

A STUDY OF ADOPTION BEHAVIOUR OF TRIBAL
FARMER IN RELATION TO IMPROVED FARM
TECHNOLOGY IN BAJAG BLOCK OF MANDLA
DISTRICT OF MADHYA PRADESH

THESIS

Submitted to the
Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur
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MASTER OF SCIENCE

IN

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THESIS



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Dedicated to
My Beloved Mother

Late Smt. RAMWATI DEVI



CERTIFICATE I



This is to certify that the thesis entitled, "A STUDY OF ADOPTION BEHAVIOUR OF TRIBAL FARMER IN RELATION TO IMPROVED FARM TECHNOLOGY IN BAYAS BLOCK OF HANDLA DISTRICT OF MADHYA PRADESH" submitted in partial fulfilment of the requirements for the degree of 'MASTER OF SCIENCE IN AGRICULTURE' of the Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, is a record of the bonafide research work carried out by SHRI JAGAT SINGH THAKUR under my guidance and supervision. The subject of the thesis has been approved by the Student's Advisory Committee and the Director of Instructions.

No part of the thesis has been submitted for any other degree or diploma (certificate awarded etc.) or has been published/published part has been fully acknowledged. All the assistance and help received during the course of the investigations have been duly acknowledged by him.

Chairman of the Advisory Committee

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CERTIFICATE II

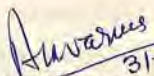
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partial fulfilment of the requirements for the degree of
'MASTER OF SCIENCE IN AGRICULTURE' in the Department of
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JABALPUR,

Dated :


(JAGAT SINGH THAKUR)

TABLE OF CONTENTS

| <u>CHAPTER</u> | | <u>PAGE</u> |
|----------------|---|-------------|
| I | INTRODUCTION .. | .. 1 - 6 |
| II | REVIEW OF LITERATURE | .. 7 - 12 |
| III | METHODOLOGY .. | .. 13 - 19 |
| IV | ANALYSIS AND INTERPRETATION OF DATA .. | .. 20 - 54 |
| V | SUMMARY, CONCLUSIONS AND SUGGESTIONS .. | .. 55 - 61 |
| | BIBLIOGRAPHY | .. 1 - 111 |
| | APPENDIX .. | .. 1 - 7 |

LIST OF TABLES

| <u>TABLE</u> | | <u>PAGE</u> |
|--------------|---|-------------|
| 1 | Percentage distribution of tribal farmers .. according to their socio-economic profile. | 21 |
| 2 | Relationship between education and extent .. of knowledge of improved seed. | 26 |
| 3 | Relationship between experience of .. farming and extent of knowledge of improved seed. | 27 |
| 4 | Relationship between economical status and.. extent of knowledge of improved seed. | 28 |
| 5 | Relationship between availability of .. improved seed and extent of knowledge of improved seed. | 29 |
| 6 | Relationship between availability of .. irrigation and extent of knowledge of improved seed. | 30 |
| 7 | Relationship between availability of .. credit and extent of knowledge of improved seed. | 32 |
| 8 | Relationship between education and .. extent of knowledge of fertilizer. | 33 |
| 9 | Relationship between experience of .. farming and extent of knowledge of fertilizer. | 35 |
| 10 | Relationship between economical status .. and extent of knowledge of fertilizer. | 36 |
| 11 | Relationship between availability of .. inputs and extent of knowledge of fertilizer. | 37 |
| 12 | Relationship between availability of .. irrigation and extent of knowledge of fertilizer. | 38 |
| 13 | Relationship between availability of .. credit and extent of knowledge of fertilizer. | 39 |
| 14 | Association of education with extent of .. adoption of improved seed. | 40 |





| <u>TABLE</u> | <u>PAGE</u> |
|--|-------------|
| 15 Association with experience of farming and extent of adoption of improved seed. .. | 41 |
| 16 Association with economical status and extent of improved seed. .. | 43 |
| 17 Association with availability of inputs and extent of adoption of improved seed. .. | 44 |
| 18 Association with availability of irrigation and extent of adoption of improved seed. .. | 45 |
| 19 Association with availability of credit and extent of adoption of improved seed. .. | 46 |
| 20 Association with education of extent of adoption of fertiliser. .. | 47 |
| 21 Association with experience of farming and extent of adoption of fertiliser. .. | 48 |
| 22 Association with economical status and extent of adoption of fertiliser. .. | 49 |
| 23 Association with availability of inputs and extent of adoption of fertiliser. .. | 50 |
| 24 Association with availability of irrigation and extent of adoption of fertiliser. .. | 51 |
| 25 Association with availability of credit and extent of adoption of fertiliser. .. | 52 |
| 26 Constraints analysis of the non-adoption of farm technologies by the tribal farmers. .. | 53 |

CHAPTER I

INTRODUCTION

The tribal people like other citizens are required to play significant and equal role in the development of national economy. The tragedy lies in this fact that tribals are unable to compete with other citizens because of their ignorance, isolated life and lack of financial resources. After the attainment of national freedom, Indian Government is making various attempts to raise the socio-economic standard of tribal people by launching several welfare projects. The declaration of 255 tribes as scheduled tribes by Indian constitution is meant for providing them complete patronage and financial assistance for their improvement.

According to census of India 1981 the total population of country was 683,810151 out of which the scheduled tribes accounted 53339191. These tribes constituted 7.8 per cent of the total population of the country. The total population of Madhya Pradesh State 52,178,844 out of which the share of tribal population is 11,987031 which constitute 23.67 per cent of total population. These people are settled in all most 47 districts of Madhya Pradesh. The highest concentration of these tribal may easily be located in 13 districts which are apparently declared as tribal district.

Mandla district, once upon a time a capital of Gondwana State ruled by Rajgonds, provide refuse for 60.36 per cent tribal population. Gonds and Baigas are major tribes living in Mandla district. Bajag block of Mandla district, having bulk of tribal population represent a typical tribal character because of true tribal culture, tribal economy and tribal socio-psychological behaviour pattern.

Tribals belonging to this block depend upon agriculture and collection of forest produce as main sources livelihood. Majority of tribal farmers command land holding less than two hectares. Further soil status of land possessed by these people is not fertile. Major crops grown by these people are paddy, jowar, maize, kodokutki, wheat and gram. Primitive method of cultivation, poor irrigational resources, soil erosion and lack of communication and extension resources are major causes for low yield. The productivity of the major crops is much lower in comparison to the productivity level of these crops at state and national level.

Table 1 : *Average productivity of major crops for year 1981-82 (kg/ha)

| Crops | India | M.P. | Mandla District |
|-----------|-------|------|-----------------|
| Rice | 1317 | 836 | 725 |
| Jowar | 716 | 827 | 832 |
| Maize | 1146 | 986 | 1118 |
| Kodokutki | 215 | 217 | 240 |
| Wheat | 1696 | 1046 | 951 |
| Gram | 1160 | 672 | 617 |

*Source M.P. Agricultural Statistics, Govt. of M.P., Bhopal.

The data as mentioned on Table 1 reveals the lower productivity level of major crops. The studies conducted on tribals of Mandla indicate that non-adoption of improved technology, non-availability of critical inputs and credit facilities and weaker extension contacts are major causes of lower productivity. In-different approach by Government officials, exploitation by outside agencies and lack of consciousness among tribals for many years were major obstacles in a way tribal development. After 5th Plan serious attempts were made to provide them facilities and advantages to make these people more self reliant and progressive. During 6th Plan integrated approach and special efforts were made to elevate the socio-economic standard of tribals.

Traditional methods of cultivation is still dominating agricultural scene in tribal area. Time has come when agriculture as business is place of way of life should be adopted. It is only possible when skill and knowledge of farming community is improved with the help of scientific farm technology. Transmission of traditional way of cultivation by improved farm practices in tribal area differs from non-tribal area.

Focus of the Problem and its Importance :

It is essential to study behaviour of tribal people in order to induce changes. Because of separation from other world these people stick to their way of life.

Once extension educational programme are introduced to bring desirable changes. It becomes essential for extension workers to possess knowledge regarding their client and factors influencing their adoption behaviour. This study will be of immense help in understanding adoption behaviour of tribal farmers of this area. The proper understanding will act as guide line to the extension worker engaged in tribal area to develop strategy for quicker and effective transfer of improved farm technology.

