

CONSTRAINTS AND OBSTACLES PERCEIVED BY MANGO GROWERS IN ADOPTION OF SCIENTIFIC MANGO PRODUCTION TECHNOLOGY

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ABSTRACT

The entire study was conducted in Banswara and Dungarpur districts of state Rajasthan in India. Bagidora and Ghari panchayat samities of Banswara district and Dungarpur and Sangwara panchayat samities of Dungarpur district were selected on the basis of maximum area under mango cultivation. Four villages having maximum area under mango cultivation were selected from each identified panchayat samiti. Thus, in all sixteen villages were selected. To select the respondents five tribal and five non-tribal mango growers were selected randomly from each identified village. Thus, in all 160 mango growers 80 tribal and 80 non-tribal farmers were included in the sample of study. Findings revealed that more than two-third of the mango growers perceived either medium or higher level of the constraints regarding scientific mango production. There was a significant difference in overall constraints perceived by tribal and non-tribal mango growers. This reveals that tribal respondents possessed more constraints than non-tribal respondents about scientific mango production. Inadequate training for acquiring skills about scientific mango production, lack of skill in performing technical operations, long juvenile period, non-availability of reliable varieties and plant material, lack of finance & credit, high cost of establishment of mango orchards, high price of reliable plant materials, perishable nature of commodity results in economic losses, lack of storage facility, high fluctuation in the market price during harvest season, high charges on availing storage houses owned privately, poor cooperative marketing system, lack of preservation facilities for mango, lack of initiatives from govt. organizations for processing & value addition and absence of value addition units were found most important constraints perceived by mango growers.

INTRODUCTION

Fruits are of great importance in human nutrition. At present, next to China, India is the second largest producer of fruits. Diversified agro-climate across the country provides a unique advantage for fruit production by extended period of availability and differential quality. Mango is world's leading fruit-crop and India occupies 1.62 million hectares area under mango fruit with a production of 12.78 million tonnes, which is 37.6 per cent of total production under fruits.

Today, India is the largest producer of mango and Rajasthan is considered to be the potential fruit growing state. In Rajasthan, mango is mainly grown in Banswara, Dungarpur, Chittorgarh, Udaipur, Jaipur, Baran, Rajsamand districts. The area under mango cultivation in the state of Rajasthan is 6407 hectare

with good production potential, which could be further developed in the form of mango bowl.

The climatic condition of Banswara and Dungarpur districts are more suitable for cultivation of mango but the productivity of mango is far below the desired level. Generally, farmers of these districts sell raw or ripe fruits during the harvest season to local contractors or other middlemen due to lack of proper marketing facilities. It is hard to see any functional processing and value addition industry in the area. Banswara and Dungarpur districts are having a high production potential of mango production but productivity and quality of mango fruits needs to be increased. