4	For Hybrid varieties – space between two lines and two crops 15 to 20 cms.	48 (60%)	32 (40%)
F	Thining		
1	15 to 20 DAS	62 (77.5%)	18 (22.5%)
G	Irrigation		
1	35 to 40 DAS	43 (53.75%)	37 (46.25%)
2	60 to 65 DAS	42 (52.5%)	38 (47.5%)
3	70 to 75 DAS	38 (47.5%)	42 (52.5%)
4	85 to 95 DAS	43 (53.75%)	37 (46.25%)
H	Intercultural operations		
1	Hoeing: 2 to 3	56 (70%)	24 (30%)
2	Weeding: 1 to 2 times	65 (81.25%)	15 (18.75%)
3	Mulching- organic material , others	36 (45%)	44 (55%)
I	Fertilizer management		
1	Rain fed -Recommended dose (NPK- 50:25:25)	39 (48.75%)	41 (51.25%)

2	Irrigated		
	a)First week:NPK-40:40:40	42 (52.5%)	38 (47.5%)
	b) Second week: N -40 at 25 to30 days	34 (42.5%)	46 (57.5%)
J	Plant protection		
A)	Names of important insects		
1	Stem borer	53 (66.25%)	27 (33.75%)
2	Stem fly	50 (62.5%)	30 (37.5%)
3	Aphids/Jassids	62 (77.5%)	18 (22.5%)
K	Important diseases		
1	Grain mould	38 (47.5%)	42 (52.5%)
2	Charcoal Rot	49 (61.25%)	31 (38.75%)
3	Smut	55 (68.75%)	25 (31.25%)
4	Sugary disease	54 (67.5%)	26 (32.5%)
	Insect control measurement		
a)	Insect control		
1	Stem borer: (chloropyriphos 20% EC 25 ml with 10 lit of water).	51 (63.75%)	29 (36.25%)
2	Stem fly : (chloropyriphos 20% EC 25 ml with 10 lit of water).	48 (60%)	32 (40%)
3	Aphids /jassids: (a. Diathomithoate 30% EC 10ml or methyl demeton 25% 8ml with 10 lit water.	55 (68.75%)	25 (31.25%)
	Disease management		
1	Grain mould: a) Before sowing thiram 3gm or Thiram 2gm + carbendazim 1 gm for 1 kg of seed, seed treatment required.	48 (60%)	32 (40%)
	b) Harvesting of sorghum according to physical maturity is recommended.	35 (43.75%)	45 (56.25%)
2	Charcoal rot : a) Before sowing 25 gm azatobacter	49 (61.25%)	31 (38.75%)

	or 4 gm Trichoderma + 25gm PSB per kg seed treatment recommended.		
	b) Crop rotation required.	42 (52.5%)	38 (47.5%)
	c) Apply recommended dose of potash.	32 (40%)	48 (60%)
	d) For decrease the infestation of disease intercropping and mixed cropping recommended.	54 (67.5%)	26 (32.5%)
	e) Timely sowing recommended.	51 (63.75%)	29 (36.25%)
3	Smut : a) Thiram 75 % or Thiram 2gm + carbendazim 1 gm per 1 kg of seed , seed treatment is recommended.	45 (56.25%)	35 (43.75%)
4	Sugary disease: Dissolve infected seed at 30% salt solution and remove floating seed and soak the bulky seed from water and dry in shade.	38 (47.5%)	42 (52.5%)
L	Harvesting: According to physical maturity.	56 (70%)	24 (30%)
M	Threshing:		
1	By the use of Thresher	59 (73.75%)	21 (26.25%)
2	Others	42 (52.5%)	38 (47.5%)

Table 24. Distribution of the respondents according to their knowledge level about technologies in front line demonstration

average overall

Sr. No.	Category	Respondents (n=150)	
		Number	Percentage
1.	Low (upto 33.33)	17	11.33
2.	Medium (33.34to66.66)	103	68.66
3.	High (above66.67)	30	20
	Total	150	100.00

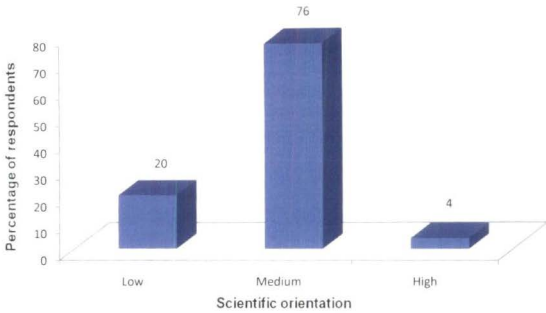


Fig.13.Distribution of respondents according to their scientific orientation

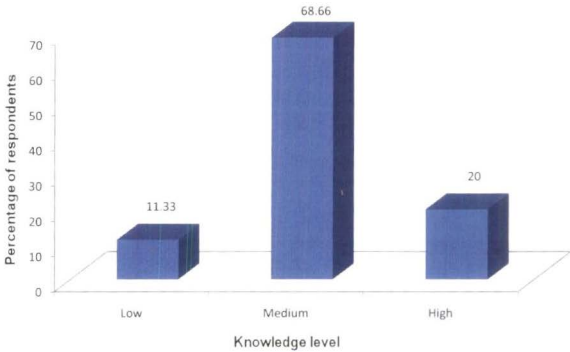


Fig.14.Distribution of respondents according to their knowledge level

The distribution of frequencies about the levels of awareness knowledge possessed by the respondent about the technologies in front line demonstration in above table shows that above 68.66 of the respondents belonged to medium category followed by 20 percent of the respondent who had high level of knowledge and 11.33 percent had low level of knowledge in low category of respondents.

Thus it may be inferred that respondent of front line demonstration possessed medium level knowledge about technologies in front line demonstration. — *pl. justify it.*

The observations made by Verma et al. (1991) that most of the respondents had medium level of knowledge were also similar to the present findings.

5.3 Attitude towards technologies in front line demonstration

Attitude indicates the positive or negative feeling of the individual respondent towards technologies in front line demonstration. The attitude also reflects on actual usage. The distribution of respondents on the basis of their attitude towards technologies in front line demonstration is depicted in Table 25.

Table 25. Distribution of the respondents according to their attitude levels towards technologies in front line demonstration

Sr. No.	Category	Respondents (n=150)	
		Number	Percentage
1.	Unfavorable (upto 33.33)	23	15.33
2.	Favorable (33.34 to 66.66)	112	74.66
3.	High favorable (above 66.67)	15	10.00
	Total	150	100.00

The data in ²Table reveals that above 74.66 percent of the respondents exhibited favorable attitude towards technologies in front line

demonstration followed by above 15.33 percent respondents showed their unfavorable attitude towards the technologies in front line demonstration . However, 10 percent respondents had high favorable attitude towards technologies in front line demonstration.

Thus it may be inferred that higher percentages of the respondents in the study area were favorable in respect of their attitude towards technologies in front line demonstration according to Table 25.

The present findings are supported by the observations of Vekaria et al. (1993) who observed that majority of the respondent's possessed middle level attitude.

5.4 Adoption about technologies in front line demonstration

The adoption shows the present stage of usage of the technologies in front line demonstration. The distribution of respondents as depicted in following Table 26.

Table 26: Distribution of the respondents according to their level of Adoption about pigeon pea cultivation regarding to technologies in front line demonstration

Sr. No.	Recommended Package Of Practices Of Pigeon pea Cultivation	Adoption		
		Complete No / %	Partial No / %	No No / %
A	Soil			
1	Soil : (medium to heavy) good water percolation capacity	34 (48.57%)	36 (51.42%)	0 (0%)
B	Recommended varieties			
a)	Hybrid varieties			
1	AKPH-4201	38 (54.28%)	24 (34.28%)	08 (11.42%)
2	AKPH-2022	37 (52.85%)	23 (32.85%)	10 (14.28%)
b)	Improved varieties			
1	TAT-10	24 (34.28%)	39 (55.71%)	07 (10%)
2	ICPL-87	34 (48.57%)	25 (35.71%)	11 (15.71%)

