“EXTENSION STRATEGIES FOR RISK MANAGEMENT IN DRY LAND AGRICULTURE IN NORTH SAURASHTRA ZONE”

By

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JUNAGADH- 362 001

JUNE – 2011
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A

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OF

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(Agriculture)

IN

AGRICULTURAL EXTENSION

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Dedicated
To
My Beloved Father
Late Shri Rasikbhai Makadia
... Sagar
ABSTRACT

To study the selected characteristics of the respondents. (2) To measure the knowledge level of respondents about recommended dry farming technologies. (3) To know the rational of adoption of the respondents about recommended dry farming technologies. (4) To ascertain the association of other agent recommended dry farming technologies with more watched.
EXTENSION STRATEGIES FOR RISK MANAGEMENT IN DRY LAND AGRICULTURE IN NORTH SAURASHTRA ZONE

Name of Student                        Major Guide
S. R. Makadia                          Dr. P. R. Kanani

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ABSTRACT

India has about 108 million hectares of dry farming area which constitutes nearly 75 per cent of the total 143 million hectares of arable land (Anon. 2005). In such areas crop production becomes relatively difficult as it mainly depends upon intensity and frequency of rainfall. Out of 19.6 million hectares of total geographical area of Gujarat, 9.6 million hectares area is under cultivation. Out of this cultivated area, 78 per cent (7.5 million ha) is rainfed (Vora, 1992). However, majority of the farmers of dry farming areas are not aware as well as not adopting recommended dry farming technologies, due to lack of technical knowledge and several constraints experienced by them in adoption of recommended dry farming technologies. Keeping the above fact in view, the study entitled “Extension Strategies for Risk Management in Dry Land Agriculture in North Saurashtra Zone” was undertaken with specific objectives viz, (1) To study the selected characteristics of the respondents. (2) To measure the knowledge level of respondents about recommended dry farming technologies. (3) To know the extent of adoption of the respondents about recommended dry farming technologies. (4) To ascertain the association of knowledge about recommended dry farming technologies with their selected
characteristics. (5) To ascertain the association of adoption about recommended dry farming technologies with their selected characteristics. (6) To identify constraints faced by respondents in adoption of recommended dry farming technologies. (7) To seek the suggestions from the dry farming adopters to overcome the constraints in adoption of recommended dry farming technologies.

In context to above objectives, a sample of 120 dry farming adopters' representing 6 village of Rajkot, Tankara and Jodiya Talukas of North Saurashtra was drawn by using random sampling techniques. To measure the dry farming adopters' knowledge about recommended dry farming technologies a teacher made knowledge test was developed and used. To measure the dry farming adopters' extent of adoption of recommended dry farming technologies the adoption quotient developed by Chattopadhyay (1974) was used with slight modification. The data were collected with the help of structured schedule by personal interview method. The data were compiled analyzed and interpreted in the light of specific objectives.

**Findings**

About one half (46.67 per cent) of the dry farming adopters belonged to middle age group, while majority of the respondents (55.83 per cent) were from primary education group, medium size of land holding (64.17 per cent) and medium annual income (62.50 per cent).

Whereas, 82.50 per cent and 75.00 per cent of dry farming adopters were from medium level cropping intensity and extension participation, respectively. Medium level marketing orientation 60.00 per cent, medium level mass media exposure 56.67 per cent, medium level social participation 53.33 per cent, medium
level irrigation potentiality 48.33 per cent and medium level risk orientation 71.67 per cent and medium level innovativeness 47.50 per cent.

Majority of the respondents (63.33 per cent) were from moderate level of knowledge about the recommended dry farming technologies, followed by low (20.83 per cent) and high (15.84 per cent) level of knowledge about recommended dry farming technologies, respectively.

About 57.50 per cent of the dry farming adopters were from medium level adoption index, followed by 24.17 per cent and 18.33 per cent with low and high level of adoption of the recommended dry farming technologies, respectively.

There was positive and significant association with the knowledge about recommended dry farming technologies and their education, size of land holding, social participation, extension participation, cropping intensity, risk orientation, innovativeness and mass media exposure.

While market orientation was negative and non significant associated with the knowledge of recommended dry farming technologies. Age was negative and significantly associated with the knowledge of recommended dry farming technologies.

While remaining all characteristics of the dry farming adopters like annual income and irrigation potentiality were non significantly associated with the knowledge of recommended dry farming technologies.

There was positive and significant association with the adoption of recommended dry farming technologies and their education, social participation, and extension participation cropping intensity, risk orientation, innovativeness and mass media exposure.
There was no significant association with the adoption of recommended dry farming technologies and their annual income, size of land holding. Age was negative and significantly associated with the adoption of recommended dry farming technologies. While market orientation and irrigation potentiality were negative and non significantly associated with the adoption of recommended dry farming technologies.

The important constraints faced by dry farming adopters were: Appearance of periodic drought spells during cultivation, Poor return as compare to modern technologies, Lack of organized extension machinery to disseminate the proven dry farming technologies, Inadequate and untimely supply of agricultural inputs, Farmers don’t willing to take risk, Lack of information and experience regarding dry farming, Poor economic status of the farmers etc.

However the suggestions expressed by more than 60.00 per cent of the dry farming adopters to overcome the constraints in adoption of recommended dry farming technologies viz: Provide special administrative setup to promote dry farming, market facilities should be strengthened, inputs should be made available at subsidized rate, sufficient and timely credit facility should be made available.
Dr. P. R. Kanani
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CERTIFICATE

This is to certify that the thesis entitled "EXTENSION STRATEGIES FOR RISK MANAGEMENT IN DRY LAND AGRICULTURE IN NORTH SAURASHTRA ZONE" submitted by Mr. Makadia Sagar R. in partial fulfillment of the requirement for the award of the degree of Master of Science (Agriculture) in Agricultural Extension Education of the Junagadh Agricultural University, Junagadh is a record of bonafide research work carried out by him under my guidance and supervision and the thesis has not previously formed the basis for the award of any degree, diploma or other similar title.

Place: Junagadh
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This is to certify that Mr. MAKADIA SAGAR RASIKBHAI has successfully completed the comprehensive/ preliminary examination held on 3/5/2011 as required under the regulation for post Graduate studies.

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This is to certify that Mr. MAKADIA SAGAR RASIKBHAI student of M. Sc. (Agriculture), Extension Education Department has made all corrections/modification in the thesis entitled “EXTENSION STRETAGIES FOR RISK MANAGEMENT IN DRY LAND AGRICULTURE IN NORTH SAURASHTRA ZONE” as suggested by the external examiner and the advisory committee in the oral examination held on 26/7/2011. The final copies of the thesis duly bound and corrected have been submitted on 16/8/2011.

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Last but not least, I am in short of words to express the grace of my beloved father Late. shri. Rasibhai M. Makadia, uncle Late. shri. Kishorbhai M. Makadia and “LORD HANUMANTE” which is ever with me.

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I am greatly beholden to Mr. H. G. Hadvani, B. P. Jethaloja, A. M. Dalsania, J.V Jivani, Kalawadia Nil, A.H. Taravia, P. M. Dadhania, A. G. Sinojiya, M. V. Unjiya, M. K. Viroja, K. K. Patel, Mavani, Humbal, Vegad Nilesh, Pagar Ashok, Shyam Hatwar, Mukesh Koli Vaghasia Pankaj and all members of Magic Moment Group for their ever willing help and cooperation during the course of investigation.

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Date: 23/06/2011

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<td>Factors associated with respondents’ extent of knowledge of recommended dry farming production technology (Final paradigm)</td>
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<td>Factors associated with respondents’ extent of adoption of recommended dry farming production technology (Final paradigm)</td>
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INTRODUCTION

India has about 47 million hectares of dry lands out of 108 million hectares of total rainfed area. Dry lands contribute 42 per cent of the total food grain production of the country. These areas produce 75 per cent of pulses and more than 90 per cent of sorghum, millet, groundnut, and pulses from arid and semi-arid regions (Anon, 2005). Thus, dry lands and rainfed
CHAPTER I

INTRODUCTION

Agriculture is the back bone of Indian economy and it is largely dependent on natural resource like soil, water and vegetation. Agricultural productivity depends on how efficiently these resources are conserved and managed. On agricultural land, our major interest is to protect the soil, conserve water and to ensure sustained crop yield and soil fertility by adopting appropriate agronomical practices.

India has about 108 million hectares of rainfed area which constitutes nearly 70 per cent of the total 143 million hectares of arable land (Anon. 2005). In such areas crop production becomes relatively difficult as it mainly depends upon intensity and frequency of rainfall. The crop production, therefore, in such areas is called rainfed farming as there is no facility to give any irrigation and even protective or life saving irrigation is not possible. These areas get an annual rainfall between 400 mm to 1000 mm which is unevenly distributed, highly uncertain and erratic. In certain areas the total annual rainfall does not exceed 500mm. The crop production, depending upon this rain, is technically called dry land farming and areas are known as dry lands (Anon. 2005).

India has about 47 million hectares of dry lands out of 108 million hectares of total rainfed area. Dry lands contribute 42 per cent of the total food grain production of the country. These areas produce 75 per cent of pulses and more than 90 per cent of sorghum, millet, groundnut and pulses from arid and semi-arid regions (Anon. 2005). Thus, dry lands and rainfed
farming will continue to play a dominant role in agricultural production.

Drylands, besides being water deficient, are characterized by high evaporation rates, exceptionally high day temperature during summer, low humidity and high run off and soil erosion. The soils of such areas are often found to be saline and low in fertility. As water is the most important factor of crop production, inadequacy and uncertainty of rainfall often cause partial or complete failure of the crops which leads to period of scarcities and famines. Thus the life of both human being and cattle in such areas becomes difficult and insecure.

Dry farming or dryland farming may be defined as: "a practice of growing profitable crops without irrigation in areas which receive an annual rainfall of 500 mm or even less (Anon. 2005)."

By 2010 A.D., India will have to produce 300 million tons of food grains to feed 1.5 billion populations (approx.). This target cannot be realized from irrigated areas alone as we have irrigation potential for 178 million hectares only (Anon. 2005). Therefore, we will have to evolve an appropriate technology for dry land farming. On the other hand, we can say that second 'green revolution' in Indian agriculture can be had in rainfed/dry land agriculture. This is important to improve the standard of living of farmers residing in these areas as well.

The production in rainfed areas are universally characterized by its year to year fluctuation. The uncertainty of output is mainly due to uneven distribution and frequent failure of rainfall. Moreover, the rainfed areas suffer from certain natural hazards like leaching and erosion and poor
management. The farmers in this area are mostly following subsistence farming and are unwilling and unable to shift to new technology and new varieties of crops, despite their greater profitability prospects. It is, therefore, a herculean task and a challenge to make these farmers for successfully adopting the new agricultural technology.

At present, nearly 70 per cent of the country’s cropped area is under rainfed condition. Rainfed agriculture accounts for more than 40 per cent of total food production, 75 per cent of oilseeds, 90 per cent of pulses and 70 per cent of cotton (Aggarwal and Kumar, 1995)

Despite all these improvements in agriculture, we have yet not been able to evolve an appropriate package of practices for our dry land areas. The income of farmers of dry land regions is still very low.

Any rapid increase in agricultural production in short run requires a quick and radical change in the methods of farming. This could be possible with the introduction of new technology. In our Indian agriculture, the new farm technology has raised the hopes for increasing the output of valuable crops. The vigorous pursuit for higher yield in crop production embarked on by the agricultural scientists during the last few years, represents a very significant milestone. In the history of Indian agriculture, remarkably high yields are obtained by adopting recommended package of practices of crops, which have opened new vistas in breaking the yield stagnation of crops.
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Dry farming in Gujarat

As far as Gujarat state is concerned, the precipitation of rain received in the state is not only inadequate but also erratic which results in drought condition, followed by crop failures. In Gujarat state, out of 19.6 m hectares of total geographical area, 96 lakh hectares area is under cultivation. Out of this cultivated area, 78 per cent (75 lakh ha) is rainfed (Vora, 1992)

The Saurashtra region of Gujarat is highly influenced by vagaries of monsoon, which result into low and unstable crop yield. The region faces twin problems of inadequate moisture availability and occurrence of mild to severe drought that result in partial or total failure of crop. This region falls under arid to semi-arid (Pan Evapotranspiration is 1873 mm and rainfall is 761 mm) and characterized as uncertain (C.V 55per cent), scanty and erratic rainfall (Malavia et al 1999) occurring in few rainy days, interspersed with prolonged dry spell.

1.1 Statement of problem

The present investigation might be the first of is kind where in the dry farming knowledge will be scanned by ‘x’ raying the finding of modern agricultural sciences.

Efforts are being made to bring more area under irrigated agriculture and thereby to increase cropping intensity. But, even when we achieve our target of 113 million hectares of irrigated area by 2000 A.D., we would still have about 45 per cent area under rainfed cultivation (Anon. 2005). We continue to stress on intensive agriculture on irrigated land but we cannot afford to be complacent with our dry lands. Therefore, improved dry farming is necessary for equity and prosperity. As such we
cannot achieve stability in food production with unstabilized dry land agriculture. Therefore, we are required to adopt improved technology especially developed for dry land agriculture.

By generating hypothesis, the present study creates a scope for further research by the formal research and development systems. Moreover, the study of dry farming practices benefits more to the formal Research and Development than farmers themselves in the juncture.

Moreover, there is low knowledge, adoption and some constraints come in the way of dry farming production which hampered the production, with this consideration the problem entitled “Extension Strategies for Risk Management in Dry Land Agriculture in North Saurashtra” was taken with following objectives.

1.2 Objectives

The general objective of the study was to know the knowledge level and adoption level of farmers of dry farming area about recommended dry farming technologies. However, the specific objectives are:

1. To study the selected characteristics of the respondents.
2. To measure the knowledge level of respondents about recommended dry farming technologies.
3. To know the extent of adoption of recommended dry farming technologies.
4. To ascertain the association of knowledge about recommended dry farming technologies with their selected characteristics.
5. To ascertain the association of adoption about recommended dry farming technologies with their selected characteristics.
6. To identify constraints faced by respondents in adoption of recommended dry farming technologies.

7. To seek the suggestions from the respondents to overcome the constraints in adoption of recommended dry farming technologies.

1.3 Significance of the study

The rural economy of India is undergoing rapid change based on introduction of science and technology in farming. In Gujarat state, out of 19.6 m hectares of total geographical area, 96 m hectares area is under cultivation. Out of this cultivated area, 78 per cent (75 lakh ha) is rainfed (Vora, 1992). Most of the area of North Saurashtra falls under the dry farming and yield of this area is very low. In this situation it is very important to find out the knowledge of farmers about recommended dry farming production technology.

The findings of this study will be helpful to the extension agency, planners and administrators in arranging the appropriate training programmers, which will reduce the technological gap among the farmers of dry farming area. Further the study will also be helpful to develop appropriate cultivation practices and in planning and implementing extension as well as research strategies to increase the yield.

1.4 Assumption of the study

The study was base on the following assumptions:

1. All the farmers of dry farming area had an equal chance to contact the extension agencies working in the area and to derive the benefits of their services.

2. The recommended improved farm practices of the dry farming were technically sound, economically feasible,
educationally attainable, culturally compatible and practically applicable to the farmers of dry farming area under study.

1.5 Limitation of the study

Due to limited time and resources available the study has following limitations.

1. The study was restricted to a selected area of the north Saurashtra zone of Gujarat state only.
2. The study was based on individuals' perception and expressed opinion of the respondents.
3. Only 120 farmers were selected for the study those who have cultivation under dry farming.
4. Some selected characteristics of farmers of dry farming area were studied.

The study was limited to the respondents for dry farming cultivation only.
REVIEW OF LITERATURE
CHAPTER -II

REVIEW OF LITERATURE

The main purpose of this chapter is to present some of the recent research studies which are related to the present investigation. There are very few studies so far conducted and reported in India as such on problem under study, however attempts has been made and the same is presented in the light of the objectives under the following heads.

2.1 Personal characteristics of the respondents.

2.2 Knowledge level of farmers about recommended dry farming technology.

2.3 Extent of adoption of farmers about recommended dry farming technology.

2.4 Association of knowledge about recommended dry farming technology with their selected characteristics.

2.5 Association of adoption about recommended dry farming technology with their selected characteristics.

2.6 Constraints faced by respondents in adoption of recommended dry farming technology.

2.7 Suggestions from the respondents to overcome the constraints in adoption of recommended dry farming technology.
2.1 SELECTED CHARACTERISTICS OF THE FARMERS

2.1.1 AGE

Age is an important determinant of a person’s behavior. Since, it is related to his likes, dislikes, interest and personal views.

Javia (2004) reported that nearly three-fifth of the groundnut growers (61.00 per cent) belonged to middle age group, whereas, 26.00 per cent and 13.00 per cent of the groundnut growers belonged to young and old age group, respectively.

Savaliya (2004) revealed that more than half (51.66 per cent) of the cattle owners were in middle age whereas, 25.84 per cent and 22.50 per cent of the respondents were in old and young age group, respectively.

Sharma et al. (2005) revealed that majority (76.56 per cent) of the respondents were in middle age group followed by young age group 13.15 per cent and old age group 10.29 per cent.

Anilkumar (2008) reported that majority (57.00 per cent) of the farm womens belonged to middle age group followed by 21.00 per cent and 22.00 per cent in old and young age groups, respectively.

Jadeja (2008) reported that majority (45.00 per cent) of the neem owners belonged to middle age group followed by 31.00 per cent and 24.00 per cent in old and young age group, respectively.
Kumbhani (2009) reported that nearly half of the coriander growers 45.63 per cent belonged to middle age group whereas, 20.00 per cent and 34.37 per cent of the respondents were in old and young age group, respectively.

2.1.2 EDUCATION

Education is a process of bringing desirable changes in the human behavior in terms of knowledge, skill and attitude. It is a process of imparting and acquiring knowledge and habit through instruction and study.

Verma (2000) stated that nearly half (44.44 per cent) of the respondents were educated up to primary level, while 24.22 per cent and 23.05 per cent respondents belonged to illiterate and secondary education level group, respectively. Only 8.59 per cent of the respondents were from higher education group.

Jadav (2001) inferred that 50.00 per cent of the onion growers were educated up to secondary level whereas, 35.83 per cent of the respondents were educated up to primary level and 14.16 per cent were educated above the secondary level.

Chavada (2005) indicated that 42.00 per cent Bt cotton growers were from the primary education, 30.67 per cent were from the secondary education, while 14.67 per cent were from the higher secondary education level and 8.66 per cent were from illiterate and 4.00 per cent respondents were from college level of education.

Tavethiya (2006) indicated that 60.00 per cent of the respondents were either illiterate or educated up to primary level
(up to 7th standard). Only 40.00 per cent respondents were educated up to secondary and above higher secondary level.

Bharad (2007) indicated that 57.50 per cent of the respondents possessed primary level of education whereas, 28.00 and 05.50 per cent of the respondent had secondary and higher secondary level of education, respectively. The Bachelor’s degree was possessed by only 7.00 per cent. It is interesting to note that only 2.00 per cent of the respondents were illiterate.

Anilkumar (2008) summarized that more than half 51.33 per cent of the respondents were educated up to primary level. Whereas, 16.67 per cent of the respondents were educated up to secondary level, 25.00 per cent were illiterate and only 05.00 per cent of the respondents were educated above higher secondary level.

Kumbhani (2009) reported that 50.62 per cent of the coriander grower’s were educated up to primary level whereas, 27.50 per cent of the respondents were illiterate, 16.88 per cent of the coriander grower’s were educated up to secondary level and only 05.00 per cent of the respondents were educated up to higher secondary.

2.1.3 SIZE OF LAND HOLDING

Chhodavadia (2001) observed that about half of the demonstrating farmers (48.08 per cent) and non-demonstrating farmers (51.92 per cent) belonged to small size of land holding followed by medium and large size of land holding.

Sahoo (2004) observed that 33.34 per cent of the groundnut growers had more than 2 ha of land whereas, 20.00
per cent of the respondents had less than 1 ha land and 46.66 per cent had more than 4 ha of land, respectively.

Barad (2004) observed that more than half (54.17 per cent) of the garlic growers had medium size of land holding, whereas 27.50 per cent and 18.33 percent of the respondents possessed small and large sized of land holding, respectively.

Tavethiya (2006) revealed that about two third (66.00 per cent) of cumin growers had medium size of land holding whereas, 11.00 per cent and 23.00 per cent respondents possessed small and large size of land holding, respectively.

Bharad (2007) observed that 60.50 per cent of the mango growers had a medium size of land holding. Remaining 31.00 per cent and 8.50 had small and big size of land holding, respectively.

Kamani (2007) stated that 32.14 per cent and 22.86 per cent of the organic cultivation farmers were medium and semi medium farmers, respectively. The organic cultivation farmers with small, large and marginal holding were 18.58, 16.42 and 10.00 per cent, respectively.

Dalsaniya (2010) revealed that about 64.17 per cent of sesame growers had medium size of land holding whereas, 20.00 and 15.83 per cent respondent’s possessed small and large size of land holding, respectively.

