ADOPTION OF RECOMMENDED CULTIVATION PRACTICES BY GRAPE GROWERS

THESIS

Submitted to
Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola
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By

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DECLARATION OF STUDENT

I hereby declare that the experimental work and its interpretation of Thesis entitled **"ADOPTION OF RECOMMENDED CULTIVATION PRACTICES BY GRAPE GROWERS"** or part there of has neither been submitted for any other Degree or Diploma of any University, nor the data have been derived from any thesis or publication of any University or scientific organization. The sources of materials used and all assistance received during the course of investigation have been duly acknowledged.

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CERTIFICATE

This is to certify that the thesis entitled **"ADOPTION OF RECOMMENDED CULTIVATION PRACTICES BY GRAPE GROWERS"**, submitted in partial fulfillment of the requirement for the degree of "**Master of Science in Agriculture (Extension Education)**" of Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola is a record of bonafide research work carried out by **Shrikisan Bajirao Thakare** under my guidance and supervision.

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

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(A) List of Tables

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(D) Abbreviations

%	-	Per cent
Agri.	-	Agriculture
Educ.	-	Education
et al.	-	Et alia (and others)
Extn.	-	Extension
Fig.	-	Figure
ha	-	Hectare
i.e.	-	That is
J	-	Journal
Res.	-	Research
Rs.	-	Rupees
viz.,	-	Namely
AD	-	After decayed
NGO's	-	Non government organization
FYM	-	Farm Yard Manure

(F) THESIS ABSTRACT

a.	Title of thesis	:	**"ADOPTION OF RECOMMENDED CULTIVATION PRACTICES BY GRAPE GROWERS"**
b.	Name of student	:	**Shrikisan Bajirao Thakare**
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ABSTRACT

The study entitled, "Adoption of recommended cultivation practices by grape growers" was purposively conducted in Chikhali Panchayt Samiti of Buldhana district of Vidarbha for present study, 150

farmers were selected from 15 village by using random sampling method. The main objective to study the adoption of recommended cultivation practices by grape growers was ascertained by using exploratory design of social research.

From the respondents, data were collected by personally interviewing with the help of pretested and well structured interview schedule. Thus, data was collected and subjected to appropriate statistical analysis.

The findings of the present investigation indicate that majority of the respondents were included in the middle age group, middle education school level, respondents had medium experience level in grape cultivation, maximum per cent of the respondents belonged to medium land holding level. Most of the number of grape vines in orchard were low level of category, most of the respondents had annual income between Rs. 500001 to 10,00,000 the respondent had belonged to very high level of socio-economic status in the village community, respondents were high level sources of information, most of the respondents had belonged to medium level of social participation, innovativeness and economic motivation, maximum per cent of the respondents under high level of risk preference.

Over half of the respondent possessed medium level of knowledge about recommended grape cultivation practices.

Majority of the respondent had low adoption level about recommended package of practices for grape cultivation.

The findings of correlation analysis revealed that, the characteristics such as experience in grape cultivation, size of orchard benefits availed, socio-economic status, sources of information, social participation, innovativeness, economic motivation and risk preference were positive and highly significantly correlated with knowledge of growers and only education was significantly correlated with knowledge of grape

growers. Whereas, age, land holding and annual income were non-significantly correlated with knowledge of grape growers.

Among the characteristics viz., education benefits availed, socio-economic status, source of information, innovativeness, economic motivation, risk preference, knowledge were positive and highly significant and positive relationship with adoption of recommended grape cultivation practices. Experience in grape cultivation and size of orchard were positive and significantly correlated with adoption of grape growers. How ever, age, land holding, annual income and social participation had non significant relationship with adoption of recommended grape cultivation practices.

The main constraints in adoption of recommended cultivation practices of grape crop were shortage of fertilizers, high cost of fertilizers shortage of irrigation water, problems in identification of disease and pest, high cost of pesticides and fungicides, jumbling while selecting pesticides and fungicides, high wages of labour, non-availability of labours at the time of pruning, thining and dipping go grape bunches in GA, in technical constraints lack of knowledge about recommended technology, fertilizer management plant protection measures, use of different plant growth regulators and timely guidance, in financial constraints were inadequate sources of finance, short of capital and no-availability of money in time, in marketing constrains low rates of grape fruit, fluctuation in market rates, late auction sale of raising in market and no guarantee of payment received from merchants were observed under the present study.

CHAPTER I

INTRODUCTION

1.1 Background information

Grape cultivation is one of the most remunerative farming enterprises in India. Grape is grown under a variety of soil and climatic conditions in three distinct agro climatic zones, namely, sub-tropical, hot-tropical and mild-tropical climatic zones in India. The botanical name of grape is *Vitis rinifera* L. family vitaceae and origin *Armenia,* near the Caspian sea.

The grape (*Vitis vinifera* L.) is one of the most remunerative horticultural crops occupying largest area among fruit crop in the worlds fruit production. The world production of grape is 57410.00 thousand metric tones and the area under grape is 7669 thousand hectares. The major grape producing countries are Italy, France, Spain, USA, Chile, South Africa (Anonymous, 2000).

In India total area under grape is 0.40 lakh hectares and annual production is 12 lakh metric tones (Anonymous, 2001). The major grape growing states are Maharashtra in the West, Karnataka, Andhra Pradesh and Tamil Nadu in the South and Punjab, Haryana and Western Uttar Pradesh in the north.

In Maharashtra area under grape is about 39,000 hectors and annual production is about 896000 metric tones per year (Anonymous, 2006). At present the cultivation of grape is mostly concentrated in five districts namely, Nashik, Sangli, Solapur, Pune and Usmanabad.

In Maharashtra viticulture industry is based on prominent commercial varieties of grape namely Thompson seedless, Sharad seedless. Tas-e-ganesh, Maru, Sonaka, Manikchaman and Banglore purple.

The cultivated grapes are believed to have been introduced in to the north India by the Persian invaders in 1300 AD, from where they were introduced into the South (Daulatbad in Aurangabad district of Maharashtra) during the historic event of changing the capital from Delhi to Daulatabad by King Mohammed-bin-Tughlak. Ibn Batata, a Moorish traveler who visited Daulatabad in 1430 AD, reported to have seen flourishing vineyards in South India. Grape was also introduced in the South in Salem and Madurai district of Tamil Nadu by the Christian missionaries around 1832 A.D. and in Hyderabad province by HEH, the Nizam of Hyderabad in the early part of the 20th Century. From Delhi, Daulatabad, Madurai, Salem it was spread in different parts of the country.

The by products from grapes are rasins, sweet juice, beverages, wine, dry fruits, manuka, kismis rasins etc which are the only processed products in India. Grape juice is rich in vitamin B and is a good source of vitamin C, the juice contains fruit sugar, fruit acid, minerals like calcium, phosphorus and iron, which play the role of health promoting ingredients in human diet. The juice is used on a large scale for preparing wine.

The soil and climate in Vidarbha region is very congenial for grape cultivation but due to unawareness of cultivators it is not grown under large area although area under grape is rapidly increasing in particular region. Fruit production is less because of lack of proper resource management and use of the traditional methods of cultivation. So in order to boost up the production within the available range of resources farmers need to adopt new techniques.

In our country fruit production is less because of use of lack of recommended cultivation practices like use of improved varieties, optimum use of manures and fertilizers, irrigation management, water harvesting techniques, use of plant growth regulators, training and pruning of fruit plants and protection against adverse weather along with the control of diseases and pests. Efficient

management of these can substantially increase fruit production (Singh, 1992).

1.2 Need and importance of study

Grape is equally predominant fruit crop of Maharashtra state. The area, production and yield per hectare of grape in Maharashtra during the year 1998-99 was 27000 hectares, and production was 682.4 metric tones per hectare. The important districts of Maharashtra, which cultivate grapes, are Nashik, Sangli, Jalgaon, Solapur, Pune, Satara and Buldhana.

In Buldhana district where the recent study has been conducted, grape cultivation covers an area of 185 hectare with production of 3750 tonnes and productivity 22 tonnes per hectares during 2006-07, which is less than average yield of Maharashtra (25.3 tonnes per hectare).

The area under grape is increasing day by day but its average yield is comparatively very low considering the other district of Maharashtra. The various cultural practices and other scientific techniques of grape production area not followed by the cultivators as a result per hectare yield of grape have not reached to its maximum level. It was therefore felt necessary to undertake the present study with the following specific objectives.

1.3 Objectives of the study

1. To study the personal, situational, socio-economic, communication and psychological characteristics of grape growers.
2. To study the extent of knowledge and adoption of recommended grape cultivation practices by the grape growers.
3. To study the relationship between selected characteristics of the grape growers with their knowledge and adoption of recommended grape cultivation practices.
4. To study the constraints encountered by the grapes growers in adoption of grape cultivation practices.

1.4 Scope and limitations

Grape is one of the most important fruit crops next to Banana in Vidarbha. The average production of grape is very low in Vidarbha as compared to other parts of Maharashtra. The desired target of production can only be achieved when majority of the farmers are motivated to adopt the new agriculture techniques. These new agricultural techniques could be useful for increasing the production of grape per hectare and by helping the farmers in reducing per hectare cultivation cost in order to increase their profit.

It is observed that the farmers in the selected area do not follow improved package of practices of grape cultivation. This particular study has been planned to know the level of knowledge and adoption about improved cultivation practices of grape cultivation and the constraints faced by the farmers in adoption of these practices.

The present study was confined to investigate the knowledge, adoption and constraints faced by the grape cultivators in Chikhali Tahasil of Buldana district.

Being a students research project study had been carried out with the following limitations.

1. This study has been conducted in only one Panchayat Samiti of Buldhana district. This being student research project time, money and some other resources do not permit to cover large area.
2. The major limitation is that the study has been conducted in limited area in Chikhali panchayt samiti. These findings are based on responses of only 150 growers having bearing orchards of grape. The results are therefore only applicable to the situation similar to this study area.

3. The findings of this study were based on the opinion expressed by the respondents. Therefore, its objectivity would be limited to the opinion expressed by them.

1.5 Hypothesis

Keeping the objectives of the study in view the following research hypothesis was framed and tested. While formulating the hypothesis the nature of relationship between the variables was determined on the basis of the review of literature. The hypothesis are set up and presented in the null form (H_0).

Ho: There is no significant relationship between the selected personal and socio-economic, psychological and situational characteristics of the grape growers and knowledge about recommended cultivation practices of grape.

Ho: There is no significant relationship between the selected personal and socio-economic, psychological and situational characteristics of the grape growers and adoption of recommended cultivation practices of grape. .

CHAPTER II

REVIEW OF LITERATURE

An exhaustive review of literature is essential in any research endevour. It makes the researcher up to date with the theoretical knowledge and findings of research topic in the field of investigation. Also, review of past literature makes the researcher aware about the methods, procedures and techniques available and used as well as the outcome and conclusions of the past studies. It provides clues and guidance about the research relevance with the topic under study. The review so colleted are presented in this chapter under the following main heads.

2.1 Reviews related to independent variables

2.2 Reviews related to dependent variables

2.3 Review related to constraints

2.1 Reviews related to independent variables

The set of independent variables includes age, education experience in grape cultivation, land holding, size of orchard, benefits availed, annual income, socio-economic status, sources of information, social participation, innovativeness, economic motivation and risk preference. The reviews of past studies pertaining to these variables have been presented below.

2.1.1 Age

Geete (1999) it is seen that young mango growers in the sample were less in number than their number in middle and old category.

Patil and Waghadhare (1989) found that, age was significantly associated with the adoption of banana cultivation technology.

Prajapati (1989) revealed that, majority of the banana growers were in middle age group.

Bhople (1995) observed that, age had highly significant but negative relationship with information management behaviour of the orchandist.

Farpat (1997) found that, majority of the banana growers (58.40 %) were in the age of 31 to 45 years.

Mahajan (2000) found that, majority of banana growers (65.00 %) were in middle age group ranging from 36 to 50 years.

Ramshetwad (2001) revealed that, majority of the banana cultivars (50.83 %) belonged to young age group ranging upto 35 years, followed by 35.83 per cent appeared in middle age group ranging from 36 to 50 years.

More (2002) found that, majority of the banana growers (40.00 %) were in middle age group, followed by 37 per cent and 23 per cent in young and old age group respectively.

Gangurde (2003) reported that, majority of the respondents (53.33 %) growing banana belonged to middle age group i.e. 36 to 50 years and 28.33 per cent belonged to young age category ranging upto 35 years.

Raju and Reddy (2003) reported that, age had a positive and non-significant relationship with the information source of the farmers.

Ajaykumar *et al.* (2006) observed that, there was a negative and significant relationship between age and information input behaviour of wheat growers in irrigated tract of Haryana.

2.1.2 Education

Mahajan (2000) revealed that, education of respondents was positively and significantly related with knowledge and adoption of banana cultivation practices.

Chikhale, Deshpande and Thakare (1996) found that education had positive and significant relationship with adoption of orange production technology.

Kharat (1996) found that there was positive and significant relationship between education level of grape growers and adoption.

Ahire (1997) found that there was positive and significant relationship between education level of grape growers and adoption behaviour.

Geete (1999) the maximum mango growers belonged to medium educational level and the percentage of highly educated respondents in the sample was observed to be 21.33 per cent and one third of the mango growers having low education.

Kubde and Kulkarni (1986) reported that the educational level of the farmers and their insecticides use were positively and significantly associated. It was also found that majority of farmers were illiterate and educated up to primary level.

Karale (2006) found that 33.34 per cent of the respondents were educated upto graduate level. It was followed by those (23.33) who were educated upto high school. Relatively less proportion of the respondents (14.16 %) had attended primary and secondary school. None of the respondents were illiterate.

Thus, it could be inferred that majority of the respondents were educated upto graduate level.

Prajapati (1989) observed that, education upto primary level was dominant character of banana growers and also found significant relationship between education and input use behavour.

Patel *et al.* (1993) reported that, education had significant association with communication sources utilization pattern of farmers in progressive and non progressive villages.

Mahajan (2000) revealed that, maximum percentage (29.30 %) of the banana growers had education upto high school level, followed by 28.00 per cent upto college level.

Ramshetwad (2001) found that, majority of the banana growers (58.33 %) were educated upto college level, followed by 23.33 per cent educated upto high school level.

Fulzele *et al.* (2003) observed that, formal education had significant relationship with the agricultural information utilization by the farmers of rainfed area.

Gangarde (2003) found that, half of the respondents (50.83 %) growing banana were educated upto college level and 25.83 per cent were educated upto high school level.

Raju and Reddy (2003) revealed that, there was a positive and significant association between education and information management behaviour of the farmers.

Ajaykumar *et al.* (2006) observed that, there was a negative and significant relationship between education and information input behavour of wheat growers.

2.1.3 Experience in grape cultivation

Bhople (1995) observed that, farm experience did not show any significant relation with regards to information management behaviour of the orchardist.

Farpat (1997) revealed that, one half of the respondents growing banana had 3 to 5 years experience in banana cultivation.

Bhosale (2003) revealed that, 58.13 per cent of the pomegranate growers had experience of 7 to 11 years while 21.25 per cent of them had experience below 6 years. The 20.62 per cent of the pomegranate growers had experience of over more than 12 years.

Mahajan (2000) found that majority of the banana growers (60.00 %) were having 11 to 20 years of experience in banana

cultivation, followed by 25.30 per cent having experience upto 10 years in banana cultivation.

Rameshetwad (2001) reported that, majority of the banana growers (39.16 %) had experience of 6-10 years.

Fulzele *et al.* (2003) observed that, farm experience had shown a significant relationship with information utilization by the farmers.

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

Karale (2006) observed that maximum percentage of the grape growers (80.33 %) were having 3.01 to 10.00 years of experience in grape cultivation. As much as 5.84 per cent of grape growers were found to be engaged in grape cultivation from 3.00 years. About one fifth (13.33) of grape growers were experienced in grape cultivation for more than 10.00 years.

Yeole (1968) observed non-significant relationship between farming experience and adoption of recommended practices.

Phadtare (1986) studied that a majority of the grape growers had less than five years experience in grape garden while 35.00 per cent of the cultivators had 6 to 10 year experience.

Bhosale (2003) revealed that 58.13 per cent of the pomegranate growers had expeinrce of 7 to 11 years while 21.25 per cent of them had expeirnece below 6 years. The 20.62 per cent of the pomegranate growers had experience of more than 12 years.

2.1.4 Land holding

Anchule (1996) observed that, 64.16 per cent of grape growers had 2.01 to 6.00 hectares of lands. 19.20 per cent of the respondents had upto 2 hectares land while 15.48 per cent of the respondents possessed above 6.00 hectares of land.

Patel *et al.* (1993) revealed that there was a non-significant relationship of land holding with communication sources utilization pattern of farmers in progressive and less progressive villages.

Mahajan (2000) revealed that, majority of the banana growers (36.70 %) were possess medium size of land ranging between 4.01 to 10.00 ha followed by 29.30 per cent having large size land holding above 10.00 hacatres.

Ramshetwad (2001) reported that, majority of the banana growers (86.60 %) possessed medium land holding between 2.01 to 10.00 hectares.

Fulzele *et al.* (2003) found that, there was no relationship between land holding and agricultural information utilization by rainfed area farmers.

Gangurde (2003) revealed that, majority of the respondents growing banana (57.50 %) were in medium category of land holding possessing land between 2.01 ha to 10 hectares.

Raju and Reddy (2003) reported that, farm size had shown positive relationship with information management behaviour of farmers.

Ajaykumar *et al.* (2006) found that, there was a negative and significant relationship between land holding and information input behaviour of wheat growers in irrigated tract.

Geete (1999) observed that the percentage of low land holders was 54, whereas the medium land holders was 32.67 per cent and the number in high land holding category was much less (13.33 %) as compared to low and medium categories.

Anchule (1996) observed that 64.16 per cent of grape growers had 2.01 to 6.00 hectares of land and 19.20 per cent of the respondents possessed above 6.00 hectares of land.

Nimje (1993) found that more than half (54 %) of the orchardists possessed land holding between 2.01 to 4.00 hectares.

Karale (2006) observed majority of the respondents (49.17 %) possessed medium land holding, followed by 37.67 per cent having semi medium land holding. The respondents found in large, small and marginal category of land holding were 12.50 per cent 3.33 and 3.33 per cent, respectively. Thus, it can be concluded that majority of the respondents possessed medium land holding.

2.1.5 Size of orchard

Prajapati (1989) reported that, majority of the respondents had medium size of land of land under banana cultivation.

Mahajan (2000) revealed that, majority of the banana growers (63.30 %) had an area between 1 to 3 hectares under banana cultivation.

Ramshetwad (2001) observed that majority of the banana growers (80.83 %) were having banana orchard in between 0.5 to 2 hectares area.

More (2002) found that, majority of the tissue culture banana growers (52.00 %) had an area in between 1.1 to 2.0 hectares under banana crop, followed by 32.00 per cent having an area upto 1.0 hectares under banana crop.

Gangurde (2003) reported that, majority of the banana growers (51.66 %) had 0.6 to 1 ha area under banana cultivation, followed by 35.00 per cent of them having more than 1 ha of area under banana crop.

Ramshetwad (2001) concluded that, majority of banana growers (39.16%) had put 0.5 to 2 hectares area under banana crop.

Karale (2006) found that the respondents (51.66 %) possessed medium size of orchard followed by small (38.34 %) and large (10.00 %) size of bearing grape orchards. Thus, it is inferred that

majority (51.66 %) of grape growers had moderate size of bearing grape orchard.

2.1.6 Benefits availed

Adhiguru *et al.* (1996) revealed that, 31.00 per cent of farmers had low level of utilization, 18.00 per cent have medium level of utilization. It was further revealed that cent per cent of the beneficiaries had utilized the subsidies on seeds and plant protection chemicals. Seed treating chemicals on subsidy was utilized by exactly one fourth of them. Only very selender percentage (5.00 and 3.00 per cent) of them utilized subsidy on sprayer and power tiller, respectively.

Mankar (1997) while evaluating the Agricultural Development Schemes Implemented through PRI's observed that only 52.00 per cent respondents had moderate level of actual benefits received and 29.33 per cent respondents had low level of actual benefits received. Only 18.66 per cent respondents had received the actual benefits at higher levels.

Jaiswal and Singh (1996) reported that the TIDP benefits were received by 74.37 per cent respondents in the form of possession and utilization of agricultural inputs like implements, soil conservation work, wells for irrigation and diesel pumps however the level of utilization of benefits varied from 55.78 to 100 per cent

Shevkari (1996) reported that in the evaluation of Government schemes for triable noted that the benefits of inputs was taken by only 10 per cent triables.

Sawswakade (1998) found that majority of the respondents (65 per cent) have availed benefits of various agricultural development schemes upto medium extent. As such as 19.33 per cent respondents were in high category of extent of benefits relatively less respondents (6.67 %) were found to be lower category of extent of benefits availed from agricultural development schemes. The extent benefits availed by triable farmers in general was therefore poor and

varies from individual depending upon other factor and thee characteristics.

Bindu (2001) observed that majority of the respondents (77.33%) have availed complete benefits from the Jawahar well scheme. Nearly (22.67%) of the respondents had availed partial benefits from the schemes.

2.1.7 Annual income

Prajapati (1989) observed that there was a significant relationship between the annual income of banana growers and their information input and information use behavour.

Jayale and Nachane (1994) clearly indicated that, annual income found to be positive and significantly correlated with the adoption of recommended practices of citrus crop.

Bhople (1995) revealed that, annual income of the orchardist had a significant relationship with information management behavour.

Ramshetwad (2001) revealed that, annual income of the majority of the banana growers (55.83 %) were in medium category Rs. 1 lakh to 2 lakhs.

Thakare (2002) found that, annual income of the orange growers had non-significant relationship with information seeking behaviour.

Fulzele *et al.* (2003) reported that, family income had shown significant relationship with the agricultural information utilization.

Gangurde (2003) revealed that, majority of the banana growers (45.00 %) had annual income in medium category i.e. 1 to 2 lakhs and 25.83 per cent had income upto 2 to 3 lakh.

Ajaykumar *et al.* (2006) found that, there was a positive but non-significant relation between annual income and information input behavour of wheat growers in irrigated tract of Haryana.

Chiprikar (1988) revealed that 67.37 per cent of grape growers annual income was ranging between Rs. 10,000 to 50,000 /-. While 24.94 per cent and 7-89 had the annual income between Rs. 51,000 to 2,00,000 and Rs. 2,00,001 to 4,00,001, respectively.

Geete (1999) found that 61 per cent of the respondents had low annual income and about 17 per cent of them had high annual income followed by about 23 per cent belonging to medium income group. It was therefore revealed that majority of the mango growers belonged to low income group.

Chikhale, Deshpande and Thakare (1996) observed that majority of the orange growers (51.50 %) were in high annual income category (above Rs. 45,000) followed by 34.00 per cent of the respondents in low income category (upto Rs. 30,000) and remaining 14.50 per cent of respondents in medium income category.

2.1.8 Socio-economic status

Bhople (1995) reported a negative and significant association between socio-economic status and information management behavior of orchardist.

Dahake (1996) reported that, more than half (53.00%) of the orange growers were having high socio-economic status.

Mahajan (2000) observed that, majority of the banana growers (46.70 %) were in upper-middle category of socio-economic status followed by 43.30 per cent in middle socio-economic status category.

Fulzele *et al.* (2003) revealed that, socio-economic status had not shown any relationship with agricultural information utilization by rainfed area farmers.

Gargurde (2003) reported that, most of the banana growers (49.16 %) had middle socio-economic status, followed by 26.66 per cent had upper position in socio-economic status category.

Ajaykumar *et al.* (2006) reported a positive and significant relationship between socio economic status and information input behaviour of wheat growers.

Nimje (1993) found that more than three - forth of the respondents (78 %) possessed moderate status socially and economically.

Karale (2006) found that majority of the grape growers (65.00 %) were found to be in medium category of socio-economic status, followed by 16.67 per cent of grape growers in low level and 15.00 per cent in high level of socio-economic status. Only 3.33 per cent in of grape growers were having very high level of socio-economic status.

Geete (1999) found that the majority of respondents (i.e. 54.67 %) in the sample belonged to belonging to low socio-economic status and only 13.33 per cent belonging to high socio-economic status.

2.1.9 Sources of information

Jayale and Nachane (1994) found that, there was significant relationship between sources of information used by mango and citrus growers and their level of adoption.

Karale (2006) observed that majority of the respondents (61.67 %) were having medium level of exposure to different sources of information about grape cultivation. About one fourth (28.33 %) of the respondents were having lower exposure to different sources of information. Only (10.00 %) of the respondents had high exposure to various sources of information for seeking information about grape cultivation. Thus, it could be inferred that majority of the grape growers

utilized various sources information to a medium level for getting information and guidelines about grape cultivation.

2.1.10 Social participation

Shrinivasa Reddy (1995) reported that, there was no significant relationship between the social participation and knowledge level of mango growers in Kolar district.

Prajapati (1989) reported that a significant association between social participation and information input and behaviour.

Chaudhary (1990) revealed that, social participation had positive and significant relationship with information gain and utilized by the farmers in Vidarbha.

More (2002) revealed that, most of the (82.00 %) farmers cultivating banana were having medium level of social participation and 14.00 per cent of respondents had low level of social participation.

Fulzele *et al.* (2003) found that, social participation had not shown any relationship with agricultural information utilization by rainfed area farmers.

Gangurde (2003) observed that, majority of the banana growers (50.83 %) had low level of social participation and 26.66 per cent were having medium level of social participation.

2.1.11 Innovativeness

Chaudhary (1990) reported that, majority of the farmers (56.00 %) in Vidarbha had medium level of innovativeness and 30 per cent were lacking in innovativness and 30 per cent were lacking in innovativeness.

Bhople (1995) reported that, majority of the orchardist (62.50 %) fall in medium level of innovativeness followed by 19.16 per cent and 18.34 per cent found to be in low and high levels of innovativeness respectively.

Raju and Reddy (2003) revealed that, innovativeness of the farmers had shown a positive and significant association with information source of the farmers.

Ajaykumar *et al.* (2006) observed that, there was a positive and significant relationship between innovativeness and information input behaviour of wheat growers.

2.1.12 Economic motivation

Bhople (1995) found that, there was a highly significant relation between economic motivation and information management behaviour of the orchardist.

Farpart (1997) revealed that, majority of the respondents (51.20 %) cultivating banana were in medium category of economic motivation.

Mahajan (2000) reported that, majority of the banana growers (69.30 %) were belonged to medium economic motivation, followed by 16.70 per cent low and 14.00 per cent had higher economic motivation.

Thakare (2002) revealed that, a big majority of the orange growers (71.66 %) were belonging to medium level of economic motivation and also reported a non-significant association with information seeking behavour.

Fulzele *et al.* (2003) reported that, there was not any relationship between economic motivation and information utilization by the farmers of rainfed area.

Gangurde (2003) revealed that, majority of the respondents (65.83 %) growing banana were belonging to medium economic motivation and 18.33 per cent had low economic motivation, followed by only 15.83 per cent having high level of economic motivation.

Raju and Reddy (2003) found that, economic motivation had a positive and significant association with the information management behaviour of the farmers.

Geete (1999) 53.3 per cent of the sample respondents possessed medium economic motivation level followed by 26.67 per cent having low economic motivation level and only fifth of the respondents having high economic motivation level.

2.1.13 Risk preference

Geete (1999) while studying the risk preference observed that a large number of respondents (i.e. 59.33 %) belonged to medium risk preference category level and only 15.33 per cent were having high risk preference level.

Salame (2000) noted that, majority of the respondents (65.33 %) preferred to take moderate risk involved in chilli cultivation and it was found positively and significantly correlated with knowledge about chilli cultivation

Kausadikar et al. (2002) reported that risk preference had positive and significant relationship with attitude of farmers towards horticultural development programme.

Bhosale (2003) found that more than half (53.33 %) of the farmers had possessed medium risk preference level whereas 29.37 per cent of respondents orange growers had high risk preference group while only 17.33 per cent of respondents farmers had possessed low risk performance.

Patel (2003) found that majority of the respondents (62.00%) preferred to take moderate risk involved in chilli cultivation followed by 23.33 per cent and 14.67 per cent of respondents preferred to take risk had low and high category respectively.

Ajaykumar et al. (2006) observed that, a positive and highly significant relationship between risk preference with information input behaviour of wheat growers.

2.2 Reviews related to dependent variables

2.2.1 Knowledge

Nimje (1993) observed that, higher production (59.33 %) of the orchardist possessed medium level of knowledge, 27.33 per cent orchardists belonged to high category of knowledge and 13.14 per cent i.e. very low respondents were in the low category of knowledge regarding recommended cultivation practices of orange.