Looking to the overall situation and problems of tribals of Bajag area the study is mainly focused to identify and analysis the adoption behaviour of tribal farmers of this area, with particular reference to the improved farm technology to satisfy following queries.

1. To what extent the tribals of this area have adopted improved farm technology to raise the level of crop production.
2. What are the factors that influence their adoption behaviour.
3. Adoption of improved farm technology.

In order to solve these questions a study is proposed to undertake following objectives :



Objectives :

1. To identify the extent of knowledge of improved farm technology by the tribal farmers.
2. To study the extent of adoption of improved farm technology by the tribal farmers.
3. To study the relationship of various socio-personal and situational factors with the adoption behaviour of tribal farmers.
4. To study the constraints in adoption of improved farm technology and to suggest ways to overcome these problems.

Limitations :

1. The adoption of improved seeds and application of fertilisers were main practices selected in this study because these were considered as most effective and crucial for increasing crop yield in this area.
2. The findings of study are based on expressed opinions by the respondent which may be subject to measurement bias.
3. Area of this study is limited to the development block of Bajag hence the limitation of generalization remains for this area only.

Definition of Terms :

In this proposed study certain terms are frequently used and their connotation are given here :

1. Extent of Knowledge :

The concept of extent of knowledge differs from place to place and situation to situation depending upon the knowledge possessed by respondent. In this study farmers adoption more than 50 per cent practices as mentioned in interview schedule are considered to be farmers having knowledge regarding improved seed and fertilizers.

2. Adoption :

In this study the term adoption means the actual use of agricultural technology namely improved seeds and chemical fertilizer they use partly or fully in their field.

3. Improved seed :

This refers to high yielding varieties which were popular in Mandla and Dindori recommended by the State Agricultural Department and J. N. Agriculture University, University Research Station situated at Dindori.

REVIEW OF LITERATURE

CHAPTER II

REVIEW OF LITERATURE

The research work done in the past has been reviewed by the author which provided theoretical frame work for this study. There were more than one thousand studies on adoption and diffusion process by the end of 1968 as reported by E. M. Rogers. Later on the number has been increased to a greater extent. In the following pages only a few significant research finding are reviewed which are based on the past research work.

A general review of adoption research studies in India was made in the report of a seminar on research in extension education in 1970 Singh, Sahay, Mathur Galkwad, Sarkar, Bhaskaran, Sinha and Kaul, Daulat Singh and Shrivastava and others reported the summaries of various research studies conducted in various part of India on adoption. The various socio-personal factors such as education economic status, farm size and social participation have been widely reported to have some relationship with adoption Fliegel (1968) in his study showed that low income respondents have adopted fewer of the practices as compared with the higher income group.

Ratan Chand and Gupta (1966) in the study conducted in villege Dahtora of Bichpuri block, Agra found that age caste had no significant relationship with the adoption



where as other factors like literacy status, economic status social participation and size of holding had significant relationship with adoption.

Salvi and Dawar (1966) in the study conducted in the Sirartaluka of Poona District in Maharashtra found that profitability compatibility, efficiency and feasibility of the recommended farm practices were related to their adoption, cost and complexity of practices did not have any relationship with adoption.

Vidhyarthi (1967) concluded from his study that economic factors were significantly related to the adoption of dwarf wheat varieties in the Aligarch district.

Studies conducted in various part of India in the field of adoption research revealed that high economic status was positively related with adoption. In most of the studies it was found that progressive farmers were better educated, younger in age and had high economic status, high organisational participation and owned large holdings.

Sinha and Bhasin (1968) found that lack of irrigation facilities, irregular supply of materials and lack of credit were most important factors influencing low adoption.

Jaiswal (1969) analysed the attitude of tribal and non-tribal leaders and followers towards agriculture development. They found that the leaders as well as followers in both communities did not possess any positive attitude

towards official programme and personnel. The attitude of the followers however was found to be more negative than that of the leaders.

Madey and Ray (1969) in a study conducted in the Kanjhawala block of Delhi Territory found that the magnitude of adoption of improved seed was highest among Rajput and lowest among (Dhimar).

Patel and Singh (1970) reported in a study conducted in four randomly selected villages of Chikhali and Palsons tehsils in Bulsar and Surat district of Gujrat respectively that farmers with larger size of holding, more irrigational facilities, higher socio-economic status, higher education higher accepted farm planning in significant greater number.

Parthasarthy (1971) found that the major obstacles in the adoption of agricultural innovation by small farmers were non-familiarity with new skill and lack of confidence, non-availability of production inputs.

Chandure and Sharma (1973) stated that small farmers did not use improved varieties of seed due to its high cost and non-availability.

Fandey (1976) found that irrigational facilities and availability of credit to be non-significant with adoption of improved seed of wheat.



Pande (1977) in a study conducted on the adoption behaviour of farmers in Panagar block found that among the various reasons for not adoption the recommended inputs were lack of finance, irrigation and lack of knowledge regarding farm technology among farmers.

Sinha and Sinha (1980) in the study conducted on farmers adopting high yielding varieties in Siddim observed that lack of knowledge and non-availability of credit facilities acted as major handicap in way of adoption. According to them extension workers need to make frequent visits in order to overcome the problems of ignorance.

Singh, Singh and Yadav (1980) conducted study on the adoption behaviour of small farmers. They found that majority of the respondents (75%) have adopted the seed technology to a high extent of adoption level while fertilizer technology was adopted by 55 per cent respondents. However, the irrigation technology was adopted by (74%) respondents to medium adoption level. The overall picture on extent of adoption rate was discouraging. Since only 13 per cent respondents had adopted. A positive and significant relationship was observed between higher level of adoption and some socio-economic characteristics like caste, education, size of holding and urban contacts among wheat growers. The significant results as implied by this study narrate the overall influence of the personality

characteristics on acceptance and adoption of any new practice. Significant relationship between knowledge and caste background of the respondents was also seen.

Kumar Sushma, Menon and Bhaskaran (1981) while conducting study on adoption behaviour of tribal people in Kerala found that established relationship between independent variable and adoption could act as guide line to achieve better results. They suggested to adopt specific Mentale group approach to achieve better results from tribal people.

Rao and Singh (1981) in a study conducted on adoption of high yielding rice varieties by communication, they found that the percentage of high adopters among the key communicators was more in non-innovative village than in the innovative village. It may be concluded that extent of adoption of high yielding rice varieties by key communicator, communicator and non-communicators differed within the communication units and from village to village. The key communicators were better adopter than communicators and the communicators were better than non-communicator with respect to their adoption status.

Waghmare and Pandit (1982) reported in a study conducted adoption of wheat technology by the tribal farmers at Madhya Pradesh. The main constraints in transfer of wheat technology were lack of knowledge and lack of technical

guidance. This calls for a concentrated efforts to be made by the extension agents to educate the tribal farmers who have remained neglected.

Bangarwa, Singh and Kadian (1982) in a study conducted on the adoption of new farm technology observed that the extent of adoption of farm technology by small farmers was comparatively less than the medium and large farmers. The average yield obtained by medium size farm groups was relatively better than those obtained by large and small farm size respondents indicating medium size of land holding as an optimum farm size group therefore it is advocated that in order to attain maximum output per cent cultivated area the practice of large and small farm size should be discouraged by enacting appropriate legislation.

Singh (1983) in a conducted study observed that higher extension contacts are instrumental in motivating the farmers to adopt farm mechanization. But it was also discovered that person with higher socio-economic status have more extension contacts.

M E T H O D O L O G Y

CHAPTER III

METHODOLOGY

This chapter deals with the methods used in this study and it includes the procedure for developing the interview schedule, selection of villages and respondents, collection of data, sources of data interviewing, type of data variables and their measurement and data processing.

Developing Interview schedule :

The interview schedule was prepared in Hindi and designed on the basis of objectives of the study. The first interview schedule was prepared and suggestions of advisory committee were incorporated. It was then pre-tested and necessary relationship corrections were made to ensure the validity and reliability of the interview schedule. After pretesting, a final schedule was prepared which contained 37 questions and it took approximately 30 minutes to take an interview with each of the respondents.

Selection of Research Site :

Mandla district is predominantly a tribal district and tribals of Bajaj Block have maintained the typical tribal character. Because of this special character this block has been selected, this block is a true representative of tribal culture, tribal economy and tribal socio-psychological behaviour pattern.

