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CHAPTER - FOUR

PRODUCTION, COST AND INCOME YIELD ANALYSIS OF GRAPE FARMING

INTRODUCTION

Since the 1970's as seen in the previous chapter we have noticed that because of the implementation of the grape garden project finance scheme by the MSCLDB, in Miraj taluka development of grape farming has been undertaken on an increasing scale by the farmers. In western parts of Miraj taluka grape farming development has developed with adequate water supply mainly through lift irrigation schemes. The size of the grape farms in this region is larger than in other parts of Miraj taluka and grape farming here has developed on scientific lines. However, in eastern parts of Miraj taluka which comes under the rain-shadow region development of grape farming has taken place with less water availability. Hence, the impact of the development of grape farming on the cultivating farmers is bound to be different in these different parts of Miraj taluka. Due to this differences in the regions, we have decided to study the impact of the MSCLDB's financing of grape farms on the cultivating farmers in the eastern part of Miraj taluka where grape farming has developed with less water availability.

While studying this impact of loan financing in the development of grape gardens we have selected a sample size of farmers and the following main aspects are studied :

1. Impact of cropping pattern.
2. Use of loans taken in the development of farm equipment and machinery, improvements on land, growth of irrigation etc.
3. Impact of loan finance on the -
   a) Cost of grape farming,
   b) production yield of grape farms and
   c) income generation of grape farms.
4. Impact of grape farming on additional employment generation in the area.
5. Increase in grape farming and the problem of marketing of grapes.
6. Use pattern of additional income generated due to development of grape farming by the farmers and
7. Problems faced by the farmers due to development of grape farms.

To study the above impact of loan finance given for grape farming data regarding the above aspects was collected from the sample selected for study with the help of questionnaire and interview method. The study of

the data thus collected is divided into three parts :

1. General information regarding grape garden growing farmers.
2. Analysis regarding grape garden farming (Production/costs/yield analysis).
3. Analysis regarding employment generation created due to grape garden farming : use pattern of additional income created.
4. Analysis of problems associated with grape garden farming.

SECTION - I

GENERAL INFORMATION REGARDING GRAPE GARDEN GROWING FARMERS

1) INFORMATION REGARDING SIZE OF THE FAMILY

Before collecting the necessary data regarding grape farming, to understand the farmer's background, information regarding their family, education and other personal details was also collected. Collection of such information is important while undertaking this type of study because the living conditions, the cultural and educational background of the farmers influence to a extent on production decision making of an average Indian farmer.

From the Table No.4.1 we find that out of the farmers surveyed, the majority of them were having joint family. Such a type of family pattern always provides

Table No.4.1

Size of Family

Particulars	No.of Farmers	Percentage to total farmers
1. Family size consisting 1 to 5 members	13	26%
2. Family size consisting 10 members	16	32%
3. Family size consisting above 11 members	21	42%
Total	50	100%

sufficient family labour when labour intensive grape farming cultivation is undertaken. Out of the fifty farm families surveyed only 13 farmers had a family size of 1 to 5 members. 16 farmers had a family size of 6 to 10 members, while 21 farmers had joint family size of 11 members and above. Thus, percentagewise we find that 74% of the families were of a size of 6 and above members. Thus, cut of the farmers undertaken for study majority of them were having joint family status. (such a family size is always advantageous while undertaking grape farming, as family members can keep a personal supervision) - family size and availability of responsible members to supervise and look after farms.

2) INFORMATION REGARDING EDUCATIONAL BACKGROUND OF GRAPE GROWING FARMERS

Change in the pattern of cultivation undertaking of cash crop cultivation especially in less irrigated areas requires dynamic decision making ability of the farmers intuition and positive determination to undertake risk in farming. Essentially means psychological preparation of the farmers which to a great extent is related to his educational background. Ability to read and write creates awareness among the farmers regarding change in the technique of production. Keeping this factor in view we collected information of the educational background of the farmers which is presented in Table No.4.2.

Table No.4.2

Educational Background of Grape Growing Farmers

Sr. No.	Particulars	No.of farmers	Percentage to total farmers
1.	Illiterate	6	12%
2.	Primary education upto 7th standard	31	62%
3.	Upto High School	12	24%
4.	College or further education	1	2%
	Total	50	100%

From the above Table No.4.2 we can see that only six of the fifty farmers were having no formal

education, 31 of the fifty farmers were having education upto the middle school level. While 12 were having education upto matriculation, one of the farmers was having education upto graduation level. Our study reveals that 88% of the total farmers surveyed could be classified as literate which helps in marking them have a progressive out look.

3) INFORMATION REGARDING SIZE OF HOLDING AND SOURCES OF IRRIGATION

Grape garden cultivation is essentially intensive and high cost cash crop cultivation specially in areas having less facilities of irrigation. The area from which the sample for study was selected is essential rainfed area depending upon well irrigation as the major source of water. In such circumstances grape farm cultivation that is undertaken will essentially been a part of mixed farming cultivation pattern. Most of the farmers will undertake production of other food grains, cereals and pulses along with grape farming on a relatively small scale. The scale of the grape farm cultivation will essentially depend upon the irrigation potential of the particular farmer. Hence as the area selected for study is dependant on well-irrigation then it follows that the size of the grape farm of each farmers will be limited by the availability of water from the wells. In well water irrigated area the natural tendency

classification of Land holdings on what basis?

Table No. 4.3

Classification of Grape Garden Growing Farmers According to Size of Holdings.

Sr. No.	Particulars	No. of Farmers	Percentage to Total farmers
1.	Holding of land 1 to 8 acres (small farmers)	20	40%
2.	Holding of land 8 to ~~10~~ 15 acres (middle farmers)	20	40%
3.	Holding of land above 15 acres (rich farmers)	10	20%
	Total	50	100%

of the farmer would be to go for mixed farming cultivation which means that in addition to grape farming, the farmers will undertake production of other agricultural commodities. From the study conducted, we found that 20 of the farmers were having a size of holding between 1 to 8 acres, 20 of the farmers had a farm size of 8 to 15 acres and there were 10 farmers having size of holding above 15 acres. The size of holding pattern in well irrigated areas does not determine the size of the grape farm but it is essentially the irrigation potential of the major sources of irrigation (our case well irrigation) which determine the size of the grape farm.

Out study of the farmers reveals that all the farmers were solely dependant on well irrigation for

irrigating the grape farms (Please refer Table No.4.4) with the amount of rainfall available in this part of

Table No.4.4

Sources of Irrigation

Sr. No.	Source of Irrigation	No. of Farmers	Percentage to Total farmers
1.	Well Irrigation	50	100%
2.	Tank Irrigation	-	-
3.	River/Lift Irrigation	-	-
	Total	50	100%

the Sangli district falling in successive years the ground water level is bound to decrease. This will effect the availability of water in the coming years, and hence in future, unless alternative sources of irrigation are not developed the extent of grape farming will show no signs of increase.

4) AVAILABILITY OF FARM INPUTS WITH THE FARMERS

Grape cultivation is highly intensive cash crop cultivation. It requires capital and labour power with the farmer. The farmer undertaking grape cultivation as a result will need agricultural implements, live-stock and sufficient labour hands in its cultivation. In our study we also gathered information regarding the farm

equipment that the farmers has. This is given in Table No.4.5.

Table No.4.5

Availability of Farm Inputs with the Grape growing farmers

Sr. No.	Particulars	No. of Farmers	Percentage to Total farmers
1.	Pump sets/Electric Motors	50	100%
2.	Spraying Pump	50	100%
3.	Bullock Cart	50	100%
4.	Tractor	2	4%

As per Table No.4.5 it is found that nearly all the farmers had electric pumpsets. This is so because wells being the only source of irrigation all had to have electric pumpsets. Grape gardens are frequently effected by pests and insecticides hence each farmer has to possess the necessary spraying pumps with him. In addition bullock carts are required for preparation of the garden and they also serve as means of transportation. All farmers surveyed had spraying pumps and bullock carts. 4% of the farmers also had tractors. Table No.4.5 reveals that minimum capital equipment is a pre condition for the development of grape cultivation and hence the relatively better off

farmers who have these capital equipment are in a position to undertake such intensive form of cash crop cultivation.

The above capital equipments and farm inputs can also be obtained by the grape growing farmers by taking loans from the Land Development Bank. Loans taken for these productive purposes help in proper development of grape farms. Therefore, in addition of financing the development of grape garden the Cooperative Land Development Bank also provided loans to the farmers for other productive purposes. Financing for other purposes is also important because development of grape farms requires proper growth of infrastructure in the form of development of irrigation, development of water pipeline, levelling of land etc. Grape cultivation in non-irrigated areas essentially depends upon development of some farm of non-premium source of irrigation. The Researcher also collected information regarding the loan taken by the farmers for other purposes from the Cooperative Land Development Bank. Collection of such information was necessary because such infrastructure development is a pre-condition for successful grape farming. Such information collected is presented in Table No.4.6.