Walke et al. (1995) revealed that 47.33 per cent of the respondents had medium level of knowledge followed by 27.33 per cent possessing high level of knowledge and 25.34 per cent of the respondents having low level of knowledge respectively about banana cultivation.

Mahajan (2000) reported that, majority of the banana growers (64.00%) found to have adopted recommended practices of banana upto medium extent.

Patil (2000) found that, majority of the respondents had medium level of knowledge about tissue culture banana cultivation.

Pawar (2001) reported that, majority of farmers had complete level of knowledge about tissue culture technique of banana.

More (2002) reported that, banana growers had medium level of knowledge regarding banana cultivation.

2.2.2 Adoption

Mahajan (2000) found that 64.00 per cent of banana growers adopted recommended practices of banana upto medium extent.

Patil (2000) revealed that majority of the banana growers had a moderate adoption of tissue culture practices of banana cultivation.

Pawar (2001) reported that most of the banana growers found to have adopted the recommended practices of tissue culture banana.

Rameshetwad (2001) found that majority of the banana growers 65.83 per cent had medium level of adoption of plant protection measures in banana. Only 23.34 per cent of them found in high category of adoption.

2.3 Reviews related to constraints

Girnale (1987) observed that, the chilli growers faced constraints like non availability of irrigation, deterioration of quality of chilli due to delay in picking, non availability of disease resistance varieties, non availability of improved seed in time, non availability of labour, lack of scientific knowledge about cultivation practices, high cost of improved variety. Seed, fertilizer and insecticides, high wages and less prices of dry chillies in the market etc were expressed by the farmers in adoption of recommended practices.

Pande and Narayanmurthy (1991) stated that, lack of finance, inadequate and untimely supply of input and inadequate irrigation were the measure constants in adoption of agricultural innovation.

Sinha *et al.* (1991) observed that lack of knowledge about cultivation of fruit crops was the major constraints in adoption of dry land horticulture to 58.57 per cent trial farmers. Similarly, half of the respondents expressed that poor economic motivation was important constraints in this regard.

Chikhale (1993) found that, majority of orange growers (69.00 %) encountered the constraints namely exorbitant prices of fertilizers, FYM, application and plant protection chemicals, irregular supply of electricity, lack of technical advice and guidance about cultivation of orange crop, lack of finance, lack of skilled labour and higher wage rates.

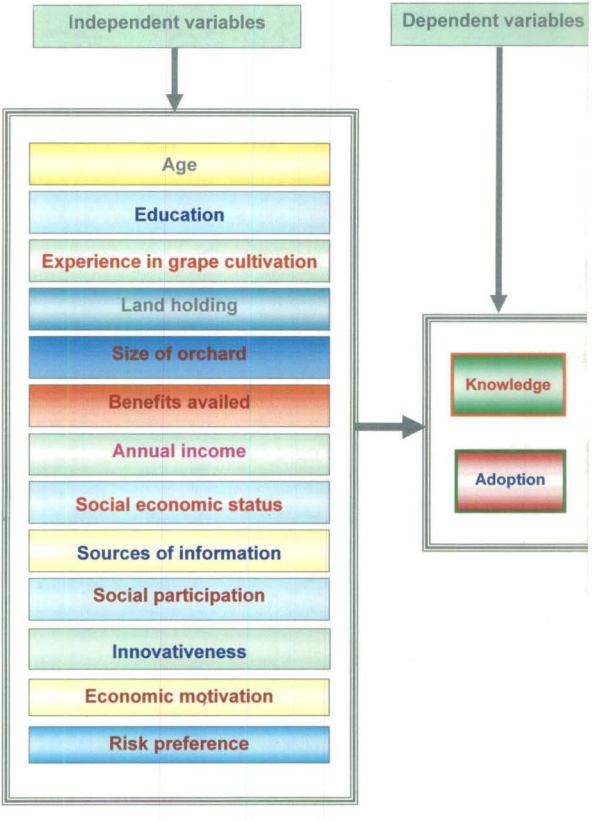


Fig. 1 : Conceptual Model of Study

CHAPTER III

METHODOLOGY

This chapter deals with methods and procedures used in the present study. It also includes introduction of the study area and information regarding different techniques used while conducting this research study. The chapter has been presented under the following subheads.

3.1 Research design
3.2 Locale of study
3.3 Sample and sampling procedures
3.4 Preparation of interview schedule
3.5 Collection of data
3.6 Variables and their measurements
3.7 Operationlization and categorization of variables
3.8 Tabulation and analysis of data

3.1 Research Design

An exploratory research design of social research was used for the present investigation.

3.2 Locale of study

This study was conducted in Chikhali Panchayat Samiti of Buldhana district in Vidarbha Region of Maharashtra state having more concentration on grape cultivation in this Panchayat samiti (185 hacatres).

Chikhali is situated to south side of Buldhana at a distance of 35 km. The Geographical area of Chikhali Panchayat samiti is 113986.22 hectares out of which area under cultivation is 92221 hectares.

The soil of this Panchayat samiti varies from medium to heavy. The annual rainfall ranges from 650 to 800 mm, which mostly

receives during June to September. The major crops grown in this Panchayat samiti are cotton, sorghum, red gram, soybean, wheat etc. besides these agronomic crops, horticultural crops like guava, lime and pomegranate area also grown. Out of total area under cultivation i.e. 92221 hectares, approximately 185 hectares area is under grape cultivation.

3.3 Sample and sampling procedure

The sampling plan adopted for this research study has been delineated in the succeeding paragraphs.

3.3.1 Selection of Panchayat Samiti

The purposive selection of Chikhali Panchayat Samiti was made on the basis of larger area under grape in the district. The area under grape in Chikhali Panchayat Samiti was about 185 hectares during 2006-07.

3.3.2 Selection of villages :

The list of villages having cultivation of grape was obtained from Buldhana district grape association Chikhali. Out of these 15 villages were purposively selected on the basis of large area under grape. The villages selected were namely, Chikhali, Sawrgaon (Dukare). Chandhai, Palaskhed (Daulat), Kavala, Mangrul (Navghre), Waghapur, Divthana, Amdapur, Undri, Godri, Shelgaon atoll, Mangrula (Isrul), Malshemba and Peth.

3.3.3 Selection of respondents

A list of grape growers whose orchards were in bearing stage was prepared from each selected village and all these grape growers were selected as Universe or population for study. Thus, in all 150 orchardists constituted population for study.

3.4 Preparation of interview schedule

In line with the objectives of the study, a structured interview schedule was prepared. It included questions pertaining to the different personal, social, economic, situational and psychological

independent variables. Another part of the schedule consists of the questions regarding adoption of recommended cultivation practice and the dependent variables. At the end, constraints faced by the grape growers in adoption of recommended cultivation practices of grape orchards were included to elicit the responses of grape growers.

The schedule was finalized after reviewing the relevant literature and discussion with the members of the advisory committee.

3.5 Collection of data

The data were collected by personally interviewing the grape growers selected, at their home or at work place.

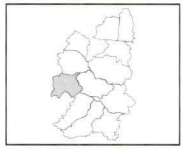
For any study to be undertaken in social science id is customary to explain precisely the variables selected with their connection. The variables selected for this study along with its operational definitions and procedures employed to measure them are delineated as under.

3.6 Variables and their measurements

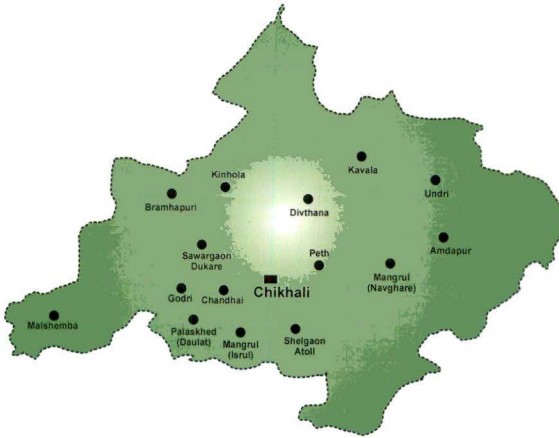
The variables selected for the study and the procedure adopted for their measurement are explained in Table 1 For the measurement of variables standardized scales were used wherever available and where they were not available schedule were developed.

The empirical measures used in the present study are given in Table 1.

Sr. No.	Variables	Empirical measures
1	Age	Chronological age of farmer in completed years was considered as score of an individual
2	Education	Number of standards in formal school passed by the grape growers
3	Experience in grape cultivation	Number of years of working in grape cultivation



Location of Chikhali taluka in Buldhana district



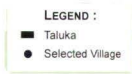


Fig. 2. Map of Chikhali Dist. Buldhana

4	Land holding	Number of hectares of land possessed by the grape grower for cultivation of crops
5	Size of orchard	A numerical score of one was assigned to each grape vine
6	Benefits availed	Number of benefits availed was considered as score
7	Annual income	Gross income in rupees derived from all the sources in a year
8	Socio-economic status	It was measured with the help of socio-economic status scale developed by Thakare (2004)
9	Source of information	It was measured in terms of number of contacts and its frequency i.e. always, sometimes and never by assigning the score 2, 1 and 0 respectively.
10	Social participation	It was measured as an individuals participation in informal and formal organization
11	Innovativeness	It was measured with the help of Scale developed by Singh(1972)
12	Economic motivation	It was measured by the scale developed by Supe (1969)
13	Risk preference	It was measured with the help of scale developed by Supe (1969)

3.7 Operationalization and categorization of variables

The operational definitions, procedure adopted for scoring and categorization of both independent and dependent variables are explained in the sub-sections.

3.7.1 Independent variables

Various independent variables under the study were operationally defined and categorized as below –

3.7.1.1 Age

Age has been defined as the chronological age of the respondents in the completed years at the time of interview. The respondents were classified in the following three categories.

Sr. No.	Age	Age (years)
1.	Young	Upto 35
2.	Middle	36 to 50
3.	Old	Above 50

3.7.1.2 Education

It refers to formal education obtained from school to the university degree by individual respondent. The following categories were formed for classifying the respondents on the basis of their educational qualification.

Sr. No.	Education	Standard passed
1.	Illiterate	No schooling
2.	Primary school	1st to 4th standard
3.	Middle school	5th to 7th standard
4.	High school	8th to 10th standard
5.	Junior College	11th to 12th standard
6.	College	Above 12th standard

3.7.1.3 Experience in grape cultivation

Total number of years of an individual respondent in grape cultivation was considered as his experience. A numerical score of one was assigned to each year of experience in grape cultivation.

The respondents were categorized on the basis of mean and standard deviation.

Sr. No.	Experience in grape cultivation	Experience in grape cultivation (years)
1	Low	Up to 3
2	Medium	3 to 6
3	High	Above 6

$\overline{X}$ = 5.66 S.D. = 3.04

3.7.1.4 Land holding

It was defined as an area of land in hectares possessed by the individual respondent, for cultivation of crop. Number of hectares of land possessed was considered as land holding and categorized as per government norms.

Sr. No.	Land holding	Land holding (ha)
1)	Marginal	Upto 1.00
2)	Small	1.01 ha to 2.00
3)	Semi-medium	2.01 ha to 4.00
4)	Medium	4.01 ha to 10.00
5)	Large	Above 10.00

3.7.1.5 Size of orchard

The number of grape vines in the orchard possessed by an individual respondent was considered as the size of orchard. A numerical score of one were assigned to each grape plant. The respondents were categorized on the basis of minimum and maximum score.

Sr. No.	Size of orchard	Number of Vines
1	Small	Up to 2266
2	Medium	2267 to 4132
3	Large	Above 4133

3.7.1.6 Benefits availed

It was operationally defined as the benefits received by the respondent beneficiary in terms of products, services, incentives and subsidies, being beneficiary of grapevine cultivation. On the basis of the benefits availed score, the respondents were categorized as below.

Sr. No.	Benefits availed	Score
1	No	0
2	Partial	1
3	Complete	2

3.7.1.7 Annual income

It refers to the gross annual income in a year by an individual and his family members from agricultural and subsidiary occupation.

It was operationally defined as gross income in rupees derived from all sources in a year of a respondent and his family members. It was categorized on the basis of minimum and maximum annual income and the respondents were categorized as below.

Sr. No.	Annual income (Rs.)
1	Up to 5,00,000
2	5, 00,001 to 10,00,000
3	Above 10,00,000

3.7.1.8 Socio-economic status

It refers to position of an individual respondent with reference to prevailing average standard of cultural position, material possession, effective income and participation in a group activity of the community.

The scale developed by Thakare (2004) was used for measurement and categorization of socio-economic status.

Sr. No.	Socio-economic status	Score range
1	Very low	Up to 5.9
2	Low	6.0 to 7.5
3	Medium	7.6 to 9.2
4	High	9.3 to 10.9
5	Very high	Above 10.09

3.7.1.9 Sources of information

It refers to different sources of information used by the respondents for seeking information about recommended grape cultivation practices.

Sources of information used by farmers to obtain information about recommended grape cultivation practices were considered as personal localite, personal cosmopolite, extension education agencies and audio visual aids.

The scoring procedure for responses was always-2, sometimes-1, never-0, Final score for an individual respondent was obtained by adding the scores of different sources on the basis of mean and standard deviation as low, medium and high.

Sr. No.	Sources of information	Score range
1	Low	Up to 17
2	Medium	17.01 to 28
3	High	Above 28.00

$\bar{X}$ = 22.46 S.D. = 5.39

3.7.1.10 Social participation

It refers to association of an individual with various social organizations either as a member or its office bearer. The scoring was made as below.

Sr. No.	Social participation	Score
1)	No participation	0
2)	Office bearer of formal organization	4
3)	Member of formal organization	2
4)	Office bearers of informal organized	3
5)	Member of informal organization	1

3.7.1.11 Innovativeness

It was operationally defined as the degree to which an individual grape grower adopt technology of grape cultivation relatively earlier than the other members of the society. A scale developed by Singh (1972) was used.

Sr. No.	Innovativeness	Score range
1	Low	Up to 10
2	Medium	10.01 to 14
3	High	Above 14

$\bar{X}$ = 12.06 S.D. 2.32

3.7.1.12 Economic motivation

It refers to occupational success in terms of profit maximization and the relative value an individual places on economic ends. Scale developed by Supe (1969) was used to measure economic motivation of the respondents.

Sr. No.	Economic motivation	Score range
1	Low	Up to 11
2	Medium	11.01 to 20
3	High	Above 20

$\bar{X}$ = 15.6 S.D. = 4.25

3.7.1.13 Risk preference

It was operationally defined as the degree to which grape growers are oriented towards risk and have courage to face the problems and uncertainty in adoption of recommended cultivation practices in grape. It was measured with the help of scale developed by Supe (1969).

