

STUDY OF ADVISORY SYSTEM USED BY GRAPE GROWERS

by

Mr. Kadam Abhishek Arvind
(Reg. No. K-17/202)



EXTENSION EDUCATION SECTION
RCSM COLLEGE OF AGRICULTURE
KOLHAPUR

MAHATMA PHULE KRISHI VIDYAPEETH
RAHURI- 413722 DIST- AHMEDNAGAR
MAHARASHTRA, INDIA

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A Thesis submitted to the
MAHATMA PHULE KRISHI VIDYAPEETH
RAHURI – 413722, DIST - AHMEDNAGAR
MAHARASHTRA STATE, INDIA

In partial fulfillment of the requirements for the degree

of

MASTER OF SCIENCE (AGRICULTURE)

in

AGRICULTURAL EXTENSION



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MAHARASHTRA, INDIA**

2019

CANDIDATE'S DECLARATION

I hereby declare that this thesis or part
there of has not been submitted by
me or other person to any other
University or Institute
for a Degree or
Diploma

Place: Kolhapur

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Date: / / 2019

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CERTIFICATE

This is to certify that the thesis entitled, “**STUDY OF ADVISORY SYSTEM USED BY GRAPE GROWERS**” submitted to the Faculty of Agriculture, Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahmednagar, Maharashtra State in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE (AGRICULTURE)** in **AGRICULTURAL EXTENSION**, is a record of a bonafide research work carried out by **Mr. KADAM ABHISHEK ARVIND** under my guidance and supervision and that no part of the thesis has been submitted for any other degree or diploma

The assistance and help received during the course of this investigation and sources of literature referred to have been duly acknowledged.

Place: Kolhapur

Date: / / 2019

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CERTIFICATE

This is to certify that the thesis entitled, “**STUDY OF ADVISORY SYSTEM USED BY GRAPE GROWERS**” submitted to the Faculty of Agriculture, Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahmednagar, (Maharashtra) in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE (AGRICULTURE)** in **AGRICULTURAL EXTENSION**, embodies the results of a piece of bonafide research work carried out by **Mr. KADAM ABHISHEK ARVIND** under the guidance and supervision of and **Dr. K. V. GURAV**, Associate Professor of Agricultural Extension, RCSM College of Agriculture, Kolhapur and that no part of the thesis has been submitted for any other degree or diploma

The assistance and help received during the course of this investigation and sources of literature referred to have been duly acknowledged.

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Date: / / 2019

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Associate Dean,
RCSM College of Agriculture,
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CERTIFICATE

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Place: Kolhapur

Date: / / 2019

(G. G. Khot)

Associate Dean

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Place: Kolhapur

Date: / /2019

(Kadam A. A.)

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LIST OF ABBREVIATIONS

Rs.	Rupee(s)
%	Per cent
@	at the rate of
Agri.	Agriculture
Agril.	Agricultural
APMC	Agricultural Produce Market Committee
cm	Centimeter
e.g.	For example
<i>et al.</i>	Et alli (and other)
etc.	Et cetra
Extn.	Extension
Fig.	Figure(s)
Govt.	Government
ha.	Hectare (S)
i.e.	Id est. (That is)
<i>J.</i>	Journal
KCC	Kisan Credit Card
kg	Kilogram(s)
KVK	Krishi Vigyan Kendra
NA	Not Available
No.	Number
NRC	National Research Centre
<i>Res.</i>	Research
SD	Standard Deviation

ABSTRACT

STUDY OF ADVISORY SYSTEM USED BY GRAPE GROWERS

By

Mr. KADAM ABHISHEK ARVIND

A candidate for the degree

of

MASTER OF SCIENCE (AGRICULTURE)

in

AGRICULTURAL EXTENSION**2019**

Research Guide**: Dr. K. V. GURAV****Department****: Extension Education**

The present investigation “Study of advisory system used by grape growers” was conducted in Tasgaon, Miraj, Khanapur and Palus tahsil of Sangli district. Three villages from each tahsil and 10 respondents from each village were selected. Data were collected by personally interviewing 120 grape growers with the help of specially designed interview schedule. The statistical tools such as frequency, percentage, mean and standard deviation were used for grouping the data.

The findings indicated that maximum number of the respondents were from middle age group (70.00 per cent), educated up to higher secondary school level (44.17 per cent), medium level of family size (56.66 per cent), possessed small size of land holding (58.34 per cent), medium size area under grape cultivation (75.83 per cent), medium level of experience in grape cultivation (52.50 per cent), medium annual income (65.83 per cent), medium sources of information (50.00 per cent), medium extension contact (65.00 per cent), medium level of innovativeness (54.17 per cent), medium level of market orientation (58.33 per cent) and medium use of advisory system (43.33 per cent).

It was observed that nearly half of the grape growers were need to provide advisory services regarding Good Agricultural Practices (GAP), quality parameters, post-harvest use of grapes for raisins, grape varieties use for raisin making, raisin preparation methods and use of market functionaries related to local and export marketing of grapes and raisins.

The important constraints faced by the respondents were lack of timeliness in public advisory (95.83 per cent), lack of technical guidance regarding post-harvest technology and export marketing (70.83 per cent), lack of cooperative mindset (65.00 per cent), too much idealistic production procedure (55.83 per cent), lack of scientific and technical knowledge to members of advisory system itself (53.33 per cent), lack of practicability of advisory practices (48.33 per cent) and conflict in traditional knowledge of farmer and modern technical knowledge (45.00 per cent).

Majority of the respondents suggested that the regular guidance and services should be provide by advisory system (95.00 per cent), the farmers need to educated in order to make them come out of their traditional mindset (65.83 per cent), regular training programs need to held by advisory system (63.33 per cent), system should be flexible and practical (56.66 per cent) and advisory system itself should be monitored frequently to prevent false knowledge by member (19.16 per cent).

1. INTRODUCTION

In an agrarian country like India national economy is born by agricultural industries. Agriculture enterprise is the way of life in India. The present agricultural enterprises are entering in to an era of science and technology. In this era, commercial farming is a rule rather than traditional subsistence farming. The farmers of today need innovative knowledge, skills and more modern technology than his forefather. Indeed, he has to be an innovative to make a living in this competitive world.

Horticulture occupies an important place in the agricultural economy of India. The contribution of horticulture is estimated to about 10 per cent of the total value of agriculture in the country. Grape (*Vitis Vinifera* L.) is the most important fruit crop grown in temperate tropical, subtropical and tropical regions of the world. It is originated in Asia Minor in the region between Black Sea and Caspian Sea which belongs to the family vitiaceae. It is a non-climacteric fruit and one of the important horticultural crops, has proved to be the best profitable crop.

Scientific research in agriculture is progressing fast. New practices, improved varieties, machinery are coming to lime-light but there is laps of time and a wide gap in research and its adoption on the farmers fields. Adoption of generated technology has always been the major aim of our development. It is beyond doubt that adoption of improved agriculture technology is positive answer to increase the agriculture production. It is therefore essential for the farmers to adopt improved agriculture practices of cereals, pulses, oilseeds and horticulture crops, thereby increasing its productivity and thus helps in improving the national economy.

The grape is one of the most delicious, refreshing and nourishing fruit. Ripe grapes are easily digestible. It is fairly good source of minerals like calcium, phosphorus, iron and vitamins like B₁ and B₂. Grape juice is a refreshing drink, a stimulant to kidneys and laxative. Ripe fruits are supposed to be the best table fruit. Wine making from grapes is a flourishing industry in many countries. Fruits are used for making jelly, syrup and raisin.

India is fast emerging as one of the major grape growing country in the world. In India it is cultivated under temperate, sub-tropical and tropical climates over an area of 138 thousand ha with annual production of 2,980 thousand million tones (Anon, 2017). The country is also a major exporter of fresh grapes to the world. The country has exported 2,14,440.6 MT of grapes to the world for the worth of Rs.2,146.22 crore (332.75 USD Millions) and raisins 25,259.50 MT during the year 2017-18. Major export destinations is Netherland, Russia, United Kingdom, Germany and United Arab Emirates (Anon, 2018).

Maharashtra, Karnataka, Punjab, Andhra Pradesh, Tamil Nadu and Haryana are the major grape growing states in India. Maharashtra is the leading grape producing state, where the total area under grape cultivation is 103.96 thousand hectores with annual production of 2,137.73

thousand MT (Anon, 2017). Maharashtra exports 1,75,370.40 MT fresh grapes valuing of Rs. 1,87,092.71 lakhs.

Maharashtra State has a plenty of scope to grow various horticultural crops. The state government has undertaken a programme to promote Horticultural Development through established nurseries and granting of subsidies to farmers to encourage them to grow selected fruit crops.

Horticultural nurseries have been established by the government of Maharashtra to produce and supply genuine plants of various fruit crops to the cultivators. The additional plantation area under fruit crop is expected to add substantially to the gross value of production from agriculture in the state in near future.

China is a major competitor for India in exports of grapes to Europe. In UK the importers are very particular about specifications for exports to UK, each bunch of grapes should weight between 300 to 600 gms. All the berries should be of uniform size and at least 18 mm in diameter. The grapes should not contain more than acceptable limits of pesticide residues.

The commercial cultivation was initially confined to Nasik, Sangli, Pune, Satara, Ahmednagar and Solapur districts in Western Maharashtra. Area under grape cultivation in Maharashtra was about 103.96 thousand ha. Out of that area under grape cultivation in Sangli district is about 24,733.31 ha. (2018). Every year production of raisins in Maharashtra was about 50,000 tones and about 28,000 tons of fresh grapes were exported to different countries. Raisins are golden, green or black colored delicacies which are favorites everybody, especially children. They have wrinkled skin surrounding chewy flesh that table test like a burst of sugary sweetness. Raisins are made by dehydrating grapes in a process using the heat of sun or a mechanical process of oven drying. Among the most popular type of raisins are Thomson seedless and Tash-A-Ganesh.

The area under grape is increasing day by day. It is necessary to study the advisory services used by grape growers. The study will primarily attempt to know the public and private advisory services and needs of post-harvest technology and export oriented marketing. The findings of this study will be useful to the planners and the executors for the effective transfer of improved grape advisory services.

Scope and Importance of the study

The present day horticulture had become an economically viable enterprise. Maharashtra assumes an important place in horticultural industry in India. The every approach and brief statement of objectives given earlier would indicate the practical utility of the research. This inturn would enable to identify technological gap in relation to adoption of advisory services, recommended grape production and post-harvest management practices for the area, which ultimately effects overall production.

To aware the farmers about various international standards and good agricultural practices for production, various certification required in international market and knowledge about banned chemicals, pesticide residual, it's maximum permissible residue level of respective chemical (MRL) and quality parameters of various countries. In short extension approach should be export market oriented.

This study is one step ahead in this direction of market led extension. Grape crop is purposively selected because farmers have developed their own strategy to tackle the problems in export. They have formed group of farmers and co-operative society's to solve their problems. Some companies are coming forward to guide the farmers. Of course, they are profit oriented and may exploit the farmers. Thus, there is great need of extension support to the farmer regarding production and export related issues *viz.* quality production, documentation, certification, various laboratories and export procedure.

Finally, the study would probe into the constraints causing gap in adoption of improved agricultural technology and advisory services in the grape cultivation. The results would help in taking appropriate measures to enhance the advisory services regarding post-harvest technology related to export oriented marketing of grapes.

Objectives of the study

1. To study the personal and socio-economic characteristics of grape growers
2. To study of public and private advisory system used by grape growers
3. To assess the needs of grape growers about post-harvest technology and export oriented marketing
4. To know the constraints and suggestions of grape growers about effective advisory services

Limitations of the study

The present study, being part of the master's programme, has the normal limitations of time, funds and lack of other facilities normally faced by single student researcher. The limitations lead to the purposive selection of only one district as the locale of the study. Generalizations made based on the findings of the study may not be directly applicable to other areas and need to be substantiated with other, similar studies since, the study has adopted the ex-post facto design and the memory bias on the part of the respondents cannot be ruled out.

2. REVIEW OF LITERATURE

It is obvious that a comprehensive review of literature is an essential part of any scientific investigation. It is always helpful to the investigator as a guideline for his approach to fulfill the requirements of his research report. The review of literature is always necessary to compare the findings of the study undertaken by the previous research workers and to take the decisions on his own findings for drawing proper inferences and conclusions.

It is observed that many social scientists and research workers undertook their studies to find out their relationship of knowledge and adoption of improved agricultural practices with the profile of the adopters in addition to their sources of information and reasons if any for non-adoption of improved agricultural practices. Considering this the researcher has collected the available relevant literature as per the objectives of the study and presented in the following sequential manner.

Objectives of Study

1. To study the personal and socio-economic characteristics of grape growers
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2.1 Independent Variables

The reviews of past studies pertaining to these variables have been presented below.

2.1.1 Age

Dhakane (2005) found that, near about half (44.66 per cent) of grape growers were belonged to the young age group i.e. up to 35 years.

Thakare (2008) studied that, more than one third (40.00 per cent) of grape growers were included in the middle age group of 36 to 50 years.

Sorate (2011) observed that, more than half (53.00 per cent) of grape growers were included in the middle age group of 36 to 50 years.

Gavade (2013) concluded that, near about half (44.66 per cent) of grape growers were included in the middle age group i.e. 36 to 50 years.

Kalamkar (2013) stated that a majority (60.83 per cent) of the potato growers were from middle age group. Whereas 17.50 per cent potato growers belonged to young age group and 21.67 per cent potato growers belonged to the old age group.

Raut (2014) revealed that, near about half (45.83 per cent) of banana growers were from middle age group i.e. 36 to 50 years.

Suramwad (2014) revealed that, near about half of the grape growers (44.17 per cent) were included in the middle age group of 36 to 50 years.

Landage (2015) revealed that 66.66 per cent of respondents had middle age group of 36 to 50 years, 16.68 per cent of them had old age group 51 and above years and 16.66 per cent brinjal growers had young age group of below 35 years.

2.1.2 Education

Chavan (2005) found that, near about half (44.33 per cent) of grape growers were received secondary education (5th to 10th standard).

Thakare (2008) concluded that, more than one forth (28.70 per cent) of the grape growers were educated up to higher secondary school education level (8th to 10th standard).

Sorate (2011) observed that, more than one third (35.00 per cent) of the grape growers were educated up to high school education level (8th to 10th standard).

Kunchala (2012) found that nearly half (45.83 per cent) of the grape cultivating progressive farmers had obtained education up to higher secondary level, followed by 25.00 per cent, 19.17 per cent and 10.00 per cent of them having college level, secondary and primary level of education, respectively.

Aundhkar *et al.* (2013) reported that majority of (35.08 per cent) orange growers having education up to middle class, 34.14 per cent have 11th and above standard. 20.00 per cent orange grower has high school education 5.83 per cent were functional illiterate while 4.16 per cent have primary education.

Gavade (2013) indicated that, near about half (45.00 per cent) of grape growers were educated up to high school education level (8th to 10th standard).

Raut (2014) indicated that near about half (46.67 per cent) of banana growers were educated up to secondary education level (8th to 10th standard).

Suramwad (2014) reported that near about half of the grape growers (44.17 per cent) were educated upto secondary school level (5th to 10th standard).

Hipperkar (2015) reported that only 6.66 per cent of pomegranate growers had educated up to post graduate level whereas, 13.33 per cent had educated up to graduate level and 35.00 per cent respondents had educated up to higher secondary school level, while 24.17 per cent of of them had high school level education and 16.67 per cent had middle school level education. While 1.67 per cent farmer had educated up to primary school and only 2.50 per cent pomegranate growers were illiterate.

2.1.3 Size of Family

Kolte (2002) found that 68.00 per cent of the chilli growers belong to medium category of family (up to 6 to 8 members) while 20.00 per cent chilli growers had small size of family (up to 5 members) and only 12.00 per cent chilli growers belonged to large size of family (9 and above members).

Kalamkar (2013) revealed that majority (62.50 per cent) of the potato growers had medium size of family and had members up to 5 to 9 members followed by small size of family (up to 4 members) and large size of family (above 10 members).

Makar (2013) reported that a majority (64.55 per cent) of the potato growers had medium family size. The 20.90 per cent of them belonged to large family size and 14.55 per cent of them found from small size.

Landage (2015) revealed that 54.15 per cent of the brinjal growers had medium family size that is between 5 to 6 members in a family, followed by 31.66 per cent of them had small family size that is up to 4 members while 14.19 per cent of the respondents had large family size that is 7 and above member in a family.