Selection of Village :

Bajag Block of Mandla district comprises of 85 villages and 16 R.A.E.O. Circles. Out of these 16 R.A.E.O. Circles 5 R.A.E.O. Circles were selected randomly when they are arranged alphabetically and one village from each R.A.E.O. Circle was selected with the help of the random number table with probability proportional to the tribal farmers population of the village. The selected villages are Bajag, Baunder, Chaghada, Grdha, Gada Sarai.

This sampling procedure is followed so that villages having higher population get more chance of selection and by random sampling bias or prejudice is removed.

In this manner one village from each R.A.E.O. Circle is selected and thus 5 villages were selected.

Selection of Respondents :

The list of tribal farmers was prepared in consultation with the Mukhia, Patwari or Patel and the names were arranged alphabetically and a number is given to them and by random table number 20 respondents were selected.

In case the selected village had less than 20 tribal farmers hundred per cent sampling was followed. Following this procedure 100 small farmers were selected and personally contacted and required information were collected from them.

Source of Data :

The data were collected from selected tribal farmers. The respondents were personally interviewed by the author with the help of interview schedule. Whatever, information supplied by the selected farmers while interviewing constituted the data for analysis.

Interviewing :

Before starting interview rapport was established with respondents by explaining the purpose of study and with assurance given to them that whatever information received through them would be kept strictly confidential and only utilized for the study purpose.

Type of Data :

The following type of data were obtained from the respondents in view of objectives of study. Data pertaining to :

1. Socio-personal factors of the respondents like their education, family size, land holding and income.
2. Socio-psychological factors like their attitudes towards improved agricultural practices and their level of technological knowledge.
3. Situational factors like availability of productive inputs in time, availability of irrigation and availability of credit and availability of agricultural information.

4. Problems faced by the respondents in adopting improved seeds and fertilizers and their suggestions to overcome their problems.
5. Problem faced by the respondents in adopting in improved seeds and chemical fertilizers and their suggestions to overcome their problems.
6. The reasons for adoption of improved seeds and chemical fertilizers.
7. The extent to which development efforts were made available to them and to what extent they were benefited from it.

The Variables and their Measurement :

In this study the extent of adoption of improved seeds and fertilizers is considered as dependent variable. Here term adoption means the acceptance of an innovations as a part of the behavioural pattern of the small farmers. Those tribal farmers who adopted the high yielding varieties and/or chemical fertilizers were called as adopters (actually used improved seeds and chemical fertilizers). Those tribal farmers who did not adopt the high yielding varieties and fertilizers were called as non-adopters.

Independent Variables :

Socio-personal factors :

- | | |
|---------------------------|------------------|
| 1. Education, | 4. Land holding, |
| 2. Family size | 5. Income |
| 3. Experience of farming, | |

Situational factors :

1. Economic status (income)
2. Availability of inputs.
3. Availability of irrigation
4. Availability of credit.

A brief description of the above independent variables and their measurement is as follows :

1. Education :

It refers the level of total knowledge obtained through schools by the respondent that may influence his adoption behaviour. By the schooling education the respondents were categorized as follows :

- a) Illiterate
- b) Upto primary education
- c) Upto middle education
- d) Higher secondary and above.

2. Experience of Farming :

The extent of experience about improved (seeds and chemical fertilizers) agricultural practices may influence the adoption of the improved agricultural practices. Questions were asked to assess the extent of knowledge and the extent of adoption of the respondents about improved agricultural practices. The respondents were categorized as follows :

- a) Within 1 to 5 years
- b) 6 to 10 years
- c) 11 to 15 years
- d) Above than 15 years.

3. Economic Status (Income) :

Level of income determines the respondents standard of living and capacity to purchase inputs required for the adoption of improved agricultural practices and this may influence the adoption behaviour. The yearly income is earned through farming and non-farming resources and placed in following categories :

- a) Low income : Less than Rs. 2000 yearly.
- b) Medium income : Between Rs. 2000 or more and upto 4000.
- c) High income : More than Rs. 4000 yearly.

4. Availability of Inputs :

The availability of input means availability of improved seeds and fertilizers in time. Availability of inputs in time is likely to affect the adoption. The respondents were asked to specify the availability or non-availability of inputs and answers were recorded in three heads :



- a) Non-available
- b) Partly available
- c) Highly available

5. Availability of Irrigation :

Irrigation may be considered as one of the important requirement for adoption of improved seeds and fertilizers by the respondents and this may affect the adoption behaviour. The respondents were asked to mention regarding irrigation facilities and the following categories were made.

- a) Nil : 1 to 40 per cent
- b) Medium : 40 to 60 per cent
- d) High : Above to 60 per cent.

6. Availability of Credit :

For purchasing the production inputs credit is required and is likely to affect the adoption of improved seeds and fertilizers. The respondents were asked question to inform the extent to which they get benefit through banks and were categorized as follows :

- a) Nil : Not taking loan
- b) Short term : Loan for 7 to 15 months
- c) Long term : Taking loan above 15 months.

Data processing :

The data were tabulated and analysed mainly on the basis of percentages.



ANALYSIS AND INTERPRETATION OF DATA

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with the findings presented in chronological order according to objectives of the study. In the first part of this chapter the percentage distribution of respondents in relation to various selected independent variables is presented with a view to give a profile of the sample respondents. The second part of this chapter deals with the association of the selected independent variables with the extent of knowledge about the improved seed and chemical fertilizer among the selected respondents, the third part of this chapter deals with the association of the selected independent variables with the extent of adoption of improved seed and chemical fertilizers, the fourth and last part of this chapter deals with constraints and suggestion for higher adoption of improved farm practices.

Socio-economic profile of the Respondents :

The distribution of the respondent in the different groups according to their socio-economic characteristics deals in the succeeding part.

Table 1 : Percentage distribution of Tribal farmers according to their socio-economic profile

| S. No. | Factors | Respondent No. Percentage |
|--------|-------------------------------------|---------------------------|
| 1. | <u>Education level :</u> | |
| | a) Illiterate | .. 33 |
| | b) Primary | .. 16 |
| | c) Middle | .. 20 |
| | d) High school and above | .. 31 |
| 2. | <u>Experience of farming :</u> | |
| | a) 1 to 5 years | .. 10 |
| | b) 6 to 10 years | .. 20 |
| | c) 11 to 15 years | .. 27 |
| | d) Above 15 years | .. 43 |
| 3. | <u>Economical status :</u> | |
| | a) Low | .. 46 |
| | b) Medium | .. 26 |
| | c) High | .. 28 |
| 4. | <u>Availability of inputs :</u> | |
| | a) Nil | .. 42 |
| | b) Partial | .. 37 |
| | c) High | .. 21 |
| 5. | <u>Availability of irrigation :</u> | |
| | a) Nil | .. 56 |
| | b) Partial | .. 30 |
| | c) High | .. 14 |
| 6. | <u>Availability of credit :</u> | |
| | a) Nil | .. 52 |
| | b) Short term | .. 27 |
| | c) Long term | .. 21 |

The data presented in Table 1 show that there were six independent variables, which were taken into consideration for the present study. They were education, experience of farming, economic status, availability of credit. Their percentage distribution is given in above mentioned table.

Education :

Out of the total tribal farmers about 1/3 were illiterate but at the same time it was also observed that 1/3 were having the education upto high school and above and 1/3 were having the education in between primary and middle level.

Thus it can be concluded that the selected tribal respondent were homogenously distributed in the different education levels and hence it homogenously affected the extent of knowledge and adoption in the later on.

Experience of farming :

The majority of the tribals were highly experienced in their farming business it is observed from the data which shows that about 43 per cent of the tribals had have the experience about farming business above 15 years and about 37 per cent had the experience about farming in between 11 to 15 years and vary small majority of the tribals have less then 10 years experience about their occupation i.e. 30 per cent only.

This phenomenon ultimately reflects towards heritage of the farming and only few just came in this occupation.

Economic Status :

The economic condition is the main factor which affect the adoption of any innovation positively. The tribals are assumed to be below poverty line and hence the observation on this factor is important in the present study. The majority of the farmers about 46 per cent were in the low income group, only 26 and 28 per cent were in medium and high income group respectively, showing in-equality of income. Distribution of this type in Indian economy the ultimately reflects in adoption of improved farm technology.

Availability of inputs :

The non-availability of agricultural inputs is assumed to be major constraint's in the adoption of farm technologies. Some time the inputs are not available in time and in required quantities of farm. From the same table it was observed that among the tribal farmers 42 per cent reported the non-availability of agricultural inputs. However, 30 per cent reported the partial availabilities of the agricultural inputs, while only 14 per cent reported the proper availability of inputs.

Thus it can be said that the inputs were not available to majority of the tribal farmers.

Availability of irrigation :

The irrigation is assumed to be catalytic agent in the adoption of improved farm practices specially fertilizers and improved seed. Thus it is important to study the availability of irrigation among the tribal farmers. From the table it was observed that among the respondents majority of the tribal farmers lack of irrigation facilities i.e. 56 per cent of the tribal farmers did not have any irrigation facility only 30 per cent of the tribal farmers had partial irrigation and 14 per cent farmers had complete irrigation.

Credit availability :

Farm credit is a major source of improved farming. Short and long term loans are meant for farming improvement. From the data it was observed that majority of the tribal farmers i.e. 52 per cent did not borrow any type of credit for farm business, 27 per cent borrowed loan of short duration i.e. short term loan for smaller non-durable types of investment, however only 21 per cent borrowed loan for long term investment like digging of well purchasing of bullocks and bullock carts etc. Thus it can be said that the majority of the tribal farmers were non-borrowers and this may reflect towards non-adoption of farm technologies.

Socio-economic factors related with the extent of knowledge :

Improved seed :

The knowledge about of improved seed accelerate the growth in agricultural productivity and production and at the same time this helps in the growth and development of National Economy by saving foreign exchange which is invested on improved seed at the time of deficit production. In the green revolution period adoption of improved seed increased many times but yet the tribals are out of the main stream of technological development, thus it is important to study the association of the same.

The adoption of any innovations depends on extent of knowledge about the improved seed. The extent of knowledge and adoption of improved seed is positively related. Hence they study of the socio-economic factors as related with the extent of knowledge is dealt with in the following discussion.

Education :

The level of education and extent of knowledge is positively related because the new farm technologies required a better understanding about the techniques of the using of improved seeds its depth of sowing seed rate, time of sowing, irrigation application etc. In the table the relationship between extent of knowledge about improved

seeds and education was studied. From the data as presented in table 2, it was observed that among the tribal farmers, 53 did not have any type of the knowledge about improved seed, 28 had partial knowledge only 19 farmers were found to be have a complete knowledge.

Table 2 : Relationship between education and extent of knowledge of improved seed.

| Education level | Extent of Knowledge | | | Total |
|-----------------------|---------------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Illiterate | 32 (41.50) | 11 (39.28) | 0 | 33 |
| Primary | 13 (24.52) | 2 (7.16) | 1 (5.26) | 16 |
| Middle | 11 (20.75) | 4 (14.28) | 5 (26.31) | 20 |
| High School and above | 7 (13.23) | 11 (39.28) | 13 (68.43) | 31 |
| Total | 53 | 28 | 19 | 100 |

(figures in bracket indicate percentage)

The data presented in Table 2 indicate that the tribals who did not have knowledge about improved seed were mostly illiterate as indicated by 41.50 per cent and 24.52 per cent had education upto primary.

However the tribal farmers who had partial knowledge about improved seed, majority had education above middle

and high school i.e. 14.28 per cent and 39.28 per cent respectively. While, the tribal farmer who had complete knowledge about improved seed majority about 70 per cent had education upto high school and above.

From the above discussion it was observed that the level of education and knowledge about improved seed go side by side and have positive relationship.

The experience of the farming is the main determinant of the extent of knowledge because it is commonly observed that the more experienced farmers generally have more knowledge about their farming business. Tribals are also no exception in this area.

Table 3 : Relationship between experience of farming and extent of knowledge of improved seed

| Experience level | Extent of Knowledge | | | Total |
|---------------------|---------------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Within 1 to 5 year | 18 (33.96) | 3 (10.71) | 0 | 21 |
| 6 to 10 years | 13 (24.52) | 7 (25.00) | 0 | 20 |
| 11 to 15 years | 11 (20.76) | 13 (46.42) | 4 (21.05) | 28 |
| Above than 15 years | 11 (20.76) | 5 (17.87) | 15 (78.95) | 31 |
| Total | 53 | 28 | 19 | 100 |

(Figures in bracket indicate percentage)

The data presented in Table 3 reveal that the tribal farmers, who had more experience (above than 15 years) about the farming and also had the complete knowledge about improved seed, were in majority i.e. 78.95 per cent. However the tribal farmers who had less experience (within 1 to 5 years) about their farming and had no knowledge of improved seed also form majority i.e. 33.96 per cent.

Thus from the above discussion it was observed that as the experience of the farming increases, the extent of knowledge about improved seed, also increases.

Economic status may not directly related with the extent of knowledge about farming but it shows their social status attached with economy and participation in the society and hence influences extent of knowledge positively.

Table 4 : Relationship between economical status and extent of knowledge of improved seed

| Economic Status | Extent of Knowledge | | | Total |
|-----------------|---------------------|---------------|--------------|-------|
| | Nil | Partial | Complete | |
| Low | 34 (64.16) | 8 (28.57) | 4 (21.05) | 46 |
| Medium | 11 (20.75) | 9 (32.14) | 6 (31.57) | 26 |
| High | 8 (15.09) | 11 (39.29) | 9 (47.38) | 28 |
| Total | 53 | 28 | 19 | 100 |

(Figures in bracket indicate percentage)



The data presented in Table 4 indicate that farmers with low economic status did not have the knowledge about improved seed, however, the farmers with high economic status had a complete and partial knowledge and were in majority i.e. about 47.38 and 39.29 per cent of the tribal farmers having complete and partial knowledge about improved seed belonged to high economic status class of tribal farmers.

Thus from the above discussion it was observed that the economic status and extent of knowledge about improved seed is positively correlated.

The proper supply of inputs and timely availability in major constraints, specially in rural areas of India. It also effects extent of adoption because due to non-availability of inputs farmers are not inclined to adopt particular technology.

Table 5 : Relationship between availability of improved seed and extent of knowledge of improved seed

| Availability of inputs | Extent of Knowledge | | | Total |
|------------------------|---------------------|---------------|---------------|-------|
| | Nil | Partial | complete | |
| Nil | 38 (71.67) | 4 (14.28) | 0 | 42 |
| Medium | 12 (23.64) | 18 (64.28) | 7 (36.84) | 37 |
| High | 3 (5.69) | 6 (21.44) | 12 (63.16) | 21 |
| Total | 53 | 28 | 19 | 100 |

(Figures in bracket indicate percentage)

The data presented in Table 5 show that among the tribal farmers, who had unavailability of inputs^{also} did not have any knowledge about improved seed, 71.67 per cent were in majority i.e. 71.67 per cent. However among those who have partial knowledge, majority i.e. 64.28 per cent had medium availability of inputs i.e. 64.28 per cent. Similarly the tribal farmers having complete knowledge about improved seed 63.16 per cent had a high availability of agricultural inputs.

Thus from the above discussion it can be said that the availability of inputs and extent of knowledge about improved seed go side by side or have positive relationship. Irrigation is assumed to be catalytic agent for the adoption of other improved farm practices and at the same time availabilities of irrigation facility also motivate farmers to seek more knowledge about improved farm practices.

Table 6 : Relationship between availability of irrigation and extent of knowledge of improved seed

| Availability of irrigation | Extent of Knowledge | | | Total |
|----------------------------|---------------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Nil | 40 (75.47) | 16 (57.14) | 8 | 56 |
| Medium | 9 (16.98) | 9 (32.14) | 12 (53.15) | 30 |
| High | 4 (7.55) | 3 (10.72) | 7 (36.85) | 14 |
| Total | 53 | 28 | 19 | 100 |

(Figures in bracket indicate percentage)

The data presented in Table 6 indicate that among the tribal farmers who did not have any irrigation facility also did not possess any knowledge about improved seed. Majority i.e. 75.47 per cent fell in this category. Where as 57.14 per cent tribal having medium irrigation facility possessed no knowledge. Where as 22.14 per cent with medium irrigation facilities possessed partial knowledge among the tribal farmers who have complete knowledge about improved seed majority i.e. 63.15 per cent had medium irrigation facilities. While 36.85 per cent farmers with high availability of irrigation resource possessed complete knowledge.

