" A STUDY OF THE FARM IMPLEMENTS AND ITS EXTENT OF USE IN FARMING BY THE FARMERS "

By
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PARBHANI
1985

AFFECTIONATELY DEDICATED

TO MY

BELOVED PARENTS.

CANDIDATE'S DECLARATION

I hereby declare that the dissertation or part thereof has not been submitted by me to any other University or Institution for a degree or diploma.

PARBHANI

(S.B. DIWE)

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CERTIFICATE I

Shri Shyam Baburao Diwe has satisfactorily prosecuted his course of research for a period of not less than four semesters and the dissertation entitled " A STUDY OF THE FARM IMPLEMENTS AND ITS EXTENT OF USE IN FARMING BY THE FARMERS " submitted by him is the result of original research work and is of sufficiently high standard to warrant its presentation to the examination. I also certify that the dissertation or part thereof has not been previously submitted by him for a degree of any University.

PARBHANI

DATED: 29th June,1985

(R.R. Kulkarni)
Guide

CERTIFICATE II

This is to certify that the dissertation entitled " A STUDY OF THE FARM IMPLEMENTS AND ITS EXTENT OF USE IN FARMING BY THE FARMERS " submitted by SHYAM BABURAO DIWE to Marathwada Agricultural University in partial fulfilment of the requirement for the degree of Master of Science in the subject of Agricultural Extension has been approved by the student's advisory committee after an oral examination in collaboration with external examiner.

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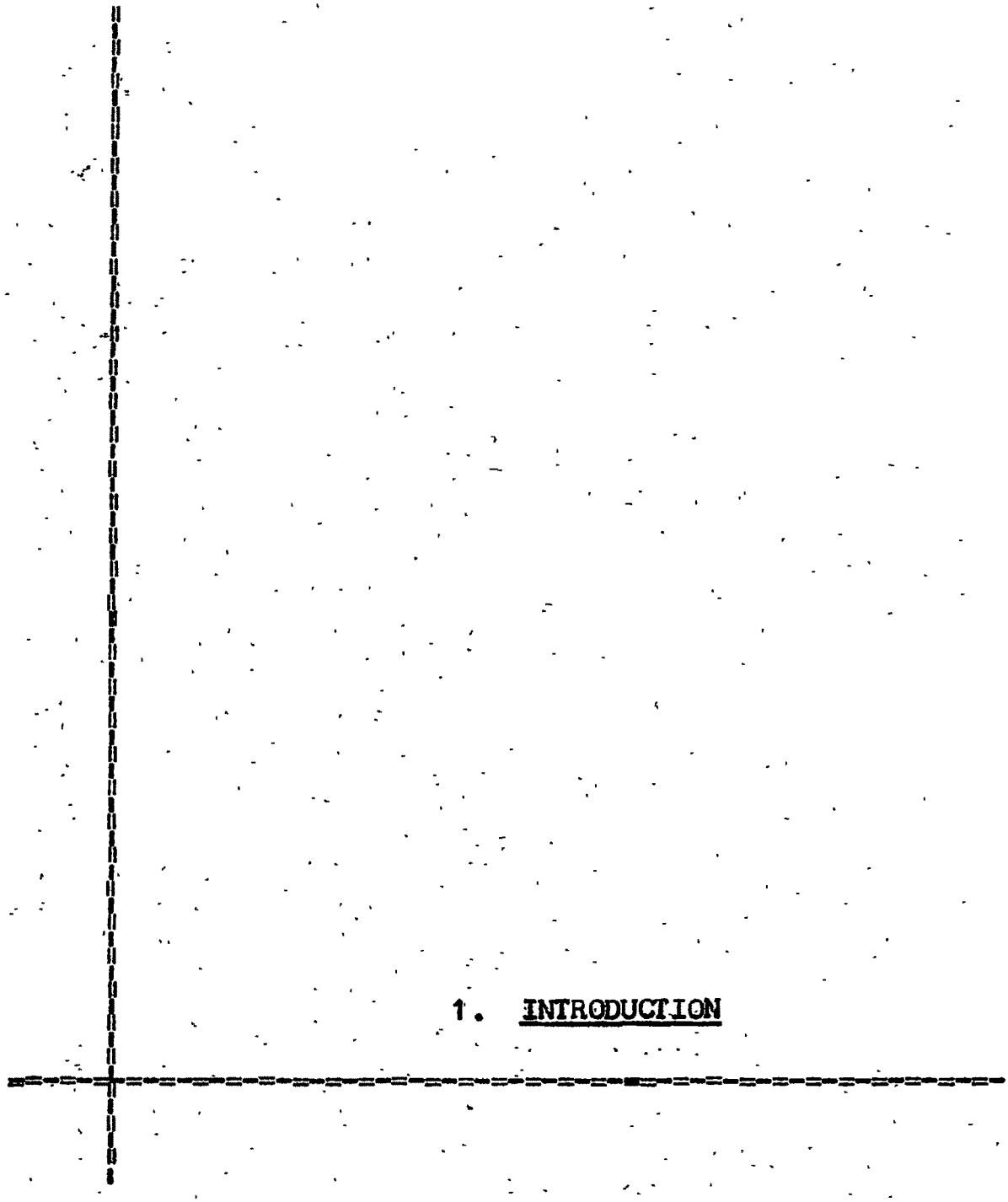

1. INTRODUCTION

1. INTRODUCTION

One of the most important problems faced by India is to feed her increasing population. The population is increasing in geometric progression while the food supply is increasing in arithmetic progression. Though 70 per cent of the working people are engaged in agriculture, they still do not get minimum required amount of food.

India is basically an agricultural country and undergoing technological revolution. Its agricultural production per hectare and per head is perhaps the lowest in the world and to achieve this broad objective the use of improved agricultural technology is the only remedy. India wants to introduce agricultural technology in each village and on each farm. This motto will guide our farmers towards the way of modernized agricultural to strengthen the national economy of the country. Agricultural as an industry can not be successful, unless adequate inputs such as improved seeds, chemical fertilizers, irrigation and improved farm implements and machinery are made available timely and adequately and also applied efficiently.

Lack of power on Indian farms is one of the major barriers to agricultural development. Though traditional methods are valued because they absorb rural population in farming but in future India has to depend on use of

power in agriculture. The sources of power has been increased by use of tractors, oil engines and electric motors. The farm mechanization is essentially a step ahead in modernization of agriculture and it will be highly profitable if it is carried out in proper lines with suitable changes and adjustment in farm business. Mechanization of agriculture will help to increase production efficiency, productivity, income, area under multiple cropping and will reduce man power. The role of the improved farm implements is three fold; to do more efficient work, to cut down the operating cost and to reduce the durgery of the work.

Mechanization of agriculture and farming process connotes application of machine power to work on land, usually performed by bullocks, horses and other drought animals and human labour[1]. Mechanical development at present do not mean the introduction of complex and high priced machines or implements. It means introduction after test, trial and modification of small machines, capable of performing operations better, quicker and

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1. J.P. Bhattacharjee, Mechanization of Agriculture in India in C.B. Memoria (ed): " Mechanization of Agriculture". Agricultural problems in India (Kitab Mahal, Allahabad, 1972): 301-316.

easier and more economically than by animals and for the introduction of usage, on a collective basis in rural areas or village centres.[2]

India's agricultural productivity is low because of use of primitive implements of cultivation by farmers and their uneconomic size of holding. The improved implements,machineries and equipments are considered as a secondary input and little attention has paid towards this in past. But now the response to mechanization and the use of improved implements is increasing. Up to 1960, the agriculture in India was chiefly depended on human labour and animal power. The use of tractor power on the farm was very slow and gradual till 1980. When high yielding varieties were introduced during 1967-68 the tractor power and the improved agricultural implements demand was increased greatly. The increase in agricultural mechanization was mainly associated with the scarcity of agricultural labour in peak periods like sowing,harvesting and also due to increase in labour wages.

The basic statistics of the Maharashtra and Marathwada (1978) region revealed that the total number of tractors operated implements like plough, disc harrows,

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2. Drown D.T. " Development and economics of mechanization of agriculture in India" Rural Sociology Vol. XIII No. 1, 1952, 13-22.

power tillers, seed planters are 53844 in Maharashtra while 5582 are in Marathwada. The total number of power driven and other miscellaneous equipments like threshers, maize shellers, harvester, power chaff cutter are 6900 in Maharashtra while 544 in Marathwada. The electric pump sets used for irrigation figured 378009 in State while they are 65730 in region. The oil engine pump sets used for irrigation and other agricultural purposes are 157802 in Maharashtra while 26978 in Marathwada. Improved seed drill are 76058 in Maharashtra while its number is 22240 in Marathwada.[3]

Presently India is producing 60,000 tractors per year and over 5,00,000 of these machines are in use at present. The availability of the tractors on the farm in India is around 1.5 to 2 tractors for every 10,000 hectares of land.

Small and medium farmers from crore of farming community, who could not modernize their farms with limited resources and are not fully benefitted by the opportunities thrown up by the "Green Revolution". In order to enable this section of farming community to purchase improved agricultural implements and machinery, Agro Industries Corporation, has organized programmes

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3. Socio-economic Review and district statistical abstract of each district in Marathwada, 1980-81.

for its distribution. Nationalised banks and other credit institutions are advancing loans to farmers for the purchase of implements and tractors. To provide technical services and machinery, hiring facilities another scheme has been formulated by Ministry of Agriculture. Agro Service Centres is being set up and financed through Nationalised Banks and other credit institutions. The loans are to be repaid in instalments spread over a period of five to seven years.

It is an admitted fact that the use of improved farm implements and machinery is essential for improving farm efficiency. The use of machinery will help proper and timely land operations, maintain proper depth of sowing, placement of fertilizers and good water management which are absolutely essential to get a good plant population and good returns from the investment on seeds, fertilizers and other inputs. The efficiency of bullocks themselves have been greatly enhanced by the use of mechanical device and partial mechanization. The Rural Development Programme has given vital importance to agricultural development. It will never be achieved without the mechanization of agriculture.

1.1 Statement of problem

It is observed that the farmers are motivated to possess or to use, if not possessed, the farm implements

and machinery. It is also observed that the ownership of the implements and machineries is related to the big farm owners. The use of implements and machineries are selective in nature with respect to crop and soil type. The improved crop production technologies make it inevitable to use farm implements, machineries and appliances for raising the crop and protecting it from pest and diseases. The past studies reviewed like Bose et al. (1969) concluded the increase in productivity to be around 20 per cent from the introduction of mechanization. Sarkar and Prahaladachar (1966) in survey conducted in Mysore revealed that 61.51 per cent of the tractor owners gave timeliness of agricultural operations as their main motive of buying tractors. Motilal (1973) reported the advantages of mechanization as increase in cropping intensity. Crop yield and displacement of human labour. Similar results were also reported by Sharma(1973) and Patel (1981). But the above studies have focussed on some of the aspects of the implements and machinery use but have not touched the availability of implements type and use to implements, facilities for hiring the implements. Very few studies are reported in this area. The present study is, therefore, undertaken to know some of the related aspects in the use of implements and machineries. The study was mainly intended to determine

the extent of use of farm implements and machineries in Marathwada region of Maharashtra state. The specific objectives of the study were as follows.

1.2 Objectives

1) To study the socio personal characteristic of respondents.

2) To know the various type of farm implements, equipments, machineries possessed by the respondents.

3) To know the extent of use of implements, equipments, machineries possessed by respondents.

4) To study the relationship between the characteristic of respondents and the use of implements, equipments and machineries.

5) To know the facilities to repair their implements, equipments and machineries.

6) To study the problems in the use of farm implements, equipments and machineries faced by the respondents.

1.3 Hypothesis

1) The selected farmers differ in respect of personal and social characteristics.

2) The selected farmers possessed different type of implements, equipments and machineries.

3) There exist dissimilarity in extent of use of implements, equipments and machineries.

4) The personal and social characteristic of selected respondents are related to the extent of use of implements, equipments and machineries.

1.4 Scope and limitation of the study

The study aims to determine the possession and extent of use of farm implements and machineries.

The findings of the study will provide background information to research workers in future, in carrying out indepth study about the use of implements, equipments and machineries. The findings of the study will also be helpful in making suggestions to the agricultural engineers and the manufacturers of the farm implements regarding the farmers need and the improvement to be made in respect of various farm implements and machineries.

This study was limited to the Extension Block of College of Agriculture, Parbhani. The results of the study may be applicable only to those areas where the similar soil types, rainfall, socio-economic conditions exist.

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2. REVIEW OF LITERATURE

2. REVIEW OF LITERATURE

Directly and indirectly related previous researches are reviewed to objectives of this study and has been given in this chapter under five main sections.

1. Socio-personal characteristics of respondents.
2. Possession of farm implements, machineries and equipments.
3. Extent of use of farm implements, machineries and equipments.
4. Socio-personal characteristics related to the use and possession of farm implements.
5. Advantages of the use of improved farm implements and mechanization.
6. Constraints in the use of farm implements, equipments and machineries.

2.1 Socio-personal characteristics of respondents

The socio-personal characteristics reviewed are presented under this head.

2.1.1 Age:

Patel (1965) in his study on small farmers reported that family of small farmers chiefly belonged to 25 to 55 years age group.

Kadam (1969) found that the majority of the hybrid jowar cultivators were in the age group of 45 years and above.

Solunke (1973) concluded that majority of the farmers were in the age group of 36 to 55 years.

Raut (1976) observed that most of the new land holders were from middle age group category having an average age of 39 years.

Rao (1983) reported that all the tractor owners were in age group of 30 to 50 years.

2.1.2 Education:

Jha (1964) reported that farmers who adopted more improved practices were educated.

Patel (1965) revealed that illiteracy was dominant among the farmers and middle and higher education was negligible.

Kadam (1969) found that majority of the farmers had received primary education.

Tripathi and Mishra (1971) observed that adoption level was highest among farmers who were primary level educated.

Rahudkar and Fatak (1977) in their study in adoption of dairy technology observed that majority of the small farmers were illiterate and only 33 per cent were educated.

Rao (1983) reported that the proportion of literacy among the tractor owners was 84 per cent.

2.1.3 Land holding

AmarSingh (1965) found large farm size with the adopters of improved farm practices.

Kadam (1969) reported that the adopters of new technology had land up to 20 acres.

Tripathi and Mishra (1971) found that the adoption level was highest for those who owned land above 4 hectares.

Rao (1983) observed that the tractor ownership was found to be more prominent among big cultivators.

2.1.4 Annual income

Fliegal and Brown (1966) found high percentage of the farmers in low income group.

Kondekar (1980) revealed that 41.82 per cent of respondents had an annual income ranging between Rs 5,000 to Rs 10,000 while 38.15 per cent respondents had annual income below Rs 5,000 and 20 per cent respondents had above Rs 10,000.

Kulkarni (1983) observed that majority of the respondents were from low income group.

2.1.5 Social participation

Patel (1965),in his study on small farmers reported that majority of the farmers were from low social participation category.

Kadam (1969) found that majority of the hybrid jowar growers were participating in voluntary organizations.

Tripathi and Mishra (1971) observed that the adoption level was highest for those who were the members of more than one organization.

2.1.6 Socio-economic status

Bhilegaonkar (1977) in his study observed that the new land holders were from low socio economic status category.

2.1.7 Risk preference

Kadam (1984) in his study reported that majority of the respondents had medium risk taking ability.

2.1.8 Economic motivation

Kadam (1984) concluded that most of the farmers were from medium economic motivation category.

2.1.9 Cropping intensity

Kadam (1984) revealed that about 59.17 per cent respondents were from low, 32.50 per cent medium and only 8.33 per cent were from high cropping intensity category.

2.2 Possession of farm implements, equipments and machineries

Mann (1967) found that practically all farms had a minimum of two ploughs, a hoe and a chaff cutter. A cane crusher was frequently shared by two or more farmers.

A bullock cart was available among medium and large holdings almost invariably. Carts were much less common among the small holdings. Improved labour saving implements like cultivators, hoes, harrows and seed drills were rare. All the implements available at the farm were bullock driven. Tractor cultivation was very rare.

Anonymous (1982) reported that only 3 per cent of the selected farmers possessed the complete set of implements. The mould board plough was found to be most popular implement among cultivators.

Bhaskaram and Praveena (1982) observed that the acceptance of improved agricultural implements like 'Royal Gorrue' and 'Enati Gorrue' and other attachments to the plough was slow.

Subramanian (1985) found that there is a greater concentration of both input and output in the developed region. Seven developed districts occupy 66 per cent of total tractors. On the other hand remaining poorly developed districts occupy only 34 per cent of tractors but they have more percentage of electric pumps (65 per cent) and diesel engine pump sets.