Sr. No.	Risk preference	Score range
1	Low	Up to9
2	Medium	9.01 to13
3	High	Above 13

$\bar{X}$ = 11.4 S.D. = 21.8

3.7.2 Dependent variables Knowledge and adoption were dependent variables, under the study were operationally defined and categorized as below –

3.7.2.1 Knowledge

English and English (1961) defined knowledge as a body of understood information possessed by an individual regarding grape cultivation practices.

It has been operationally defined as awareness of knowledge possessed by an individual respondent regarding recommended grape cultivation practices.

A teacher made knowledge scale was developed. Response were taken on three point continuum as complete, partial and no knowledge by assigning score 2, 1 and 0 respectively. The knowledge score was then converted into knowledge index.

$$\text{Knowledge index} = \frac{\text{Actual obtained knowledge score}}{\text{Maximum possible obtainable knowledge score}} \times 100$$

Finally on the basis of knowledge index respondents categorization was made into three classes i.e. low (upto 33.33), medium (33.34 to 66.66) and high (above 66.66).

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

3.7.2.2 Adoption

Rogers (1995) defined adoption as the decision to make full use of innovation in the best course of action available.

It was operationally defined as an extent of actual use of recommended improved grape cultivation practices by grape growers.

It was measured on three point continuum as complete, partial and no adoption by assigning the score 2, 1 and 0 respectively. The adoption score was then converted into adoption index.

$$\text{Adoption index} = \frac{\text{Actual obtained adoption score}}{\text{Maximum possible obtainable adoption score}} \times 100$$

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

Constraints

The Oxford Dictionary meaning of the word constraints is confinement, restriction of liberty or compulsion of circumstances or compulsion put upon the behavior.

It was operationally defined as the problems or difficulties faced by the grape growers in adoption of recommended grape cultivation practices. The frequency and percentage was worked out as under.

3.8 Tabulation and analysis of data

3.8.1 Arithmetic mean ($\bar{X}$)

Arithmetic mean is calculated by sum of all the individual score divided by number of cases.

$$\bar{X} = \frac{\Sigma X}{n}$$

Where,

$\bar{X}$ - Arithmetic mean

ΣX - Sum of respondents score

n - No. of respondents

3.8.2 Standard deviation

Standard deviation is a measure of variability calculated around mean. It is denoted by Greek letter σ (sigma).

$$\sigma = \sqrt{\frac{N\Sigma X2 - (\Sigma X)^2}{n}}$$

Where,

- σ - Standard deviation
- ΣX^2 - Sum of square of X series
- $(\Sigma X)^2$ - Square of sum of X series
- n - No. of respondents

3.8.3 Coefficient of correlation

The relationship between independent and dependent variable was established by calculating the coefficient of correlation with the formula given below.

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

Where,

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

CHAPTER IV

SOCIO-ECONOMIC STATUS OF BULDHANA DISTRICT

It is proposed here to outline some of the main agro economic features of Buldhana district. This helps for providing the background for the proper assessment and understanding of the holding studied in the course of investigation. The economic returns from the cultivation of various fruit crops are mainly influenced by the climatic conditions, rainfall and type of soil study of crop enterprise therefore needs to be undertaken in the light of agro-climatic conditions of the study area.

4.1 Location

The district is mainly covered in Survey of India topographic sheet No. 55D/8 & partly in 46P and 56 A and lies between 19°51' to 21°17' North latitude and 75°57' to 76°49' East Longitude.The district Head quarters is at Buldhana which is connected to all talukas by state highway.The state capital of Mumbai is 450 km to the west and is connected to Buldhana by road.The distances of the other major towns from Buldhana is - Aurangabad (180 km),Pune (425 km), Amravati (200 km), Nagpur (350 km).

4.2 Area and Administrative Divisions

Buldhana district covers an area of 9661 sq. km. The district is having maximum width of 91.73 kilometers and length of 160.93 kilometer.

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Final

The district comprises totally 1427 Villages out of which 1294 inhabited and 133 village are uninhabited, having total population of 15.08 Lacs (1981 Census).

4.3 Boundaries

Buldhana district is located in the central portion of the state of Maharashtra. Akola, Jalgaon, Jalna, Parbhani districts are the adjoining districts to the east, west & south respectively. Nemad district of the Madhya Pradesh is to the north. The Tapi-Purna river belt region covering 7 Tahasils to the north namely Malkapur, Nandura, Khamgaon, Jalgaon Jamod, Sangrampur, Motala, Shegaon. The other region comprising 6 Tahasils of Buldhana, Chikhali, Mehakar, Deulgaon Raja, Sindakhed Raja, Lonar to the south of the Ajanta range.The Satpura range having a NNE-SSW direction runs through northern part of Jalgaon Jamod and Sangrampur Tahasils. The two hilly ranges of southern part are named as southern & central belt. The central belt runs NW-SE for near about 64km. & turn to EW for 26km. The southern belt of the hill ranges extend from Dhad to Lonar in NW-SE direction for 103 km distance. The world famous Lonar Crater considered to be more than 50,000 years old , is present in Buldhana district and is soon to be developed as a tourist spot.

4.4 Soil Types

There are three major soil types in this district, locally called as Bharkali, morand and Barad. Morand soils are silt and lime mixed heavy in texture and blackish one suitable for cotton growing. Black soil is also found in Chikhali and Mehakar area but the depth of Top soil being very low hence suitable for wheat growing. Sandy soils are locally called as Barad, percentage of sand is more than silt and clay hence light in nature hence identified as light soils. These are very

poor fertile soil types than morand. Constitute the physical basis of all agricultural practices. The infiltration and transmission of moisture through soil depends upon the particle size, amount of organic mater in the soil depth. These factors are also depend upon the approach of soil for the saturation its swollen capacity and individual physical properties. Coarse shallow soil covers the high lands in district. The depth of such soil remains very lese. The infiltration is much less in these type of soils and run off is more. This type covers an area of 4564.72 Sq. Km.

Medium black soil is developed comparatively in the plains along the tributaries of main rivers and small plateau of the district. This type of soil area generally low in clayey material. The area covered by the type of soil in the district is 3574.68 sq.m. and remains at 37 percentage of the total soil. Deep black soil generally develops along the banks of the major river and main tributeries of the river in the district it has been developed along Purna (Tapi) Nalganga, Vishwaganga, Painganga, and Purna (Godavari) rivers. The soils contains much clayey material which generally have nature of swelling in high degree. The black cotton soil derived from the Deccan trap of the region are more fertile and contains rich plant elements such as lime,magnesia, Iron and alkalis. The cropping pattern of the district is generally based upon the fertility of the soil present in the area.

4.6 Climate and Rainfall

The district gets rain from south west Monsoons. The rainfall period is from June to September. However rain generally falls in the months of June and July upto the end of October. The district falls under the assured rainfall zone and average rainfall ranging from 500 to 900 mm.

The climate of the Buldhana district is generally dry and hot, Buldhana town itself i.e. district headquarters has a comparatively cool weather and is considered to be the most pleasant place in district .The general climate of the district is characterised by Hot and Dry summers and cold winters with the seasonal variation in the temperature being pretty large.Hailstorms are common during February to April and also during the post monsoon period from November to January.

4.7 Socio Economic Features

4.7.1 Economy

As per 1991 census the total population is 1881438 (Male population : 9,32,407 female population : 9,19,031) population density is 195 per Square kilometer. 82% people are living in rural area & 18% are in town and urban areas The number of females per one thousand male population is 955.

4.7.2 SC/ST Population

The percentage of scheduled caste population is 6.18 percentage of total district population percentage less. The percentage of SC population in Maharashtra is 11.09 % 77.19 percent population is engaged in primary sector i.e. Agriculture and related enterprises

4.7.3 Literacy

Literacy percentage of Buldhana is 50.14 % the total male literates are 64.43% whereas female literate are 37.27%

4.8 Agriculture And Cropping Pattern

As per the report of Agriculture commissioner Pune the total geographical area of district is 967100 hectare. Out of which in

the year 1993.94 the cultivable area is 80.76% is under Grain and other land 2.76% is cultivable waste land.

4.8.1 Cropping Pattern

Presently the area under cultivation is 742227. Area under food grain cultivation is 411006 hectares this amounts to 55.37 % of cultivable area. jowar ranks the first position among the millets and other food grain covering about 53.87% both Jowar and cotton both occupy about 60% of total area under field crops pulses beans and oilseeds cover remaining 40% area under kharif cropping. Area under oilseeds is 10.64% wheat is 2.85% etc.

The district has more area under kharif than Rabi crops. There are local variations in this pattern. The southern tahasil has considerable preparation of the rabi crops While the Northern tahasil most of the cropped area is under kharif alone. Jowar, Cotton. Groundnut, Udid and tur are the main crops grown in Kharif season and wheat grain and sunflower are the principal crops of rabi season. Jowar in grown in this district in Kharif senson only. Dugax cane has a negligible area.

High yielding varieties are being used for Tur, Cotton Groundnut in all 80% of the cultivable area is under High yielding varieties hybrid and improved varieties of seeds.

4.8.2 Fruits and Vegetables

Khamgaon Taluka has maximum area under fruits and vegetables as per statistical report 1995-96 i.e. 554 hector.Guava is predominantly grown in Buldhana, Motala. Nandura area. Banana, a major cash crop grown in Jalgaon Jamod area.Chili is grown in

Malakapur and Nandura tahasils.Orange and lemon is grown in patches is very small areas throughout the district.

4.9 Transport And Communication Network

4.9.1 Transport Network

There is 86 Km. National highway No.6 passing through Malkapur Nandura & Khamgaon Towns. The total length of state Highway is 565.94 Kms. The total length of Zilla Parishad roads is 751.40 Kms.The number of main bridges are 14. 506 villages are not easily accessible for State Transport buses. There is no Air Port in this district.The railway line runs parallel to National Highway No.6 in this district; it is a broad gauge line having a length of 105 km. This line goes through Malkapur ,Nandura, Jalumb, Shegaon Tahasil headquarters in northern part of the district. Jalamb is the railway junction on this line with this line connecting Bhusawal in Jalgaon district to the eastern sides and goes to Akola towards eastern side and then to Nagpur.

4.9.2 Communication Network

The total number of telephone exchanges stationed in this district till 1996-96 are and the number of telephones are 12866. There is no S.T.D. facility at Motala, Dehlgaon Raja, Sindhkhedraja, Lonar, Mehkar.The number of Telegraph offices are 161. 27 Police stations are connected by wireless system. Fax Machines have been setup at every Tahasil Offices. Satellite communication link through National Informatics Centre is working at Buldana with which communication to all districts Head Quarters of our country and secretariats be done.

CHAPTER V

RESULTS AND DISCUSSION

This chapter deals with the results obtained from the analysis of the collected data of the present study along with the discussion. The data have been analysed taking into account the study objectives. The results of the present investigation are presented under following sections.

5.1 Profile of grape growers

5.2 Knowledge and adoption of recommended cultivation practices by grape growers

5.3 Relational analysis

5.4 Constraints faced by the farmers in adoption of grape cultivation practices

5.5 Empirical research model

5.1 Profile of the grape growers

The study of personal, socio-economical and psychological characteristics was made with reference to age, education, experience in grape cultivation, land holding, size of orchard, benefits availed, annual income, socio economic status, sources of information, social participation, innovativeness, economic motivation, and risk preference. The results pertaining to the characteristics have been presented under following subheads.

5.1.1 Age

Age is important factor, which determines the role of farmers in adoption of improved practices. The distribution of the respondents according to age was ascertained and has been presented in Table 2.

Table 2 : Distribution of the respondents according to their age

Sr. No.	Age	Respondents (n=150)	
		Number	Percentage
1.	Young	39	26.00
2.	Middle	60	40.00
3.	Old	51	34.00
	Total	**150**	**100.00**

The age wise distribution of the respondents in Table 2 shows that respondents to the extent (40.00 %) were included in the middle age group of 36 to 50 years. The respondents to the extent of (34.00 %) appeared in old age category that is above 50 years, followed by (26.00 %) respondents who were in the young age group of up to 35 years.

It can be therefore concluded from the above findings that grape growers were mostly middle age farmers.

5.1.2 Education

Education has been considered as one of the most important variable with the help of which social change can be achieved. The education of the respondents was studied and the result has been presented in Table 3.

Table 3 : Distribution of the respondents according to their education

Sr. No.	Education	Respondents (n=150)	
		Frequency	Percent
1	Illiterate	9	06.00
2	Primary school	23	15.30
3	Middle school	37	24.70
4	High school	29	19.30
5	Higher secondary school	43	28.70
6	Above higher secondary school	9	06.00
	Total	**150**	**100.00**

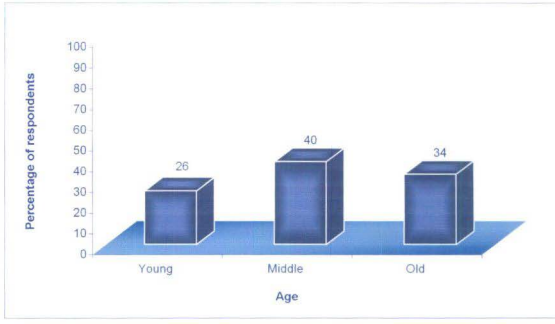

Fig. 3 : Distribution of the respondents according to their age

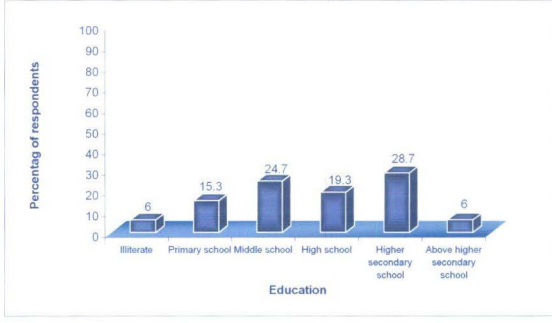

Fig. 4 : Distribution of the respondents according to their education

It is evident form Table 3 that 28.70 per cent of the respondents were educated upto higher secondary school, followed by 24.70 per cent respondents who could reach middle school level of education. Further, it was found that 19.30 per cent of them were educated upto high school, 15.30 per cent respondents were educated upto primary school and 12.00 per cent respondents were educated above higher secondary school level and 12.00 per cent respondents were illiterate.