2.1.4 ANNUAL INCOME

Verma (2000) reported that 44.50 per cent of the groundnut growers belonged to the annual income group of Rs. 20,001 to 40,000, while 30.50 and 25.00 per cent of the
respondents belonged to the income group of more than Rs. 40,000 to 1,00,000 and Rs. 10,001 to 20,000, respectively.

Jadav (2001) revealed that 46.67 per cent of onion growers had medium annual income group, while 23.33 per cent and 30.00 per cent of the onion growers were from the low and high annual income group, respectively.

Chavada (2005) reported that that 50.00 per cent of the respondents had medium annual income Rs. 15,000 to 25,000. While, 26.67 and 23.33 per cent of them had lower and high annual income, respectively.

Kamani (2007), revealed that 61.43 per cent of the organic cultivation farmers had medium annual income, followed by 25.00 per cent and 13.57 per cent with high and low income, respectively.

Anilkumar (2008) found out that 28.33 per cent of the farm women belonged to the annual income group of Rs. 20001 to Rs. 40000, while 13.17 and 44.17 per cent of the respondents belonged to the income group of more than Rs. 80000 and Rs.40001 to Rs. 80000, respectively. Only 14.33 per cent of the respondents were in the income group of up to Rs. 20000.

Kumbhani (2009) indicated that 60.00 per cent of the respondents had medium income about Rs 40,000 to 80,000. About 16.88 per cent of the respondents were from high income. Whereas, 23.12 per cent of the respondents had income of below Rs 40,000, respectively.
2.1.5 IRRIGATION POTENTIALITY

Verma (2000) stated that majority of the groundnut growers (64.06 per cent) had medium irrigation facility followed by low irrigation facility 25.78 per cent. Only 10.16 per cent of the respondents had high irrigation facility.

Jadav (2001) revealed that 17.50 per cent of onion growers had low irrigation potentiality whereas, 59.17 and 23.33 per cent of the respondents were having medium and high irrigation potentiality, respectively.

Tavethiya (2006) observed that 38.00 per cent of the respondents possessed up to 25.00 per cent irrigation facility and 30.00 per cent possessed 26.00 to 50.00 per cent irrigation facilities while only 20.00 and 12.00 of respondents possessed 51.00 to 75.00 per cent and 76.00 to 100.00 per cent irrigation facilities, respectively.

Bharad (2007) revealed that 64.00 per cent of the mango growers had a medium level of irrigation facility. While 31.50 per cent and 4.50 per cent were in the category of less and more irrigation facilities, respectively.

Dalsaniya (2010) reported that 43.33 per cent growers having bore well as irrigation facility. Whereas, 21.67 per cent sesame growers were found using well and canal for irrigating their crops. Only 16.67 per cent sesame growers had canal to irrigate their crops. Remaining 10.00 and 08.33 per cent sesame growers had well and Check dam as irrigation source which with respect to irrigation potentiality, respectively.
2.1.6 SOCIAL PARTICIPATION

Chhodavadia (2001) indicated that majority of demonstrating farmers (73.08 per cent) had medium social participation, and 19.23 per cent had high and 07.69 per cent had low social participation, while non-demonstrators farmers majority (67.31 per cent) of the respondents were found in medium social participation, while 19.23 per cent had low and 13.46 per cent had high social participation.

Javia (2004) revealed that majority (68.00 per cent) of the respondents had medium social participation followed by low 19.00 per cent social participation, whereas only 13.00 per cent of the respondents had high social participation.

Chavada (2006) reported majority 61.11 per cent of the respondents had medium social participation followed by low (16.67 per cent) and high (22.22 per cent) social participation.

Makwana (2007) revealed that majority of (66.67 per cent) the Gir maldharis had low social participation followed by medium (20.83 per cent) and high social participation (12.50 per cent) respectively.

Anilkumar (2008) reported that 60.00 per cent of the respondents had medium social participation, followed by low (21.67 per cent) and high (18.33 per cent) social participation.

Jadeja (2008) reported that 60.00 per cent of the respondents had medium social participation, followed by low (18.00 per cent) and high (16.00 per cent) social participation.

Dalsaniya (2010) concluded that 53.33 per cent of the sesame growers had medium level of social participation,
followed by high (11.67 per cent) and low social participation (35.00 per cent), respectively.

2.1.7 EXTENSION PARTICIPATION

Verma (2000) revealed that about three forth (73.83 per cent) of the groundnut growers had medium extension participation whereas, 15.63 and 10.54 per cent of the respondents had low and high extension participation, respectively.

Jahagirdar and Sundararwamy (2003) revealed that majority (70.00 per cent) of the respondents had low extension participation followed by 30.00 per cent had high extension participation.

Sahoo (2004) revealed that 72.50 per cent of the respondents had medium extension participation, whereas 5.00 and 22.50 per cent of the respondents had low and high extension participation, respectively.

Makwana (2007) reported that more than one half (53.33 per cent) of the Gir maldharis were from medium extension participation group.

Jadeja (2008) revealed that 58.00 per cent of the neem owners had medium extension participation, whereas 23.00 per cent and 19.00 per cent of them had high and low extension participation, respectively.

Kumbhani (2009) indicated that 54.37 per cent of the coriander growers had medium extension participation, whereas 23.76 and 21.87 per cent of them high and low extension participation, respectively.


2.1.8 CROPPING INTENSITY

Verma (2000) found that more than half (55.09 per cent) of the respondents were from the category of medium cropping intensity, while 25.38 and 19.53 per cent of the respondents were from the categories of high and low cropping intensity groups, respectively.

Jadav (2001) revealed that more than half of the onion growers (57.50 per cent) had medium onion cropping intensity whereas, 22.50 and 20.00 per cent respondents with high and low onion cropping intensity, respectively.

Kamani (2007) found that majority of the organic cultivars (61.43 per cent) had medium level of cropping intensity. On the other hand, 25.00 per cent organic cultivars had low cropping intensity. Remaining (13.57 per cent) organic farmers had high level of cropping intensity.

Satasiya (2008) indicated that majority of demonstrating' farmers (63.63 per cent) had medium cropping intensity, and 16.36 per cent had high and 20.00 per cent had low cropping intensity, while non-demonstrators farmers majority 58.18 per cent respondents were found in medium cropping intensity, while 9.09 per cent had low and 32.72 per cent had high cropping intensity, respectively.

Kumbhani (2009) revealed that 65.62 per cent respondent had medium cropping intensity followed by 15.63 and 18.75 per cent respondent with high and low cropping intensity, respectively.
2.1.9 RISK ORIENTATION

Jadav (2001) indicated that majority (72.50 per cent) of the onion growers were from the medium risk orientation group; followed by 16.67 and 10.83 per cent respondents were from low and high risk orientation group, respectively.

Sahoo (2004) found that 62.50 per cent of the respondents were from medium risk orientation group, whereas 30.84 and 6.66 per cent of the respondents belonged to low and high risk orientation, respectively.

Patel (2005) observed that slightly more than two third (67.78 per cent) of the organic followers had medium level of risk orientation, while 24.44 and 7.78 per cent of them had high and low level of orientation, respectively.

Chavada (2006) indicated that majority (80.56 per cent) of the respondents were from medium risk orientation group, where as 12.22 and 7.22 per cent of respondents belonged to low and high level of risk orientation, respectively.

Tavethiya (2006) clearly indicated that 56.00 per cent respondents were belonged to medium risk orientation group, followed by 28.00 and 16.00 per cent respondents were from high and low risk orientation, respectively.

Dalsaniya (2010) indicated that 71.67 per cent respondents belonged to medium risk orientation group, followed by 17.50 and 10.83 per cent respondents were from low and high risk orientation, respectively.
2.1.10 INNOVATIVENESS

Javia (2004) stated that majority of groundnut growers (62.00 per cent) had medium level of innovativeness followed by low (21.00 per cent) and high (17.00 per cent) level of innovativeness, respectively.

Chavada (2005) revealed that 84.66 per cent of Bt cotton growers had medium level of innovativeness, followed by 8.67 and 6.67 per cent of respondents belonged to high and low categories, respectively.

Tavethiya (2006) revealed that about 41.00 per cent of the cumin grower were found to have high innovativeness whereas, 37.00 and 22.00 per cent of them medium and low innovativeness, respectively.

Bharad (2007) revealed that the majority (55.00 per cent) of mango growers had high level of innovativeness followed by average (29.00 per cent) and poor (16.00 per cent) level of innovativeness among mango growers.

Jadeja (2008) found that about 42.00 per cent of the neem owners were found to have high innovativeness whereas, 40.00 and 18.00 per cent of them medium and low innovativeness, respectively.

Kumbhani (2009) indicated that about 41.87 per cent of the coriander grower were found to have high innovativeness, whereas 39.37 and 18.76 per cent of them medium and low innovativeness, respectively.
2.1.11 MARKET ORIENTATION

Prajapati and Patel (2000) revealed that nearly two thirds of the potato growers (65.00 per cent) found in medium category of market orientation. Remaining 19.00 and 16.00 per cent of the potato growers were in high and low categories of market orientation, respectively.

Javia (2004) concluded that 62.00 per cent of the groundnut growers were found in medium category of market orientation followed by low (21.00 per cent) and high(17.00 per cent), respectively.

Patel (2005) reported that 50.00 per cent organic followers had low level of market orientation, followed by 40.00 and 10.00 per cent who had medium and low level of market orientation, respectively.

Kamani (2007) reported that 50.00 per cent organic followers had low level of market orientation, followed by 38.57 per cent and 11.43 per cent who had medium and low level of market orientation, respectively.

Chauhan (2008) reported that 64.38 per cent trained farmers had medium level of market orientation, followed by 19.98 and 15.54 per cent who had high and low level of market orientation, respectively.

Dalsaniya (2010) reported that 60.00 per cent sesame growers had medium level of market orientation, followed by 21.67 per cent and 18.33 per cent had low and high level of market orientation, respectively.
2.1.12 MASS MEDIA EXPOSURE

Jadav (2005) stated that 60.50 per cent of the mango orchard growers had medium level of mass media exposure whereas 24.00 and 15.50 per cent of them had low and high level of mass media exposure, respectively.

Tavethiya (2006) found that 60.00 per cent of the cumin growers had medium mass media exposure, whereas 20.00 per cent of the respondents had low and 20.00 per cent of the respondents had high mass media exposure.

Bharad (2007) found that 53.50 per cent of the mango growers had medium level of mass media exposure whereas, 43.50 and 3.00 per cent of them had high and low level of mass media exposure, respectively.

Anilkumar (2008) found that 53.33 per cent of the farm women had medium level of mass media exposure, whereas 20.84 and 25.83 per cent of them had high and low level of mass media exposure, respectively.

Dalsaniya (2010) concluded that 56.67 per cent of the respondents had medium level of mass media exposure, whereas 25.00 and 18.33 per cent of them had high and low level of mass media exposure respectively.

2.2 KNOWLEDGE LEVEL OF THE FARMERS ABOUT CROP PRODUCTION TECHNOLOGY.

Knowledge of the farmers plays an important role in adoption of improved agricultural technology. English and English (1961) defined knowledge as "body of understood
information possessed by an individual or by a culture or society."

Sagwal and Malik (2001) reported that 55.00 per cent of the respondents had high level of knowledge about essential production practices and the remaining 45.00 per cent had medium level of knowledge regarding essential production practice of rice.

Chaudhury et al. (2002) revealed that 51.67 per cent of the farmers possessed high level of knowledge about maize production technology whereas, 48.33 per cent of the respondents had low level of knowledge.

Sahoo (2004) found that majority (73.33 per cent) of the groundnut growers had medium knowledge about eco-friendly practices, followed by 18.34 and 8.33 per cent with high and low level of knowledge, respectively.

Barad (2004) concluded that 65.00 per cent of garlic growers were medium knowledge whereas, 15.00 per cent of low and 20.00 per cent of high knowledge about recommended garlic production technology, respectively.

Patel (2005) stated that majority of groundnut growers (71.00 per cent) had medium level of knowledge, followed by 19.00 and 10.00 per cent with high and low levels of knowledge about organic farming practices, respectively.

Chavada (2005) concluded that 81.33 per cent of Bt. cotton growers had medium level of knowledge, followed by 10.67 per cent has high and 8.00 per cent had low level of knowledge about distinctive feature of Bt cotton growers.
Lalitha *et al.* (2006) found that majority of farmers (72 per cent) had medium knowledge about recommended dry farming practices, whereas 28 per cent farmers had high level of knowledge about recommended dry farming practices.

Subhash *et al.* (2006) reported that majority of respondents (54.17 per cent) had medium level of knowledge about pear millet production technology of dry farming, whereas 19.16 and 26.67 percent respondents had low and high level of knowledge, respectively, about pear millet production technology of dry farming.

Tavethiya (2006) revealed 60.00 per cent of the cumin growers were medium level knowledge whereas; equal number of cumin growers i.e. 20.00 per cent each had high and low levels knowledge about recommended cumin production technology.

Anilkumar (2008) found that 54.16 per cent of the farm women had medium level of knowledge whereas, 20.83 per cent had high and 25.00 per cent had low level of knowledge about improved animal husbandry practices.

Jadeja (2008) revealed that 73.00 per cent of the respondents had medium level of knowledge whereas, 13.00 per cent had low and 14.00 per cent had high level of knowledge about indigenous scientific practices.

Kumbhani (2009) indicated that 65.62 per cent of the coriander growers were medium level knowledge of coriander production technology. A considerably 17.51 and 16.87 per cent of respondents were in high and low knowledge group, respectively.
2.3 EXTENT OF ADOPTION OF RECOMMENDED CROP PRODUCTION TECHNOLOGY

Adoption is a decision to continue full use of an innovation. Adoption is a mental process through which an individual passes from first hearing about the innovation to final adoption. It is also a decision making process.

Mundwa and Patel (2000) observed that nearly two-third of the respondents of the wheat production technology of rainfed 63.33 per cent had medium level of adoption. The remaining 16.67 per cent and 20.00 per cent of respondents had high and low level of adoption, respectively.

Patel et al. (2000) revealed that the 77.50 per cent of the cotton growers had medium level of adoption of the dry farming technology of cotton. There were 12.50 and 10.00 per cent of the cotton growers had low and high level of adoption, respectively.

Vekaria et al. (2000) revealed that majority (69.05 per cent) of the groundnut growers were under the category of medium adopters while, 15.71 and 15.24 per cent of the respondents were found under low and high adopter categories, respectively.

Prajapati et al. (2002) opined that majority of the chilli growers (70.00 per cent) had moderately adopted the recommended chilli cultivation technology. There were 20.83 and 9.17 per cent of the farmers having low and high level of adoption, respectively.

Singh (2003) observed that 50.00 per cent of farmers belonged to low adoption category, 44.05 per cent had medium
adoption and only 5.95 per cent of the farmers belonged to higher adoption category.

Barad (2004) concluded that 63.33 per cent of the garlic growers were medium adopters whereas, 20.00 per cent and 16.17 per cent of respondents were high and low adoption group, respectively.

Javia (2004) revealed that majority of respondents (61.00 per cent) were from medium level of adoption category, followed by 20.00 and 19.00 per cent in high and low adoption categories, respectively.

Bharad (2007) indicated that majority of the respondents (66.50 per cent) possessed medium level of extent of adoption followed by high 20.50 and low 13.00 per cent extent of adoption of recommended mango production technology.

Anilkumar (2008) indicated that 50.00 per cent of the farm women were from medium adopters, whereas, 30.00 per cent were low and 20.00 per cent were from high adopters of the dairy practices.

Kumbhani (2009) indicated that 61.87 per cent of the coriander growers were medium adoption of improved coriander production technology. A considerably 23.75 and 14.37 per cent of respondents were in low and high adoption group, respectively.
2.4 ASSOCIATION OF DEPENDENT VARIABLE (KNOWLEDGE) WITH INDEPENDENT VARIABLE (SELECTED CHARACTERISTICS OF FARMERS)

2.4.1. AGE AND KNOWLEDGE

Nurzaman et al. (2001) found that there was a negative and significant relationship between age and knowledge of farmers about integrated pest management.

Barad (2002) revealed that there was positive and significant association between age of the cattle owners and their extent of knowledge about traditional veterinary practices.

Jadav et al. (2003) observed that there was negative and significant association between onion growers’ knowledge of recommended onion production technology and their age.

Chavada (2005) observed that there was negative and non-significant association between extent of knowledge of farmers and their age.

Tavethiya (2006) concluded that there was negative and significant association between extent of knowledge of farmers towards and their age.

Dalsaniya (2010) concluded that there was negative and significant association between extent of knowledge of farmers and their age.

2.4.2 EDUCATION AND KNOWLEDGE

Barad (2002) observed that there was negative and significant association between education of the cattle owners and their extent of knowledge of traditional veterinary practices.
Temkar and Chauhan (2002) revealed that extent of knowledge regarding artificial insemination was significantly correlated with the education of the respondents.

Tavethiya (2006) concluded that there was positive and significant linear association between extent of knowledge of farmers and their education.

Anilkumar (2008) revealed that there was positive and significant association between extent of knowledge of Farm Women and their education.

Jadeja (2008) concluded that there was positive and significant association between farmers' extent of knowledge about use of different parts of neem and their education.

Kumbhani (2009) concluded that there was positive and significant linear association between extent of knowledge of farmers and their education.

### 2.4.3 SIZE OF LAND HOLDING KNOWLEDGE

Kumbhare (2000) found that the size of land holding was positive and non-significantly correlated with the knowledge possessed by castor growers about improved castor production technology.

Jadav (2001) reported that land holding of onion growers found to have non-significantly association with knowledge of farmers about recommended onion production technology.

Sahoo (2004) observed that there was no association between extent of knowledge of respondents and their size of land holding.
Patel (2005) said that there was positive and significant association between extent of knowledge of the respondents and their size of land holding.

Dalsaniya (2010) concluded that there was no relationship between knowledge of sesame production practices and size of land holding of the respondents.

2.4.4 ANNUAL INCOME AND KNOWLEDGE

Chhodavadia (2001) revealed that there was highly significant relationship between income of the respondents and their knowledge level of groundnut – pigeon pea relay cropping system.

Tavethiya (2006) indicated that there was non significant relationship between extent of knowledge and their annual income.

Satasiya (2008) found that there is no association between level of knowledge of demonstrator and non-demonstrator farmers and their annual income.

Chauhan (2008) inferred that there was no significant relation observed between extent of knowledge and their annual income.

Jadeja (2008) concluded that there was no association between farmers’ extent of knowledge about use of different parts of neem and their annual income.

Kumbhani (2009) inferred that there was non significant relationship between extent of knowledge and their annual income.
2.4.5 IRRIGATION POTENTIALITY AND KNOWLEDGE

Jadav (2001) indicated that there was positive and significant association between onion growers' knowledge and their irrigation potentiality.

Chavada (2005) concluded that there was positive and significant association between knowledge of Bt cotton growers and their irrigation potentiality.

Tavethiya (2006) concluded that there was positive and significant association between cumin growers’ knowledge of cumin production technology and their irrigation potentiality.

Chauhan (2008) indicated that there was positive and significant association between organic farmers’ knowledge and their irrigation potentiality.

Dalsaniya (2010) concluded that there was positive association between Kharif sesame growers’ knowledge of sesame production technology and their irrigation potentiality.

2.4.6 SOCIAL PARTICIPATION AND KNOWLEDGE

Jadav (2001) pointed out that there was positive and significant association between onion growers’ knowledge of recommended onion production technology and their social participation.

Barad (2004) concluded that there was positive and significant association between knowledge of garlic growers about recommended garlic production technology and their social participation.
Chavada (2005) concluded that there was positive and significant association between Bt cotton growers’ knowledge about distinctive features of Bt cotton and their social participation.

Anilkumar (2008) revealed that there was positive and significant association between Farm Women knowledge of dairy practices and their social participation.

Chauhan (2008) indicated that there was positive and significant association between extent of the trained farmers and their social participation.

Kumbhani (2009) inferred that there was positive and significant association between coriander growers’ knowledge of recommended coriander production technology and their social participation. The knowledge of coriander growers increased with an increase in social participation.

2.4.7 EXTENSION PARTICIPATION AND KNOWLEDGE

Loganandhan (2002) reported that organic followers were found better in participation of extension activities, and utilization of information sources.

Sahoo (2004) revealed that there was highly significant relationship between level of knowledge of the respondents and their extension participation.

Jadeja (2008) inferred that there was positive and significant association between the farmers’ extent of knowledge about use of different parts of neem and their extension participation.
Satsaitya (2008) reported that there was a positive and significant association between the knowledge of the respondents about castor production technology and their extension participation.

2.4.8 CROPPING INTENSITY AND KNOWLEDGE

Jadav (2001) revealed that there was positive and significant association between onion crop intensity and knowledge of recommended onion crop technology.

Chavada (2005) concluded that there was positive and significant association between knowledge of Bt cotton growers and their cropping intensity.

Tavethiya (2006) concluded that there was association between cumin crop intensity and knowledge at recommended cumin technology. It is obvious that with increase in crop intensity the knowledge also increased.

Satsaitya (2008) concluded that there was positive and significant association between crop intensity and knowledge in demonstrator farmers.