2.1.4 Land Holding

Karale (2006) observed that, near about half (49.17 per cent) of grape growers were medium land holding ranging from 4.01 to 10.00 ha.

Thakare (2008) found that, near about half (45.20 per cent) of grape grower respondents belonged to category of medium land holding ranging from 4.01 to 10.00 ha.

Waghmare (2010) showed that sweet orange growers (8.30 per cent) were marginal farmers, while 12.50 per cent of the respondents were small farmers, followed by 8.30 per cent and 40.90 per cent respondents were semi-medium and medium category. Majority (30.00 per cent) of the respondent were large farmers.

Sawale (2011) observed that higher percentage (51.25 per cent) of pomegranate growers were found in semi-medium land holding category, 32.50 per cent were in small land holding category and 13.75 per cent of them from medium land holding. Only, 2.50 per cent of the pomegranate growers were found in big land holding.

Bhandare (2011) revealed that significant (39.17 per cent) of the sweet orange growers were having semi – medium land holding followed by near about one fourth (22.50 per cent) of the respondents were possessing medium land holding, next to them one fifth (20.00 per cent) were having small land holding followed by 12.50 per cent of respondents were having marginal land holding and 5.83 per cent of them were having large land holding.

Rajesh (2011) reported that slightly more than one third (35.24 per cent) of the grape farmers possessed medium size of land holding, followed by more than one fourth (26.67 per cent) and 22.85 per cent who had marginal and small size of land holding. Rest 15.24 per cent of the farmers had large size of land holding.

Sorate (2011) concluded that, near to one third (31.00 per cent) of grape growers were belonged to category of medium land holding ranging from 4.01 to 10.00 ha.

Kachare (2012) observed that about half of the sweet orange growers (52.50 per cent) possessed semi-medium land holding followed by 25.00 per cent respondents possessed medium

land holding, followed by 15.84 per cent respondents possessed large land holding, followed by 5.00 per cent respondents small land holding and lastly only 1.66 per cent respondents possessed marginal land holding.

Gavade (2013) studied that, more than one third (37.00 per cent) of grape growers were possessed medium land holding ranging from 4.01 to 10.00 ha.

Raut (2014) revealed that, near about half (42.50 per cent) of the banana growers were belonged to category of small land holding between 1.01 to 2.00 ha.

Suramwad (2014) revealed that, relatively higher proportion of the grape growers (49.17 per cent) belonged to category of small land holding ranging from 1.01 to 2.00 ha.

Hipperkar (2015) observed that 64.17 per cent of the pomegranate growers possessed medium land holding and 24.17 per cent respondents possessed small land holding, followed by 11.66 per cent of them possessed big land holding.

2.1.5 Area Under Grape Cultivation

Patel (2007) showed that less than one half (47.67 per cent) of the grape growers were found to have land under grape cultivation in between 0.26 to 0.50 hectares, followed by 35.67 per cent, 11.33 per cent and 5.33 per cent of them had up to 0.25 hectares, more than 0.75 hectares and between 0.51 to 0.75 hectares of land under grape cultivation, respectively.

Howal *et.al*, (2009) noticed that 45.32 per cent pomegranate growers had large area, 39.34 per cent had medium area and 14.84 per cent had small area.

Gaikwad and Khalache (2010) reported that area under custard apple cultivation 88.15 per cent had medium area 8.15 per cent had large area and 3.70 per cent had small area.

Khot (2011) stated that a little more than one half (52.50 per cent) of the grape growers had 1.1 to 2.0 ha area under grape with drip irrigation system, followed by 35.83 per cent of the grape growers had up to 1.00 ha area under grape with drip irrigation system. Only 11.67 per cent of the grape growers had more than 2.00 ha area under grape with drip irrigation system, respondents were found in small land holding category and 10.83 per cent in high land holding category.

Suramwad (2014) revealed that, large majority of the grape growers (86.67 per cent) had a small grape orchard having size from 0.17 to 1.07 ha.

Jamadar (2015) shows that 82.50 per cent of grape growers were found in small area under grape cultivation category, 12.50 per cent were in medium area under grape cultivation category and 5.00 per cent of grape growers were found in large area under grape cultivation category.

2.1.6 Experience in Grape Cultivation

Karale (2006) observed that, majority of the grape growers (80.33 per cent) were having 3.01 to 10.00 years of experience in grape cultivation.

Thakare (2008) found that, near about half (44.60 per cent of the grape farmers had experience of 3 to 6 years in grape cultivation.

Gaikwad and Khalache (2010) showed that 74.10 per cent custard apple growers had medium farming experience, 15.56 per cent respondents had low farming experience and 10.34 per cent respondents had high farming experience.

Waghmare (2010) reported that two third of the sweet orange growers (63.34 per cent) had medium farming experience while, 22.50 per cent of the respondents had high farming experience whereas, 14.16 per cent of them were found in low farming experience category.

Bhandare (2011) indicated that majority of the sweet orange growers (66.66 per cent) were having medium farming experience while 18.33 per cent of the respondents were high farming experience whereas 15.00 per cent of respondents were found in low farming experience category.

Sorate (2011) concluded that, majority of the grape growers (79.00 per cent) had experience of 4 to 8 years in grape cultivation.

Jamadar (2012) reported that the most of the sugarcane growers (56.67 per cent) had medium farming experience, while 24.16 per cent of the growers had low farming experience, whereas 19.17 per cent of them were found in high farming experience category.

Gavade (2013) revealed that, near about majority (57.00 per cent) of the grape growers had experience of 4 to 6 years in cultivation of grape.

Suramwad (2014) reported that, more than half of the grape growers (56.67 per cent) had experience of 6 to 15 years in grape cultivation.

Hipperkar (2015) that three fifth (61.67 per cent) of pomegranate growers had medium farming experience whereas, 23.33 per cent of respondents had low farming experience and only 15.00 per cent of them had high farming experience.

2.1.7 Annual Income

Ingale (2003) observed that a majority (69.17 per cent) of the ber growers had medium level of annual income ranging from Rs. 50,001 ta Rs. 1,33,000 while 11.66 per cent of the respondent had low annual income (up to Rs 50,000). Only 19.17 per cent of them had high annual income (Rs. 1,33,001 and above).

Khair (2005) observed that 15.50 per cent of the fig growers had low annual income, 64.50 per cent of the growers had medium annual income and 20.00 per cent had low annual income.

Manpadlekar (2006) noticed that majority of the farm women (58.34 per cent) had medium annual income while, 27.50 per cent of the farm women had low annual income whereas, and 14.16 per cent of the farm women belonged to high annual income category.

Waghmare. (2010) studied that 83.33 per cent of the sweet orange growers had medium annual income, while 12.50 per cent of the respondents had higher income. Whereas, 14.17 per cent of the respondents belonged to low annual income category.

Bhandare (2011) revealed that majority of the sweet orange farmers (72.50 per cent) had low annual income while near about one fourth (22.83 per cent) of the respondents had higher annual income whereas, 6.67 per cent of the respondents had medium annual income.

Sawale (2011) observed that 72.50 per cent of the pomegranate growers had medium annual income followed by 16.25 per cent and 11.25 per cent had low and high annual income, respectively.

Jamadar (2012) noticed that majority of the sugarcane growers (61.67 per cent) had medium annual income, while, 20.00 per cent of the respondents had high annual income whereas, 18.33 per cent of the respondents belonged to low annual income.

Chiranthan G. (2013) observed that 77.33 per cent of the citrus growers had medium annual income followed by 13.33 per cent and 21.33 per cent had low and high annual income, respectively.

Suramwad (2014) observed that, large majority of the grape growers (91.67 per cent) were belonged to have medium annual income.

Hipperkar (2015) that 77.50 per cent pomegranate growers had medium level of annual income followed by 13.33 per cent of them categorized under low level of annual income and 9.17 per cent of respondents had high level of annual income.

2.1.8 Sources Of Information

Thakare (2008) found that, majority of the grape growers (75.34 per cent) were having high level of sources of information.

Garje (2010) reported that, majority of grape growers (69.17 per cent) had used medium source of information.

Sorate (2011) concluded that, majority of the grape growers (68.00 per cent) were having medium level of sources of information.

Gavade (2013) observed that, majority of the grape farmers (68.00 per cent) were having medium level of sources of information.

Raut (2014) revealed that, majority (67.50 per cent) of the banana growers were using medium sources of information whereas, 16.67 per cent and 15.83 per cent of the respondents had high and low sources of information, respectively.

Suramwad (2014) observed that, majority of the grape growers (65.00 per cent) were having medium level of sources of information.

2.1.9 Extension Contact

Bedre (2009) observed that 45.25 per cent pomegranate growers had medium extension contact, 20.25 per cent respondents had high extension contact whereas 34.50 per cent of them had low extension contact.

Howal *et al.* (2009) reported that 63.00 per cent pomegranate growers had medium extension contact followed by 19.14 per cent of them had low extension contact whereas, 17.86 per cent pomegranate growers had high extension contact.

Uma Maheswra Rao *et. al.* (2010) revealed that in their study impact of training programmes of Krishi Vigyan Kendra, 65.00 per cent of the respondents had medium level of extension contact

Fuke (2011) evident that maximum number of the proprietors of agro service centers (45.00 per cent) having medium level of extension contact, followed by 32.50 per cent of respondents comes under high level of extension contact and less number (22.50 per cent) of proprietors respondents comes under low level of extension contact respectively.

Kachare (2012) observed that majority (64.16 per cent) of the sweet orange growers had medium extension contact followed by 18.33 per cent of respondents had low extension contact and 17.31 per cent of the respondents had high extension contact.

Aundhkar *et al.* (2013) reported that the extension contact profile of orange growers showed that majority of respondent (69.16 per cent) had high extension contact, 25.00 per cent had medium contact and 4.90 per cent had low extension contact.

Chiranthan (2013) noticed that 64.17 per cent of the citrus growers had medium level of extension contact followed by 20.83 per cent and 15.00 per cent had low and high extension contact, respectively.

Suryawanshi (2014) reported that in his study training needs of agricultural input dealers in transfer of agriculture technology, majority of the respondents (55.83 per cent) were found medium level of extension contact and 25.84 per cent of them had high extension contact whereas, 18.33 per cent of them had low extension contact.

Jamadar (2015) indicates that 48.33 per cent of the grape growers were found medium level of extension contact and 20.83 per cent of them had high extension contact. Whereas, 30.84 per cent of them had low extension contact.

2.1.10 Innovativeness

Desai (1997) observed that slightly more than half (50.86 per cent) of the mango growers were highly innovative followed by 46.86 per cent were medium innovative and only 2.28 per cent of them were low innovative.

Patel (2006) examined that slightly more than three fifth (62.25 per cent) of the aonla growers had medium innovation proneness, followed by 27.00 per cent and 10.50 per cent had high and low level of innovation proneness, respectively.

Patil (2008) observed that, majority of the grape growers (61.33 per cent) were fall in medium level of innovativeness and only 16.67 per cent found to be in low level of innovativeness.

Thakare (2008) concluded that, large majority of the grape growers (98.67 per cent) were fall in medium level of innovativeness and only 1.33 per cent found to be in low level of innovativeness.

Kunchala (2012) stated that in his study attitude of the farmers towards private extension services, an overwhelming number (94.16 per cent) of the progressive farmers had medium to high level of innovativeness.

Gavade (2013) revealed that, majority (64.00 per cent) of the grape growers were included in the medium category of innovativeness.

Suramwad (2014) observed that, majority of the grape growers (69.17 per cent) was included in the category of medium innovativeness level.

2.1.11 Market Orientation

Patel (2007) disclosed that nearly three fourth (71.33 per cent) of the grape growers had medium level of market orientation, followed by (16.34 per cent) and (12.33 per cent) had low and high level of market orientation, respectively.

Kota S. K. (2012) revealed that less than three fourth of mango growers had knowledge on integrated disease management, integrated pest management, irrigation management. More than (90.00 per cent) of the mango growers completely adopted the practices like recommended variety for export and protocols for bearing orchard whereas mango growers (80.00 to 90.00 per cent) completely adopted practices like harvesting, nutrient management, recommended spacing. Nearly half of the farmers adopted practices like desapping, integrated disease management, integrated pest management, transportation and irrigation management. Larger majority of the farmers had not adopted the practices namely, hot water treatment for mango, conditions for storage of produce and cleaning.

2.2 Dependent Variable

2.2.1 Advisory Systems

Saravanan and Bhattacharjee (2014) reported that 60.00 per cent of the farmers do not access any source of information for advanced agricultural technologies resulting in huge adoption gap. The requirement of field level extension personnel is estimated to be about 1.3 to 1.5 million against the present availability of about 0.1 million personnel. The paper talks about the status and future prospects of mobile telephony and its implication in agriculture extension through MAAS.

Singh (2015) revealed that the information gathered through agro-advisory service has been very useful and helpful to the farmers. The farmers have started taking interest in accessing information on the management of crops and animal husbandry. The seed for crops and pig management have been the major aspects on which farmers have been found interested to get information. Since the initial stage of the programme, sufficient numbers of farmer have been found to be benefitted through the agro-advisory service.

Patil (2017) revealed that majority (70.73 per cent) of farmers reported that understanding of the message become difficult, if any doubt arises followed by difficult to understand technical words in the message (63.41 per cent) and skill oriented messages could not be understood through text message (57.72 per cent). The study recommends the need for considering constraints faced by farmers as they influence the accessibility and utilization pattern of KMAS.

2.3 Needs of Grape Growers About Post-Harvest Technology and Export Oriented

Marketing

Singh Karan (1973) in his study on marketing of grapes through co-operatives in Ludhiana district of Punjab, found that through co-operative marketing, the net returns could be increased by reduction in marketing costs and increase in gross returns by selling at the right place. Co-operative marketing reduced costs by 21.29 per cent while returns increased by 24.55 per cent.

Aher (1989) noted that in the case of grapes, higher costs, higher returns and higher risks are found. Small farmers prefer to sell their output locally. The medium size farmer makes outright sale to merchants in his vineyard only, while big farmer takes risk in selling some of his produce in distant markets.

Pandey (1990) pointed out that, major problems in the export are the absence of sustained surpluses, low productivity, high post-harvest losses etc. Hygienic and cost effective packaging is critical to success in our efforts to increase agricultural export. The core of strategy, however must embrace 'selectivity'. The government should concentrate on selected products with potential in the international market rather than spend energy only on a vast variety. Fruit and vegetables can earn 20 to 30 times higher foreign exchange per unit area than the cereals which occupy the largest portion of our land.

Undirwade *et al.* (1992) conducted a study on marketing of grapes in Dhule district and found that farmers preferred to sell their produce to pre-harvest contractor (66.76 per cent).

Hinge *et al.* (1993) conducted a study of marketing of grapes from Nasik district in domestic and export markets. It was observed that the various functions performed were grading, packing, pre-cooling and cold storage, transporting and selling. For domestic marketing, grading consists of removal of immature and spoiled berries.

Patil and Patil (1994) observed that seedless grapes are used for raisins, wine, juice and export. The constraints noticed in the export are inadequate pre-cooling, cold storage, refrigerated

transportation, packaging and market survey.

Pangire (1995) in his study on marketing of grapes in Maharashtra found that there were seven grape marketing channels. 51.20 per cent grape growers marketed their produce through channel III (Producer - Commission agent - Retailer – Consumer). The quantity sold through this channel was 32.60 per cent, followed by 21.62 per cent quantity sold through the channel VI (Producer - Export trader) by 18.40 per cent sample grape growers. The channel VII (Producer - Retailer – Consumer) was found in all the sample grape growers, however, the quantity sold through it was only 5.79 per cent.

Kodag (1998) in his study on export marketing of grapes and raisins in Sangli district, concluded that 60.00 per cent of marketing of grapes is done through middlemen at the time of harvest only, 65.00 per cent grape export market is handled by private export companies and cold storage units and 35.00 per cent by grape growers co-operative societies. It is observed that in 95-96 the share of Sangli district in grape export was 25.30 per cent and 20 per cent of the total grape export from India and Maharashtra, respectively.

Kwik Naijel (2000) mentioned that major challenges before export of grapes from India are short shelf life, residues of pesticides, and uncertainty in grape quality standards.