It can be concluded from the above findings that most of the grape grower's were educated upto higher secondary school followed by middle school level education.

5.1.3 Experience in grape cultivation

Experience was the important factor in influencing the respondents in terms of knowledge and adoption. The results obtained have been presented in Table 4. The respondents were categorized as below -

Table 4 : Distribution of the respondent according to their experience in grape cultivation

Sr. No.	Experience in grape cultivation	Respondents (n=150)	
		Number	Percentage
1.	Low	41	27.33
2.	Medium	67	44.60
3.	High	42	28.07
	Total	**150**	**100.00**

From the Table 4 it was apparent that most of the respondents (44.60%) had experience of 3 to 6 years in grape cultivation. It was fallowed by (28.07%) respondents who had experience above 6 years and (27.33%) of the respondents had experience up to 3 years in grape cultivation. It could be therefore

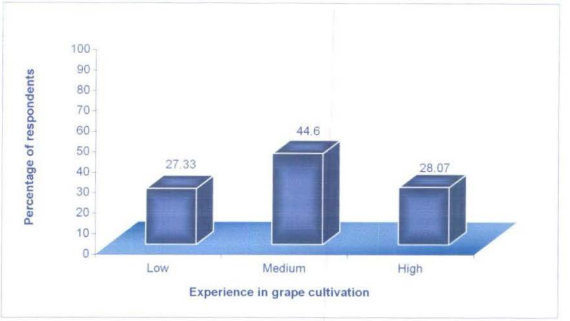

Fig. 5 : Distribution of the respondent according to their experience in grape cultivation

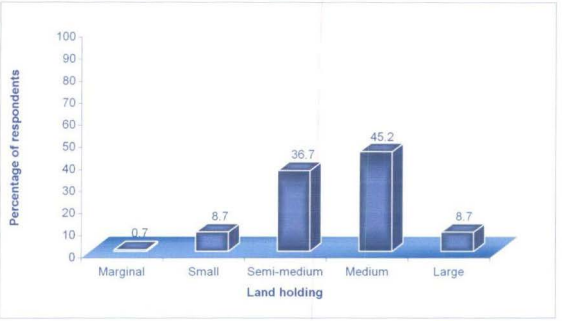

Fig. 6 : Distribution of the respondents according to their land holding

concluded that, most of the respondents had medium level of experience in grape cultivation.

5.1.4 Land holding

Land holding was assumed as an important variable that influences utility perception behavior of the respondents. The results obtained have been presented in Table 5.

Table 5 : Distribution of the respondents according to their land holding

Sr. No.	Land holding	Respondent (n = 150)	
		Frequency	Percent
1	Marginal	1	00.70
2	Small	13	08.70
3	Semi-medium	55	36.70
4	Medium	68	45.20
5	Large	13	08.70
	Total	150	100.00

It is evident from Table 5 that maximum per cent of the respondents (45.20%) belonged to category of medium land holding ranging from 4.01 to 10.00 ha. It was followed by (36.70%) of the respondents belonging to category of semi-medium land holding possessing land from 2.01 to 4.00 ha. and (0.70%) of the respondents who possessed land up to 1.00 ha. and belonging to marginal land holding category. An equal percentage of the respondents (8.7%) belonged to large holding above 10.00 ha. and small holding category that is 1.02 to 2.00 ha respectively. Therefore, it could be inferred that, maximum no. of the respondents had medium land holding ranging from 4.01 to 10.00 ha.

5.1.5 Size of orchard

The size of grape orchard determines the adoption of recommended cultivation practices by grape growers. The results obtained in this regards have been presented in Table 6.

Table 6 : Distribution of the respondents according to their size of grape orchard

Sr. No.	size of orchard	Respondents (n=150)	
		Number	Percentage
1	Small	105	70.00
2	Medium	30	20.00
3	Large	15	10.00
	Total	**150**	**100.00**

It is apparent from Table 6 that about (70.00%) of the respondents had a grape orchard having grape vines up to 2266 under cultivation followed by (20.00%) of the respondents had grape vine numbering 2267 to 4132 and few (10.00 %) of the respondents had above 4132 grape vines under cultivation. It could be therefore, inferred that, majority of the respondents had small orchard size.

5.1.6 Benefits availed

The benefits received by the respondents beneficiary in terms of products, services, incentives and subsidies, being beneficiary of grape vine cultivation was studied. The results obtained have been presented in Table 7.

Table 7 : Distribution of the respondents according to their Benefits availed

Sr. No.	Benefits availed	Respondents (n=150)	
		Number	Percentage
1	No	78	52.00
2	Partial	46	30.70
3	Complete	26	17.30
	Total	**150**	**100.00**

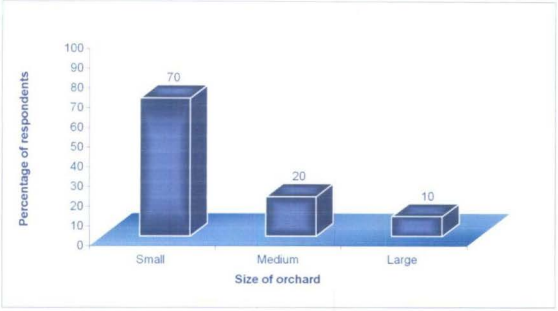

Fig. 7 : Distribution of the respondents according to their size of grape orchard

Fig. 8 : Distribution of the respondents according to their Benefits availed

Fig. 9 : Distribution of the respondents according to their annual income

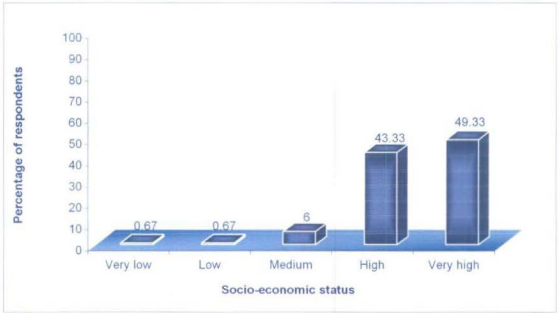

Fig. 10 : Distribution of the respondents according to their Socio- economic status

From the distribution of the respondents according to benefits availed in Table 7 it may be noted that more than fifty per cent of the respondents (52.00%) had not availed the benefits. It was followed by (30.70%) who availed partial benefits and (17.30%) who availed complete benefits. Therefore it could be inferred that, most of the respondents did not availed the benefits.

5.1.7 Annual income

Annual income provides for availability of capital for farming. The results obtained have been presented in Table 8.

Table 8 : Distribution of the respondents according to their annual income

Sr. No.	Annual income (Rs.)	Respondents (n=150)	
		Number	Percentage
1	Up to 5,00,000	32	21.30
2	5,00,001 to 10,00,000	82	54.70
3	Above 10,00,000	36	24.00
	Total	**150**	**100.00**

From the distribution of the respondents according to annual income in Table 8 it may be noted that majority of the respondents (54.70 %) had annual income between Rs. 5, 00,001 to 10, 00,000. It was followed by 24.00 per cent respondents who were found to have annual income of above Rs. 10, 00,000. The percentage of the respondents having annual income Up to 5, 00,000 were found to be 21.30 per cent.

5.1.8 Socio- economic status

Socio-economic status was the important factor in influencing adoption of recommended cultivation practices. The results obtained have been presented in Table 9.

Table 9: Distribution of the respondents according to their Socio-economic status

Sr. No.	Socio- economic status	Respondents (n=150)	
		Number	Percentage
1	Very low	1	0.67
2	Low	1	0.67
3	Medium	9	6.00
4	High	65	43.33
5	Very high	74	49.33
	Total	**150**	**100.00**

It is apparent from the Table 9 that (49.33%) of the respondents had belonged to very high category of socio-economic status in the village community. This was followed by (43.33%) and (6.00%) of the respondents who have occupied high and medium position in the socio- economic status in their village respectively.

5.1.9 Sources of information

The individual is likely to use different sources for getting information about recommended grape cultivation practices. The frequency of use of various sources of information about adoption of recommended cultivation practices by grape growers is shown in Table 10.

Table 10 : Distribution of the respondents according to sources of information

Sr. No.	Sources of information	Respondents (n=150)	
		Number	Percentage
1.	Low	2	1.33
2.	Medium	35	23.33
3.	High	113	75.34
	Total	**150**	**100.00**

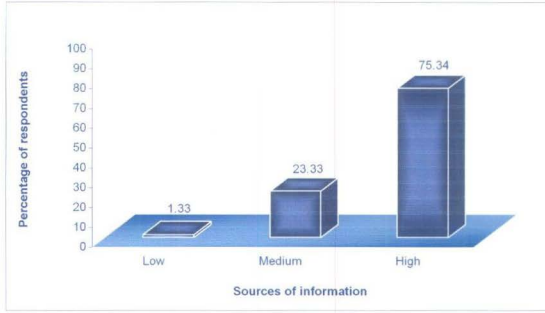

Fig. 11 : Distribution of the respondents according to sources of information

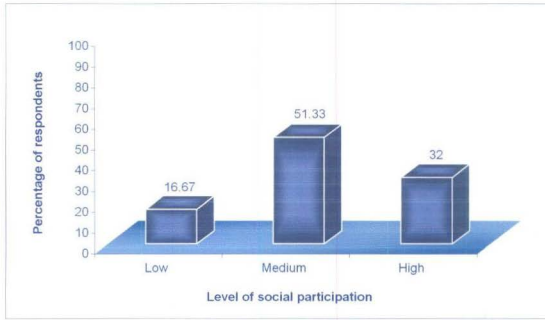

Fig. 12 : Distribution of the respondents according to their level of social participation

It is observed form Table 10 that majority of the respondents (75.34%) were having high sources of information. While (23.33%) of the respondents were having medium sources of information. Only (1.33%) of the respondents were having low sources of information about grape cultivation.

5.1.10 Social participation

The distribution of the respondents according to their social participation is shown in Table 11.

Table 11 : Distribution of the respondents according to their level of social participation

Sr. No.	Level of social participation	Respondents (n=150)	
		Number	Percentage
1.	Low	25	16.67
2.	Medium	77	51.33
3.	High	48	32.00
	Total	**150**	**100.00**

It is apparent from the Table 11 that more than fifty per cent of the respondents (51.33%) had belonged to medium category of social participation. This was followed by (32.00%) of the respondents who have occupied high level of social participation and least of the respondents (16.67 %) had belonged to low social participation category.

5.1.11 Innovativeness

The distribution of the respondents according to their innovativeness is shown in Table 12.

Table 12 : Distribution of the respondents according to their level of innovativeness

Sr. No.	Level of innovativeness	Respondents (n=150)	
		Number	Percentage
1.	Low	2	1.33
2.	Medium	148	98.67
3.	High	0	0.00
	Total	**150**	**100.00**

It is apparent from the Table 12 that nearly cent per cent of the respondents (98.67 %) were included in the medium category of innovativeness. It was followed by meager 1.33 per cent of the respondents who was included in the low innovativeness category. None of the respondents were included in the category of high innovativeness.

5.1.12 Economic motivation

The distribution of the respondents according to their economic motivation is shown in Table 13.

Table 13 : Distribution of the respondents according to their level of economic motivation

Sr. No.	Level of economic motivation	Respondents (n=150)	
		Number	Percentage
1.	Low	20	13.33
2.	Medium	121	80.67
3.	High	9	6.00
	Total	**150**	**100.00**

The distribution of the respondents according to their level of economic motivation in Table 13 showed that majority of the respondents (80.67 %) had medium level of economic motivation. This was followed by 13.33 per cent of the respondents who had low level

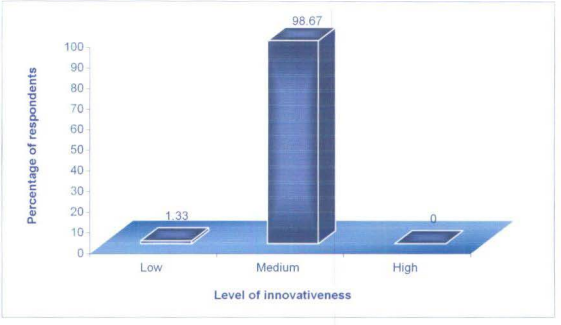

Fig. 13 : Distribution of the respondents according to their level of innovativeness

Fig. 14 : Distribution of the respondents according to their level of economic motivation

of economic motivation and only 6.00 per cent of the respondents had high level of economic motivation.

5.1.13 Risk preference

The distribution of the respondents according to their risk preference is shown in Table 14.

Table 14: Distribution of the respondents according to their level of Risk preference

Sr. No.	Risk preference	Respondents (n=150)	
		Number	Percentage
1	Low	1	0.66
2	Medium	55	36.67
3	High	94	62.67
	Total	**150**	**100.00**

It is evident from Table 14 that maximum percent of the respondents (62.67%) was observed under high risk preference category. Thus was followed by (36.67%) of them who were under medium risk preference category. Only one respondent (0.66%) appeared in low risk preference category.

5.2 Dependent variables

5.2.1 Knowledge

Adequate and relevant knowledge of grape cultivation by the grape growers has relevance in obtaining maximum benefit through production. Looking to the importance of knowledge, respondents knowledge was studied practice wise and the data in this regards has been presented in Table 15.