3	AKT-8811	38 (54.28%)	25 (31.25%)	07 (10%)
4	BDN-2	41 (58.57%)	21 (30%)	08 (11.42%)
5	PKV-TARA	40 (50%)	18 (25.71%)	12 (17.14%)
6	BSMR-853	44 (62.85%)	13 (18.57%)	13 (18.57%)
7	BSMR-736	70 (100%)	0 (0%)	0 (0%)
8	C-11	29 (41.42%)	21 (30%)	20 (28.57%)
9	ICPL-87119(AASHA)	39 (55.71%)	20 (28.57%)	11 (15.71%)
C	Seed and Seed Treatment			
	Seed (Improved varieties)			
1	TAT-10, ICPL-87 – 40 to 45 kg	36 (51.42%)	27 (38.57%)	07 (10%)
2	AKT-8811 – 25 to 30 kg	39 (71.42%)	16 (28.57%)	15 (21.42%)
3	BDN-2, BSMR-736 – 12 to 15 kg	66 (94.28%)	04 (5.71%)	0 (0%)
4	C-11, ICPL-87119(AASHA) – 12 to 15 kg	38 (54.28%)	28 (40%)	04 (5.71%)
	Seed(Hybrid varieties)			
1	AKPH-4201 – 5 to 7 kg	43 (61.42%)	20 (28.57%)	07 (10%)
2	AKPH-2022 – 3 to 4 kg	36 (51.42%)	27 (38.57%)	07 (10%)
	Seed Treatment			
	Rhizobium and PSB seed treatment also Trichoderma seed treatment.	30 (42.85%)	37 (52.85%)	03 (4.28%)
D	Sowing			
1	Sowing time-(first week of july)	36 (51.42%)	16 (22.85%)	18 (25.71%)
2	Sowing across the slope	30 (42.85%)	30 (42.85%)	10 (14.28%)
3	By the use of seed drill	28 (40%)	36 (51.42%)	06 (8.57%)
4	For Hybrid varieties – space between two lines 60-75 cms. and for improved varieties 25-30 cms.	38 (54.28%)	22 (31.42%)	10 (14.28%)

5	For improved varieties – space between two crops 20-30 cms. and for improved varieties 20-30 cms.	42 (60%)	18 (25.71%)	10 (14.28%)
E	Irrigation			
1	4-5 irrigations	36 (51.42%)	18 (25.71%)	16 (22.85%)
F	Fertilizer management			
1	Recommended dose (NPK-25:50:20)	22 (31.42%)	36 (51.42%)	12 (17.14%)
2	Sulphur application 20 kg per hec. If required.	28 (40)	10 (14.28%)	32 (45.71%)
G	Plant protection			
A)	Names of important insects			
1	Helicoverpa armigera	-	-	
2	Plume moth	-	-	
3	Tur pod fly	-	-	
4	Pod bug		-	
5	Leaf folder	-	-	
H	Important diseases			
1	Fusarium Wilt	-	-	
2	Sterility mosaic	-	-	
3	Phytophthora blight	-	-	
	Insect control measurement			
a)	Insect control			
1	Helicoverpa armigera: (chloropyrifos 20% EC 25 ml/ profenofos 50% EC 25ml.	38 (54.28%)	32 (45.71%)	0 (0%)
2	Plume moth: (Quinolphos 25% EC 16 ml /phenthoate 50%EC 14ml	44 (62.85%)	20 (28.57%)	06 (8.57%)
3	Tur pod fly: (Quinolphos 25% EC 16 ml/ phenthoate 50%EC 14ml per 10 lit water.	35 (50%)	30 (42.85%)	05 (7.14%)
4	Pod bug: (Quinolphos 25% EC 16 ml/Fozelon 35%EC 20 ml/ phenthoate 50%EC 10ml per 10 lit water.	38 (54.28%)	26 (37.14%)	06 (8.57%)
5	Leaf folder: (Quinolphos 25% EC 16 ml/ Fozelon 35%EC 20 ml or phenthoate 50%EC 14ml per 10 lit water.	36 (51.42%)	22 (31.42%)	12 (17.14%)

Disease management				
1	Fusarium Wilt: (Disease resistant varieties – c-11, ICPL-7119, BSMR- 736. Before sowing Thiram 3gm and Trichoderma 4gm per kg of seed , seed treatment required.	50 (71.42%)	11 (15.71%)	09 (12.85%)
2	Sterility mosaic: (Disease resistant varieties – BSMR-853, BSMR- 736, AASHA , PKV-TARA)	51 (72.85%)	12 (17.14%)	07 (10%)
3	Phytophthora blight : (Disease affected stem and crop burning required.)	39 (55.71.%)	26 (37.14%)	05 (7.14%)
I	Harvesting: According to physical maturity.	50 (71.42%)	13 (18.57%)	07 (10%)
J	Threshing:			
1	By the use of Threshing	44 (62.85%)	17 (7.14%)	09 (12.85%)
2	Others	33 (47.14%)	03 (4.28%)	34 (48.57%)

The data in Table 23 reveals that respondents in completely cent percent adoption of variety BSMR-736(100%), and majority of respondent at completely adoption level i. e. seed rate of BDN-2, BSMR-736 (94.28%), disease resistant varieties i.e. BSMR-853, BSMR-736, AASHA, PKV-TARA (72.85%) .

As regards partial adoption of technologies in front line demonstration about improved variety TAT-10 is 55.71 per cent respondents, recommended seed rate of pigeon pea was partially adopted by 52.08 per cent respondents. And recommended dose of NPK , use of seed drill, soil adoption was partially adopted 51.42 percent of respondents each.

The adoption index for Adoption about technologies in front line demonstration of pigeon pea crop about farmers was work out. On the basis of that adoption index, the respondents were classified into three categories and the distribution is presented in Table 27.

Table 27. Distribution of respondents according to Adoption about Sorghum regarding to technologies in front line demonstration

Sr. No.	Recommended Package Of Practices Of Sorghum Cultivation	Adoption		
		Complete No / %	Partial No / %	No No / %
A	Soil			
1	Soil : (medium to heavy) good water percolation capacity	48 (60%)	20 (25%)	12 (15%)
B	Preparatory Tillage			
1	Harrowing : (3 to 4)	37 (46.25%)	21 (26.25%)	22 (27.5%)
2	Is their Necessary of stubbles burning	42 (52.5%)	10 (12.5%)	28 (35%)
3	Recommended fertilizer doses(FYM/ Compost 10 to 15 cartloads per ha.)	35 (43.75%)	20 (25%)	25 (31.25%)
4	FYM mix in soil by the harrow.	14 (17.5%)	34 (42.5%)	32 (40%)
C	Recommended varieties			
a)	Hybrid varieties			
1	CSH-15R	42 (52.5%)	26 (32.5%)	12 (15%)
2	CSH-19R	44 (55%)	24 (30%)	12 (15%)
b)	Improved varieties			
1	PKV KRANTI	80 (100%)	0 (0%)	0(0%)
2	SPV-504	39 (48.75%)	31 (38.75%)	10 (12.5%)
3	CSV-14R	35 (43.75%)	32 (40%)	13 (16.25%)
4	CSV-18R	42 (52.5%)	30 (37.5%)	08 (10%)
5	SPV-1359(PHULE YASHODA)	22 (27.5%)	40 (50%)	18 (22.5%)
c)	Local varieties			
1	Maldandi-35-1	38 (47.5%)	30 (37.5%)	12 (15%)
2	Ringani	37 (46.25%)	20 (25%)	23 (28.75%)

D	Seed and Seed Treatment			
	Seed			
1	7.5 to 10 kg per ha. Required for sowing	53 (66.25%)	27 (33.75%)	0 (0%)
	Seed Treatment			
	Thiram 3 gm or thiram 2gm +carbendazim 1gm per 1 kg of seed required.	25 (31.25%)	33 (41.25%)	22 (27.5%)
E	Sowing			
1	Sowing time-(25sept- 15 octo)	57 (71.25%)	23 (28.75%)	0 (0%)
2	Sowing across the slope	33 (41.25%)	39 (48.75%)	08 (10%)
3	By the use of double seed drill	36 (45%)	14 (17.5%)	30 (37.5)
4	For Hybrid varieties – space between two lines and two crops 15 to 20 cms.	38 (47.5%)	30 (37.5%)	12 (15%)
F	Thinning			
1	15 to 20 DAS	47 (58.75%)	14 (17.5%)	19 (23.75%)
G	Irrigation			
1	35 to 40 DAS	34 (42.5%)	23 (28.75%)	23 (28.75%)
2	60 to 65 DAS	33 (41.25%)	29 (36.25%)	18 (22.5%)
3	70 to 75 DAS	23 (28.75%)	28 (35%)	29 (36.25%)
4	85 to 95 DAS	25 (31.25%)	28 (35%)	27 (33.75%)
H	Intercultural operations			
1	Hoeing: 2 to 3	24 (30%)	40 (50%)	16 (20%)
2	Weeding: 1 to 2 times	48 (60%)	21 (26.25%)	11 (13.75%)
3	Mulching- organic material , others	22 (27.5%)	27 (33.75%)	30 (37.5%)
I	Fertilizer management			
1	Rainfed -Recommended dose (NPK- 50:25:25)	38 (47.5%)	29 (36.25%)	13 (16.25%)
2	Irrigated			
	a)First week:NPK-40:40:40	32 (40%)	30 (37.5%)	18 (22.5%)

	b) Second week -40 at 25 to 30 days	28 (35%)	29 (36.25%)	23 (28.75%)
J	Plant protection			
A)	Names of important insects			
1	Stem borer	-	-	
2	Stem fly	-	-	
3	Aphids/Jassids	-	-	
K	Important diseases			
1	Grain mould	-	-	
2	Charcoal Rot		-	
3	Smut		-	
4	Sugary disease	-	-	
	Insect control measurement			
a)	Insect control			
1	Stem borer: (chloropyrifos 20% EC 25 ml with 10 lit of water).	48 (60%)	20 (25%)	12 (15%)
2	Stem fly : (chloropyrifos 20% EC 25 ml with 10 lit of water).	34 (42.5%)	30 (37.5%)	18 (22.5%)
3	Aphids /jassids: (a. Diathomithoate 30% EC 10ml or methyl demeton 25% 8ml with 10 lit water.	30 (37.5%)	29 (36.25%)	21 (26.25%)
	Disease management			
1	Grain mould: a) Before sowing thiram 3gm or Thiram 2gm + carbendazim 1 gm for 1 kg of seed, seed treatment required.	26 (32.5%)	30 (37.5%)	24 (30%)
	b) Harvesting of sorghum according to physical maturity is recommended.	31 (38.75%)	29 (36.25%)	20 (25%)
2	Charcoal rot : a) Before sowing 25 gm azatobacter or 4 gm Trichoderma + 25gm PSB per kg seed treatment recommended.	33 (41.25%)	17 (21.25%)	30 (37.5)
	b) Crop rotation required.	42 (52.5%)	28 (35%)	10 (12.5%)
	c) Apply recommended dose of potash.	33 (41.25%)	36 (45%)	11 (13.75%)
	d) For decrease the infestation of disease	25 (31.25%)	40 (50%)	15 (18.75%)

	intercropping and mixed cropping recommended.			
	e) Timely sowing recommended.	51 (63.75%)	20 (25%)	09 (11.25)
3	Smut : a) Thiram 75 % or Thiram 2gm + carbendazim 1 gm per 1 kg of seed , seed treatment is recommended.	44 (55%)	26 (32.5%)	10 (12.5%)
4	Sugary disease: Dissolve infected seed at 30% salt solution and remove floating seed and soak the bulky seed from water and dry in shade.	32 (40%)	13 (16.25%)	35 (43.75%)
L	Harvesting: According to physical maturity.	52 (65%)	20 (25%)	08 (10%)
M	Threshing:			
1	By the use of Thresher	60 (75%)	10 (12.5%)	10 (12.5%)
2	Others	28 (35%)	27 (33.75%)	25 (31.25%)

The data in Table 21 reveals that respondents in completely cent percent adoption of recommended variety PKV-Kranti (100%), and majority of respondent at completely adoption level i. e. Threshing by the use of Thresher (75%), and time of sowing (71.25%) .

As regards partial adoption of technologies in front line demonstration about disease management of charcoal rot by intercropping and mixed cropping and interculture operation i. e. Hoeing 2-3 is 50 per cent respondents each. Sowing across the slope was partially adopted by 48.75 per cent respondents; application of recommended dose of potash for control of charcoal rot was partially adopted by 45 percent of respondents, mixing of FYM in soil by the use of harrow was partially adopted by 42.5 percent of respondent, seed treatment Thiram 3 gm or thiram 2gm +carbendazim 1gm per 1 kg of seed was partially adopted by 41.25 percent of respondent.

Thus, it may be inferred that the respondents adopted technologies of front line demonstration at completely or partial level.

Ahead for dependant variables
pl. discuss the results & justify it.

The adoption index for Adoption about technologies in front line demonstration of sorghum crop about farmers was work out. On the basis of adoption index, the respondents were classified into three categories and the distribution is presented in Table 28.

Table 28. Distribution of the respondents according to their level of Adoption about technologies in front line demonstration

Sr. No.	Category	Respondents (n=150)	
		Number	Percentage
1.	Low (upto 33.33)	25	16.66
2.	Medium (33.34 to 66.66)	99	66
3.	High (above66.67)	26	17.33
	Total	150	100.00

The data in above table revealed that the higher proportion of respondent 66 percent had medium level of adoption of technologies in front line demonstration followed by 17.33 percent respondents who were belong to high adoption and 16.66 percent respondents who were belong to low category about technologies in front line demonstration.

The present findings are supported by the observations Monimozhi and Laxmi santa (1993) that the majority of the respondents have middle level adoption.

5.5. Adoption behaviour about technologies in front line demonstration

An attempt was also made to analyze the adoption behaviour of the respondents as a composite measure of extent of knowledge, attitude and adoption level about technologies in front line demonstration is presented in Table 29.

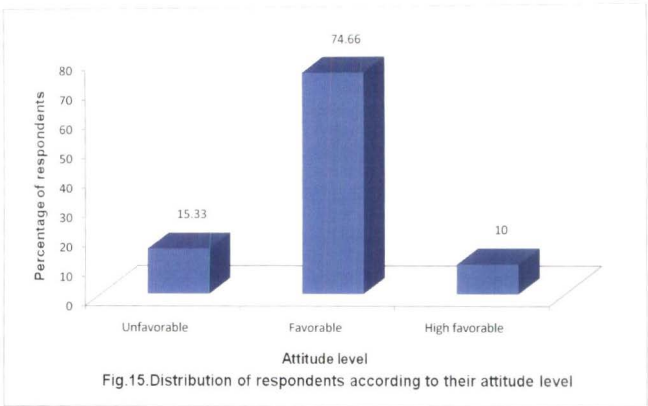


Fig.15.Distribution of respondents according to their attitude level

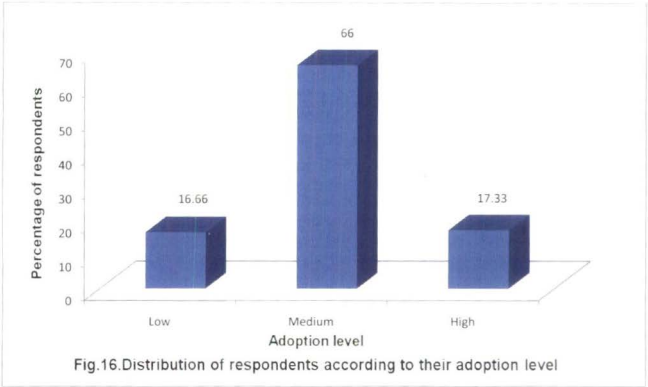


Fig.16.Distribution of respondents according to their adoption level

Table 29: Distribution of the respondents according to their levels of adoption behaviour about technologies in front line demonstration

Sr. No.	Category	Respondents (n=150)	
		Number	Percentage
1.	Low (Upto 33.33)	00	0.0
2.	Medium (33.34 -66.67)	54	36
3.	High (Above 66.67)	96	64
	Total	150	100.00

The data given in Table 23 indicates that higher proportion (64.00%) respondents had high level adoption behaviour about technologies in front line demonstration followed by (36.00%) respondents who had medium level adoption behaviour and no (0.00%) respondents had low level of adoption behaviour.

5.6. Constraints faced by farmers in adoption of technologies in front line demonstration

The information on constraints faced by farmers while in adopting various improved technologies in front line demonstration was collected and presented in Table 30.

The major constraints expressed by the majority of respondents in adoption of technologies in front line demonstration were lack of sources of information (71.33%), lack of complete information about various technologies (60.00%), lack of information about various diseases and pests (52.00%), lack of guidance for use of improved technologies (46.66%), lack of knowledge about technologies used in FLD (40.00%), lack of knowledge about various varieties (36.66%) and difficulties in maintaining the distance between row to row and plant to plant (28.00%) are as constraints faced by them.

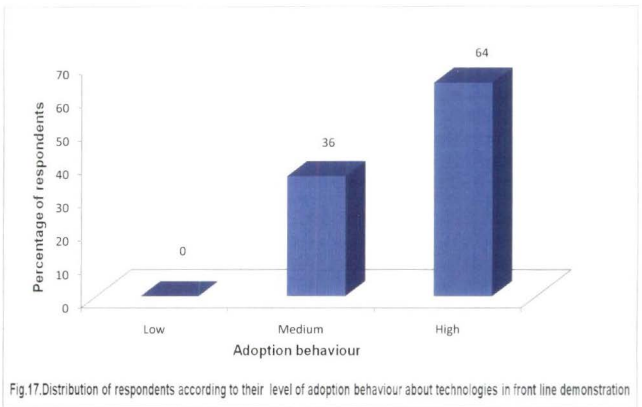


Table 30: Distribution of respondents according to constraints faced by them in adoption of technologies in front line demonstration

Sr. No.	Constraints	Respondents (N=150)	
		Number	Percentage
1	Lack of knowledge about technologies used in FLD.	60	40.00
2	Lack of complete information about various technologies.	90	60.00
3	Lack of guidance for use of improved technologies.	70	46.66
4	Lack of knowledge about various varieties.	55	36.66
5	Difficulties in maintaining the distance between row to row and plant to plant.	42	28.00
6	Lack of information about various diseases and pests.	78	52.00
7	Minimum / lack of Sources of information.	107	71.33

Thus, it could be inferred that respondent farmers are constraints related to lack of knowledge, guidance and sources of information etc. in adoption of technologies in front line demonstration.