Satpute (1985) observed that the farm implements owned by the farmers were less. It was also revealed that the bullock power possessed by the farmers was inadequate in the Purna command area.

2.3 Extent of use of farm implements, equipments and machineries

Patil (1964) reported that 80 per cent of the respondents adopted the use of iron plough and this contributed significantly to the increase in crop yield of paddy.

Rao (1968) reported that small farmers used less hybrid seed, fertilized, farm implements and improved farm practices than medium and larger farmers.

Sarkar (1968) in a survey observed that the extent of use of oil engine, electric pump and tractor has increased significantly during 1951-61 in all the parts of India.

Reddy et al. (1969) reported that push hoe and Japanese rotary weeder was adopted by only 3 respondents (2 per cent).

Sundraswamy (1971) reported that half of the farmers under study did not practice deep ploughing with iron plough and could not maintain proper spacing.

Patel (1972) reported that in Matar taluka, the farmers used electric motor, oil engine and leather buckets to irrigate the farm. The tractor and bullock are used as a traction power in agriculture.

Reddy and Reddy (1972) found that in case of paddy the extent of adoption was high (about 30 per cent) for

four practices namely use of improved seed, spraying in nursery and main field, line ploughing and rotary weeder. The iron plough was not adopted at all.

Shah (1972) reported that in Satara district (Maharashtra) the use of iron plough is more widespread and the next in importance is oil engine while in Kolaba (Maharashtra) and Kuria (Gujarat) district tractor was more popular.

Pathak and Desai (1976) found that the extent of mechanization in agriculture was very low in Rajasthan. In fourteen tehsils even a single tractor was not reported. The use of oil engine was also very low, that is, 2 oil engines per 100 hectares of land.

Yeshwant (1976) reported that the use of iron plough has become common whereas, purchase of tractor was gathering momentum. Development of electric power in State has reflected in increase in pump sets.

Deshmukh (1977) observed that after rural electrification 86 per cent of the respondents were using improved implements and therefore, electrification played an important role in adoption of improved implements.

Mahajan (1980) found that the use of mould board plough by 83.12 per cent of farmers,about 24 per cent farmers used the tractor for farm operations. The farmer

also expressed the use of other implements like disc harrow, bund farmer, improved wooden seed drill, sprayer, duster and chaff cutter.

Patel (1980) reported that among the different inputs, the use of tractor, improved implements and machinery, and irrigation was found to be very poor in both Saurashtra and Gujarat region.

2.4 Personal characters related with the use and possession of farm implements

The studies reviewed under this heading are not directly related to the use of farm implements but are related to farm technologies use which may serve as a guideline for framing the hypothesis.

2.4.1 Age

Chand and Gupta (1966) reported that evidence did not support the hypothesis that the accepter would be younger than non-accepter. According to them there is no association between age of the operators and the adoption of improved farm practices. The same conclusion was drawn by other researchers like Reddy et al. (1969), Basaram (1970), Matilalkar (1970), Patel and Singh (1970).

Singh (1972) observed that age was not related to the adoption of farm mechanization. This conclusion was also supported by Naidu et al. (1974) and Singh (1983).

Dhaliwal (1963) found the association of age with the adoption of improved farm technology. The same results were drawn from other researchers as Singh and Singh (1968), Sinna et al. (1972), Godse (1974) and Rao (1983).

2.4.2 Education

Chand and Gupta (1966) found that the formal education of the farm operator was associated with the adoption of improved farm practices. These conclusions were also drawn by Basaram (1970), Patel and Singh (1970), Singh (1970), Jha and Shekawat (1972), Reddy and Reddy (1972), Sinna et al. (1972), Veerabhadhaih (1973), Naidu et al. (1974), Godse (1974) and Singh (1983).

Veerbhaargava et al. (1969) found no significant association between education and adoption of improved farm practices. The above conclusion was also supported by Reddy and Reddy (1972), Sharma and Nair (1974).

2.4.3 Land holding

Chand and Gupta (1966) observed that if the size of holding was small the acceptance of improved farm practices was low and vice-versa. The similar findings were reported by Rao (1966), Singh and Singh (1968), Veerbhargava et al. (1969), Basaram (1970), Reddy and Reddy (1972), Naidu et al. (1974), Godse (1974), Anonymous (1981), Bangarava (1982), Rao (1983) and Singh (1983).

Singh (1970) found that the size of holding was independent of the adoption of improved agricultural technologies. The results were confirmed by studies like Patel and Singh (1970), Jha and Shekawat (1972).

2.4.4 Social participation

Chand and Gupta (1966) found that the social participation of the farmer is directly associated with the adoption of improved farm practices. Similar conclusion was also drawn by Patnaik (1972), Singh et al. (1972), Singh (1972), Naidu et al. (1974), Balsubramanian (1980), Singh (1983).

2.4.5 Extension contact

Positive and significant relationship between extension contacts and the adoption of improved farm practices was reported by Deb and Sharma (1964). The other researchers, who supported this finding were Singh (1972), Mahajan (1980) and Singh (1983).

2.4.6 Caste

Mulay and Ray (1965) observed that highest, magnitude of adoption of implements is by Sanis and then by Ahirs and Brahmins. This is because these caste were depended upon cultivation by bullocks and that is why the implements drawn by bullocks have been adopted by these caste. This finding revealed that the caste of the farmer has some influence on adoption and use of improved farm implements.

Rajendra (1966) found that the adoption level was highest for agricultural caste and it differed significantly from the adoption level of lower caste and schedule caste.

Chand and Gupta (1966) observed that the caste of the farmer does not have any relationship with the adoption of improved farm practices.

Mudra and Bathom (1967) and Patnaik (1972) concluded that the use of mould board plough and electric motor was associated with high caste.

2.4.7 Annual income

Choubey (1972) reported positive and significant relation between extent of adoption of improved farm practices and annual income. This finding was also supported by the other research workers namely Balsubramanian (1980), Mahajan (1980), Patnaik (1972) who concluded that the use of mould board plough and electric motor was associated with high annual income.

2.4.8 Risk preference

Singh et al. (1970) found that risk preference contributed significantly to the adoption behaviour of farmers.

Singh (1972) reported that risk preference has a positive and significant correlation with farm mechanization.

Balsubramanian (1980) reported positive and significant relation between the adoption of rice technology and risk orientation.

Mahajan (1980) reported the positive and significant association between adoption of agricultural technology and risk orientation.

2.4.9 Scientific orientation

Chattopadhya (1963) in his study reported negative correlation between fatalism (opposite to scientism) and adoption.

Supe and Singh (1972) observed that scientific orientation contributed positively to the prediction of rational behaviour.

Singh (1972) reported that a farm mechanization established positive and significant correlation with scientific orientation.

2.4.10 Economic motivation

Singh et al. (1970) found that economic motivation was contributing significantly to the adoption behaviour of farmers.

Rao et al. (1971) reported that high economic motivation was responsible for high percentage of adoption of improved farm practices.

Supe and Singh (1972) observed that economic motivation contributed much to the prediction of rational behaviour.

Singh (1972) reported that a farm mechanization established positive and significant correlation with economic motivation.

Somasundram (1976) found that the adopter and non-adopter small farmers showed more or less equal economic motivation.

2.4.11 Attitude towards farm implements

Godse (1974) found relationship between the high caste of the farmers and the favourable perception of characteristics of farm machinery.

2.5 Advantages of the use of improved farm implements and mechanization

Rao and Singh (1964) in pilot a study reported that farms who used tractor had 40 hectares of land who obtained higher yields of all major crops.

Kahlon (1964) reported that power farming helps farmers to adopt more paying crop rotations and avoid the difficulties in labour requirements at peak periods like sowing and threshing.

Sarkar and Prahaladachar (1966) in a survey conducted in Mysore revealed that 61.51 per cent of the tractor owners gave timeliness of agricultural operation as their main object of buying tractor.

Jhunjhunwala and Mepherson (1972) reported that the production on the tractorised farms increased by 135 per cent while the production on non-tractorised farm decreased by 23 per cent. Total employment of landless labour on tractorised farms was increased by 22 per cent.

Motilal (1973) reported the advantages of mechanization, as increase in cropping intensity of crop yield and displacement of human labour. Similar results were reported by Sharma (1973).

Grewal et al. (1973) found that the cropping intensity was higher on tractorised farms and mechanization helped in timely performance of land operations and the better placement of seeds and fertilizers.

Grewal et al. (1974) found that mechanization would lead to double and multiple cropping and improved cultural practices which inturn increased labour opportunities on the farm. The importance of mechanization can be seen during peak periods when the availability of labour was scarce and could be overcomed by selective farm mechanization.

Patel (1981) reported that tractor contributed sufficiently to the food production. In Uttar Pradesh tractorised farms increased productivity of over 37 per cent per cropped hectare. While in Karnal it was found that the cropping intensity was 20 per cent higher on tractorised farms than on the non-tractorised farms.

Hidajat (1982) concluded that simple agricultural tools and machinery appeared to be suitable for small scale farming in Indonesia. In addition the impact of these machines on productivity was significant. Sagar et al. (1984) also putforth the same results.

2.6 Constraints in the use of farm implements, equipments and machineries

George and Choukidar (1972) reported that non-adoption of the recommended package of practices was partial due to economic reasons like small farm size, difficulties in mechanization, problems of water management and partly on account of socio-psychological factors like knowledge and attitude of farmers.

Kulkarni (1973) observed that uneconomic size and quantum of holding, traditional implements used, poor irrigation facilities, poor fertilizers and insecticide application has resulted in high technological differences and poor yield performances.

Raut (1974) found that availability of farm implements on hire basis was important need in supplies.

Banerjee (1974) observed that lack of resources, non-availability of required inputs and their untimely supply, high cost of cultivation, high risk and uncertainty were responsible for non-adoption.

Grey (1975) concluded that mainly the shortages of finance and low level of education were the limiting factors in the use of better agricultural inputs including implements by the farmers.

Nirwal and Arya (1975) reported that only 10 per cent of small farmers did not adopt the improved farm practices due to inadequate material resources.

Venkatram and Ramanna (1977) reported one serious constraint in the use of power tiller was the non-availability of prompt service facilities, spare parts and unpredictable machine breakdown. The unpredictable diesel prices was constraint in use of power tiller.

Ravishankar (1978) revealed that the design and the cost of dry farming implements including seed cum fertilizer drill are the major constraints in the use of implements.

Kulkarni (1979) reported that heaviness of the implements requiring at least 4 bullocks to draw was a one of the constraints reported by about one twentieth and one tenth of tribal and non-tribal farmers, respectively.

Mahajan (1980) pointed out the problems of farmers like inadequate credit, low price of farm produce, non-existance of farm road, high rate of interest charged, inadequate irrigation facilities and lack of supply of improved seed from input agencies or department caused low adoption.

Kahlon (1981) reported the fragmentation of holding has lead most small and medium farmers to stick to the traditional wooden plough. Lack of training to village artisans and lack of quality control and standardization among manufacturers are some of the constraints listed in study.

Tripathi et al. (1982) reported the constraint in use of Japanese weeder was straight line transplanting of paddy.

Madansingh and Mathur (1982) revealed that higher gap in seed rate and depth of sowing among small and marginal farmer was due to economic factor and non-availability of equipments in time.

Chitnis (1983) reported that at village level the equipments like sprayers, dusters and improved implements were not available. This constraint was reported by 68, 74 and 89 per cent of big, medium and small farmers respectively.

Gualiani and Dhull (1984) found that adoption of recommended crop production technology was low in jowar crop due to various socio-economic constraints.

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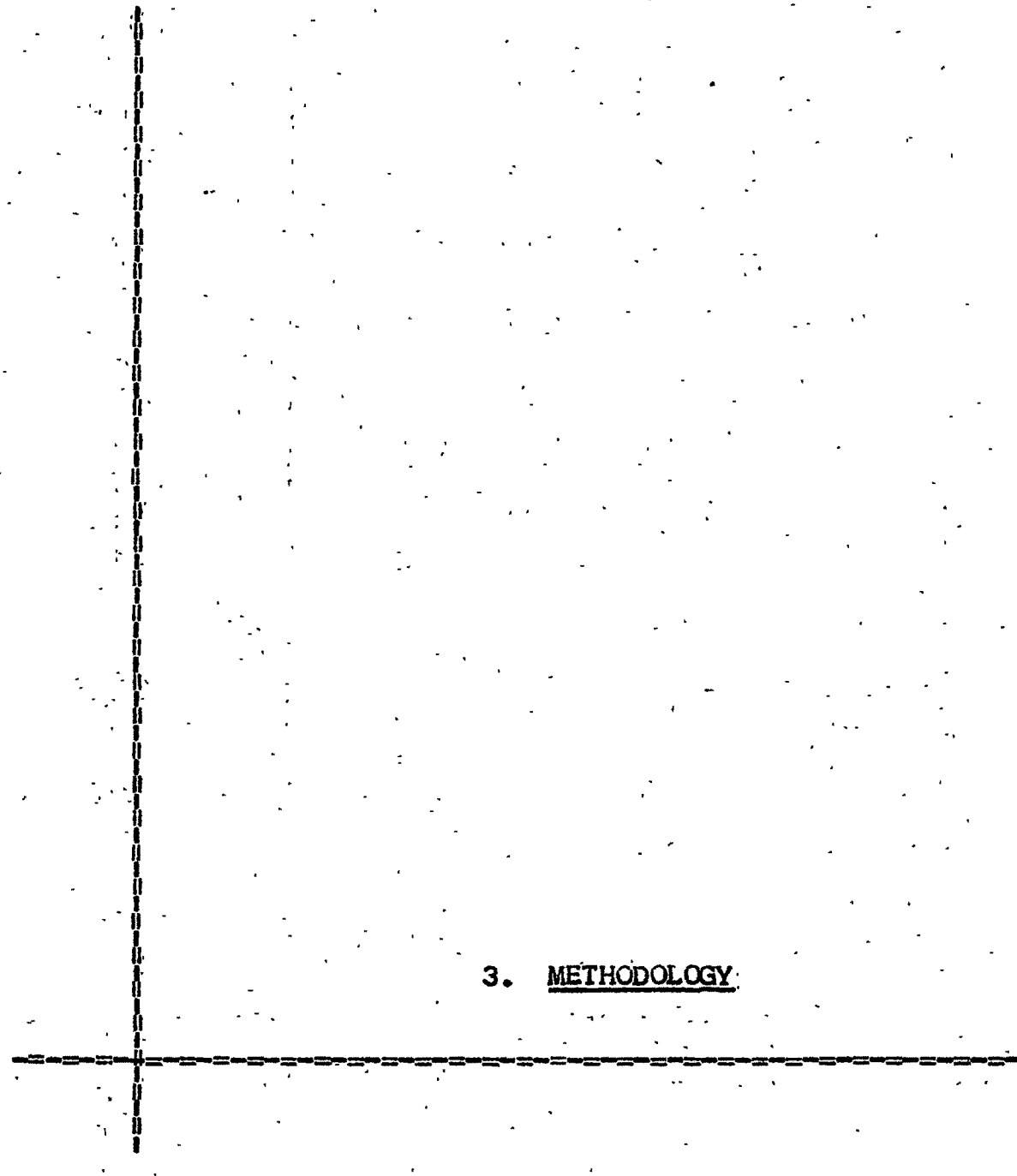


3. METHODOLOGY

3. METHODOLOGY

The methodology adopted for studying the specific objective is described in this chapter under five heads-

1. Locale of study.
2. Research design.
3. Method of sampling.
4. The explication process.
5. Statistical test used.

3.1 Locale of study

The present study was conducted in Extension Block of College of Agriculture, Parbhani which includes 30 villages from Parbhani and Basmath Talukas.

3.2 Research design

Since the variables selected for the study are operated in situation the 'Ex-post facto' method of research design was used.

3.3 Method of sampling

The extension block of college of Agriculture,Parbhani was selected purposively. This block was comprised of 30 villages out of those, four villages namely Yekrukha, Bhogaon, Nandgaon and Katneshwar were selected randomly by using Tippet's random number table. A list of the farmer of all the above mentioned villages was obtained and from each village 45 farmers were selected randomly

by using Tippets random number table. Thus total sample comprised of 180 respondents. The size of the sample was decided on the basis of triout study. The name of the selected villages and the number of the farmers selected from each village is given in Table 1.

Table 1: Name of the villages and number of farmers selected

Sr. No.	Name of village	Number of farmers selected
1	Yekrukha	45
2	Bhogaon	45
3	Nandgaon	45
4	Katneshwar	45

3.3.1 Data collection

Keeping the objectives in the view an interview schedule was prepared for data collection (Appendix I). The interview schedule was prepared to obtain information regarding socio-personal characteristic, implement possession, implement use, extent of use of implements and constraints. Before finalization of the schedule, it was pretested by 30 farmers from the village Yerandeshwar. The schedule was prepared in local language Marathi. The data were collected with the help of this

interview schedule by personally discussing with the respondents.

3.4 The explication process

Under this head measurements of independent and dependent variables are described.

3.4.1 Independent variable

3.4.1.1 Age

The age refers to the chronological age of the respondent at the time of interview. All the respondents according to their age were categorised into 3 age groups like-

Young	18-30 years
Middle	31-45 years
Old	46 and above years

One score was assigned for each chronological age of the respondents for relational analysis.

3.4.1.2 Land holding

Land holding means number of the hectares of the agricultural land possessed and cultivated by the farmer. The respondents were classified on the basis of total operational land holding as-

Small	Below 2 hectares
Medium	2.1 to 5 hectares
Big	5.1 and above hectares

Three score were assigned to each hectare of land possessed by the respondent for relational analysis.

3.4.1.3 Education

This refers to the formal education of the respondent. The respondents were asked whether they are educated or illiterate, and if educated up to what standard. The scoring was given as per scale developed by Trivedi (1963). The respondents were categorised into different educational categories as mentioned below.

Illiterate	0
Primary	1 to 4
Middle school	5 to 7
High school	8 to 10 and above

3.4.1.4 Annual income

It refers to the total annual income from agriculture and allied occupations. One score was assigned to each 1000 Rs of annual income and the respondents were categorised into following three income groups as-

Below Rs 5000/

Rs 5001 to Rs 13000/

Rs 13001 and above

3.4.1.5 Caste

Caste is the status of an individual in society possessed by birth. The caste of the respondent was

done (Trivedi, 1963). The following categories were framed.

Caste level	Scores
Low	1-2
Medium	3-4
High	5-6

3.4.1.6 Occupation

This refers to the individuals engagement in activities for earning the money for the family. The scoring is done as per the SES scale developed by Trivedi (1963). The respondents were classified in two categories viz. i) agriculture and ii) agriculture and allied. The allied occupation includes labourer, caste occupation, business, independent profession and service.

3.4.1.7 Farming experience

This has been defined as actual number of years the farmer has put in farming as occupation. One score was assigned for each year of farming. The respondents were grouped as-

Below 20 years

21-40 years

41 and above years.

3.4.1.8 Social participation

This refers the participation of respondents in social institution as a member or office bearer. For measurement of this variable SES scale developed by Trivedi (1963) was used and the respondents were grouped into following categories.

Category	Score
Member of one organization	1
Member of more than one organization	2
Office bearer	3
Distinctive features	4

3.4.1.9 Extension contact

The extension contact was operationally defined in the study as frequent visit of an individual with extension personnel. The scoring was done as weekly-8, fortnightly-4, monthly-2, more than a month-1 and not at all -0 (Mahajan, 1980). The respondents were grouped into following categories.

Category	Score
High	10-15
Medium	5-9
Low	1-4

3.4.1.10 Training

The training is a conscious effort made to improve or to increase skill, power intelligence and to develop one's attitude in a desired direction to do an assigned job effectively. The respondents were asked whether they have received training or not. The training received were given one score for each training and untrainees were given zero. The respondents were categorised in two groups like - Trained and Untrained.

3.4.1.11 Number of fragments

The respondent was asked as in how many pieces he possessed his total land. For each piece, one score was assigned and the respondents were categorised into following fragment groups-

High fragments	5-6
Medium fragments	3-4
Low fragments	1-2

3.4.1.12 Cropping intensity

Cropping intensity was measured by the following formula:

$$\text{Cropping intensity} = \frac{\text{Gross cropped area}}{\text{Actual cultivated area}} \times 100$$

3.4.1.13 Risk preference

The degree to which farmer are oriented to risk and uncertainty and have a courage to face problems in farming is measured in this scale. For this purpose six multiple choice questions were put to respondents (Supe, 1969). Out of six statements, statement 2,3,4,6 are positive while 1 and 5 are negative (Appendix I). The scoring was done as fully satisfied-5, satisfied-4, undecideness-3, unsatisfied-1 for positive statements and the reverse scoring was followed for negative statements. The total score for all the items was obtained by simple addition. The respondents were categorised as-

High risk taker	23-28
Medium risk taker	19-22
Low risk taker	15-18

3.4.1.14 Economic motivation

Occupational success in terms of profit maximation and a relative value a individual places on economic ends is measured in economic motivation scale. For this purpose six multiple choice questions were put to respondents (Supe, 1969). Out of six statements, 1,2,3,4,5 are positive while 6 is negative. The scoring was done as fully satisfied-5, satisfied-4, undecideness-3,unsatisfied-2 and fully unsatisfied-1 for positive statements and the

reverse scoring procedure was followed for negative statements. The total score was obtained by simple addition and the respondents were grouped into following categories.

Low motivators	16-19
Medium motivators	20-23
High motivators	24-28

3.4.1.15 Scientific orientation

The degree to which farmer are oriented to use the scientific methods in farming is measured in this scale. The respondents were asked six multiple choice questions (Supe, 1969). Out of six statements 1, 3, 4, 5 and 6 are positive while 2 is negative. The scoring is done as fully satisfied-5, satisfied-4, undecideness-3, unsatisfied-2, fully unsatisfied-1 for positive statements and the reverse scoring procedure was followed for negative statements. The total score was obtained by simple addition and the respondents were categorised into following groups.

Low scientific oriented	17-20
Medium scientific oriented	21-24
High scientific oriented	25-28

3.1.4.16 Attitude towards farm implements

Thurstone (1964) defined attitude as a degree of positive or negative effects associated with some

psychological objects like symbol, pharse, slogan, person, institution, local or idea towards which people differ with varying degree.

The scale developed by Singh and Singh (1974) with some modifications was used to suit the conditions. The last five statements as given in Appendix I were added in the existing scale. Out of 14 statements 1, 6, 9, 11, 13 were positive while 2, 3, 5, 7, 8, 10, 12 and 14 were negative. The scoring assigned were as fully agree-5, agree-4, undecideness-3, disagree-2, fully disagree-1 for positive statements and the reverse scoring procedure was followed for negative statements. The total score was obtained by simple addition and respondents were classified as-

Favourable	51-58
Undecideness	43-50
Unfavourable	35-42

For validating the scale the technique of construct validity was followed by using scientific orientation as criterion. The correlation coefficient between these 2 tests was .81 and was significant at .01 level of probability.

The reliability of this scale was calculated by Spearman-Brown-Prophecy formula (1968).

$$rtt = \frac{N\,(r)}{1+(N-1)r}$$

Where,

N = number of times the scale being lengthened (here twice)

r = reliability of original scale

rtt = reliability coefficient of the scale under study

Hence

$$rtt = \frac{2\ (.79)}{1+\ (2-1)\ .81} = .80$$

The reliability coefficient was significant at .01 level of probability.

3.4.2 Dependent variable

The dependent variables are extent of use of implements, extent of use of equipments and extent of use of machinery. While calculating the extent of use, the use made by hiring the implements, equipments and machinery were also taken into consideration. The extent of use was calculated by considering the ratio method.

3.4.2.1 Land implement ratio

It is calculated by formula:

$$\text{Land implement ratio} = \frac{\text{Total land holding}}{\text{Number of implemented used}}$$

In implements different types of ploughs, harrow, hoes and seed drills were considered.

3.4.2.2 Land equipment ratio

It is calculated by the formula:

$$\text{Land equipment ratio} = \frac{\text{Total land holding}}{\text{Number of equipments used}}$$

In equipments different types of sprayers, duster, seed dressing drums were considered.

3.4.2.3 Land machinery ratio

It is calculated by the formula:

$$\text{Land machinery ratio} = \frac{\text{Total land holding}}{\text{Number of machineries used}}$$

In machineries oil engines, electric motors, tractors, threshers, chaff cutters and other power drawn implements were considered.

3.5 Statistical test used

The statistical tests used in the present study for the analysis of the data were as follows:

3.5.1 Frequency and percentage

Frequency and percentage were used for making simple comparison. To calculate the percentage, the frequency of a particular category was multiplied by 100 and divided by the total number of respondents.

3.5.2 Correlation coefficient

This test was used for identifying the relationship between independent and dependent variables. The data was computarised and the 'r' values were obtained. The formula used was as follows:

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

3.5.3 Chi-square test

This test was used for testing the association between the two variables. The formula used was-

$$X^2 = \sum_{i}^{n} \frac{(O - E)^2}{E}$$

Where,

O = observed value

E = expected value

$\sum_{i}^{n}$ = summation of all values

...

4. FINDINGS

4. FINDINGS

The objectives of this study was to assess the extent of use of farm implements, equipments and machineries by the farmers. One of the objectives was also to know the possession of farm implements, equipments and machineries, the socio-personal characteristics of respondents, the facilities for the repairs and the constraints were also included in the study. The study also attempts to know the suggestions offered by the respondents. The findings of the study are presented in III sections. Section I deals with the socio-personal characteristics of the respondents. While section II includes the possession of farm implements, equipments, machineries and the extent of use of these implements, equipments and machineries possessed by farmers, relationship of independent and dependent variables. In section III, the facilities about the repair of implements, equipments and machineries, the constraints and the suggestions offered by the respondents are described.

SECTION I

4.1 Characteristics of respondents

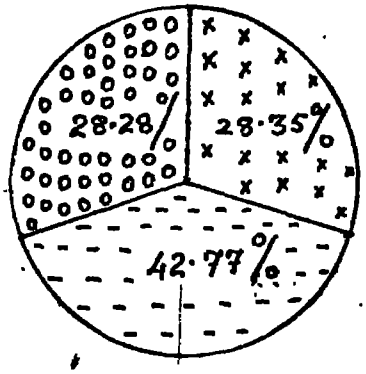
The different characteristics of the respondents studied are presented in Table 2.

Table 2: Personal and social characteristics of farmers

Sr. No.	Characteristic	Frequency	Percentage
1	2	3	4
1	Age (years)		
	18-30	51	28.35
	31-45	77	42.77
	46 and above	52	28.88
2	Land holding (in hectares)		
	Below 2	95	52.77
	2.1 to 5	50	27.77
	5.1 and above	35	19.40
3	Education		
	Illiterate	20	11.11
	Primary	54	30.00
	Middle school	71	39.45
	High school	35	19.44
4	Annual income (in Rs)		
	Below 5000	81	45.00
	5001-13000	73	40.55
	13001 and above	26	14.45
5	Occupation		
	Agriculture	149	82.77
	Agriculture and allied occupation	31	17.23
6	Farming experience (in years)		
	Below 20	105	58.35
	21-40	59	32.77
	41 and above	16	8.88
7	Social participation		
	Member of one organization	109	60.87
	Member of more than one organization	48	26.66
	Office holder	23	12.77

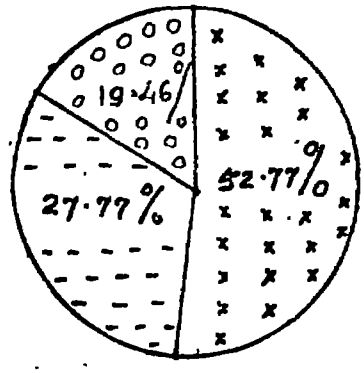
Continued

1	2	3	4
8	Extension contact		
	High (10-15)	33	18.33
	Medium (5-9)	73	40.55
	Low (1-4)	74	41.12
9	Number of fragments		
	High (5-6)	12	6.66
	Medium (3-4)	60	33.34
	Low (1-2)	108	60.00
10	Cropping intensity		
	High (151-200 %)	68	37.77
	Medium (101-150%)	95	52.79
	Low (50-100%)	11	9.44
11	Risk preference		
	High risk taker (24-28)	23	12.78
	Medium risk taker (19-23)	96	53.34
	Low risk taker (14-18)	61	33.88
12	Economic motivation		
	High motivators (24-28)	41	22.77
	Medium motivators (20-23)	99	55.00
	Low motivators (16-19)	40	22.33
13	Scientific orientation		
	High scientific oriented (25-28)	35	19.44
	Medium scientific oriented(21-24)	105	58.33
	Low scientific oriented (17-20)	40	22.23
14	Attitude towards use of farm implements		
	Favourable (51-58)	26	14.14
	Undecided (43-50)	93	51.68
	Unfavourable (35-42)	61	33.88
15	Caste		
	Low (1-2)	22	12.22
	Medium (3-4)	57	31.36
	High (5-6)	101	50.11
16	Training		
	Training received	139	72.22
	Training not received	41	27.88



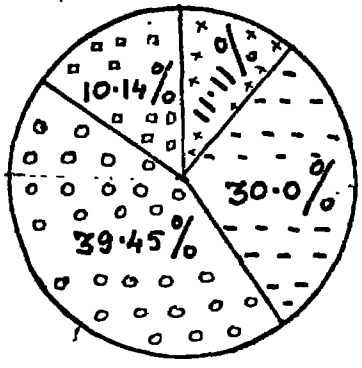
AGE (Years)

- 18-30
- 31-45
- 46 and above



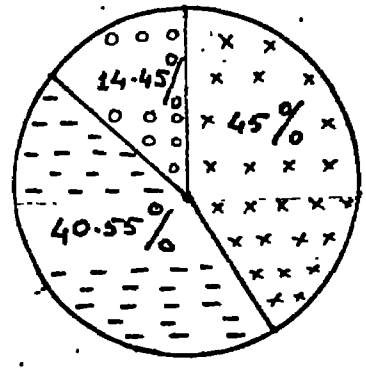
LAND HOLDING [In Hectares]

- Below 2
- 2.1 to 5
- 5.1 and above



EDUCATION

- Illeterate
- Primary School
- Middle School
- High School and above



ANNUAL INCOME

- Below Rs 5000
- Rs 5001 to Rs 15000
- Rs 15001 and above

Fig 1 A: Characteristics of respondents

4.1.1 Age

It was reveealed from Table 2 that 42.77 per cent respondents were middle aged (31-45) and out of the remaining respondents, 28.35 per cent were young (18-30) and 28.88 per cent were old (46 and above years).

4.1.2 Land holding

It was noticed that half (52.77 per cent) of the respondents were having holding below 2 hectares, 27.77 per cent respondents had land between 2.1 to 5 hectares and only 19.46 per cent were holding land above 5.1 hectares.

4.1.3 Education

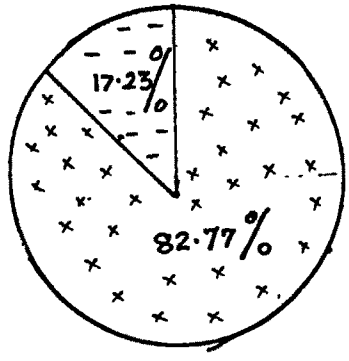
It was revealed that the annual income of 45 per cent of the farmers were below 5000 rupees, 40 per cent farmers were having the annual income between 5001 to 13000 rupees. Only 14.45 per cent had annual income above 13,001 rupees but below 13,000 rupees.

4.1.5 Occupation

It was observed that 82.77 respondents were engaged in the occupation of farming while 17.23 per cent were cultivating land and had supplementary occupations like labourer, caste occupation, business, independent profession or service.

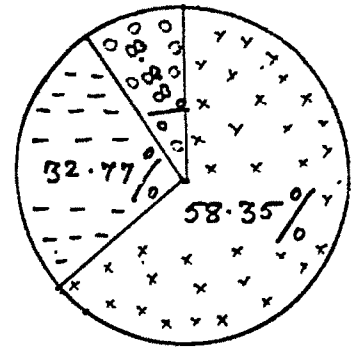
4.1.6 Farming experience

It was observed that 58.35 per cent respondents were having farming experience up to 20 years. About 32 per cent



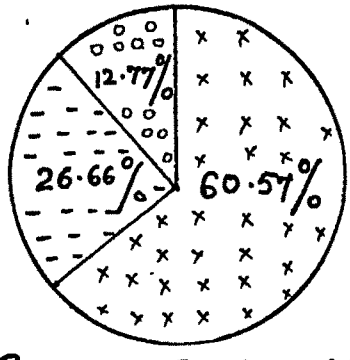
OCCUPATION

- Agriculture
- Agriculture and allied both



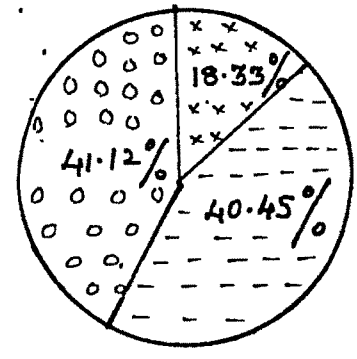
FARMING EXPERIENCE (Years)

- Below 20
- 21 to 40
- 41 and above



SOCIAL PARTICIPATION

- Member of one organization
- Member of more than one organization
- Office holder



EXTENSION CONTACT

- High
- Medium
- Low

Fig-1 B: Characteristics of respondents

respondents were farming experience between 21-40 years and 8.88 per cent respondents had it above 41 years.

4.1.7 Social participation

In social participation, it was observed that 60.57 per cent respondents were the member of one organization, 22.66 per cent respondents were the member of more than one organization while 12.77 per cent respondents were the office holders in said institutions.

4.1.8 Extension contact

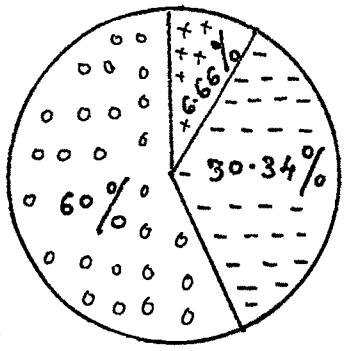
It was observed in this respect that 40.65 per cent of the respondents were having medium extension contact, 41.12 per cent respondents were from the low extension contact category. Only 18.33 per cent of the respondents were grouped in the high extension contact category.

4.1.9 Number of fragments

Data clearly indicated that 60 per cent respondents' land was not much fragmented, 33.34 per cent respondents were having land in pieces of 3-4 while about 7 per cent respondents' land was observed in high fragments category.

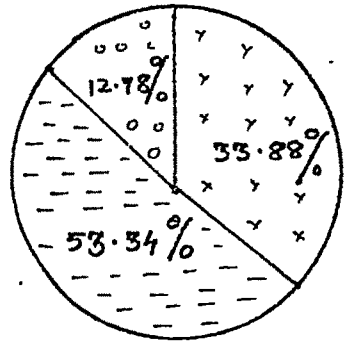
4.1.10 Cropping intensity

Cropping intensity data proved that 52.79 per cent farmers were from the medium cropping intensity. About 38 per cent respondents were from high cropping intensity



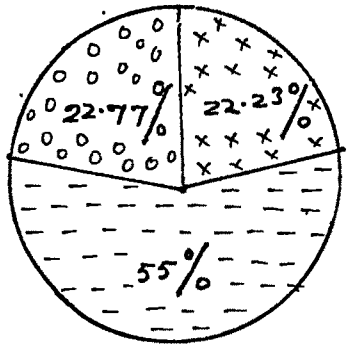
NUMBER OF FRAGMENTS

- High
- Medium
- Low



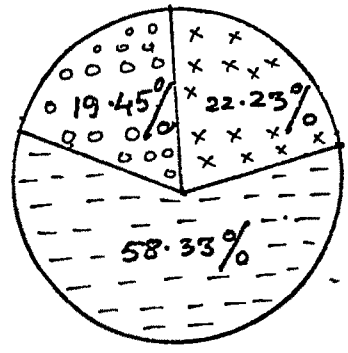
RISK PREFERENCE

- Low
- Medium
- High



ECONOMIC MOTIVATION

- Low
- Medium
- High



SCIENTIFIC ORIENTATION

- Low
- Medium
- High

Fig-1C: Characteristics of respondents

group and only 9.44 per cent respondents were located in low cropping intensity category.

4.1.11 Risk preference

Information in this aspect indicated that 53.34 per cent of the respondents were located in medium risk preference category followed by 33.88 and 12.98 per cent in low and high risk preference category respectively.

4.1.12 Economic motivation

Fifty five per cent of the respondents were found located in medium economic motivation category and 22.77 per cent respondents in high economic motivation category. About 23 per cent respondents were from low economic motivation category.

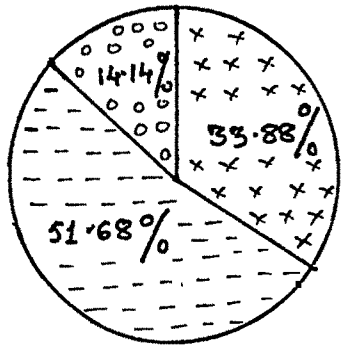
4.1.13 Scientific orientation

The data depicted proved that 60 per cent respondents were grouped in medium scientific orientation followed by 22.23 per cent and 19.44 per cent from low and high scientific orientation categories respectively.

4.1.14 Attitude towards use of improved farm implements

Majority of the respondents did not form any attitude towards the use of improved farm implements (51.68 per cent). The 33.88 per cent respondents were located in unfavourable attitude category while 14.14 per cent of the respondents

ATTITUDE TOWARDS USE OF FARM IMPLEMENTS



- Unfavourable
- Undecided
- favourable

CROPPING INTENSITY

- Low
- Medium
- High

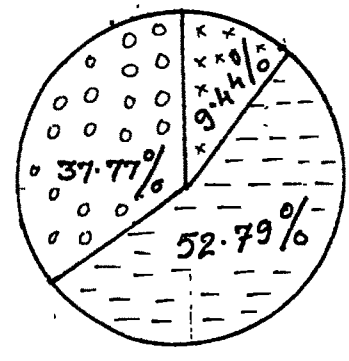


Fig- 1D: Characteristics of respondents

had favourable attitude towards the use of improved farm implements.

The hypothesis 1 framed in respect of personal and social characteristics is accepted since the selected farmers differed in respect of these characteristics.

SECTION II

4.2 Possession of different farm implements, equipments and machineries by the respondents

The different implements, equipments and machineries possessed by the respondents were recorded during data collection and are presented in Table 3.

Table 3 clearly indicated that the most common implements possessed by farmers were harrow (91.66 per cent), seed drill (91.66 per cent) and hoes (91.66 per cent) while wooden plough was possessed by 83.33 per cent of the respondents. The iron plough was found to be possessed by only 19.44 per cent of the respondents.

In case of equipments, it was observed that sprayer was possessed by 44.44 per cent respondents. While duster was possessed by 17.17 per cent of the farmers. As regards machineries it was revealed that electric motor possession was higher as 39.44 per cent respondents were possessing it. The thresher and tractor was possessed by 3.88 and 1.66 per cent respondents respectively.

Table 3: Distribution of respondents by possession of different farm implements, equipments and machineries

Sr. No.	Item	Frequency	Per cent	Observed land to implements, equipments, machineries, ratio *	Recommended implements, equipments machineries per hectare **
	Implements				
1	Wooden plough	150	83.33	4.20	2.00
2	Iron plough	35	19.44	16.50	3.00
3	Harrow	165	91.66	4.02	2.00
4	Seed drill	165	91.66	4.02	2.00
5	Hoes	165	91.66	4.02	3.00
	Equipments				
6	Sprays	80	44.44	8.10	2.00
7	Dusters	32	17.77	18.36	2.00
	Machineries				
8	Electric motor	71	39.44	8.69	15.00
9	Thresher	7	3.88	84.16	20.00
10	Tractor	3	1.66	198.00	40.00

* Ratio are given in hectares of land per implement equipment and machineries.

** Guidelines for Agril. Officer, Department of Agriculture, Maharashtra State, Pune.

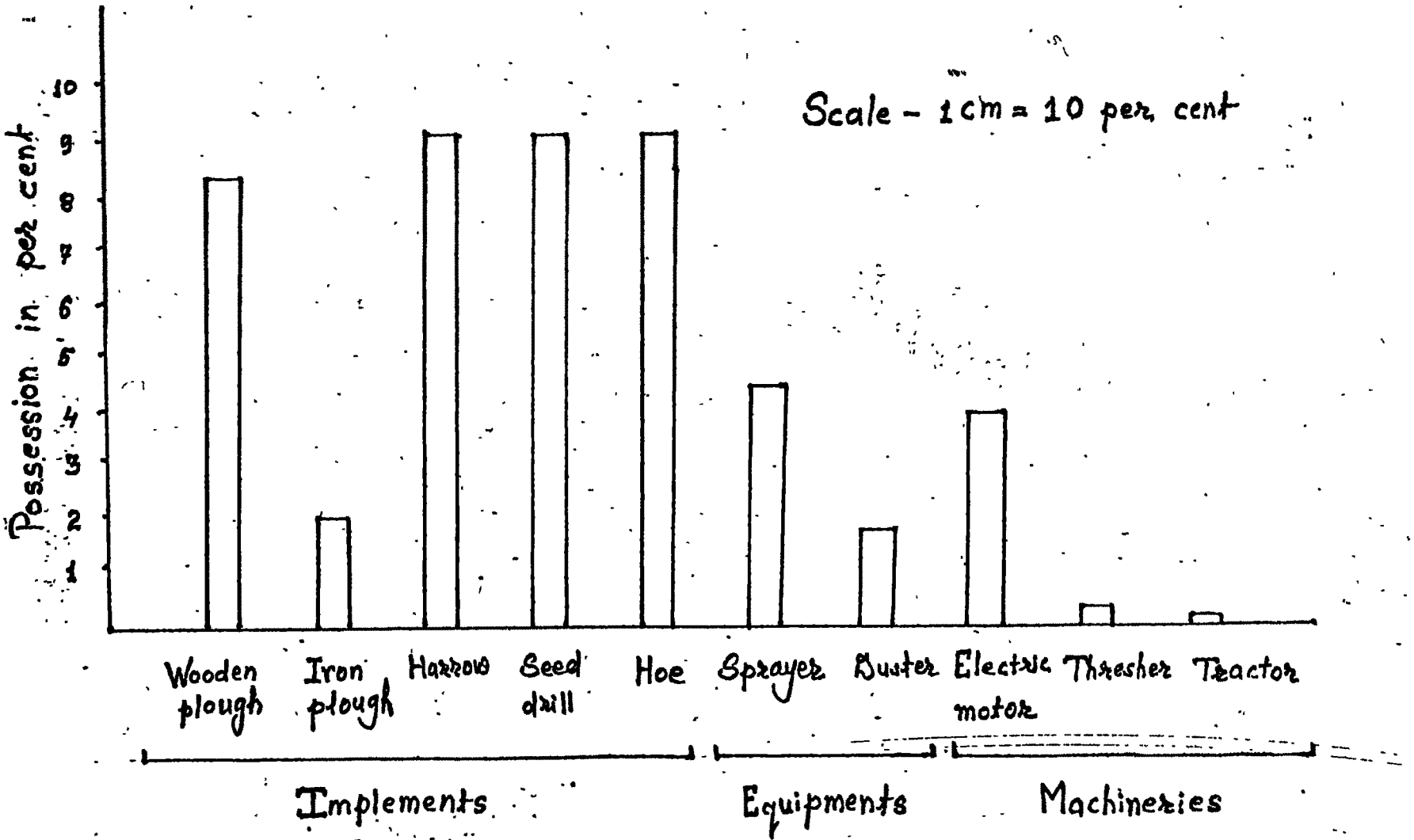


Fig-2 Possession of different farm implements, equipments, machineries.

When the land to implements, equipments and machineries ratio was calculated it was observed that in implement one wooden plough was observed for 4.20 hectares but iron plough was for 16.50 hectares, harrow for 4.02 hectares, seed drill for 4.02 hectares and hoes for 4.02 hectares.

In respect of equipment the ratio per equipment was 8.10 hectares per sprayer and 18.36 hectares for a duster.

As regards machineries ratio, it was noticed that one electric motor was used for 8.69 hectares. A thresher was used for threshing the crop grown from 84.16 hectares while for a tractor it is 198 hectares. So on the basis of above findings. The hypothesis 9 framed earlier is accepted.

From the above finding its can be concluded that the land to implements, equipments, machineries ratio as recommended by Department of Agriculture and as observed was wider. It was nearly half in case of wooden plough, harrow, seed drill and electric motor. The gap between recommended ratio and the observed ratio was still wider in case of iron plough, sprayer, duster, thresher and tractor.

4.2.1 Number of the different farm implements, equipments and machineries possessed by the respondents

The attempt is made to know the number of different farm implements, equipments and machineries possessed by the respondents.

It can be concluded from Table 4 that 52.77 per cent respondent possessed only one wooden plough, harrow and seed drill. Two wooden ploughs were possessed by 20 per cent of respondents and only 9.44 per cent and 1.11 per cent respondents were possessing three and four wooden plough respectively. One iron plough was possessed by 18.33 per cent respondents, while 1.66 per cent respondents were possessing two iron ploughs. In case of harrows, it was found that 17.22 per cent respondents were possessing two harrows, 15.00 per cent respondents were possessing three harrows while only 12.22 per cent and 1.66 per cent respondents were possessing four and five harrows, respectively. Two seed drills were possessed by 17.22 per cent respondents, while 15 per cent possessed three. Only 5 per cent respondents possessed 4 seed drills and 1.66 per cent possessed 5 seed drills. 38.88 per cent respondents were found to be possessing one hoe. 22.22 per cent possessing two, 12.77 possessing three, 11.11 per cent possessed four and only 2.77 per cent possessed 5 hoes. In case of sprayers, 39.44 per cent respondents possessed one sprayer and 5.00 per cent possessed two sprayers. One duster was possessed by 16.11 per cent respondents and 1.66 per cent respondents were possessing two dusters. One electric motor was found to be possessed by 36.11 per cent respondents, two by 2.77 per cent respondents and only 0.55 per cent respondents were possessing 3 electric motors.

Table 4: Distribution of respondents by the number of different farm implements, equipments and machineries possessed by them

Sr. No.	Item	Number of items				
		1	2	3	4	5
	Implements					
1	Wooden ploughs	52.77	20.00	19.44	1.11	-
2	Iron ploughs	18.33	1.11	-	-	-
3	Harrows	52.77	17.22	15.00	2.22	1.66
4	Seed drills	52.77	17.22	15.00	5.00	1.66
5	Hoes	38.88	22.22	12.77	11.11	2.77
	Equipments					
6	Sprayers	39.44	5.00	-	-	-
7	Dusters	16.11	1.66	-	-	-
	Machineries					
8	Oil engines	36.11	2.77	0.55	-	-
9	Threshers	3.88	-	-	-	-
10	Tractors	1.66	-	-	-	-

In case of threshers and tractors, it was found that only 3.88 per cent and 1.66 per cent respondents were possessing these machines.

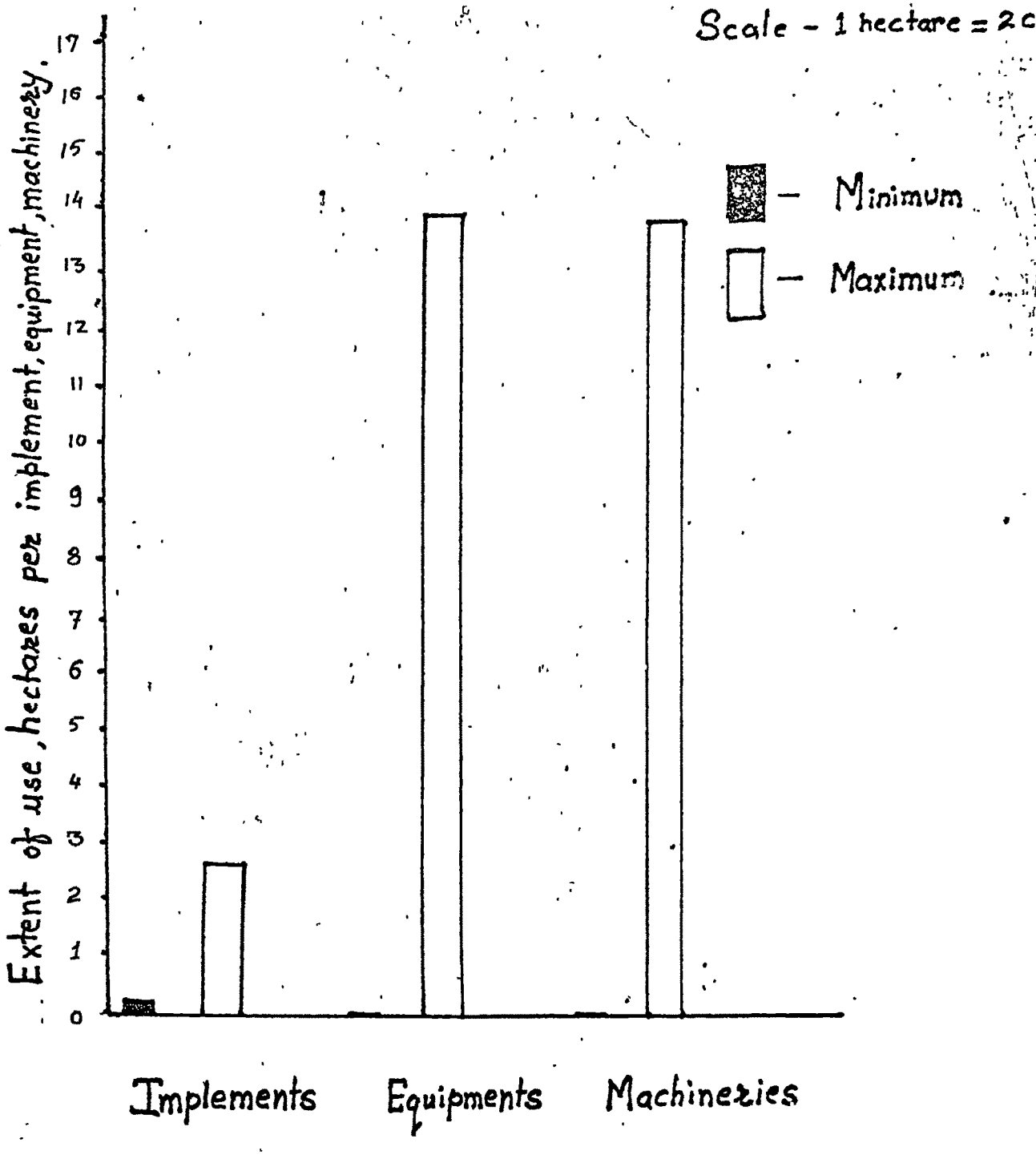


Fig-3 Extent of use of implements, equipments and machineries.

4.3 Extent of use of farm implements, equipments and machineries

The minimum and maximum extent of use of farm implements, equipments and machineries was calculated and presented in Table 5.

Table 5: Extent of use of farm implements, equipments and machineries

Sr. No.	Item	Extent of use*	
		Minimum	Maximum
1	Implements	0.01	1.30
2	Equipments	0	7.00
3	Machineries	0	7.00

* Extent of use is given in hectares of land per implement, equipment and machinery

It was revealed from the above table that,the maximum extent of use of implement was 1.30 hectares, it was minimum as 0.01 hectares. In respect of equipment and machinery use the maximum was 7 hectares. The minimum use for equipments and machineries was zero.

Thus the hypothesis 3 that there exist dissimilarity in use of implements equipments and machineries is accepted.

4.4 Relationship between independent and dependent variables

The relationship between the independent and dependent variables was calculated by calculating the zero order correlation coefficient between independent and dependent variables and are presented below.

4.4.1 Relationship between characteristics of respondents with extent of use of implements

It was observed from Table 6 that characteristics of farmers namely land holding, number of fragments and risk preference were positively related to the extent of use of implements but were non-significant. The other variables namely age, occupation, annual income, farming experience, education, extension contact, social participation, cropping intensity, economic motivation, scientific, orientation and attitude towards farm implements were negatively related to the extent of use of implements. Only annual income was found to be negatively and significantly related to extent of use of implements. The caste and training was found to be positively associated but non-significant to extent of use of implements.

The hypothesis 4 framed in respect of relationship between independent variables and use of implement was accepted partially as land holding, number of fragments and risk preference was positively related to the use of farm implements.

Table 6: Relationship between characteristics of respondents and extent of use of farm implements

Sr. No.	Characteristics	Zero order correlation coefficient (r)
1	Age	-0.0108
2	Land holding	0.0394
3	Occupation	-0.0703
4	Annual income	-0.2930**
5	Farming experience	-0.0110
6	Education	-0.0825
7	Number of fragments	0.1090
8	Extension contact	-0.0049
9	Social participation	-0.0715
10	Cropping intensity	-0.1730
11	Risk preference	0.0089
12	Economic motivation	-0.0020
13	Scientific orientation	-0.1500
14	Attitude towards farm implements	-0.0795
15	Caste	45.22 (X^2 value)
16	Training	79.75 (X^2 value)

* Significant at 0.05 [illegible] level

** Significant at 0.01 [illegible] level

4.4.2 Relationship between characteristics of respondents and extent of use of equipments

It is observed from Table 7 that out of the total characteristics of the respondents selected age, land holding, annual income, farming experience, education, number of fragments, extension contact, risk preference, economic motivation, scientific orientation and attitude towards farm implements were positively related to the extent of use of equipments. Independent variables like occupation, social participation and cropping intensity were found to be negatively related with the extent of use of equipments. Land holding, annual income, extension contact and scientific orientation were positively and significantly related to the extent of use of equipments, while occupation and cropping intensity were found to be negatively and significantly related to the extent of use of farm equipments. The caste and training was positively associated but non-significant with the extent use of equipments.

The hypothesis 4 framed earlier in respect of relationship between socio-personal characteristics of respondents and use of equipments was partially accepted as land holding, annual income, extension contact and scientific orientation were positively and significantly related to the use of equipments.

Table 7: Relationship between characteristics of respondents and the use of equipments

Sr. No.	Characteristics	Zero order correlation coefficient (r)
1	Age	0.743
2	Land holding	0.639**
3	Occupation	-0.182*
4	Annual income	0.439**
5	Farming experience	0.145
6	Education	0.0594
7	Number of fragments	0.0042
8	Extension contract	0.197*
9	Social participation	-0.0114
10	Cropping intensity	-0.356**
11	Risk preference	0.0116
12	Economic motivation	0.150
13	Scientific orientation	0.226**
14	Attitude towards farm implements	+0.161
15	Caste	45.22 (X^2 value)
16	Training	79.75 (X^2 value)

* Significant at 0.05 [illegible] level

** Significant at 0.01 [illegible] level

4.4.3 Relationship between characteristic of respondents and use of machineries

It is revealed from Table 8 that age, land holding, annual income, farming experience, education, number of fragments, extension contacts, social participation, risk preference, economic motivation, scientific orientation and attitude towards farm implements were positively related with the use of farm machinery. The variables like land holding, annual income and attitude towards farm implements were positively and significantly related to the use of farm machineries. The variables occupation and cropping intensity were negatively and significantly related to the use of machineries. The caste and training was found to be positively associated, but non-significant, with extent of use of farm machineries.

The hypothesis 4 framed in respect of relationship between independent variables and use of machineries was partially accepted as the variables, land holding, annual income and attitude towards use of farm implements were positively and significantly related to the use of machineries.

Table 8: Relationship between characteristics of respondents and the use of farm machineries

Sr. No.	Characteristics	Zero order correlation coefficient (r)
1	Age	0.0463
2	Land holding	0.749**
3	Occupation	-0.202*
4	Annual income	0.463**
5	Farming experience	0.0619
6	Education	0.131
7	Number of fragments	0.0380
8	Extension contact	0.167
9	Social participation	0.106
10	Cropping intensity	-0.440**
11	Risk preference	0.0089
12	Economic motivation	0.121
13	Scientific orientation	0.156
14	Attitude towards use of implements	0.276**
15	Caste	45.22 (X^2 value)
16	Training	79.75 (X^2 value)

* Significant at 0.05 [illegible] level

** Significant at 0.01 [illegible] level

SECTION III

4.5 Facilities available to repair implements, equipments and machineries

It was clearly observed that (Table 9) the majority of the respondents were repairing their implements from the carpenter or blacksmith of their village or nearby village (92.00 per cent), while 12.77 per cent of respondents were repairing the equipments and machineries from the workshop. Only 8.33 per cent of the respondents were repairing their implements, equipments and machineries by taking the guidance from the agro-service centres at taluka places.

Table 9: Distribution of respondents according to the facilities available to repair their implements, equipments and machineries

Sr. No.	Facilities	Frequency	Percentage
1	From carpenter or blacksmith of village or nearby village	165	92.00
2	Work-shop	23	12.77
3	Agro service centres at taluka place	15	8.33

4.6 Constraints in the use of farm implements,equipments and machineries

Constraints are the difficulties faced by the respondents for the efficient use of implements,equipments and machineries. The attempt was made to know the different constraint faced by the farmers. Different problems faced by these respondents were asked and were categorised as socio-economic constraints, situational, supply and service constraints, credit and administrative constraints and technical constraints. The responses with the ranks of the problems are given in Table 10.

It is clear from Table 10 that there were three socio-economic constraints. The poor economic condition, high cost of implements were most important constraints which was stated by 88.88 per cent and 62.22 per cent of respondents respectively. Only 3.09 per cent respondents stated the constraint as non-availability of family labour employment due to use of machineries. There are five situations, supply and service constraints, out of which, non-availability of repair and service facilities were major and were mentioned by 88.33 per cent respondents. Small size of holding and non-availability of implements in market were stated by 39.44 and 33.88 per cent respondents respectively.

Table 10: Distribution of respondents according to constraints faced by them

Sr. No.	Constraints	Frequency	Percentage	Rank
	Socio-economic constraints			
1	Poor economic condition	160	88.88	I
2	High cost of implements	112	62.22	V
3	Unemployment of family labour due to use of machines	6	3.09	XIII
	Situational, supply and service constraints			
4	Non-availability of service and repair facilities	159	88.33	II
5	Small size of land holding	71	39.44	VIII
6	Non-availability of implement in the market at the time of purchase	61	33.88	IX
7	Non-availability of implements on hire when required	29	16.11	X
8	Non-availability of required spare part of machines	20	11.11	XI
	Credit and administrative constraints			
9	Non-availability of credit at proper time	152	84.44	III
10	High interest charged on credit supplied by credit agency	90	50.00	VII
11	Complicated credit procedure	110	61.11	VI
12	Inadequate and untimely electric supply	10	5.55	XII
	Technical constraints			
13	Lack of technical knowledge about use of implements	146	81.11	IV

1. Poor economic condition
2. High cost of implements
3. Unemployment of family labour due to use of machines
4. Non availabity of service and repair facilities
5. Small size of holding
6. Non availability of implements in market
7. Nonavailability of implements on hire
8. Non availability of required spare parts
9. Nonavailability of credit at proper time
10. High interest charged on cridit
11. Complicated credit procedure
12. Inadequate and untimely electric supply
13. Lack of technical knowledge

Scale 1cm = 10 per cent

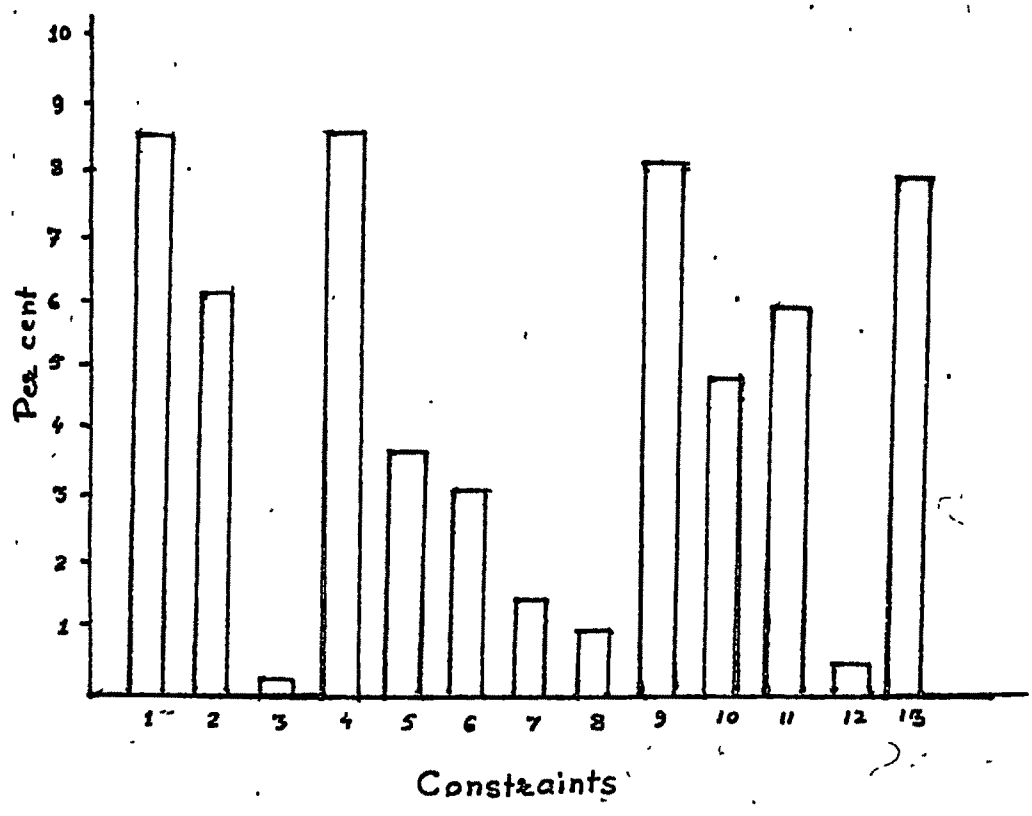


Fig-4 Constraints in the use of implements equipments machineries

The non-availability of implement on hire (16.11 per cent) and non-availability of spare parts (11.11 per cent) were the minor constraints reported. Four credit and administrative constraints were reported like non-availability of credit at proper time (84.44 per cent). High interest charged on credit (50.00 per cent), and complicated credit procedure (61.11 per cent) were the important constraints in this group. While the inadequate and untimely electric supply was the constraint reported by 5.55 per cent of the respondents. Only one major technical constraint was noticed and which was lack of technical knowledge about the use of improved farm implements (81.11 per cent).

4.7 Suggestions from respondents for better use of farm implements, equipments and machineries

Suggestions offered by respondents for better use of farm implements, equipments and machineries during data collection are presented in Table 11.

It is observed from Table 11 that, 83.33 per cent of the respondents stated to provide the facilities for repair of implements in village. To supply the credit at proper time was the suggestion given by 78.88 per cent of the respondents. While 76.11 per cent of the respondents suggested to provide guidance and training about the

use of improved farm implements. To reduce the charges on hired implements was suggested by 49.44 per cent of the respondents. Proper and easy procedure for obtaining the credit should be followed was stated by 48.33 per cent respondents.

Table 11: Suggestions offered by respondents for better use of farm implements,equipments and machineries

Sr. No.	Suggestions	Frequency	Percentage
1	To provide facilities for repair of implements in village	150	83.33
2	To supply credit at proper time	142	78.88
3	To give guidance or training about the use of improved implements	137	76.11
4	To reduce the charges on hired implements	89	49.44
5	Proper and easy procedure of obtaining the credit should be followed	87	48.33
6	Charging of less interest on credit	80	44.44
7	Provide the implements on subsidy	78	43.33
8	To reduce the cost of implements	20	11.11
9	To provide required spare parts in market	11	5.77

To reduce the interest charges and to provide the implements on subsidy were the suggestions made by 44.44 and 43.33 per cent of the respondents, respectively. Reduction in cost of implements was suggested by 11.11 per cent respondents. About 6 per cent of the respondents suggested to provide required spare parts in market from Agro service centres.

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5. DISCUSSION

5. DISCUSSION

The present study was conducted with a view to know the extent of use of farm implements, equipments and machineries. It was also attempted to know the relationship between characteristics of respondents and the extent of use of farm implements, equipments and machineries. The facilities available to repair the implements, equipments, and machineries, the constraints faced and suggestions made by the farmers were some of the objectives of the study. The probable reasons for the findings are discussed in this chapter.

5.1 Characteristic of respondents

In the farming community traditional joint families are becoming nuclear by way of family partitions. The partitions are generally made for the sake of escaping from the land ceiling. Act which was the major reason putforth by the respondent farmers in the interview. This reason seems to be appropriate that is why majority of the respondents were found in middle age group having 2 hectares of land. This findings is similar with the findings of Solunke (1972), Raut (1976) and Rao (1983).

In locale of the study Maratha caste was predominant caste and was considered superior to the other caste, which has reflected in the sample. The general literacy

per cent of locale of the study among the farming community was low. It was observed in the study that primary level education was dominant among the farmers. In the past days educational facilities were not sufficient,similarly the attitude of the farm families for higher education was rather unfavourable. These reasons seems to be worthy for higher caste and primary education among sampled farmers. The findings of the study corraborates the findings of study like Patel (1965), Mulay and Ray (1965), Kadam (1969), Tripathi and Mishra (1971), Rahudkar and Fatak (1977).

The annual income of the respondent was below Rs 5000 and the agriculture was the main occupation. Because of the small and the partial use of agricultural technologies the income of the farmer was little low. The similar findings were reported by Fliegal and Brown (1966) and Kulkarni (1983).

The low social participation and low extension contact predominated in the sample. The farmer who do not participate in more than one organization could not develop better contacts with extension personnel. The participating farmers in social organization could meet different extension personnel and thereby acquire the knowledge about the technologies. Hence most of the farmers participation and extension contacts were low.

The researchers like Patel (1965), Tripathi and Mishra (1971) and Bhilegaonkar (1977) have also reported the similar findings in their studies.