Thus from the above discussion it was observed that the irrigation facility available with tribal farmers is the major factor, which determine the extent of knowledge about improved seed.

Long term and short term investments in farm business is a main indicator of the acceptability and applicability of farm innovation.

Thus the extent of knowledge also depends upon the availability of credit facility because having credit facility at the disposal of the needy farmer he tries to know about improved techniques of farm production so that he may be in position to repay the loan.

Table 7 : Relationship between availability of credit and extent of knowledge of improved seed

| Availability of Credit | Extent of Knowledge | | | Total |
|------------------------|---------------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Nil | 41 (77.36) | 11 (39.28) | 0 | 52 |
| Short term | 8 (15.09) | 10 (35.72) | 9 (47.37) | 27 |
| Long term | 4 (7.55) | 7 (25.00) | 10 (52.63) | 21 |
| Total | 53 | 28 | 19 | 100 |

(Figures in bracket indicate percentage)

The data presented in Table 7 reveal that among the tribal farmers who did not avail any credit facility majority i.e. 77.36 per cent had no knowledge about improved seed, while the percentages go on decreasing as the tribal farmers avail the credit facility.

However among the tribal farmers who had partial knowledge about improved seed 39.28 per cent did not borrow any type of loan, while 35.72 per cent borrowed short term loan and remaining 25 per cent borrowed long term loan. Among the tribal farmer who had complete knowledge about improved seed none was found to be non-borrower 47.36 per cent borrowed short term and 52.63 per cent borrowed long term loan.

Thus we may conclude that the short term and long term borrowed for farm business have positive association with the extent of knowledge about improved seed.

The tremendous increase in food production is not only due to adoption of improved seed alone but the fertilizer management technology also helps in. The education is main determinat of knowledge about fertilizer because fertilizer application is fully technical and required good knowledge about doses, time and method of fertilizer application.

Table 8 : Relationship between education and extent of knowledge of fertilizer

| Education level | Extent of Knowledge | | | Total |
|-----------------------|---------------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Illiterate | 20 (40.00) | 13 (43.33) | 0 | 33 |
| Primary | 12 (24.00) | 2 (6.67) | 2 (10.00) | 16 |
| Middle | 10 (20.00) | 5 (16.67) | 5 (25.00) | 20 |
| High school and above | 8 (16.00) | 10 (33.33) | 13 (65.00) | 31 |
| Total | 50 | 30 | 20 | 100 |

(Figure in bracket indicate percentage)

The data presented in Table 8 show that the tribal farmers having no knowledge about fertilizer, majority came from illiterate group and percentage of respondents decreases as level of education increases. However among the tribal farmers who have partial knowledge about fertilizer majority i.e. 43.33 per cent were illiterate followed by 33.33 per cent having higher education. But among the tribal farmers who have complete knowledge about fertilizer majority i.e. 65.00 per cent had education background upto high school and above. The results suggest that the level of education and knowledge about fertilizer are positively related. Some of the tribal farmers are of the opinion that the fertilizer application destroy the soil texture and structure and hence affect the fertility level of land.

Thus farming experience is main determinant which affect the extent of knowledge about fertilizer application in crop production.

The data presented in Table 9 indicate that experience of farming and knowledge about fertilizer application are positively related, because majority tribal farmers i.e. 55.00 per cent having higher experience about farming also had complete knowledge about fertilizer and 34 per cent tribal farmers having less experience about farming the lacked of knowledge about fertilizer. We



Table 9 : Relationship between experience of farming and extent of knowledge of fertilizer

| Experience level | Extent of Knowledge | | | Total |
|---------------------|---------------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Within 1 to 5 years | 17 (34.00) | 4 (13.33) | 0 | 21 |
| 6 to 10 years | 8 (16.00) | 10 (33.33) | 2 (10.00) | 20 |
| 11 to 15 years | 15 (30.00) | 6 (20.00) | 7 (35.00) | 28 |
| Above to 15 years | 10 (20.00) | 10 (33.34) | 11 (55.00) | 31 |
| Total | 50 | 30 | 20 | 100 |

(Figures in bracket indicate percentage)

may say that higher the experience of the farming higher will be the knowledge about fertilizer among tribal farmers also.

The economic status highly influences, the social participation and there by knowledge about new innovation. Thus economic status in the society among the tribal farmers may influence knowledge about fertilizer.

The data presented in Table 10 reveal that the majority tribal farmers with low economic status had no knowledge about fertilizer i.e. 82.00 per cent and it is also interesting to note that not a single tribal farmer

Table 10 : Relationship between economical status and extent of knowledge of fertilizer

| Economical level | Extent of Knowledge | | | Total |
|------------------|---------------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Low | 41 (82.00) | 5 (16.66) | 0 | 46 |
| Medium | 9 (18.00) | 10 (33.34) | 7 (35.00) | 26 |
| High | 0 | 15 (50.00) | 13 (65.00) | 28 |
| Total | 50 | 30 | 20 | 100 |

(Figure in bracket indicate percentage)

from higher economic status was found with no knowledge about fertilizer. As economic status increases the percentage of tribal farmers having partial and complete knowledge about fertilizer also increases.

Thus this shows that higher the economic status higher will be the degree of knowledge about fertilizers among the tribal farmers. The non-availability of major agricultural inputs acts as a constraints in knowledge and adoption of these inputs. It is fact that farmers will not take any interests to gain knowledge about any new production if inputs are not available in sufficient quantity that too well in time.

Table 11 : Relationship between availability of inputs and extent of knowledge of fertilizer

| Availability of inputs | Extent of Knowledge | | | Total |
|------------------------|---------------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Nil | 37 (74.00) | 5 (16.66) | 0 | 42 |
| Medium | 12 (24.00) | 15 (50.00) | 10 (50.00) | 37 |
| High | 1 (02.00) | 10 (33.34) | 10 (50.00) | 21 |
| Total | 50 | 30 | 20 | 100 |

(Figure in bracket indicate percentage)

The data presented in Table 11 show that majority of the farmers having non-availability of inputs, did not have any knowledge about fertilizer and the percentage of tribal farmers having no knowledge decreases as the input availability increases. Tribal farmers having better availability of inputs have partial and complete knowledge about fertilizer form good number as it is evident from the data i.e. 50 per cent of the tribal farmers having maximum supply of inputs had partial and complete knowledge about fertilizers.

Thus we can say that availability of input is highly responsible for extent of knowledge about fertilizer among the tribal farmers.

The irrigation is an important factor which determine the knowledge regarding other input specially fertilizers in crop production.

Table 12 : Relationship between availability of irrigation and extent of knowledge of fertilizer

| Availability of irrigation | Extent of Knowledge | | | Total |
|----------------------------|---------------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Nil | 44 (88.00) | 12 (40.00) | 0 | 56 |
| Partial | 6 (12.00) | 16 (53.33) | 8 (40.00) | 30 |
| High | 0 | 2 (06.69) | 12 (60.00) | 14 |
| Total | 50 | 30 | 20 | 100 |

(Figures in bracket indicate percentage)

The data presented in Table 12 reveal that among the tribal farmers, who did not have irrigation facility also did not possess any knowledge about fertilizer, were in majority i.e. 88.00 per cent. However among the tribal farmers who had partial irrigation and also had partial knowledge about fertilizer use are in majority i.e. 53.33 per cent. Farmers having irrigation facilities also formed majority i.e. 60.00 per cent in possession of complete knowledge.

Thus we can say that irrigation availability and extent of knowledge about fertilizer use go side by side.

Credit availability and extent of knowledge about fertilizer may also have positive relationship because fertilizer application need pocket expenses in a large amount.

Table 13 : Relationship between availability of credit and extent of knowledge of fertilizer

| Availability of credit | Extent of Knowledge | | | Total |
|------------------------|---------------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Nil | 42 (84.00) | 10 (33.33) | 0 | 52 |
| Short | 7 (14.00) | 9 (30.00) | 11 (55.00) | 27 |
| Long | 1 (02.00) | 11 (36.67) | 9 (45.00) | 21 |
| Total | 50 | 30 | 20 | 100 |

(Figures in bracket indicate percentage)

The data presented in Table 13 indicate that among the tribal farmer, who did not avail any credit facility also had no knowledge about fertilizer use were in majority i.e. 84.00 per cent. However, the tribal farmers who availed the short term credit facility^{and} had complete knowledge were in majority i.e. 55.00 per cent while there is no such

relation observed among the tribal farmers who have partial knowledge about fertilizer use, as these farmers were homogenously divided.