Analysis of the Table No.4.6 shows that 64% of the farmers had taken a loan for digging of new wells

and 24% of the farmers took a loan for rennovation of old wells. Bank loan for this purpose is important

Table No.4.6

Purposewise Distribution of Productive Loans

Sr. No.	Particulars	No.of Farmers	Percentage to Total Farmers
1.	Loans for Digging of new wells	32	64%
2.	Loans for Repairs of Wells	12	24%
3.	Loans for purchase of Electric Motors	18	36%
4.	Loans for Cement Pipeline(PVC)	16	32%
5.	Loans for purchase of Tractors	1	2%
6.	Loans for Land Improvements	1	2%

because in the area of study well-irrigation is the major source of irrigation. Importance of well-irrigation would mean that installation of pumps, development of pipeline, would be needed to irrigate the grape gardens. Loans for these two purposes were taken by 36 and 32% of the farmers. This means that the remaining farmers already had the development of well-irrigation. Among the other productive purposes 2% of the farmers obtain a loan for the purchase of tractor and for land development scheme. The table, however, reveals that most of the farmers took a loan for development of proper well

irrigation development scheme.

5) EXTENT OF SELF-FINANCE BY GRAPE GROWING FARMERS

In addition to capital farm equipment while developing grape garden in addition to bank loan finance the farmers financial viability is also important. This is because in the initial stages of the grape garden development heavy expenditure has to be incurred while the returns come after nearly a year, in the initial stages bank finances available may not be adequate and therefore, the farmers should be financially viable to put in some amount of financial investment. In our study we obtained information regarding the self-investment made by the farmers. This information is presented in Table No.4.7. According to the Table we find that 32% of the farmers had invested 1000 to Rs.5000 in the development of the grape garden, 62% had invested Rs.5,000 to Rs.21,000/- while 6% of the farmers have invested more than Rs.10,000 as self-investment. Thus, this table reveals that in the development of grape farming, the farmers should be financially viable to invest money whenever bank finance is inadequate or is not available when needed. This also proves that the well to do farmers having adequate farm equipment and who are in a position to invest self-finances are in a better position to undertake this type of cash

All these groups should have been accumulated in small, middle & big farmer groups. So that behaviour patterns of these groups become clear.

Table No.4.7

Extent of Self-Investment made by Grape Growing Farmers.

Sr. No.	Particulars	No. of Farmers	Percentage to Total Farmers
1.	Investment between Rs.1000 to Rs.5000	16	32%
2.	Investment between Rs.5,000 to Rs.10,000	31	62%
3.	Investment above Rs.10,000	3	6%
	Total	50	100%

crop cultivation.

6) AGENCIES PROVIDING INFORMATION TO FARMERS REGARDING GRAPE CULTIVATION

Grape farming as a form of cash crop cultivation developed in Miraj taluka since the 1970's. The farmers were encouraged to undertake this cultivation mainly by the successful experience of farmers in the nearby Tasgaon taluka. Grape cultivation is highly intensive form of cultivation in the sence that the farmer has to keep a close watch on the development of the garden. The grape vine-yard, the buds the fruit all have to be developed scientifically with proper watering, pronning and spraying of proper pesticides. In addition the spacing of the sampling preparation of the farm doses

of fertilizers etc. All this, needs proper and timely guidance and assistances to the farmers. More so, if the garden is a new garden. Hence in this form of cultivation the farmer needs guidance and directives which is very important for the proper development of the garden. Taking this into view we also gathered information regarding the person or institution which provided the farmers with the necessary guidance and help. This information is presented in Table No.4.8

Table No.4.8

Agencies providing information and guidance to farmers

Sr. No.	Agencies providing information	No.of farmers making use of the agency	Percentage to Total Farmers
1.	Grape Growing Farmers	50	100%
2.	Friends/Relatives	50	100%
3.	Agricultural College	10	20%
4.	Guidance provided by the Grape Growers' Association	40	80%
5.	Bank Officers/Supervisory Staff	10	20%
6.	Radio	10	20%
7.	Television	1	2%

According to Table No.4.8 we find that other grape cultivating farmers and friends were consulted by all the farmers surveyed. Grape growing farmers of Miraj

taluka have formed a 'Grape Growers Association' which provides necessary guidance and technical assistance to the member farmers. Most of the farmers consult each other whenever the association meets. In addition the association also conducts discussions and problem solving seminars where agricultural experts are invited to guide the farmers. Nearly 80% of the farmers have taken benefit of the associations activities.

Relatives, however, we find that extension and demonstration activities of the agricultural college and guidance from the banking sector was not adequate and only 20% of the farmers approached to these agencies for guidance. Radio and Television can also act as a media of extention to provide farmers with expert guidance. But in this case only 20% of the farmers reported that they made use of radio for guidance and only 2% took guidance from the various farm programmes on television.

The above data analysis reveals that by and large most of the farmers while solving the problems consult the local grape growing farmers nearby this cooperation between farmers is helpful for grape growing because small farmers by consulting local big grape growing experienced farmers can solve their problems associated with grape farming. However, the

local Agricultural Colleges should increase their guidance and provide technical information to the farmers so that they cultivate grape farming in better scientific method. In addition the cooperative Land Development Bank can also provide increased assistance to the farmers.

7) INFORMATION REGARDING AVAILABILITY OF FARM EQUIPMENT AND MACHINERY

Grape farming is a highly intensive form of cash crop cultivation where adequate capital and labour has to be invested by the cultivating farmer. Therefore when grape farming is undertaken the farmer has to possess farm equipment and other capital implements. We gathered information regarding the availability of farm equipment with the farmers. It was found that 49 of the 50 farmers had with them their own farm equipment which are needed for grape farms. These equipments were by and large bought through loans taken from the Cooperative Land Development Bank. Only one farmer was not in possession of his own equipment and, therefor took them on hire from other farmers. This information thus reveals that grape farming is highly capital intensive and the necessary farm equipment has to be available to the farmer whenever needed. This farm equipment is needed for spraying of chemicals and pesticides, harvesting of crops, pronning of vines etc.

all activities which have to be done timely and hence ready availability of equipment is a must.

8) INFORMATION REGARDING CROPPING PATTERN OF THE FARMERS

The area selected for study is essentially a non-perinial area where over the years crops that are cultivated are basically rain-fed. The only source of irrigation available is well irrigation and here too the availability of water is getting reduced due to fall in the annual average rain-fall in this area. Thus, water availability is the main factor on which the development and extention of grape farming depends. The size of grape farm in the area of study, thus, depends on the potential of the well to irrigate the grape farm. In such situation it is obvious that the farmers will undertake grape farming only on a limited scale and a major portion of their holding will be utilised for production of other crops. Thus, in the area understudy grape farming is a part of the mixed farming pattern adopted by the farmers in non-irrigated areas. When the farmers under study introduced grape farms it also meant that other cash crops development on their well-irrigation may have been reduced because well-irrigation in the area understudy has no potential to provide water to two cash crops at a time. Information regarding the cropping

pattern reveals that the farmers under study developed grape farms on a limited size which was a small fraction of their overall holdings. Thus, alongwith grape farming they alsc undertook cultivation of Kharif crops like jowar, groundnuts, tur, rabi crops like gram, wheat and some form of vegetable cultivation. As availability of water was limited to start a grape farm it meant that the earlier cash crops cultivation had to be replaced by this type of high profits cash crop cultivation. The farmers understudy gave up the cultivation of sugarcane, beetul leaves plantation and turmeric and vegetable cultivation and introduced grape farming. This replacement was mainly due to inadequate water supply which did not permit simultaneous cultivation of two cash crops. To undertake the study in the change in cropping pattern brought about due to introduction of grape farming by farmers in the area of study, we collected information from the farmers as to what crops they cultivated before and after they undertook grape farming. The information of the farmers is tabulated and presented in Table No.4.9.

The analysis of the above data reveals that with the introduction of grape farming the farmers reduced the cultivation of cash crops namely (a) sugar-cane (b) Beetul leaves plantation and substituted it by

Table No.4.9

Shift in Cropping Pattern

(Area in Acres)

Area under Cash Crops Before Grape Farming			Area under Cash Crops after Grape Garden Development			
Sugar-cane	Beetul leaves plantation	Others	Grape Gardens	Sugar-cane	Beetul Leaves plantation	Others
76.20	18.30	38.20	61.10	22	5	28.20

growing grape gardens. The shift over to grape farming was mainly done by reducing the cultivation of other cash crops, as water available was not sufficient to undertake more than one cash crop, which required more water. Before grape farms developed the area under sugarcane was 76.20 acres, Beetul Leaves were grown in 18.30 acres. After grape farms developed and expanded, we find that area under sugar-cane was reduced to 22 acres and Beetul leaves area came down to 5 acres only.

SECTION - II

1) FEATURES OF GRAPE FARMING

In the recent years Maharashtra is one of the States which is becoming important in the field of grape cultivation, especially seedless grapes. As such grape farming in Maharashtra has a history which starts with the grape gardens developed during the Mughal rule, when some grape gardens were developed in Daulatabad. Modern methods of grape farming were developed by 'Doctor Cheema' in 1921 when he established at 'Ganesh-Khind', the fruit research centre which was affiliated to the College of Agriculture, Pune. In those days, 'Bhokri', 'Fakdi' and 'Gosavi' variety of grapes were developed. In those days the seeds of the grapes were sown and the vines were developed. Since 1940's important varieties of grapes were also developed and these included, 'Dabuki, Anabshi, Kalisahbi etc. After 1950 grape farming got further development through the work of Doctor Nagpal and Doctor Gupta who developed new grape varieties.