Sopan Kanchan (2000) stated that, export of grapes from India is merely 5.00 per cent of total output of grapes in India, and majority export is from Maharashtra. From 1990-91 grape growers in Maharashtra had made consistent efforts to export grapes and it will become fruitful because Mahagraper had given net rate to export grapes Rs.40 to Rs. 60 per kg. Exports also become helpful in the case of adopting new technology, high quality of grapes, wastage percentage is reduced and shelf life had enhanced.

Ronald Pinto and Rohit Pandhare (2000) pointed out that, Chile, South Africa, Israil, Greece, U.S.A., Mexico and Australia are the countries who grow grapes for exports. Chile is the main exporter of grapes. Engald and other European Countries like Holland, Germany are major potential markets available to Indian grapes. One thing is important about exporting grapes to U K. and European market is that there is less competition to Indian grapes, because harvesting period of grapes in India is February to May and harvesting period of other major grape producing and exporting countries like Chile, South Africa, Israil, U.S.A., Greece, Australia is May to February.

Rathore (2001) has pointed out positive and negative impact of WTO on Indian horticulture. He stated that the world market will be open to all the countries meaning there by that while India can export, other countries can also tap our market. Hence, the strategy in the context of WTO will include the enhancement of export on the one hand and reduction of import on the other through indigenous competition. In that sense, marketing is as important as production. In India, marketing is the weakest aspect both at internal and external levels. Our farmers have to get over the mind set that their job is only production and marketing is to be done by others. In fact, they have to plan and

adopt appropriate marketing strategies.

2.4 Constraints Faced By The Grape Growers

Modak and Sawant (2004) reported that, majority (70.00 per cent) of the respondents faced the major constraints in marketing of minor fruits crops were inadequate transport facilities, high transportation charges, labour scarcity, high wage rate and unavailability of authorized place at Mumbai market and season bound business.

Chavan (2005) studied that, important constraints faced by majority of grape growers were supply of input materials namely, lack of availability of irrigation facilities (84.67 per cent), shortage of skilled labour (68.00 per cent) and lack of improved variety grafts (64.00 per cent).

Dhakane (2005) concluded that, majority of the grape farmers had lack of knowledge about control measure of insects, pests and diseases (81.63 per cent), lack of technical knowledge about doses of manures and fertilizer (80.67 per cent), high cost of insecticide and pesticides was the constraints faced by (76.67 per cent) of the grape growers. Other constraints were non availability of cold storage facilities (71.33 per cent) and lack of knowledge about marketing (67.33 per cent).

Angadi *et al.* (2007) in their study entitled, constraints in use of organic manures perceived by farmers of Tungabhadra command of Karnataka revealed that, majority (68.00 per cent) of farmers expressed that maintenance of animal as major constraint in use of organic manures. Other problems expressed by farmers were labour problem (37.33 per cent) and non availability of good manures (29.33 per cent).

Hinge (2009) observed that, the major problems perceived by the wine grape growers were high cost of planting material (100.00 per cent), irregular and insufficient supply of electricity for irrigation (100.00 per cent), high cost of plant protection chemicals (88.75 per cent), inadequate guidance regarding improved technology (86.62 per cent) and high cost of fertilizers (82.50 per cent).

Sorate (2011) showed that, problem of marketing of grapes; the most occurring problems were low rate of grape fruit (94.00 per cent), the fluctuation in market rates (89.00 per cent), late auction sale of raisins in the market (54.00 per cent) and no guarantee of payment received from merchants (53.00 per cent) to the grape growers.

Mule (2012) indicated that, large majority (94.44 per cent) of sweet orange growers face the constraints with respect of lack of improved varieties.

Gavade (2013) found that, near about large majority of the grape growers (81.00 per cent) and (68.00 per cent) expressed constraints as, shortage of irrigation water during summer season and high cost of water supply by tankers respectively.

Raut (2014) noted that, large majority of the banana growers were lack of knowledge about making products from banana (84.16 per cent), heavy loss during the post harvesting works (83.33 per cent) and lack of assured market (80.00 per cent).

2.5 Suggestions Made By The Grape Growers

Modak and Sawant (2004) revealed that, constraint faced by the farmer in production and marketing of minor fruits growers and offered major suggestions for improving production technique like developing new varieties (78.67 per cent), purchase of fruits on co-operative basis (66.67 per cent), information of these crops and availability of planting material (61.33 per cent).

Dhakane (2005) reported that, the suggestions made by the grape growers, these had been a need of proper provision of obtaining remunerative prices of grape (93.33 per cent), information about markets prices of different market should be made available (91.33 per cent) transportation charges should be reasonable (84.66 per cent), increase the subsidy on drip irrigation system (83.33 per cent).

Umesh *et al.* (2006) observed that, the constraints and suggestion expressed by project affected farmers in adoption of modern agricultural technology revealed that, the major suggestions of the respondents were the provision of irrigation facilities (80.00 per cent), training programme for new agricultural technology should be arranged (68.00 per cent), provision of more subsidy of FYM/Fertilizer/Insecticides (66.40 per cent), provision of technical guidance (58.00 per cent) and on time supply of seeds (24.00 per cent).

Desai *et al.* (2007) in their study on performance of rainfed farming system in Mehboobnagar district of Andhra Pradesh reported that the important suggestions of the respondents were crop insurance (42.25 per cent), subsidy and good quality seed should be provided (39.80 per cent), development of need based extension services especially in peak session (23.70 per cent), storage facility should be improved 19.60 per cent and development of farm machinery for rainfed areas (20.80 per cent).

Gotyal (2007) in his study suggestions given by government intervention for creation of water source, supply of sufficient quantity of agro-chemicals on subsidized rates, uninterrupted and sufficient supply of electricity were important suggestions given by cent per cent farmers. Other suggestions expressed by growers were lack of appropriate technology on pruning schedule and plant protection for quality grape production (90.00 per cent) and financial support at low rate of interest to increase grape area (90.00 per cent), establishment of co-operative marketing (84.00 per cent), availability of information on demand, supply and market information (80.00 per cent), provision for crop insurance (80.00 per cent), establishment of processing unit by government on co-operative basis (71.00 per cent) and ensuring rail facilities and refrigerated van (61.00 per cent). Introduction of improved clones for cultivation, ensuring availability of downy mildew and powdery mildew resistant varieties and demonstration of coloured berry varieties were the most specific suggestions given by (21.00, 19.00 and 16.00 per cent) of grape growers.

Aglawe (2012) found that, Suggestions made by the respondents of turmeric growers were minimum support price for turmeric (92.50 per cent), market facilities should be provided by the

Government (90.83 per cent), control of middleman and commission agent by adopting control measures of rules and regulation (86.60 per cent), In time and sufficient credit facilities should be made available by financial institutions nearby locality (85.00 per cent), for technical knowhow of post harvest technology of the turmeric training should given by appropriate source (Agril. University, Agril. Department, KVK) (84.16 per cent), seed treatment chemical (Quinolphos) should be made available at reasonable rates (81.66 per cent), to minimize transport cost on produce the sale counter to be open at nearby in the sample area (72.50 per cent), bio-pesticides and fungicides should be made available (58.33 per cent).

Raut (2014) concluded that, suggestions made by the banana growers as information may be given on other improved varieties of banana (92.50 per cent), to give a information about making processed products from banana (91.66 per cent), to provide current market condition regularly (90.23 per cent), chemical fertilizers should be made available in time (87.50 per cent), pesticides may be made available at proper time (84.16 per cent) and need a detail information about planting of tissue culture crops (57.50 per cent).

3. METHODOLOGY

This chapter describes the method and procedure used for carrying out present study. Every possible effort was made to adopt appropriate method and procedures in order to research reliable, unbiased and practical conclusions. It contains the tools and techniques employed for data collection. The sampling procedure adopted as well as the devices used for analysis of data are also explained. This chapter also incorporates the procedure for measurement of independent variable under study.

The methodology adopted is described in this chapter as given below.

- 3.1 Locale of research study
- 3.2 Research design
- 3.3 Sampling plan
- 3.4 Preparation of interview schedule
- 3.5 Pre-testing of interview schedule
- 3.6 Collection of data
- 3.7 Compilation of data
- 3.8 Variable and empirical measurement
- 3.9 Operationalization, scoring and categorization of Variables.
- 3.10 Analysis of data
- 3.11 Statistical techniques used for analysis of data

3.1 Locale of Research Study

The study was conducted in Sangli district of Maharashtra State.

3.1.1 Geographical Location

The Sangli district which lies between 16°45' to 17°22' latitude and 73°42' to 75°40' altitude. It is surrounded by Satara and Solapur districts to the North, Kolhapur district and Belgaum district of Karnataka state to the South, Vijapur district of Karnataka state to the East, Ratnagiri district to the West. The Sangli district comprises 8572 sq. km area and administratively divided into 10 tahsils.

Out of 10 tahsils of Sangli district Tasgaon, Khanapur, Miraj and Palus tahsils were selected purposively on the basis of highest area under Grape crop. These tahsils are located on the middle, northern and southern side of the district, respectively.

3.1.2 Area and Population

The total geographical area of the District is 7,76,261.00 ha. with a population of 28,22,143. The male number is 14,35,728 & female 13,86,415 constituting a male / female ratio of 1000:965. The urban population is 7,49,560 and rural population is 20,72,583. The SC population is 3,53,050 constituting a 12.51 per cent of the total population whereas ST population is 18,344 constituting a 0.65 per cent of the total population. The literacy percentage of the District is 81.48 per cent. The

population Density is 329/Sq.km. (Data is as per 2011 Census)

3.1.3 Land Utilization Pattern

Land utilization pattern of Sangli district is given below.

Sr. No.	Particulars	Area(ha)
1	Total geographical area	861065
2	Area under forest	47593
3	Barren/uncultivated land	38202
4	Non-agricultural land	39585
5	Cultivable waste land	61205
6	Current fallow	9043
7	Other fallow	27730
8	Net area sown	637707
9	Area sown more than once	165206
10	Total cropped area	802913

Source: Socio-economic review and district statistical abstract of Sangli District (2017-2018)

Land utilization pattern of selected tahsils is given below. (Area in ha.)

Sr. No.	Classification	Tasgaon	Khanapur	Miraj	Palus
1	Geographical area	111259	132602	92624	NA
2	Area under forest	4961	10936	1079	NA
3	Land put to non-agricultural use	10076	13324	10910	NA
A	Non-agricultural land	4261	7842	9970	NA
B	Barren/uncultivated land	5815	5482	940	NA
4	Gross cultivated area	102573	115984	91833	NA
A	Net sown area	79786	87342	72737	NA
B	Area sown more than Once	22787	28642	19096	NA
5	Total cultivable land	96222	108342	80635	NA

Source: Socio-economic review and district statistical abstract of Sangli District (2017-2018)

***Note:** As Palus is newly formed/separated tahsil the separate data is not available with the concerned authorities.

3.1.4 Soil

Sangli district possess different types of soils i.e. black, deep black, yellowish red and light brown soil. Specially the eastern side of the district has low rainfall receiving area. In Shirala tahsil yellowish red soil have found which containing more amount of Iron. The Krishna, Warana and Yerla rivers belt having more than 90 cm depth of black soil have found which including Walwa, Tasgaon and Miraj Tahsils. Normally water table found at 6 m depth. Other than hill sloppy other area having light brown coloured soil has found. The black soil is found in Bor, Agrani and Man rivers belts which including Atpadi, Jat and Khanapur tahsil of Sangli district.

3.1.5 Rivers

Rivers are one of the important sources of irrigation in Sangli district. The major rivers in Sangli district are Krishna, Warana, Yerala, Man, Bor, and Agrani. Of these Krishna, Warana and Yerla flow through the areas with incessant rains. Krishna River flows approximately 130 km from West to East and after that South-East of the district. Warana River flows 173 km long from South-West to East region along with Kolhapur and Sangli district border.

3.1.6 Climate

Sangli has a semi-arid climate with three seasons, a hot, dry summer from the middle of February to the middle of June, a monsoon from the middle June to late October and a mild cool season from early November to early February. The temperature has a range between 14°C to 42°C. The districts average rainfall is 400 to 450 mm. The maximum rainfall in Shirala tahsil and minimum rainfall in Atpadi tahsil.

3.1.7 Cropping Pattern

The detail cropping pattern of Sangli district is given below.

Sr. No.	Crop	Area(ha)
A	<u>Cereals</u>	
1	Paddy	17686
2	Wheat	28883
3	Kharif sorghum	112305
4	Rabbi sorghum	159544
5	Pearl millet	42546
6	Maize	17054
7	Other cereals	5719
	Total cereals	383737
B	<u>Pulses</u>	
1	Tur	9696
2	Gram	30836
3	Greengram	5869
4	Blackgram	6321
5	Other pulses	39185
	Total pulses	91907
C	<u>Oilseeds</u>	
1	Groundnut	35259
2	Sunflower	8745
3	Soybean	60108
4	Other oilseeds	7606
	Total oilseeds	111718
D	<u>Cash crop</u>	
1	Sugarcane	55270
E	<u>Fruit crop</u>	
1	Grape	27733.31

Source: Socio-economic review and district statistical abstract of Sangli District (2017-2018)

3.1.8 Crop wise area of selected tahsils (Area in ha.)

Sr. No.	Name of Crop	Tasgaon	Khanapur	Miraj	Palus
A	<u>Cereals</u>				
1	Paddy	1624	5	96	NA
2	Wheat	5347	4557	3810	NA
3	Sorghum	40829	45247	29878	NA
4	Maize	2491	2240	1668	NA
5	Pearl millet	1412	7325	8260	NA
B	<u>Pulses</u>				
1	Gram	6921	4979	5308	NA
2	Tur	1636	3624	1192	NA
C	<u>Oilseeds</u>				
1	Groundnut	1610	10529	4422	NA
2	Sunflower	380	711	572	NA
3	Soybean	13093	6390	23235	NA
D	<u>Cash crop</u>				
1	Sugarcane	2250	4900	13800	NA
E	<u>Fruit crop</u>				
1	Grape	7920.40	782	7270	1234

Source: Socio-economic review and district statistical abstract of Sangli District (2017-2018)

3.1.9 Area of the selected tahsils under irrigation

Irrigation statistics of the selected research site is given below. (Area in ha.)

Sr. No.	Particulars	Tasgaon	Khanapur	Miraj	Palus
1	Net area under irrigation	22594	17956	25146	NA
2	Total area under irrigation	23239	20800	26621	NA
3	Total area under cultivation	102573	115984	91833	NA
4	Percent area under irrigation to area under cultivation	22.66	17.93	28.99	NA

Source: Socio-economic review and district statistical abstract of Sangli District (2017-2018)

3.1.10 Transport and Communication Facilities

In Sangli district buses and railway are the significant means of transportation. The state transport buses, 29 corporation buses, trucks, tempos, private jeeps, autos are the major means of transportation.

Total road length 12023.30 km (2017). Pune-Banglore (NH-4) highway passes through this district. Post offices (419) and telephone facilities i.e. landline 8.25 lakh individual connections are

available in almost all the villages. The Radio, television and internet means of communication are also spreading in the district.

3.1.11 Other Facilities

The institutes i.e. primary schools, secondary schools, hospitals, nationalized banks, credit co-operatives, cold storage facilities, co-operative dairy societies, lift irrigation societies, mahila mandals, self help group, fair price shops, medical stores and other such mandals are operating in the district.

3.2 Research Design

The present investigation was conducted to ascertain study of advisory system use by grape growers. Therefore ex-post facto design of social research used for the present investigation.

3.3 Sampling Plan

Sampling plan adopted for this research study is as under.

3.3.1 Selection of Tahsils

There are ten tahsils in Sangli district i.e. Shirala, Walwa, Palus, Kadegaon, Khanapur, Atpadi, Tasgaon, Miraj, Kavte-Mahankal and Jat. Out of these 10 tahsils Tasgaon, Khanapur and Miraj were selected on the basis of highest area and productivity of grape cultivation and Palus is selected purposively by considering the export oriented quality of grape production,

Sr. No.	Tahsils	Area (ha)
1	Miraj	7270
2	Walwa	912
3	Shirala	0
4	Tasgaon	7920.40
5	Kadegaon	126.60
6	Khanapur	782
7	Atpadi	196.31
8	Palus	1234
9	Jat	4652
10	Kavte Mahankal	1640
Total		24733.31

Source: Socio-economic review and district statistical abstract of Sangli District (2017-2018)

3.3.2 Selection of Villages

On the basis of highest area under grape, three villages from each tahsil were selected by random sampling method in consultation with the Agri. Assistants of the Department of Agriculture Maharashtra State. Tahsil wise selected village list are given appendix I.