Thus we may say that the extent of credit facility and extent of knowledge about fertilizer have positive relationship among tribal farmers.

The literacy plays an important role in adoption of new innovation specially in agricultural field.

Table 14 : Association of education with extent of adoption of improved seed

| Education level | Adoption | | | Total |
|-----------------------|---------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Illiterate | 22 (39.28) | 11 (40.70) | 0 | 33 |
| Primary | 14 (25.00) | 2 (07.40) | 0 | 16 |
| Middle | 12 (21.43) | 4 (14.80) | 4 (23.53) | 20 |
| High school and above | 8 (14.29) | 10 (37.10) | 13 (76.47) | 31 |
| Total | 56 | 27 | 17 | 100 |

(Figures in bracket indicate percentage)

The data presented in Table 14 show that among the non-adopter majority of the farmers were illiterate 39.28 per cent and had a very low level of literacy

25.00 per cent but as level of education increases the percentage of tribal non-adopter farmers for improved seed decreases. While the majority of tribals who were the partial adopters of improved seed were also illiterate 40.70 per cent but majority of complete adopter of improved seed had high education level.

This shows that most of the illiterate and low educated tribal farmer are non-adopter of the improved seed. However those who had the education above high school were good adopter of improved seed.

Extent of adoption is highly dependent upon farming experience because risk bearing ability about any innovation also increases with increase in farm experience.

Table 15 : Association with experience of farming and extent of adoption of improved seed

| Experience level | Adoption | | | Total |
|--------------------|---------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| 1 to 5 years | 19 (33.94) | 2 (7.40) | 0 | 21 |
| 6 to 10 years | 14 (25.00) | 6 (22.22) | 0 | 20 |
| 11 to 15 years | 15 (26.76) | 11 (40.74) | 2 (11.76) | 28 |
| 15 and above years | 8 (14.28) | 8 (29.64) | 15 (55.24) | 31 |
| Total | 56 | 27 | 17 | 100 |

(Figures in bracket indicate percentage)

The data presented in Table 15 reveal that those who were young in farming experience formed majority among non-adoption as indicated by 33.94 per cent of the tribal farmers following the category of having farming experience upto 5 years only. However percentage of the non-adopter and partial adopter were nearly same in middle experienced farmers and ranges between 25 to 40 per cent where those having experience about farming above 15 years were complete adopter of improved seed were in majority i.e. 88.24 per cent.

This shows that the experience about farming is a crucial factor responsible for adoption and non-adoption of improved seed among the tribal farmers.

The economic status are directly related to the efficiency of the farmers to take risk for bearing expenditure in agricultural sector.

The data presented in Table 16 show that among low income status tribal farmer majority were the non-adopter 67.86 per cent. However among partial adopters majority came from high income status i.e. 55.56 per cent followed by medium economic status i.e. 25.92 per cent. In the case of high complete adoption as expected majority also came from high economic status i.e. 58.83 per cent to adopt improved seed.



Table 16 : Association with economical status and extent of improved seed

| Economical status | Adoption | | | Total |
|-------------------|---------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Low | 38 (67.86) | 5 (18.52) | 3 (17.64) | 46 |
| Medium | 15 (26.78) | 7 (25.92) | 4 (23.53) | 26 |
| High | 3 (5.36) | 15 (55.56) | 10 (58.83) | 28 |
| Total | 56 | 27 | 17 | 100 |

(Figures in bracket indicate percentage)

This shows that as the economic status increases adoption of improved seed also increases.

The input availability is directly related to extent of adoption because willingness as well as availability of input go side by side for quick adoption.

The data presented in Table 17 indicate that among the non-adopter of improved seed majority of the tribal farmers lacked availability of inputs i.e. 67.85 per cent and as availability of inputs increase the number of non-adopter also decreases. However, those have partial adoption of improved seed the majority of the tribal farmers had medium supply of agricultural inputs, and those having

Table 17 : Association with availability of inputs and extent of adoption of improved seed

| Availability of inputs | Adoption | | | Total |
|------------------------|---------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Nil | 38 (67.85) | 4 (14.81) | 0 | 42 |
| Medium | 13 (23.22) | 17 (62.97) | 7 (41.18) | 37 |
| High | 5 (8.93) | 6 (22.22) | 10 (58.82) | 21 |
| Total | 56 | 27 | 17 | 100 |

(Figures in bracket indicate percentage)

complete adoption of improved seed, majority i.e. 58.82 per cent fall in the category of having high availability of inputs.

Thus it can be concluded that the tribal farmers having good availability of inputs adopt seed technology in a better way.

The data presented in Table 18 reveal that among irrigated and partially irrigated farmer there was better progress for complete adoption of improved seed nearly 50.00 per cent of the farmers in each category adopted improved seed. While on unirrigated farmers

Table 18 : Association with availability of irrigation and extent of adoption of improved seed

| Availability of irrigation | Adoption | | | Total |
|----------------------------|---------------|---------------|--------------|-------|
| | Nil | Partial | Complete | |
| Nil | 42 (75.00) | 14 (51.85) | 0 | 56 |
| Medium | 12 (21.43) | 10 (37.04) | 8 (47.05) | 30 |
| High | 2 (3.57) | 3 (11.11) | 9 (52.95) | 14 |
| Total | 56 | 27 | 17 | 100 |

(Figures in bracket indicate percentage)

majority of the tribal farmers were non-adopter of the improved seed i.e. 75.00 per cent. However the same is the case with partial adoption of improved seed on tribal farmers.

Thus, it can be concluded that for complete adoption of improved seed irrigation is most essential condition.

The data presented in Table 19 indicate that among the tribal farmer, having no credit facilities, majority i.e. 67.86 per cent did not adopt improved seed. This percentage showed decrease with increase in credit facility and nature of investment i.e. short term and long term.

Table 19 : Association with availability of credit and extent of adoption of improved seed

| Availability of credit | Adoption | | | Total |
|------------------------|---------------|---------------|--------------|-------|
| | Nil | Partial | Complete | |
| Nil | 38 (67.86) | 14 (51.85) | 0 | 52 |
| Short term | 13 (23.21) | 5 (18.51) | 9 (52.94) | 27 |
| Long term | 5 (8.93) | 8 (29.64) | 8 (47.06) | 21 |
| Total | 56 | 27 | 17 | 100 |

(figures in bracket indicate percentage)

However among the partial adopter of improved seed nearly 50.00 per cent did not avail any credit facility. It is observed that among complete adopters majority i.e. 52.94 per cent availed short term loan facilities. Reasoning behind this complete adoption may be due to suitability of short term loans for adoption of improved seeds and purchase of fertilizer etc.

The data presented in Table 20 show that among the tribal farmers those who are illiterate or having primary education status majority i.e. 40.98 per cent did not adopt fertilizer on their field. However this percentage decreases with increase in education. But

Table 20 : Association with education of extent of adoption of fertilizer

| Education level | Adoption | | | Total |
|-----------------------|---------------|--------------|---------------|-------|
| | Nil | Partial | Complete | |
| Illiterate | 25 (40.98) | 8 (40.00) | 0 | 33 |
| Primary | 15 (26.59) | 1 (5.00) | 0 | 16 |
| Middle | 13 (21.31) | 2 (10.00) | 5 (26.31) | 20 |
| High school and above | 8 (13.12) | 9 (45.00) | 14 (73.69) | 31 |
| Total | 61 | 20 | 19 | 100 |

(Figure in bracket indicate percentage)

among partial adopter nearly 40 per cent were illiterate and 45.00 per cent had education above high school while from complete adopter of fertilizer majority 73.69 per cent had education upto high school or above.

Thus from the above table it was observed that education and complete adoption were highly related among the tribal farmers.

Table 21 : Association with experience of farming and extent of adoption of fertilizer

| Experience level | Adoption | | | Total |
|------------------|---------------|--------------|---------------|-------|
| | Nil | Partial | Complete | |
| 1 to 5 years | 20 (32.79) | 1 (5.00) | 0 | 21 |
| 6 to 10 years | 16 (26.22) | 4 (20.00) | 0 | 20 |
| 11 to 15 years | 19 (31.14) | 7 (35.00) | 2 (10.53) | 28 |
| Above 15 years | 6 (9.95) | 8 (40.00) | 17 (89.47) | 31 |
| Total | 61 | 20 | 19 | 100 |

(Figures in bracket indicate percentage)

The data presented in Table 21 reveal that among complete adopter of fertilizer majority i.e. 89.47 per cent commanded the farm experience of about 15 years or more than 15 years. The data further reveals that among partial adopters majority of farmers i.e. 40.00 and 35.00 per cent had experience of farming about 11 to 15 years and above than 15 years respectively. Among non-adopters the experience of farming seemed to play no significant role as farmers were equally distributed.