Since 1960's grape farming developed in Western Maharashtra to a great extent with new varieties coming from Russia. In the early period Nasik and Pune district and some parts of Aurangabad district had extensive grape cultivation. In these development

the role of Agricultural College of Pune, Mahatma Phule Agricultural University, Rahuri and the Agricultural College, Aurangabad was important. Since 1970's, however, we find the greater development of seedless variety of grapes in Sangli district and Solapur district. Tasgaon, Miraj and Khanapur talukas of Sangli district have become famous for grape farming. The seedless variety of grapes were essentially imported from the grape vineyards of California, U.S.A., from where the Thompson seedless variety of grapes vines came into Sangli district. William Thompson of California was the first man to develop the Thompson seedless variety of grapes. Out of total area under grape garden farming in California State in U.S.A., 40 percent of the area is under Thompson seedless variety of grapes. The Thompson seedless grapes are big, and longer in length and have a greater pulp content and are sweeter in taste. The grapes develop faster and the stern and branches of the vines are strong and solid. In California, the grapes are cutdown with the help of cutting machines, which is specially developed for grape farms. Thompson seedless grapes can be preserved in cold storage for a maximum period of three months. Most of this grape variety is dryed and converted into 'Dry-Grapes'. Half of the World's total dry grapes and 95 percent of the dry-grapes of California are prepared from the Thompson seedless

variety of grapes. In addition, from this variety of seedless grapes, white wine is also produced through the fermentation process. With the help of these seedless variety the farmers latter developed local varieties like Tas-E Ganesh, Tas-E-Chaman, Sonaka varieties. In recent years grape farming has also spread to Sangola, Pandharpur and Barshi talukas of Solapur district. In Sangli district we find that grape farming has developed relatively in areas having less supply of water but having fairly dry climate. In Sangli district grape farming is well developed in Tasgaon, Khanapur and Miraj talukas were irrigation development is fairly less and if there is adequate water in the form of lift irrigation in these talukas sugarcane is cultivated. In these talukas were grape farms have developed well-irrigation is the main source of irrigation. In the area of this study which is the eastern part of Miraj taluka, well irrigation is the only source of water supply.

Grape farming has been developed here by the farmers with limited water supply. Prior to grape farming the farmers in these areas were undertaking Beetul leaves plantation but as this become less profitable they switched over to grape farming.

The average size of a grape farm in these area is one acre, though the farmers cultivating grapes have a larger size of land holding. The reason for such small

size of grape farm is the limited water available from the only sources of irrigation that is wells. Hence grape farming in this area is undertaken in conditions where water availability is becoming a problem for the farmers.

Comparatively in the western parts of Miraj taluka where the Krishna river flows grape farming is undertaken in well irrigated areas through lift irrigation scheme as water availabilities is more in these areas, the average size of grape farms here are relatively more larger than the selected area of study. With assured water supply grape gardens are of a bigger size in these areas.

GEO-CLIMATIC CONDITIONS SUITABLE FOR GRAPE FARMING

Grape gardens need essentially red-soil formation. The soil formation may be of 1" rocky formation underneath. Fertile black soil is not needed because for grape gardens moisture retaining soil is not needed. Such soil formation is found in eastern parts of Miraj taluka. Even in black soil grape farms can be undertaken but over the black soil a layer of rocks and stones has to be laid over which red soil will have to be put. Climatewise grape garders essentially need dry and clear sky conditions. Moisture in the atmosphere is not good for grape farming. If grape gardens are grown near

sugar cane fields then the possibility of dew which is formed will effect the grape gardens. Hence, grape gardens developed in areas where cash crop cultivation is undertaken are more effected by insecticides. In the area of study there is no cash crop cultivation and therefore, the area remains dry and clear which suits grape farming. Grape farming like other cash crops also requires adequate and timely supply of water but water requirements are relatively less than sugar-cane, turmeric and Beetul leaves cultivation. In the area of study rainfall over the years is decreasing and water supply is only through wells. In such a situation we find farmers having grape gardens who's size varies between 1 acre to 20 gunthas. In areas where water is not sufficient drip irrigation will prove to be better way of water supply. However, along with drip irrigation water supply through flow method is also essential as flowing water reduces soil salinity, while undertaking grape farming farmer has to take adequate precautions against natural calamities and unpredicted weather changes like non-seasonal rains, excess cold thunder storms and hail storms. Such natural calamities affect the grape farms and bring about losses to the farmers. In addition such weather changes effect the grapes and some insects and pests also develop against which the farmer has to take precautions through timely

spraying of insecticides and pesticides.

DEVELOPMENT OF GRAPE GARDENS

Grape farming is essentially a high investment labour intensive form of cash crop cultivation. The per acre cost of cultivation of grapes of Thompson seedless variety is such that the initial investment in the first two years is high, it is estimated by the MSCLDB that in the first-year the cost of cultivation per acre is Rs.45,000/- and in the second year cost is estimated to be Rs.15,000/-[1]. Thus, the total capital expenditure in the first two years in recent years is estimated to be Rs.60,000/-. However, due to rising price of inputs, the costs each year are bound to increase. From the third year onwards when grape production starts the costs come down to Rs.11,500/- per acre as per calculation of MSCLDB. From the 4th year onwards yearly recurring expenditure is estimated to remain as in the third year. Grape gardens have to be developed systematically with personal attention by the farmer. The supply of adequate and timely water, fertilizers and spraying of chemicals has to be done at proper timely and diseases have to be anticipated by the farmers with changes in weather for which the farmer has to keep a close watch, on the development of his grape farms. In the initial stages when a farmer decides to develop a grape garden he has to have with him, initially -

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1. Cost estimates, income estimates figures given here are reproduced from the calculations made by the Sangli Branch of MSCLDB in their "Grape Project No.6, Horticulture Scheme, Financing for Grape Cultivators.

(1) Assured water supply who's quantity will decide the size of the grape garden.

(2) The erection of the grape garden needs high investment and, therefore, he should have finances available with him. Thus, finance can be taken in the form of loan from the banking institution. With the satisfaction of the above condition the grape garden has to be prepared for this the land will have to be prepared with layer of red soil. The land will have to be level and plots will have to be prepared the size of each plot should be 6'X4' or 6'X6' so that the gap between two plots is 6' and gap between two grape vines is 4'. Once the plots are prepared the soil will have to be covered with cowdung layer of dry leaves, super phosphate and 10% B.S.A. powder should be sprayed in these plots so that termites do not develop in soil. After the plots are prepared between the plots water should be flown. In grape farms of bigger-size the farmers keep more distances between two plots. So that it is easy for them to take small tractors, spraying equipment into the farms. Moreover, labourers can move more freely in the garden and more sunlight will also come inside the farms. Once the plots are prepared the grape vines are soon planted in the following two ways -

(1) Direct branch planting and

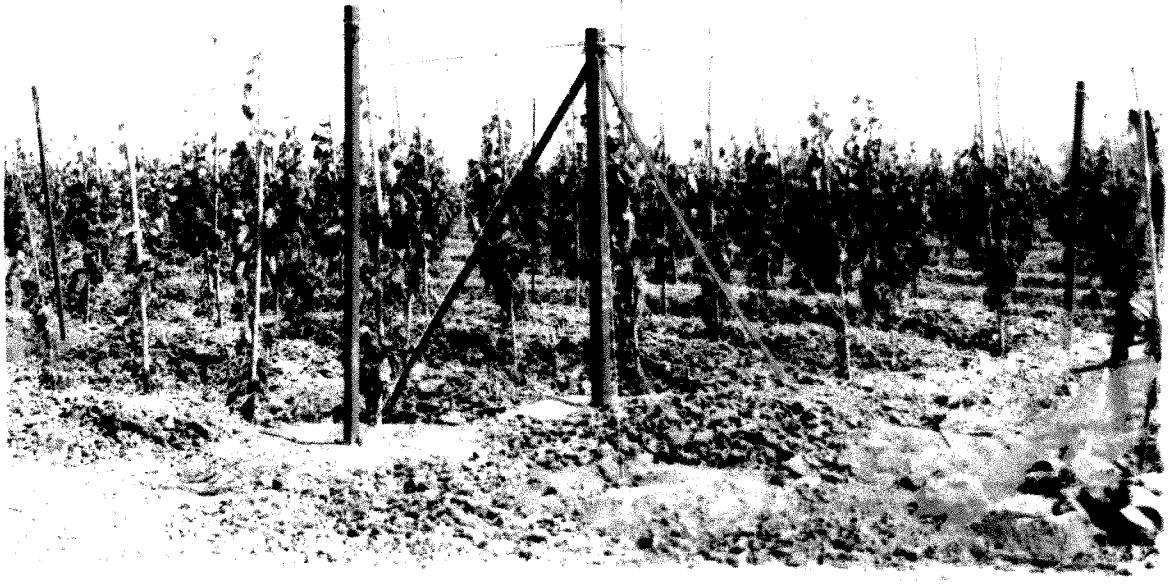
(2) Development of Nursery and then trans-plantation of the vines on the grape farms. Most of the farmers prefer the direct branch plantation method. At present the following seedless variety of grapes are available for cultivation.