3.3.3 Selection of Respondents

The list of farmers from selected villages is obtained from Extension personnel (Agril. Assistant) and the Taluka Agriculture Officer, 10 farmers from each village were selected who possess minimum 5 years of experience in grape cultivation and minimum 0.40ha area under grape cultivation. Thus total 120 respondents were selected from 12 villages constituted the sample of study. Village wise list of the respondents along with mobile numbers are given in appendix I.

3.4 Preparation of Interview Schedule

Interview schedule consisting of relevant questions related with the objectives of the study was prepared. Necessary care was taken to keep the language simple so as to get desired responses from the respondents.

The interview schedule was developed in English language and then translated into Marathi for local use. The interview schedule contained questions related to personal, psychological and socio-economical characteristics of the grape growers in the first part, the questions about the cultivation and post-harvest management practices adopted to meet export standard by grape growers were asked in the second part and constraints faced and suggestion made by grape growers in third part of the schedule.

3.5 Pre Testing of Interview Schedule

The pre-testing of interview schedule is necessary on the part of researcher. It identifies mistakes, ambiguities and shortfalls. It also helps in achieving clarity, reliability and validity of the interview schedule. The pre-testing of interview schedule was done on 10 farmers of non-sampled area. The data collected from these farmers were thoroughly studied to detect unfamiliar words, vagueness and complexity of questions included in the schedule. Considering the experiences of pre-testing, language of few questions was appropriately modified to increase clarity of questions included in the interview schedule. The interview schedule was then finalized and required number of copies were prepared for data collection. The final interview schedule was given in appendix II.

3.6 Collection of Data

Personal interview technique was used for collection of data. Majority of the selected respondents were contacted at their home and at their leisure time. In some cases they were contacted at their farms also. In the first instance researcher introduced himself or introduced by Gramsevak or Agricultural Assistant or friends. After the introduction, purpose of visit, object and importance of the study and the significance of the co-operation of the respondents in the investigation were explained to respondents to establish proper rapport. Thereafter, the interview was conducted and responses were marked in the schedule. Every possible case was taken to maintain congenial atmosphere free from discomfort and outside influence to get the unbiased opinions of the responder. Some of the respondents were visited more than once to collect the data

their convenience. The Interview schedules thus filled were checked before closure of interview for its completion in all respects.

3.7 Compilation of Data

The information collected through interview was transferred from the interview schedule to the primary table (master table) and then to the secondary tables. Wherever necessary the information in qualitative form was converted into quantitative form and computation of score was done. The quantitative data were used to find out the nature of relationship between independent and dependent variables. The data was analyzed through statistical tools.

3.8 Variables and Their Empirical Measurement

Sr. No.	Independent Variables	Measurement techniques
1	Age	Chronological age in year of the respondent at the time of interview
2	Education	The extent of formal education standard completed by the respondent at the time of interview
3	Size of family	Total number of members living together in family
4	Land holding	The total land in ha possessed by respondent
5	Area under grape cultivation	Grape cultivated area out of total land holding
6	Experience in grape cultivation	Number of years in grape cultivation
7	Annual income	Total earned income in rupees from all sources by the respondents in one year
8	Source of information	Use of different sources for getting information by the respondents
9	Extension contact	Contacts of respondents with Extension agencies for getting information
10	Innovativeness	Time taken by respondents for adoption of new improved recommended grape production technology
11	Market orientation	The method adopted by grape growers to sale grape and grape produce in local and export oriented marketing
	Dependent Variable	
1	Advisory System	Public and private advisory services used by grape growers for grape cultivation, post-harvest technology and export oriented marketing

3.9 Operationalization, Scoring and Categorization of Variables

3.9.1 Independent Variables

3.9.1.1 Age

Age of respondents was measured as reported by the respondents themselves in the form of number of years completed as on date of interview. The chronological age of grape growers was considered and then respondents were classified into following categories made by Government of Maharashtra as below.

Sr. No.	Age	Years
1	Young	Up to 35
2	Middle	36 to 55
3	Old	56 and above

3.9.1.2 Education

Education was operationalized as formal schooling standard completed by an individual respondent. It was measured in terms of standard in formal school passed by the respondent and considered the score as such. Following categories are made by Ministry of Education, Govt. of India and accordingly the respondents were classified on the basis of their education.

Sr. No.	Education	Standard passed
1	Illiterate	No formal Education.
2	Primary education	(1 st to 7 th standard)
3	Secondary education	(8 th to 10 th standard)
4	Higher Secondary education	(11 th to 12 th standard)
5	College	Graduation and above

3.9.1.3 Size of family

Size of family was operationalized as the total number of members living together in a family of cattle owner, under a common roof having blood relations and sharing common food. According to the total score obtained the respondent were classified in to following three categories by using formula $\text{mean} \pm \text{S.D}$ as given below.

Sr. No.	Category	No. of family members
1	Small family	up to 5
2	Medium family	6 to 7
3	Large family	8 and above
Mean= 6.43		S.D.= 1.62

3.9.1.4 Land Holding

Land holding was defined as the number of hectares of land possessed by the farmers. The farmers were grouped in to five categories according to the standard category made by Government of Maharashtra as below.

Sr. No.	Category	Land holding (ha.)
1	Marginal	Up to 1.00
2	Small	1.01 to 2.00
3	Semi-medium	2.01 to 4.00
4	Medium	4.01 to 10.00
5	Big	10.01 & above

3.9.1.5 Area under grape cultivation

It is the actual area of land under grape cultivation during the sample year. Based on the area under grape cultivation the respondent grape growers were classified into following category by using formula mean \pm S.D as given below

Sr. No.	Category	Area (ha.)
1	Small	Up to 1.01 ha.
2	Medium	1.02 to 2.10 ha.
3	Large	2.11 ha. and above
Mean = 1.56		SD = 0.55

3.9.1.6 Experience in grape cultivation

Grape cultivation experience was operationalized as the period of respondent's involvement in grape cultivation measured in completed years. Accordingly, to the present concept of the grape cultivation experience, the respondents were grouped into three groups as following on the basis of mean \pm S.D. as given below.

Sr. No.	Category	Years
1	Low	up to 10 year
2	Medium	11 to 21 years
3	High	22 and above years
Mean = 16.14		SD= 5.95

3.9.1.7 Annual income

Annual income of each grape grower was determined by considering the total income earned from all the sources in one year and expressed in terms of rupees. The categories were made on the basis of using mean \pm S.D. as given below.

Sr. No.	Category	Annual income (Rs.)
1	Low	Up to Rs.10,49,968
2	Medium	Rs.10,49,969 to Rs.19,79,025
3	High	Rs.19,79,026 and above
Mean= 1514495.83		SD= 464528.95

3.9.1.8 Source of information

The source of information has been operationally defined as the information sources consulted by the grape grower for seeking technical information and guidance about grape cultivation practices.

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

The scoring procedure for responses was for 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. Thus, total score was worked out and the respondents were classified into following categories as per mean \pm S.D.

Sr. No.	Category	Score
1	Low	Up to 16
2	Medium	17 to 19
3	High	20 and above
Mean = 18.29		SD= 2.04

3.9.1.9 Extension contact

Operationally extension contact of respondents refers to the various extension contact made by individual respondent for seeking information about grape cultivation. Extension contact was measured on three point continuum namely regular, occasionally and never by assigning score 2, 1 and 0 respectively. The raw score of extension contact was work out. The categorization of respondent was made with the help of mean and standard deviation.

Sr. No.	Category	Score
1	Low	Up to 5
2	Medium	6 to 7
3	High	8 and above
Mean = 6.86		SD= 0.97

3.9.1.10 Innovativeness

It was operationally defined as the degree to which an individual grape grower adopts new ideas of grape cultivation relatively earlier than the other members of the society. A scale developed by Singh (1977) was used to measure innovativeness of the respondents. The scale consisted of six items. Out of these items, three items were positive and three items were negative. The responses were collected on a three-point continuum scoring procedure followed was as under.

Particulars	Responses		
	Agree	Somewhat agree	Disagree
Score for positive items	3	2	1
Score for negative items	1	2	3

Thus, the maximum score an individual may get was 18 and minimum was 6. The categories were made on the basis of using mean \pm S.D. as given below.

Sr. No.	Category	Score
1	Low	Up to 11
2	Medium	12 to 13
3	High	14 and above
Mean=12.5		S.D.=1.39

3.9.1.11 Market Orientation

It was operationalized as the orientation of grape growers towards various elements of marketing system. It was measured with the help of the scale developed by Samanta (1977) with slight modifications. The scale consisted of six items. Out of these items, three items were positive and three items were negative. The responses were collected on a three-point continuum scoring procedure followed was as under.

Particulars	Responses		
	Agree	Somewhat agree	Disagree
Score for positive items	3	2	1
Score for negative items	1	2	3

Thus, the maximum score an individual may get was 18 and minimum was 6. The categories were made on the basis of using mean \pm S.D. as given below.

Sr. No.	Category	Score
1	Low	Up to 12
2	Medium	13 to 14
3	High	15 and above
Mean=13.54		S.D.=1.15

3.9.2 Dependent variable

3.9.2.1 Advisory System

The advisory system has been operationally defined as the public and private advisory services consulted by the grape grower for seeking technical information and guidance about grape cultivation practices, post-harvest technology and export-oriented marketing.

Advisory system was measured on three-point continuum namely regular, occasionally and never by assigning score 2, 1 and 0 respectively. The raw score of advisory system was work out. The categorization of respondent was made with the help of mean and standard deviation.

Sr. No.	Category	Score
1	Low	Up to 12
2	Medium	13 to 15
3	High	16 and above
Mean = 13.65		SD= 2.14

3.9.3 Needs of grape growers about post-harvest technology and export oriented marketing

Needs of grape growers asses on the basis of adoption of post-harvest and marketing of grape. In the present study needs refers to requirement of different facilities and resources of the individual grape grower while adopting post-harvest management and export oriented marketing.

The response of individual grape grower during data collection toward Good Agricultural Practices, quality parameters, post-harvest use of grapes, grape varieties use for raisin making, raisin preparation methods and use of market functionaries related to local and export marketing of grapes and raisins. The frequency and percentage of each items were worked out for the interpretation.

3.9.4 Constraints faced by the grape growers

The meaning of word constraints is confinement, restriction of liberty or compulsion of circumstances or compulsion put upon the behavior. Reading H. F. (1971) defined constraints as use of force to influence or prevent as action or quality or state of being compelled to do or not to do something.

In the present study constraints refers to the difficulties faced by individual grape grower while adopting advisory services of grape. Constraints expressed by individual grape grower during data collection were classified into different categories. The frequency and percentage of each constraint were worked out for the interpretation.

3.9.5 Suggestions made by the grape growers

Suggestions were invited from the grape growers to overcome the problems faced by them in the adoption of grape growers about effective advisory services. The suggestions were grouped on the basis of pertaining to their constraints and are placed in the form of the frequency percentages for drawing the inferences of the study.

3.10 Analysis of Data

The information collected through the interviews was transferred from the interview schedules to primary tables and then secondary tables. Wherever necessary the information of qualitative nature was converted into quantitative form.

3.11 Statistical Methods Used For Data Analysis

The statistical testes used in the present study for analysis of data, are given below.

3.11.1 Frequency and percentage

Frequency and percentage were used for making simple comparisons. The frequency of the particular category was multiplied by hundred and divided by total number of respondents to get percentage.

3.11.2 Mean

Mean of sample was calculated by summing all the individual score and dividing it by number of cases. The formula is

$$\bar{X} = \frac{\sum Xi}{n}$$

Where,

\bar{X} = Arithmetic mean

X_i = Value of the i^{th} respondent

n = Number of cases

3.11.3 Standard Deviation

Standard deviation is a measure of variability calculated around mean. It was denoted by Greek letter N (sigma) and calculated with the following formula.

$$S.D = \sqrt{\frac{\sum (X_i - \bar{X})^2}{n-1}}$$

Where, S.D= Standard deviation,

\bar{X} = Mean of the sample,

X_i = Individual score of the i^{th} respondent,

n = Total number of respondents

3.12 Operational Definitions

1. **Age:** Age is operationalized as the chronological age of the farmers.
2. **Education:** Education refers to the number of years of formal school completed by the farmers.
3. **Size of family:** Total number of members living together in family.
4. **Land holding:** It refers to the total land possessed by the farmer.
5. **Area under grape cultivation:** Grape cultivated area out of total land holding.
6. **Experience in grape cultivation:** No. of years in Grape cultivation.
7. **Annual income:** Total income obtained from all sources in one year.
8. **Source of information:** Use of different sources for getting information by the respondents.
9. **Extension contact:** Contact of farmers with extension agencies for getting information.
10. **Innovativeness:** Time taken by respondents for adoption of new improved recommended grape production technology.
11. **Market orientation:** It refers on the judgment taken by an individual farmer to sell his produce for better price by analyzing various prevailing infrastructure and market intelligentsia.
12. **Advisory system:** Public and private advisory services used by grape growers for grape cultivation, post-harvest technology and export oriented marketing.

4. RESULTS AND DISCUSSION

This chapter deals with the presentation of analysis and interpretation of data with view to draw meaningful conclusions by the use of appropriate statistical tests. The results of the various aspects under study are discussed considering the findings of the past studies and rationales are provided wherever needed. In general, this chapter presents the findings of the study under the followings section.

1. Personal and socio-economic characteristics of Grape growers
2. Public and private advisory system used by Grape growers
3. Needs of Grape growers about post-harvest technology and export oriented marketing
4. Constraints and suggestions of Grape growers about effective advisory services

4.1 Personal and Socio-Economic Characteristics of Grape Growers

4.1.1 Age

Age denotes chronologically completed years by the respondents. Age is important factor, which determines the role of farmers in adoption of advisory system by grape growers.

The information pertaining to the age of the grape growers was collected, tabulated, analyzed and categorized in three categories on the basis of prevailing norms and depicted in Table 4.1

Table 4.1 Classification of the respondents according to their age

Sr. No.	Category	Respondent (N = 120)	
		Number	Percentage
1	Young (up to 35 year)	29	24.17
2	Middle (36 to 55 years)	84	70.00
3	Old (56 and above years)	7	5.83
	Total	120	100.00

The data in Table 4.1 and fig. 4.1 revealed that three fifth (70.00 per cent) of the respondents were from middle age group of 36 to 55 years, followed by young age group (24.17 per cent), only 5.83 per cent of the respondents belonged to old age group i.e. above 56 years. In the present finding the minimum and maximum age of the respondents were found 30 and 58 years respectively. The average age of the grape growers was 41 years.

The middle age group of respondents is adopting various new technologies on their farm, such as new variety, post-harvest practices, export marketing, use of advisory services and attends the various type of agricultural Exhibitions compared to young and old age group.

Similar findings were reported by Kalamkar (2013) and Landage (2015).

4.1.2 Education

Formal education enhances comprehensibility and skill of an individual. An educated individual is more prone to analyze the cause and effect relationship of different phenomena. This also leads to improve skill of an individual in problem solving.

The information pertaining to the education of the Grape growers was collected, tabulated, analyzed and categorized in five categories according to the standard category made on the basis of prevailing norms of the State Government of Maharashtra and shown in Table 4.2

Table 4.2 Classification of the respondents according to their education

Sr. No.	Category	Respondent (N = 120)	
		Number	Percentage
1	Illiterate	0	0
2	Primary education (1 st to 7 th standard)	3	2.50
3	Secondary education (8 th to 10 th standard)	36	30.00
4	Higher Secondary education (11 th to 12 th standard)	53	44.17
5	College level (Graduation and above)	28	23.33
	Total	120	100.00

It was observed from Table 4.2 and fig. 4.2 that, 44.17 per cent of the grape growers had Higher Secondary education followed by Secondary education (30.00 per cent), 'Graduation and above' (23.33 per cent), Primary education (2.50 per cent). No any respondent was found illiterate. The average education of the grape growers was 12th standard.

The results shows that the grape cultivation was preferred mostly by higher secondary, secondary and graduated people. The majority of the respondents were well educated that they are enough aware and had knowledge about the various grape cultivation practices. They manage all types of farm operations. From the above observation it has clearly seen that majority of the respondents were educated up to Higher Secondary education.

Similar findings were reported by Thakare (2008), Sorate (2011) and Kunchala (2012).