The risk taking ability, scientific orientation and economic motivation which determines the personality of the individual were purposively included in the study. The farmer who is a risk taker, economically motivated and had developed scientific attitude is prone to adopt farm practices. These variables are complementary in nature. The education and annual income plays vital role in development of these variables. The low income and less education was the characteristics which seems to be appropriate reason for medium economic motivation, scientific orientation and the neutral attitude. The findings of the present study are in line with the findings of Kadam (1984).

The intensity of cropping depends on the irrigation facilities, type of crop and varieties grown and also the psychological variables mentioned above. The economically motivated farmers take two or three crops in year on a same piece of land and thereby increase the intensity of cropping. In the present study medium cropping intensity could be attributed to the traditional method of farming. That is, two crop rotations or even single crop like cotton in a year. The low intensity of cropping was also reported by Kadam (1984) and many other past researchers.

5.2 Possession of farm implements, equipments and machineries

From the findings it could be concluded that possession of implements was higher followed by equipments and machineries. This may be due to the fact that implements are essential for land preparation or preparatory tillage. While equipments are meant for plant protection purposes and may be classified as a secondary or partially essential for the crop cultivation. The possession of the machinery was found to be very poor. This is due to high initial cost of machineries and medium socio-personal and psychological characteristics of the respondents.

In past studies also the possession of more number of implements was reported. The worth mentioning studies are like Mann (1964), Anonymous (1982), Bhaskaram and Praveena (1982) and Satpute (1985).

5.3 Extent of use of farm implements, equipments and machineries

In the study the extent of use of implements was found better than equipments and machineries. This may be due to the fact putforth by many respondents during data collection that high initial cost of equipments and machineries, the more hire charges, no technical

knowledge and the lack of facilities about repair of equipments and machineries at village. Similar findings were also reported in the study of Pathak and Desai (1976) and Patel (1980).

5.4 Relationship between independent variables and extent of use of farm implements

Out of 14 independent variables studies three variables namely land holding, number of land fragments and risk preference were positively related to the extent of use of farm implements. For efficient and timely field operations sufficient number of implements are required hence as the quantum of land increases it requires the more number of implements which hold true in the positive relationship between land size and the extent of use of implements. If the land is divided in more than one piece and the fragments are at the different corners of the village this also involves either two or three implements to do the farm operations within a specified time. This is specially the case at the time of sowing and interculture operations. The risk taker farmer is generally the high adopter of technologies and for harvesting the benefits of agricultural technologies like seed, fertilizers, plant protection measures the use of implements is invitable. The past studies

reviewed namely Chand and Gupta (1966), Naidu et al. (1974). Godse (1974), Bangarava (1982), Rao (1983) and Singh (1983), Balasubramanian (1980) and Mahajan (1980) have established positive relationship between the characteristics namely land holding, risk preference and number of fragments with adoption of agricultural practices. These findings are indirectly related to the findings of the present study since in package of practices use of implement is must.

The annual income of the respondents was found to be negatively and significantly related to the use of implements. This may be due to the use of machineries in place of implements. This conclusion is further proved by the positive significant relationship between the use of machineries and equipments of this study. The contradictory findings regarding the negative relationship between the annual income and adoption of technology was also reported in the studies like Chaubey (1972), Mahajan (1980) and Singh (1983).

5.5 Relationship between independent variables and extent of use of equipments

Out of 14 independent variables considered for relationship, four variables namely land holding, annual income, extension contacts and scientific orientation were found to be positively and significantly related to

the use of equipments. The two variables like occupation and cropping intensity established negative and significant relationship. The size of land, the annual income extension contacts and scientific orientation go hand in hand. Bigger size of holding involves more number of equipments for protecting the crops grown on the longer area. The use of more number of equipments for plant protection save the crop from pest and diseases damage which reflect in the increase yield and the annual income. The use of equipments requires scientific bent of mind of a farmer. This results in use of plant protection equipments for achieving higher income. Similar findings were also quoted by Rao (1966), Veerabhargava et al.(1969), Reddy and Reddy (1972), Anonymous (1981).

For obtaining information about the equipments purchase and about plant protection practices farmer has to pay frequent visits to extension personnel and this has resulted in positive significant relationship between extension contacts and the use of equipments, similar findings of the study were also reported by Singh (1972), Mahajan (1980) and Singh (1983).

The occupation and cropping intensity were negatively and significantly related to the use of equipments. Double and triple cropping system does not necessarily involve more number of equipments. The equipments used in one

season could be re-used in another and hence established negative relationship.

The farmers having allied occupation divert his attention from day to day agriculture operations including protection of crop which might have resulted in less use of equipments by farmers having allied occupation.

5.6 Relationship between independent variable and the extent of use of farm machineries

Three variables namely land holding, annual income, and attitude towards the use of farm machineries were positive and significant.

Increase land holding requires use of farm machineries for the field operations. Similarly the large farm size increases the annual income hence the use of farm machinery seems to be related to land holding and annual income.

The attitude is a predisposing factor for use of farm machineries. The favourable attitude increases use while unfavourable retards. The favourable attitude of farmer is, therefore, positively related to use of farm machineries.

The above findings could be supported by Chand and Gupta (1966), Singh and Singh (1968), Basaram (1970), Anonymous (1981), Rao (1983), Patnaik (1972), Mahajan (1980) and Singh (1983) in their studies.

The reasoning regarding the negative significant relationship between occupation, cropping intensity and the use of farm machineries is similar as given in the foregoing paragraphs of use of equipments.

5.7 Facilities available to repair implements, equipments and machineries

As given in earlier chapter it is clearly indicated that the majority of the farmers were repairing their implements from the carpenter or blacksmith in village or nearby village. It implies that the most of the farmers were possessing implements which can be repaired by carpenter or blacksmith. Few respondents repaired their equipments, machineries and implements from workshop as per the guidance of Agro service centre at taluka place. For traditional implements the carpenters and blacksmiths are the person who repair on the basis of Jajmani or Balutedari system. They are paid in term of grain at the time of harvest which is preferred by both the parties. Even in some villages the local carpenter and blacksmith are not available or due to unhealthy relation between the parties the implements are repaired outside the village. In one of the village it was observed that no carpenter and blacksmith reside in the village. The equipments and machineries are repaired at taluka place because of the non-availability of skilled persons in village.

5.8 Constraints in the use of farm implements, equipments and machineries

The respondents were asked to state the reason for non-use of farm implements, equipments and machineries. The constraints reported were classified into four categories as socio-economic constraints, situational, supply and service constraints, credit and administrative constraints and technical constraints. Under the socio-economic constraints, the poor economic condition was the major constraints followed by high cost of implements and unemployment of family labour due to use of machines.

Non-availability of repair facilities, small size of land holding, non-availability of implements in market were the important situational and supply and service constraints observed. The minor constraints recorded were the non-availability of implements on hire and non-availability of spare parts.

In credit and administrative constraints category major constraints recorded were non-availability of credit at proper time and complicated credit procedure. The other constraints recorded in this category was the inadequate and untimely electric supply.

In technical constraint the lack of technical knowledge about the use of improved implements and machineries was mentioned.

So it can be concluded that the major constraints given are situational, supply and service constraints, followed by socio-economic, credit, administrative and technical constraints. Similar constraints were also reported by George and Choukidar (1972), Kulkarni (1973), Venkatram and Rammana (1977), Mahajan (1980), Kahlon(1981), Madansingh and Mathur (1982) and Chitnis (1983), which if properly taken care of can accelerate the use of implements, equipments and machineries.

5.9 Suggestions

The major suggestions putforth by the respondents were to provide facilities for repair of implements, supply of credits at proper time and guidance or training about the use of improved farm implements, equipments and machineries. The other suggestions reported were to reduce the charge on hire implements, proper and easy procedure for credits, low interest on credit, provision of the implements on subsidised rate, reducing the cost of implements and availability of genuine part of machinery in market were some of the suggestions made by farmers. Similar suggestions were also reported by Raut (1974), Banarjee (1974) in their study and should be considered in developing the strategy of improved implements, equipments and machineries use.

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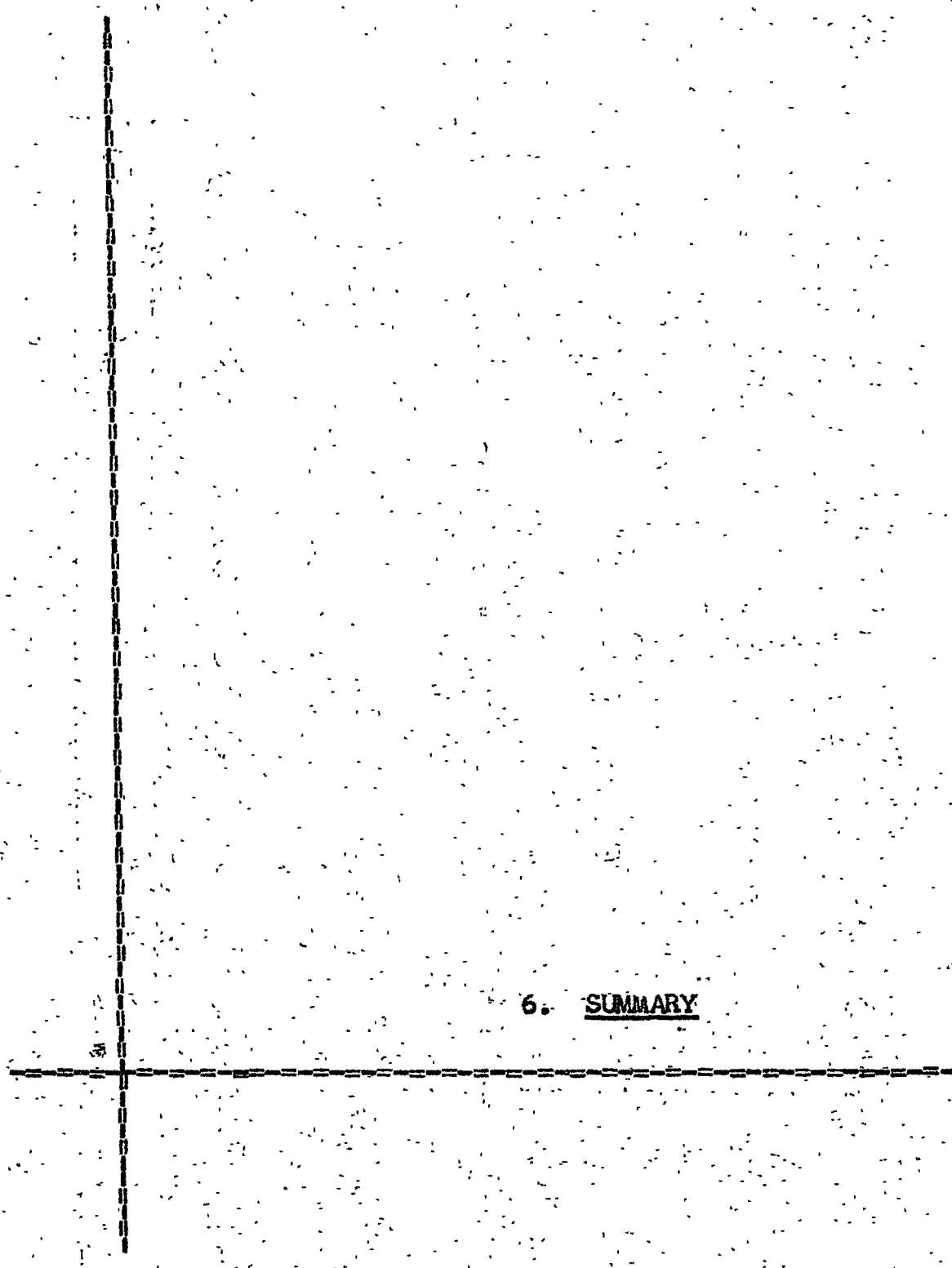

6. SUMMARY

6. SUMMARY

The present study was conducted in Extension Block of College of Agriculture, Marathwada Agricultural University, Parbhani with a view to assess the extent of use of farm implements, equipments and machineries. The specific objectives of the study were:

1) To study the socio-personal characteristics of respondents.

2) To know the various type of farm implements,equipments and machineries possessed by the respondents.

3) To know the extent of use of implements, equipments and machineries.

4) To study the relationship between characteristics of respondents and the use of implements, equipments and machineries.

5) To know the facilities to repair their implements, equipments and machineries.

6) To study the problems in the use of farm implements, equipments and machineries.

The investigation was carried out in College Extension Block, College of Agriculture, Parbhani. Four villages were selected by using Tippets random number table. The information pertaining to the objectives was collected from 180 randomly selected respondents.

The data were collected with the help of specially design schedule for obtaining the relevant information on the objectives. The frequencies and percentages Chi-square and the correlation coefficient were used for interpretation of data. The salient findings of the study are presented below.

6.1 Characteristics of respondents

6.1.1 Age

Majority (42.77 per cent) of the respondents were observed in the age group of 31-45 years, while nearly equal number of respondents (28 per cent) were observed in the age group of 18-30 years and 46 and above year groups.

6.1.2 Land holding

About 53 per cent of the respondents were having land below 2 hectares followed by 28 per cent from 2.1 to 5 hectares and 19.46 per cent from 5.1 and above hectares of land categories.

6.1.3 Education

About 40 per cent respondents were educated up to middle school, followed by 30 per cent up to primary school, 19.44 per cent up to high school. Only 11.11 per cent were illiterate.

6.1.4 Annual income

Nearly 45 per cent respondents were from low income category (below Rs 5000) followed by 41 per cent from middle income category (Rs 5001-13000). Fourteen per cent respondents were found located in the high income category (Rs 13001 and above).

6.1.5 Occupation

Majority of the respondents occupation was agriculture (82.77 per cent) and only 17.23 per cent respondents were having allied occupation like service, business, caste occupation and other in addition to agriculture.

6.1.6 Farming experience

Majority (58.35 per cent) respondents were having farming experience up to 20 years, 32.77 per cent were having the farming experience between 21 to 40 years while only 8.88 per cent of the respondents had the farming experience of 41 years and above.

6.1.7 Social participation

About 60 per cent respondents were the members of one organization while about 27 per cent respondents were the members of more than one organization and only about 13 per cent respondents were the office holders in said organizations.

6.1.8 Extension contact

About 41 per cent and 40 per cent respondents were having low and medium extension contacts respectively. Only 19 per cent of the respondents had high extension contacts.

6.1.9 Number of fragments

Majority (60 per cent) of respondents had low number of fragments, followed by 33.44 per cent medium and 6.66 per cent higher number of fragments of their land.

6.1.10 Cropping intensity

With respect to cropping intensity it was observed that about 53 per cent respondents were located in medium cropping intensity category followed by about 38 per cent in high and only about 9 per cent in low cropping intensity category.

6.1.11 Risk preference

About 53 per cent respondents are from the medium risk taker group followed by low risk takers (about 34 per cent). Only 13 per cent were observed in the high risk takers group.

6.1.12 Economic motivation

Majority (55 per cent) of respondents were observed in high economic motivation category. About equal per cent (22.50 %) respondents were found in medium and low economic motivation category.

6.1.13 Scientific orientation

Majority (58.33 per cent) respondents were observed to be medium scientifically oriented followed by low (22.23) and high (19.44 per cent) scientifically oriented respondents.

6.1.14 Attitude towards farm implements

Of the selected respondents 51.68 per cent were undecided, 33.68 per cent held an unfavourable attitude and only 14.14 per cent hold favourable attitude towards the use of farm implements.

6.2 Possession of farm implements, equipments and machineries

In case of possession of farm implements, it was observed that harrows, seed drills, hoes and wooden ploughs were possessed by more than 80 [redacted] of the respondents, [redacted] were possessing

6.3 Extent of use of implements, equipments and machineries

It was evident from the study that the extent of use of implement was better as compared to equipments and machineries. It can also be concluded that there was wide gap between the recommended use of implements, equipments and machineries and the use observed in study.

6.4 Relationship between characteristic of respondents and extent of use of farm implements

In case of extent of use of farm implements it was observed that land holding, number of fragments and risk preference were positively related to the extent of use of farm implements.

6.5 Relationship between characteristics of respondents and extent of use of equipments

It was observed that land holding, annual income, extension contact and scientific orientation was found to be positively and significant related to equipment use.

6.6 Relationship between characteristics of respondents and extent of use of machineries

It was observed that out of all the variables selected land holding, annual income and attitude towards farm implements were positively and significantly related to the use of machineries. It was observed that occupation

and cropping intensity was negatively and significantly related to the extent of use of farm machineries.

6.7 Facilities available to repair the implements, equipments and machineries

Almost all the respondents who possessed implements were repairing their implements from the carpenter or blacksmith of village or nearby village. While only few were repairing their equipments and machineries from workshop and by obtaining the guidance from Agro service centres situated at taluka place.