1. Thompson seedless,
2. Sonaka
3. Tas-Ganesh and
4. Manik Chaman.

Of the above varieties the farmers prefer cultivation of Thompson seedless as the grapes are more sweeter for eating, dry grapes can be prepared well and they are less prone to diseases. However, the other varieties are preferred by the merchants as the grapes are longer and thus are more in weight, but these varieties are more disease affected. The planting of grapes is taken up in the month of August before which the plots are prepared in May and June, when the branch is planted each branch should have normally five buds of which two buds should be inside the soil, the third at the soil level and the remaining two buds above soil level. One's the branches are planted close supervision has to be kept by the farmers so that no disease affects the branches which are planted. After the plantation the leaves and the branches developed and in this development

the leaves may be effected by disease for which chemical insecticides have to be sprayed every 10 days. In the vines development uneveness in their development has to be reduced. For the better development of the vines a dose of N.P.K. has to be given regularly when the grape vines grow upto a distances of three feet they are supported by bamboo sticks. After this growth the branches have to spread on the toppings for which with the help of iron angles or stone blocks the trelishing is prepared. While preparing the trelishing for one acres of grape garden 4 corner angles (3" into 3" into 9') are required, support angles required are 8 (2" x 2"), 100 inside angles (1" x 1") are needed. Over these angles the wires are laid on which the branches of the grape vines are tied.

Once the vines develop upto the level of the over head wires the branches will have to be spread on the over head wires. Each vine should have 10 branches with should develop and 5 each should go in each direction. These branches will have to be tied to the over head wires. Each of the 10 branches should be grown on the topping to a length where each sub-branch has 15 leaves each. Each of this 15 leaves sub-branch should be tied to the topping. On each of the vines thus developed there have to grow 24 bunches grapes, so that each bunch of grapes has a area of 1 square feet of land.



THE PREPARATORY STAGE OF GRAPE CULTIVATION

THE FINAL AND HARVESTING STAGE OF GRAPES

THE GRADING, PACKAGING AND LABELLING OF GRAPES BY HIRED LABOURERS

Once the sub-branches are developed the buds will have to be exposed so that the fruit formation takes place. At this stage chemical spraying has to take place in addition when the fruit germination takes place in the exposed buds insecticides will also have to be sprayed. Once the flowering takes place on these bunches of grapes these bunches will have to be dipped in zebralic acid. So that fruit formation is well developed. Taking into account the size of the grape bunches each grape plant should have 26 to 28 grape bunches. At this stage soil nutrients will have to be increased more chemical fertilizers like Aluminum sulphate, potash, DAP will have to be given and on an average 100 kg. of chemical fertilizers will have to be put in for one acre of grape garden. So that the grapes are well developed. At this stage the farmers have to undertake Girdling on the stem of the vines at a distance of 1 feet above the ground level. Girdling is basically done to prevent the Nutrients prepared by the leaves from spreading down to the steam of the plant, so that the grapes get more supply of nutrients prepared by the leaves. After the Girdling is over another dose of chemical fertilizers has to be given. After the bunches of grapes are developed the bunches have to be thinned and in each bunch a few weaker grapes have to be removed so that the remaining grapes develop well and in each bunch optimum

number of grapes remain. All the grape bunches should be tied to the wire topping and spraying of chemicals should be constantly carried on. At this stage proper care has to be taken of the grapes. When the grape fruit start bearing juicy content a fertilizer dose has to be given and when sugar formation takes place oilcakes have to be mixed to the soil. The grapes are ready for cutting after four to four and half months.

The grapes are ready for cutting normally in the month of February to early May. When the grapes are ready for cutting adequate labour has to be employed for the harvesting operation. The grapes will have to be cut from the branches and collected in the farm house. For marketing of grapes proper packing of grapes has to be done and the grapes packed will have to be transported to the area of sales. This process is a labour intensive process. Marketing of grapes can be done in two ways -

1) Grapes can be packed in cardboard boxes and be sent to the buyer. This type of selling is quite costly.
2) Sometimes the farmers collect the grapes in baskets and the grapes are sold non packed in the baskets.

Grape farming is a high investment cash crop farming. In addition, for successful grape farming the

farmers have to develop a scientific attitude towards grape cultivation. The plantation of the branches, supply of water input of fertilizers, spraying of chemicals, the cutting and prooning of leaves and branches, all have to be done with proper care and at proper time. Advance precautions have to be taken against the development of disease. All this requires keen observation of the grape gardens by the farmer himself. In addition the cultivator must keep personal supervision of the farms. He should collect information from the various agencies and other farmers. Thus, if proper care is taken at different stages of production and the inputs are properly given grape farming can be more profitable than other cash crop to the farmer specially in areas where cash crop farming is undertaken with less water availability. It is noticed by the researcher that the bigger farmer with more capital and more water and with scientific cultivation is relatively more suited for grape farming as grape farming on larger size of farm is developed with more capital intensive farming and it is looked upon as a sort of industrial enterprise where with proper farm management and optimum use of inputs with cost efficiency the range of profitability is increased.

2) PRODUCTION COST AND YIELD ANALYSIS OF GRAPE FARMS

When the study was undertaken the farmers selected for the study who formed the sample group were selected through stratified sample technique. Out of the 50 farmers selected for the study 10 farmers belonged to the holding size group of above 50 acres. 20 farmers had a land holding size of 8 to 15 acres, while remaining 20 belonged to the size of less than 8 acres when the information regarding size of the grape farm was studied it was found that 10 farmers belonging to the first group had one acre each as there grape farms. All the remaining 40 farmers had a grape farm who's size was less than 1 acre. The reason for this is that in the area understudy well irrigation is the only source of irrigation. And therefore, availability of water puts restriction on the size of the grape farm even if a farmer having a holding of more than 50 acre could manage to develop only 1 acre of grape farm. As water availability was restricted, therefore, while analysing the production trends we decided to study the production trend by comparing the production on one acre grape farm with the production trend on less than one acre grape farm i with the production trend on less than one acre grape farms.

While tabulating the data the total production, total cost of all the one acre farms (of 10 farmers) was calculated and to derive the average per acre farm production this total was divided by the number of farms. (10 farms of one acre each size). Similarly the total production and total cost of the remaining 40 farmers were calculated and to the derive the per farm average production and average cost. The total was divided by the total area under grape farms of these farmers which comes to 32 acres. The production and cost trends are tabulated as follows :

A) PRODUCTION AND COST TRENDS OF ONE ACRE SIZE GRAPE FARMS

Among the 50 farmers surveyed 10 farmers who had a total farms size of more than 15 acre each cultivated one acre ⊠ each of grape farms. There may be basically two reasons why even big farmers in this area are having only one acre of grape farms. The first important reason is the restriction on the availability water as well irrigation is the only source of irrigation and water available from these wells is not sufficient enough to provide water to more area.

Grape farming is risk investment and enterprenurship is needed to be displayed by the farmers in drought prone area as Miraj taluka. Therefore, such grape farming will be undertaken on a small scale only.

Table No.4.10

Production and Cost Trends of One Acre Size Grape Farms.

Items	1982-83		1983-84		1984-85		1985-86		1986-87	
	Total	Per Acre	Total	Per Acre	Total	Per Acre	Total	Per Acre	Total	Per Acre
1. Crop Yield in Kgs.	76,500	7,650	85,000	85,000	75,500	7,550	74,400	7,440	62,400	6,240
2. Crop Yield in Rupee Terms	4,50,500	45,050	5,00,500	50,050	4,53,000	45,300	4,46,400	44,640	3,73,800	37,300
3. Total Cost of Production	1,19,000	19,600	2,19,000	21,900	2,02,000	20,200	2,12,000	21,200	1,72,500	17,250
4. Net Profits(2-3)	2,54,000	25,400	2,81,500	28,150	2,51,000	25,100	2,34,400	23,440	2,01,300	20,130

A 3-yr av. of cost, output & rev. & profits could have been taken.

The production and the cost trend in one acre grape farms is presented in Table No.4.10. We have studied the production and cost trends from 1982-83 to 1986-87 as these figures were provided by the farmers. To calculate per acre production on one acre grape farms we followed the following method.

First, the total grape production on all ten acres of grapes grown by ten farmers (big farmers) was calculated. This was done by adding together the total production of grapes on the farms of all ten farmers. Total production thus calculated was for all the years 1982-83 to 1986-87. The total grape production thus, was 76,500 kgs. in 1982-83, 85,000 kgs. in 1983-84, 75,500 kgs. in 1984-85. In 1985-86 total grape production was 74,400 kgs. and in 1986-87, the total grape production was 62,400 kgs. From the above total grape production, per acre grape production was calculated by dividing the total grape production by the number of acres under grape production.

Similarly to calculate per acre yield in money terms, the per acre farm yield in kilos was multiplied by the price obtained by the farmer per kg. in the particular year and the total yield per acre in rupee terms was calculated.

Per acre production of grapes on one acre size grape farms increased from 7650 kgs. in 1982-83 to 8500 kgs. in 1983-84. However, from 1984-85 to 1986-87 per acre grape production shows a fall in production and 1986-87 per acre grape production, in this farm size came down to 6240 kgs. Decline in per acre production in the last three years was mainly due to -

(1) Fall in average annual rainfall due to failure of mansoon rains.

(2) Climatic variations which affected production like non-seasonal rainfall, excessive cold and fog in the last three years.