Dalsaniya (2010) concluded that there was association between sesame cropping intensity and knowledge at recommended sesame technology.

2.4.9 RISK ORIENTATION AND KNOWLEDGE

Chhodavadia (2001) indicated that associations between the risk preference and knowledge level of groundnut-pigeon pea relay cropping system by both the groups of respondents were positive and highly significant.
Chavada (2005) concluded that there was positive and significant association between knowledge of Bt cotton growers and their risk orientation.

Tavethiya (2006) found that there was significant relationship between cumin growers’ knowledge of recommended cumin production technology and their risk orientation.

Satasiya (2008) concluded that there was positive and significant association between knowledge of castor growers and their risk orientation.

Chauhan (2008) inferred that there was significant relationship between extent of knowledge and their risk orientation.

**2.4.10 INNOVATIVENESS AND KNOWLEDGE**

Patel (2005) found that there was positive and significant association between the level of knowledge of farmers’ in relation to organic farming practices and their innovativeness.

Tavethiya (2006) inferred that there was positive and significant association between the level of knowledge of farmers and their innovativeness.

Satasiya (2008) reported that there was positive and significant association between the level of knowledge of farmers and their innovativeness.

Chauhan (2008) reported that there was positive and significant association between the level of knowledge of farmers and their innovativeness.
Kumbhani (2009) inferred that there was positive and significant association between the level of knowledge of farmers and their innovativeness.

**2.4.11 MARKET ORIENTATION AND KNOWLEDGE**

Amir (1996) reported that market orientation was positively and significantly associated with the extent of knowledge about improved summer groundnut production technology.

Dhorajia (1996) concluded that there was positively and highly significant relationship between the market orientation of castor growers and level of knowledge of IPM in castor cultivation.

Kumbhare (2000) concluded that there was positive and highly significant relationship between castor growers’ extent of knowledge of improved castor production technology and their market orientation.

Chauhan (2008) reported that market orientation was negative and non significant associated with the extent of knowledge about organic farming practices.

**2.4.12 MASS MEDIA EXPOSURE AND KNOWLEDGE**

Sahoo (2004) inferred that there was positive and significant association between level of knowledge and their exposure to information sources.

Tavethiya (2006) revealed that there was positive and significant association between the level of knowledge and their exposure to information sources.
Makwana (2007) indicated that there was negative association between the level of knowledge and their exposure to information sources.

Anilkumar (2008) pointed out that there was no association between the level of knowledge and their exposure to information sources.

Dalsaniya (2010) concluded that there was positive and significant association between the level of knowledge of farmers and their mass media exposure.

2.5 ASSOCIATION OF DEPENDENT VARIABLE (ADOPTION) WITH INDEPENDENT VARIABLE (SELECTED CHARACTERISTICS OF FARMERS).

2.5.1 AGE AND EXTENT OF ADOPTION

Jadav et al. (2003) revealed that age was negative and significantly associated with onion growers’ adoption of recommended onion production technology.

Sahoo (2004) reported that there was positive and non-significant relationship between age of respondents and their adoption of eco-friendly practices in groundnut.

Kotadiya (2006) concluded that there was negative and significant association between age and adoption of beneficiary farmers and negative and non-significant correlation in case of non-beneficiary farmers.

Makwana (2007) revealed that there was positive and significant association between Gir maldharis adoption of improved animal husbandry practices and their age.
Kumbhani (2009) concluded that there was negative and significant association between coriander growers’ adoption of recommended coriander production technology and their age.

2.5.2 EDUCATION AND EXTENT OF ADOPTION

Chaudhary et al. (2001) highlighted the positive and significant association between education of respondents and adoption of improved rice cultivation technology.

Singh (2002) reported that education had positive and significant relationship with adoption of pulse crops in arid zone.

Jadav et al. (2003) inferred that education had positive and significant association with onion growers’ adoption of recommended onion production technology.

Singh (2003) revealed that there was a positive and significant correlation between education of respondents and adoption of bajra production technology.

Patel (2005) suggested that education was significantly and positively related with adoption of organic farmers.

Dalsaniya (2010) concluded that there was positive and significant association between Kharif sesame growers’ adoption of recommended sesame production technology and their education.

2.5.3 SIZE OF LAND HOLDING AND EXTENT OF ADOPTION

Gomase et al. (1998) showed that the size of land holding was significant and positive related with the adoption of recommended cultivation of Kagzi lime.
Jadav (2001) reported that there was no association between onion growers’ adoption of recommended onion production technology and their size of land holding.

Ranganathan et al. (2001) opined that there was a non-significant correlation between size of land holding and the adoption level of farmers about organic farming in rice cultivation.

Sahoo (2004) concluded that there was no association between extent of adoption and their size of land holding.

Kumbhani (2009) concluded that there is no association between coriander growers’ adoption of recommended coriander production technology and their size of land holding.

### 2.5.4 ANNUAL INCOME AND EXTENT OF ADOPTION

Chavada (1998) opined that there was non-significant association between the extent of adoption of groundnut based inter/relay crop growers about improved groundnut based inter/relay crop production technology and their annual income.

Chchodavadia (2001) opined that there was no association between the extent of adoption of demonstration an non-demonstrators pertaining to groundnut pigeon pea relay cropping system and their annual income.

Kamani (2007) found that there was no association between farmers’ level of adoption towards organic framings practices on their annual income.
Anilkumar (2008) concluded that there was positive and significant association between annual income and extent of adoption of farm women dairy practices.

Satasiya (2008) reported that there was no association between farmers level of adoption for castor production practices on their annual income.

Dalsaniya (2010) concluded that there was no association between farmers’ level of adoption for sesame production practices on their annual income.

2.5.5 IRRIGATION POTENTIALITY AND EXTENT OF ADOPTION

Jadav (2001) revealed that there was an association between onion grower’s extent of adoption of recommended onion production technology and their irrigation potentiality.

Barad (2004) concluded that there was positive and significant association between garlic growers’ adoption of recommended garlic production technology and their irrigation potentiality.

Tavethiya (2006) concluded that there was positive and significant association between adoption of recommended cumin production technology and their irrigation potentiality.

Satasiya (2008) indicated that the irrigation potentiality of the demonstrator respondents was positive and significant related with their adoption for recommended castor production practices.
Chauhan (2008) revealed that there was significant relationship between irrigation potentiality and extent of adoption of organic farming practice.

Kumbhani (2009) concluded that there was positive & significant association between adoption of recommended coriander production technology and their irrigation potentiality.

**2.5.6 SOCIAL PARTICIPATION AND EXTENT OF ADOPTION**

Bhatt (2002) inferred that social participation was associated significantly with the adoption of improved wheat production technology in case of trained respondents. While in case of untrained respondents, social participation was not associated with their extent of adoption.

Barad (2004) concluded that there was positive and significant association between garlic growers’ adoption of recommended garlic production technology and their social participation.

Tavethiya (2006) reported that was positive and significant association between cumin growers’ adoption of recommended cumin production technology and their social participation.

Makwana (2007) reported that social participation had positive and significant association with Gir *maldharis* adoption of improved animal husbandry.

Anilkumar (2008) inferred that there was no association between Farm Women adoption of dairy practices and their social participation.
Dalsaniya (2010) concluded that there was positive significant association between *Kharif* sesame growers' adoption of recommended sesame production technology and their social participation. The adoption increased with an increase of social participation of the respondents.

### 2.5.7 EXTENSION PARTICIPATION AND EXTENT OF ADOPTION

Jadav (2001) reported that there was high and significant relationship between onion growers' adoption of recommended onion production technology and their extension participation.

Ranganathan *et al.* (2001) opined that there was a positive and significant correlation of extension participation with the adoption level of farmers about organic farming in rice cultivation.

Bhatt (2002) indicated that extent of adoption of trained respondents was significantly associated with their extension participation. While non-significant but positive association was observed in case of untrained respondents.

Sahoo (2004) revealed that there was positive and significant association between groundnut growers' extent of adoption and their extension participation.

Satasiya (2008) concluded that there was positive & significant association between adoption of recommended castor production technology and extension participation.

Kumbhani (2009) indicated that there was positive significant association between coriander growers' adoption of
recommended coriander production technology and their extension participation.

2.5.8 CROPPING INTENSITY AND EXTENT OF ADOPTION

Jadav (2001) concluded that there was highly significant association between onion growers’ adoption of recommended onion production technology and their onion crop intensity.

Barad (2004) concluded that there was positive and significant association between garlic growers’ adoption of recommended garlic production technology and their garlic crop intensity.

Tavethiya (2006) indicated that there was positive and significant association between cumin growers’ adoption of recommended cumin production technology and their cumin crop intensity.

Satasiya (2008) revealed that there was positive and significant association between castor growers’ adoption of recommended castor production technology and crop intensity.

2.5.9 RISK ORIENTATION AND EXTENT OF ADOPTION

Jadav (2001) revealed that risk orientation was significantly associated with onion growers’ adoption of recommended onion production technology.

Sahoo (2004) revealed that risk orientation was negative and non-significantly associated with groundnut growers’ adoption of recommended eco-friendly practices.

Kamani (2007) found that the risk orientation was positive and significant relationship with extent of adoption.
Satasiya (2008) indicated that the risk orientation of the demonstrator respondents was positive and significant related with their adoption for recommended castor production practices.

Chauhan (2008) indicated that the risk orientation was positive and significant relationship with extent of adoption.

Kumbhani (2009) concluded that there was positive significant association between coriander growers adoption of recommended coriander production technology and risk orientation.

2.5.10 INNOVATIVENESS AND EXTENT OF ADOPTION

Loganandhan (2002) found that organic farmers had lower degree of innovation proneness than conventional farmers.

Sahoo (2004) revealed that there was positive and significant association between extent of adoption and their innovativeness.

Tavethiya (2006) revealed that there was positive significant association between cumin growers' adoption of recommended cumin production technology and their innovativeness.

Kamani (2007) found that the innovativeness of the respondents was positive and significant related with their adoption towards organic farming practices.

Satasiya (2008) inferred that the innovativeness of the demonstrator respondents was positively and significantly related with their adoption for recommended castor production practices.
Dalsaniya (2010) concluded that there was positive significant association between *Kharif* sesame growers’ adoption of recommended sesame production technology and their innovativeness.

### 2.5.11 MARKET ORIENTATION AND EXTEND OF ADOPTION

Prasad and Sundarswamy (2000) observed positive and significant relationship of market orientation with adoption of dry farming technology.

Kamani (2007) reported that there was no association between market orientation and extent of adoption.

Chauhan (2008) observed that there was negative and non significant revealed that there was no association between market orientation and extent of adoption.

Kumbhani (2009) indicated that there was no association between market orientation and extent of adoption.

### 2.1.12 MASS MEDIA EXPOSURE AND EXTENT OF ADOPTION

Manju (1996) inferred that extent of adoption of indigenous coconut cultivation practices possessed a positive and significant relationship with exposure to information sources.

Tavethiya (2006) revealed that there was positive and significant association between cumin growers’ adoption of recommended cumin production technology and their exposure to information sources.
Makwana (2007) inferred that there was no association between Gir *maldharis* adoption of improved animal husbandry and their exposure to information sources.

Anilkumar (2008) reported that there was no association between Farm Women adoption of dairy practices and their exposure to information sources.

Dalsaniya (2010) concluded that there was positive significant association between *Kharif* sesame growers’ adoption of recommended sesame production technology and their mass media exposure.

### 2.6 CONSTRAINTS FACED BY CROP GROWERS IN ADOPTION OF IMPROVED CROP PRODUCTION TECHNOLOGY.

Constraints in the adoption of agricultural technology should be studied critically for the speedy transfer of any technology. Moreover it plays an important role in adoption of new agricultural technology just as weeds in the flow of water in an irrigation channel. So, for increasing extent of adoption of improved agricultural technology, it is necessary to minimize the constraints, as far as possible. The views and findings of different investigators are presented as under:

Jadav (2001) revealed that majority of the onion growers expressed lack of irrigation (75.00 per cent), problem in onion storage (73.33 per cent), low price of onion in the market (71.66 per cent), high price of fertilizer (67.50 per cent), inadequate and irregular power supply (66.66 per cent), high cost of pesticides (65.00 per cent) and poor economic condition (60.00 per cent).
Prajapati et al. (2002) concluded that lack of knowledge about recommended chilli production technology and unavailability of fertilizers in time and weight and quality loss during storage and transportation were the major constraints faced by farmers in adoption of chilli production technology.

Tavethiya (2006) observed that the constraints like inadequate and irregular power supply (82.00 per cent), weight and quality loss during storage and transportation (78.00 per cent), high charges of electricity (77.00 per cent), inadequate storage facilities (75.00 per cent), lack of market infrastructure facilities (71.00 per cent), lack of post harvest management facilities (70.00 per cent) and fluctuation of cumin price in the market (69.00 per cent).

Kamani (2007) found that certain situations like fragmented holding, less consumers awareness both organic food products, lack of faith among consumer etc. were the common constraints perceived by the farmers.

Satasiya (2008) concluded that high price of improved seeds (Rank I), high cost of threshing/harvesting (Rank II), lack of irrigation facility (Rank III), non availability of finance in time (Rank IV), high price of chemical fertilizers (Rank V), high price of herbicides and high price of fungicides/Pesticides (Rank VI), lack Of Knowledge About Critical Stages (Rank VII), high cost of labour (Rank VIII), non-availability of Extension workers in villages as per time schedule (Rank IX), unawareness about the recommendation of pesticides/fungicides (Rank X).
2.7 SUGGESTIONS TO OVERCOME THE CONSTRAINTS IN ADOPTION OF IMPROVED CROP PRODUCTION TECHNOLOGY.

The farmers faced some constraints in adoption of any improved production technology. At the same time, they have some suggestions which may very important in the sense that, these suggestions may be useful in developing strategies for minimizing the constraints.

The views of various experts, investigators, sociologist, economist and technologist in this respect are shown as under:

Dangar (1996) stated that the most important suggestions expressed by the chiku growers to overcome the constraints in adoption of improved chiku cultivation practices were; regular electric power supply should be made available (85.00 per cent), exploration of additional irrigation facility (78.00 per cent), crop insurance scheme should be introduced (75.00 per cent), training should be imparted to the fruit growers in relation to the best orchard management (69.00 per cent), agricultural input should be subsidized (65.00 per cent) and organization of demonstration on improved technology of chiku cultivation (56.00 per cent).

Verma (2000) concluded the most important suggestions offered by the majority of the groundnut growers were ranked as;

1. The government should purchase groundnut at remunerative price.
2. Inputs should be made available at subsidized rate.
3. Multiple resistance variety should be developed.
4. Soil testing facilities should be made available at field level by organizing camps.

5. Subsidies should be given to increase farm mechanization.

6. Production and availability of the seed of improved varieties should be ensured.

7. There must be regular electric supply at the time of critical irrigation.

Jadav (2001) concluded that the most important suggestions expressed by the onion growers to overcome the constraints for the adoption of improved onion production practices were: provision of irrigation water (90.00 per cent), remunerative price should be given to onion growers (83.33 per cent), sufficient and regular electricity should be provided (74.16 per cent), provision of storage facility (70.00 per cent), all inputs should be made available (55.00 per cent) and sufficient and timely credit facility should be made available (55.00 per cent).

Jadav (2005) reported that out of suggestions given by the respondents to overcome the constraints in adoption of improved mango production technology, the following eight suggestions expressed by more than 60.00 per cent were,

1. Regular electric power supply should be made available.

2. Crop insurance scheme should be introduced in mango crop.

3. Effective control measures of pests and diseases should be evolved.
4. Price of pesticides and fertilizers should be low.

5. Co-operative society for mango should be constituted.

6. Training should be imported to the fruit growers in relation to the best orchard management.

7. Remunerative minimum prices should be fixed by the Government.

Satasiya (2008) revealed that important suggestions offered by the majority (77.27 per cent) of the respondents were; cost of harvesting/threshing should be reduced (Rank I), farmers should be protected by crop insurance, if crops fails (Rank II), inputs should be made available at subsidized rate (Rank III), remunerative price should be made available to the castor growers for their products (Rank IV).
Theoretical Orientation

The review of literature related to the study is given in the preceding chapter, an inclusive theoretical orientation. The chapter has been broken down into the following major heads:

3.1 Conceptual framework

3.1.1 Independent variables

The main objective of conceptual framework being developed in this study is to provide an abstract view to the knowledge and extent of adoption of the respondents on recommended production technology of dry farming and their interaction with potential socio-economic and psychological levels (Verma, 2000, Bharad, 2007). (Barad, 2004 and Bharad, 2007) had medium size of land holding, (Jadav, 2001 and Kamari, 2007) had medium annual income, (Jadav, 2001) had medium irrigation potentiality, (Jada, 2004, Anil Kumar, 2008) had medium social participation (Jadave, 2008), had medium extension participation, (Jadav, 2001 and Kamari, 2007).
CHAPTER-III

THEORETICAL ORIENTATION

The review of literature related to the study is given in the preceding chapter helped in formulating theoretical orientation. The chapter has been sub divided in to the following major heads.

3.1 Conceptual framework of the study

3.2 The paradigm

3.1 CONCEPTUAL FRAMEWORK OF THE STUDY

3.1.1 Independent variables

The main objective of conceptual framework being developed in this study is to provide an abstract view to the knowledge and extent of adoption of the respondents on recommended production technology of dry farming and their interaction with personnel, socio-economic and psychological characters. The framework is expected to facilitate theoretical and empirical analysis of the knowledge and extent of adoption of respondents (Fig. 1 & 2).

Majority of the farmers were from middle age group (Javia, 2004 and Jadeja, 2008), were educated up to primary level (Verma, 2000, Bharad, 2007), (Barad, 2004 and Bharad, 2007) had medium size of land holding, (Jadav, 2001 and Kamani, 2007) had medium annual income, (Jadav, 2001) had medium irrigation potentiality, (Javia 2004, Anilkumar 2008) had medium social participation, (Jadeja, 2008) had medium extension participation, (Jadav, 2001 and Kamani, 2007)

3.1.2 Dependent variables

3.1.2.1 Knowledge

Knowledge is the body of understood information possessed by an individual or by a culture. It is that part of a person’s information which is established fact (English and English, 1961). Knowledge is considered as those behaviour and test situations, which emphasize the remembering, either by recognition or recall of ideas, material or phenomena (Bloom et al., 1955). Knowledge is the function of an innovation decision process when "the individual is exposed to an innovation existence and gains some understanding of its functions." There are three components of the knowledge viz.,

1. “Awareness knowledge” which refers to the information that innovation exists.

2. “How to knowledge” which refers to the information needed to use an innovation properly.

3. “Principle knowledge” which comprises the functioning. Principles underlying the innovation (Rogers and shoemaker, 1971)

Taking a clue from the foregoing discussion, the knowledge considered as a body of “understood information” and “how to knowledge” possessed by the farmers about dry farming product.
The farmers can utilize their information and know-how in attitude of dry farming production technology.

Majority of the farmers had medium level of knowledge about dry farming practices (Lalitha et al, 2006). Majority of respondents (54.17 per cent) had medium level of knowledge about pear millet production technology of dry farming (Subhash et al, 2006). Majority of the garlic growers had medium level of knowledge (Barad, 2004). Majority of the groundnut growers had medium level of knowledge (Patel, 2005). Majority of the Farm Women had medium level of knowledge improved animal husbandry practices (Anilkumar, 2008).

3.1.2.2 Adoption

According to Rogers (1962), adoption process is the mental process through which an individual passes from first hearing about an innovation to its final adoption. It is also a decision making process, as adoption of an innovation requires a decision by an individual. The adoption could take place any where on the “Continuum” from unawareness to complete knowledge. The innovation adoption process has two components.

1. The symbolic adoption in which the idea is accepted.

2. The use of adoption in which the material component of practices of innovation is accepted.

In some of the studies, the use of adoption of recommended “package of practices” have been regarded as use of adoption (Gunawardana et al, 1980).
Majority of the respondents were medium adopters of recommended production technology (Barad, 2004; Bharad, 2007; Anilkumar, 2008; Javiya, 2004).