6.8 Constraints in the use of farm implements, equipments and machineries

The major constraints reported were the poor economic condition, non-availability of service and repair facilities, non-availability of credit at proper time, lack of technical knowledge about the use of implements. These constraints were stated by about 80 per cent of the respondents. While high cost of implements, complicated credit procedure, high interest charged on credit were reported by more than 50 per cent of the respondents. The other constraints observed were small size of holding, non-availability of implements in market at the time of purchase, non-availability of implements on hire when required, non-availability of spare parts of machines,

inadequate and untimely electric supply and unemployment of family labour.

6.9 Suggestions from respondents for better use of farm implements, equipments and machineries

The major suggestions offered by the respondents were to provide facilities for repair of implements, supply credit at proper time, guidance or training about the use of improved implements, equipments and machineries, reduction in the charges on hired implements, easy procedure of the credit, low interest on credit and to provide the implements on subsidy. Reduction in the cost of implements and easy availability of spare parts in market were also the suggestion reported by very few respondents.

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7. IMPLICATIONS

7. IMPLICATIONS

The implications of the study are given in this chapter based on the findings of the study for the improvement of use of implements, equipments and machineries.

It was observed that the value orientation of the majority of the respondents was medium with respect to risk preference, scientific orientation and economic motivation. It is, therefore, suggested that efforts in this area may be made to increase the risk preference, scientific orientation and economic motivation providing them proper guidance in respect of use of implements, equipments and machineries. It was also evident from the study that the attitude of the respondents was mostly undecided, it is therefore, suggested that the extension worker should divert the respondents mind by giving guidance and should create favourable attitude towards the use of farm implements, equipments and machineries.

It was revealed in the study that the possession of farm implement was better, followed by equipments and machineries. It is suggested that input organization should supply the implements, equipments and machineries on subsidised rate to the farmers.

As regards the extent of use it was found in the study that the extent of implements was better than the

use of equipments and machineries. So it is suggested that the extension workers and manufacturers of the implements should organize the training for farmers and make them aware about different farm implements, equipments and machineries available and their relative advantages.

It is also suggested to design such implements, equipments and machineries which can be suitable to soil, rainfall and socio-economic conditions and can be used, possessed and repaired by the small and medium farmers economically.

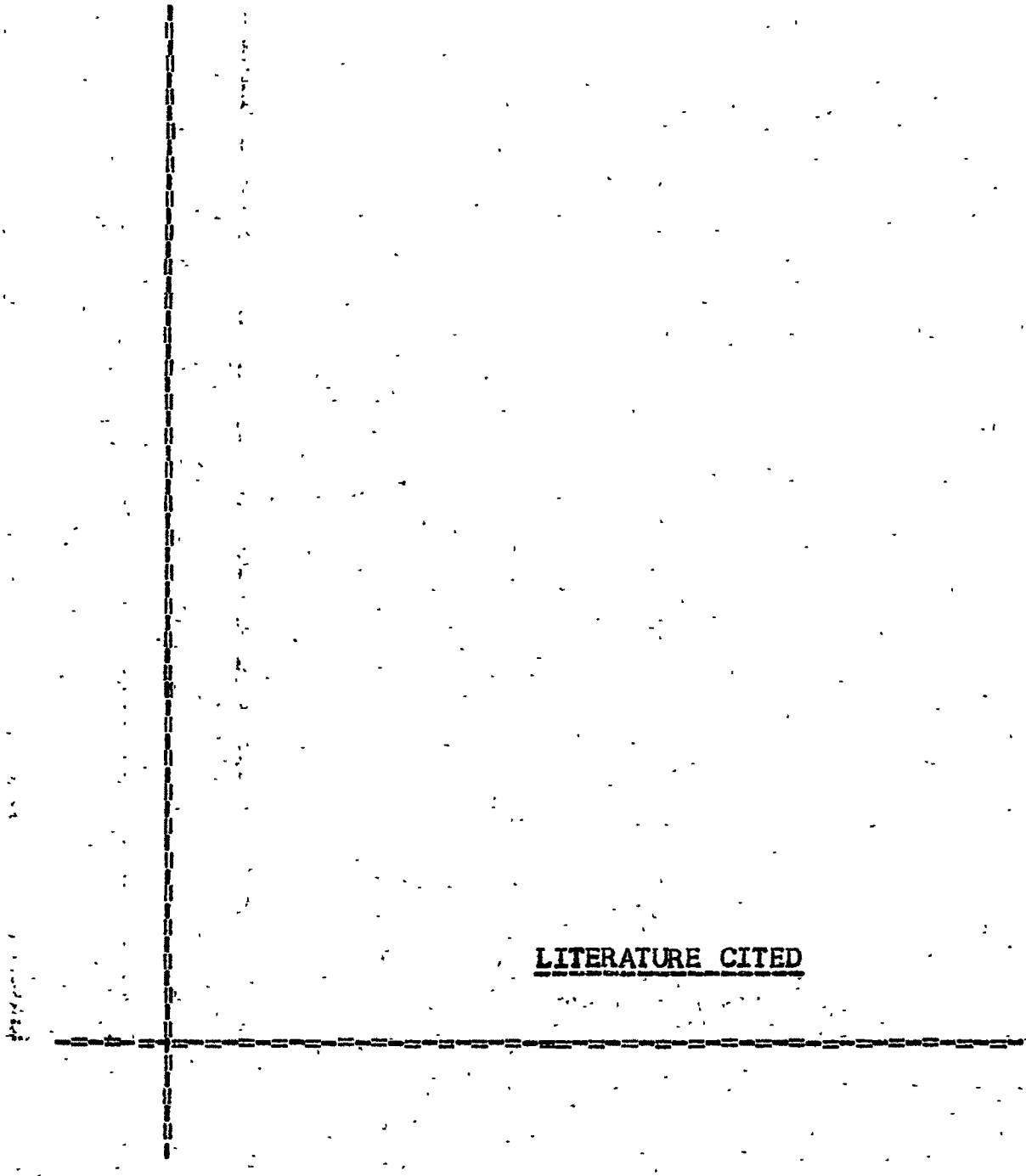
It was evident from the study that those who possessed equipments and machineries did not have repair facilities near to their village so it is suggested that the Agro service centres should be opened and skilled persons should be employed for the guidance and repairs.

Needed area of research

The study was confined to College Extension Block, College of Agriculture, Parbhani. It is suggested that the research in this aspect may be conducted at different areas in order to test the validity of the findings of this study.

It is suggested that in future researches, the variables like innovativeness credit orientation, awareness may also be stressed as they are likely to effect the use of implements, equipments and machineries. A study can also be conducted to know the impact of use of improved farm implements, equipments and machineries and the occurring socio-economic consequences in the farmers.

...


LITERATURE CITED

LITERATURE CITED

*Amarsingh. 1965. Study of farmers characteristics associated with the adoption of improved farm practices in community Development Block, Dist. Muzzafurnagar. M.Sc.(Agri) Thesis, Govt. Agri. College, Kanpur.

Anonymous. 1981. Use and marketing of plant protection appliances - Main findings. Agricultural situation in India, 36(3).

Anonymous. 1982. Impact of improved implements on crop production in Assam. Agricultural situation in India, 15(3): 215-216.

Balsubramanian, U.A. 1980. A study of the innovativeness in relation to adoption of high yielding rice technology and sequential socio-economic changes in farming community in Tamilnadu, unpublished Ph.D. Thesis. Divn. of Agri. Extension, IARI, New Delhi.

Banarjee, B.N. 1974. Factors associated with adoption of new farm practices. Farm Journal, 16(1): 17-21.

Bangarwa, B.S., Raj Singh and Kadain, R.S. 1982. Adoption of new farm technology - Harayana Study. Kurukshetra, 30(10):14-17.

Basaram, C.S. 1970. "Adoption of new farm practices" Indian Journal of Social research, 11(1): 68-101.

Bhaskaram, K. and Praveena, C. 1982. Adoption of improved dryland technology in an integrated dryland Agri. Development project in Andhra Pradesh. Indian Journal of Extension Education, 18(3&4): 32-39.

Bhilegaonkar, M.G. 1977. A study of the productivity of new land holders. Social sciences and statistics sub-committee Agresco Report (1977-78), M.A.U.,Parbhani.

*Bose, S.R. and Clark, E.H. 1969. Some basic considerations on agricultural mechanization in West Pakistan; Pakisthan Development review. In Javed Hamed; Agri. Mechanization a case for fractional technology; A.D.C. teaching forum No.33, September, 1973.

Chand Ratan and Gupta, M.L. 1966. " A study of the adopters and their characteristic " Indian Journal of Extension Education, 1(4): 259-67.

Chattopadhaya. 1976. Diffusion of wheat technology in traditionally rice growing, state an analysis. M.Sc. Thesis Div. of Agri. Ext. IARI, New Delhi.

Chitnis, D.H. 1983. A study of the technological gap in dry farming system and factors associated with technological gap. Ph.D. Thesis, M.A.U.,Parbhani.

Choubey, C.L. 1972. " A study of differential adoption of the high yielding wheat varieties technology as related to and influenced by selected demographic, socio-psychological and political variables in Sehore dist. Madhya Pradesh". Unpublished Ph.D. Thesis, Divn. of Agri. Ext. IARI, New Delhi.

Das, K.K. and S.S. Sarkar. 1970. Attitude of farmers towards Taichung Native-1 a high yielding variety of rice; Ind. J. Agric. Sci., 40: 59-64.

Deb, P.C. and Sharma, M.C. 1969. Rationality in decision making in adoption of improved farm practices. J. Research PAU, Ludhiana, (1): 125-28.

Deshmukh, R.G. 1977. Impact of rural electrification on agricultural development. M.Sc. (Agri) Thesis, M.A.U., Parbhani.

*Dhaliwal, A.J.S. 1963. A study of some important factors affecting the adoption of few selected agricultural practices by cultivators of Ludhiana C.D. Block. M.Sc.(Agri) Thesis, PAU, Ludhiana.

Dwarkinath, K. and Veerabhadraiah, V. 1970. A study of adoption of hybrid maize in Bangalore dist. Mysore. J.Agric. Sci., (4): 326-336.

Fliegel, F.C. and Brown, J. 1966. Low income farm people. J.Corp. Ext., 4(1): 45-50.

George, P.S. and Choukidar, V.V. 1972. Modernization of paddy-rice system and challanges ahead. Ind. J. Agri. Econ., 27(2): 14-24.

Gill, D.S. and Kahlon, A.S. 1967. A case for mechanizing selected agricultural operations in Punjab. Agri. Situation in India, 21(2): 1085-1088.

Godse, P.D. 1974. A study of characteristic of farm machinery in relation to their adoption as perceived by farmers in Shrirampur Taluka of Ahmednagar Dist. M.Sc.(Agri) Thesis, MPKV, Rahuri.

Grewal, S.S. and Kahlon, A.S. 1973. Impact of farm mechanization on land productivity and labour employment. J.Research, PAU, 10(3): 353-358.

Grewal, S.S. and Kahlon, A.S. 1974. Impact of farm mechanization on farm employment in Punjab; Ind. J. Agri. Econ; 27(4)

Grey, S.C. 1975. Problems of small farmers; Kurukshetra,P.6.

Gualiani, S.S. and Dhull, D.N. 1984. Transfer of technology in Jowar crop: Harayana farming, 13(8): 9-11.

Hidajat Mattatmadja. 1982. Farm mechanization and Agro industry development with special emphasis on rice production: Endonesian agric. Research and Development Jour., 4(3): 79-85.

Jha, P.N. and Shekawat, G.S. 1972. Adoption behaviour of farmers towards hybrid jowar cultivation. Ind. J. Ext. Edu., 8(1&2): 24-31.

Jhunjhunwala Bharat and McPherson, W.W. 1972. Agricultural mechanization and income distribution in Faizabad Dist. East Uttqr Pradesh, Ind. J. Agri. Econ., 27(4): 56-63.

Kadam,L.K, 1984. Adoption of dry farming technology in drought prone area. M.Sc.(Agri) Thesis, M.A.U., Parbhani.

Kadam, N.R. 1969. The farmers and hybrid Jowar cultivation. Rural India, (32): 102-105.

Kahlon, A.S. 1964. A better shape for Punjab agriculture, Agri. Situation in India, 19(1).

Kahlon, A.S. Jr. 1981. Factors affecting improved animal drawn implements in India; Agri. situation in India, 36(4): 259-261.

Kahlon, A.S. and Sharma, A.C. 1969. Pattern of mechanization for 10-20 acres farm in Ludhiana dist. Agri. Situation in India, 23(11): 1113-1116.

Kondekar, J.A. 1980. Food consumption pattern in relation to nutritional awareness of farm families. M.Sc.(Agri) Thesis, M.A.U., Parbhani.

Kulkarni, M.G. 1973. Problems of tribal development: A case study of Poona, Gokhale Institute of Politics and Economics, Poona.

Kulkarni, R.R. 1979. Analysis of technological gap in tribal farming system, Ph.D. Thesis, M.A.U.,Parbhani.

Kulkarni, V.M. 1983. Role of rural women in agriculture. M.Sc. (Agri) Thesis, M.A.U., Parbhani.

Madansingh and Mathur, P.N. 1982. Technological gap in Bajara Technology: A critical study. Ind. J. Ext. Edn., 18(3&4): 51-55.

Mahajan, B.S. 1980. A study of factors affecting adoption of agricultural technology and accurring socio-economic consequences in Jayakwadi Command Area (Maharashtra), Ph.D. Thesis, Div. of Agri. Ext. IARI, New Delhi.

Mann, K.S. 1967. Farming characteristic of operational holdings in Punjab: Agri.Situation in India, 22(8): 885-893.

*Matilalkar. 1970. The adoption process and the adoption categories of some improved practices in paddy cultivation in West Bengal village; M.Sc.(Agri) Thesis, College of Agriculture, Rajendranagar.

Motilal, G. 1973. Economics of tractor utilization. Ind. J. Agri. Econ., 28(1): 96-105.

Naidu, R.B. and Bhaskaram, K. 1974. Influence of socio-economic factors on adoption of improved farm practices, Andhra Agri. Jour., 21(1&2): 40-45.

*Nirwal, R.S. and Arya, B.S. 1975. " Who adopts improved farm practices " Farmers training and functional literacy education by Anil Bordia; Indian Adult Education, Indraprastha Marg, New Delhi.

Patel, A.P. 1981. Farm mechanization in India - A study, Kurukshetra, 29(11): 15-19.

Patel, A.S. 1980. Some institutional and systematic constraints to farming efficiency in SAT Gujarat; Arth Vikas, 15(2): 42-47.

Patel, N.P. 1965. Study of small farmers and their problems as related to agriculture. M.Sc.(Agri) Thesis, IARI, New Delhi.

Patel, P.M. and Singh, K.N. 1970. Differential characteristic of adopters and non-adopters of farm planning. Ind. J. Ext. Edu., 6(1&2): 96-102.

Patel, R.M. 1972. Some issues of rural research and development. Arth Vikas, 11(1): 48.

Pathak, M.T. and Desai, M.D. 1976. Levels of agricultural development in Tehsils of Rajasthan, Arth Vikas, 12(2): 30-31.

Patil, N.P. 1964. Adoption of improved practices and its effect on paddy yield: Agri situation in India, 18(10): 671-673.

Patnaik. 1972. Tribes and their development, Hyderabad.

Rahudkar, W.B. and Patak, V.N. 1977. A study of adoption of dairy technology by small and marginal farmers. M.Sc. (Agri) Thesis, M.A.U., Parbhani.

*Rao, N.G. 1966. A study of extent of knowledge and adoption of hybrid maize cultivation in Hizarbad Panchayat Samiti of Karimnagar dist. (A.P.); Unpub. M.Sc.(Agri) Thesis. College of Agril.Rajendranagar.

Rao, P.K. 1983. Benefits of tractorization: Kurukshetra, 31(14): 14-16.

Rao, P.R. and Singh, C.B. 1964. A study on tractorization Agri. Situation in India, 19(5):449-452.

Rao, T.R. 1967-68. Economic aspects of high yielding varieties in West Godavari dist. A study of IR-8 in Kharif, Ind. J. Agri. Econ. P.23.

Ravishankar, N. 1978. A study to evaluate selected dry farming technologies for appropriateness to small farmers of Tumkur Dist. Unpub. M.Sc. Thesis, University of Agri. Sciences, Bangalore.

Raut Prabhakar. 1974. A study of small farmers in relation to their needs and adoption of new agricultural technology, M.Sc.(Agri) Thesis, MPKV, Rahuri.