Per acre production on one acre size grape farms in money terms shows two trends -

From 1982-83 to 1983-84 per acre production in rupees increased from Rs.15,050 to Rs.50,050 but from 1984-85 the per acre production in money terms has declined from Rs.45,300 to Rs.44,640 in 1985-86 and to Rs.37,380 in 1986-87. Production in money terms has fallen mainly because actual physical production has declined in these three years. Moreover, the price of grapes paid to farmers have remained more or less constant.

Per acre cost of production, however, on one acre size of grape farms shows increasing trend. To why ? calculate per acre cost of production, we followed the

following method.

In the initial stages, with the data available from the response of the farmer in the Questionnaire, the total cost of production of the each farmer was calculated to produce one acre of grape production. While calculating total cost, the cost of production alongwith repayments and interest costs was added. The total costs of each farmer (10 in all) was added and thus we obtained total cost of production to produce 10 acres of grape farm for all the years i.e. 1982-83 to 1986-87. Total cost of production thus calculated came to Rs.1,96,000 in 1982-83 2,19,000 in 1983-84, Rs.2,02,000 in 1984-85. In 1985-86 total cost of production of 10 acres grape farm was Rs.2,12,000 and in 1986-87 it was Rs.1,72,500 in 1986-87. From the above total cost of production, per acre cost of production was calculated by dividing total cost of production by 10 acres. While calculating total cost of production, total cost of the farmer for producing one acre grapes cost of loan repayment and interest costs have been added. Per acre cost of production on one acre grape farms has increased from Rs.19,600 in 1982-83 to Rs.21,900 in 1983-84, they increased from Rs.20,200 in 1984-85 to Rs.21,200 in 1985-86. However, 1986-87 per acre total cost has declined to Rs.17,250. Increase in cost of production in grape farming has been a cause of worry, for the farmers and nearly all farmers complained

that increasing costs are one of the main problems in grape farming. Grape farming is essentially capital intensive farming and over the years cost of inputs like iron bars, and wire, chemicals, fertilizers, pesticides, packing cost, farm wages have been rising which increased cost of production. The chemical acid which is required for grapes is mainly imported and is in short supply. Hence, its price too is increasing rapidly over the years. This analysis, therefore, suggests that as far as grape farming is concerned on relatively small size of grape farm, cost of production shows increasing trend. Therefore, in drought prone areas like the area under study with favourable climate and proper farming technique only farmers will be able to increase their production. So that in spite of rising costs they may be able to earn sufficient profits from this type of risk farming.

Per acre net profits (Total production in rupees minus total cost) on one acre grape farms show declining trend. To calculate per acre net profits we followed the same method as was followed to calculate per acre cost, and production. Total profits in production of ten acres of grapes for all the ten farmers yearwise was as follows. Rs.2,54,000 in 1982-83, Rs.2,81,500 in 1983-84, Rs.2,51,000 in 1984-85. In 1985-86, total profits were Rs.2,34,400 and in 1986-87 they were Rs.2,01,300. From the above total net profits

per farm (one acre) size profits was calculated. From 1982-83 to 1986-87 per acre net profits increased from Rs.25,400 to Rs.28,150 from 1982-83 to 1983-84, but from then onwards per acre net profits are showing follcwing trend.

Per acre profits have declined from Rs.25,100 in 1984-85 to Rs.23,440 in 1985-86 to Rs.20,130 in 1986-87. Net profitability per acre has declined mainly because per acre production has fallen whereas per acre total cost of production is always increasing each year. Moreover, prices of grapes have also not increased substantially to bring more profits to the farmer.

B) PRODUCTION AND COST ANALYSIS OF LESS THAN ONE ACRE SIZE OF GRAPE FARMS

Of the total 50 farmers surveyed 40 farmers had grape farms who's size was less than one acre. On an average nearly all the 40 farmers had a grape farm of 25 to 30 gunthas. Thus, we find that majority of the farmers surveyed had grape farm of less than one acre. The total area of these 40 farmers under grape cultivation was 32 acres. The production and cost trends of these farmers is presented in Table No.4.11.

In Table No.4.11 we have given total figures as well as per farm size figures of these farms which are less than one acre size.

To calculate per farm production yield we

Table No.4.11

Production and Cost Trends of Less than One Acre size of Grape Farms

Items	1982-83		1983-84		1984-85		1985-86		1986-87	
	Total	Per Farm	Total	Per Farm	Total	Per Farm	Total	Per Farm	Total	Per Farm
1. Crop Yield in Kgs.	2,14,600	6,706	2,51,100	7,847	2,73,100	4,534	2,59,800	8,118	2,48,200	7,756
2. Crop Yield in Rupee Terms	12,66,600	39,585	15,02,800	46,965	16,37,800	51,180	15,44,800	48,275	15,01,200	46,900
3. Total Cost	5,99,500	18,735	6,82,000	21,315	7,44,000	23,250	7,44,000	23,250	7,79,000	24,345
4. Net Profit(2-3)	6,67,100	20,850	8,20,600	25,650	8,93,800	27,930	6,00,800	25,025	7,22,200	22,555

followed the following method -

Firstly total production in Kgs. of each of the 40 farmers was tabulated as was made available from the response of the farmers. On the basis of this the total production of grapes on the total area under grapes of these farmers was obtained. On the 32 acres of grape farms of the 40 farmers total grape production in the period 1982-83 to 1986-87 was as follows -

Years	Total yield in Kgs. (Area of grape farms : 32 acres)
1982-83	2,14,600 kgs.
1983-84	2,51,100 kgs.
1984-85	2,73,100 kgs.
1985-86	2,59,800 kgs.
1986-87	2,48,200 kgs.

To obtain per farm yield the above total production was divided by the total area under grape farms each year to get yearwise per grape farm yield.

Average per farm production on these less than one acre size of grape farms shows three trends from 1982-83 to 1986-87.

(1) Per farm production increased from 6706 kgs. to 7847 kgs. between 1982-83 to 1983-84.

(2) In 1984-85 however the production came down to 4534 kgs.

(3) In 1985-86 and 1986-87 per farm size production again increased to 8118 kgs. in 1985-86 and 7756 kgs. in 1986-87.

The fluctuations in less than one acre farm size production is more or less identical to the trends that are noticed in the production trends, in the one acre size grape farms. Thus, we can make a conclusion that the production trends of the one acre size farms and the less than one acre size farms show similar trends of the area studied.

Per farm grape production in money terms on the less than one acre size grape farms, show the following trends.

While calculating crop yield in money terms per farm size we followed the following method.

The total production on all 32 acres of grape farms cultivated by the 40 farmers was multiplied by the per kg. price which the farmer got by marketing grapes. Thus yearwise the total crop yield in money terms on 32 acres of grape farms is as follows :

Year	Total Yield in money terms
1982-83	12,66,600
1983-84	15,02,800
1984-85	16,37,800
1985-86	15,42,800
1986-87	15,01,200

To obtain per farm crop yield in money terms the above total yield in money terms was divided by total area under grapes, that is 32 acres.

In 1982-83, 1983-84 and 1984-85 per farm grape production in money terms increased from Rs.39,581 to Rs.46,965 and Rs.51,180.

However, in 1985-86 and 1986-87 the production in money terms shows a decline from Rs.48,275 to Rs.46,900. This decline is mainly due to fall in production in physical terms price of grapes remaining more or less constant.

Total cost of production of grapes on less than one acre size grape farm show rising trends. Estimation of total cost of production was done by adding up the cost of production of each farmer (40 in all) to develop the 32 acres total area under grapes of the middle and small farmers. The yearwise total cost of production of the total area under grapes (32 acres) yearwise is as follows -

Year	Total Cost of Production (of 32 acres)
1982-83	5,99,500
1983-84	6,82,000
1984-85	7,44,000
1985-86	7,44,000
1986-87	7,79,000

To derive per farm cost of production, this total cost of production was divided by number of acres under cultivation that is 32 acres. Rise in total cost of production on these farm size is, however, higher than the rise in cost of production. On one acre size grape farms the cost of production has increased from Rs.18,735 to Rs.23,250 in 1984-85. They further increased to Rs.24,345 in 1986-87 compared to one acre grape farms. This rise in cost of production is higher. This means that as the cost of inputs increased grape farming on smaller size of farms, becomes more costly than grape farming on relatively larger grape farm.

Comparison of total cost of production on one acre and less than one acre grape farm from the data collected also shows that total cost of production of less than one acre size grape farms is more than total cost of production on one acre size grape farms. Hence, these comparable figures may suggest that if the cost of cultivation are more on smaller farms it is preferable to cultivate one acre or more grape farms size but in our area of study availability of water is the main constraint on the farmers. And therefore, size of farms depends more on water rather than on optimisation of costs. Comparison of cost of production is more appropriate if the size of farms vary in size to a comparable extent. But in our study comparison of

data is made of farm size which are not of much difference in size. Hence from the point of view of analysis such comparison may not be very appropriate.