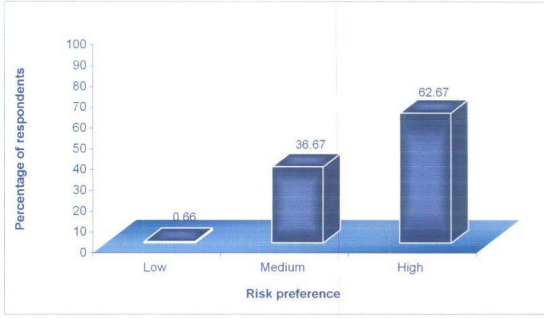

Fig. 15 : Distribution of the respondents according to their level of Risk preference

Table 15 : Practice wise distribution of the respondents according to their knowledge about grape vine cultivation

Sr. No.		Cultivation practices	Knowledge		
A		**Land preparation**	**CK**	**PK**	**NK**
	1	Soil recommended for grape cultivation	**133 (88.67)**	11 (7.33)	6 4.00)
	2	Practices for land preparation	**103 (68.67)**	39 (26.00)	8 (5.33)
B		**Variety**			
	1	Recommended variety for grape cultivation	**77 (51.33)**	64 (42.67)	11 (7.33)
	2	Characteristics of grape crop variety	**71 (47.33)**	45 (30.00)	34 (22.67)
C		**Propagation**			
	1	Method of propagation	**83 (55.33)**	46 (30.67)	23 (22.67)
D		**Planting**			
	1	Recommended planting time	**72 (48.00)**	55 (36.67)	23 (15.33)
	2	Recommended planting depth	31 (20.67	55 (36.67)	**64 (42.67)**
E		**Spacing**			
	1	Recommended spacing	44 (29.33)	47 (31.33)	**59 (39.33)**
	2	Grapevine population	50 (33.33)	37 (34.67)	**73 (48.67)**
F		**Training**			
	1	Type of training	32. (21.33)	50 (33.33)	**68 (45.33)**

G		**Pruning**			
	1	Time for pruning	**75**	52	23
			(50.00)	(34.67)	(15.33)
H		**Organic manure**			
	1	Recommended dose of	**83**	50	17
		FYM	**(55.33)**	(33.33)	(11.33)
I		**Fertilizer application**			
	1	Recommended dose of	42	43	**65**
		fertilizer	(28.00)	(42.00)	**(43.33)**
J		**Irrigation**			
	1	Time for irrigation	37	35	**78**
			(24.67)	(23.33)	**(52.00)**
	2	Method of irrigation	**80**	55	15
			(53.33)	(36.67)	(10.00)
K		**Plant protection**			
	1	Major pest	**78**	57	15
			(52.00)	(38.00)	(10.00)
	2	Recommended	59	**64**	27
		insecticides	(39.33)	**(42.67)**	(18.00)
	3	Major diseases	**61**	**61**	28
			(40.67)	**(40.67)**	(18.67)
	4	Recommended chemicals	**61**	50	39
			(40.67)	(33.33)	(26.00)
L		**Harvesting**			
	1	Stage of harvesting	**67**	54	29
			(44.67)	(36.00)	(19.33)
M		**Marketing**			
	1	Size of grape fruit	**83**	33	34
			(55.33)	(22.00)	(22.67)

CK – Complete knowledge **PK – Partial knowledge**
NK – No knowledge

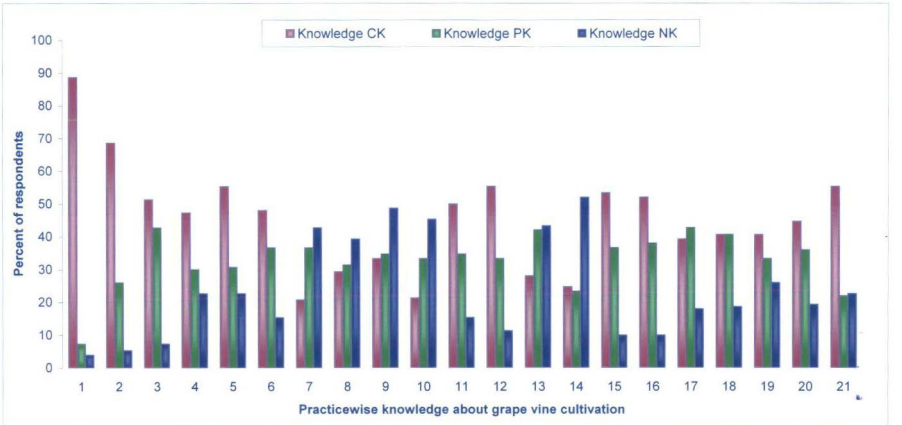

Fig. 16 : Practice wise distribution of the respondents according to their knowledge about grape vine cultivation

From Table 15 it has been revealed that majority of the respondents were having complete knowledge about type of soil recommended for grape (88.67%), land preparation (68.67%), recommended variety for grape cultivation (51.33%), characteristics of grape variety (47.33%), propagation method for grape crop (55.33%), planting time for grape crop (48.00%), time of pruning (50.00%), FYM application rate (55.33%), method of irrigation (53.33%), major pest (52.00%), major disease (40.67%), chemical for disease control (40.67%), harvesting stage (44.67%) and grape fruit size for market (55.33%).

From Table 15 it has been further revealed that most of the respondents were having partial knowledge about insecticide for pest control (42.67%) and major disease (40.67%).

From Table 15 it has been revealed that most of the respondents were having no knowledge about planting depth for grape crop (42.67%), spacing (39.33%), grape vine population (48.67%), type of training (45.33%), fertilizer application rate (43.33%) and time of irrigation (52.00%).

5.2.2 Knowledge index

Adequate and relevant knowledge of recommended cultivation practices of grape crop is very important for the grape growers in receiving maximum benefits through production. Looking to the importance of knowledge, respondents knowledge about recommended practices of grape cultivation have been studied and the data in this regard have been presented in Table 15.

Table 16 : Distribution of respondents according to knowledge levels

Sr. No.	Knowledge level	Respondents (n=150)	
		Number	Percentage
1.	Low	4	2.66
2.	Medium	88	58.68
3.	High	58	58.66
	Total	**150**	**100.00**

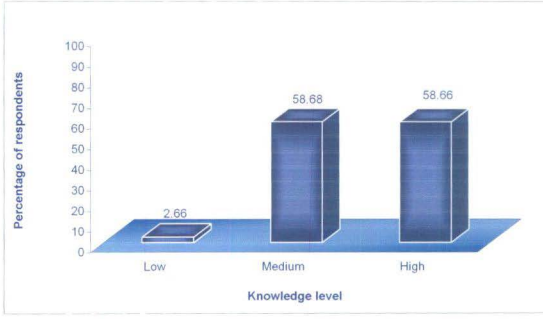

Fig. 17 : Distribution of respondents according to knowledge levels

The knowledge possessed by the grape growers indicated that most of the respondents (58.68%) were having medium level of knowledge of grape cultivation while, 38.66 per cent of the respondents were having low level of knowledge, where as only 2.66 per cent respondents were having high level of knowledge.

Thus is can be inferred that majority of the respondents were having medium level of knowledge about grape cultivation practices.

Table 17 : Distribution of the respondents according to their adoption of grape vine cultivation

Sr. No.		Cultivation practices	Adoption		
A		**Land preparation**	**CA**	**PA**	**NA**
	1	Soil recommended for grape cultivation	**134 (89.33)**	13 (8.67)	3 (2.00)
	2	Practices for land preparation	**100 (66.67)**	40 (26.67)	10 (6.67)
B		**Variety**			
	1	Recommended variety for grape cultivation	**77 (51.33)**	63 (42.00)	10 (6.67)
	2	Characteristics of grape crop variety	**79 (52.67)**	51 (34.00)	20 (13.33)
C		**Propagation**			
	1	Method of propagation	**82 (54.67)**	54 (36.00)	14 (9.33)
D		**Planting**			
	1	Recommended planting time	**74 (49.33)**	51 (34.00)	25 (16.67)
	2	Recommended planting depth	**64 (42.67)**	55 (36.67)	31 (20.67)

E		**Spacing**			
	1	Recommended spacing	**64 (42.67)**	50 (33.33)	36 (24.00)
	2	Grapevine population	**63 (42.00)**	50 (33.33)	37 (24.67)
F		**Training**			
	1	Type of training	**73 (48.67)**	57 (38.00)	20 (13.33)
G		**Pruning**			
	1	Time for pruning	**75 (50.00)**	50 (33.33)	25 (16.67)
H		**Organic manure**			
	1	Recommended dose of FYM	**63 (42.00)**	54 (36.00)	33 (22.00)
I		**Fertilizer application**			
	1	Recommended dose of fertilizer	44 (29.33)	**54 (36.00)**	52 (34.67)
J		**Irrigation**			
	1	Time for irrigation	**77 (51.33)**	55 (36.67)	18 (12.00)
	2	Method of irrigation	**71 (47.33)**	61 (40.67)	18 (12.00)
K		**Plant protection**			
	1	Major pest	**92 (61.33)**	40 (26.67)	18 (12.00)
	2	Recommended insecticides	**75 (50.00)**	50 (33.33)	25 (16.67)
	3	Major diseases	**82 (54.67)**	46 (30.67)	22 (14.67)
	4	Recommended chemicals	**74 (49.33)**	40 (26.67)	36 (24.00)

L		**Harvesting**			
	1	Stage of harvesting	**85**	46	19
			(56.67)	(30.67)	(12.67)
M		**Marketing**			
	1	Size of grape fruit	**87**	36	27
			(58.00)	(24.00)	(18.00)

CA – Complete adoption PA – Partial adoption
NA – No adoption

From Table 17 it has been revealed that majority of the respondents had completely adopted the practice of soil recommended (89.33%), most of them had adopted land preparation practices (66.67%), recommended varieties of grape (51.33%), quality characteristics of grape (52.67%), propagation method (49.33%), planting time for grape crop and planting depth (42.67%), spacing for grape crop (42.00%), grape vine population (48.67%), type of training (50.00%), time for pruning (42.00%), recommended dose of FYM application (42.00%), recommended time for irrigation (51.33%) method of irrigation (47.33%), major pest (61.33%), major disease (54.67%), chemical for disease control (49.33%), harvesting stage (56.67%) and size of grape fruit for market (58.00%).

About 36.00 per cent of the respondents had partially adopted the recommended doses of fertilizers.

5.2.3 Adoption index

Adoption is decision making process and important to the grape growers in receiving maximum production from grape crop. Looking to the importance of adoption, respondents adoption about grape crop have been studied and the data in this regard have been presented in Table 18.

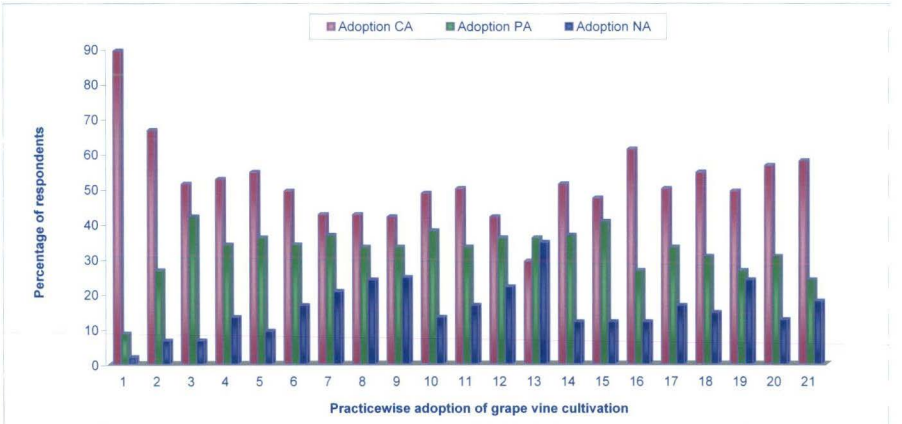

Fig. 18 : Distribution of the respondents according to their adoption of grape vine cultivation

Table 18 : Distribution of respondents according to adoption level

Sr. No.	Adoption level	Respondents (n=150)	
		Number	Percentage
1.	Low	40	26.67
2.	Medium	70	46.66
3.	High	40	26.67
	Total	**150**	**100.00**

It was observed from Table 18 that most of the respondents (46.66 %) had medium level of adoption of grape cultivation technology. The percentage of respondents having low level of adoption was (26.67%), where as (26.67%) respondents were having high level of adoption.

Thus it can be inferred that most of the respondents were grouped in medium level of adoption about grape cultivation technology.

5.3 Relationship between selected characteristics and adoption of recommended cultivator practices by grape growers

Efforts have also been made to find out the relationship of selected characteristics of grape growers with their knowledge and adoption of recommended cultivation practices. The correlation of independent variables with the dependent variable was worked out and tested for its significance.

5.3.1 Relationship of selected characteristics of grape growers

The correlation coefficients of knowledge of grape growers towards the grape cultivation practices with independent variables have been depicted in Table 19.

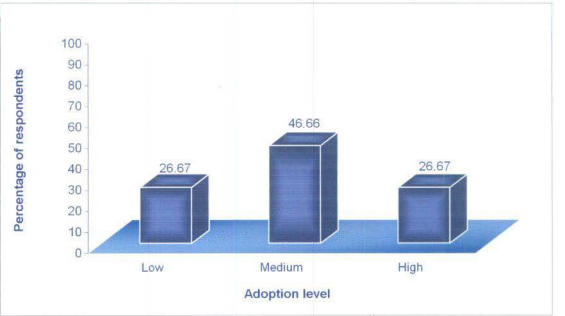

Fig. 19 : Distribution of respondents according to adoption level

Table 19 : Coefficient of correlation of selected characteristics of the respondents with their knowledge

Sr. No.	Variable	'r' value
1.	Age	0.024^{NS}
2.	Education	0.175*
3.	Experience in grape cultivation	0.214**
4.	Land holding	0.024^{NS}
5.	Size of orchard	0.214**
6.	Benefits availed	0.220**
7.	Annual income	0.051^{NS}
8.	Socio-economic status	0.224**
9.	Source of information	0.231**
10.	Social participation	0.242**
11.	Innovativeness	0.210**
12.	Economic motivation	0.248**
13.	Risk preference	0.209**

N.S. - Non-significant
* - Significant at 0.05 level of probability
** - Significant at 0.01 level of probability

It could be seen from Table 19 that among the selected variables experience in grape cultivation. Size of orchard, benefits availed, socio-economic status, sources of information, social participation, innovativeness economic motivation and risk preference were positively and highly significantly correlated with the knowledge towards grape cultivation practices. The variables education was positively and significantly correlated with the knowledge towards cultivation practices of grape. Therefore, the null hypothesis was rejected for these variables. The variables age, land holding and annual income were having non-significant relationship with knowledge

towards recommended grape cultivation practices. Therefore, the null hypothesis was accepted for the variables age, land holding and annual income.

5.3.2 Relationship between selected characteristics of grape growers with their adoption

The correlation coefficient of adoption of grape growers toward the grape cultivation practices with independent variable have been depicted in Table 20.

Table 20 : Coefficient of correlation of selected characteristics of the respondents with their adoption of recommended cultivation practices for grape

Sr. No.	Variable	'r' value
1.	Age	0.024 NS
2.	Education	0.216**
3.	Experience in grape cultivation	0.204*
4.	Land holding	0.025 NS
5.	Size of orchard	0.200*
6.	Benefits availed	0.219**
7.	Annual income	0.049 NS
8.	Socio-economic status	0.211**
9.	Source of information	0.220**
10.	Social participation	0.203 NS
11.	Innovtivenesss	0.221**
12.	Economic motivation	0.228**
13.	Risk preference	0.219**
14.	Knowledge	0289**

N.S. - Non-significant
* - Significant at 0.05 level of probability
** - Significant at 0.01 level of probability

It could be seen from Table 20 that among the selected variables education, benefits availed, socio-economic status, sources of information, innovativeness, economic motivation, risk preference were positively and highly significantly correlated with the adoption of recommended cultivation practices of grape. Knowledge was positively and highly significantly correlated with adoption. The variables namely experience in grape cultivation and size of orchard were also positively and significantly correlated with adoption towards grape cultivation practices. Thus, the null hypothesis was rejected for these variables and it indicated that the respondents had adoption about recommended cultivation practices. The variables age, land holding, annual income and social participation were having non-significant relationship with adoption towards grape cultivation practices therefore, the null hypothesis was accepted for these variables.