Raut, U.S. 1976. Training needs of new land holders: Agri Ext. Eco. and Stat. Sub-committee, Agresco report (1976-77), M.A.U. Parbhani, P.53.

Reddy, K.J. and Reddy, G.B. 1972. Adoption of improved agricultural practices in Andhra Pradesh. Ind. J. Ext. Edu., 8(1&2): 14-23.

Sagar, S.L. and Ray, G.L. 1984. Factors contributing to the farmers productivity of crops; Ind. J. Ext. Edu., 20(1&2): 20-28.

Salunke, V.G. 1972. A study of characteristic of small farmers performance in farming and potential for change. M.Sc.(Agri) Thesis Unpub. Agri. College,Poona.

Sarkar, K.K. and Prahaladachar,M. 1966. Mechanization as technological change; Ind. J. Agri. Eco., 21(1): 180.

Sarkar, K.K. 1968. Growth of farm mechanization in India, A statistical appraisal, Agri. Situation in India, 23(7): 677-683.

Satpute, T.G. 1985. Problems in irrigation water utilization in Purna command area. Agresco report 1984-85. Dept. of Agri Eco. and Stat. M.A.U.,Parbhani.

Shah, C.H. 1972. Impact of Tenancy reforms on level of technology (Gujarat & Maharashtra), Arth Vikas, 7(2): 19-40.

Sharma, S.K. and Nair. 1974. A multivariate study of the HYV paddy. Ind. J. Ext. Edu., 10(1&2): 30-35.

Singh, D. and Shrivastava. 1970. Adoption problem of some farmers in U.P. Research in Ext. and Edu. IARI, New Delhi, P.363.

*Singh Ranjit. 1972. A study of the socio-psychological values and some biographical characteristic in relation to adoption of farm mechanization by farmers of Ludhiana block, Unpub. Ph.D. Thesis, PAU,Ludhiana.

Singh Ranjit. 1983. Selected characteristic of farmers in relation to their adoption of farm mechanization. Ind. J. Ext. Edu., 19(3&4): 11-17.

Singh Ratnakar. 1970. Which farmer adopts improved practices ?. Rural India, 34: 91-92.

Singh, R.P. and Singh, K.N. 1968. Attitude of farm people towards chemical fertilizers. Ind. J. Ext. Edu., 4(1&2): 49-54.

Sinha, P.R.R., Prasad, R. and Bhasin, H.S. 1972. Adoption/ non-adoption of some selected farm practices as related to some personal characteristic of the farmers. J.Research PAU, 9(1): 126-133.

Somasundaram, D. 1976. A diagonistic study of small farmers with respect to new agri. technology and its effective communication for adoption, Unpub. Ph.D. Thesis, Div. of Agri. Ext. IARI, New Delhi.

Subramanian, M.S. 1985. Agricultural development in Tamilnadu; Kisan World, 12(1): 18-20.

Sundraswamy, B. 1971. Extent of adoption of recommended practices and information sources consulted by farmers in respect of hybrid jowar cultivation in selected taluka of Mysore dist: M.Sc.(Agri) Thesis unpub. Dept. of Agri. Ext, ICRI, Coimbatore.

Supe, S.V. and Singh, S.N. 1972. A conceptual variable analysis of rational behaviour of farmers. Ind. J. Ext. Edu., 8(3&4): 54-60.

Tripathi, P., Singh, K.N. and Shankar Sahoo. 1982.Constraints in adoption of H.Y. rice technology in Costal Orissa. Ind. J. Ext. Edu., 18(1&2): 51-58.

Veerabhadraiah, V. and Sethurao, M.K. 1973. Farm practices adoption by farmers and their attitude towards new agricultural technology; Mysore J. Agri. Sci., 7(4): 596-603.

Veerbhargava, R.M. and Lakshamana, C. 1969. Extent of adoption and adoption categories among the paddy growers in selected block of Guntur dist. Andhra Pradesh Agri. J., 26(2): 43-49.

Venkataram, J.V. and Rammana, R. 1977. Economics of power tiller Vs. Bullock power in preparing paddy land. Mysore J.Agri. Sci., 11(2): 239-243.

Yeshwanth, T.S. 1976. Land utilization in Madhya Pradesh, Arth Vijuna, 8(3): 259-272.

*Originals not seen.

APPENDIX

(APPENDIX-I)

शेती व्यवसायातील सुधारीत अवजारांच्या उपयोगाचा अभ्यास

मुलाखात परिशिष्ट

१. शेतकऱ्याचे नाव :

२. गाव तालुका जिल्हा

३. वय वर्ष

४. जमीन कोरडवाहू हेक्टर
बागायत हेक्टर
एकूण हेक्टर

५. व्यवसाय - शेती
शेती अनुषंगिक
इतर [नाव]

६. वार्षिक उत्पन्न - शेतीपासून रु.
दुय्यम धंद्यापासून रु.
इतर [नाव] रु.

७. शेतीचा अनुभव : वर्ष

८. कुटुंबातील व्यक्तिचे शिक्षण

अ.क्र.	व्यक्तिचे नाव	वय	शिक्षण
१.			
२.			
३.			
४.			
५.			

९. प्रशिक्षण : होय / नाही

असल्यास

अ.क्र.	प्रशिक्षण	कालावधी	कितीवेळा	ठिकाण
१.	चर्चा सत्र			
२.	कृषि व्यवसाय प्रशिक्षण			
३.	तीन दिवसाचे प्रशिक्षण			
४.	अल्पकालीन प्रशिक्षण			
५.	परिसंवाद			
६.	इतर [नावे]			

१०. जात :

११. पोट हिस्स्यांची संख्या :

१२. खालील विस्तार अधिका-यांना आपण शेतीविषयक समस्याबद्दल किती वेळा भेटी दिल्या.

अ.क्र.	अधिकारी/विस्तारक	रोज	आठवडा	पंधरा दिवस	महिना	नाही
१.	ग्रामविस्तारक					
२.	कृषि अधिकारी					
३.	गट विकास अधिकारी					
४.	उप-विभागीय अधिकारी					
५.	कृषि तज्ञ					
६.	विषय तज्ञ					
७.	बँक कर्मचारी					
८.	औते अवजाराचे वितरक					

१३. सामाजिक सहभागीत्व -

अ.क्र.	संस्थेचे नाव	सदस्य	पदाधिकारी
१.	ग्राम पंचायत		
२.	पंचायत समिती		
३.	जिल्हा परिषद		
४.	शेतकरी संघ		
५.	भुविकास बँक		
६.	सोसायटी / सहकारी संस्था		
७.	भजन मंडळ		
८.	युवक मंडळ		

१४. गेल्या वर्षी घेतलेल्या पिकाची माहिती -

अ.क्र.	हंगाम	पिक	वाण	क्षेत्र
१.	खरीप			
२.	रब्बी			
३.	उन्हाळी			

१५. जोखीम पत्करण्याची क्षमता -

अ.क्र.	विधाने	एकदम मान्य	मान्य	सांगु शकत नाही	अमान्य	एकदम अमान्य
१.	शेतक-याने एका ऐवजी अनेक पिके घेवून एक व दोन पिके घेतल्यानंतर येणारे जोखिम टाळावे					

अ.क्र.	विधाने	एकदम मान्य	मान्य	सांगु शकत नाही	अमान्य	एकदम अमान्य
२.	शेतकरी शेतक-याने कमी जोखमेचा व कमी प्रमाणात जोखिम घेवून कमी फायदा घेण्याऐवजी जास्तीत जास्त फायदा घेण्याची संधी द्यावी.					
३.	जेव्हा शेतक-याला यशाची संपूर्ण माहिती असते व यश निश्चित असते तेव्हा तो जोखिम पत्करायला तयार असतो.					
४.	जे शेतकरी जादा जोखिम घेवू इच्छितात तेशेतकरी सर्वसामान्य पणे सामान्य शेतक-यापेक्षा आर्थिक दृष्टया चांगले असतात.					
५.	जोपर्यंत दुसर इतर शेतकरी एखाद्या पध्दतीचा यशस्वी रित्या अवलंबन करत नाही तो पर्यंत न केल्यास उत्तम.					
६.	शेतक-याने नविन कोणतीही पध्दत शेतीत अवलंबिने म्हणजे जोखिम घेणे होय, परंतु ती फायदेशीर रहात नाही.					

१६. आर्थिक प्रेरणा -

अ.क्र.	विधाने	एकदम मान्य	मान्य	सांगु शकत नाही	अमान्य	एकदम अमान्य
१.	शेतक-याने जास्त उत्पादन व पैसा मिळेल या उद्देशाने काम करावे.					
२.	जो जास्त नफा घेतो तो एक यशस्वी शेतकरी असतो.					
३.	शेतक-याने अधा नविन पध्दतीचा वापर करायला पाहिजे की ज्यामुळे त्याला जास्त नफा होईल.					
४.	शेतक-याने धान्याबरोबर आर्थिक नफा होईल असे पिक घेतले पाहिजे.					
५.	जोपर्यंत शेतकरी आपल्या मुलाला आर्थिक साहाय्य करत नाही तोपर्यंत त्या मुलाला चांगली सुरवात करणे कठिण जाते.					
६.	शेतक-याने पैसा कमवायला पाहिजे पण जिवनातल्या महत्वाच्या गोष्टी म्हणजे आर्थिक नफा नव्हे.					

अ.क्र.	विधाने	एकदम मान्य	मान्य	सांगू शकत नाही	अमान्य	एकदम अमान्य
१.	शेतक-याने जुन्या पध्दतीपेक्षा नवीन पध्दतीने शेती केल्यास ती जास्त परिणामकारक रहाते.					
२.	शेतक-याच्या पुर्वजांनी ज्या प्रकारे शेती केली ती आजसुध्दा चांगली आहे.					
३.	जरी शेतक-याला नविन पध्दती शिकण्याकरिता वेळ लागतो तरी त्याचा काहिच उपयोग होत नाही.					
४.	जर शेतक-याला शेतीचा जास्त अनुभव असेल तर त्याने शेतीत नविन पध्दतीचा वापर करायला पाहिजे.					
५.	चांगला शेतकरी नवनविन युक्त्यांचे आपल्या शेतीत अवलंबन करतो.					
६.	शेतक-यांचे राहणीमान सुधरवण्या-साठी त्याने आपल्या पारंपारिक पध्दतीने चालु असलेल्या शेती पध्दतीत बदल करायला पाहिजे.					

१८. सुधारीत औजारे वापरायचा कल -

अ.क्र.	विधाने	एकदम मान्य	मान्य	सांगु शकत नाही	अमान्य	एकदम अमान्य
१.	सुधारित औजारे वापरल्याने वेळेची व मजूरांची बचत होते.					
२.	मोल्ड बोर्ड नांगर वापरल्याने जमीनीचा पोत बिघडतो.					
३.	सुधारीत औजारे हि त्याच्या फायद्याच्या दृष्टीने स्वस्त नाही.					
४.	मजूराला सुधारलेली औजारे वापरणे कठिण जाते.					
५.	सुधारलेली औजारे ही फक्त मोठया शेतक-यांना फायदेशीर ठरतात.					
६.	सुधारलेल्या अवजाराने जमीनीची मशागत चांगली होते.					
७.	बैलाच्या साह्याने सुधारलेल्या औजारांचा वापर केल्यास बैल अधुंक अशक्त होतात.					
८.	मोल्ड बोर्ड नांगर हा फक्त तने असलेल्या शेतातच उपयोगी आहे.					
९.	सुधारलेली औजारे वापरल्याने पिक उत्पादनात वाढ होते.					
* १०.	सुधारलेली औजारे/मशिन वापरल्याने शारीरीक इजा होण्याची शक्यता असते.					

अ.क्र.	विधाने	एकदम मान्य	मान्य	सांगु शकत नाही	अमान्य	एकदम अ
* ११.	सुधारलेली औजारे वापरण्यास प्रतिकार करणे म्हणजे ठोबळ चूक आहे.					
* १२.	कोरडवाहू शेतीत सुधारलेली औजारे वापरु नये.					
* १३.	सुधारीत औजारे वापरल्याने रोग व किडीस काही प्रमाणात बंदोबस्त होतो.					
* १४.	सुधारलेली औजारे ही मोजक्या पेशात भाड्याने मिळत नाहीत.					

१५. आपण शेती व्यवसायात कोणकोणती अवजारे वापरता.

अ.क्र.	अवजराचे नांव	वापरता काय होय/नाही	संख्या	स्वत: च्या मालकीची	भाड्याने	कोणत्या पिका साठी	पिका चे क्षेत्र	एकण किती पिक क्षेत्रावर वापर केला
१	२	३	४	५	६	७	८	९
१.	नांगर							
	लाकडी							
	लोखंडी							
	फळाचा							
	सरीचा							
	बळीराम							

१	२	३	४	५	६	७	८	९
२	कुळव							
	लाकडी							
	लोखंडी							
	अ•सायन							
	ब•तव्याचा							
	क•नार्वेजियन							
३•	पेरणी							
	तिफन							
	अ•लोखंडी							
	ब•लाकडी							
	क•सुधारित							
	दुफन							
	पूणेरी पेरणी यंत्र							
	ज्योती टोकण यंत्र							
४•	अंतर मशागत							
	अकोला कोळपे							
	जपानी कोळपे							
	फिरते कोळपे							
	कर्जत हात कोळपे							
	लाकडी कोळपे							
५•	पिक संरक्षक							
	अ• डस्टर							
	१•रोटरी							
	२•पावर							
	१•दट्ट्याने चालणारा							
	४•भात्याने चालणारा							
	ब•स्प्रेअर							
	१•हात पंप							
	२• बादलीतील पंप							

पुढे चा

१	२	३	४	५	६	७	८	९

३ • नॅपसॅक स्प्रेअर

४ • कॉम्प्रेशन स्प्रेअर

५ • रॉकिंग स्प्रेअर

६ • फूट स्प्रेअर

७ • मोटावरील स्प्रेपंप

८ • डस्टर स्प्रेअर एकत्रित

९ • सीड ड्रेसर

३ • पाणिपुरवठा

१ • मोट

२ • लोखंडी रहाट

३ • डिझेल इंजिन/
विजेची मोटर

४ • टरबाईन पंप

४ • कापणी

१ • कॉटन पूलर

२ • विळा

३ • कापणी यंत्र

५ • मळणी

१ • दगडी/लाकडी रूळ

२ • पावर ट्रेसर

३ • ओलसाड गहू
मळणी यंत्र

६ • उफणणी:

१ • धान्य उफणण्याचा
पंखा

२ • उपनेर

३ • महासोळणी यंत्र

पुढे चालू••

१	२	३	४	५	६	७	८	९

१०• वाहतूक

१• ट्रॅक्टर

२• ट्रक

३• बैलगाडी

११• इतर औजारे

१• कुदळी

२• फावडे

३• तिकास

४• सब्बल

५• कोयता

६• चाफकटर

७•

८•

९•

१०•

२०• आपल्या जवळील असलेल्या अवजाराची दुरुस्ती आपण कोठून करता•

अ• जवळच्या गावातील सुताराकडून किंवा लोहाराकडून

ब• कृषि सेवा केंद्रातील तज्ञाचा सल्ला घेवून

क• वर्ष शाप

ड•

२१• आपल्याला सुधारित औजारे वापरतांना कोणत्या अडचणी येतात•

१• सुधारित औजारे विकत घेण्यासाठी बँकेतून कर्ज वेळेवर मिळत नाही•

२• कर्ज मिळण्याची पध्दत फार किचकट आहे•

३• कर्जावरील व्याज जास्त आहे•

४• औजारांच्या किंमती जास्त आहेत•

५. औजारे बाजारात आल्याबरोबर विकल्या जातात, त्यामुळे विक्त घेवू शकत नाही.

६. औजारे पाहिजे तितकी व वेळेवर बाजारात मिळत नाहीत.

७. सुधारलेली औजारे जवळपासच्या खेड्यात भाड्याने मिळत नाहीत.

८. सुधारित औजारांची तांत्रिक ज्ञान नाही.

९. पैशाच्या अभावामुळे

१०. सुधारित औजारे दुरुस्त करण्याची सोय नाही.

११. विद्युत प्रवाहात नेहमी खंड पडल्यामुळे काम करणे कठिण जाते.

१२. सुधारित औजाराचे सुटे भाग बाजारात मिळत नाहीत.

१३. जमीन कमी असल्यामुळे औजारे वापरणे परवडत नाही.

१४. सुधारित औजारांच्या वापरामुळे घरातील व्यक्तींना काम मिळत नाही.

१५.

१६.

२१) वरील अडचणीचे नियंत्रण करण्याकरिता आपण काय सुचना कराल.

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