4.1.3 Size of Family

The size of family refers to the total number of individuals living together under common roof, having blood ties with each other and is directly dependent on the head of the family. It was therefore thought that, the size of family might influence the adoption behaviour of the respondents.

The information pertaining to the size of family of the grape growers was collected, tabulated, analyzed and categorized in three categories on the basis of mean \pm S.D and presented in Table 4.3.

Table 4.3 Classification of respondents according to their size of family

Sr. No.	Category	Respondent (N = 120)	
		Number	Percentage
1	Small (up to 5 members)	30	25.00
2	Medium (6 to 7 members)	68	56.66
3	Large (8 & above members)	22	18.34
	Total	120	100.00

It is observed from Table 4.3 and fig. 4.3 that, majority (56.66 per cent) of the grape growers had medium size of family having 6 to 7 members; while 25.00 per cent and 18.34 per cent of the grape growers had small and large size of family respectively. The average seven members were found in family.

Thus the medium type of family is helpful in various types of farm operations such as planting, intercultural operations and harvesting which are carried out in short period as compared to small size of family.

Similar findings were reported by Landage (2015).

4.1.4 Land holding

Land holding is assumed as an important variable that influences perception behavior of the respondents.

The information pertaining to the land holding of the grape growers was collected, tabulated, analyzed and categorized in five categories according to the standard category made by Government of Maharashtra and depicted in table 4.4.

Table 4.4 Classification of the respondents according to their land holding

Sr. No.	Category	Respondents (N = 120)	
		Number	Percentage
1	Marginal (Up to 1.00 ha.)	5	4.16
2	Small (1.01 to 2.00 ha.)	70	58.34
3	Semi-medium (2.01 to 4.00 ha.)	45	37.50
4	Medium (4.01 to 10.00 ha.)	0	0
5	Big (10.01 ha. and above)	0	0
	Total	120	100.00

It is evident from Table 4.4 and fig. 4.4 that 58.34 per cent of the respondents had ‘Small’ size of land holding, while 37.50 per cent of the grape growers had ‘Semi-medium’ size of land holding followed by ‘Marginal’ (4.16 per cent) of land holding. The average land holding of the grape growers is 2.05 ha.

Due to the more population the piece of land was bifurcated or distributed into the next generation. So 58.34 per cent of the respondents found in small land holding category.

Similar findings were reported by Raut (2014) and Suramwad (2014).

4.1.5 Area Under Grape Cultivation

Area under grape is assumed as an important variable that influences perception behavior of the respondents.

The information pertaining to the area under grape cultivation of the grape growers was collected, tabulated, analyzed and categorized in three categories on the basis of mean \pm S.D and presented in Table 4.5.

Table 4.5 Classification of respondents according to their area under grape cultivation

Sr. No.	Category	Respondent (N = 120)	
		Number	Percentage
1	Small (Up to 1.01 ha.)	19	15.84
2	Medium (1.02 – 2.10 ha.)	91	75.83
3	Large (2.11 ha. and above)	10	8.33
	Total	120	100.00

It is concluded from Table 4.5 and fig. 4.5 that a maximum number (75.83 per cent) of the respondents had medium size area under grape cultivation, while 15.84 per cent of the respondents had small area under grape and 8.33 per cent had large area under grape. The average land under grape is 1.56 ha.

The increasing population puts an extra pressure on agriculture and the piece of land was bifurcated or distributed into the next generation. Thus the land holding and area under grape becomes less day by day.

It confirms the findings of Gaikwad and Khalache (2010).

4.1.6 Experience in Grape Cultivation

Experience is the important factor in influencing the grape farming in terms of knowledge as well as adoption.

The information pertaining to the grape cultivation experience of the grape growers was collected, tabulated, analyzed and categorized in three categories on the basis of mean \pm S.D and depicted in Table 4.6.

Table 4.6 Classification of respondents according to their experience in grape cultivation

Sr. No.	Category	Respondent (N = 120)	
		Number	Percentage
1	Low (Up to 10 year)	30	25.00
2	Medium (11 to 21 years)	63	52.50
3	High (22 and above years)	27	22.50
	Total	120	100.00

It is observed from Table 4.6 and fig. 4.6 that a majority of (52.50 per cent) the respondents had medium level of experience in grape cultivation and 25.00 per cent of them had low level of experience, whereas only 22.50 per cent respondent had high level of experience in grape cultivation. The average grape cultivation experience of the grape growers is 16 years.

The land of study area is suitable for grape cultivation and main crop is grape. Hence the farmers had medium experience in grape cultivation.

Similar findings were reported by Waghmare (2010).

4.1.7 Annual Income

Annual income is a major determinant of the economic status of an individual. Better financial position of an individual provides him a chance to take risks in trying out improved crop production technology. He can also afford to spend more on items required in connection with the new farming techniques. Thus, annual income motivates and influences farmers to adopt more new agricultural techniques. The information pertaining to the annual income of the grape growers was collected, tabulated, analyzed and categorized in three categories on the basis of mean \pm S.D and depicted in Table 4.7.

Table 4.7 Classification of the respondents according to their annual income

Sr. No.	Category	Respondents (N = 120)	
		Number	Percentage
1	Low Up to Rs.10,49,968	19	15.83
2	Medium Rs.10,49,969 to Rs.19,79,025	79	65.83
3	High Rs.19,79,026 and above	22	18.34
	Total	120	100.00

It is noticed from Table 4.7 and fig. 4.7 that a majority (65.83 per cent) of the grape growers had medium annual income between Rs.10,49,969 to Rs.19,79,025 whereas, 18.34 per cent respondents had high annual income and 15.83 per cent had low level of annual income i.e. Rs. 10,49,968. The average income of the grape grower is Rs. 15,14,495.83.

The data revealed that maximum grape growers had medium level of income. This is because of majority of the grape growers had small size of land holding. The respondents with higher income are ready to invest large amount on inputs and ready to adopt various types of new technologies as compared to low income group of grape growers.

4.1.8 Sources of information

The individual is likely to use different sources for getting information about recommended grape cultivation practices.

Table 4.8 Classification of the respondents according to sources of information

Sr. No.	Category	Respondents (N = 120)	
		Number	Percentage
1	Low (Up to 16)	26	21.66
2	Medium (17 to 19)	60	50.00
3	High (20 and above)	34	28.34
	Total	120	100.00

From Table 4.8 and fig. 4.8. It can be revealed that majority (50.00 per cent) of the respondents were using medium sources of information. Whereas, 28.34 per cent and 21.66 per cent of the respondents had high and low sources of information respectively.

From these observations it can be concluded that substantial proportion of the grape growers had used various sources of information. It could be concluded that, most of the respondents had medium level of use of sources of information.

Similar findings were reported by Garje (2010), Sorate (2011) and Suramwad (2014).

4.1.9 Extension Contact

Extension contact is an important indicator for adoption of grape cultivation practices. It is presumed that the farmers have more contacts with extension worker and other agencies may derive more benefits from development agencies and hence it was necessary to study in the present case.

The information pertaining to the extension contact of the grape growers was collected, tabulated, analyzed and categorized in three category on the basis of mean \pm S.D and presented in Table 4.9

Table 4.9 Classification of the respondents according to their extension contact

Sr. No.	Category	Respondents (N = 120)	
		Number	Percentage
1	Low (Up to 5)	11	9.17
2	Medium (6 to 7)	78	65.00
3	High (8 and above)	31	25.83
	Total	120	100.00

It is observed from the Table 4.9 and fig. 4.9 that 65.00 per cent of the respondents had medium extension contact followed by 25.83 per cent and 9.17 per cent of the respondents had high and low extension contacts respectively. The average extension contact score is 7.

Thus, it is concluded that majority of the respondents had medium level of contact with extension agencies for seeking the information about agriculture including recommended cultivation and post-harvest management practices of grape crop.

Similar findings were reported by Kachare (2012) and Chiranthan (2013).

4.1.10 Innovativeness

The information pertaining to the innovativeness of the grape growers was collected, tabulated, analyzed and categorized in three categories on the basis of mean \pm SD and depicted in Table 4.10

Table 4.10 Classification of the respondents according to their level of innovativeness

Sr. No.	Category	Respondent (N = 120)	
		Number	Percentage
1	Low (Up to 11)	29	24.17
2	Medium (12 to 13)	65	54.17
3	High (14 and above)	26	21.66
	Total	120	100.00

It is apparent from the Table 4.10 and fig. 4.10 that, majority of the respondents (54.17 per cent) were included in the medium category of innovativeness followed by 24.17 per cent of the respondents who were observed in low level of innovativeness category and only 21.66 per cent of the respondents were included in the category of high innovativeness level.

From the above findings it could be concluded that higher proportion of the respondents were observed in medium level of innovativeness.

Similar findings were reported by Patil (2008), Gavade (2013) and Suramwad (2014).

4.1.11 Market Orientation

The information pertaining to the market orientation of the grape growers was collected, tabulated, analyzed and categorized in three categories on the basis of mean \pm SD and depicted in Table 4.11

Table 4.11 Classification of respondents according to their market orientation

Sr. No.	Category	Respondent (N = 120)	
		Number	Percentage
1	Low (Up to 12)	26	21.67
2	Medium (13 to 14)	70	58.33
3	High (15 and above)	24	20.00
	Total	120	100.00

It is observed from the Table 4.11 and fig. 4.11 that, three fifth (58.33 per cent) of the respondents had medium market orientation followed by 21.67 per cent and 20.00 per cent of respondents had low and high market orientation respectively. The average market orientation

score of grape growers was 14.

It is clear from the data that majority of grape growers were from medium level of market orientation. It implies that, they are conscious to sell their produces at better price and get the market information delivered through their sources of information.

Similar findings were reported by Patel (2007).

4.2 Dependent Variables

4.2.1 Advisory System

The information pertaining to the advisory system used by the grape growers was collected, tabulated, analyzed and categorized in three categories on the basis of mean \pm SD and depicted in Table 4.12

Table 4.12 Classification of respondents according to their use of advisory system

Sr. No.	Category	Respondent (N = 120)	
		Number	Percentage
1	Low (Up to 12)	39	32.50
2	Medium (13 to 15)	52	43.33
3	High (16 and above)	29	24.17
	Total	120	100.00

It is observed from the Table 4.12 and fig. 4.12 that 43.33 per cent of the respondents had medium use of advisory services followed by 32.50 per cent and 24.17 per cent of the respondents had low and high use of advisory services respectively. The average advisory system score is 14.

Thus, it is concluded that majority of the respondents had medium level of contact with advisory services agencies for seeking the information about agriculture including recommended cultivation, plant protection, post-harvest management and marketing practices of grape crop.

4.3 Needs of grape growers about post-harvest technology and export oriented marketing

Needs of grape growers asses on the basis of adoption of post-harvest and marketing of grape. In the present study needs refers to requirement of different facilities and resources of the individual grape grower while adopting post-harvest management and export oriented marketing.

The response of individual grape grower during data collection toward Good Agricultural Practices, quality parameters, post-harvest use of grapes, grape varieties use for raisin making, raisin preparation methods and use of market functionaries related to local and export marketing of grapes and raisins. The frequency and percentage of each items were worked out for the interpretation. The information pertaining to the need of grape growers was collected, tabulated, analyzed and depicted in Table 4.13 to Table 4.23

4.3.1 Adoption of Good Agriculture Practices (GAP)

The information pertaining to the adoption of Good Agriculture Practices (GAP) as per recommendation of National Research Center for Grape, by the grape growers was collected and tabulated in Table 4.13.

Table 4.13 Good Agricultural Practices (GAP) as per recommendation of NRC, Grape

Sr. No.	Good Agricultural Practices	No. of respondents (N= 120)	Percentage
1	Varieties	114	95.00
2	Rootstock	90	75.00
3	Training, Pruning and Canopy management	96	80.00
4	Nutrient and Water management	95	79.17
5	Use of Bio-regulators	88	73.33
6	Disease management	79	65.83
7	Pest management	79	65.83
8	Maturity indices and harvesting time	98	81.66
9	Post-harvest quality management	88	73.33
10	Safe use of agro chemicals Maximum Residual Level (MRL)	76	63.33

It is observed from the Table 4.13, that the percentage of grape growers adopted the Good Agricultural Practices was 95.00 per cent for varieties, 75.00 per cent for rootstock, 80.00 per cent for training, pruning and canopy management, 79.17 per cent for nutrient and water management, 73.33 per cent for bio-regulators, 65.83 per cent for disease and pest management, 81.66 per cent for maturity indices and time of harvesting, 73.33 per cent for post-harvest quality of grapes and 63.33 per cent for Maximum Residual Level (MRL) as per recommendation of NRC, Grape.

4.3.2 Quality parameters adopted by the grape growers to meet the export standards

The information pertaining to the quality parameters adopted by the grape growers to meet the export standards was collected and tabulated in Table 4.14

Table 4.14 Quality parameters adopted by the grape growers to meet the export standards

Sr. No.	Quality Parameters	No. of respondents (N= 120)	Percentage
1	Shape of bunch - elongated and spread	76	63.33
2	Berry shape – elongated or round	78	65.00
3	Colour of berry - light green/purple/red/black	90	75.00
4	Skin of berry – thin or thick	95	79.17
5	Arrangement of berries in bunch - equitable	78	65.00
6	Number of berries in bunch - 125 to150	95	79.17
7	Average weight of bunch - 400 to 500 g	114	95.00
8	Length of the berry - 18 to 20 mm	100	83.33
9	Average weight of berry - 3 to 3.5 gm	80	66.66
10	Girth of berry - 16 to 18 mm	80	66.66
11	Sugar content - 18 to 21° Brix	104	86.66
12	Acid content - 0.5 to 0.6%	100	83.33
13	Look of bunch - attractive	97	80.83
14	Taste of juice – sweet	107	89.16
15	Gloss of bunch- natural	95	79.17

It was observed from Table 4.14, that the percentage of the grape growers adopt the quality parameters to meet the export standard of grapes which is 95.00 per cent for average weight of bunch, for taste of juice 89.16 per cent, for sugar content 86.66 per cent, for acid content 83.33 per cent, for length of the berry 83.33 per cent, for look of bunch 80.83 per cent, for skin of berry 79.17 per cent, for number of berries in bunch 79.17 per cent, for gloss of bunch 79.17 per cent, for colour of berry 75.00 per cent, for average weight of berry 66.66 per cent, for girth of berry 66.66 per cent, for berry shape 65.00 per cent, for arrangement of berries in bunch 65.00 per cent and 63.33 per cent for shape of bunch.

4.3.3 Post-Harvest Management of Grape

4.3.3.1 Use of Grape fruits after harvest

The information pertaining to the use of grape fruits after harvest by the grape growers were collected and tabulated in Table 4.15

Table 4.15 Use of Grape fruits after harvest

Sr. No.	Use of Grape Fruits	No. of respondents (N= 120)	Percentage
1	Sale	120	100.00
2	Preparation of raisins	98	81.66

Table 4.15 revealed that 100 per cent of the grape growers sale their grape as a fresh in market as well as 81.66 per cent of the grape growers also prepares raisins.

Thus, it was concluded that all respondents had sale their grapes in market also majority of the respondents prepared the raisins from grapes for earning the profits. Also, it is concluded that near about all the grape growers sale their fresh fruits as well as go for raisin preparation.

4.3.3.2 Raisins preparation

The different methods used for the preparation of raisins by the grape growers were tabulated in Table 4.16

Table 4.16 Methods of raisins preparation

Sr. No.	Methods of raisins preparation	No. of respondents (N= 120)	Percentage
1	Cold dipped method (Green raisin)	98	81.66
2	Sulphur bleached raisin (Yellow raisin)	87	72.50
3	Natural raisins	-	-
4	Golden bleached raisins	-	-
5	Valencia (Lexias)	-	-
6	Soda oil method	-	-
7	Greek process	-	-
8	Soda dip method	-	-
9	Currants	-	-
10	Vine dried raisins	-	-

Table 4.16 revealed that 81.66 per cent of the farmers used cold dipped method for raisin preparation and 72.50 per cent respondents used sulphur bleached method for raisin preparation.

Thus, it was concluded that majority of the grape growers use cold dipped method as well as sulphur bleached method for preparation of green raisins and yellow raisins respectively. It has large demand of green and yellow raisins in market. Some other methods like natural raisins, golden bleached raisins, valencia (lexias), soda oil method, greek process, soda dip method, currants and vine dried raisins not used in study area because of the unavailability of technological guidance and less demands in market.