5.4 Constraints faced by the grape growers

In the present study constraints referred to problems or difficulties faced by individual respondents in adoption of recommended gape cultivation practices. The relevant data in this regard has been presented in Table 21.

Table 21 : Distribution of respondents according to their constraints faced during grape cultivation

Sr. No.	Constraints	Respondents	
		Number	Percentage
A)	**Constraints of cultivation**		
1	Shortage of fertilizers	75	50.00
2	High cost of fertilizers	80	53.30
3	Shortage of irrigation water	85	56.70
4	Problems in identification of disease and pest	60	46.70
5	High cost of pesticides and fungicides	80	53.30

6	Jumbling while selecting pesticides and fungicides	90	60.00
7	High wages of labour	50	33.83
8	Non-availability of labours at the time of pruning, thinning and dipping of grape bunches in GA	75	50.00
B)	**Technical constraints**		
1	Lack of knowledge about recommended technology	90	60.00
2	Lack of knowledge about fertilizer management	80	53.30
3	Lack of knowledge about plant protection measures	75	50.00
4	Lack of knowledge about use of different plant growth regulators	95	63.30
5	Lack of timely guidance	80	53.30
C)	**Financial**		
1	Inadequate sources of finance	70	46.70
2	Short of capital	75	50.00
3	No-availability of money in time	85	56.70
D)	**Marketing**		
1	Low rates of grape fruit	90	60.00
2	Fluctuation in market rates	90	60.00
3	Late auction sale of raisins in the market	80	53.30
4	No guarantee of payment received from merchants	75	50.00

From Table 21 it has been revealed that 63.30 per cent of the respondents expressed lack of knowledge about use of different plant growth regulators, followed by jumbling while selecting pesticides

and fungicides (60.00%), lack of knowledge about recommended technology (60.00%), low rates of grape fruit (60.00%), fluctuation in markets (60.00%), shortage of irrigation water (56.70%), high cost of fertilizers (53.30%), lack of knowledge about fertilizer management (53.30%), lack of timely guidance, late auction sale of raisins in the market (53.30%), shortage of fertilizers (50.00%), lack of knowledge about plant protection measures, short of capital (50.00%), no guarantee of payment received from merchants (50.00%) and non-availability of labours at the time of pruning, thinning and dipping of grape bunches in GA..

5.5 Empirical research model

Considering the anticipated relations amongst the independent and dependent variables and the actual result obtained after analysis of data an empirical model of relations was prepared and relationship has been depicted in Fig. 1. The empirical model shows the observed relation of independent variables with the dependent variable i.e. knowledge and adoption. The variables viz., experience in grape cultivation, land holding, size of orchard, benefits availed, annual income, socio-economic status, sources of information, social participation, innovativeness, economic motivation and risk preference were found to have positive and highly significant relation with knowledge and education was positively and significantly correlated with knowledge. Variables age, land holding and annual income were having non-significant correlation towards the characteristics of the respondents. Variables education, benefits availed, socio-economic status, sources of information, innovativeness, economic motivation, risk preference and knowledge were found to have positive and highly significant correlation with adoption. Variables experience in grape cultivation and size of orchards were having positive and significant correlation with adoption. The remaining selected variables age, land holding, annual income and social participation were non significant with adoption towards the characteristic of respondents. The observed empirical relation has been presented in fig. 20.

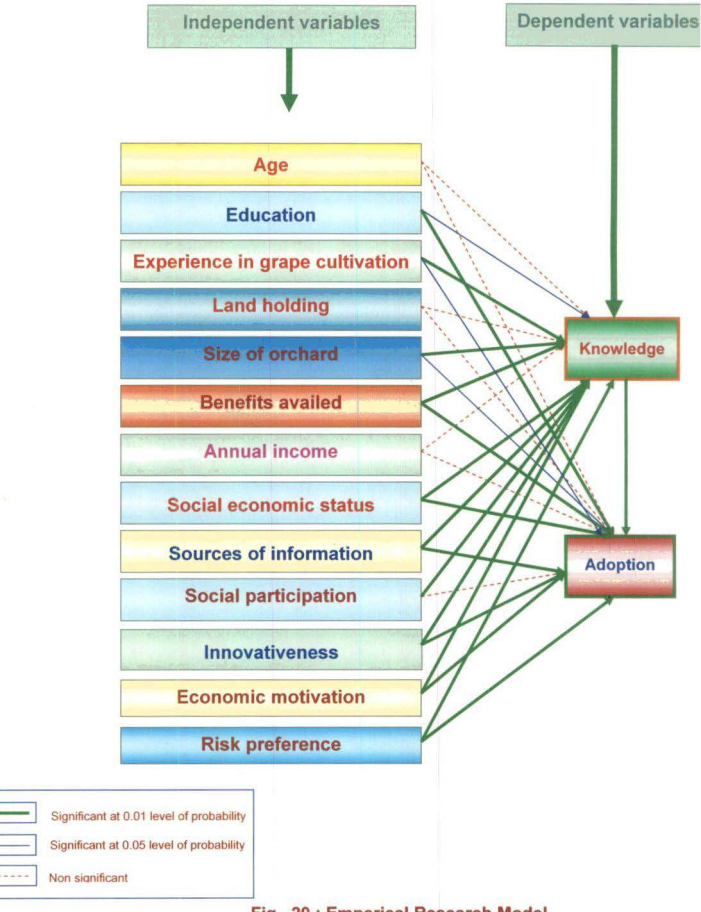

Fig. 20 : Emperical Research Model

CHAPTER VI

SUMMARY AND CONCLUSIONS

The present study "Adoption of recommended cultivation practices by grape growers" was conducted in Chikhali Panchayat samiti of Buldhana district. The study was planned to investigate the adoption of recommended cultivation practices by grape growers. It was also thought to be worth while to ascertain the constraints faced by the grape growers, in adoption of recommended cultivation practices.

6.1 Objectives of the study

The present study was therefore undertaken with the following specific objectives.

1. To study the personal, situational, socio-economic, communication and psychological characteristics of grape growers.
2. To study the extent of knowledge and adoption of recommended grape cultivation practices by the grape growers.
3. To study the relationship between selected characteristics of the grape growers with their knowledge and adoption of recommended grape cultivation practices.
4. To study the constraints encountered by the grape growers in adoption of grape cultivation practices.

6.2 Methodology

The exploratory research design of social research was used in the present investigation. The sample was drawn from Chikhali Panchayat samiti of Buldhana district of Maharashta state. From this Panchayat samiti 15 villages were selected on the basis of large area under grape crop. Thus, 150 farmers constituted the sample for the

study. Data were collected by personally interviewing the respondents with the help of pretested and structured interview schedule. The data collected were tabulated and the statistical tools namely mean, standard deviation, percentage, frequency and correlation coefficient were employed for interpretation of the findings. Null hypothesis set for the study was tested for its acceptance or rejection. The respondents were selected from these villages randomly by consulting with Talathi and Sarpanch of that villages.

The characteristics of the respondents namely age, education, experience in grape cultivation, land holding, size of orchard, benefits availed, annual income, socio-economic status, source of information, social participation, innovativeness, economic motivation and risk preference were studied as an independent variables. Whereas the knowledge and adoption were studied as dependent variables.

6.3 Findings

The salient findings of the study have been summarized as under.

1. Most of the respondents (40.00 %) were included in the middle age group of 36 to 50 years.
2. Near about one third (28.70 %) of the respondents were educated upto higher secondary school followed by 24.70 per cent of the respondents who could reach middle school level of education.
3. About 44.60 per cent of the respondents had experience of 3 to 6 years in grape cultivation.
4. Over one third of the respondents (45.20 %) belonged to category of medium land holding ranging from 4.01 to 10.00 ha.
5. Over two third of the respondents (70.00 %) had a grape orchard having vines upto 2266 numbers.

6. Over half of the respondents (52.00 %) had not availed benefit of NHM.
7. More than half of the respondents (54.70 %) had annual income between Rs. 500001 to 1000000.
8. Nearly half of the respondents (49.33 %) had belonged to very high category of socio-economic status in the village community.
9. More than three-fourth of the respondents (75.34 %) were having high sources of information.
10. Over half of the respondents (51.33 %) had belonged to medium category of social participation.
11. Majority of the respondents (98.67 %) were included in the category of medium innovativeness.
12. Majority of the respondents (80.67 %) had medium level of economic motivation.
13. More than half of the respondents (62.67 %) were found taking high risk in grape cultivation.
14. About 58.68 per cent grape growers had medium level of knowledge of recommended grape cultivation practices
15. About 46.66 per cent grape growers had medium level of adoption recommended grape cultivation practices.

6.4 Relational analysis

The findings of relational analysis of the selected characteristics of respondents with knowledge and adoption about recommended grape cultivation practices have been summarized as under.

6.4.1 Knowledge

The findings of correlation analysis revealed that, the characteristics such as experience in grape cultivation, size of orchard benefits availed, socio-economic status, source of information, social participation, innovativeness, economic motivation and risk preference

were positively and highly significantly correlated. The variable education was significantly correlated with knowledge of the grape growers. Whereas, age, land holding and annual income were non-significantly correlated with knowledge of the grape growers.

6.4.2 Adoption

Among the characteristics viz., education benefits availed, socio-economic status, sources of information, innovativeness, economic motivation, risk preference and knowledge were positively and highly significantly correlated with adoption of recommended grape cultivation practices. Experience in grape cultivation and size of orchard were positively and significantly correlated with adoption of grape growers. However, age, land holding, annual income and social participation did not show significant relationship with adoption of recommended grape cultivation practices.

6.5 Constraints faced by the grape growers in adoption of recommended grape cultivation practices

Majority of the respondents expressed perceived lack of knowledge about use of different plant growth regulators (63.30%) followed by jumbling while selecting pesticides and fungicides (60.00%), lack of knowledge about recommended technology (60.00%), low rates of grape fruit (60.00%), fluctuation in markets (60.00%), shortage of irrigation water (56.70%), high cost of fertilizers (53.30%), lack of knowledge about fertilizer management (53.30%), lack of timely guidance, late auction scale of raisins in the market (53.30%), shortage of fertilizers (50.00%), lack of knowledge about plant protection measures, short of capital (50.00%), no guarantee of payment received from merchants (50.00%) and non-availability of labours at the time of pruning, thinning and dipping of grape bunches in GA..

CHAPTER VII

IMPLICATIONS

The implications based on the findings of this investigation have been presented into two parts viz., action and implications. Implications with regards to research are based on experiences during the course of investigation and will be useful for guidelines and suggestions for further research on same topic. Action implications may also be useful for extension personnel, policy makers, NGO's personnel and other related personel, engaged in agricultural development.

7.1 Implication for action

1. The main constraints in adoption of recommended practices of grape were high cost of required inputs. In this regards it implicated that farmers should try the early available credit sources which may also be used for making capital availability when needed for grape cultivation.
2. The findings of the study further then revealed that, the most of the respondents possessed medium level of knowledge about recommended cultivation practices of grape. The inadequate knowledge certainly reflects on adoption. In order to achieve a higher level of adoption by grape growers, they are required to be fully equipped with latest technical know-how about cultivation of grape crop. Therefore, the implication is that the extension agency may give suitable educational efforts by way of undertaking specialized training programmes, method and results demonstrations and field visits.
3. The extent of adoption of recommended cultivation practices for grape crop revealed that most of the respondents had medium level

of adoption. It thus implied that adoption of recommended cultivation by grape growers was not to the fullest extent. The extension workers may therefore convince the grape growers by arranging demonstrations both method and results demonstrations and field visits to the demonstration plot.

4. The findings with regards to the marketing of grape revealed that the respondents did not realized remunerative prices for their grape produce. They further revealed that the transport of grape produce to the distant market individually requires higher expenses. This tends to imply that there is need to safeguard the interest of grape growers and maximize their returns.

In this context it may be suggested that in dealing of grape produce, collective transport should be facilitated by forming informal groups or for marketing of grape produce and also packing of the grape produce be introduced increase the shelf life of grape while transporting to distant market.

7.2 Implications for future research

1. The study was conducted in sample villages in only one Panchayat Samiti (Chikhali) of Buldhana district in Vidarbha region with restricted sample size therefore generalization based on this study alone will not be meaningful. It is therefore implicated that study may be extended to other similar areas like Chikhali Panchayat samiti with sufficient sample size.
2. It will be better if more independent variables could be selected for such type of studies in future.
3. To determine the variation in adoption of recommended cultivation practices of grapes, the study may be undertaken in different region of Maharashtra state, wherever there is a large area under grape cultivation.

CHAPTER VIII

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6. Research paper published (if any) : -

7. Field of interest (in which you desire to work) : Agriculture

Place : Akola

Date : 03/07/2008

Thakare

Signature of Student

APPENDIX – I

INTERVIEW SCHEDULE

INTERVIEW SCHEDULE

Title of Thesis : **Adoption of Recommended cultivation practices by grape growers**

Name of Researcher : **Thakare Shrikisan Bajirao**
M.Sc. (Agril.)Extension Education
Dr. PDKV, Akola

- General Information -

Name of farmer:
Village : ..... **Taluka** : .....
Dist. : .....

- Personal Information -

1. **Age** : ..... Years
2. **Education** : ..... Std.
3. **Experience in grape cultivation**
   a. From how many years you are engaged in grape cultivation _____ years.
4. **Land holding**
   a. Irrigated land : ..... Hectare
   b. Rainfed land : ..... Hectare
   c. Total land possessed : ..... Hectare
5. **Size of orchard**
   a. Land under crop : ..... Hectare
   b. No. of grape vine : ..... Hectare
6. **Benefits availed : Please mention the benefits availed by you**

Sr. No.	Type of benefits	Yes or No	Entitled amount (Rs)	Actual amount received (Rs)	Mode of benefits
1.					
2.					
3.					
4.					
5.					