3.1.3 Association

It is envisaged that the extent of association between two variables (independent and dependent) provides the strength and direction and effects of one variable on the other variable and independent variable, which are included in present study. Attempts are being made to ascertain the extent of association between the variables and their direction. As regards to the association between selected characteristics of the farmers and their knowledge level, it was observed that age was significantly associated with knowledge level (Nurzaman et al. 2001 and Tavethiya, 2006), education was significantly associated with knowledge level (Jadeja, 2008), size of land holding was significantly associated with knowledge level (Patel, 2005), annual income was not significantly associated with knowledge level (Tavethiya, 2006), irrigation potentiality was non significantly associated with knowledge level (Jadav, 2001), social participation was significantly associated with knowledge level (Jadav, 2001 and Chavada, 2005), extension participation was significantly associated with knowledge level (Jadeja, 2008), cropping intensity was significantly associated with knowledge level (Jadav, 2001 and Satasiya, 2008), risk orientation was significantly associated with knowledge level (Tavethiya, 2006), innovativeness was significantly associated with knowledge level (Tavethiya, 2006), market orientation was negative and non significantly associated with knowledge level (Chauhan 2008), and mass media exposure was significantly associated with knowledge level (Sahoo, 2004 and Tavethiya, 2006).
As regards to the association between selected characteristics of the farmers and their extent of adoption, it was observed that age was significantly associated with extent of adoption (Jadav et al., 2003 and Kotadiya, 2006), education was significantly associated with extent of adoption (Chaudhary et al. 2001 and Patel 2005), size of land holding was not significantly associated with extent of adoption (Jadav, 2001 and Sahoo, 2004), annual income was non significantly associated with extent of adoption (Chhodavadia, 2001 and Kamani, 2007), irrigation potentiality was negative and non significantly associated with extent of adoption (Jadav, 2001), social participation was significantly associated with extent of adoption (Bhatt, 2002 and Makwana 2007), extension participation was significantly associated with extent of adoption (Jadav, 2001; Ranganathan et al. 2001 and Sahoo, 2004), cropping intensity was significantly associated with extent of adoption (Jadav, 2001 and Tavethiya, 2006), risk orientation was significantly associated with extent of adoption (Jadav, 2001 and Satasiya, 2008), innovativeness was significantly associated with extent of adoption (Sahoo, 2004 and Kamani, 2007), market orientation was negative and non significantly associated with extent of adoption (Kamani, 2007 and Chauhan, 2008), mass media exposure was significantly associated with extent of adoption (Makwana, 2006 and Manju, 1996).

3.1.4 Constraints

The difficulties or problems faced by respondents while adoptions of recommended agricultural production technology were considered as constraints.
As regards constraints faced by respondents in adoption of dry farming practices were bio-physical constraints such as soil fertility variation, uneven distribution of rainfall, rapidly increase of pest and insect population; micro level constraints such as illiteracy, poor economic status of the farmers, religious beliefs; technological constraints such as lack of pest and disease resistant variety, lack of short duration variety, lack of sound research, lack of proper technology of integrated pest management; administrative constraints such as inadequate and untimely supply of agricultural inputs, lack of market facility for organically produced commodity and lastly extension constraints such as lack of organized extension organic farming technologies. (Rahman, 2000)

3.1.5 Suggestions

The ways and means or opinions as suggested by the respondent farmers to overcome constraints in adoption of improved production technology were considered as the suggestions in this study.

As regards suggestions to overcome the constraints in adoption of recommended groundnut growers were: The government should purchase groundnut at remunerative price, inputs should be made available at subsidized rate, multiple resistance variety should be developed, soil testing facilities should be made available at field level by organizing camps, subsidies should be given to increase farm mechanization (Verma, 2000) and Provision of irrigation water, remunerative price should be given to onion growers, sufficient of regular electricity should be supplied (Jadav, 2001).
3.2 THE PARADIGM

The conceptual framework given in the preceding section may be presented paradigmatically which has been developed during the course of study. The models shown in Fig.1 & 2 are tentative and generalized one. The final form of such a model will be suggested at the end of this thesis in the chapter of "summary and conclusions" on all the aspects based on objectives of the study.
Factors associated with respondents’ extent of knowledge of recommended dry farming technology (Tentative paradigm)

Factors associated with

Independent Variables
- Age
- Education
- Size of Land Holding
- Annual Income
- Irrigation potentiality
- Social Participation
- Extension Participation
- Cropping Intensity
- Risk Orientation
- Innovativeness
- Marketing Orientation
- Mass media Exposure

Dependent Variables

Knowledge

Fig. 1 Factors associated with respondents’ extent of knowledge of recommended dry farming production technology (Tentative paradigm)
Factors associated with respondents' extent of adoption of recommended dry farming technology (Tentative paradigm)

Factors associated with

Independent Variables
- Age
- Education
- Size of Land Holding
- Annual Income
- Irrigation potentiality
- Social Participation
- Extension Participation
- Cropping Intensity
- Risk Orientation
- Innovativeness
- Marketing Orientation
- Mass media Exposure

Dependent Variables

Adoption

Fig. 2 Factors associated with respondents' extent of adoption of recommended dry farming technology (Tentative paradigm)
RESEARCH METHODOLOGY

4.1 IDENTIFICATION OF THE PROBLEM

Research on dry farming practices and farmer’s experimentation is still in its infancy. Given the complexities of this issue, many researchers expect this phase to be descriptive.
CHAPTER IV

RESEARCH METHODOLOGY

Methodology deals with the methods and procedures followed in carrying out this study. It describes and classifies the methods were used for measuring the dependent and independent variables as well as techniques followed for collection and analysis of data.

4.1 Identification of the problem

4.2 Sources of the data

4.3 Area of the study

4.4 Research design

4.5 Sampling technique

4.6 Operationalization of concepts

4.7 Measurement of variables

4.7.1 Independent variables

4.7.2 Dependent variables

4.8 Tools of data collection and field procedures

4.9 Analysis of the data

4.1 IDENTIFICATION OF THE PROBLEM

Research on dry farming practices and farmer's experimentation is still in its infancy. Given the complexities of this issue, many researchers expect this phase to be descriptive.
It would therefore take some time to attain quantitative vigour, for certain patterns to concretize the analytical issues.

Farming is main occupation in area under study. In these areas, farming plays a significant role for socio-economic upliftment of the weaker sections of the society. To solve their problems on farm management, farmers through their age long experience and wisdom, develop different practices, which are mostly dependent on the resource available in that particular area.

Keeping this important criterion in view, present study was under taken. The idea of research problem is discussed with Major advisor, Committee Member, Scientists of Department of Agronomy, and other experts working at Junagadh Agricultural University, Junagadh.

4.2 SOURCES OF THE DATA

The basic information regarding the study was gathered from the records of Gram and Taluka Panchayat, Office of District Agricultural Officer and several farmers of dry farming area.

The secondary data and other relevant information for the study was collected from published reports, papers, reference books and periodicals on the subject published by different authors and agencies and discussed with experts.

4.3 AREA OF THE STUDY

The study was conducted in the North Saurashtra agro climatic zone of Gujarat state for the following reasons.
1. The area has ideal condition for successful dry farming.
2. Soil and climate are very favorable for successful dry farming.
3. Similar research study was not conducted in the area under study.

4. The researcher being familiar with the farming condition of the area.

4.4 RESEARCH DESIGN

This study was conducted by using an *ex-post facto* research design. It is systematic empirical enquiry in which the scientist does not have direct control over the independent variables because their manifestations have already occurred or they are inherently not manipulated (Kerlinger, 1969).

4.5 SAMPLING TECHNIQUES

Random sampling technique was used for this study. The sampling technique is described as under.

4.5.1 Selection of the Talukas

The North Saurashtra zone is consisted of 40 talukas of 5 districts of the state having common agro-climatic conditions. Out of 40 talukas, 3 talukas were selected randomly by lottery method.

4.5.2 Selection of the Villages

Two villages from each selected taluka were selected randomly.
Fig. 3: Map of North Saurashtra Zone
### Table – 1 Selected talukas, villages and respondents

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of selected talukas and villages</th>
<th>Total number of farmers</th>
<th>Number of selected farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rajkot</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gadhaka</td>
<td>435</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Kheradi</td>
<td>660</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Tankara</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jabalpur</td>
<td>500</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Dhunada</td>
<td>465</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Jodiya</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kunnad</td>
<td>600</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Hadiyana</td>
<td>580</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>3240</strong></td>
<td><strong>120</strong></td>
</tr>
</tbody>
</table>

#### 4.5.3 Selection of the Respondents

Total 120 respondents were selected from selected villages by using random sampling method with a condition that the farmers should be cultivated under dry farming since last two years.

#### 4.6 OPERATIONALIZATION OF THE CONCEPTS

The various terms used in this study need to be defined so, as to clarify the concept in the particular content, in which they were used.

##### 4.6.1 Knowledge

It is the body of understood information possessed by an individual.
4.6.2 Adoption

It is the degree of use of recommended crop production technology by farmers as recommended by the Gujarat/Junagadh Agricultural University.

4.6.3 Constraints

This referred to the items of difficulty which faced by the farmers in adoption of new farm technology.

4.6.4 Age

It referred to the completed years of the respondents on the date of interview rounded off to the nearest years.

4.6.5 Education

It is the ability of farmers to read and write or formal education received up to a certain standard. It is the level of literacy of the farmer.

4.6.6 Size of land holding

It is the number of hectare of land an individual farmer possesses and cultivates.

4.6.7 Annual income

This indicates about the total annual income was earned by the respondents from both farming and allied fields put together.

4.6.8 Irrigation potentiality

It referred as, with the available irrigation source farmers irrigating the area.
4.6.9 Social participation

It referred to the participation of a respondent in local organizations (formal or informal).

4.6.10 Extension participation

It is define as, the degree to which an individual farmer participate in the activities carried out by the VLWs, AEOs and other extension personnel for informing or the guiding and to what extent he from JAU existed at village or Taluka level.

4.6.11 Cropping intensity

It is percentage of proportion of total cropped area to the size of cultivable holding. It can also be said as the proportion of total cropped area.

4.6.12 Risk orientation

It is the degree to which respondents are oriented towards the risk and uncertainty in their occupation.

4.6.13 Innovativeness

Innovativeness is operationally defined as the degree to which a farmer is relatively earlier in adopting the new ideas.

4.6.14 Market orientation

It referred to the judgment taken by individual farmer to sell his produce for better price by analyzing the various prevailing infrastructure and market intelligence.

4.6.15 Mass media exposure

It is operationalised as the extent of contact of farmers and use of various sources of information like radio, television,
demonstration, print media, agricultural fair, farmer's day etc. for the crop production under dry farming.

4.7 MEASUREMENT OF VARIABLES

4.7.1 MEASUREMENT OF INDEPENDENT VARIABLES

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Variables</th>
<th>Measurement Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age</td>
<td>Structured schedule developed</td>
</tr>
<tr>
<td>2</td>
<td>Education</td>
<td>Scale developed by Trivedi (1963)</td>
</tr>
<tr>
<td>3</td>
<td>Size of land holding</td>
<td>Structured schedule developed</td>
</tr>
<tr>
<td>4</td>
<td>Annual income</td>
<td>Scale developed by Pareek and Trivedi (1963)</td>
</tr>
<tr>
<td>5</td>
<td>Irrigation potentiality</td>
<td>Scale developed by Geethakutty (1993)</td>
</tr>
<tr>
<td>6</td>
<td>Social participation</td>
<td>Scale developed by Subramaniam (1986)</td>
</tr>
<tr>
<td>7</td>
<td>Extension participation</td>
<td>Scale developed by Siddaramaiah and Jalihal (1983)</td>
</tr>
<tr>
<td>8</td>
<td>Cropping intensity</td>
<td>Scale developed by Singh (1981)</td>
</tr>
<tr>
<td>9</td>
<td>Risk orientation</td>
<td>Scale developed by Singh and Supe (1969)</td>
</tr>
<tr>
<td>10</td>
<td>Innovativeness</td>
<td>Scale developed by Singh (1977)</td>
</tr>
<tr>
<td>11</td>
<td>Market orientation</td>
<td>Scale of Samantha (1977)</td>
</tr>
<tr>
<td>12</td>
<td>Mass media exposure</td>
<td>Structure schedule developed</td>
</tr>
</tbody>
</table>
4.7.1.1 Age

The age was taken as the completed number of years of the respondents on the date of interview and rounded up to the nearest years. The respondents were categorized into three groups.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Age</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Young age group = Up to 35 years</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Middle age group = 36 to 50 years</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Old age group = Above 50 years</td>
<td>3</td>
</tr>
</tbody>
</table>

4.7.1.2 Education

The education of the respondents was measured as the level of education in terms of educational standard that respondents had passed. The respondents were divided into categories on their level of education in terms of educational standard one has passed. It was measured with the help of socio-economic status scale developed by Trivedi (1963).

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Level of education</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Illiterate</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Primary education</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>High school education</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Higher Secondary education</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Graduate</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Post graduate</td>
<td>5</td>
</tr>
</tbody>
</table>
4.7.1.3 Size of land holding

It was measured with help of structured schedule on the basis of total land possessed by the respondents. On the basis of land possessed in hectares, the respondents were grouped into three categories.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Size of land holding</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Small size of land holding = Up to 1 ha.</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Medium size of land holding = above 1 to 2 ha.</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Large size of land holding = above 2 ha.</td>
<td>3</td>
</tr>
</tbody>
</table>

4.7.1.4 Annual income

This indicates the total annual income expressed in rupees earned by the respondents from both farm and non-farm enterprises put together. The actual income in monetary term was taken into account on the basis of annual income the respondents were grouped into three categories. Scale developed by Pareek and Trivedi (1963).

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Annual income</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low (up to Rs. 40,000)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Medium (Rs 40,001 to 80,000)</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>High (Above Rs. 80,000)</td>
<td>3</td>
</tr>
</tbody>
</table>
4.7.1.5 Irrigation potentiality

The extent to which crops are being irrigated was measured. The scoring procedure developed by Geethakutty (1993) was used with slight modification, *viz*; availability of irrigation water and area covered under irrigation was considered for the purpose. Facility of irrigation sources of the respondents was taken into consideration, as it is an important input for crop production. The detail of categorization and scoring procedure was as follows.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Well only</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>Canal only</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>Well and canal</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>Tube well /Bore well</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>Check dam</td>
<td>5</td>
</tr>
</tbody>
</table>

4.7.1.6 Social participation

It was measured with the help of the scale developed by Subramaniam (1986) with the necessary modification to suit the present study. The score procedure is given below:

<table>
<thead>
<tr>
<th>Sr.no.</th>
<th>Social participation</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Membership in any organization</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No membership</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Membership in each organization</td>
<td>1</td>
</tr>
<tr>
<td>Frequency of attending meeting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Occasionally</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Regularly</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

To obtain the final score for social participation of each respondent the score given for membership were multiplied with the scores given for attending meeting and were added up for all the organizations. The respondents were grouped into three categories as under:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Categories</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Low social participation</td>
<td>&lt;Mean – S. D.</td>
</tr>
<tr>
<td>2.</td>
<td>Medium social participation</td>
<td>Mean ± S. D.</td>
</tr>
<tr>
<td>3.</td>
<td>High social participation</td>
<td>&gt;Mean + S. D.</td>
</tr>
</tbody>
</table>

4.7.1.7 Extension participation

The extent of contact of a farmer with different extension agencies and their participation in various extension activities or programmes like meetings, seminar etc.

It was measured with the help of extension participation scale developed by Siddaramaiah and Jalihal (1983).
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of extension activities</th>
<th>Yes/No</th>
<th>Weightage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Conducted demonstration on your field?</td>
<td></td>
<td>9.50</td>
</tr>
<tr>
<td>2.</td>
<td>Had discussion with ext. workers?</td>
<td></td>
<td>6.84</td>
</tr>
<tr>
<td>3.</td>
<td>Participated on field days on the farmers’ fields?</td>
<td></td>
<td>6.63</td>
</tr>
<tr>
<td>4.</td>
<td>Participated in ext. meetings?</td>
<td></td>
<td>6.60</td>
</tr>
<tr>
<td>5.</td>
<td>See demonstration plot of your neighbor and had discussion with him</td>
<td></td>
<td>6.16</td>
</tr>
<tr>
<td>6.</td>
<td>Participated in krushi mela?</td>
<td></td>
<td>4.84</td>
</tr>
<tr>
<td>7.</td>
<td>Visited any agricultural exhibition?</td>
<td></td>
<td>2.79</td>
</tr>
<tr>
<td>8.</td>
<td>Had read ext. publications?</td>
<td></td>
<td>1.89</td>
</tr>
<tr>
<td>9.</td>
<td>Listened radio programmes on agriculture</td>
<td></td>
<td>1.50</td>
</tr>
<tr>
<td>10.</td>
<td>Viewed T.V. Programmes on agriculture</td>
<td></td>
<td>1.50</td>
</tr>
</tbody>
</table>

**Extension Participation Index** = \frac{\text{Actual total score value}}{\text{Possible total score}} \times 100

Respondents were grouped into three categories.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Categories</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Low extension participation</td>
<td>Mean – S. D.</td>
</tr>
<tr>
<td>2.</td>
<td>Medium extension participation</td>
<td>Mean ± S. D.</td>
</tr>
<tr>
<td>3.</td>
<td>High extension participation</td>
<td>Mean + S. D.</td>
</tr>
</tbody>
</table>
4.7.1.8 Cropping intensity

It denotes the intensity of land used by the farmers. In other words it is a ratio of total cropped area to net cultivated area expressed in percentage. This was calculated with the help of formula given by Singh (1981).

\[
\text{Cropping Intensity} = \frac{\text{Total cropped area in ha.}}{\text{Net cultivated area in ha.}} \times 100
\]

The respondents were classified into following three groups with the help of mean and S.D. viz.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Categories</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Low Cropping intensity</td>
<td>Mean - S. D.</td>
</tr>
<tr>
<td>2.</td>
<td>Medium Cropping intensity</td>
<td>Mean + S. D.</td>
</tr>
<tr>
<td>3.</td>
<td>High Cropping intensity</td>
<td>Mean + S. D.</td>
</tr>
</tbody>
</table>

4.7.1.9 Risk orientation

The scale developed by Singh and Supe (1969) was used with slight modification to measure the risk orientation of the respondents.

The scale consisted 6 statements out of which two were negative. The respondents were asked to respond on three point continuum rating scale as agree, undecided and disagree giving 3, 2 and 1 score, respectively for positive statements and 1, 2 and 3 score respectively for negative statements. The total score
was calculated by summing up the scores obtained for each statement by the respondents.

The respondents were classified into three categories on the basis of mean and S.D. as under.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Categories</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Low risk orientation</td>
<td>Mean – S. D.</td>
</tr>
<tr>
<td>2.</td>
<td>Medium risk orientation</td>
<td>Mean ± S. D.</td>
</tr>
<tr>
<td>3.</td>
<td>High risk orientation</td>
<td>Mean + S. D.</td>
</tr>
</tbody>
</table>

**4.7.1.10 Innovativeness**

Innovativeness is operationally defined as the degree to which a farmer is relatively earlier in adoption of new ideas. The procedure developed by Singh (1977) was used to measure the innovativeness of a farmer. The questions were asked as;

"When would you prefer to adopt an improved practice in farming?"

1. As soon as it is brought to my knowledge – 3
2. After I have seen some other farmers using successfully – 2
3. Prefer to wait and take my own time – 1

**4.7.1.11 Market orientation**

It referred to the judgment taken by individual farmer to sell his produce for better price by analyzing the various prevailing infrastructure and market intelligentsia. Market orientation of the farmers was measured with the help of scale developed by Samantha (1977) with due modification. It consisted of six items. The first, fourth and fifth statement were
negative and the rest were positive. The farmers opinions were sought on four continuum viz., strongly agree, agree, disagree and strongly disagree scoring was done as follows.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Negative</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

The score about market orientation score of individual respondents was the sum up separately and by using mean and standard deviation the respondents were classified in three categories.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Categories</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Low market orientation</td>
<td>Mean – S. D.</td>
</tr>
<tr>
<td>2.</td>
<td>Medium market orientation</td>
<td>Mean ± S. D.</td>
</tr>
<tr>
<td>3.</td>
<td>High market orientation</td>
<td>Mean + S. D.</td>
</tr>
</tbody>
</table>

4.7.1.12 Mass media exposure

To measure the mass media exposure of the respondents, the scores were assigned to respondents on the basis of frequency of their use of various sources of information. The scores assigned to various frequencies of uses were regularly (3), frequently (2), Once in a week (1), and not at all (0).

Thus, the score assigned to each type of information sources of which respondents had responded were summed up. The sum total of the score, thus, obtained was considered as an index of respondents mass media exposure.
According to the mass media exposure of respondents the mean and standard deviation were worked out and the respondents were grouped into three categories viz., low, medium and high.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Categories</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Low mass media exposure</td>
<td>Mean – S. D.</td>
</tr>
<tr>
<td>2.</td>
<td>Medium mass media exposure</td>
<td>Mean ± S. D.</td>
</tr>
<tr>
<td>3.</td>
<td>High mass media exposure</td>
<td>Mean + S. D.</td>
</tr>
</tbody>
</table>

### 4.7.2 MEASUREMENT OF DEPENDENT VARIABLES

#### 4.7.2.1 Knowledge

For measuring the knowledge of respondents about recommended dry farming technology, the teacher made test was used.

The respondents were asked whether they know particular recommended dry farming technology or not, for each recommended dry farming technology, total numbers of respondents were calculated accordingly those who know that practice.

A unit score was given to correct and zero to incorrect response. The total score obtained by individual respondent for all the statements was calculated. Then, with the help of mean and standard deviation, the respondents were categorized as under.
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Categories</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Low level of knowledge</td>
<td>$&lt;$Mean – S. D.</td>
</tr>
<tr>
<td>2.</td>
<td>Medium level of knowledge</td>
<td>Mean ± S. D.</td>
</tr>
<tr>
<td>3.</td>
<td>High level of knowledge</td>
<td>$&gt;$Mean + S. D.</td>
</tr>
</tbody>
</table>

### 4.7.2.2 Adoption

The adoption of recommended dry farming technology was divided into 30 different practices and decided by consulting the experts/scientists/extension workers working in the concern field. The weightage of particular practice were determined by seeking the opinions of the expert scientist/extension workers. Considering the total score 100 for the weightage of a particular practice was assigned by each expert. The different weightage was given to each practice. The farmers were asked about the practices they followed on their farm. Their responses were recorded in the schedule. A comprehensive list of all the practices adopted by farmers under above sub heads was then prepared. The responses obtained from different farmers experts were analyzed and the mean and standard deviation were calculated.