4.3.3.3 Varieties used for raisin preparation

The different varieties used for the raisins preparation by the grape growers in study area were tabulated in Table 4.17

Table 4.17 Varieties used for raisin preparation

Sr. No.	Name of Varieties	No. of respondents (N= 120)	Percentage
1	Thompson seedless	82	68.83
2	Tas-A-Ganesh	75	62.50
3	Sonaka	46	38.33
4	Manik Chaman	55	45.83
5	Sharad seedless	47	39.16

Table 4.17 revealed that the varieties used for raisin preparation by the grape growers was 68.83 per cent Thompson seedless, 62.50 per cent Tas-A-Ganesh, 38.33 per cent Sonaka, 45.83 per cent Manik Chaman and 39.16 per cent Sharad Seedless.

Thus, it was concluded that the majority of the grape growers used Thompson seedless variety for raisin preparation as per the recommendations of NRC, Grape. Also the varieties like Tas-A-Ganesh, Sonaka, Manik Chaman and Sharad seedless for raisin preparation in study areas.

4.3.4 Marketing of Grapes

4.3.4.1 Mode of marketing fresh grape fruits and raisins

The information pertaining to the mode of marketing fresh grape fruits and raisins by the grape growers were collected and tabulated in Table 4.18

Table 4.18 Mode of marketing fresh grape fruits and raisins

Sr. No.	Category	No. of respondents (N= 120)	Percentage
1	Local market	120	100.00
2	Export market	90	75.00

It was observed from Table 4.18, that 100 per cent of the grape growers used local market for sale their fresh grape and raisins and 75.00 per cent of the grape growers also used export market for saling their produce.

Thus, it was concluded that majority of the grape growers used local and export market as a mode of marketing of fresh grape fruts and raisins. The export market create more profit than local market.

4.3.4.2 Export of fresh grapes and raisins

The information pertaining to the export of fresh grape fruits and raisins by the grape growers were collected and tabulated in Table 4.19

Table 4.19 Farmers exporting fresh grapes and raisins

Sr. No.	Category	No. of respondents (N= 120)	Percentage
1	Fresh Grape Fruits	90	75.00
2	Raisins	75	62.50

Table 4.19 revealed that 75.00 per cent of the grape growers export grapes as a fresh fruits and 62.50 per cent as a raisins.

Thus, it was concluded that majority of the grape growers sale their fresh grape fruits and raisins through export market.

4.3.4.3 Marketing Channels

The different marketing channels used by the grape growers for marketing of grapes and raisins were tabulated in Table 4.20

Table 4.20 Use of Marketing Channels

Sr. No.	Marketing Channels	No. of respondents (N= 120)	Percentage
1	Pre harvest contract entire garden	37	30.83
2	Through middle mans in APMC	76	63.33
3	Auction sale in APMC	40	33.33
4	Contract on rate/kg basis	75	62.50
5	Agreement with traders in different places	69	57.50

Table 4.20 revealed that marketing channels used by the grape growers for marketing of grapes and raisins were through middle mans in APMC 63.33 per cent, contract on rate/kg basis 62.50 per cent, agreement with traders in different places 57.50 per cent, auction sale in APMC 33.33 per cent and pre harvest contract entire garden 30.83 per cent.

Thus, it was concluded that majority of the grape growers use middle men in APMC, contract on rate/kg basis and agreement with traders followed by auction in APMC and pre harvest contract as a marketing channels for sale grape and raisins.

4.3.4.4 Use of Cold Storage

The information pertaining to the cold storage facilities used for storage of fresh grape fruits and raisins by the grape growers in study area were collected and tabulated in Table 4.21

Table 4.21 Use of Cold Storage

Sr. No.	Category	No. of respondents (N= 120)	Percentage
1	Community based cold storage	30	25.00
2	Private based cold storage	78	65.00
3	Government cold storage	27	22.50

Table 4.21 revealed that 65.00 per cent of the grape growers used private cold storage facility for grapes and raisins storage followed by community based cold storage (25.00 per cent) and Government cold storage in study area (22.50 per cent).

Thus, it was concluded that majority of grape growers store their grapes and raisins in private cold storage because of less availability of Government and community based cold storages.

4.3.4.5 Facilities used for transportation

The information pertaining to the facilities used for transportation of grape produce during local market as well as distance/export market by the grape growers in study area were collected and tabulated in Table 4.22

Table 4.22 Facilities used for transportation

Sr. No.	Transport Facilities	No. of respondents (N= 120)	Percentage
A	Local market		
1	Tractors	120	100.00
2	Mini lorry / tempo	97	80.83
B	Distance market / Export market		
1	Refrigerated van	-	-
2	Railway wagons for distance market	30	25.00
3	Airport	-	-
4	Seaport for export market	57	47.50

It is observed from Table 4.22 that 100.00 per cent of the grape growers use tractor for transportation of grape produce during local market followed by mini lorry and tempo (80.83 per cent). About 47.50 per cent of the grape growers use seaport for distance and export market followed by railway wagons (25.00 per cent).

The data revealed that majority of the grape growers used tractor, mini lorry for local market and seaport, railway wagons for distance and export market for transportation of grape produce.

4.3.4.6 Packaging of grapes and raisins

The different packaging material used for packaging of grape and raisins by the grape growers in study area for local and export market were tabulated in Table 4.23

Table 4.23 Material used for packaging of Grapes and Raisins

Sr. No.	Name of material used	No. of respondents (N= 120)	Percentage
	Local market		
1	Plastic crates	120	100.00
2	Corrugated fibreboard box	120	100.00
3	Cardboard box	70	58.33
	Export market		
4	Expanded polystyrene box for export	90	75.00
5	Polyethylene bags for export	68	56.66

Table 4.23 revealed that 100.00 per cent of the grape growers use plastic crates and corrugated fibreboard boxes for packaging of grape and raisins followed by expanded polystyrene boxes (75.00 per cent), cardboard boxes (58.33 per cent) and polyethylene bags (56.66 per cent).

The expanded polystyrene boxes and polyethylene bags are mainly used for export purpose and plastic crates, corrugated fibreboard boxes and cardboard boxes was used for local market purpose.

4.4 Constraints faced by the Grape Growers in adoption of Effective Advisory Services

Constraints refer to the difficulties or causes which prohibit farmers to adopt advisory services of grape growers.

Table 4.24 Constraints faced by the grape growers in adoption of Effective Advisory Services

Sr. No.	Constraints	Respondents (N = 120)		Rank
		Frequency	Percentage	
1	Lack of timeliness in public advisory	115	95.83	I
2	Lack of technical guidance regarding post-harvest technology and export marketing	85	70.83	II
3	Lack of cooperative mindset due to personal rivalry	78	65.00	III
4	Too much idealistic production procedure advised by advisory system	67	55.83	IV
5	Lack of scientific and technical knowledge to members of advisory system itself	64	53.33	V
6	Lack of practicability of advisory practices by advisory system	58	48.33	VI
7	Conflict in traditional knowledge of farmer and modern technical knowledge of member of advisory system	54	45.00	VII

It was observed from table 4.24 that, majority (95.83 per cent) of the grape growers were stated lack of timeliness in public advisory as major constraint followed by lack of technical guidance regarding post-harvest technology and export marketing (70.83 per cent). Lack of cooperative mindset due to personal rivalry (65.00 per cent). The 55.83 per cent of the respondents stated too much idealistic production procedure advised by advisory system. Lack of scientific and technical knowledge to members of advisory system itself (53.33 per cent). While 48.33 per cent of the respondents faced the problem of lack of practicability of advisory practices by advisory system and 45.00 per cent of the respondents faced the problem of conflict in traditional knowledge of farmer and modern technical knowledge of member of advisory system.

4.5 Suggestions made by the Grape Growers for Effective Advisory Services

Suggestions were invited from the grape growers to overcome the problems faced by them in the adoption of grape growers about effective advisory services. The suggestions given by the farmers to overcome constraints and adoption of effective advisory services of grape growers were collected and depicted in table 4.25

Table 4.25 Suggestions made by the grape growers to effective advisory services

Sr. No.	Suggestion	Respondents (N= 120)		Rank
		Frequency	Percentage	
1	Regular guidance and services should be provide by advisory system	114	95.00	I
2	Farmers need to educated in order to make them come out of their traditional mindset	79	65.83	II
3	Regular training programs need to held by advisory system through KVK for latest package of practices	76	63.33	III
4	Advisory system should be flexible and practical in giving it's advises about new practices to be followed	68	56.66	IV
5	Advisory system itself should be monitored frequently to prevent misguiding knowledge by member	23	19.16	V

It is concluded from Table 4.25 that majority (95.00 per cent) of the respondents suggested that the regular guidance and services should be provide by advisory system followed by the farmers need to educated in order to make them come out of their traditional mindset (65.83 per cent). Another suggestion were regular training programs need to held by advisory system through KVK for latest package of practices (63.33 per cent). While 56.66 per cent of the respondents suggested that the advisory system should be flexible and practical in giving it's advises about new practices to be followed. 19.16 per cent of the respondents suggested that the advisory system itself should be monitored frequently to prevent misguiding knowledge by member.

5. SUMMARY, CONCLUSION AND IMPLICATIONS

This chapter deals with summary of the findings of the study and implications for the future line of action and research.

The present investigation “Study of Advisory System Use By Grape Growers” was designed conducted in Tasgaon, Khanapur, Miraj and Palus tahsil of Sangli district. The study was under taken with following objectives.

1. To study the personal and socio-economic characteristics of grape growers.
2. To study of public and private advisory system used by grape growers.
3. To assess the needs of grape growers about post-harvest technology and export oriented marketing.
4. To know the constraints and suggestions of grape growers about effective advisory services.

5.1 Summary

5.1.1 Personal and Socio-Economic Characteristics of the Grape Growers

5.1.1.1 Age

The age wise distribution of the respondents shows that majority (70.00 per cent) of the respondents were from middle age group of 36 to 55 years, followed by young age (24.17 per cent) , only 5.83 per cent belonged old age group i.e. above 56 years.

5.1.2 Education

The study reported that 44.17 per cent of grape growers had Higher Secondary education followed by Secondary education (30.00 per cent), ‘Graduation and above’ (23.33 per cent), Primary education (2.50 per cent) and no any respondent were found illiterate.

5.1.3 Size of Family

Majority (56.66 per cent) of the grape growers had medium size of family having 6 to 7 members, while 25.00 per cent and 18.34 per cent of the finger millet growers had small and large size of family respectively.

5.1.4 Land holding

Majority (58.34 per cent) of the respondents had ‘Small’ size of land holding, while, 37.50 per cent of the grape growers had ‘Semi-medium’ size of land holding followed by ‘Marginal’ (4.16 per cent) of land holding.

5.1.5 Area Under Grape Cultivation

Majority (75.83 per cent) of the respondents had medium size area under grape cultivation, while 15.84 per cent of respondents had small area under grape and 8.33 per cent had large area under grape.

5.1.6 Experience in Grape Cultivation

Majority (52.50 per cent) of the respondents had medium level of experience in grape cultivation and 25.00 per cent of them had low level of experience, whereas only 22.50 per cent respondent had high level of experience in grape cultivation.

5.1.7 Annual Income

Majority (65.83 per cent) of the grape growers had medium annual income between Rs.10,49,969 to Rs.19,79,025 whereas, 18.34 per cent respondents had high annual income and 15.83 per cent had low level of annual income i.e. Rs. 10,49,968.

5.1.8 Sources of information

Majority (50.00 per cent) of the respondents were using medium sources of information whereas, 28.33 per cent and 21.66 per cent of the respondents had high and low sources of information, respectively.

5.1.9 Extension Contact

Majority (65.00 per cent) of the respondents had medium extension contact followed by 25.83 per cent and 9.17 per cent of the respondents had high and low extension contacts respectively.

5.1.10 Innovativeness

Majority (54.17 per cent) of the respondents were included in the medium category of innovativeness followed by 24.17 per cent of the respondents who were observed in low level of innovativeness category and 21.66 per cent of the respondents were included in the category of high innovativeness level.

5.1.11 Market Orientation

Three fifth (58.33 per cent) of the respondents had medium market orientation followed by 21.67 per cent and 20.00 per cent of respondents had low and high market orientation respectively.

5.1.12 Advisory System

Majority (43.33 per cent) of the respondents had medium use of advisory system followed by 32.50 per cent and 24.17 per cent of the respondents had low and high use of advisory services respectively.

5.2 Needs of grape growers about post-harvest technology and export oriented marketing

5.2.1 Good Agricultural Practices (GAP) as per recommendation of NRC, Grape

The percentage of grape growers adopted the Good Agricultural Practices which has 95.00 per cent varieties, 75.00 per cent rootstock, 80.00 per cent training, pruning and canopy management, 79.17 per cent nutrient and water management, 73.33 per cent bio-regulators, 65.83 per cent disease and pest management, 81.66 per cent maturity indices and time of

harvesting, 73.33 per cent post-harvest quality of grapes and 63.33 per cent Maximum Residual Level (MRL) as per recommendation of NRC, Grape.

5.2.2 Quality parameters adopted by the grape growers to meet the export standards

The percentage of the grape growers adopt the quality parameters to meet the export standard of grapes which is 63.33 per cent for shape of bunch, for berry shape 65.00 per cent, for colour of berry 75.00 per cent, for skin of berry 79.17 per cent, for arrangement of berries in bunch 65.00 per cent, for number of berries in bunch 79.17 per cent, for average weight of bunch 95.00 per cent, for length of the berry 83.33 per cent, for average weight of berry 66.66 per cent, for girth of berry 66.66 per cent, for sugar content 86.66 per cent, for acid content 83.33 per cent, for look of bunch 80.83 per cent, for taste of juice 89.16 per cent and for gloss of bunch 79.17 per cent.

5.2.3 Post-Harvest Management of Grape

Majority (100.00 per cent) of the grape growers sale their grape as a fresh in market and 81.66 per cent of the grape growers for preparation of raisins. The methods used for raisins preparation by the grape growers was 81.66 per cent cold dipped method and 72.50 per cent sulphur bleached method. Majority (68.83 per cent) of the grape growers used Thompson seedless, 62.50 per cent Tas-A-Ganesh, 38.33 per cent Sonaka, 45.83 per cent Manik Chaman and 39.16 per cent Sharad Seedless varieties for raisin preparation.

5.2.4 Marketing of Grapes

Concluded that the 100.00 per cent of the grape growers used local market for sale their fresh grape and raisins; 75.00 per cent of the grape growers through export market. The study revealed that 75.00 per cent of the grape growers export grapes as a fresh fruits and 62.50 per cent as a raisins.

Revealed that percentage of the grape growers was used marketing channels for marketing of grapes and raisins which was through middle mans in APMC 63.33 per cent, contract on rate/kg basis 62.50 per cent, agreement with traders in different places 57.50 per cent, auction sale in APMC 33.33 per cent and pre harvest contract entire garden 30.83 per cent.

Observed that 65.00 per cent of the grape growers used private cold storage facility for grapes and raisins storage followed by 25.00 per cent community based cold storage and 22.50 per cent Government cold storage in study area.

Observed that 100.00 per cent of the grape growers use tractor for transportation of grape produce during local market followed by 80.83 per cent mini lorry and tempo. The percentage of the grape growers about 47.50 per cent use seaport for distance and export market followed by 25.00 per cent railway wagons.

Material used for packaging of grape and raisins in which 100.00 per cent of the grape growers use plastic crates and corrugated fibreboard boxes followed by 75.00 per cent expanded polystyrene boxes, 58.33 per cent cardboard boxes and 56.66 per cent polyethylene bags.

5.3 Constraints Faced By The Grape Growers In Adoption of Effective Advisory Services

Majority (95.83 per cent) of the grape growers were stated lack of timeliness in public advisory as major constraint followed by lack of technical guidance regarding post-harvest technology and export marketing (70.83 per cent). Lack of cooperative mindset due to personal rivalry (65.00 per cent). The 55.83 per cent of the respondents stated too much idealistic production procedure advised by advisory system. Lack of scientific and technical knowledge to members of advisory system itself (53.33 per cent). While 48.33 per cent of the respondents faced the problem of lack of practicability of advisory practices by advisory system and 45.00 per cent of the respondents faced the problem of conflict in traditional knowledge of farmer and modern technical knowledge of member of advisory system.