			Type of cultivation	Score (√)	
	b)				
		a.	Rainfed	(1)	
		b.	Irrigated	(2)	
	c)		**Cropping pattern**		
		i)	Seasonal cropping / Single cropping	(1)	
		ii)	Double / Multiple cropping	(2)	
		iii)	Biannual cropping	(3)	
		iv)	Orchards	(4)	
	d)		**Source of irrigation**		
		i)	Number of source	(0)	
		ii)	River	(1)	
		ii)	Well	(2)	
		iv)	Canal	(3)	
	e)		**Ownership of land**		
		i)	Land leased out : ____ ha.	(1)	
		ii)	Land leased in : 2 ha.	(2)	
	f)		**Contingency paid yearly worker**		
			No	(0)	
			Yes	(1)	
3)	a)		**Family education**		
		i)	Illiterate	(0)	
		ii)	Elementary (Can read and write only)	(1)	
		iii)	Primary	(2)	
		iv)	Middle school	(3)	
		v)	High school	(4)	
		vi)	Technical college	(5)	
		vii)	Non technical college	(5)	
		vii)	Professional (Medical/ Engineering/ Agriculture)	(6)	
	b)		**Wife's education**		
		i)	Illiterate	(0)	
		ii)	Elementary (Can read and write only)	(1)	
		iii)	Primary	(2)	
		iv)	Middle school	(3)	
		v)	High school	(4)	
		vi)	Technical college	(5)	
		vii)	Non-technical college	(5)	
		viii)	Professional (Medical/ Engineering/ Agriculture)	(6)	

4)			**Annual income**		**4.32**
	1)		Below poverty line	(1)	
	2)		Upto Rs. 50,000/-	(2)	
	3)		Rs. 50,000/- to Rs. 1,00,000/-	(3)	
	4)		Rs. 1,00,000/- to 1,50,000	(4)	
	5)		Rs. 1,50,000/- to creamy layer	(5)	
	6)		Above creamy layer	(6)	
5)			**Socio-political participation**	**Score (√)**	**3.35**
		i)	Without any position in social or political organization	(0)	
		ii)	Membership of one social or political organization	(1)	
		iii)	Membership of one social and political organization	(2)	
		iv)	Involved in community work though not having membership or official position in any social or political organization	(3)	
		v)	Financial contribution / Raising common funds	(3)	
		vi)	Official position in social or political organization	(4)	
		vii)	Village leader/opinion leader	(5)	
		viii)	Wide public leader	(6)	
6)			**Household**		**2.16**
	a.		**Type of house**		
		i)	Shed Thatched (Stalk farmers)	(1)	
		ii)	Mudwalls and thatched	(2)	
		iii)	Brick wall and tiled	(3)	
		iv)	Concrete house	(4)	
		v)	Double storied	(5)	
	b.		**Ownership of house**		
		1)	Rented	(1)	
		2)	Own	(2)	
	c.		**Other facilities**		
		i)	Toilet/soak pit available	(1)	
		ii)	Well inside the yard	(2)	
		iii)	Bio gas connection	(3)	
		iv)	LPG connection	(4)	
	d.		**Condition of the house**		
		i)	Need much repair	(1)	
		ii)	Need some repair	(2)	

		iv)	Devan	(3)	
		v)	Sofa	(3)	
	III.		**Other house hold equipments**		
		i)	Watch / Torch	(1)	
		ii)	Fan	(2)	
		iii)	Camera	(2)	
		iv)	CD Player	(3)	
		v)	Mixer / Grinder	(3)	
		vi)	Tape recorder	(3)	
		vii)	Telephone	(4)	
		viii)	Cooler	(5)	
		ix)	Refrigerator	(5)	
	c.		**Animal possession**		
	I)		**Farm animals (Bullock)**		
		i)	Non discrete	(1)	
		ii)	Discrete	(2)	
	II)		**Milch animals**		
		i)	Non-discrete	(1)	
		ii)	Discrete	(2)	
	III.		**Goat / sheep**		
		i)	Non-discrete	(1)	
		ii)	Discrete	(2)	
	IV.		**Poultry**		
	d.		**Information sources**	**Score (√)**	
		I)	Books	(1)	
		II)	Farm publications	(2)	
		III)	Agricultural bulletins / Magazines	(2)	
		IV)	New paper-daily / Weekly / Fortnightly	(3)	
		V)	Radio	(3)	
		VI)	TV-Black and White / Coloured	(4)	
		VII)	Internet access (Common)	(5)	
	e.		**Farm structure**		
	I)		**Cattle shed**		
		i)	Katcha	(1)	
		ii)	Pucca	(2)	
	II)		**Implements shade**		
		i)	Katcha	(1)	
		ii)	Pucca	(2)	

	f.		**Transport**		
		I)	Cycle	(1)	
		II)	Bullock cart	(2)	
		III)	Motor cycle/moped	(3)	
		IV)	Jeep / Lorry / Van	(4)	
		V)	Tractor / Truck	(4)	
	g.		**Farm visits / Exhibition / Extension activities**		
		I)	Always	(3)	
		II)	Sometimes	(2)	
		III)	Never	(1)	
8)			**Other attributes**		**1.00**
		I)	Seed producer	(1)	
		II)	Progressive farmer	(2)	
		III)	Prize winner - Village / Tahsil / District level	(3)	
		IV)	Krishi Pandit	(3)	
	a.		**Loans**		
		i)	Borrowed	(1)	
		ii)	Not Borrowed	(2)	
	b.		**Repayment behaviour**		
		i)	Defaulter	(1)	
		ii)	Non defaulter	(2)	

9. Sources of information

Sr. No.		Source of information	Always	Sometimes	Never
(A)		**Personal sources**			
	1	Neighbours			
	2	Friends			
	3	Relatives			
	4	Progressive farmers			
	5	Gram Panchayat Members			
	6	Local leader			
(B)		**Impersonal sources**			
	1	Garm Sevak			
	2	Krishi Sevak			
	3	Agril. Supervisor			
	4	Agril. Officer			
	5	Agril. Extension Officer			
	6	Agril. University / KVK Scientist			

	7	Horticulture Officer			
	8	Group Discussion			
	9	Training			
	10	Demonstration			
	11	Tour			
	12	Participation in Agril. Exhibition			
(C)		**Mass media sources**			
	1	Radio			
	2	Television			
	3	Newspaper			
	4	Agriculture literature (Magazine / Publications)			
	5	Internet			
(D)		**Trade Organizations**			
	1	Agriculture producer marketing committee			
	2	Authorized dealer (Fertilizer, Insecticides, Seed)			
	3	Co-operative			
	4	Other (please mention)			

10. Social Participation

Sr. No.	Social organization	Position		Duration
		Member	Officer	
I.	Formal organization			
1)	Zilla Parishad/ Panchayat Samiti			
2)	Gram Panchayat			
3)	Primary Service Co-op. Society			
4)	School Committee			
5)	Sugar Factory			
6)	Dairy Co-operative			
7)	Others (Specify)			
II.	Informal organization			
1)	Bhajani Mandal			
2)	Shetkari Sanghatana			
3)	Yuvak Mandal			
4)	Self help group			
5)	Others (Specify)			

11. Innovativeness (Singh, 1972)

Sr. No.	Statement	Agree	Undecided	Disagree
1)	I feel restless till I try out new farm practice I have heard about.			
2)	They talk of many new farm practices these days but who knows if they are better than old practices.			
3)	After all, our forefathers were wise in their farming practices and I did not see any reason for changing these old practices.			
4)	Often new farm practices are not successful. However. If they are promising. I would like to adopt them.			
5)	From time to time I have heard of several new farm practices and I have tried most of these in last few years.			
6)	Some how, I believe that the traditional ways are the best.			

Statement 1, 4, 5 are positive
Statement 2, 3, 6 are negative

12. Economic motivation (Supe, 1969)

Sr. No.	Economic motivation	SA	A	UD	DA	SD
1)	A farmer should work towards larger yield and economic profit.					
2)	The most successful orchadist is one who makes the most profit.					
3)	The farmer should try any new farming idea which may earn him more money.					
4)	The farmer should grow cash crop like banana to increase monetary profits in comparison to growing of food crop for home consumption.					
5)	It is difficult for the farmers children to make good start unless he provides them with economic assistance.					

6)	A farmer must earn his living but the most important thing in life can not be defined in economic terms.					

Statement 1, 2, 3, 4, and 5 are positive
Statement 6 is negative

13. Risk Preference (Supe, 1969)

Sr. No.	Statement	SA	A	UD	DA	SD
1)	A farmers should grow large number of crops avoid greater risk involved in growing one or two crops.					
2)	A farmers should rather take more of chances in making a big profit than to content with a smaller but less risky profit.					
3)	A farmer who is willing to take greater risk than the average farmers usually does better financially.					
4)	It is good for a farmer to take risk when he knows his chance of success is fairly high.					
5)	It is better for a farmer not to try new farming method unless most other farmers have used then with success.					
6)	Trying an entirely new method in faming by farmer involves risk but it is worth luring.					

SA = Strongly agree A = Agree UD = Undecided
DA = Disagree SD = Strongly disagree

: PART - II :

1. Knowledge

Below given are some questions related to knowledge about recommended cultivation practices of grape. Please give appropriate answer to them.

Sr. No.		Cultivation practices	Knowledge		
			CK	PK	NK
A.		**Land preparation (Ploughing, Harrowing, etc.)**			
	i)	What type of soil is recommended for cultivation of grape ? (light, friable Joamy soils, freed rainage, etc.)			
	ii)	Which practices are necessary for land preparation ?			
B.		**Variety (Sonaka, sharad etc.)**			
	i)	Name the varieties of grape recommended for cultivation in this area ? (Sonaka, sharad etc.)			
	ii)	What is quality characteristic of recommended variety of grape (i.e. wine, manuka, sweet juice, etc.)			
C.		**Propagation**			
	i)	Which propagation method generally use in this area ? (cuttings, etc.)			
D.		**Planting**			
	i)	Which is suitable planting time recommended for grape crop ? (January and February)			
	ii)	What should be planting depth for grape crop ? (50-75 cm)			
E.		**Spacing**			
	i)	What is recommended spacing for grape crop ? (3.0 x 1.5 m, 3.0 x 1.4, etc.)			
	ii)	What should be the optimum grapevine population of grape crop ? (2200, 2380, etc.)			
F.		**Training**			
	i)	Which type of training recommended in grape crop ? (Head system, pergola system , etc.)			
G.		**Pruning**			
	i)	Which is suitable time for pruning in grape crop ? (April, October pruning)			
H.		**Organic manure**			
	i)	What is recommended dose of FYM per hectare for grape crop ? (90-100 CL)			
I.		**Fertilizer application**			
	i)	What is the recommended dose of fertilizer per hectare ? (900 kg N : 500 kg, P_2O_5 700 kg K_2O)			

J.		**Irrigation**			
	i)	What is the recommended time for irrigation of grape ?			
	ii)	Which suitable method of irrigation use in this area ?			
K.		**Plant protection**			
	i)	Name the major pests of grape crop ?			
	ii)	Name the insecticide recommended for control of pests ?			
	iii)	Name the major diseases of grape crop ?			
	iv)	Name the chemical recommended for control of above disease ?			
L.		**Harvesting**			
	i)	What is appropriate stage of harvesting of grape crop ? (February, March)			
M.		**Marketing**			
	i)	Which size is suitable for marketing of grapes ? (large, etc.)			

CK = Complete Knowledge, PK = Partial Knowledge,
NK = Non Knowledge

2. Adoption

Please indicate about the improved cultivation practices that you have adopted on your farm for grape crop.

Sr. No.		Cultivation practices	Adoption		
			CA	PA	NA
A.		**Land preparation**			
	i)	Type of soil on which grape was grown ?			
	ii)	Which is major operation followed for land preparation ?			
B.		**Variety**			
	i)	Which variety that you adopted for grape crop ?			
	ii)	Which use adopted that you selected variety of grape crop ?			
C.		Propagation			
	i)	Which propagation method have you followed for grape crop ?			
D.		**Planting**			
	i)	At what period grape crop was planted ?			
	ii)	At what dept the grape vine were placed while planting ?			

E.		**Spacing**			
	i)	Which spacing you followed in grape crop ?			
	ii)	What was the optimum grapevine population in your field ?			
F.		**Training**			
	i)	Which training method you followed in grape crop field ?			
G.		**Pruning**			
	i)	Which period that you have followed for pruning of grape crop ?			
H.		**Organic manure**			
	i)	Which dose that you followed for FYM application for grape crop ?			
I.		**Fertilizer application**			
	i)	Which does that you followed for fertilizer application in grape crop ?			
J.		**Irrigation**			
	i)	When you followed the irrigation for grape crop ?			
	ii)	Which critical growth stage have followed for irrigation to grape crop ?			
K.		**Plant protection**			
	i)	Which major pest observed on grape crop ?			
	ii)	Which chemical used for control of pests on grape crop ?			
	v)	Which chemical used for control of disease on grape crop ?			
	iii)	Which major disease observed on grape crop ?			
L.		**Harvesting**			
	i)	Which period that you have followed for harvesting of grape crop ?			
M.		**Marketing**			
	i)	Which type of size of grape that you have followed for marketing ?			

CA = Complete Adoption, PA = Partial Adoption,
NA = Non Adoption

: PART - III :

1. Constraints in adoption grape cultivation practices

Please tell about the constraints that you face in cultivation of grape crop.

Sr. No.	Constraints	Tick (√)
A	**Cultivation constraints**	
	1. Inadequate and timely availability of fertilizers	
	2. High cost of inorganic fertilizers and micronutrients	
	3. Shortage of irrigation water during summer	
	4. Problems in identification of disease and pest affected sample	
	5. High cost of pesticides and fungicides	
	6. Jumbling while selecting pesticides and fungicides	
	7. High wages of labour	
	8. Non-availability of labours at the time of pruning, thinning and dipping of grape bunches in GA	
B)	**Technical constraints**	
	1. Lack of knowledge about recommended technology	
	2. Lack of knowledge about fertilizer management	
	3. Lack of knowledge about plant protection measures	
	4. Lack of knowledge about use of different plant growth regulators i.e. GA, Leosin, CPPU, 6BA	
	5. Lack of timely guidance	
C)	**Financial constraints**	
	1. Inadequate sources of finance	
	2. Short of capital	
	3. Non-availability of money in time	
D)	**Marketing constraints**	
	1. Low rates of grape fruit	
	2. Fluctuation in market rates	
	3. Late auction sale of raisins in the market	
	4. No guarantee of payment received from merchants	