The present findings are supported by Nikhade and Nimje (1988) and Antwal and Bharaswadkar (1990) who reported that lack of knowledge about new technology was the major problem in adoption of technologies in front line demonstration.

5.7 Relational Analysis

In order to find out the relationship of the selected characteristics of the respondents with their knowledge, attitude and adoption were worked out. The results obtained from the relational analysis have been presented as below.

5.7.1 Relationship of selected characteristics of respondents with their knowledge

The correlation coefficient of knowledge with socio-economic, situational psychological and communication characteristics of the respondents has been furnished in Table 31.

Table 31: Coefficient of correlation of characteristics of the respondents with their knowledge

Sr. No.	Variables	'r' values
1	Age	0.145375
2	Education	-0.11776
3	Land holding	0.148343
4	Annual income	0.260303*
5	Farming experience	0.21348*
6	Social participation	-0.01867
7	Sources of information	-0.09292
8	Risk preferences	-0.04561
9	Extension contact	0.199864*
10	Innovativeness	0.209453*
11	Scientific orientation	0.24625*

** Significant at 0.01 level of probability

* Significant at 0.05 level of probability

It is evident from Table 20 that among the selected variables farming experience, extension contact, innovativeness, and scientific orientation were positively and significantly correlated with knowledge at 0.05 level of probability. Therefore, the null hypothesis was rejected for these characteristics stating that there exists a significant relation, The variables age, education, land holding, social participation, source of information, risk preferences did not show any significant relation with knowledge of front line demonstration. The null hypothesis for this variable was therefore accepted. The logical reasoning behind this may be that this

variable had no influence on acquisition of knowledge of growers they sought the knowledge about technologies in front line demonstration.

The findings indicated that farmers with medium annual income, high farming experience, medium extension contact, medium innovativeness and medium scientific orientation tried to acquire more amount of knowledge with respect to technologies in front line demonstration.

Manjunath and Savnaur (1998) reported that there was none significant relation of age with knowledge,

5.7.2 Relationship of selected characteristics of the respondents with their attitude level.

The correlation coefficient of attitude with socio-economic, situational psychological and communication characteristics and attitude of respondents has been furnished in Table 32.

Table 32: Coefficient of correlation of independent variables with their attitude level

Sr. No.	Variables	'r' values
1	Age	-0.0785
2	Education	0.119671
3	Land holding	0.159278
4	Annual income	0.153216
5	Farming experience	0.00586
6	Social participation	-0.05868
7	Sources of information	-0.10722
8	Risk preferences	-0.20044*
9	Extension contact	0.208121*
10	Innovativeness	0.248405*
11	Scientific orientation	0.222359*

** Significant at 0.01 level of probability

* Significant at 0.05 level of probability

It is observed from the Table 12, that among selected variables risk preferences, extension contact, innovativeness and scientific orientation were positively and significantly correlated with attitude at 0.05 level of probability. Therefore the null hypothesis was rejected for these characteristics stating that there exist significant relation between these characteristics and attitude about technologies in front line demonstration.

The variables age, education, land holding, annual income, farming experience, social participation, source of information did not show any significant relation with attitude of front line demonstration. Therefore the null hypothesis for this variable was accepted.

5.7.3 Relationship of selected characteristics of the respondents with their adoption level.

The correlation coefficient of adoption with socio-economic, situational psychological and communication characteristics and adoption of respondents has been furnished in Table 33.

Table 33: Coefficient of correlation of independent variables with their adoption level

Sr. No.	Variables	'r' values
1	Age	0.137994
2	Education	-0.04076
3	Land holding	0.090252
4	Annual income	0.162165
5	Farming experience	0.194823
6	Social participation	-0.00595
7	Sources of information	-0.11354
8	Risk preferences	-0.06048
9	Extension contact	0.221174*
10	Innovativeness	0.205416*
11	Scientific orientation	0.250349*

** Significant at 0.01 level of probability

* Significant at 0.05 level of probability

It is observed from the Table 22, that among selected variables extension contact, innovativeness and scientific orientation were positively and significantly correlated with attitude at 0.05 level of probability. Therefore the null hypothesis was rejected for these characteristics stating that there exist significant relation between these characteristics and adoption about technologies in front line demonstration.

The variables age, education, land holding, annual income, farming experience, social participation, source of information, risk preferences did not show any significant relation with adoption about technologies in front line demonstration. Therefore the null hypothesis for this variable was accepted.

Manjunath and Savnaur (1998) reported that there was none significant relation of age with adoption, Kadam and Borse(1993) reported that there was none significant relation of education with adoption, Sudha(1997) reported that there was none significant relation of land holding with adoption, Sudha(1997) reported that there was none significant relation of annual income with adoption, Sudha(1997) reported that there was none significant relation of source of information with adoption.

From the above tables, it is observed that among selected variables extension contact, innovativeness and scientific orientation were positively and significantly correlated with knowledge, attitude and adoption respectively at 0.05 level of probability.

5.7.4. Adoption behaviour

The correlation of personal, socio-economic, communication, psychological and situational characteristics of the respondents with their adoption behaviour about technologies in front line demonstration was worked out and presented in Table 28. The results in Table 28 indicated that independent variables i.e. scientific orientation (0.21) were positively and significantly correlated with adoption behaviour at 0.05 level of probability. Therefore, null hypothesis formulated for these variables was rejected.

Table 34: Coefficient of correlation of selected characteristics of respondents with their adoption behavior about technologies in front line demonstration

Sr. No.	Variables	'r' value
1	Age	0.38**
2	Education	0.33**
3	Land holding	0.57**
4	Annual income	0.61**
5	Farming experience	0.47**
6	Social participation	0.60**
7	Source of information	0.51**
8	Risk preferences	0.37**
9	Extension contact	0.61**
10	Innovativeness	0.48**
11	Scientific orientation	0.21*
12	Knowledge	0.43**
13	Attitude	0.68**
14	Adoption	0.54**

**significant at 0.01 level of probability

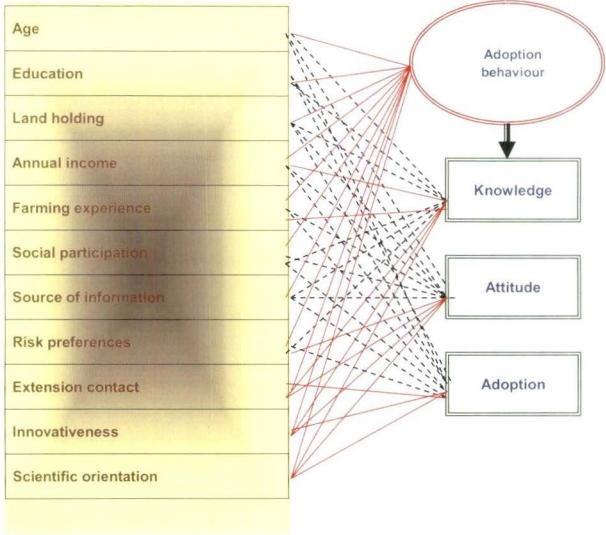
* significant at 0.05 level of probability

The independent variables age (0.38), education (0.33), land holding (0.57), annual income (0.61), farming experience (0.47), social participation (0.60), sources of information (0.51), risk preferences (0.37), extension contacts (0.61), innovativeness (0.48) and dependent variables knowledge (0.43), attitude (0.68) and adoption (0.54) were also positively and significantly correlated with adoption behaviour at 0.01 level of probability.

5.8. Empirical Model of the study

INDEPENDENT VARIABLES

DEPENDENT VARIABLES



Significant 

Non significant 

Fig. 18: Empirical Model of the study

Chapter - VI

*Summary
and
Conclusions*

CHAPTER VI

SUMMARY AND CONCLUSIONS

The study entitled "Adoption behaviour of farmers about technologies in front line demonstration" was planned and carried out in Aheri and Mulchera Tahsils of Gadchiroli district and Akola, Balapur and Barshitakli Tahsils of Akola district of Maharashtra state.

6.1. The specific objectives of the study

1. To study the socio-economics, situational psychological and communication characteristics of farmers.
- 2) To study the adoption behavior of farmers about technologies in Front Line Demonstration.
- 3) To study the relationship between socio-economic, situational, psychological and communication characteristics of farmer with adoption of improved agricultural technologies after front line demonstration.
- 4) To study the constraints faced by the farmers in adoption of improved agricultural practices after seeing front line demonstration.

This study was an outcome of the collection and analysis of information from sample of total 150 respondent farmers from 17 randomly selected villages in Aheri and Mulchera Tahsils of Gadchiroli district and Akola, Balapur and Barshitakli Tahsils of Akola district where technologies of front line demonstration was concentrated.

Data were collected by personally interviewing the respondents with the help of pre-tested structural schedule which was then tabulated properly, calculated the frequency and percentages. Various statistical methods like mean, standard deviation and correlation coefficient were used for interpretation of the data in this study.