5.4 Suggestions Made By The Grape Growers To Effective Advisory Services

Majority (95.00 per cent) of the respondents suggested that the regular guidance and services should be provide by advisory system followed by the farmers need to educated in order to make them come out of their traditional mindset (65.83 per cent). Another suggestion were regular training programs need to held by advisory system through KVK for latest package of practices (63.33 per cent). While 56.66 per cent of the respondents suggested that the advisory system should be flexible and practical in giving it's advises about new practices to be followed. 19.16 per cent of the respondents suggested that the advisory system itself should be monitored frequently to prevent misguiding knowledge by member.

5.5 Conclusion

5.5.1 Personal and Socio-Economic Characteristics of the Grape Growers

Majority of the grape growers belonged to the middle age group, most of them had received higher secondary education, having medium size of family, having small land holding, medium area under grape cultivation, having medium grape cultivation experience, medium annual income, medium level of source of information, having medium level of extension contact, medium level of innovativeness and having medium level of market orientation.

5.5.2 Advisory System

It was observed that that majority of the grape growers had medium level of contact with advisory services agencies for seeking the information about agriculture including recommended cultivation, plant protection, post-harvest management and marketing practices of grape crop.

5.5.3 Needs of grape growers about post-harvest technology and export oriented marketing

It was observed that nearly half of the grape growers were need to provide advisory services regarding Good Agricultural Practices, quality parameters, post-harvest use of grapes,

grape varieties use for raisin making, raisin preparation methods and use of market functionaries related to local and export marketing of grapes and raisins.

5.6 Implications

The implications based on the findings of the present study, following suggestions in the form of implication are offered. The implications are presented into two parts viz., implication for action and implications for future research. 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, development departments, policy makers, NGO's personnel and other related personnel, engaged in agricultural development.

Implication for Action

The findings of the study reveals that majority of the farmers had medium to low level of knowledge regarding recommended grape post-harvest technology and export oriented marketing. It was also observed that most of the farmers had medium to low adoption of advisory services of grape. This indicates that the farmers were not aware of the recommended grape post-harvest technology and export oriented marketing and at the same time they were slow to adopt advisory system of grape crop.

1. Even though the people have the knowledge of advisory services of grape the adoption is not up to the mark. So the Department of Agricultural Maharashtra State should conduct the "Front Line Demonstration" (FLD) and Result Demonstrations of grape post-harvest technology and export oriented marketing in cluster villages. Also, Krishi Vigyan Kendras conduct the "On Farm Testing" (OFT).
2. The extension personnel from various sector viz. State Department of Agricultural, Krishi Vigyan Kendras should provide the literature, audio, video material and should organize training cum brain storming programme in consultation with State Agriculture University, to the grape growers for increasing the adoption of post-harvest technologies and export oriented marketing.
3. As there are medium age group and having higher secondary and above education farmers, it is necessary to organize frequently trainings regarding the post-harvest technology including export oriented marketing by KVKs reduction in middleman charges in exporting.
4. The present study was confined to limited area and sample. So, the conclusion will be applicable to area of the study only. For generalizing the conclusions, it is necessary to conduct similar studies in other districts of the regions by drawing larger sample.

Research Implications

1. The personal and socio-economic factors which contribute towards high and low agricultural productivity may be studied to a greater depth.
2. This study would also be useful as a benchmark for further probe into the studies of similar type.
3. To cover wide range of factors of human behaviour of the farmers in transfer of technology further interdisciplinary research is necessary.

6. LITERATURE CITED

- Anonymous. 2017. Indian Horticultural database, National Horticulture Board, Govt. of India.
- Anonymous. 2017. Socio-economic review and district statistical abstract of Sangli District.
- Anonymous. 2018. Indian Horticultural database. National Horticulture Board, Govt. of India.
- Aglawe, D. D. 2012. Technological gap in turmeric production technology. M.Sc. (Agri.) Thesis (Unpublished), Dr. PDKV, Akola. (M.S.).
- Aher, B. M. 1989. Economics of Grape Cultivation in Niphad Taluka. Ph.D. Thesis (Unpublished), Shivaji University, Kolhapur.
- Angadi, J. G., Patil, S. L. and Hanumanaikar. 2007. Constraint in use of organic measure perceived by farmers of Tungabhadra command of Karnataka. National Seminar on Appropriate Extension Strategies for Management of Rural Resources, Nagpur 18-20 Dec.
- Aundhkar, R. S., Deshmukh, A. N., Tale, S. G. and Shinde, P. P. 2013. A study adoption of drip irrigation on technologies by sweet orange grower, Chandur bazaar, Amravati district (MS). *Agric. Update.*, **2**(4): 620-622.
- Bedre, V. S. 2009. Knowledge of adoption of recommended package of practices by pomegranate growers. M.Sc. (Agri.) Thesis (Unpublished), VNMKV, Parbhani. (M.S.).
- Bhandare, C. L. 2011. Adoption of recommended packages of practices of sweet orange growers in Aurangabad district. M.Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri.
- Chavan, S. S. 2005. A study on adoption of recommended package of practices in grape cultivation by the growers in Sangli district of Maharashtra state. M.Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri.
- Chiranthan, G. 2013. Training needs of citrus regarding cultivation technology. *Indian Res. J. Extn. Edu.*, **13**(4): 122-125.
- Desai, C. P. 1997. A study on techno-economic consequences in adoption of drip irrigation system by mango growers of Junagadh district in Gujarat State. Ph.D. Thesis (Unpublished), GAU, Anand.
- Desai, G. R., Venkateswarai, J., Ramanrao, S. V., Kumar, S. and Manohari, P. L. 2007. Performance of rainfed farming system in Mehboobnagar district of Andhra Pradesh. *Manage Extension Research Review*, **23**: 72-82.
- Dhakne, S. S. 2005. A study of knowledge and adoption of recommended grape production technology in Barshi tehsil of Solapur district. M.Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri.
- Fuke, A. B. 2011. Role of Agro-service Centers in Agricultural Development. M.Sc. (Agri.) Thesis (Unpublished), Dr. PDKV, Akola. (M.S.)

- Gaikwad, J. H. and Khalache, P. G. 2010. Work on a technological gap an emerging issue in transfer of custard apple production technology. Purandar dist. Pune. *Agric. Update*, 5(3&4): 417-420.
- Gavade, K. G. 2013. Adoption behaviour of grape Growers. M.Sc. (Agri.) Thesis (Unpublished), Dr. PDKV, Akola. (M.S.)
- Garje, P. S. 2010. Management aspects of grape marketing. M.Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri. (M.S.)
- Gotyal, S. H. 2007. Backward and forward linkages of grape production in Karnataka. Ph.D. Thesis (Unpublished), Univ. Agric. Sci., Dharwad.
- Hinge, B. J. and Tilekar, S. N. 1993. A study of marketing of grapes in domestic and export markets, agresco report. Department of Agricultural Economics, MPKV, Rahuri, 56-59.
- Hinge, R. B. 2009. A study on diffusion and adoption of wine grape production technology in Maharashtra. M.Sc. (Agri.) Thesis (Unpublished), University of Agricultural Sciences, Dharwad.
- Hipperkar, B. G. 2015. Entrepreneurial behaviour of pomegranate grower in Aurangabad district. M.Sc. (Agri.) Thesis (Unpublished), VNMKV, Parbhani.
- Howal, A. A., Khalache, P.G. and Sonawane, H. P. 2009. A study on attributes and constraints of the pomegranate cultivators of Solapur dist. (MH). *Agric. Update*, 4(3&4): 282-284.
- Ingale, P. H. 2003. Adoption of recommended package of practices of ber cultivation in Sangola tahsil of Solapur district. M.Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri. (M.S.).
- Jamadar, C. R. 2012. Training needs of sugarcane growers about recommended production technology. M.Sc. (Agri.) Thesis (Unpublished), VNMKV, Parbhani.
- Jamadar, K. C. 2015. Training need of grape growers. M.Sc. (Agri.) Thesis (Unpublished), MAU, Parbhani (M.S.).
- Kachare, V. S. 2012. Study on adoption gap in sweet orange production practices M.Sc. (Agri.) Thesis (Unpublished), VNMKV, Parbhani (M.S.).
- Kalamkar, R. B. 2013. Training needs of potato growers. M.Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri (M.S.).
- Karale, N. B. 2006. Resource management by the grape growers. M.Sc. (Agri.) Thesis (Unpublished), Dr. PDKV, Akola.
- Khaire, P. R. 2005. Training needs of fig growers in Pune district. M.Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri (M.S.).
- Khot, A. V. 2011. Extent of economic gain through drip irrigation system by grape growers. M.Sc. (Agri.) Thesis (Unpublished), AAU, Aanand.
- Kodag, V. B. 1998. A Study of Export Marketing of Grapes and Raisins in Sangli District. Ph.D. Thesis (Unpublished), Shivaji University, Kolhapur. pp: 251-256.

- Kolte, J. B. 2002. A study of adoption of improved cultivation practices of chilli in Rahuri tahsil of Ahmednagar district. M. Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri (M.S.).
- Kota, S. K., Tarde, V. J. and Babar, M. S. 2012. Knowledge and adoption of export oriented practices followed by the mango growers. *International J. of Extn. Edu. Vol.*, **8**: 51-55.
- Kunchala, K. 2012. Attitude of the farmers towards private extension services. M.Sc. (Agri.) Thesis (Unpublished), AAU, Anand.
- Kwik Najjel. 2000. Threats in Exporting of Grapes: A Practical Experience, Drakshadeep, Mahagrapes, **pp**: 19-20.
- Landage, N. N. 2015. Utilization pattern and extent of use of pesticides by brinjal growers. M.Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri (M.S.).
- Makar, H. B. 2013. Potato production technology followed by farmers. M.Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri (M.S.).
- Manpadlekar, A. P. 2006. Training needs of farm women in Tur (Pigeon pea) production technology. M.Sc. (Agri.) Thesis (Unpublished), VNMKV, Parbhani. (M.S.).
- Modak, S. J. and Sawant, P. A. 2004. Constraint faced by the farmer in production and marketing of minor fruits. *Asian Journal of Extension Education*, **22**(20): 198-202.
- Mule, R. T. 2012. Profile and problems of sweet orange growers. M.Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri (M.S.).
- Pandey, K. N. 1990. Agricultural Export: Issues in Indian Horticulture, Kisanworld, **pp**: 41.
- Pangire, B. V. 1995. A Study on Marketing of Grapes in Maharashtra, Ph.D. Thesis (Unpublished), MPKV, Rahuri.
- Patel, K. B. 2006. A study on extent of adoption of recommended aonla production technology by Aonla growers of Kheda district of Gujarat. M.Sc. (Agri.) Thesis (Unpublished), AAU, Anand.
- Patel, K. M. 2007. Time-lag in adoption of tissue culture raised grape plants for middle Gujrat. Ph.D. (Agri.) Thesis (Unpublished), AAU, Anand.
- Patil, A. B. 2008. A study on constraints of grape exporting farmers of Maharashtra state. Ph.D. Thesis (Unpublished), Univ. Agric. Sci., Dharwad.
- Patil, K. V., Patel, V. T. and Prajapati, R. R. 2017. Constraints in Using Kisan Mobile Advisory Service as Perceived by Farmers in Banaskantha District of Gujarat, India. *Int. J. Curr. Microbiol. App. Sci.*, **6**(11): 237-240.
- Patil, V. K. and Patil, S. G. 1994. Prospects for grape production and export, Drakshavritta Souvenir, 164-169.
- Rahore, D. S. 2001. Preparing to face WTO challenges, Indian Horticulture, **pp**: 33.
- Raut, P. S. 2014. A study on banana production technology in Kolhapur district. M.Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri (M.S.).

- Rajesh. 2011. A Scale to Measure Attitude of the farmers towards Bio Control Measures of Plant Protection. M.Sc. (Agri.) Thesis (Unpublished), AAU, Anand.
- Reading, H. F. 1971. Simple dictionary of Social Sciences, New Delhi, Ambika publication.
- Ronald Pinto and Pandhare Rohit. 2000. Future of Indian Grapes in International Market: Maharashtra in Grape Export at World Level, Drakshadeep, Mahagrapes, Pune, 129-131.
- Saravanan, R. and Bhattacharjee, S. 2014. Mobile Phone Applications for Agriculture Extension in India: Worldwide mAgri innovations and promise for future, New Delhi, New India Publishing Agency, pp: 340.
- Saravanan, R. and Bhattacharjee, S. 2015. mExtension – Mobile Phones for Agricultural Advisory Services. Global Forum for Rural Advisory Services (GFRAS), pp: 1-4.
- Sawale, S. V. 2011. Knowledge and adoption of post-harvest technology by the pomegranate growers. M.Sc. (Agri.) Thesis (Unpublished), VNMKV, Parbhani (M.S.).
- Singh Karan. 1973. Marketing of grapes through co-operative, *Indian Journal of Agricultural Marketing*, **16**(1-2): 1-6.
- Singh, R., Syiem, W., Feroze, S. M., Devarani, L., Ray, L., Singh, A. K., Singh, N. J. and Anurag, T. S. 2015. Impact assessment of mobile based agro-advisory: A case study of tribal farmers of Ri-Bhoi district of Meghalaya. *Agril. Econ. Res. Rev.*, **28**: 183-87.
- Sopan Kanchan. 2000. Grape exports from Maharashtra, Drakshadeep, Mahagrapes Pune. pp: 13-15.
- Sorate, P. T. 2011. Technological gap in cultivation of grape in Buldhana District. M.Sc. (Agri.) Thesis (Unpublished), Dr. PDKV, Akola.
- Suramwad, S. R. 2014. Adoption behavior of grape growers in Sangli District. M.Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri (M.S.).
- Suryawanshi, S. S. 2014. Training needs of Agricultural input dealers in transfer of Agriculture technology. M.Sc. (Agri.) Thesis (Unpublished), MPKV, Rahuri (M.S.).
- Thakare, S. B. 2008. Adoption of recommended cultivation practices by grape cultivation. M.Sc. (Agri.) Thesis (Unpublished), Dr. PDKV, Akola.
- Uma Maheshwara Rao, Chandrashekara, P. and Veeraiah. 2010. Impact of training programmes of Krishivigyan Kendra. *Agril. Extn. Rahuri*, Jan-March: 3-5.
- Umesh, Chinchmalatpure R. and Mayani, V. V. 2006. Constraint and Suggestions expressed by project affected farmers in adoption of Modern Agriculture Technology, *Manage Extension Research Review*, **7**: 71-75.
- Undirwade, S. B., Bidwai, P. N. and Nighot, M. N. 1992. A Study on Marketing of Grapes in Dhule District, *Maharashtra Journal of Agricultural Economics*, **4**(1): 29.
- Waghmare, O. R. 2010. Training needs of sweet orange growers. M.Sc. (Agri.) Thesis (Unpublished), MAU, Parbhani.