The respondents were grouped into three categories on the basis of mean and standard deviation.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Categories</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Low adoption</td>
<td>Mean – S. D.</td>
</tr>
<tr>
<td>2.</td>
<td>Medium adoption</td>
<td>Mean ± S. D.</td>
</tr>
<tr>
<td>3.</td>
<td>High adoption</td>
<td>Mean + S. D.</td>
</tr>
</tbody>
</table>
For measuring the adoption of recommended dry farming technology, the adoption index was developed in using adoption quotient developed by Chattopadhyay (1974) with slight modification.

\[
AQ = \left( \frac{e_1}{P_1} W_1 + \frac{e_2}{P_2} W_1 + \ldots + \frac{e_n}{P_n} W_n \right) \times \frac{100}{W \times N}
\]

Where,

- **AQ.** = Adoption quotient
- **e₁....eₙ** = Extent of adoption in terms of score obtained by the farmers for recommended dry farming technology
- **P₁...Pₙ** = Potentiality of the respondents in terms of score obtained for the particular practices.
- **W₁...Wₙ** = Weightage of the particular practice, for adoption score 1 and non-adoption score 0.
- **W** = Summation of the weightage of all practices included.
- **N** = Number of years for which adoption quotient was calculated.

### 4.8 TOOLS OF DATA COLLECTION AND FIELD PROCEDURES

#### 4.8.1 Collection of data

The basic information regarding the study were gathered from the records of Village Panchayat, Taluka Panchayat and office of the District Panchayat, sub divisional Agricultural officers and several farmers of dry farming area.
After the primary survey, an interview schedule was prepared in light of objectives and the farmers were personally interviewed by the investigator.

The secondary data and other relevant information for the study were gathered from the reference books, annual reports, bulletins journals and periodicals on the subject published by different authors, organizations, institutions and agencies.

4.8.2 Construction of interview schedule

To cover all pertinent aspects, in light of the objectives of the study, an interview schedule with questions (on all dependent and independent variables) was prepared for collection of data. A few modifications were made after the pre-testing. The final schedule was translated into vernacular Gujarati language and it was personally introduced to the respondents individually by following the participatory principles of interviewing to elicit better responses. The responses were recorded in the schedule itself.

4.9 Analysis of the data

All the responses were recorded and transferred to master sheet. They were compiled, scored, tabulated and analyzed to give statistical treatments in such a way that they might give proper answer to the specific objective of the study. The following statistical tools were used for interpreting the data.

4.9.1 Frequency and percentage

Simple averages and percentages methods were extensively used to analyze the collected data.
4.9.2 Mean score

Mean score was calculated for assigning the ranks. The mean score was obtained by total scores of an item divided by the total number of respondents.

4.9.3 Standard deviation

Standard deviation was worked out from the total score obtained by each respondent as per the following formula.

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

Where,

\[ X_i = \text{individual score} \]

\[ \bar{X} = \text{mean score} \]

\[ n = \text{total number of respondents} \]

The maximum and minimum score limits were obtained by the following formula.

\[ X_i = \text{Mean} \pm S.D. \]

4.9.4 Coefficient of correlation (r)

To find out the relationship between dependent and independent variables, the Pearson’s product moment method of computing correlation coefficient, which provides generally accepted means for measuring the relationship, was used (Chandel, 1975).

Following formula was used to calculate the correlation coefficient (Garret, 1967).
\[ r = \frac{SP(XY)}{\sqrt{SS(x)SS(y)}} \]

Where,

\[ r = \text{Co-efficient of correlation} \]

\[ X \text{ and } Y = \text{Two variables under study.} \]

\[ SP(xy) = \text{Sum of product of the deviations on } x \text{ and } y \text{ from their means.} \]

\[ SS(x) = \text{Sum of squares of deviations due to 'x' variable.} \]

\[ SS(y) = \text{Sum of squares of deviations due to 'y' variable.} \]

For testing the significance of 'r', 't' value was calculated by using the following formula:

\[ t = \frac{r \sqrt{n - 2}}{\sqrt{1 - r^2}} \]

Where,

\[ t = \text{Calculated 't' value} \]

\[ r = \text{Coefficient of correlation} \]

\[ n = \text{Total member of observations.} \]

4.10 Research hypothesis (in null form)

H1: 1 There is no association between the farmer’s knowledge of recommended dry farming technology and their age.

H1: 2 There is no association between the farmer’s knowledge of recommended dry farming technology and their education.
H1: 3 There is no association between the farmer's knowledge of recommended dry farming technology and their size of land holding.

H1: 4 There is no association between the farmer's knowledge of recommended dry farming technology and their annual income.

H1: 5 There is no association between the farmer's knowledge of recommended dry farming technology and their irrigation potentiality.

H1: 6 There is no association between the farmer's knowledge of recommended dry farming technology and their social participation.

H1: 7 There is no association between the farmer's knowledge of recommended dry farming technology and their extension participation.

H1: 8 There is no association between the farmer's knowledge of recommended dry farming technology and their cropping intensity.

H1: 9 There is no association between the farmer's knowledge of recommended dry farming technology and their risk orientation.

H1: 10 There is no association between the farmer's knowledge of recommended dry farming technology and their innovativeness.

H1: 11 There is no association between the farmer's knowledge of recommended dry farming technology and their market orientation.
H1: There is no association between the farmer's knowledge of recommended dry farming technology and their mass media exposure.

H2: 1 There is no association between the farmer's adoption of recommended dry farming technology and their age.

H2: 2 There is no association between the farmer's adoption of recommended dry farming technology and their education.

H2: 3 There is no association between the farmer's adoption of recommended dry farming technology and their size of land holding.

H2: 4 There is no association between the farmer's adoption of recommended dry farming technology and their annual income.

H2: 5 There is no association between the farmer's adoption of recommended dry farming technology and their irrigation potentiality.

H2: 6 There is no association between the farmer's adoption of recommended dry farming technology and their social participation.

H2: 7 There is no association between the farmer's adoption of recommended dry farming technology and their extension participation.

H2: 8 There is no association between the farmer's adoption of recommended dry farming technology and their cropping intensity.
H2: 9  There is no association between the farmer’s adoption of recommended dry farming technology and their risk orientation.

H2: 10 There is no association between the farmer’s adoption of recommended dry farming technology and their innovativeness.

H2: 11 There is no association between the farmer’s adoption of recommended dry farming technology and their market orientation.

H2: 12 There is no association between the farmer’s adoption of recommended dry farming technology and their mass media exposure.
CHAPTER V

5.1. Knowledge about recommended dry farming technology

5.2. Association of knowledge about recommended dry farming technology with their selected characteristics.

5.3. Association of adoption about recommended dry farming technology with their selected characteristics.

5.4. Constraints faced by respondents in adoption of recommended dry farming technology.

5.5. Knowledge of respondents on dry farming technology are mainly influenced by different characteristics of respondents. It was not possible to include all the characteristics of respondents. However, some important characteristics of respondents are

FINDINGS & DISCUSSION
CHAPTER V

FINDINGS AND DISCUSSION

This chapter deals with the findings and discussion of the study. The information collected through personal interview from the respondents was classified, tabulated and analyzed in light of the objectives of the study. The facts and findings of the study have been presented under the following heads:

5.1 Selected characteristics of the respondents.

5.2 Knowledge level of respondents about recommended dry farming technology.

5.3 Extent of adoption of recommended dry farming technology.

5.4 Association of knowledge about recommended dry farming technology with their selected characteristics.

5.5 Association of adoption about recommended dry farming technology with their selected characteristics.

5.6 Constraints faced by respondents in adoption of recommended dry farming technology.

5.7 Suggestions from the respondents to overcome the constraints in adoption of recommended dry farming technology.

5.1. SELECTED CHARACTERISTICS OF RESPONDENTS

Knowledge and adoption of the recommended dry farming technology are mainly influenced by different characteristics of respondents. It was not possible to include all the characteristics of the respondents. However, some important characteristics of
the respondents were selected and findings were presented as under.

5.1.1 AGE

The data in Table 2(1) revealed that about half of the respondents (46.67 per cent) of the respondents were in middle age group, whereas 30.83 and 22.50 per cent of the respondents were in young and old age group, respectively.

The observed findings might be due to the fact that generally in the rural social system, the head of the families who in majority cases were of middle aged, used to take decision in farming and other activity.

This finding was in conformity with the findings of Savaliya (2004) and Jadeja (2008).

5.1.2 EDUCATION

The data presented in the Table 2(2) indicated that more than half of the respondents (55.83 per cent) of the respondents were educated up to primary level whereas, 26.67 per cent of the respondents were illiterate, 13.33 per cent of the respondents were educated up to secondary level and only 04.17 per cent of the respondents were educated up to higher secondary.

Probable reason might be that most of the respondents were middle aged. Due to lack of proper educational facilities in area under study they could not get higher education. So, majority of the respondents were educated up to primary level.

This finding was in conformity with the findings of Verma (2000) and Anilkumar (2008).
5.1.3 SIZE OF LAND HOLDING

The data in Table 2(3) revealed that about 64.17 per cent of respondents were from medium size of land holding whereas, 20.00 and 15.83 per cent respondents possessed small and large sized of land holding, respectively.

This might be due to the fact in rural areas yet joint family system is prevailing.

This finding was in conformity with the findings of Barad (2004), Tavethiya (2006) and Bharad (2007).

5.1.4 ANNUAL INCOME

The data regarding annual income of respondents were furnished in Table 2(4). The table indicated that 62.50 per cent of the respondents were from medium income about Rs 40,000 to 80,000. About 12.50 per cent of the respondents were from high income. Whereas, 25.00 per cent of the respondents were from income of below Rs 40,000, respectively.

The probable reason for this might be that crops grown in this area and their varities under dry farming might have given good performance and yield even though less rainfall, the farmers were getting assured average yield. Therefore, majority of the respondents’ viz., 62.50 per cent and 12.50 per cent were from the categories of medium and high-income group, respectively.

This finding was in line with Jadav (2001), Chavada (2006) and Kamani (2007).
Table 2. Distribution of the respondents according to their selected characteristics  

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Characteristics</th>
<th>No. of respondents</th>
<th>Percent</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Young age group (Up to 35 years)</td>
<td>37</td>
<td>30.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Middle age group (36 to 50 years)</td>
<td>56</td>
<td>46.67</td>
<td>1.91</td>
<td>0.72</td>
</tr>
<tr>
<td></td>
<td>Old age group (Above 50 years)</td>
<td>27</td>
<td>22.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Illiterate</td>
<td>32</td>
<td>26.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primary (1 to 7th standard)</td>
<td>67</td>
<td>55.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secondary (8th to 10th standard)</td>
<td>16</td>
<td>13.33</td>
<td>0.95</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>Higher education (Above 10th)</td>
<td>05</td>
<td>04.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Size of land holding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Small size (up to 1 ha)</td>
<td>24</td>
<td>20.00</td>
<td>1.95</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>Medium size (1.01 to 2 ha)</td>
<td>77</td>
<td>64.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Large size (above 2 ha)</td>
<td>19</td>
<td>15.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Annual income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low (Up to Rs. 40,000)</td>
<td>15</td>
<td>12.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium (Rs. 40,000 to 80,000)</td>
<td>75</td>
<td>62.50</td>
<td>2.12</td>
<td>0.60</td>
</tr>
<tr>
<td></td>
<td>High (Above Rs. 80,000)</td>
<td>30</td>
<td>25.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Irrigation Potentiality

<table>
<thead>
<tr>
<th></th>
<th>Well</th>
<th>48.33</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canal</td>
<td>33</td>
<td>27.50</td>
</tr>
<tr>
<td>Well + Canal</td>
<td>29</td>
<td>24.17</td>
</tr>
<tr>
<td>Bore well</td>
<td>00</td>
<td>00.00</td>
</tr>
<tr>
<td>Check Dam</td>
<td>00</td>
<td>00.00</td>
</tr>
</tbody>
</table>

## Social participation

<table>
<thead>
<tr>
<th>Social Participation</th>
<th>42</th>
<th>35.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Social Participation (Less than 1.12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium Social Participation (1.13 to 2.41)</td>
<td>64</td>
<td>53.33</td>
</tr>
<tr>
<td>High Social Participation (Above 2.41)</td>
<td>14</td>
<td>11.67</td>
</tr>
</tbody>
</table>

## Extension participation

<table>
<thead>
<tr>
<th>Extension Participation</th>
<th>27</th>
<th>22.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Extension Participation (Below 13.53)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium Extension Participation (13.54 to 25.89)</td>
<td>90</td>
<td>75.00</td>
</tr>
<tr>
<td>High Extension Participation (Above 25.89)</td>
<td>03</td>
<td>02.50</td>
</tr>
<tr>
<td>8</td>
<td>Cropping intensity</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td></td>
<td>Low Cropping Intensity</td>
<td>00</td>
</tr>
<tr>
<td></td>
<td>(below 99.4)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium Cropping Intensity</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>(99.5 to 232.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Cropping Intensity</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>(Above 232.3)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9</th>
<th>Risk orientation</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Risk Orientation</td>
<td>21</td>
<td>17.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Below 7.07)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium Risk Orientation</td>
<td>86</td>
<td>71.67</td>
<td>11.08</td>
</tr>
<tr>
<td></td>
<td>(7.08 to 15.09)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Risk Orientation</td>
<td>13</td>
<td>10.83</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Above 15.09)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10</th>
<th>Innovativeness</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Innovativeness</td>
<td>15</td>
<td>12.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Below 1.59)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium Innovativeness</td>
<td>57</td>
<td>47.50</td>
<td>2.26</td>
</tr>
<tr>
<td></td>
<td>(1.60 to 2.93)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Innovativeness</td>
<td>48</td>
<td>40.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Above 2.93)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11</th>
<th>Market orientation</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Market Orientation</td>
<td>26</td>
<td>21.67</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Below 11.71)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium Market Orientation</td>
<td>72</td>
<td>60.00</td>
<td>16.00</td>
</tr>
<tr>
<td></td>
<td>(11.72 to 20.28)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Market Orientation</td>
<td>22</td>
<td>18.33</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Above 20.28)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass media exposure</td>
<td>22</td>
<td>18.33</td>
<td></td>
<td>68</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>----</td>
<td>-------</td>
<td>-------</td>
<td>-----</td>
</tr>
<tr>
<td>Low Mass Media Exposure (Below 6.43 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium Mass Media Exposure (6.44 to 15.09 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Mass Media Exposure (Above 15.09 )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5.1.5 IRRIGATION POTENTIALITY

The data in Table 2(5) reported that 48.33 per cent growers having well as irrigation facility. Whereas, 27.50 per cent respondents were found using canal for irrigating their crops. Only 24.17 per cent respondents were from the well and canal both as irrigation sources which with respect to irrigation potentiality, respectively.

Therefore, it can be concluded that 100 per cent of the farmers were from well and canal as irrigation sources. This might be due to the fact that in the study area, the well is the main irrigation source of common to most of the farmers.

This finding was in line with the findings of Bharad (2007).

5.1.6 SOCIAL PARTICIPATION

From the data of Table 2(6) it can be concluded that 53.33 per cent of the respondents were from medium level of social participation, followed by high (11.67 per cent) and low social participation (35.00 per cent), respectively.

It is known that there were many co-operative organizations in the area under study. Most of villages of North Saurashtra zone having at least two co-operative society viz.,
service cooperative society and milk producers co-operative society. The majority of the farmers were members of both the types of co-operative societies. Moreover, farmers were found members of outside organizations *viz.*, many taluka panchayat, district panchayat, farmers club, SHG, NGOs etc.

This finding was supported by Javia (2004), Makwana (2007) and Anilkumar (2008).

**5.1.7 EXTENSION PARTICIPATION**

The data regarding extension participation are presented in Table 2(7). On the basis of data, it is clear that (75.00 per cent) of the respondents were from medium extension participation, whereas 22.50 and 02.50 per cent of them were from low and high extension participation, respectively.

It can be inferred that the farmers of this area are educated, so they participate in different extension activities.

This finding was in line with the findings of Sahoo (2004).

**5.1.8 CROPPING INTENSITY**

From the Table 2(8) revealed that 82.50 per cent respondents were from medium cropping intensity, followed by 17.50 per cent respondent with high cropping intensity, respectively.

This might be due to the fact that climatic conditions, structure and soil texture are suitable for crop production in dry farming.

This finding was in conformity with findings of Jadav (2001).
5.1.9 RISK ORIENTATION

The data presented in Table 2(9) clearly indicated that 71.67 per cent respondents belonged to medium risk orientation group, followed by 17.50 and 10.83 per cent respondents were from low and high risk orientation, respectively.

Therefore, it can be concluded that majority of the respondents were opted for medium risk in adoption of recommended dry farming technology.

Similar finding was reported by Jadav (2001) and Tavethiya (2006).

5.1.10 INNOVATIVENESS

It is apparent from the Table 2(10) that 47.50 per cent of the respondents were found to have medium innovativeness, whereas 40.00 and 12.50 per cent of them were from high and low innovativeness, respectively.

Out of total 87.50 per cent were from medium and high innovativeness was found in this area because the farmers of area under study were educated and progressive in nature.

This finding was in line with the finding of Javia (2004) and Chavada (2005).

5.1.11 MARKET ORIENTATION

The data in Table 2(11) indicated that 60.00 per cent of the respondents were from medium level of market orientation, followed by 21.67 per cent and 18.33 per cent were from low and high level of market orientation, respectively.

It is obvious from the data that a half section of respondents were from medium level of market orientation. It implies that they are conscious to sell their produces at better price and get the information about market prices delivered
through their sources of mass media viz; news paper, radio, T.V, etc.

Similar finding was reported by Prajapati and Patel (2000) and Javia (2004).

5.1.12 MASS MEDIA EXPOSURE

The data in Table 2(12), it is clear that 56.67 per cent of the respondents were from medium level of mass media exposure, whereas 25.00 and 18.33 per cent of them were from high and low level of mass media exposure respectively.

This might be due to the fact that in the rural area the modern means of communication is not still popular or the programmers related to agriculture are not regularly listen or seen by the farmers.

This finding was in line with the findings of Bharad (2007), and Anilkumar (2008).

5.2 KNOWLEDGE LEVEL OF THE RESPONDENTS ABOUT RECOMMENDED DRY FARMING TECHNOLOGY

As discussed in the methodology to measure the knowledge of respondents about recommended dry farming technology a teacher made knowledge test was developed and used.

The knowledge score of respondents for improved dry farming technology were calculated as sum of the correct responses and converted in to percentages. The respondents were classified in to three categories based on mean and SD.
Low knowledge group = mean – S.D.  
(Below 54.42 Score)

Medium knowledge group = mean ± S.D.  
(54.43 to 75.61 Score)

High knowledge group = mean + S.D  
(Above 75.61 Score)

The extent of respondents’ knowledge of recommended dry farming technology are presented in Table-3 and depicted in Figure-4.

**Table3. Distribution of respondents based on their knowledge about dry farming technology. n = 120**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Knowledge Score</th>
<th>Frequency</th>
<th>Per Cent</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Below 54.42</td>
<td>25</td>
<td>20.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>Between 54.43 to 75.61</td>
<td>76</td>
<td>63.33</td>
<td>65.02</td>
<td>10.59</td>
</tr>
<tr>
<td>High</td>
<td>Above 75.61</td>
<td>19</td>
<td>15.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>120</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fig. 4 Extent of knowledge of respondents about recommended dry farming technology.
From the Table-3 and Figure-4, it is clear that 63.33 per cent of the respondents were medium level knowledge of dry farming technology. The considerable amounts (20.83 and 15.84 per cent) of respondents were in low and high knowledge group, respectively.

This might be due to fact that the respondents were from medium social participation, medium risk orientation and medium extension participation. These factors were from favourably helped the respondents in getting more knowledge about recommended dry farming technology.

This finding was in line with the findings of Barad (2004), Patel (2005), Chavada (2005), Tavethiya (2006) and Anilkumar (2008).

5.2.1 Knowledge of the respondents about selected dry farming practices.

As indicated in the Table 4 that only three practices out of 30 dry farming practices viz; bunding across the slope and levelling the land before onset of monsoon and while an efficient plant protection measure should be adopted to protect the plant from insect-pest followed by all (100 per cent) the respondents.

Sowing the seed with help of seed-cum-fertilizer drill, deep summer ploughing were well known to majority (96.66 per cent and 95.83 per cent) of the respondents.

Almost most of the farmers (85.00 per cent) given the seed treatment before sowing the seed. Due to the seed treatment induces the germination percentage of seed and makes seed free from the disease. Groundnut wilt, Cumin wilt and other soil
borne disease are gradually decreased due to the use of seed
treatment in different crop.