Net profit of grape farming on less than one acre farms shows a rise in net profitability from Rs.20,850 in 1982-83 to Rs.20,793 in 1984-85. The net profit from growth of grape farms by each of the 40 farmers was obtained. Then to calculate the total net profits of grape farming on all these 32 acres of grapes the net profits of all farmers was added up. The total net profit thus, obtained yearwise is as follows-

Year	Net Profit of Total Grape Farms (32 acres) Rs.
1982-83	6,67,100
1983-84	8,20,600
1984-85	8,93,800
1985-86	6,00,800
1986-87	7,22,200

From the above total net profit of developing grape farms in 32 acres by these 40 farmers, per farm net profits were derived by dividing the total net profits by the total area under grape farms that is 32. In 1985-86 and 1986-87 net profitability on these size of grape farms came down to Rs.25,025 in 1985-86 to Rs.20,255 in 1986-87 fall in net profitability were mainly due to fall in physical production and rise in

cost of production.

While the data collection was under taken we also had discussion with the farmers regarding their experiences of grape farming, in the process of these discussion and replies to our open ended questions the following views of the farmers regarding production and cost of cultivation were gathered.

(1) Majority of the farmers expressed their opinion that actual physical production in the past few year has fallen short of their expectations. The farmers in general were expecting per acre production of between 9000 kgs. to 12000 kgs. of grapes per acre but their experiences shows that actual production has fall short of these targets.

(2) The farmers were of the opinion that in the last three years the prices of grapes which the farmers got from the middle man have remain more or less that is between Rs.5 to Rs.6 per kg. but in the same period the cost of essential inputs had increased and this had affected their profits to a great extent. It is a common complaint that in this type of high risk cash crop cultivation, costs are increased while the overall profitability is falling. In such a situation we also asked the farmers whether they had any plans of diversification of cultivation in present and in future. Replies to such a question indicated

that presently of the 50 farmers there were 7 farmers who undertook diversification of production and alongwith grape farming they had entered into other fruit cultivation like pomogranates and chikoo cultivation. These types of fruit garden farming also can develop in areas having less water and also do not need very fertile soil.

SECTION - III

A) EMPLOYMENT GENERATION THROUGH DEVELOPMENT OF GRAPE FARMING

Grape farming is a highly intensive form of cultivation. It is capital intensive as well as labour intensive. In addition it also needs a great degree of personal supervision by the farmer. This is so because slight changes in weather effect the standing crop. Grape farming essentially needs a sufficient supply of human labour to carry out various production activities. In the initial stages in the development of the farm, a sufficient amount of labour is needed when the grape vines develop cutting and prooning has to be done. When the grapes develop they have to be sprayed with the required chemicals. In addition spraying of insectisides is to be done the whole year. At the time of harvesting and when the grapes are ready to be removed labour power is required to collect the grapes pack the grapes and make them ready for marketing. As the grape vine

yards have erections farm machinery cannot be used to undertake, the above activities therefore, human labour is the only way in which these activities can be done. Even if the size of the farm is relatively small minimum labour force is essential for its proper developments. Hence, wherever grape farming develops in a particular region the possibility on additional employment being created is always there. Essentially this employment generation will be a seasonal in nature. As activities on the farm increased for that particular period of time seasonal employment will be created. In addition to seasonal labour demands each farmer having a grape farm will always keep with him, On the farm some permanent labour force. Such permanent labourers are to a great extent skilled in the art of grape cultivation. In addition to hired labour the farmers also get labour supply and working hands in the form of family members who also work on the grape farms as grape farming has relatively less heavy mannual work. In the grape farms there is some work activities which are of the nature of light work. The work of light nature can be done by the female labour. Hence, employment available to females also increases when grape farming is undertaken.

In the survey conducted by the researcher had also undertook the study of the amount of additional labour employed on farms with the development of grape

farming. Information was collected from the farmers about the number of labour employed by them before grape farms were introduced and the extent of labour employment after grape farms were introduced. Normally, if the size of the grape farms is bigger, more labourers will be employed. Therefore, the above information collected is tabulated in three sub-groups. Additional employment generated on the grape farms of large farmer, middle farmer and small farmer is tabulated separately as shown in Table Nos.4.12, 4.13 and 4.14.

1) Additional Employment Generated on Grape Gardens of Big Farmer (Table No.4.12)

a. Relatively seasonal employment has increased after grape farms were introduced before the grape farms, these farmers employed 18 women as seasonal workers and 19 males as seasonal male workers. After introduction of grape farms 73 females and 67 males were provided seasonal employment.

b. Permanent employment for hired labour did not increase relatively. Prior to grape farming permanent hired labour employed was 6 after introduction of grape farm these increased to 8.

c. Family labour also shows a marginal increase from 31 employed before grape farming to 34 employed after grape farming was introduced.

Table No.4.12

Additional Employment Generation due to Development of Grape Farms by Big Farmers

	Permanent Labour Employed		Seasonal Labour Employed		Family Labour Employed		Total Labour Employed	
	Before Grape Farming	After Grape Farming	Before Grape Farming	After Grape Farming	Before Grape Farming	After Grape Farming	Before Grape Farming	After Grape Farming
Female M	-	1	18	73	0	0	18	74
Male	6	7	19	67	31	34	56	108
Total	6	8	37	140	31	34	74	182

Table No.4.13

Additional Employment Generation with Development of Grape Farms by Middle-size farmers.

	Permanent Labour Employed		Seasonal Labour Employed		Family Labour Employed		Total Labour Employed	
	Before Grape Farming	After Grape Farming	Before Grape Farming	After Grape Farming	Before Grape Farming	After Grape Farming	Before Grape Farming	After Grape Farming
Female	2	3	31	145	3	9	36	157
Male	8	12	29	103	26	46	63	161
Total	10	15	60	248	29	55	99	318

Table No.4.14

Additional Employment Generation due to Development of Grape Farms by Small Farmers.

	Permanent Labour Employed		Seasonal Labour Employed		Family Labour Employed		Total Labour Employed	
	Before Grape Farming	After Grape Farming	Before Grape Farming	After Grape Farming	Before Grape Farming	After Grape Farming	Before Grape Farming	After Grape Farming
Female	0	0	38	167	07	08	45	175
Male	6	12	33	114	40	54	79	180
Total	6	12	71	281	47	62	124	355

d. As far as family labour is concerned we find that these big farmers have not allowed the women in their families to go and work on the grape farms. This is a tendency common to big farmers in India who discourage the women to go out of the houses.

2) The pattern of employment on the grape farms of the middle class farmers shows the following features - (Please refer Table No.4.13)

a. Permanent employment for hired labour increased from 2 women and 8 male labourers employment before grape cultivation to 15 employed (12 male and 3 females) after introduction of grape farming.

b. Seasonal employment of hired labour increased from 31 females and 29 male employed before grape farming to 145 female employed and 103 male employed after grape farms were developed.

c. Family members also increased their work on the grape farms. Before the grape farms 3 female and 26 male family members were working on the farms, but after the grape farms were started 9 female and 46 male family members were found to be working.

3) As far as the small farmer who undertakes grape farming is concerned we find the following trend of additional employment generation on their grape farms. (Please refer Table No.4.14).

Permanent employment generation increased from six male labourers employed before grape farming to 12 male labourers employed. After introduction of grape farming, temporary farm labour employed increased from 71 labourers to 281 employed with introduction of grape farming. Of these 167 were female labour and 140 were male labourers. Family members employed also increased due to grape farming and of these male family members employed increased from 40 employed before grape farming to 54 employed after introduction of grape farms. Thus, we find that because of grape farming undertaken by small farmers also additional employment is generated on there farms also. In this category however, there was one farmer surveyed who did not hire any permanent or seasonal labourer while developing his grape farm. The labour activity on his grape farm was carried out by himself and his family members.

4) The study reveals that -

a. The 50 farmers who undertook grape farming increased employment when grape farms were started. For all the 50 farmers relatively seasonal employment generation increased more than permanent employment for hired labour.

b. After the grape farms were started the tendency for family members to go and work on the grape

duration of seasonal employment needs to be mentioned

farms also increased and alongwith male family members, female family members also went to the farms and assisted the males. For 50 farmers surveyed we find that additional employment generated because of development of grape farms increased as follows :

i) Agricultural labourers got employment of a permanent type because of development of grape farms.

ii) 501 additional seasonal labourers got employment.

iii) Because of grape farming 44 additional family members started working on the farms.

iv) Thus, total additional employment generated because of grape farming gave employment to 558 additional labour hands. This proves our hypothesis that grape farming is labour intensive and when developed will create additional employment opportunities for agricultural labour in the area of development. However, this employment generated will mainly be seasonal in nature.

With the growth of grape farming we find that employment generation though mainly seasonal has been generated with increased demand for farm labour the wage rate should also by and large also increase. We find that in the area under study wages paid to farm labour engaged in grape farming has increased. Before undertaking grape farming the farmer use to pay the farm

labour wages as follows :

Male labour was paid Rs.9/- per day per labourer. Female farm labour was paid Rs.7/- per day. After the grape farms were developed we find that the wages paid to the workers working on grape farms have increased at present farm labour working on the grape farm is paid wages as follows :

(a) Male farm labourer gets Rs.12 per day.

(b) Female farm labourer gets Rs.9 per day.

The reasons for this increase in wages may be due to -

(1) In the period when labour activities increase on the grape farms adequate farm labour may not be available and hence higher wages may have to be given to attract labour.

(2) Farm labour working on the grape farms has to possess a minimum skill in grape farming activities. Thus, these farm labourers are some what specialised in the art of grape farming. Hence, they may have to be paid higher wages than those farm labourers who work on other non-grape growing farms.