The personal, socio-economic, communication, psychological and situational characteristics of the selected farmers namely age,

education, land holding, annual income, farming experience, social participation, sources of information, risk preferences, extension contact, innovativeness, scientific orientation were studied as independent variables. However the adoption behaviour was studied as dependent variable.

6.2. Findings

The salient findings drawn from the data of the present study along with probable implications are summarized in the succeeding paragraphs.

6.2.1. Distributional analysis

6.2.1.1 Personal, socio-economic, communication, psychological and situational characteristics of farmers.

1. It is observed that the (42.66%) farmers found to be in old age category followed by over one third of them in middle age group.
2. Relatively below half proportion of farmers (38.66%) were educated upto high school level followed by about one fourth of the farmers (24.00%) who were educated upto college level.
3. Near about half of the respondent families (45.33%) were found to be possessing semi medium level land holding ranging from of 2.01 to 4.00 hectare followed by 30.00 per cent respondents farmers possessed small level land holding.
4. The annual income above half of the respondents (55.33%) was found to be of medium level i.e. ranging between Rs. 50001 to 100000.
5. The majority of the respondents (77.33%) had high level of farming experience followed by near about one fifth of the respondents (18.66%) who were in medium level of farming experience.
6. More than half of the farmers (56.66%) had belonged to the category of medium level of social participation followed by above one fourth of the farmers were in low level i. e. 29.33 percent social participation.

7. As regard to sources of information majority of the farmers (62.66%) were found to be having medium level of source of information.
8. Above three fourth (76.00%) of the respondents had medium level of risk preferences.
9. Majority of the respondent farmers (67.33%) had medium level of extension contact followed by below one fifth of the respondent farmers having low level (15.33%) extension contact.
10. As regards the innovativeness, most of the respondent farmers (81.33%) were observed in medium category ranging between 15 to 16.
11. Above three fourth of the farmers (76.00%) had observed in medium category of scientific orientation.

6.2.1.2. Knowledge about technologies in front line demonstration

In the practice wise knowledge of pigeon pea cultivation it was noted that 92.85 per cent of the farmer respondents had been know about use of thresher for threshing pigeon pea crop. Also the majority of farmers had been known the harvesting according the physical maturity and BDN-2, BSMR-736 varieties of pigeon pea. In sorghum cultivation it was noted that 90.00 percent of the farmer respondent had been known about the improved variety PKV KRANTI. Also the majority of respondents had been known about seed requirement per hectare 7.5 to 10 kg for sowing sorghum crop.

6.2.1.3. Attitude towards technologies in front line demonstration

1. The majority of the farmers (74.66%) were found to be favorable attitude towards technologies about front line demonstration followed by 15.33 per cent of respondent had unfavorable attitude towards technologies in front line demonstration.

6.2.1.4. Adoption about technologies in front line demonstration

1. The findings on practice wise adoption indicated that 94.28 per cent of respondents had been completely adopted the cultivation of improved

varieties BDN-2, BSMR-736 of pigeon pea. Findings also shows that 100.00 percent of the respondent had been completely adopted the improved variety PKV KRANTI of sorghum.

2. Above than half (55.71%) respondents had been adopted TAT-10 variety for cultivation of pigeon pea crop. In sorghum cultivation half of respondents adopted SPV-1359(PHULE YASHODA), For reducing the infestation of disease, intercropping and mixed cropping recommended for sorghum cultivation.
3. As regards the extent of adoption about technologies in front line demonstration by respondent farmers, higher proportion of 66.00 per cent respondents were belonged to medium category of adoption.

6.2.1.5. Adoption behaviour about technologies in front line demonstration

About two third (64.00%) of the respondents had been in high level adoption behaviour followed by 36.00 per cent respondents who had been in medium level adoption behaviour.

6.2.3. Constraints faced by farmers in adoption of technologies in front line demonstration.

Minimum/ lack of sources of information (71.33%), Lack of complete information about various technologies (60.00%), Lack of information about various diseases and pests. (52.00%), Lack of guidance for use of improved technologies (46.66%) and Lack of knowledge about technologies used in FLD (40.00%) were some of the major constraints faced by the farmers in adoption of technologies in front line demonstration.



Chapter – VII

Implications

CHAPTER VII

IMPLICATIONS

The present study entitled "Adoption behaviour of farmers about technologies in front line demonstration" was conducted in Aheri and Mulchera tahsils of Gadchiroli district and Akola, Balapur and Barshitakli tahsils of Akola district. Hence, the present findings will be applicable to the study area or the area having similar socio-economic conditions. The findings of present study are of practical value and will be useful to the policy makers, researchers and extension personnel working at various levels.

The implications based on finding of present study are presented in two parts. First part deals with implications for extension work (Action) and second deals with implication for future work (Research).

7.1. Implications for action

1. The findings of the present investigation related to extent of knowledge revealed that majority of the farmers possessed medium level of knowledge about technologies in front line demonstration. It is, therefore, implied that the systematic efforts on the part of extension agency are required to promote technologies of front line demonstration by imparting knowledge to them, in the areas in which they are deficient, under the guidance of subject specialists.
2. Findings related to the adoption of technologies in front line demonstration revealed that majority of the farmers had medium level of adoption. It was, thus, implied that the adoption of technologies in front line demonstration should be made effective from productive point of view. The advantages of adoption of technologies in front line demonstration should be made known by extension worker to others. It would facilitate the dissemination and the application of technologies in front line demonstration more effectively by the farmers.

3. The findings related to constraints faced by the farmers in adopting various technologies in front line demonstration indicates that lack of Sources of information, lack of complete information about various technologies, lack of information about various diseases and pests, lack of guidance for use of improved technologies, etc. were the major constraints reported by respondents. These findings emphasize the need of equipping the farmers about the lack of Sources of information. There is also a need to create awareness about lack of complete information about various technologies through mass media.

7.2. Implications for future research

The respondent farmers in study area are adopted the recommended dose of fertilizers in limited numbers. Hence,

1. Agricultural universities in general and the Department of Agronomy and Department of Soil science in particular should evaluate various reasons for non adoption of recommended dose of fertilizers. They may collect the reactions from the users and understand the drawbacks. Considering the feedback of research work on development about the awareness of fertilizers doses. It should be according to the available fertilizers in their local areas.
2. In the present study stress was given on knowing extent of knowledge and adoption of technologies in front line demonstration by the respondents. As per the general observations of the investigation or during study, the farmers in study area were also found that minimum respondents adopt seed treatment of rhizobium, PSB and trichoderma not uses of maximum sources of information etc. Hence, it is implied that to create awareness about seed treatments and use of sources of information by the various extension agencies in future to know the extent of knowledge and adoption of technologies in front line demonstration.

Chapter – VIII

Literature

Cited

literature cited not written correctly.

CHAPTER VIII

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6. Research paper published : Non
7. Field of Interest : Extension Activities, Administration

Place: Akola

Date: 27/6/2016


(V.D.Metangale)

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प्रश्नावली

प्रबंधकाचे नाव
मेढांगळे वैभव दिलीप
एम.एस्सी. (द्वितीय)
विस्तार शिक्षण विभाग
रजि. नं. एचएच/५८४

मार्गदर्शक
डॉ. आर. एस. वाघमारे
सह्योगी प्राध्यापक
विस्तार शिक्षण विभाग
डॉ. पंदेकृवि, अकोला

प्रबंधाचा विषय - प्रथम पिक प्रात्याक्षिकातील तंत्रज्ञानाच्याविषयी शेतकऱ्यांचा अवलंबनाचा अभ्यास

साधारण माहिती

शेतकऱ्याचे नाव :

गाव: ता: जिल्हा:

भाग-१

१. वय :..... वर्ष

२. शिक्षण :..... वर्ग

३. जमीनधारणा

अनु.क्र.	नाव	जमीन हे.
१	कोरडवाहू	
२	बागायती/ओलीताखालील	
	एकूण	

४. वार्षिक उत्पन्न

अ. मुख्य स्रोत :..... रु.

ब. दुय्यम स्रोत :..... रु.

एकूण :..... रु.