**Table 4. Knowledge about the selected dry farming practices
of the farmers.**

<table>
<thead>
<tr>
<th>Sr. no</th>
<th>Name of dry farming practices</th>
<th>Knowledge</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
<td>Percentage</td>
<td>Rank</td>
</tr>
<tr>
<td>1</td>
<td>Bunding across the slope should be done before onset of monsoon.</td>
<td>120</td>
<td>100.00</td>
<td>I</td>
</tr>
<tr>
<td>2</td>
<td>Leveling the land should be done before onset of monsoon.</td>
<td>120</td>
<td>100.00</td>
<td>I</td>
</tr>
<tr>
<td>3</td>
<td>Deep summer ploughing should be followed by surface tillage.</td>
<td>115</td>
<td>95.83</td>
<td>V</td>
</tr>
<tr>
<td>4</td>
<td>Application of organic manures like F.Y.M., compost @ 15-20 tonnes/ha or green manuring</td>
<td>102</td>
<td>85.00</td>
<td>VIII</td>
</tr>
<tr>
<td></td>
<td>should be done.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Fertilizers should be basal placed at a depth of 7.5 to 10cm in the soil and the seeds</td>
<td>57</td>
<td>47.50</td>
<td>XVIII</td>
</tr>
<tr>
<td></td>
<td>should be sown in the same furrows about 3 cm above the fertilizers.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Soil applications of BHC (10%) dust @ 25-30 kg/ha for termites and Thimet 20 G @ 15 kg/ha</td>
<td>80</td>
<td>66.67</td>
<td>XIII</td>
</tr>
<tr>
<td></td>
<td>for white grub should be done at the time of final field preparation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Selection of suitable crops and their varieties, as mentioned in genetic approaches of the text, must be done.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>7</td>
<td>Proper crop rotation should be followed which should preferably have at least one legume crop every year.</td>
<td>65</td>
<td>54.16</td>
<td>XVII</td>
</tr>
<tr>
<td>9</td>
<td>Seeds must be treated with a suitable fungicide and that of legumes with a bacterial culture before sowing.</td>
<td>102</td>
<td>85.00</td>
<td>VIII</td>
</tr>
<tr>
<td>10</td>
<td>For better seed-soil-moisture contact thorough soil compaction should be done by running a planker or a roller.</td>
<td>32</td>
<td>26.66</td>
<td>XXV</td>
</tr>
<tr>
<td>11</td>
<td>At the event of total crop failure during kharif season a suitable catch crop like urid T.9 or toria etc. should be sown.</td>
<td>50</td>
<td>41.67</td>
<td>XX</td>
</tr>
<tr>
<td>12</td>
<td>Inter-cropping of oil seeds and pulses should be done with jowar, bajra and maize crop for the purpose of making best use of soil and inter-row moisture harvesting.</td>
<td>45</td>
<td>37.50</td>
<td>XXI</td>
</tr>
<tr>
<td>13</td>
<td>Line sowing by drilling the seed at a depth of 7.5 to 10 cm or even more depending upon the situation should be practiced.</td>
<td>56</td>
<td>46.67</td>
<td>XIX</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Twenty five per cent more than the recommended seed rate should be used and thinning of excess plants should be done about 2-3 weeks after germination.</td>
<td>80</td>
<td>66.67</td>
<td>XIII</td>
</tr>
<tr>
<td>15</td>
<td>Proper weed management practices should be followed by adopting integrated weed control measures like one hand weeding about 20-25 days after sowing, then one hoeing about 5-10 days later followed by use of appropriate herbicide for an effective weed control.</td>
<td>115</td>
<td>95.83</td>
<td>V</td>
</tr>
<tr>
<td>16</td>
<td>Mulching should be done by providing frequent interculture and pulverizing the soil.</td>
<td>102</td>
<td>85.00</td>
<td>VIII</td>
</tr>
<tr>
<td>17</td>
<td>Water harvesting between the rows should be done by growing pulse crops.</td>
<td>44</td>
<td>36.67</td>
<td>XXII</td>
</tr>
<tr>
<td>18</td>
<td>Run-off water should be collected in some nearby located pond which may be used for recycling in the form of protective or life saving irrigation to the crop.</td>
<td>70</td>
<td>58.33</td>
<td>XVI</td>
</tr>
<tr>
<td>19</td>
<td>An efficient plant protection measure should be adopted to protect the plants from various insect/pest and disease damage.</td>
<td>120</td>
<td>100</td>
<td>I</td>
</tr>
<tr>
<td></td>
<td>Crops should be harvested at physiological maturity so that the following or succeeding crop may be sown slightly earlier than the scheduled time and best use of rain water or residual moisture may be made for crop production.</td>
<td>100</td>
<td>83.33</td>
<td>XII</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>21</td>
<td>Groundnut should be sprayed with Plano fix for modified growth, higher drought resistance and better yield.</td>
<td>0</td>
<td>0.00</td>
<td>XXIX</td>
</tr>
<tr>
<td>22</td>
<td>To sow improved variety of pearlmillet (GHB-32) within 15 days of onset of monsoon for harvesting maximum fodder yield.</td>
<td>0</td>
<td>0.00</td>
<td>XXX</td>
</tr>
<tr>
<td>23</td>
<td>Adopt shallow ploughing before sowing and make ridge and furrow after 25 days after sowing and at the stage of pegging, earthing up should be done in groundnut.</td>
<td>101</td>
<td>84.16</td>
<td>XI</td>
</tr>
<tr>
<td>24</td>
<td>The small seeds (test weight not less than 20 g) can be used effectively for sowing with the use of small size seeds, the farmers can save seed rate.</td>
<td>22</td>
<td>18.33</td>
<td>XXVI</td>
</tr>
<tr>
<td>25</td>
<td>In North Saurashtra Agroclimatic Zone to sow the castor GAUCH-1 at a distance of 90x45 cm</td>
<td>75</td>
<td>62.50</td>
<td>XV</td>
</tr>
<tr>
<td>26</td>
<td>The inter-row spacing of groundnut and Castor should be</td>
<td>11</td>
<td>09.16</td>
<td>XXVII</td>
</tr>
</tbody>
</table>
Findings and Discussion

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>In North Saurashtra zone to grow pearlmillet (100% recommended seed rate) as mixed cropping with greengram</td>
<td>35</td>
</tr>
<tr>
<td>28</td>
<td>Sowing the seed with help of seed-cum-fertilizer drill.</td>
<td>116</td>
</tr>
<tr>
<td>29</td>
<td>In North Saurashtra Agro climatic Zone to fertilize castor with 30 N and 30 P2O5 kg/ha.</td>
<td>22</td>
</tr>
<tr>
<td>30</td>
<td>To minimize the risk factors, the farmers growing pearlmillet as rainfed crop are advised to apply the recommended dose of nitrogen fertilizer either in two splits (25% as basal + 75% at tillering) or in three splits (25% as basal + 50% at tillering+ 25% at flag leaf stage).</td>
<td>42</td>
</tr>
</tbody>
</table>

Mean = 58.64

S.D = 32.46

Seed treatment with suitable fungicide and legume with bacterial culture is the practice that was well known all of the farmers, because it is easily available, it did not require any specific technical guidance, it helps to protect the plant against some disease and pest.

Respondents were from medium knowledge (66.67 per cent and ) about practices namely twenty five per cent more than the recommended seed rate should be used and Soil applications of BHC (10%) dust @ 25-30 kg/ha for termites and Thimet 20 G @
15 kg/ha for white grub should be done at the time of final field preparation.

Groundnut should be sprayed with Plano fix for modified growth, higher drought resistance and better yield practice was known by none (0.00 per cent) of the respondents because use of the growth regulator was not popular in area under study.

5.3 EXTENT OF ADOPTION ABOUT RECOMMENDED DRY FARMING TECHNOLOGY.

The data regarding the extent of adoption of recommended dry farming technology were collected. As discussed in the methodology, the adoption index was developed and used to measure the adoption of recommended dry farming technology. The adoption quotient (AQ) developed by Chattopadhyay (1974) was used with slight modification. Adoption level of respondents was calculated based on maximum score obtained by them. Respondents were classified in to three categories on the basis of mean and standard deviation.

Low adoption = Mean – S.D.
(Below 51.29 Score)

Medium adoption = Mean ± S.D.
(51.30 to 69.41 Score)

High adoption = Mean + S.D.
(Above 69.41 Score)

These data regarding adoption of dry farming technology are presented in Table-5 and also depicted diagrammatically in Figure-5.
Table 5 Distribution of respondents based on their adoption about recommended dry farming technology.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Adoption score</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Mean</th>
<th>S. D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>&lt; 51.29</td>
<td>29</td>
<td>24.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>51.30 to 69.41</td>
<td>69</td>
<td>57.50</td>
<td>60.35</td>
<td>09.06</td>
</tr>
<tr>
<td>High</td>
<td>&gt; 69.41</td>
<td>22</td>
<td>18.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>120</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the perusal of the data in Table-4 and Figure-5, it is clear that 57.50 per cent of the respondents were in medium adoption of recommended dry farming technology. The considerable of respondents were in low (24.17 per cent) and high (18.33 per cent) adoption group.

It can be concluded that the majority of the respondents were in medium adoption of the recommended dry farming technology, followed by low and high group, respectively. This might be due to fact that the majority of the respondents were from medium level of adoption regarding dry farming technology, social participation, risk orientation. These phenomena might have helped to the respondents for adoption of recommended dry farming technology.

This finding was in conformity with findings of Patel et al. (2000), Vekaria et al. (2000), Barad (2004), Bharad (2007) and Anilkumar (2008).
Fig. 5 Extent of adoption of respondents about recommended dry farming technology.
5.3.1 Adoption of the respondents about selected dry farming practices.

As indicated in the Table 5 and figure:6 that only three practices out of 30 dry farming practices viz; bunding across the slope and levelling the land before onset of monsoon adopted by all (100 per cent) the respondents.

Adoption rate was high of respondents of some practices like deep summer ploughing (93.33 per cent) and Proper weed management practices should be followed by adopting integrated weed control measures like one hand weeding about 20-25 days after sowing, then one hoeing about 5-10 days later followed by use of appropriate herbicide for an effective weed control (93.33 percent).

Respondents were from medium adopter of some practices like mulching should be done by providing frequent inter culture and pulverizing the soil (80.00 per cent). Shallow ploughing before sowing and making ridges and furrows after 25 days after sowing and at the stage of pegging, earthing up practice in ground nut was adopted by 79.16 per cent respondent.

The practices like sowing of improved variety of pearl millet (GHB-32) within 15 days of onset of monsoon for harvesting maximum fodder yield’ was not adopted by any respondents because in kharif season farmers of the area under study were not grown pearl millet as fodder purpose.
Table 6. Adoption about the selected dry farming practices of the farmers.  

<table>
<thead>
<tr>
<th>Sr. no</th>
<th>Name of dry farming practices</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency</td>
</tr>
<tr>
<td>1</td>
<td>Bunding across the slope should be done before onset of monsoon.</td>
<td>120</td>
</tr>
<tr>
<td>2</td>
<td>Leveling the land should be done before onset of monsoon.</td>
<td>120</td>
</tr>
<tr>
<td>3</td>
<td>Deep summer ploughing should be followed by surface tillage.</td>
<td>112</td>
</tr>
<tr>
<td>4</td>
<td>Application of organic manures like F.Y.M., compost @ 15-20 tonnes/ha or green manuring should be done.</td>
<td>96</td>
</tr>
<tr>
<td>5</td>
<td>Fertilizers should be (basal dose) placed at depth of 7.5 to 10cm in the soil and the seeds should be sown in the same furrows about 3 cm above the fertilizers.</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>Soil applications of BHC (10%) dust @ 25-30 kg/ha for termites and Thimet 20 G @ 15 kg/ha for white grub should be done at the time of final field preparation.</td>
<td>65</td>
</tr>
<tr>
<td>7</td>
<td>Selection of suitable crops and their varieties, as mentioned in genetic approaches of the text, must be done.</td>
<td>100</td>
</tr>
<tr>
<td>No.</td>
<td>Statement</td>
<td>Value 1</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>8</td>
<td>Proper crop rotation should be followed which should preferably have at least one legume crop every year.</td>
<td>60</td>
</tr>
<tr>
<td>9</td>
<td>Seeds must be treated with a suitable fungicide and that of legumes with a bacterial culture before sowing.</td>
<td>96</td>
</tr>
<tr>
<td>10</td>
<td>For better seed-soil-moisture contact, thorough soil compaction should be done by running a planker or a roller.</td>
<td>29</td>
</tr>
<tr>
<td>11</td>
<td>At the event of total crop failure during <em>kharif</em> season a suitable catch crop like urid T.9 or toria etc. should be sown.</td>
<td>44</td>
</tr>
<tr>
<td>12</td>
<td>Inter-cropping of oil seeds and pulses should be done with jowar, bajra and maize crop for the purpose of making best use of soil and interrow moisture harvesting.</td>
<td>42</td>
</tr>
<tr>
<td>13</td>
<td>Line sowing by drilling the seed at a depth of 7.5 to 10 cm or even more depending upon the situation should be practiced.</td>
<td>48</td>
</tr>
<tr>
<td>14</td>
<td>Twenty five per cent more than the recommended seed rate should be used and thinning of excess plants should be done.</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>15</td>
<td>Proper weed management practices should be followed by adopting integrated weed control measures like one hand weeding about 20-25 days after sowing, then one hoeing about 5-10 days later followed by use of appropriate herbicide for an effective weed control.</td>
<td>112</td>
</tr>
<tr>
<td>16</td>
<td>Mulching should be done by providing frequent inter culture and pulverizing the soil.</td>
<td>96</td>
</tr>
<tr>
<td>17</td>
<td>Water harvesting between the rows should be done by growing pulse crops.</td>
<td>41</td>
</tr>
<tr>
<td>18</td>
<td>Run-off water should be collected in some nearby located pond which may be used for recycling in the form of protective or life saving irrigation to the crop.</td>
<td>55</td>
</tr>
<tr>
<td>19</td>
<td>An efficient plant protection measure should be adopted to protect the plants from various insect/pest and disease damage.</td>
<td>120</td>
</tr>
<tr>
<td>20</td>
<td>Crops should be harvested at physiological maturity so that</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>the following or succeeding crop may be sown slightly earlier than the scheduled time and best use of rain water or residual moisture may be made for crop production.</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Groundnut should be sprayed with Plano fix for modified growth, higher drought resistance and better yield.</td>
<td>0</td>
</tr>
<tr>
<td>22</td>
<td>To sow improved variety of pearlmillet (GHB-32) within 15 days of onset of monsoon for harvesting maximum fodder yield.</td>
<td>0</td>
</tr>
<tr>
<td>23</td>
<td>Adopt shallow ploughing before sowing and make ridge and furrow after 25 days after sowing and at the stage of pegging, earthing up should be done in groundnut.</td>
<td>95</td>
</tr>
<tr>
<td>24</td>
<td>The small seeds (test weight not less than 20 g) can be used effectively for sowing with the use of small size seeds, the farmers can save seed rate.</td>
<td>19</td>
</tr>
<tr>
<td>25</td>
<td>In North Saurashtra Agroclimatic Zone to sow the castor GAUCH-1 at a distance of 90x45 cm</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>The inter-row spacing of groundnut and Castor should be maintained at 45 and 180 cm respectively of 3:1 crop row ratio.</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>08</td>
<td>06.66</td>
</tr>
<tr>
<td></td>
<td>In North Saurashtra zone to grow pearlmillet (100% recommended seed rate) as mixed cropping with greengram</td>
<td>32</td>
</tr>
<tr>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sowing the seed with help of seed-cum-fertilizer drill.</td>
<td>113</td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In North Saurashtra Agroclimatic Zone to fertilize castor with 30 N and 30 P2O5 kg/ha.</td>
<td>19</td>
</tr>
<tr>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>To minimize the risk factors, the farmers growing pearlmillet as rainfed crop are advised to apply the recommended dose of nitrogen fertilizer either in two splits (25% as basal + 75% at tillering) or in three splits (25% as basal + 50% at tillering+ 25% at flag leaf stage).</td>
<td>35</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Mean = 54.13**  
**S.D = 32.28**
1. Bunding across the slope should be done before onset of monsoon.
2. Levelling the land should be done before onset of monsoon.
3. Deep summer ploughing should be followed by surface tillage.
4. Application of organic manures like F.Y.M., compost @ 15-20 tonnes/ha.
5. Fertilizers should be basal placed at a depth of 7.5 to 10 cm in the soil.
6. Soil applications of BHC (10%) dust @ 25-30 kg/ha for termites and Thimet 20 G @ 15 kg/ha for white grub.
7. Selection of suitable crops and their varieties, as mentioned in genetic approaches of the text.
8. Proper crop rotation should be followed which should preferably have at least one legume crop every year.
9. Seeds must be treated with a suitable fungicide and that of legumes with a bacterial culture before sowing.
10. Soil compaction should be done by running a planker or a roller.
11. At the event of total crop failure during kharif season a suitable catch crop like urd T.9 or toria etc. should be sown.
12. Inter-cropping of oil seeds and pulses should he done with jowar and bajra.
13. Line sowing by drilling the seed at a depth of 7.5 to 10 cm.
14. 25% more than the recommended seed rate should be used.
15. Adopt integrated weed control measures like one hand weeding about 20-25 days after sowing, then one hoeing about 5-10 days later.
16. Mulching should be done by providing frequent inter culture and pulverizing the soil.
17. Water harvesting between the rows should be done by growing pulse crops.
18. Run-off water should be collected in some nearby located pond.
19. An efficient plant protection measure should be adopted.
20. Crops should be harvested at physiological maturity.
21. Groundnut should be sprayed with Plano fix for modified growth, higher drought resistance and better yield.
22. To sow improved variety of pearl millet (GHB-32) within 15 days of onset of monsoon for harvesting maximum fodder yield.
23. Adopt shallow ploughing before sowing and make ridge and furrow after 25 days after sowing and at the stage of pegging, earthing up should be done in groundnut.
24. The small seeds (test weight not less than 20 g) can be used effectively for sowing with the use of small size seeds, the farmers can save seed rate.
25. In North Saurashtra Agroclimatic Zone to sow the castor GAUCH-1 at a distance of 90x45 cm.
26. The inter-row spacing of groundnut and Castor should be maintained at 45 and 180 cm respectively of 3:1 crop row ratio.
27. In North Saurashtra zone to grow pearl millet as mixed cropping with greengram.
28. Sowing the seed with help of seed-cum-fertilizer drill.
29. In North Saurashtra Agroclimatic Zone to fertilize castor with 30 N and 30 P2O5 kg/ha.
30. To minimize the risk factors, the farmers growing pearl millet as rainfed crop are advised to apply the recommended dose of nitrogen fertilizer either in two splits (25% as basal + 75% at tillering) or in three splits (25% as basal + 50% at tillering+ 25% at flag leaf stage).
Fig. 6: Adoption about the selected dry farming practices of the respondents
5.4 ASSOCIATION OF KNOWLEDGE ABOUT RECOMMENDED DRY FARMING TECHNOLOGY WITH THEIR SELECTED CHARACTERISTICS.

In order to ascertain the association between the level of knowledge (dependent variable) of the farmers and each of their selected characteristics (independent variables), the correlation co-efficient (‘r’) were calculated on the basis of operational measures developed for the variables, empirical hypotheses were stated for testing the association and its significance on zero order correlation are given in Table 7.

5.4.1 AGE AND EXTENT OF KNOWLEDGE

The data presented in Table-7 used to test the null hypothesis (H1: 1) that there was no association between extent of knowledge of farmers and their age.

The calculated value of correlation coefficient (r= -0.1974) was negative and significant at 0.05 level. Hence, null hypothesis was rejected and it can be concluded that there was negative and significant association between extent of knowledge of farmers and their age. The direction of association was negative and significant which indicated that farmers’ knowledge of dry farming technology is increased significantly with decreased in their age.

This might be due to fact that the young age farmers played appreciable role in seeking latest technological know how farm decisions, further; the young farmers might be progressive in nature and always eager to take risk. Thus, age played an important role in shaping the positive knowledge towards dry farming technology.
This finding was in conformity with the findings of Nurzaman et al. (2001) and Tavethiya (2006).

Table -7 Correlation between knowledge about dry farming technology followed by the farmers and the independent variables

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of the independent variables</th>
<th>'r' value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age</td>
<td>-0.1974*</td>
</tr>
<tr>
<td>2</td>
<td>Education</td>
<td>0.2705**</td>
</tr>
<tr>
<td>3</td>
<td>Size of land holding</td>
<td>0.2023*</td>
</tr>
<tr>
<td>4</td>
<td>Annual income</td>
<td>0.1068 NS</td>
</tr>
<tr>
<td>5</td>
<td>Irrigation potentiality</td>
<td>0.0644 NS</td>
</tr>
<tr>
<td>6</td>
<td>Social participation</td>
<td>0.2175*</td>
</tr>
<tr>
<td>7</td>
<td>Extension participation</td>
<td>0.2372**</td>
</tr>
<tr>
<td>8</td>
<td>Cropping intensity</td>
<td>0.2579**</td>
</tr>
<tr>
<td>9</td>
<td>Risk orientation</td>
<td>0.2602**</td>
</tr>
<tr>
<td>10</td>
<td>Innovativeness</td>
<td>0.2958**</td>
</tr>
<tr>
<td>11</td>
<td>Market orientation</td>
<td>-0.0169 NS</td>
</tr>
<tr>
<td>12</td>
<td>Mass media exposure</td>
<td>0.1818*</td>
</tr>
</tbody>
</table>

* Significant at 0.05 level $r = 0.1740$

** Significant at 0.01 level $r = 0.2280$

NS = Non significant
5.4.2 EDUCATION AND EXTENT OF KNOWLEDGE

The data shown in Table-7 used to test the null hypothesis (H1: 2) that there was no association between knowledge of farmers and their education. The calculated correlation coefficient value \( r = 0.2705 \) was significant at 0.01 level. Hence, the null hypothesis was rejected and it can be concluded, that there was positive and significant linear association between extent of knowledge of farmers and their education.