B) NATURE OF EMPLOYMENT AND NUMBER OF MANDAYS OF EMPLOYMENT GENERATED ON ONE ACRE SIZE OF GRAPE FARM.

To study the nature of employment and the number of mandays of employment generated on the grape farms, as a case study we collected information from a few farmers surveyed. This information was for one acre size grape farm. As per the information given we compiled the data into a tabular form which is presented in Table No.4.15.

Table No.4.15

Nature of Employment and Number of Mandays of Employment Generated on one acre size of Grape Farm.

	Nature of Work (April to March : 1st phase of work)	No.of Mandays Employment generated
1.	Initial Soil preparation/manuring	30
2.	Scrapping Process	30
3.	Spraying of Medicines	50
4.	Prunning of nodes	70
5.	October dose of fertilizers	25
6.	Prunning of buds	20
7.	Pasting of new nodes	25
8.	Prunning of excess Growth of Leaves	35
9.	Dripping the grapes in zebric acid (twice a year)	40 + 40
10.	Girdling	10
11.	Thinning Process	50
12.	Spraying of Medicine/Insecticides	150
13.	Tieying of branches	30
14.	Cutting of Grapes	125
	Total	730

From the Table No.4.15 we can study the nature of employment and the manday's of employment generated on one acre of size of grape farm. Grape farming is a labour intensive form of cash crop cultivation. The employment season normally starts in the month of April and lasts upto March end, when the grapes are ready for cutting. While making this analysis we are pre-supposing that one acre size of grape farm is existing and was developed in the previous year and in the current year the grape farm is ready to bear fruits. In the first year of development of the grape farm as the grapes do not grow, relatively less employment is needed. In the first stage of the farm development that is from April to October, the grape garden needs manuring and spraying of pesticides for which 30 manday's of employment is generated. The grape vines stem and branches are also scrapped from which 30 mandays of employment is generated. In September, the branches of vines sprout new leaves which have to be cut so that later the branches grow well. For this nature of job more labour is needed., and in the process 70 mandays of employment is generated. In late September the grape vineyard has to be sprayed with insecticides and medicines and in this purpose 50 mandays labour employment is generated.

In the secondphase of grape farming growth which is from October to March. The labour and farm activity on the grape farm increases and in this phase of development we find that more farm labourers are employed and in the process more mandays of employment is generated. In October the farm is given another dose of fertilizers and manuare from which 25 mandays of employment is generated. Then in October the branches and sub-branches are prunned by which latter on the fruits grow well. In this process 20 ⊠ mandays of labour employment is generated. The nodes of the new branches are pasted and in this process another 25 mandays of employment is generated. After this the grapes grow on the branches and sub-branches. The bunches of grapes are small in size and hence to protect them from disease they have to be dipped in zebralic acid twice for this process more labour is needed and on an average 80 manday's of employment is generated. Once the grapes grow, constant spraying of insecticides is needed for which more labourers are needed and therefore, in this process maximum that is 150 mandays of employment is generated. After this the process of stem girdling is undertaken and here 10 manday's of employment is generated. The bunches of grapes that grow are thinned down so that less and strong grapes remain and in this thinning process 50 mandays of employment is generated.

On the overhead wires the fruit bearing grape vine branches have to be tied in the process of which 30 mandays of employment is generated on one acre size of grape farms. In March normally the fruit is ready for harvesting. In the process of harvesting cutting on grapes packing on grapes more farm hands are needed. Therefore, in the harvesting season more mandays of employment is generated. On one acre size of grape farm for cutting of grapes 125 mandays of employment is created.

Thus, we find that on one acre of grape farm which was developed a year back from April to March end, there are various activities which need farm hands tc work on the grape farm. In the process of all these activities from April to March end on one acre size of grape farm - 730 mandays employment is generated. Thus, we can say that grape farming is essentially a labour intensive form of cash crop cultivation. In the process of development of the grape farm especially from the second year onwards, the amount of labour both permanent and seasonal needed is more. Hence in this pattern of employment the number of mandays of employment generated is bound to be high. More mandays of employment means more work and more work means more wage availability for the agricultural labourers in the area where grape gardens are developed by farmers.

SECTION - IV

INCOME GENERATED AND USE PATTERN OF INCOME GENERATED FROM GRAPE FARMING

A) INCOME GENERATED FROM GRAPE FARM DEVELOPMENT

Grape farming developed by the 50 farmers studied has led to income generation to ethe farmers on the basis of net profits that each farmer got. The income obtained by the farmers while analysing is divided into two parts. Per acre income generated to 10 big farmers who developed one acre size grape farm is calculated. Then per farm income generated to the 40 small and medium farmers is tabulated separately. The income generation obtained by the 50 farmers who took grape garden development loans from the Miraj sub-branch of MSCLDB and developed grape farms is tabulated as below:

Table No.4.16

Income Generation from Grape Farming

Year	Income generated on 1 acre size grap farm	Income Generated on per farm of less than one acre.
1982-83	25,400	20,850
1983-84	28,150	25,650
1984-85	25,100	27,930
1985-86	33,440	25,025
1986-87	20,130	22,555

Why should this be more? How much less than one acre? Is it 50%?

B) USE PATTERN OF INCOME GENERATED FROM GRAPE FARMING

Grape farming undertaken intensively and systematically with personal attention always brings to the farmer sufficient income generation provided there is no natural climatic effects grape farming is high risk, high profit cash crop cultivation. Our survey has found that during the period under study, the farmers have got sufficient profits from grape farming. Accretion of profits over period of time increases the financial stability of the farmers. Financial stability and increased income lead to increased spending by the farmers. In the study we also undertook to analysis as to how the farmer spent his increased income ℅ mainly derived from grape farming. In our questionnaire we asked the farmers how this income was spent. This response of the farmers is tabulated in Table No.4.17.

The analysis of the Table No.4.17 presents very interesting findings. We find the farmers have spent relatively equally on non-productive purposes. As far as production purposes are concerned we find that 80% of the farmers have spent the additional income generation on digging and renovation of wells. This is natural because well-irrigation is the only source of irrigation and hence proper care of the wells has to be taken. 52% of the farmers used a part of the income

Use of income by 50 farmers shown have been given on the basis of small, med & big farmers.

Table No.4.17

Use pattern of Income Generated from Development of Grape Farms

Purpose for which Income Used	No.of Farmers	Percentage to Total Farmers
1. Land purchase	9	18%
2. Plantation of new grape gardens	26	52%
3. Well digging and repairs	40	80%
4. House Construction	19	38%
5. Marriage (Son,daughter)	27	54%
6. Education (Son, daughter)	14	28%
7. Purchase of Agricultural Implements and Vehicles	20	40%
8. Repayment of Private Loans	37	74%
9. Gold Purchase	22	44%
10. Fixed deposits and savings certificates	10	20%

generated for development of new grape gardens which means income generated for existing grape farms was reinvested in future development of grape farming. 40% of the farmers also used a part of the additional income generated for purchase of agricultural implements and vehicles. Such expenditure would help the farmers in future farming activities. Some farmers that is 18% spent the additional income generated for purchase of new

agricultural land which led to increased land asset of the farmers. Significantly, however, we find that only 20% of the farmers spent a part of additional income to increase monetary savings in the form of deposits with banks and purchase of saving certificates etc.

Thus, we find that farmers under study were not much interested in investing increased additional income in money savings. However, 44% of the farmers did purchase gold from the additional income generated, 38% of the farmers also spent some income on house building activities.

As far as use of income for non-productive purpose is concerned we find that 74% of the farmers used a part of their income to repay private loans, which may have been taken mainly for consumption purposes. 54% of the farmers used the part of the additional income for financing marriage ceremony of dependents and 28% of the the farmers used the part of the income for financing education of their dependents.

The use pattern of the additional income generated shows that for productive purposes relatively more money was spent on improvement of present infra-structure like repairing of old wells significant income was also spent to increase the size of grape farms. On the non-productive purpose side repayment of private

loans was a major purpose. The farmers under study did not use much of the income in monetary investment.

C) REPAYMENT AND OVERDUES

Grape farming being a heavy investment farming most of the farmers have to approach to the cooperative banking institutions for finances to development of grape farms. Thus, nearly all farmers took loans for grape farming. The repayment capacity of such farmers, therefore, to a great extent depends on the additional income cycle that grape farms generate for the farmers. Repayments of loans taken, therefore, depends on satisfactory income yield from these farms. Data regarding bank loan repayment is presented in Table No.4.18 . The table shows that in our area of study 80%

Table No.4.18

Repayment of Bank Loans by the Farmers

Particulars	No.of Farmers	Percentage to Total farmers
1. Regular Repayment	40	80%
2. Defaulters	10	20%
Total	50	100%

of the farmers were regularly repaying bank instalments and only 20% of the farmers had some loans overdue, from

them. This means the repayment capacity of the farmers is sound which may be mainly due to sufficient income generation accruing to the farmers from development of grape farmers. Grape farms well-developed and with no natural climatic upheavals is a profitable cash crop farming. Such farming helps in repayment of loans as it increases the repaying capacity of the farmer. Farmers surveyed by the researcher have repaid their loans which means that grape farming has generated sufficient income for them by and large.