५. शेतीचा अनुभव :..... वर्षे

६. सामाजिक सहभाग :

अनु.क्र.	सामाजिक संस्था	सहभागित्वाचा प्रकार		
		सदस्य	पदाधिकारी	कार्यकाळ
अ	औपचारीक सामाजिक संस्था			
१	ग्रामसेवा सहकारी संस्था			
२	ग्रामपंचायत			
३	पंचायत समिती			
४	शाळा समिती			
५	तांदूळ गिरणी			
ब.	अनौपचारीक सामाजिक संस्था			
१	भजन मंडळ			
२	शेतकरी संघटना			
३	इतर (नमूद करावे)			

७. माहितीचे साधने

अनु.क्र.	माहितीचे साधने	नेहमी	कधीकधी	कधीच नाही
अ	औपचारीक स्रोत			
१	ग्रामसेवक			
२	पंचायत समिती			
३	कृषी अधिकारी			
४	गटविकास अधिकारी			
५	विद्यापीठी शास्त्रज्ञ			
ब	अनौपचारीक स्रोत			
१	स्थानिक पुढारी			
२	मित्र			
३	कृषी केंद्र			
क	प्रसार माध्यमांचे स्रोत			
१	रेडिओ			
२	दुरदर्शन			
३	वर्तमानपत्रे			
४	कृषी पत्रिका			
५	कृषी प्रदर्शनी			

८. जोखीम अग्रक्रम

अ.क्र.	विधाने	पूर्ण सहमत	सहमत	अनिश्चित	असहमत	पूर्ण असहमत
१	शेतकऱ्यांनी जास्त पिके पेरवी आणि एक किंवा दोन पिके पेरल्यामुळे होणारे नुकसान टाळावे					
२	शेतकऱ्यांनी चांगली संधी साधून जास्त नफा मिळवावा पण धोका नसलेल्या कमी उत्पन्नात समाधान मानू नये					
३	जो शेतकरी साधारण शेतकऱ्यापेक्षा जास्त धोका पत्कारण्यास तयार असतो, तो आर्थिकदृष्ट्या यशस्वी होतो.					
४	जेव्हा यशस्वी होण्याची जास्त शक्यता असते त्यावेळी शेतकऱ्यांनी धोका पत्करून ती गोष्ट करणे चांगली आहे.					
५	इतर बहुतांश शेतकऱ्यांनी यशस्वीपणे नवीन शेती पद्धतीचा वापर केल्यावरच शेतकऱ्याने अवलंबन करणे चांगले आहे.					
६	एकदम नवीन सुधारलेली शेतीची पद्धत वापरण्यात धोका असला तरी ते करणे योग्य आहे.					

९. विस्तार संपर्क

अ.क्र.	माहितीचा स्रोत	नेहमी	कधीकधी	कधीच नाही
अ	स्थानिक स्रोत			
१	सरपंच			
२	मित्र /नातेवाईक			
३	शेजारी			
४	प्रगतिशिल शेतकरी			
५	इतर (नमूद करावे)			
ब.	संस्था साधने			
१	ग्रामसेवक			
२	कृषी सहाय्यक			
३	कृषी पर्यवेक्षक			
४	कृषी विस्तार अधिकारी			
५	तालुका कृषी अधिकारी			
६	जिल्हा कृषी अधिकारी			
७	कृषी विद्यापीठ/कृ.वी.के. शास्त्रज्ञ			
क	प्रसार माध्यमे			
१	रेडिओ			
२	दुरदर्शन			
३	वर्तमानपत्र			
४	मोबाईल			
५	कृषी पत्रिका			
६	इंटरनेट			
७	प्रदर्शनी			

१०. नाविन्यपूर्णतः

अनु. क्र.	विधाने	मान्य	सांगता येत नाही	अमान्य
१	जोपर्यंत मी एकलेली नवीन शेती विषयक माहितीचे अवलंबन करत नाही तोपर्यंत मी अस्वस्थ असतो.			
२	शेती शास्त्रज्ञ अनेक निरनिराळ्या सुधारीत पद्धती संबंधी बोलत असतात. पण त्या जुन्या पद्धतीपेक्षा चांगल्या आहेत किंवा नाही कोणास ठाऊक?			
३	आपले पूर्वज त्यांची शेती करण्यास हुशारच होते. त्यामुळे त्यांनी अवलंबलेल्या जुन्या पद्धतीत बदल करण्यात मला काहीच कारण दिसत नाही.			
४	बहुतेक वेळा नवीन शेतीपद्धती अपयशी ठरते पण मी निश्चितपणे फायदेशीर असेल तर मी ती अवलंबवील.			
५	वेळो वेळी मी नवीन शेती पद्धती बदल ऐकत आला आणि मागील काही वर्षांपासून मी त्याचा उपयोग करीत आहे.			
६	कसेही का असेल पारंपारिक शेती पद्धती उत्तम आहेत असा मला विश्वास वाटतो			

११. शास्त्रीयभिमुखता

अनु.क्र.	वाक्य	पूर्ण सहमत	सहमत	अनिश्चित	असहमत	पूर्ण असहमत
१	जुन्या शेती पद्धतीपेक्षा नवीन सुधारलेल्या पद्धतीमुळे शेतकऱ्यांना जास्त पैसा मिळतो.					
२	शेतकऱ्यांच्या वाडवडिलांनी ज्या पद्धतीने तो मार्ग आजही चांगला आहे.					
३	ज्या शेतकऱ्यांना शेतीचा बराच अनुभव आहे, तरी ही त्यांनी नवीन शेती पद्धतींचा वापर करावा.					
४	जरी नवीन शेती पद्धती शिकण्यास वेळ लागत असला तरीही तो मार्ग वाया जात नाही.					
५	चांगला शेतकरी नवीन शेती कल्पनांचे प्रयोग करीत असतो.					
६	शेतकऱ्यांचे राहणीमान वाढविण्यासाठी जुन्या पद्धतीत बदल करणे आवश्यक.					

भाग - २

१. तूर लागवड तंत्रज्ञान - ज्ञानपातळी व अवलंबनाचा अभ्यास

अ. क्र.	शिफारस केलेले तूर लागवड तंत्रज्ञान	माहिती		अवलंबन		अवलंबन न करण्याची कारणे
		आहे (१)	नाही (०)	संपूर्ण (२)	अंशता (१)	
अ.	जमीन					
१	जमीन : (मध्यम ते खोल/भारी) जलधारण असलेली/पाण्याचा चांगला निचरा होणारी					
ब	शिफारस केलेले वाण					
अ	संकरित वाण					
१	एकेपीएच ४२०१					
२	एकेपीएच २०२२					
ब	सुधारीत / शुद्ध वाण					
१	टीएटी १०					
२	आयीपीएल ८७					
३	एकेटी ८८११					
४	बीडीएन २					
५	पीकेव्ही तारा					
६	बीएसएमआर - ८५३					
७	बीएसएमआर ७३६					
८	सी - ११					
९	आयीपीएल ८७१११ (आशा)					
क	बियाणे व बिज प्रक्रिया					
	बियाणे					
१	बियाणे					
२	$Q > rEQ > r$ १०, आयसीपीएल ८७ - ४०-४५ किलो					
३	टो विशाखा १, एकेटी ८८११ - २५-३० किलो					
४	बीडीएन २, बीएसएमआर ७३६ - १२ ते १५					
४	सी-११, आशा १२-१५					
	संकरित वाण					
१	एकेपीएच ४१०१ - ५-७ किलो					
२	एकेपीएच २०२२ - ३-४					
	बिजप्रक्रिया					
	रायझोबियम व पीएसबी जिवाणू संवर्धनाची बीजप्रक्रिया करावी, तसेच ट्रायकोडर्मा व जैविक बुरशी नाशकाची बीज प्रक्रिया करावी.					

ड	पेरणी						
१	पेरणी वेळ - (जुलैचा पहिला आठवडा)						
२	उताराला आडवी						
३	पाभरीचा वापर करून						
४	दोन ओळीतील अंतर संकरीत वाणासाठी जवळपास ६०-७५ सें.मी. इतके ठेवावे व सुधारीत वाणासाठी २५ते ३० सेंमी. ठेवावे.						
५	दोन झाडातील अंतर संकरीत साठी २०-३० सें.मी. व सुधारीत वाणासाठी २०-३० सें.मी. ठेवावे.						
ई	ओलीत						
१	पीकाच्या सोयीनुसार ४-५ ओलीत करावे.						
क	खत व्यवस्थापन						
१	शिफारसीत मात्रा (नत्र: स्फुरद :पालाश किलो) सर्वसाधारण २५:५०:२० प्रती हेक्टरी द्यावे						
२	गंधकाची कमतरता असल्यास जमिनीत २० किलो गंधक प्रति हेक्टरी द्यावे.						
ख	पीक संरक्षण						
अ	महत्त्वाच्या किडीचे नावे						
१	हेलीकोव्हरपाची अळी						
२	पिसारी पतंग						
३	शेंगेवरील माशी						
४	शेंगेवरील डेकून						
५	पाने गुंडाळणारी अळी						
ब	महत्त्वाचे रोग						
१	मर						
२	वांझ (स्ट्रोलोट मोसॅक)						
३	खोडावरील करपा						
	किड नियंत्रणाचे उपाय						
अ	किड नियंत्रण						
१	हेलीकोव्हरपाची अळी : (क्लोरोपायरीफॉस २० टक्के प्रवाही २५ मि.ली. किंवा प्रोफेनोफॉस ५० टक्के प्रवाही २५ मि.ली. किंवा क्विनॉलफॉस २५ टक्के प्रवाही १६ मि.ली.)						