7. APPENDICES

Appendix- I

Village wise list of the selected farmers

Sr.No.	Tehsil	Village	Name of farmer	Mobile No.
1.	Tasgaon	Kumathe	Mr. Mahaling Vishnu Hajare	9975109557
2.		Kumathe	Mr. Mahaling Rajaram Patil	9527317545
3.		Kumathe	Mr. Mahesh Khandu Ghatge	9975427181
4.		Kumathe	Mr. Manoj Bhau Patil	9966717104
5.		Kumathe	Mr. Ranjeet Krushna Patil	8830054025
6.		Kumathe	Mr. Sachin Ramchandra Mali	8329129760
7.		Kumathe	Mr. Mahesh Vilas Pawar	7588588434
8.		Kumathe	Mr. Sagar Vilas Mali	9665239796
9.		Kumathe	Mr. Shashi Mahadev Mali	9503526689
10.		Kumathe	Mr. Shshikant Vitthal Patil	9175837121
11.		Manerajuri	Mr. Amol Dinkar Jamdade	8830060725
12.		Manerajuri	Mr. Ananda Sampat Kadam	8890202868
13.		Manerajuri	Mr. Arvind Bhimrao Jamdade	7028583176
14.		Manerajuri	Mr. Atui Anil Patil	9011038999
15.		Manerajuri	Mr. Bharat Rajaram Jadhav	7385701251
16.		Manerajuri	Mr. Chandrakant Balvant Landge	9860671163
17.		Manerajuri	Mr. Ganesh Manik Mane	9049487411
18.		Manerajuri	Mr. Somnath Sambhaji Pawar	9527701080
19.		Manerajuri	Mr. Himmatrao Nana Suryavanshi	9145749221
20.		Manerajuri	Mr. Haribhau Sampat Shinde	9921330024
21.		Rajapur	Mr. Sudam Rajaram Patil	9637084064
22.		Rajapur	Mr. Sandip Manik Patil	9422892290
23.		Rajapur	Mr. Ganesh Bhimrao Patil	9503516710
24.		Rajapur	Mr. Rahul Sampat Pawar	9665385182
25.		Rajapur	Mr. Ashok Bhimrao Patil	9404238148
26.		Rajapur	Mr. Avinash Dinkar Patil	9130367140
27.		Rajapur	Mr. Anandrao Hari Patil	9561429304
28.		Rajapur	Mr. Sanjay Vishnu Khabale	7743969316
29.		Rajapur	Mr. Kiran Subhash Thorat	7774994555
30.		Rajapur	Mr. Prakash Arjun Thorat	9665315777

31.	Miraj	Takali	Mr. Jahangir Miraso Jamadar	9423037842
32.		Takali	Mr. Mahaveer Amgonda Patil	9588625799
33.		Takali	Mr. Sanjay Maruti Pujari	9623727201
34.		Takali	Mr. Dhanpal Bhimanna Pujari	8208400369
35.		Takali	Mr. Vinod Prakash Karande	8657211637
36.		Takali	Mr. Kiran Sadashiv Gulavne	9860881281
37.		Takali	Mr. Dipak Bharat Sutar	8657487545
38.		Takali	Mr. Samrat Pungonda Patil	8956481848
39.		Takali	Mr. Abhijeet Bhimrao Patil	8956841884
40.		Takali	Mr. Arvind Dhanpal Desai	9960811860
41.		Arag	Mr. Sunil Bhupal Mali	9766013329
42.		Arag	Mr. Sunil Shamrao Bokare	9421226239
43.		Arag	Mr. Latik Jahangir Mujavar	9421221318
44.		Arag	Mr. Jahangir Miraso Makandar	9421181017
45.		Arag	Mr. Sachin Maruti Bokare	8177948485
46.		Arag	Mr. Bharat Maruti Talande	9860840648
47.		Arag	Mr. Babaso Vishnu Mali	9975898393
48.		Arag	Mr. Suresh Ravso Gavde	9405860237
49.		Arag	Mr. Arun Vilas Sutar	9421221414
50.		Arag	Mr. Rahul Nagesh Mali	9503593255
51.		Bedag	Mr. Amar Mahadev Gharge	7588367227
52.		Bedag	Mr. Vinayak Rajaram Patil	8421581080
53.		Bedag	Mr. Santosh Sarjerao Desai	7385054116
54.		Bedag	Mr. Dilip Krushna Patil	9850427978
55.		Bedag	Mr. Mahadev Ramchandra Thorve	8421650777
56.		Bedag	Mr. Sharad Vilas Patil	7588367228
57.		Bedag	Mr. Arun Vilas Patil	9284857262
58.		Bedag	Mr. Vijay Bajarang Patil	8657903901
59.		Bedag	Mr. Pradip Nivas Omase	9673093782
60.		Bedag	Mr. Sangmesh Shankar Omase	8627879036

61.	Khanapur	Karve	Mr. Sudarshan Babu Jadhav	9637190037
62.		Karve	Mr. Vilas Ananda More	9975432657
63.		Karve	Mr. Sunil Vishvas Jadhav	9172822237
64.		Karve	Mr. Bhanaji Ramchandra Jadhav	9975432657
65.		Karve	Mr. Rohit Lakshman More	9637353004
66.		Karve	Mr. Manoj Jayram Kambale	9545887399
67.		Karve	Mr. Vijay Vilas Kambale	9970773848
68.		Karve	Mr. Sunil Vijay Jadhav	9970778838
69.		Karve	Mr. Akshay Vijay Jadhav	7387317769
70.		Karve	Mr. Sundar Shahaji Jadhav	8411844883
71.		Gardi	Mr. Sayaji Jaysing Babar	8368812093
72.		Gardi	Mr. Anand Babasaheb Babar	9625934603
73.		Gardi	Mr. Sarjerao Ganpati Babar	7827908681
74.		Gardi	Mr. Rajendra Kisan Babar	7350635745
75.		Gardi	Mr. Hemant Rrajaram Suryavanshi	9354586610
76.		Gardi	Mr. Pradip Jagannath Suryavanshi	8851310838
77.		Gardi	Mr. Kisan Baburao Suryavanshi	7226087333
78.		Gardi	Mr. Satish Popat Kumbhar	7227975362
79.		Gardi	Mr. Ankush Rajaram Yadav	9223274424
80.		Gardi	Mr. Ravindra Tukaram Chavhan	9625220148
81.		Ghanvad	Mr. Ramchandra Shamrao Gosavi	7827912115
82.		Ghanvad	Mr. Sunil Shivaji Gosavi	9821837594
83.		Ghanvad	Mr. Surendra Ishwar Sawant	9625218968
84.		Ghanvad	Mr. Sukhdev Masu Bhosle	9354912127
85.		Ghanvad	Mr. Ananda Jotiram Sawant	9625223648
86.		Ghanvad	Mr. Anil Kisan Sawant	9327910296
87.		Ghanvad	Mr. Vilas Sadashiv Sutar	9625220663
88.		Ghanvad	Mr. Sagar Jayram Kadam	9315734073
89.		Ghanvad	Mr. Balu Chandrakant Jadhav	7827043675
90.		Ghanvad	Mr. Mahadev Anil Mane	7683098569

91.	Palus	Palus	Mr. Laxaman Uttam Patil	8851527724
92.		Palus	Mr. Balasaheb Vishnu Patil	7678267090
93.		Palus	Mr. Pramod Dashrat Patil	9625922598
94.		Palus	Mr. Shivaji Mahadev Pawar	9016325939
95.		Palus	Mr. Yashwant Gajanan Sawant	9625927780
96.		Palus	Mr. Kumar Baban Yesugade	8178014078
97.		Palus	Mr. Ganesh Dilip Yesugade	7827903389
98.		Palus	Mr. Shankar Daji Kadam	9156396039
99.		Palus	Mr. Hanmant Vilas Mohite	9156302529
100.		Palus	Mr. Ashok Appa Nikam	7058508791
101.		Kundal	Mr. Vinod Hindurao Lad	9623121355
102.		Kundal	Mr. Pravin Bhimrao Lad	9890625253
103.		Kundal	Mr. Ananda Shamrao Lad	8605628086
104.		Kundal	Mr. Ram Hanmant Mali	9767142976
105.		Kundal	Mr. Arun Anandrao Lad	7020778128
106.		Kundal	Mr. Kiran Shivaji Lad	8788649763
107.		Kundal	Mr. Vilas Vitthal Lad	9921114626
108.		Kundal	Mr. Mahadev Namdev Lad	9405782435
109.		Kundal	Mr. Maharudra Swami Jangam	9960022316
110.		Kundal	Mr. Jitendra Baburao Jadhav	9850636063
111.		Bambavde	Mr. Sadashiv Dyanu Kumbhar	8828837362
112.		Bambavde	Mr. Suresh Tukaram Kumbhar	9284857262
113.		Bambavde	Mr. Rahul Raghunath Patil	9860881281
114.		Bambavde	Mr. Vijay Sadashiv Pawar	9767450556
115.		Bambavde	Mr. Hanmant Shankar Pawar	9922403566
116.		Bambavde	Mr. Dhanaji Pandhurang Pawar	9767458160
117.		Bambavde	Mr. Prakash Tukaram Yadav	8956323036
118.		Bambavde	Mr. Ankush Tukaram Jadhav	8806643680
119.		Bambavde	Mr. Sachin Ashok Jadhav	9552982951
120.		Bambavde	Mr. Shivaji Pravin Patil	9975476008

Appendix- II
INTERVIEW SCHEDULE

MAHATMA PHULE KRISHI VIDYAPEETH, RAHURI

Department of Extension Education

RCSM College of Agriculture, Kolhapur

Thesis Title : “Study of Advisory System Used By Grape Growers”

Name of the Researcher : Mr. Kadam Abhishek Arvind

Name of the Research Guide : Dr. K. V. Gurav
Associate Professor of Agril. Extension,
RCSM College of Agriculture, Kolhapur

Part A

1. Name of the Farmer : -----

2. Address : Village ----- Tahsil ----- Dist – Sangli

3. Mobile/Landline No. : -----

4. Age : ----- Years

5. Education : -----Std.

6. Family Size

Male	Female	Boys	Girls	Total

7. Land holding

Sr.No.	Type of land	Area (ha.)
1	Rainfed	
2	Irrigated	
	Total	

8. Area under Grape Cultivation : ----- ha.

9. Experience in Grape Cultivation : ----- years

10. Annual Income

Sr. No.	Occupation	Income/(Rs.)
1	Farming	
2	Grape	
3	Agril. allied business	
4	Job/ Service	
5	Business	
6	Others (Please specify)	
	Total	

11. Extension Contact (Please mark ✓ in appropriate column)

Sr. No.	Particulars	Regular	Sometimes	Never
1.	Agriculture Department			
2.	Agril. University /Agriculture College, Kolhapur			
3.	K.V.K.			
4.	Progressive Farmers / Neighbourhood Farmers			
5.	KrishiSeva Kendra			
6.	Farmer Scientist Forum			
7.	Others (Please specify)			

12. Source of Information (Please mark ✓ in appropriate column)

Sr. No.	Source of information	Regular	Sometimes	Never
(A)	Personal contact			
1	Neighbors /friends /relatives			
2	Progressive farmers			
3	Local leader			
4	Agriculture department			
5	Agril. University /agriculture college, kolhapur			
6	Kvk subject matter specialist/ scientists			
(B)	Group contact			
1	Progressive farmers group			

2	Farmers tour			
3	Demonstration			
4	Group discussion			
5	Training			
(C)	Mass media contact			
1	Radio, television, newspaper			
2	Internet			
3	Agriculture university literature			
4	Farmers scientist forum			
5	Grape growers association			
6	Agril. Exhibition			
7	KVK			
8	KCC			

13. Innovativeness (Please mark ✓ in appropriate column)

Sr. No.	Statements	Agree	Undecided	Disagree
1	I feel restless till try out a new farm practices I have heard about it.			
2	They talk of many new practices these days but who know if they are better than old one.			
3	After all our fore fathers had wisdom in their farming practices and I did not see any reason for changing their old methods.			
4	After all new farm practices are not successful however; if they are promising I would surely like to adopt them.			
5	From time to time I have heard several new farm practices and I have tried most of these in last few years.			
6	Somehow I believed that the traditional ways of farming are the best.			

14. Market Orientation (Please mark ✓ in appropriate column)

Sr. No.	Statement	A	SA	DA
1.	Market news is not much useful to the farmer			
2.	A farmer can get good price by grading his produce			
3.	Warehouses can help the farmer to get better prices for his produce			
4.	One should sell his produce to the nearest market irrespective of price			
5.	One should grow those crops which have more demand in the market			
6.	One should purchase his inputs from the shop his other relatives purchase			

(A- Agree, SA- Somewhat Agree, DA- Disagree)

15. Advisory Services Used(Please mark ✓ in appropriate column)

Sr. No.	Advisory services used	Regular	Sometime	Never
A.	Govt. Organizations			
1.	Deputy Director of Horticulture			
2.	Agriculture Department			
3.	Agriculture University			
4.	Scientists NRC Grape, Pune			
5.	APEDA			
6.	KVK			
B.	Co-operative Organizations			
1.	Mahagrapes			
2.	Draksha Bagaitdar Sangh			
3.	Maharashtra State Grape Growers Assosiation			
4.	Grape Growers Co-operative Societies			
5.	Local Organization			
C.	Private Agency			
1.	Private Consultant			
2.	Private Exporter			
3.	Private Input Dealers			
4.	Others (Please specify)			

Part B

1. Which management practices do you adopt to meet quality parameters?

(Please mark ✓ in appropriate column)

Sl. No.	Quality Parameters	Mark
1	Shape of bunch - elongated and spread	
2	Berry shape – elongated or round	
3	Colour of berry - light green/purple/red/black	
4	Skin of berry – thin or thick	
5	Arrangement of berries in bunch - equitable	
6	Number of berries in bunch - 125 to 150	
7	Average weight of bunch - 400 to 500 g	
8	Length of the berry - 18 to 20 mm	
9	Average weight of berry - 3 to 3.5 gm	
10	Girth of berry - 16 to 18 mm	
11	Sugar content - 18 to 21° Brix	
12	Acid content - 0.5 to 0.6%	
13	Look of bunch - attractive	
14	Taste of juice – sweet	
15	Gloss of bunch- natural	

2. Good Agriculture Practices for production of quality table grapes

Are you adopt Good Agriculture Practices (GAP) as per recommended by NRC, Grape.
Yes/No.

If yes, (Please mark ✓ in appropriate column)

Sl. No.	Good Agriculture Practices	Mark
1	Varieties	
2	Rootstock	
3	Training, Pruning and Canopy management	
4	Nutrient and Water management	
5	Use of Bio-regulators	
6	Disease management	
7	Pest management	
8	Maturity indices and harvesting time	
9	Post-harvest quality management	
10	Safe use of agro chemicals Maximum Residual Level (MRL)	

3. Post- Harvest Management of Grape

1) Use of grape fruits after harvest (Please mark ✓ in appropriate column)

Sr. No.	Use of Grape Fruits	Mark
1	Sale	
2	Preparation of raisins	

2) Methods used for raisins preparation (Please mark ✓ in appropriate column)

Sr. No.	Methods of raisins preparation	Mark
1	Cold dipped method (Green raisin)	
2	Sulphur bleached raisin (Yellow raisin)	
3	Natural raisins	
4	Golden bleached raisins	
5	Valencia (Lexias)	
6	Soda oil method	
7	Greek process	
8	Soda dip method	
9	Currants	
10	Vine dried raisins	

3) Are you preparing raisins and which varieties of grape used? Yes/No

4) Mention Varieties used for raisin preparation (Please mark ✓ in appropriate column)

Sr. No.	Name of Varieties	Mark
1	Thompson seedless	
2	Tas-A-Ganesh	
3	Sonaka	
4	Manik Chaman	
5	Sharad seedless	

4. Marketing and storage of Grapes and Raisins

1) **Mention the market of fresh grapes and raisins.**(Please mark ✓ in appropriate column)

Sr. No.	Category	Mark
1	Local market	
2	Export market	

2) **Are you export your fresh grapes and raisins?** Yes/No

3) **Mention the which type of commodity exporting (Fresh Grapes/ Raisins).**

(Please mark ✓ in appropriate column)

Sr. No.	Category	Mark
1	Fresh Grape Fruits	
2	Raisins	

4) **Through which of the following marketing channels you market your produce?**

(Please mark ✓ in appropriate column)

Sr. No.	Marketing Channels	Mark
1	Pre harvest contract entire garden	
2	Through middle mans in APMC	
3	Auction sale in APMC	
4	Contract on rate/kg basis	
5	Agreement with traders in different places	

5) **Are you storing your fresh grapes and raisins in cold storage?** Yes/No

6) **Mention the available cold storage units** (Please mark ✓ in appropriate column)

Sr. No.	Category	Mark
1	Community based cold storage	
2	Private based cold storage	
3	Government cold storage	

7) Mention different types of transportation modes available

(Please mark ✓ in appropriate column)

Sr. No.	Transport Facilities	Mark
A	Local market	
1	Tractors	
2	Mini lorry / tempo	
B	Distance market / Export market	
1	Refrigerated van	
2	Railway wagons	
3	Airport	
4	Seaport	

8) Which type of packaging material used for packaging of grapes?

(Please mark ✓ in appropriate column)

Sr. No.	Name of material used	Mark
	Local market	
1	Plastic crates	
2	Corrugated fibreboard box	
3	Cardboard box	
	Export market	
4	Expanded polystyrene box for export	
5	Polyethylene bags for export	

Part C

1. Constraints Faced By The Grape Growers In Adoption of Effective Advisory Services.

- 1. -----

- 2. -----

- 3. -----

- 4. -----

- 5. -----

- 6. -----

2. Suggestions Made By The Grape Growers To Effective Advisory Services.

- 1. -----

- 2. -----

- 3. -----

- 4. -----

- 5. -----

- 6. -----

8. VITAE

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IN
AGRICULTURAL EXTENSION

2019

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