Thus this finding confirms the notion that farm experience plays significant role in adoption of fertilizer.

Since fertilizer is a costly inputs the economic status of farmers plays an importance role in adoption of fertilizer specially among the tribal farmers.

Table 22 : Association with economical status and extent of adoption of fertilizer

| Economical status | Adoption | | | Total |
|-------------------|---------------|--------------|---------------|-------|
| | Nil | Partial | Complete | |
| Low | 41 (67.21) | 5 (25.00) | 0 | 46 |
| Medium | 11 (18.03) | 9 (45.00) | 6 (31.57) | 26 |
| High | 9 (14.76) | 6 (30.00) | 13 (68.43) | 28 |
| Total | 61 | 20 | 19 | 100 |

(Figure in bracket indicate percentage)

The data presented in Table 22 indicate that among the low income group the non-adopter of the fertilizer were in majority i.e. 69.21 per cent and percentage of non-adopter go on decreasing with the increase in income status. In case of partial adoption of fertilizer medium income group responded more than other two groups. However in case of complete adoption majority (68.43 per cent) of the tribal farmer had high economic status.

Thus it can be concluded safely that economic status and adoption of fertilizers by tribal farmers is positively related.

Table 23 : Association with availability of inputs and extent of adoption of fertilizer

| Availability of inputs | Adoption | | | Total |
|------------------------|---------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Nil | 41 (67.22) | 1 (5.00) | 0 | 42 |
| Medium | 15 (24.59) | 13 (65.00) | 9 (47.36) | 37 |
| High | 5 (8.19) | 6 (30.00) | 10 (52.64) | 21 |
| Total | 61 | 20 | 19 | 100 |

(Figures in bracket indicate percentage)

The data presented in Table 23 reveal that among the non-adopter tribal farmers majority i.e. 67.22 per cent reported the non-availability of inputs. However those having partial adoption majority i.e. 65.00 per cent reported medium availability of inputs. While among complete adopter of fertilizer, 52.64 per cent having high and 47.36 per cent having medium availability responded as major adopter.

Thus availability of inputs and adoption of fertilizer by tribal farmer are highly related.

Irrigation application is major input which increases response of fertilizer.

Table 24 : Association with availability of irrigation and extent of adoption of fertilizer

| Availability of irrigation | Adoption | | | Total |
|----------------------------|---------------|---------------|---------------|-------|
| | Nil | Partial | Complete | |
| Nil | 46 (75.42) | 10 (50.00) | 0 | 56 |
| Medium | 12 (19.67) | 8 (40.00) | 10 (52.63) | 30 |
| High | 3 (4.91) | 2 (10.00) | 9 (47.37) | 14 |
| Total | 61 | 20 | 19 | 100 |

(Figures in bracket indicate percentage)

The data presented in Table 24 revealed that among the tribal farmers those who did not have irrigation facility 75.42 per cent did not adopt the fertilizer. But as extent of irrigation increases percentage of non-adopter of fertilizer doses decreases. The similar phenomenon was found with respect to partial adoption of fertilizer by tribal farmers. But for complete adoption of fertilizer 52.63 per cent having medium and 47.37 per cent having high availability of irrigation were reported as major adopters.

Thus we can say that for adoption of fertilizer irrigation is pre requisite.

Table 25 : Association with availability of credit and extent of adoption of fertilizer

| Availability of credit | Adoption | | | Total |
|------------------------|---------------|---------------|---------------|------------|
| | Nil | Partial | Complete | |
| Nil | 41 (67.21) | 11 (55.00) | 0 | 52 |
| Short term | 17 (27.86) | 3 (15.00) | 7 (36.84) | 27 |
| Long term | 3 (6.93) | 6 (30.00) | 12 (63.16) | 21 |
| Total | 61 | 20 | 19 | 100 |

(Figures in bracket indicate percentage)

The data presented in Table 25 indicate that majority of tribal farmers i.e. 67.21 per cent having non-adoption of fertilizer did not avail the credit facility. In case of partial adoption of fertilizer maximum percentage of tribal farmers i.e. 55 per cent were non-borrower and nearly 30 per cent borrowed, long term loan followed by 15.00 per cent short term loan borrower.

However in case of complete adoption of fertilizers the long term loan played important role as observed by data i.e. majority of 63.16 per cent borrowed long term loan and only 36.84 per cent borrowed short term loan.

Table 26 : Constraints analysis of the non-adoption of farm technologies by the tribal farmers

| Constraints | (In Percentage) | | | |
|--|-----------------|--------|----------------|------|
| | Improved X seed | Rank X | Ferti- X liner | Rank |
| 1. Timely non-availability of inputs | 34 | IV | 27 | IV |
| 2. Not available in required quantities | 28 | V | 22 | V |
| 3. Lack of knowledge about techniques | 52 | II | 55 | II |
| 4. Non-availability credit | 61 | I | 59 | I |
| 5. Fertilizer application in large adversely affects the production. | - | - | 42 | III |
| 6. There is more infection of diseases and pests in improved seeds. | 38 | III | - | - |

Major constraints which acted as a obstacles in way of adoption are described in above table. The major constraints as reported by respondents was non-availability of credit facilities. 61 per cent and 59 per cent tribal farmers reported non-availability of credit as major cause of non-adoption of improved seed and fertilizer respectively.

Lack of knowledge about technologies occupied second rank as 52 per cent and 55 per cent reported as major constraint for non-adoption of improved seed and fertilizer. The adverse affect of fertilizer doses and

problems of plant protection measures due to improved seeds were next constraints as reported by respondents for non-adoption of improved seed.

Most surprisingly failure of supply of inputs in time and required quantity were ranked lowest among constraints by the tribal farmers.

SUMMARY, CONCLUSIONS AND SUGGESTIONS

CHAPTER V

SUMMARY, CONCLUSIONS AND SUGGESTIONS

The main purpose of this chapter is to present summary and conclusion on the basis of the foregoing analysis and to indicate some of their implication for action, particularly focussed on the tribal farmers of Mandla District of Madhya Pradesh. As stated earlier this study was mainly focussed on the adoption behaviour of tribal farmers.

Adoption of the two selected agricultural innovations, mainly improved seeds and fertilisers by the tribal farmers was considered as the dependent variables. Out of the several factors - socio-personal, socio-psychological and situational factors were considered as independents variables in this study.

Bajag block comprises of 16 V.L.W. Circles. Out of these 5 V.L.W. Circles were selected randomly and from each selected circle 20 farmers were selected randomly. Thus in total all 100 tribal farmers were selected for the purpose of the study.

Socio-economic profile of the respondents :

The six independent variable were studied, they were education, experience of farming, economic status, availability of inputs, availability of irrigation and availability of credit. Thus the following are the main conclusions derived from this study.

a) Education :

Selected tribal respondents were homogeneously distributed in the different educational level.

b) Experience of farming :

Majority of the adopted farmers were highly experienced in their farming business.

c) Availability of inputs :

Due to non-availability of inputs in proper time and required quantity, majority of tribal farmers failed to adopt improved farm technology.

d) Availability of irrigation :

The majority of the tribal farmers did not have an assured irrigation facilities for intensive use of scientific cultivation.

e) Credit availability :

The majority of the tribal farmers was found to be non-borrowers.

Socio-economic factors played significant role in obtaining knowledge and adoption of improved seeds :

1. The level of education and knowledge and adoption were positively related. As education level increases the knowledge and adoption of improved seed shows increasing trend and vice-versa.
2. The experience about farming was also directly related with knowledge and adoption of improved seed among tribal farmers.

3. It was also concluded that the economic status of the tribal farmers was directly correlated with extent of knowledge and adoption of improved seed by tribal farmers.
4. The extent of knowledge and adoption of improved seed were also directly related with availability of inputs.
5. It was also observed that irrigation facilities available with tribal farmers was also a major determinant of extent of knowledge and adoption of improved seed.
6. It was observed that the short term and long term borrowing had positive association with the extent of knowledge about improved seed but only short term loan borrowed by tribal farmers was main determinant of level of adoption of improved seed.