२. दृष्टीकोन

अनु.क्र.	वाक्य	पुर्ण सहमत	सहमत	अनिश्चित	असहमत	पुर्ण असहमत
१	तूरीच्या पिकासाठी गंधकाची कमतरता असल्यास २० किलो गंधक प्रति हेक्टर दिल्याने फायदा होतो.					
२	तुरीची पेरणी पाभरीचा वापर करून करावी.					
३	वांझ या रोगाला मारोती हा वान मोठ्या प्रमाणात बळी पडतो.					
४	मर या रोगाच्या व्यवस्थापनासाठी पेरणीपूर्वी थायरम व ट्रायकोडर्मा यांची बिजप्रक्रिया करावी.					
५	खोडावरील करपा या रोगाच्या व्यवस्थापनासाठी मॅन्कोझेब या बुरशीनाशकाची फवारणी करावी.					
६	जर तुरीच्या पेरणीला उशीर होत असल्यास झालेल्या उशीरामुळे दोन झाडातील व ओळीतील अंतर कमी करावे.					
७	तूरीला ४-५ संरक्षित ओलीत देण्याची गरज आहे.					
८	संकरित वाणाची पेरणी बियाण्याचे मूल्य पाहता टोकण पद्धतीने करावी.					
९	पाऊस अगोदर आल्यास जुलैच्या पहिल्या आठवड्या अगोदर पेरणी करावी.					
१०	खात्रीचे पर्जन्य असलेल्या भागात आशा (आयसीपीएल ८७११९) या वाणाची पेरणी करावी.					
११	तुर या पिकांमध्ये आंतरपीक घेणे फायदेशीर आहे.					
१२	बीएसएमआर-७३६ हा वाण मर व वांझ या रोगास प्रतीबंधक आहे.					

विस्तार शिक्षण विभाग
पदव्युत्तर महाविद्यालय,
डॉ. पंजाबराव देशमुख कृषी विद्यापीठ, अकोला
जिल्हा - अकोला (महाराष्ट्र)

प्रश्नावली

प्रबंधकाचे नाव
मेटांगळे वैभव दिलीप
एम.एस्सी. (द्वितीय)
विस्तार शिक्षण विभाग
रजि. नं. एचएच/५८४

मार्गदर्शक
डॉ. आर. एस. वाघमारे
सह्योगी प्राध्यापक
विस्तार शिक्षण विभाग
डॉ. पंढेकृवि, अकोला

प्रबंधाचा विषय - प्रथम पिक प्रात्याक्षिकातील तंत्रज्ञानाच्याविषयी शेतकऱ्यांचा अवलंबनाचा अभ्यास

साधारण माहिती

शेतकऱ्याचे नाव :

गाव : ता : जिल्हा :

भाग-१

१. वय : वर्ष

२. शिक्षण : वर्ग

३. जमीनधारणा

अनु.क्र.	नाव	जमीन हे.
१	कोरडवाहू	
२	बागायती/ओलीताखालील	
	एकूण	

४. वार्षिक उत्पन्न

अ. मुख्य स्रोत : रु.

ब. दुय्यम स्रोत : रु.

एकूण : रु.

५. शेतीचा अनुभव : वर्षे

६. सामाजिक सहभाग :

अनु.क्र.	सामाजिक संस्था	सहभागित्वाचा प्रकार		
		सदस्य	पदाधिकारी	कार्यकाळ
अ	औपचारीक सामाजिक संस्था			
१	ग्रामसेवा सहकारी संस्था			
२	ग्रामपंचायत			
३	पंचायत समिती			
४	शाळा समिती			
५	तांदूळ गिरणी			
ब.	अनौपचारीक सामाजिक संस्था			
१	भजन मंडळ			
२	शेतकरी संघटना			
३	इतर (नमूद करावे)			

७. माहितीचे साधने

अनु.क्र.	माहितीचे साधने	नेहमी	कधीकधी	कधीच नाही
अ	औपचारीक स्रोत			
१	ग्रामसेवक			
२	पंचायत समिती			
३	कृषी अधिकारी			
४	गटविकास अधिकारी			
५	विद्यापीठी शास्त्रज्ञ			
ब	अनौपचारीक स्रोत			
१	स्थानिक पुढारी			
२	मित्र			
३	कृषी केंद्र			
क	प्रसार माध्यमांचे स्रोत			
१	रेडिओ			
२	दुरदर्शन			
३	वर्तमानपत्रे			
४	कृषी पत्रिका			
५	कृषी प्रदर्शनी			

८. जोखीम अग्रक्रम

अ.क्र.	विधाने	पुर्ण सहमत	सहमत	अनिश्चित	असहमत	पूर्ण असहमत
१	शेतकऱ्यांनी जास्त पिके पेरावी आणि एक किंवा दोन पिके पेरल्यामुळे होणारे नुकसान टाळावे					
२	शेतकऱ्यांनी चांगली संधी साधून जास्त नफा मिळवावा पण धोका नसलेल्या कमी उत्पन्नात समाधान मानू नये					
३	जो शेतकरी साधारण शेतकऱ्यांपेक्षा जास्त धोका पत्कारण्यास तयार असतो. तो आर्थिकदृष्ट्या यशस्वी होतो.					
४	जेव्हा यशस्वी होण्याची जास्त शक्यता असते त्यावेळी शेतकऱ्यांनी धोका पत्करून ती गोष्ट करणे चांगली आहे.					
५	इतर बहुतांश शेतकऱ्यांनी यशस्वीपणे नवीन शेती पद्धतीचा वापर केल्यावरच शेतकऱ्याने अवलंबन करणे चांगले आहे.					
६	एकदम नवीन सुधारलेली शेतीची पद्धत वापरण्यात धोका असला तरी ते करणे योग्य आहे.					

९. विस्तार संपर्क

अ.क्र.	माहितीचा स्रोत	नेहमी	कधीकधी	कधीच नाही
अ	स्थानिक स्रोत			
१	सरपंच			
२	मित्र /नातेवाईक			
३	शेजारी			
४	प्रगतिशील शेतकरी			
५	इतर (नमूद करावे)			
ब.	संस्था साधने			
१	ग्रामसेवक			
२	कृषी सहाय्यक			
३	कृषी पर्यवेक्षक			
४	कृषी विस्तार अधिकारी			
५	तालुका कृषी अधिकारी			
६	जिल्हा कृषी अधिकारी			
७	कृषी विद्यापीठ/कृ.वै.के. शास्त्रज्ञ			
क	प्रसार माध्यमे			
१	रेडिओ			
२	दुरदर्शन			
३	वर्तमानपत्र			
४	मोबाईल			
५	कृषी पत्रिका			
६	इंटरनेट			
७	प्रदर्शनी			

१०. नाविन्यपूर्णतः

अनु. क्र.	विधाने	मान्य	सांगता येत नाही	अमान्य
१	जोपर्यंत मी एकलेली नवीन शेती विषयक माहितीचे अवलंबन करत नाही तोपर्यंत मी अस्वस्थ असतो.			
२	शेती शास्त्रज्ञ अनेक निरनिराळ्या सुधारीत पद्धती संबंधी बोलत असतात. पण त्या जुन्या पद्धतीपेक्षा चांगल्या आहेत किंवा नाही कोणास ठाऊक?			
३	आपले पूर्वज त्यांची शेती करण्यास हुशारच होते. त्यामुळे त्यांनी अवलंबलेल्या जुन्या पद्धतीत बदल करण्यात मला काहीच कारण दिसत नाही.			
४	बहुतेक वेळा नवीन शेतीपद्धती अपयशी ठरते पण मी निश्चितपणे फायदेशीर असेल तर मी ती अवलंबवील.			
५	वेळे वेळे मी नवीन शेती पद्धती बदल ऐकत आला आणि मागील काही वर्षांपासून मी त्याचा उपयोग करीत आहे.			
६	कसेही का असेल पारंपारिक शेती पद्धती उत्तम आहेत असा मला विश्वास वाटतो			

११. शास्त्रीयभिमुखता

अनु. क्र.	वाक्य	पूर्ण सहमत	सहमत	अनिश्चित	असहमत	पूर्ण असहमत
१	जुन्या शेती पद्धतीपेक्षा नवीन सुधारलेल्या पद्धतीमुळे शेतकऱ्यांना जास्त पैसा मिळतो.					
२	शेतकऱ्यांच्या वाडवडिलांनी ज्या पद्धतीने तो मार्ग आजही चांगला आहे.					
३	ज्या शेतकऱ्यांना शेतीचा बराच अनुभव आहे, तरी ही त्यांनी नवीन शेती पद्धतीचा वापर करावा.					
४	जरी नवीन शेती पद्धती शिकण्यास वेळ लागत असला तरीही तो मार्ग वाया जात नाही.					
५	चांगला शेतकरी नवीन शेती कल्पनांचे प्रयोग करीत असतो.					
६	शेतकऱ्यांचे राहणीमान वाढविण्यासाठी जुन्या पद्धतीत बदल करणे आवश्यक.					