This might be due to the fact the educated farmers generally have high extension participation, high innovativeness, and also have progressive out look and rational thinking. Thus, they understand the importance of dry farming technology.

This finding was in line with that Tavethiya (2006) and Anilkumar (2008).

5.4.3 SIZE OF LAND HOLDING AND EXTENT OF KNOWLEDGE

The data in Table-7 used for testing the null hypothesis (H1: 3) shows that there was no association between the respondents knowledge of recommended dry farming technology and their size of land holding.

The correlation co-efficient obtained \( r = 0.2023 \) was positive significant at 0.05 level. Hence, null hypothesis was rejected. It can be inferred that there was no relationship between knowledge of dry farming practices and size of land holding of the respondents.

This might be due to the fact that most of the respondents were from medium size land holding which was not influence the farmers’ knowledge about recommended dry farming technology.
This finding was in conformity with the findings of Patel (2005).

5.4.4 ANNUAL INCOME AND EXTENT OF KNOWLEDGE

The data presented in Table-7 used to test null hypothesis (H1: 4) found that there was no significant relationship between level of knowledge of the respondents and their annual income.

The calculated value ($r = 0.1068$) was non significant. Hence, the null hypothesis was accepted and it can be inferred that there was non significant relationship between extent of knowledge and their annual income. It can be concluded that respondents irrespective of annual income were going for recommended technologies to ensure higher production and they did not have any concern with annual income and dry farming technology. In this way they were aware of different recommended technologies. It means knowledge level of respondents did not relate with their annual income.

This finding was in conformity with the findings of Jadeja (2008).

5.4.5 IRRIGATION POTENTIALITY AND EXTENT OF KNOWLEDGE

On the basis of the data presented in Table-7 used to test the null hypothesis (H1: 5) that there was no association between the respondents knowledge of recommended dry farming technology and their irrigation potentiality.

The computed correlation co-efficient value of ($r = 0.0644$) was positive and non significant revealed that there was no association between irrigation potentiality and extent of knowledge. Hence the hypothesis was accepted.
This might due to fact that irrigation potentiality cannot influence on the knowledge of respondents.

5.4.6 SOCIAL PARTICIPATION AND EXTENT OF KNOWLEDGE

The data in Table-7 used to test the null hypothesis (H1: 6) that there was no association between the respondents knowledge of recommended dry farming technology and their social participation. The calculated co-coefficient of correlation \( r = 0.2175 \) was significant at 0.05 level. Hence, null hypothesis was rejected and it can be inferred that there was positive and significant association between respondents’ knowledge of recommended dry farming technology and their social participation. The knowledge of dry farming increased with an increase in social participation.

This might be due to fact that, those who have participated in the programme related to the theme of dry farming technology organized by various organizations might have been in close contact with various sources of information. These organizations might have facilitated them for getting latest information about dry farming technology.

This finding was in conformity with Jadav (2001), Barad (2004), Chavada (2005) and Chauhan (2008).

5.4.7 EXTENSION PARTICIPATION AND EXTENT OF KNOWLEDGE

The data presented in Table-7 and the null hypothesis (H1: 7) indicated that there was no association between extent of knowledge of the respondents and their extension participation was tested.
The calculated correlation coefficient \( r = 0.2372 \) was significant at 0.01 level. Hence, the null hypothesis was rejected and indicated that these two variables were highly dependent on each other. This is due to the fact that generally the agricultural extension workers and concerned authorities inform people regarding such practices those are not only cheap and sustainable but also ecologically protective. Also the respondents who have participated in various extension activities might have acquired higher knowledge and better understanding and ultimately they might have known more about different dry farming technology. It can be summarized that increase in extension participation is responsible for the increase in knowledge of dry farming technology.

Similar finding were from been reported by Jadeja (2008) and Satasiya (2008).

5.4.8 CROPPING INTENSITY AND EXTENT OF KNOWLEDGE

The null hypothesis (H1: 8) indicated that there was no association between the respondents knowledge of recommended dry farming technology and their cropping intensity was tested with the help of the data in Table-7.

The computed correlation co-efficient value \( r = 0.2579 \) was positive and highly significant at 0.01 level. Hence, null hypothesis was rejected. It can be concluded that there was association between crop intensity and knowledge at recommended dry farming technology. It is obvious that with increase in crop intensity the knowledge also increased. This might be due to the fact the cropping intensity as per the recommended package of practices for the dry farming crop will
increase the yield. So the experience might have influenced the knowledge of dry farming technology.

This finding was in conformity with the finding of Jadav (2001) and Chavada (2005).

5.4.9 RISK ORIENTATION AND EXTENT OF KNOWLEDGE

The data depicted in Table-7 was used for testing the null hypothesis (H1: 9) between the extent of knowledge of recommended dry farming technology and their risk orientation.

The computed co-efficient of correlation value of (r = 0.2602) was positive and highly significant at 0.01 level hence, null hypothesis was rejected. Therefore, it can be said that there was significant relationship between knowledge of respondents toward recommended dry farming technology and their risk orientation.

In the area of dry farming rain is irregular and inadequate so that it can’t be predicted for the dry spell. The respondents might have kept the pace with this phenomenon. So they are the risky in nature, venturesome and ‘come what may’ type behaviour farmers. As a result they might be benefited due to this character led them this position and significant relationship.

Chavada (2005) supported these results.

5.4.10 INNOVATIVENESS AND EXTENT OF KNOWLEDGE

The data presented in the Table-7 used to test the hypothesis (H1: 10) that there was no association between extent of knowledge of the respondents and their innovativeness.

The calculated value (r = 0.2958) was highly significant 0.01. Hence, the null hypothesis was rejected and it can be
inferred that there was positive and significant association between the level of knowledge of farmers and their innovativeness.

This means that as the innovativeness of the respondents increased their level of knowledge about dry farming technology which might be due the frequent contact with extension functionaries in their jurisdiction.

This finding was in line with Patel (2005) and Tavethiya (2006).

5.4.11 MARKET ORIENTATION AND EXTENT OF KNOWLEDGE

The data presented in the Table-7 used to test the hypothesis (H1: 11) that there was no association between extent of knowledge of the respondents and their market orientation.

The computed correlation coefficient ($r = -0.0169$) was found negative and non significant revealed that there was no association between market orientation and extent of knowledge. Hence the hypothesis was accepted.

This might due to fact that market orientation cannot influence on the knowledge of respondents.

This finding was in line with Chauhan (2008).

5.4.12 MASS MEDIA EXPOSURE AND KNOWLEDGE

The data presented in Table-7 used for testing null hypothesis (H1: 12) that there was no association between extent of knowledge of the respondents and their mass media exposure.

The calculated correlation coefficient value ($r = 0.1818$) was found significant at 0.05 per cent level. The null hypothesis was rejected and it can be inferred that there was positive and
significant association between the level of knowledge of farmers and their mass media exposure.

This might be due to the fact that respondents having higher exposure to mass media including magazine could got more useful information for their farming. They could get more benefits of the mass media. Thus, mass media play vital role for the enhancement of knowledge in relation to dry farming technology.

5.5 ASSOCIATION OF ADOPTION ABOUT RECOMMENDED DRY FARMING TECHNOLOGY WITH THEIR SELECTED CHARACTERISTICS.

In order to ascertain the association between extent of adoption of the farmers (dependent variable and their selected characteristics as independent variables) the correlation coefficient (‘r’ value) were calculated on the basis of operational measures developed for the variables, empirical hypotheses were stated for testing the association and their significant on zero order correlation. The results of correlation are given in Table-8.

5.5.1 AGE AND EXTENT OF ADOPTION

The data in Table-8 used for testing the null hypothesis (H2: 1) that there was no relationship between respondents’ adoption of recommended dry farming technology and their age.

The calculated correlation co-efficient value of (r = -0.2367) was found significant at 0.01 level. Thus, null hypothesis was rejected and it can be concluded that there was negative and significant association between respondents’ adoption of recommended dry farming technology and their age.
The direction of association was negative and significant which indicated that respondents’ adoption of recommended dry farming technology increased significant with decrease in their age.

The probable reason for above finding might be that majority of the young respondents were educated and having more social participation and having good knowledge regarding dry farming technology.

This finding was in line with the findings of Kotadiya (2006).

5.5.2 EDUCATION AND EXTENT OF ADOPTION

The data in Table-8 used for testing the null hypothesis (H2: 2) that there was no association between the respondents adoption of recommended dry farming technology and their education.

The calculated co-efficient of correlation value of ($r = 0.3005$) was positively highly significant at 0.01 level. Hence, the null hypothesis was rejected and it could be inferred that there was positive and significant association between respondents’ adoption of recommended dry farming technology and their education.

It can be said that with increased in education the level of adoption also increased.

The probable reason may be that educated respondents understand the importance of innovations which can be quickly and easily adopted by them. They also keep faith in new research and possess higher change proneness.
Table 8: Correlation between adoption about Recommended dry farming technology followed by the farmers and the independent variables

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of the independent variables</th>
<th>‘r’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Age</td>
<td>-0.2367*</td>
</tr>
<tr>
<td>2</td>
<td>Education</td>
<td>0.3005**</td>
</tr>
<tr>
<td>3</td>
<td>Size of land holding</td>
<td>0.1324 NS</td>
</tr>
<tr>
<td>4</td>
<td>Annual income</td>
<td>0.0884 NS</td>
</tr>
<tr>
<td>5</td>
<td>Irrigation potentiality</td>
<td>-0.0452 NS</td>
</tr>
<tr>
<td>6</td>
<td>Social participation</td>
<td>0.2027*</td>
</tr>
<tr>
<td>7</td>
<td>Extension participation</td>
<td>0.2543**</td>
</tr>
<tr>
<td>8</td>
<td>Cropping intensity</td>
<td>0.2327**</td>
</tr>
<tr>
<td>9</td>
<td>Risk orientation</td>
<td>0.2019*</td>
</tr>
<tr>
<td>10</td>
<td>Innovativeness</td>
<td>0.2762**</td>
</tr>
<tr>
<td>11</td>
<td>Market orientation</td>
<td>-0.038 NS</td>
</tr>
<tr>
<td>12</td>
<td>Mass media exposure</td>
<td>0.2044*</td>
</tr>
</tbody>
</table>

* Significant at 0.05 level r = 0.1740
** Significant at 0.01 level r = 0.2280

NS = Non significant
5.5.3 SIZE OF LAND HOLDING AND EXTENT OF ADOPTION

The data presented in Table-8 used to test the null hypothesis (H2: 3) that there was no association between respondents adoption of recommended dry farming technology and their size of land holding.

The correlation co-efficient obtained \( r = 0.1324 \) was non significant at 0.05 level. Hence, the null hypothesis was accepted. It can be concluded that there is no association between respondents’ adoption of recommended dry farming technology and their size of land holding.

This might be due to the fact that irrespective of size of land holding almost all the respondents inclined to adopt equally, the recommended dry farming technology for getting higher yield and income.

This finding was supported by the finding Ranganathan et al (2001).

5.5.4 ANNUAL INCOME AND EXTENT OF ADOPTION

The data in Table-8 used for testing null hypothesis (H2: 4) that there was no relationship between respondents adoption of recommended dry farming technology and their annual income.

The calculated correlation coefficient \( r = 0.0884 \) was non significant at 0.05 level. Hence, the null hypothesis was accepted.

It can be said that there was no association between farmers’ level of adoption for dry farming practices on their annual income. This might be due to the fact that farmers who
are adopting dry farming technology were not from one category of income, but irrespective of income group of farmers were adopting dry farming technology, so they think that the disparity in income is not because of the dry farming practices.

This finding was supported by Chhodavadia (2001).

5.5.5 IRRIGATION POTENTIALITY AND EXTENT OF ADOPTION

The data in Table-8 used to test the null hypothesis (H2: 5) that there was no association between respondents adoption of recommended dry farming technology and their irrigation potentiality.

The computed correlation co-efficient value of \( r = -0.0452 \) was negative and non significant at 0.05 level. Hence, null hypothesis was accepted.

This might be due to the fact that under dry farming area the technologies were adopted. So, irrigation potentiality did not influence the adoption of dry farming technology.

5.5.6 SOCIAL PARTICIPATION AND EXTENT OF ADOPTION

The data in Table-8 used for testing the null hypothesis (H2: 6) that there was no association between the respondents adoption of recommended dry farming technology and their social participation.

The correlation co-efficient obtained \( r = 0.2027 \) was positive and significant at 0.05 level. Hence, null hypothesis was rejected and it can be inferred that there was positive and significant association between respondents’ adoption of recommended dry farming technology and their social
participation. The adoption increased with an increase of social participation of the respondents.

The probable reason for this might be that more social participation provides more in-depth information and better understanding to the respondents, which leads them to adopt the recommended dry farming technology in a better way.

This finding was in conformity with the findings of Barad (2004) and Makwana (2007).

**5.5.7 EXTENSION PARTICIPATION AND EXTENT OF ADOPTION**

The data in Table-8 used for testing the null hypothesis (H2: 7) that there was no association between the respondents’ adoption of recommended dry farming technology and their extension participation.

The computed co-efficient of correlation value of \( r = 0.2543 \) was positive and significant at 0.01 level. Hence, null hypothesis was rejected. Therefore, it can be said that there was positive significant association between respondents’ adoption of recommended dry farming technology and their extension participation.

The probable reason might be that due to more participation in extension activities the respondents acquired more knowledge and other facilities like extension service, availability credit, input supply at a time which facilitated them for higher adoption in dry farming technology.

This finding was in conformity with the finding of Jadav (2001), Ranganathan *et al.* (2001) and Satasiya (2008).
5.5.8 CROPPING INTENSITY AND EXTENT OF ADOPTION

The data in Table-8 used for testing the null hypothesis (H2: 8) that there was no association between the respondents’ adoption of recommended dry farming technology and their coriander crop intensity.

The calculated correlation co-efficient value of \( r = 0.2327 \) was found to be positive and significant at 0.01 level. Hence, null hypothesis was rejected. It can therefore, be said that there is positive and significant association between respondents’ adoption of recommended dry farming technology and crop intensity. The positive direction of relationship indicated that respondents’ adoption increased with an increase in their crop intensity.

The probable reason might be that due to the increase in crop intensity the respondents might have received more production per unit area which might have generated more income in a less rainfall situation.

This finding was supported by the finding of Barad (2004).

5.5.9 RISK ORIENTATION AND EXTENT OF ADOPTION

The data depicted in Table-8 used for testing the null hypothesis (H2: 9) that there was no association between the respondents’ adoption of recommended dry farming technology and their risk orientation.

The computed co-efficient of correlation value of \( r = 0.2019 \) was positive and significant at 0.05 level. Hence, null hypothesis was rejected. Therefore, it can be said that there was positive and significant association between respondents’ adoption of recommended dry farming technology and risk
orientation. The positive direction of relationship indicated that with increase risk orientation the adoption is increased. The probable reason for this result could be that respondents secure benefits of high production while taking risk in adoption of recommended dry farming technology.

The finding was in conformity with the finding of Jadav (2001), Kamani (2007) and Chauhan (2008).

5.5.10 INNOVATIVENESS AND EXTENT OF ADOPTION

The data in Table-8 used for testing the null hypothesis (H2: 10) that there was no association between the respondents adoption of recommended dry farming technology and their innovativeness.

The computed co-efficient of correlation value of \( r = 0.2762 \) was highly positive and significant at 0.01 level. Hence, null hypothesis was rejected. Therefore, it can be said that there was positive and significant association between respondents’ adoption of recommended dry farming technology and their innovativeness.

The probable reason might be that due to innovation in dry farming technology they might have tried out different dry farming technology for more yield.

This finding was in conformity with the finding of Sahoo (2004).

5.5.11 MARKET ORIENTATION AND EXTENT OF ADOPTION

The data in Table-8 used for testing the null hypothesis (H2: 11) that there was no association between the respondents
adoption of recommended dry farming technology and their Market orientation.

The computed correlation coefficient \( r = -0.038 \) was found negative and non significant revealed that there was no association between market orientation and extent of adoption. Hence the hypothesis was accepted.

The probable reason for no influence of market orientation on adoption of dry farming practices can be explained to the reason that resources to be purchased from market are very less. On the other hand, for selling of dry farming product market network has not yet been fully developed.

The present finding was inline with the findings of Chauhan (2008).

5.4.12 MASS MEDIA EXPOSURE AND EXTENT OF ADOPTION

The data in Table-8 used for testing the null hypothesis (H2: 12) that there was no association between the respondents adoption of recommended dry farming production technology and their mass media exposure.

The computed co-efficient of correlation value of \( r = 0.2044 \) was positive and significant at 0.05 level. Hence, null hypothesis was rejected. Therefore, it can be said that there was positive and significant association between respondents’ adoption of recommended dry farming technology and their mass media exposure.

The probable reason for this result could be that more than half of the respondents were from the medium income group and medium education which help in use of mass media technology which aware the farmers about new technology.
This finding was in line with the finding of Tavethiya (2006) and Manju (1996).

5.6 CONSTRAINTS FACED BY RESPONDENTS IN ADOPTION OF IMPROVED DRY FARMING TECHNOLOGY.

In the process of agricultural development, the prime mover is considered to be the improved farming technology. The benefit of such technology is actually derived only when farmers in their local situations efficiently utilized it. The farmers are very much eager to get maximum benefits from the agricultural technology. However, many of them could not do so, because a large number of impediments are coming in that way, creating large adoption gap culminating in low yield in the area. To understand and overcome strategies for enhancing the yield, this study was undertaken.

The parts of constraints were kept pre-determined and give score 3, 2, 1, and 0 for most important, important, less important and not important respectively in questionnaire. The responses were recorded in the schedule itself. The constraints under each of the practice required to be rated by each and every respondent. The frequency was calculated for each constraint and converted in to score and rank was given. The higher ranks indicated higher perception of the respondents for that constraint and *vice versa*. The constraints and the mean score are given in the following Table-7.

Socio – economical and phenomenal constraints were identified under 30 sub constraints grouped in eight major heads viz; (A) Bio – physical constraints, (B) Micro level constraints, (C) Technological constraints, (D) Administrative constraints, (E) Extension constraints, (F) Other constraints.
<table>
<thead>
<tr>
<th>Sr. no</th>
<th>Constraints</th>
<th>Mean Score</th>
<th>Rank</th>
<th>Over all rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>BIOPHYSICAL CONSTRAINTS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>1. Appearance of periodic drought spells during crop season.</td>
<td>2.62</td>
<td>I</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(315)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Poor water retention capacity of the soils.</td>
<td>2.02</td>
<td>II</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(243)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Insect-pest and diseases are not easily control in dry farming.</td>
<td>1.92</td>
<td>III</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(231)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Induce the weed seeds.</td>
<td>1.09</td>
<td>IV</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(131)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td><strong>MICRO-LEVEL CONSTRAINTS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Medium education of the respondents.</td>
<td>1.90</td>
<td>II</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(228)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Lack of awareness about dry farming.</td>
<td>1.70</td>
<td>V</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(204)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Poor economic status of the farmers.</td>
<td>1.73</td>
<td>IV</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(208)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Farmers don’t willing to take risk.</td>
<td>2.23</td>
<td>I</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(268)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Lack of information and experience regarding dry farming.</td>
<td>1.76</td>
<td>II</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(212)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td><strong>TECHNOLOGICAL CONSTRAINTS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Lack of pest and disease resistant varieties.</td>
<td>1.78</td>
<td>II</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(214)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Lack of short duration varieties.</td>
<td>1.29</td>
<td>IV</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(155)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Controversy among family members regarding dry farming.
3. Natural hazards.
4. There is no special incentive or awards for adopters of recommended dry farming practices

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>II</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(211)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.58</td>
<td>III</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>(190)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.27</td>
<td>IV</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>(152)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(A) BIO – PHYSICAL CONSTRAINTS

It is obvious from Table 9, that out of four constraints of bio-physical constraints: appearance of periodic drought spells during cultivation and poor water retention capacity of the soils were perceived as first and second by the respondents, respectively. However, considering all the constraints together, they were ranked 1\textsuperscript{st} and 8\textsuperscript{th}, respectively. This might be due to the fact that periodic drought spell directly affect on the yield of the crops. Like wise the poor water retention capacity of the soils directly affected the seed germination and development of the root systems.