SECTION - V

PROBLEMS RELATED TO GRAPE FARMING

A) MARKETING OF GRAPES

Grape farming is a high risk, high profit form of cash crop cultivation. Our study shows that grape farming is becoming more and more high cost farming. In such a situation to earn satisfactory profits it is essential that -

(1) The farmers try to improve crop productivity

(2) The grapes should be so marketed that they bring satisfactory remunerative prices for the farmers.

Hence in our opinion proper marketing of grapes is very important for the proper development of grape farming. Remunerative prices should be available to the

farmers so that it serves as and incentive for grape farming. Marketing of grapes is a complex issue as it involves (a) collection of grapes; (b) proper packing and (c) proper transportation as the demand for grapes will be coming from urban consumers marketing of grapes in Sangli district is essentially undertaken by commission agents and local dalals. It is found that as far as marketing of grapes is concerned the farmers have no control nor have they their own marketing agency. In such a situation the marketing of these cash crop is still in the hands of private middlemen which has resulted in the farmers been deprived of remunerative prices.

Marketing of grapes by the commission agents and dalals is mainly done to provide grapes for outside markets like Bombay and nearby cities. These local dalals essentially supply the grapes to local dalals in Bombay, Calcutta, Delhi, Lucknow, Nagpur, Ahmadabad etc. The local dalals in Miraj approach the farmers on behalf of the merchants in these cities and give the money guarantee to the farmers. The local dalals in Miraj have paid the farmers between Rs.4 to Rs.5 per kg. to the farmers as price between 1975 to 1980. Between 1980 to 1987 on an average they paid the farmers price for their grapes ranging between Rs.5 to Rs.6 since Jaunary, 1988 due to short fall in production relatively

the prices for grape paid to the farmers have gone upto Rs.6 to Rs.8 per kg. The local merchants take commission from the farmers for marketing their grapes. The local Miraj merchants charge a commission ranging between 2 to 3%. The dalals at Miraj normally supply the best quality grapes to out station markets and earn a commission ranging between 7 to 10%. In the initial period the Miraj dalals normally supplied the grapes to Bombay market. But since the 1980's the Bombay market is getting grape supplies from other parts of Maharashtra and therefore, at present they are not giving satisfactory price to the fruit merchants of Miraj. In addition during the grape season there is arrival in the fruit market of other fruits like water melon citrus fruits. These arrivals reduce demand for grapes and hence the prices of grapes fall in the market. The local dalals of Miraj were also interviewed and they provided information that on and average the selling costs range between 30 to 40% of profits and cost of marketing is rising mainly due to increasing transport and packing costs. They also gave information that they provided farmer with advance payments with and since the farmers took advances to meet their requirement, they had to sell that grapes to the local merchants only. The Miraj merchants in recent years are also undertaking export of quality grapes to Gulf Countries. While exporting the grapes the quality is

very important. The farmers are paid fixed prices which are higher than local prices. While marketing export grapes the local merchants normally do not take commission from the farmers.

VIEWS OF FARMERS REGARDING PRESENT MARKETING

While conducting the survey the farmers were asked questions relating to marketing of grapes. Analysis of the answers provided by the farmers brings out the following views of the farmers.

(1) Most of the farmers complain that they were not getting proper prices through the present marketing structure.

(2) For marketing of their grapes they had to depend entirely on the local merchants. Though the district grape growers association was formed it did not undertake the marketing of grapes.

(3) The farmers were reluctant to supply the grapes directly to the merchants in other cities as the money guarantee was a main problem and therefore, they supplied the grapes to out station merchants through the local Miraj merchants.

(4) One way to reduce the dependants on local merchants was to undertake self-marketing of grapes through retail selling of grapes in near by cities like Miraj, Sangli and Kolhapur by the farmers themselves.

However, it was found that the farmers have not undertook retail selling mainly due to -

(a) the stocks not being sold quickly

(b) flow of cash is not at a particular time.

(c) the rates also fluctuate.

Thus, though retail selling minus packing is cheaper; the farmers are not showing tendency to undertake retail selling. Of the total farmers surveyed it was found that only 1 to 2% of the farmers undertook retail selling.

Thus, our survey finds out that marketing of grapes is solely in the hands of private marketing agencies. The local dalal's mainly supply the grapes to wholesale merchants in Bombay and other cities. Thus, the private agencies who undertake marketing pay non-satisfactory price to the farmers. Moreover, the farmers too are not satisfied with the existing marketing system. Export-quality grapes however, brings in better prices to farmers, for which quality production is essential. The Grape Growers Association has not taken up the challange to market the production of grapes. The farmers in recent years not satisfied with prices, have shown a tendency to go in for 'dry grape' processing and then marketing of their grape production. Grape growing farmers to get remunerative prices have to form their own channel of marketing so that both the producers and the buyers benefit.

B) NATURAL FACTORS AFFECTING GRAPE CULTIVATION

Grape farming being intensive farming in addition also is a risk barring farm activity. This is so because grape farming means a standing crop all the 12 months which means the garden can be affected by changing climatic conditions all through the year. The vagaries of the whether of the particular region have a great effect on the grape farms which may prove to be non-profitable for the farmer. In recent years the area under study has witnessed fluctuations in non-anticipated wheather conditions which affects the grape gardens and the standing crops. We collected information from the farmers about the natural causes which affected his grape farming. This information is tabulated in Table No.4.19.

Table No.4.19

Natural Factors Affecting the Grape Farming

Particulars	No.of Farmers	Percentage to Total Farmers
1. Untimely rains/Thunder storms	30	60%
2. Extreme cold	5	10%
3. Mist	5	10%
4. Cloudy weather	5	10%
5. Inadequate water etc.	5	10%
Total	50	100%

Analysis of the Table No.4.19 reveals that 60% of the farmers felt that non-seasonal rains, rain storms were main natural climatic factors which affected grape farming. 10% of the farmers felt that excessive cold, cold mist, cloudy weather also effected the grape farms, but the most important natural climatic factor was unseasonal rains against which proper protection cannot be undertaking, whereas in the case of excessive cloudy weather protective measures can be undertaking by the farmers. In the year 1987-88 when the survey was being undertaken it was found that in October the standing crop was well developed. The researcher predicted a bumper crop for the farmers. However, this prediction proved to be wrong as the area under study received non-seasonal erratic rains in November which affected the grape fruits resulting in lesser production of grapes in the area under study.

C) PROBLEMS RELATING TO BANK-FARMER RELATIONS

We also gather information from the farmers regarding their relationship with Land Development Bank, the officers and supervisory staff of the Bank we also asked the farmers whether they had any problems or greviances regarding availability of loan producer of loan sanction etc. The response of the farmer surveyed indicates the following broad features -

(1) On the whole of the farmers seen the satisfied about there relations with the bank officers and staff.

(2) They were also satisfied with the amcunt of loans sanctioned for grape farming. Regarding loan sanctioned they argue that the loan limit was sufficient. However, the increase made in the limit of loan sanction was not sufficient enough to cover the increased cost of inputs. One section of the farmers argue that the Cooperative Land Development Bank should provide the loan more in kind element. This was because they felt that the costs of inputs were rising and the inputs were not properly available. Hence, instead of increasing the limit of loan sanctioned it would be more beneficial to the farmer if the loan was given in kind and the Bank took the responsibility of provided the necessary inputs.

(3) As regards the problem of delay in loan sanction. The farmers were of the opinion that the bank procedure nor the bank officials were responsible for delay in getting of loan amount because the farmers themselves took a longer time to collect the necessary documents needed by the Bank for the sanction of loan. Thus, it is mentioning that the farmer under study were satisfied and had no complaints what so ever regarding the bank procedure and the attitude of the Banks. There

main complaint, however, was that the necessary officials documents which were to be got from government officers like Gram Panchayats etc. were not easily available and the officials also harassed the farmers.

D) DIFFICULTIES FACED BY THE BANK STAFF IN IMPLEMENTING THE GRAPE GARDEN DEVELOPMENT SCHEME

The officers and staff of the Miraj sub-branch of MSCLDB were interviewed and the researcher asked them what problems they faced in the implementation of the above scheme. On the whole the bank staff opined that the following problems were important.

(a) The farmers in the area of study lacked self-initiative and did not come forward themselves to take benefit of the Scheme. The bank staff had to go to the farmers, convince them and then create initiative among the farmers. The lack of initiative on the part of the farmer was mainly due to the risk involved in grape farming, especially in the water-scarce area.

(b) The supervisory staff complained that they were given a area of ccverage which was very vast. This resulted in them, not being able to keep a close watch and supervision on the end-use of the loan. This resulted in many borrowers not using all the loan amount for productive purposes, resulting in fall in overall production and productivity. The supervisory staff felt

that if close-watch on the end-use of the loan had to be maintained, it was necessary to increase the number of supervisory staff. So that each supervisory got a limited area over which he could maintain close supervision.

(c) The supervisory staff to keep a close supervision on the borrowing farmer members had to undertake a lot of travelling into remote rural areas away from the Miraj sub-branch. The cost of travelling and other daily expenditure involved during the tour period, has increased to a great extent. However, the travelling allowances and other allowances given to them by the bank was not sufficient and they felt that there has to be periodical upward revision of the rates and amount of allowances admissible while on tour.