भाग - २

१. रब्बी ज्वारी लागवड तंत्रज्ञान - ज्ञानपातळी व अवलंबनाचा अभ्यास

अ. क्र.	शिफारस केलेले रब्बी ज्वारी लागवड तंत्रज्ञान	माहिती		अवलंबन		अवलंबन न करण्याची कारणे
		आहे (१)	नाही (०)	संपूर्ण (२)	अंशता (१)	
अ.	जमीन					
१	जमीन : (मध्यम ते खोल/भारी) जास्त जलसंधारण असलेली/पाण्याचा चांगला निचरा होणारी					
ब	पूर्व मशागत					
१	वखराच्या पाळ्या : (३ ते ४)					
२	घसकट जमा करून जाळण्याची गरी आहे					
३	शिफारसीत भरखताची मात्रा काय आहे (शेणखत/कंपोस्ट हे. १० ते १५ गाड्या)					
४	शेणखत वखराची पाळी देऊन जमिनीत मिसळावे					
क	शिफारस केलेले वाण					
	अ. संकरीत वाण					
१	सी.एस.एच.-१५ आर					
२	सी.एस.एच.-१९ आर					
ब	सुधारीत/शुद्ध वाण					
१	पीकेव्ही क्रांती (एकेएसव्ही १३ आर)					
२	एस.पी.व्ही. ५०४					
३	सी.एस.व्ही. १४ आर					
४	सी.एस.व्ही. १८ आर					
५	एस.पी.व्ही. १३५९ (फुले यशोदा)					
क	स्थानिक वाण					
१	मालदांडी -३५ - १					
२	रिंगणी					
ड	बियाणे व बिज प्रक्रिया					
१	बियाण्याचे प्रति हेक्टर प्रमाण (७.५ ते १० किलो प्रति हेक्टर)					
२	बीज प्रक्रिया : अ. थायरम ३ ग्रॅम किंवा ब. थायरम २ ग्रॅम + कार्बेनडॅझीम १ ग्रॅम १ किलो बियाण्यास चोळावे किंवा क. ३०० मेश गंधकाची भुकटी ४ ग्रॅम प्रति किलो, अथवा ड. वेगट बियाण्यास ३० टक्के मिठांच्या द्रावणात बुडवणे					
ई	पेरणी					
१	पेरणी वेळ : (२५ सप्टेंबर ते १५ ऑक्टोबर)					
२	उताराला आडवी					
३	दोन चाडे तिफणीचा वापर करून					
४	दोन झाडातील व दोन ओळीतील अंतर १५ ते २० सेंमी. इतके ठेवावे					

क	विरळणी						
१	पेरणीपासून १५-२० दिवसानंतर						
२	हेक्टरी झाडांची संख्या (१.५० लाख)						
३	विरळणी करताना खोडमाशी प्रस्त रोप काढून टाकावे						
ख	ओलीत						
१	पौकाची जोमदार वाढीची सुरुवात-३५ ते ४० दिवस (पेरणीनंतर)						
२	पीक पोटरीत येण्याचा काळ - ६० ते ६५ दिवस						
३	पीक फुलण्यात येण्याचा काळ - ७० ते ७५ दिवस						
४	दाणे भरण्याचा काळ - ८५ ते ९५ दिवस						
ग	आंतर मशागत						
१	कोळपणी : २-३ कोळपण्या						
२	निंदणी : १ ते २ वेळा						
३	आच्छादन : १. सेंद्रीय पदार्थाद्वारा २. इतर						
घ	खत व्यवस्थापन						
१.	कोरडवाहू - शिफारसीत मात्रा (नत्र : स्फुरद : पालाश किलो) सर्वसाधारण ५०:२५:२५ प्रति हेक्टरी संपूर्ण पेरणीवेळी.						
२	ओलित						
	अ. पहिला हप्ता : नत्र ४०, स्फुरद ४०, पालाश ४०						
	ब. दुसरा हप्ता : नत्र ४०- २५ ते ३० दिवसांनी						
	पीक संरक्षण						
	अ. महत्त्वाच्या किडीचे नावे						
	१. खोड किडा						
	२. खोडमाशी						
	३. मावा/तुडतुडे						
	ब. महत्त्वाचे रोग						
	१. दाण्यावरील बुरशी						
	२. खडखड्या						
	३. काणी						
	४. अरगट (चिकटा)						
२.	किडी व रोग नियंत्रणाचे उपाय						
	अ. किड नियंत्रण						
	१. खोड माशी (क्लोरपायरीफॉस २० टक्के प्रवाही २५ मि.ली. १० लि. पाण्यात मिसळून फवारावे)						
	२. खोड किडा : अ. उगवणीनंतर ३० दिवसांनी किंवा ब. कार्बारील ५० टक्के पा.मी. भुकटी ४० ग्रॅम किंवा क. क्लोरपायरीफॉस २० टक्के प्रवाही २५ मि.ली. १० लिटर पाण्यात मिसळून फवारणे किंवा ड. ट्रायकोप्रॅमा चिलोसिस किटकांची अंडी १.५० लाख प्रती हेक्टरी शेतामध्ये सोडणे						

	३. मावा/तुडतुई : अ. डायमिथोएट ३०टक्के प्रवाही १० मी.ली. किंवा ब. मिथील डिमेटॉन २५ टक्के ८ मिली किंवा क. मोनोक्रोटोफास ३६ टक्के प्रवाही ६ मि.ली. १० लिटर पाण्यात मिसळून फवारणे						
	रोग नियंत्रण						
	१. दाण्यावरील बुरशी (थायरम ३ ग्रॅम किंवा थायरम २ ग्रॅम + कार्बेन्डाझीम १ ग्रॅम १ किलो बियाण्यास चोळणे)						
	२. ज्वारीची कापणी शारीरिक परिपक्वतेच्या अवस्थेत करावी.						
	३. पिक पावसात सापडू न देणे						
२.	खडखड्या :						
	१. अ. पेरणीपूर्वी २५ ग्रॅम अॅझोटोबॅक्टर किंवा ब. ४ ग्रॅम ट्रायकोडर्मा + २५ ग्रॅम पी.एस.बी. प्रति किलो						
	२. पिकाची फेरपालट करावी.						
	३. पालाशाची योग्य मात्रा देणे						
	४. रोगाचे प्रमाण कमी करण्यासाठी आंतरपीक/मिश्र पिक घेणे						
	५. पेरणी योग्यवेळी करणे						
३.	काणी						
	१. अ. थायरम ७५ टक्के किंवा ब. ३०० मेश गंधकाची भुकटी ४ ग्रॅम अथवा क. थायरम २ ग्रॅम + कार्बेन्डाझीम १ ग्रॅम १ किलो बियाण्यास चोळणे						
	२. रोगट कणसे काढून नायनाट करावा						
	अरगट (चिकटा) : रोगट बियाण्यास ३०% मिठाचे द्रावणात बुडवून तरंगणारे बियाणे काढून जाळाचे तळाशी राहिलेले बियाणे स्वच्छ पाण्याने धुवून सावलीत वाळवावे.						
	कापणी : शारीरिक परिपक्वतेनुसार करणे						
	मळणी						
	१. यंत्राद्वारे						
	२. इतर						

२. दृष्टीकोन

अनु.क्र.	वाक्य	पुर्ण सहमत	सहमत	अनिश्चित	असहमत	पुर्ण असहमत
१	ज्वारी पिकावर येणाऱ्या विविध किडी व रोगांची माहिती असणे आवश्यक आहे.					
२	रासायनिक किटकनाशके वापरणे घातक आहे.					
३	शिफारस केलेली खतमात्रा पिकाच्या जोरदार वाढीसाठी उपयुक्त आहे.					
४	विद्यापीठाने निर्माण केलेल्या ज्वारीच्या जाती शेतकऱ्यांच्या उपयोगाच्या आहेत.					
५	पेरणी अगोदर बिजप्रक्रिया केल्याने पिकाची वाढ जोमाने होते व मर, उभळ सारखे रोग नियंत्रीत होतात.					
६	दोन झाडातील व ओळीतील अंतर राखल्याने उत्पादनात वाढ होते.					
७	आंतर मशागत केल्याने पिकाच्या वाढीवर परिणाम होतो.					
८	वरखत देतांना जमिनीत पुरेसा ओलावा असणे आवश्यक आहे.					
९	पाण्याची कमतरता असतांना आच्छादन केल्याने फायदा होतो.					
१०	पेरणीनंतर १५-२० दिवसांनी विरळणी करणे आवश्यक आहे.					
११	रब्बी ज्वारीच्या पेरणीस उशीर झाल्यास मुरमाशीचा प्रादुर्भाव होण्याची शक्यता असते.					
१२	रब्बी ज्वारीचे ओलीत व्यवस्थापन केल्यास उत्पादनात चांगला फायदा होतो.					