Socio-economic factors related with knowledge and adoption of fertilizers :

- a) The level of education was directly related with extent of knowledge and adoption of fertilizers by tribal farmers.
- b) It was also observed that higher the experience about farming higher would be knowledge and adoption of improved seed.

- c) The extent of knowledge and adoption of fertilizer were also significantly influenced by economic status of tribal farmers.
- d) The availability of inputs was highly responsible for extent of knowledge and adoption of fertilizer by tribal farmers.
- e) The availability of irrigation was also highly responsible for extent of adoption of fertilizer.
- f) Availability of credit and knowledge of fertilizer were related but adoption of fertilizer was highly correlated with nature of loan borrowed.
- g) The long term loan seemed to play significant role in adoption process.
- h) The major constraints as experienced by tribal farmers were non-availability of credit and lack of knowledge about technologies.

Suggestions and Recommendations :

Following suggestion are put forward concerning this study as related to its application and future course of research.

1. Education :

All though this study failed to reveal any association of education with adoption of tribal farmer behaviour. But the impact of education may

not be minimised looking to useful contribution played by educational institutions in development of farm technology.

Tribal youths may be given appropriate training particularly in farm technology while receiving education at school level.

2. Finance and Credit :

All though tribal farmers had been provided sufficient credit facilities to make them more self-reliant. It is observed that tribals are reluctant to utilise loan facilities due to certain reasons. It is therefore suggested that simplified loaning procedure may be adopted while financing tribal society. Similarly provision of loan at the proper time may allow tribal farmers to obtain maximum benefit.

3. Irrigation facilities :

Lack of irrigation facilities are major disincentives in a way of adoption of improved farm technology. It is well known fact that improved farm technology in absence of irrigation facilities may not prove very successful.

4. Supply of Inputs :

It is revealed during this study that failure of supply of inputs at proper time and in sufficient

quantity acted as a biggest obstacles is a way adoption of farm technology. Previous researchers also recommended that non-availability of inputs as disincentive should be removed. Tribal farmers living in remote area are facing this hardship. Specialised efforts are needed to tackle this problem.

It is also observed during this study adoption of improved seed was lagging behind as compared to other improved farm practices. It is well known fact that improved seed in sufficient quantity are not generally available to farm community. Multiplication of improved seed at district level may improve the position of supply of seeds. This effort may also help the scientist in improving adaptivity of seeds as per agro-climatic conditions.

Conclusion :

Madhya Pradesh as largest tribal state of the nation should shoulder the responsibility of socio-economic development of tribal farm community. Mandla District, having 60 per cent of tribal population, are comparatively backward district in terms of agriculture production. The designing of programme based on their needs may act as a crucial factor for changing the condition of the tribal farmers.

The proper monetary incentives in form of cash and kind, should be made available and the factors acting as a disincentive should be removed if tribal farmers are supposed to play important role in development in agriculture production.



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APPENDIX

विषय :- मध्य प्रदेश के मंडला जिले के आदिवासी किसानों का उन्नत कृषि कार्यमाला अपनाते संबंधी व्यवहार का अध्ययन.

अनुसंधानकर्ता

जगत सिंह ठाकुर

कृषि विस्तार अधिकारी

ब०ने०कृ०वि०वि०, जबलपुर.

11 सामान्य जानकारी -

1. 1अ। किसान का नाम :-----
1ब। गाँव :-----
1स। ब्लॉक :-----
1द। तहसील :-----

12 शिक्षा सम्बन्धी जानकारी -

- 1अ। अशिक्षित :-----
1ब। प्राथमरी :-----
1स। मिडिल तक :-----
1द। हाई स्कूल :-----
1इ। स्नातक या अधिक :-----

13 परिवार के सदस्यों की संख्या -

- 1अ। पुरुष :-----
1ब। स्त्री :-----
1स। बच्चे :-----

14 बेटी का अनुभव -

- 1अ। 1 से 5 वर्ष का :-----
1ब। 6 से 10 वर्ष का :-----
1स। 11 से 15 वर्ष का :-----
1द। 16 से अधिक :-----

101 लिए गए इन का उपयोग -

| उद्देश्य | राशि | कितनी वर्ष की | ताँटाई | प्रकार |
|----------|------|---------------|--------|--------|
| | | | | राशि |

102

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105

106 आप कौन से बीजों का उपयोग करते हैं। देशी/उन्नत

107 क्या आप खेती में उपयोग होने वाले निम्न तरीकों के बारे में जानते हैं -

| साधन | कोई जानकारी नहीं | कुछ जानकारी है | पूर्ण जानकारी है |
|------|------------------|----------------|------------------|
| | | | |

108 उन्नत बीज

109 रसायनिक खाद

110 यदि आप उन्नत बीजों का उपयोग करते हैं तो कितने वर्षों से एवं कौन-कौन से फसल के बीजों का उपयोग करते हैं -

| फसल | बीज का नाम | कितने वर्षों से |
|-----|------------|-----------------|
| | | |

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1148 क्या आपको उन्नत बीज की प्राप्ति में किसी कठिनाई का सामना करना पड़ता है।

हाँ / नहीं

यदि हाँ तो कृपया जानकारी दीजिये -

138 बीज की कीमत अधिक होती है।

139 समय पर उपलब्ध नहीं होते।

140 कभी बार जाना पड़ता है।

141 सिंचाई साधनों का करण।

142 कोई अन्य कारण -----



1151 क्या आप बीजों के बारे में समस्त जानकारी प्राप्त करना चाहते हैं।

हाँ / नहीं

1152 क्या आप रासायनिक खादों का उपयोग करते हैं।

हाँ / नहीं

1171 आपने कनि-कनि से रासायनिक खादों का इस वर्ष उपयोग किया -

रासायनिक खाद का नाम

मात्र एवं किस फसल में

133

134

135

1181 आपको रासायनिक खाद के बारे में जानकारी कहाँ से प्राप्त हुई -

136 ग्राम सेवक से।

137 सहकारी समिति के किसी सदस्य से।

138 किसी मित्र से।

139 रिश्तेदार से।

140 पड़ोसी से।

141 कृषि विभाग के किसी कर्मचारी से।

- ।ग। छेड़वाँ से ।
- ।घ। समाचार पत्रों से ।
- ।ङ। पत्रिका से ।
- ।च। अन्य -----

।19। यदि आप रासायनिक कार्यों का उपयोग नहीं करते तो क्या कारण है -

- ।अ। कीमत अधिक होती है ।
- ।ब। उपयोग करने की जानकारी नहीं है ।
- ।स। भूमि पर मलत प्रभाव डालती है ।
- ।द। फसल में कोई विशेष उत्पादन वृद्धि नहीं होती ।
- ।इ। सिंचाई सुविधा नहीं है ।
- ।फ। किसी जोखिम की संभावना होती है ।
- ।ग। इसका उपयोग से फसल में बीमारियाँ एवं कीड़े अधिक लगते हैं ।
- ।घ। सरपसवार अधिक होते हैं ।
- ।ङ। अन्य कारण -----

।20। क्या उन्नत बीज एवं रासायनिक खाद का उपयोग करने में आपकी परेशानी का सामना करना पड़ता है -

| नाम | किसका नहीं | कुछ | अत्यधिक |
|--------------|------------|-----|---------|
| रासायनिक खाद | | | |
| बीज उन्नत | | | |

।21। किस ऋतु तक आप यह सोचते हैं कि वृष्टि के निम्नलिखित तरीके अपनाकर लाभप्रद है -

| नाम | पूर्ण रूप से | आंशिक रूप से | किसका नहीं |
|--------------|--------------|--------------|------------|
| रासायनिक खाद | | | |
| बीज उन्नत | | | |

122। आपके पात कृषि के निम्नलिखित तरीके अपनाने के लिए कितनी प्रकार के साधन है 6

नाम पर्याप्त ऊँच सीमा तक बिलकुल नहीं न्यूनतम

रासायनिक उाद
बीज उन्नत

123। क्या आप सुझाव ले सकते है जिससे आपकी खेती में पैदावार बढ़ाने में आपकी मदद की जा सके -

।अ।

।ब।

।स।

।द।

।इ।

।फ।

।ग।