(B) MICRO LEVEL CONSTRAINTS

Among the micro level constraints, farmers do not willing to take risk, medium education and lack of information and experience regarding dry farming were ranked first, second and thirds respectively within the group while they were overall ranked 5\textsuperscript{th}, 12\textsuperscript{th} and 14\textsuperscript{th}, respectively.

As per the above discussion due to the lack of innovativeness and poor status of farmers which prevent them to take risk. In village level higher education facilities were not
available, thus medium education were seen in farmers' characteristics.

(C) TECHNOLOGICAL CONSTRAINTS

Among the technological constraints lack of sound research and development of dry farming, lack of pest and disease resistant varieties, lack of drought resistance varieties and lack of short duration varieties were ranked first, second, thirds and fourth respectively within the group while they were overall ranked 9th, 13th, 18th and 22nd, respectively.

As per the above discussion there have not effective research on dry farming as compare to other farming so that there were lack of pest or disease resistance varieties.

(D) ADMINISTRATIVE CONSTRAINTS

Among the administrative constraints inadequate and untimely supply of agricultural inputs, lack of market facility and lack of special administrative set up were ranked first, second and thirds respectively within the group while the same were overall ranked 5th, 8th and 22nd, respectively.

This might be due to the fact that sometimes there were scarcity of fertilizer and seed of selected varieties and not timely availability.

(E) EXTENSION CONSTRAINTS

Among the extension constraints lack of extension machinery to disseminate the proven dry farming technologies, poor contact of extension workers with farmers and apathetic attitude of extension functionary towards farmers and their problems were ranked first, second and thirds respectively
within the group while the same were overall ranked 3rd, 6th and 10th, respectively.

This might be due to the fact that there is neither any special organized institute for documentation and testing of dry farming knowledge nor any communiqué for the transfer of dry farming technological known how.

(F) OTHER CONSTRAINTS

As far as other constraints are concerned, among the constraints, poor return as compare to modern technologies, controversy among family members regarding dry farming and natural hazards were ranked first, second and thirds respectively within the group while the same were overall ranked 2nd, 14th and 19th, respectively.

It is fact that in dry farming the crop yield are reduce, but in other farming or after adoption of the modern technology the crop yield are gradually increase, because insect pest or disease are easily control in this farming system. Besides, high wind speed, low rainfall, high intensity of rainfall, very cold temperatures etc. are natural hazards which are indirectly affected the quality of the dry farming product.

5.7 SUGGESTIONS FROM THE RESPONDENTS TO OVERCOME THE CONSTRAINTS IN ADOPTION OF RECOMMENDED DRY FARMING TECHNOLOGY.

For ascertaining the suggestions to overcome the constraints in adoption of recommended dry farming technology, the suggestions were invited openly from respondents. The frequency was calculated for each suggestion and converted in to percentage and rank was given. The suggestions along with their percentages are presented in Table-10.
The most important suggestions offered by the respondents to overcome the constraints in adoption of recommended dry farming technology were: Provide special administrative setup to promote dry farming (97.50 per cent), Market facilities should be strengthened (95.83 per cent), Inputs should be made available at subsidized rate (80.00 per cent), Sufficient and timely credit facility should be made available (65.83 per cent).

The comparatively less important suggestions as expressed by the respondents were: Training should be imported to the respondents (53.33 per cent), Effective soil moisture conservation technology should be developed (47.50 per cent), and Agriculture literature should be provided (38.33 per cent).

**Table -10 Suggestions from the respondents to overcome the constraints in adoption of recommended dry farming technology.**

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Suggestions</th>
<th>Frequency</th>
<th>Per cent</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inputs should be made available at subsidized rate</td>
<td>96</td>
<td>80.00</td>
<td>III</td>
</tr>
<tr>
<td>2</td>
<td>Sufficient and timely credit facility should be made available.</td>
<td>79</td>
<td>65.83</td>
<td>IV</td>
</tr>
<tr>
<td>3</td>
<td>Provide special administrative setup to promote dry farming.</td>
<td>117</td>
<td>97.50</td>
<td>I</td>
</tr>
<tr>
<td>4</td>
<td>Market facilities should be strengthened</td>
<td>115</td>
<td>95.83</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td>Effective soil moisture conservation technology should be developed</td>
<td>57</td>
<td>47.50</td>
<td>VI</td>
</tr>
<tr>
<td>------</td>
<td>---------------------------------------------------------------------</td>
<td>-----</td>
<td>-------</td>
<td>------</td>
</tr>
<tr>
<td>6</td>
<td>Agriculture literature should be provided</td>
<td>46</td>
<td>38.33</td>
<td>VII</td>
</tr>
<tr>
<td>7</td>
<td>Training should be imported to the respondents</td>
<td>64</td>
<td>53.33</td>
<td>V</td>
</tr>
</tbody>
</table>

It can be concluded that important suggestions offered by more than 65.00 per cent of respondents were: Provide special administrative setup to promote dry farming (rank first), Market facilities should be strengthened (rank second), Inputs should be made available at subsidized rate (rank third), and Sufficient and timely credit facility should be made available (rank fourth).

It is clear from the (Table-8) about the suggestions made by the majority of the farmers that these suggestions are based on the facilities have been availed but are not sufficient and satisfied up to the extent of their expectations.

Thus, it can be concluded from the facts mentioned above that the facilities to the respondents’ are already being provided by the human resources or by natural resources needs to be strengthened and tailored according to the requirements of respondents. The other suggestions offered by the farmers need to be looked in to account very carefully by the appropriate agencies to improve the productivity of crop.

The finding was in conformity with the finding of Verma (2000) and Jadav (2001).
SUMMARY AND CONCLUSION
CHAPTER VI

SUMMARY AND CONCLUSIONS

In this chapter, a nutshell description of the study in respect of the summary, conclusion, implication and suggestions for the further research is included. This chapter has been divided into the following subheads.

6.1 Summary
6.2 Conclusions
6.3 Implications
6.4 Suggestions for the further research

6.1 SUMMARY

Despite considerable advance in agricultural production technology as well as expansion in infrastructure for increasing productivity of various crops the gap between how already attained and their application in the field is still quite large. There is a wide scope for increasing the production per unit area. Farmers of dry farming area did not know and adopt the recommended dry farming production technology. Due to several problems experienced by them in adoption of recommended dry farming production technology to the farms, a study entitled “Extension Strategies for Risk Management in Dry Land Agriculture in North Saurashtra Zone” was undertaken with following specific objectives:
1. To study the selected characteristics of the respondents.
2. To measure the knowledge level of respondents about recommended dry farming technologies.
3. To know the extent of adoption of recommended dry farming technologies.
4. To ascertain the association of knowledge about recommended dry farming technologies with their selected characteristics.
5. To ascertain the association of adoption about recommended dry farming technologies with their selected characteristics.
6. To identify constraints faced by respondents in adoption of recommended dry farming technologies.
7. To seek the suggestions from the respondents to overcome the constraints in adoption of recommended dry farming technologies.

The theoretical orientation was developed for the study on the basis of reviewed literature having direct or indirect bearing on the present study. The various concepts utilized in the study were operationalized, the tentative paradigm was laid down, and working hypotheses were formulated.

Knowledge and adoption (dependent variables), setting and selection of respondents, analysis of data and the various statistical measures were used to test the hypotheses.

The statistical measures such as percentage, standard deviation, mean score, and correlation co-efficient were used.

To measure respondents’ extent of knowledge about recommended dry farming technology, a teacher made knowledge test was developed and used. The format of knowledge test is given in Appendix part II.
To measure respondents’ extent of adoption of recommended dry farming technology, the adoption index was developed and used. The adoption quotient developed by Chattopadhyay (1974) was used with slight modification. The selected independent variables such as age, education, size of land holding, annual income, irrigation potentiality, social participation, extension participation, cropping intensity, risk orientation, innovativeness, market orientation, and mass media exposure were measured by scales developed by other researchers and with the help of responses to appropriate questions with schedule (Appendix part III).

Based on the empirical measures on interview schedules with questions on dependent and independent variables were used for collecting the data from the respondents. A sample of 120 respondents’ representing 6 village of Rajkot, Tankara and Jodiya Talukas of North Saurashtra was drawn by using random sampling techniques. The respondents were personally interviewed with the help of structured interview schedule. The data were collected and analyzed in light of the objectives of the study. The following important conclusions were drawn based on the findings of the study.

6.2 CONCLUSIONS

6.2.1 CHARACTERISTICS OF THE RESPONDENT

More than one half; (56.67 per cent), (55.83 per cent) and (55.33 per cent), respondents’ belonged to medium mass media exposure, primary education and medium social participation, respectively.

Majority (82.50 per cent), (75.00 per cent), (71.67 per cent), (64.17 per cent), (62.50 per cent) and (60.00 per cent) of
respondents’ belonged to medium cropping intensity, extension participation, risk orientation, size of land holding, annual income and market orientation, respectively.

As less than one half (47.50 per cent), (46.67 per cent) and (48.33 per cent) respondents belonged to medium innovativeness, middle age and well irrigation potentiality, respectively.

6.2.2 RESPONDENT’S KNOWLEDGE

Majority (63.33 per cent) of the respondents had medium level of knowledge about the recommended dry farming technology. Whereas, 20.83 per cent and 15.84 per cent numbers of respondents had low & high levels knowledge about recommended dry farming technology, respectively.

6.2.3 RESPONDENT’S ADOPTION

Majority (57.50 per cent) of the respondents had medium adoption about the recommended dry farming technology. Whereas, 18.33 per cent had high and 24.17 per cent had low extent of adoption about recommended dry farming technology, respectively.

6.2.4 ASSOCIATION OF KNOWLEDGE AND ADOPTION (DEPENDENT VARIABLES) WITH SELECTED CHARACTERISTICS OF RESPONDENTS (INDEPENDENT VARIABLES)

6.2.4.1 Association of Knowledge with Selected Characteristics of Respondents

There was no significant association with the knowledge about recommended dry farming technology and their annual income and irrigation potentiality. Age was negative and
Factors associated with respondents' extent of knowledge of recommended dry farming technology (Final paradigm)

Factors associated with

Independent Variables
- Age
- Education
- Size of Land Holding
- Social Participation
- Extension Participation

Dependent Variables
- Cropping Intensity
- Risk Orientation
- Innovativeness
- Mass media Exposure

Knowledge

Fig. 7 Factors associated with respondents' extent of knowledge of recommended dry farming production technology (Final paradigm)
Factors associated with respondents' extent of adoption of recommended dry farming technology (Final paradigm)

Factors associated with

Independent Variables
- Age
- Education
- Social Participation
- Extension Participation

Dependent Variables
- Cropping Intensity
- Risk Orientation
- Innovativeness
- Mass media Exposure

Adoption

Fig. 8 Factors associated with respondents' extent of adoption of recommended dry farming production technology (Final paradigm)
significantly associated with the knowledge of recommended dry farming technology. While market orientation was negative and non significant associated with the knowledge of recommended dry farming technology.

While remaining all characteristics of the respondents like education, size of land holding, social participation, and extension participation, cropping intensity, risk orientation, innovativeness and mass media exposure were positively and significantly associated with the knowledge of recommended dry farming technology.

6.2.4.2 Association of Adoption with Selected Characteristic of Respondents

There was no significant association with the adoption of recommended dry farming technology and their annual income, size of land holding. Age was negative and significantly associated with the adoption of recommended dry farming technology. While market orientation and irrigation potentiality were negative and non significantly associated with the adoption of recommended dry farming technology.

All other characteristics of the respondents like education, social participation, and extension participation cropping intensity, risk orientation, innovativeness and mass media exposure were positively significantly associated with the adoption of recommended dry farming technology.

6.2.5 CONSTRAINTS IN ADOPTION OF RECOMMENDED DRY FARMING TECHNOLOGY

The important constraints faced by respondents were:

1. Appearance of periodic drought spells during cultivation.
2. Poor return as compare to modern technologies.
3. Lack of organized extension machinery to disseminate the proven dry farming technologies.
4. Inadequate and untimely supply of agricultural inputs.
5. Farmers don’t willing to take risk.
6. Lack of information and experience regarding dry farming.
7. Poor economic status of the farmers.
8. Lack of pest and disease resistant varieties.
9. Lack of sound research and development of dry farming.
10. Lack of drought resistance varieties.
11. Controversy among family members regarding dry farming.
12. Lack of availability of labour in time.
13. Lack of special administrative setup to promote dry farming.
14. Lack of organized extension machinery to disseminate the proven dry farming technologies.

6.2.6 SUGGESTIONS TO OVERCOME THE CONSTRAINTS IN ADOPTION OF RECOMMENDED DRY FARMING TECHNOLOGY

Out of 7 suggestions given by the respondents to overcome the constraints in adoption of recommended dry farming technology the three most important suggestions expressed by respondents were:

1. Provide special administrative setup to promote dry farming.
2. Market facilities should be strengthened.
3. Inputs should be made available at subsidized rate.

The other general suggestions to overcome the constraints expressed by respondents were:
1. Sufficient and timely credit facility should be made available.

2. Training should be imported to the farmers.

3. Effective soil moisture conservation technology should be developed.

4. Agriculture literature should be provided.

The tentative paradigm was developed in the beginning of the thesis while arriving at the conceptual framework of this study (Fig. 1 & 2). Now final form of paradigm based on the findings of this study is presented in the Fig. 6 & 7 showing only those independent variables that statistically significantly association with respondents’ knowledge and adoption about recommended dry farming technology.

6.3 IMPLICATIONS

1) Having discussed the respondent’s knowledge and adoption of recommended dry farming technology as well as suggestions to overcome the constraints, some measures emerging from this study for increasing the per unit production of the area have been suggested. Extension personnel should make use of the level of knowledge on different aspects about recommended dry farming technology, while conducting respondents training programme in general and particularly in this area.

2) Identification, documentation of dry farming practices related to various crops in other part of the state should be carried out and that needs sincere efforts on the part of agricultural scientists and extension machinery.
3) There is an urgent need for arriving at consensus on the methodology of the study of dry farming practices.

4) Some simple and low cost dry farming practices should be appreciated by the formal Research and Development System (R&D). Transfer of suitable dry farming practices to similar agro-climatic zones offers cost effective development approaches.

5) The research findings of the investigation have obvious implications for the research and action to be pursued by the formal Research and Development institutions. It calls for immediate research and consensus by the researchers on important dry farming practices.

6) It is high time to educate and convince the farming community to adopt dry farming practices through conducting result and method demonstrations on the farmer's field which prove the efficacies of practices like application of plano fix for modified growth in ground nut and to sow improved variety of pearl millet (GHB-32) within a 15 days of onset of monsoon which were not adopted by majority of the respondents.

7) Such practices should be encouraged among the peasantry and sufficient research should be conducted to find out the rationality behind these practices.
6.4 SUGGESTIONS FOR THE FURTHER RESEARCH

1) The study was confirmed to only North Saurashtra Zone of the Gujarat State. The dry farming practices are extremely location specific, other dry farming practices may be prevailing in other crops and in other areas. These are also being collected and comparative studies can be made these after.

2) Agricultural scientists and extension personnel can take concerted efforts in identification, documentation of different dry farming practices in agriculture.

3) The present study is expected to motivate further research on dry farming practices involving the testing of hypothesis empirically.

4) A strategy should be designed that could facilitate the adopting and promotion of dry farming at grass root level.

5) A common understanding of dry farming must be made.

6) Lack of information, lack of training facilities, non availability of dry farming technologies and lack of knowledge were the major reason deter elicited by the respondents. Therefore, there is a need to provide sufficient information through the various possible media, provide dry farming materials to the farmers through village adoption agencies, offer good training facilities and also provide sufficient credit facilities to overcome the partial and non partial adoption of dry farming practices.
REFERENCES


Makwana, B. A. (2007). Knowledge and adoption of improved animal husbandry practices followed by gir maldharis in gir area of gujarat state. m.sc. (agri.). thesis (unpublished), g.a.u, junagadh.


APPENDIX- I

"EXTENSION STRATEGIES FOR RISK MANAGEMENT IN DRY LAND AGRICULTURE IN NORTH SAURASHTRA ZONE"

INTERVIEW SCHEDULE

Part-I

Respondent Number: - ______

Date: - ______

Name of the farmer: __________________________

Village: ________ Taluka: ________ District: ________

1. Age________

2. Education:

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 or above 12

3. Size of land holding:

(I) Irrigated: _______ ha

(II) Unirrigated: _______ ha

(III) Fallow: _______ ha

(V) Total: _______ ha

4. Annual income

(I) Income from agriculture: __________

(II) Income from other than agriculture: __________

(III) Total income: __________
5. Irrigation potentiality:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Source of irrigation</th>
<th>Period of water available</th>
<th>Area</th>
<th>Irrigated(ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Through out year</td>
<td>Partial available</td>
<td>Never</td>
</tr>
<tr>
<td>1</td>
<td>Well</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Canal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Well +Canal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Bore Well</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Check Dam</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Social Participation:

Are you a member and/or holding any position in any organization?

Yes/ No. If yes give details

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Organization</th>
<th>Position</th>
<th>Participation in Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Member</td>
<td>Position</td>
</tr>
<tr>
<td>(A)</td>
<td>In Village:--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Gram Panchayat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Milk</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. Extension participation:

Did you participate in the following programme?

Yes/No, if yes answer the following.

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Name of Extension activities</th>
<th>Yes/No</th>
<th>Weightage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Conducted demonstration on your field?</td>
<td></td>
<td>9.50</td>
</tr>
<tr>
<td>2.</td>
<td>Had discussion with ext.workers?</td>
<td></td>
<td>6.84</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Season</td>
<td>Crop</td>
<td>Area (ha)</td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
<td>-----------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>1.</td>
<td>Monsoon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Rabi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Winter</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9. Risk orientation:

Please, give your agreement, disagreement or undecideness about each of the statements.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Statement</th>
<th>Agree</th>
<th>Undecided</th>
<th>disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A farmers should grow larger number of crop to avoid greater risk involved in growing one or two crop (-)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>A farmers should rather take more of a chance in making a big profit than to be content with a smaller but less risky profit (+)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>A farmers who is willing to take greater risk than the average farmers usually does better financially (+)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>It is good for a farmer to take risk when he knows his chance of success is fairly high (+)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>It is better for a farmer not to try new farming methods unless most other farmers have used them with success (-)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Trying an entirely new method in farming involves risk, but it is worth taking (+)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. Innovativeness:

Q. When would you prefer to adopt an important practice in farming?

(I) As soon as it is brought to my knowledge.

(II) After I have seen some other farmers using it successfully.

(III) Prefer to wait and take my own time.
11. Market Orientation

Please the degree of your agreement or disagreement to each of the statements given below by putting tick mark (√) to each of them on five point continuum.

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Statement</th>
<th>SA</th>
<th>A</th>
<th>UD</th>
<th>DA</th>
<th>SDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Market News is not so useful a farmers (-)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>A farmers can get good price by grading his produce (+)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>One should sell his produce to the nearest market irrespective of price (-)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>One should purchase his inputs from the shop where is other relative purchase (-)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Ware houses can help the farmers to get better price for his produce (+)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>One demand grow crops which have more consumers demand. (+)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SA = strongly agree  
A = Agree  
UD = Undecided  
DA = Disagree  
SDA = strongly disagree
12. Mass media exposure:

How frequently do you use the following mass media for dry farming production practices?

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Mass media exposure</th>
<th>Regularly</th>
<th>Frequently</th>
<th>Once in a week</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Radio</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Television</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Newspaper</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Printed literature</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Agril. Exhibition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Demonstration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Any other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Study of level of knowledge of respondents regarding to recommended DRY FARMING TECHNOLOGY.

Please give the responses, yes/No to the following questions/statements.

<table>
<thead>
<tr>
<th>SR. NO.</th>
<th>RECOMMENDATIONS</th>
<th>DO YOU KNOW?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bunding across the slope should be done before onset of monsoon.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Leveling the land should be done before onset of monsoon.</td>
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</table>
Part III

Study of level of adoption of respondents regarding to recommended DRY FARMING TECHNOLOGY.

Please give the responses, yes/No to the following questions/statements.

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<th>SR. NO.</th>
<th>RECOMMENDATIONS</th>
<th>DO YOU ADOPT?</th>
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<th>Less Important</th>
<th>Not Important</th>
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<td><strong>BIOPHYSICAL CONSTRAINTS</strong>&lt;br&gt;1. Appearance of periodic drought spells during crop season.&lt;br&gt;2. Poor water retention capacity of the soils.&lt;br&gt;3. Insect-pest and diseases are not easily control in dry farming.&lt;br&gt;4. Induce the weed seeds.</td>
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<td>B</td>
<td><strong>MICROLEVEL CONSTRAINTS</strong>&lt;br&gt;1. Medium education of the respondents.&lt;br&gt;2. Lack of awareness about dry farming.&lt;br&gt;3. Poor economic status of the farmers.&lt;br&gt;4. Farmers don’t willing to take risk.&lt;br&gt;5. Lack of information and experience regarding dry farming.</td>
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<td>C</td>
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<td>3. Poor contact of extension workers with farmers</td>
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II. SUGGESTIONS

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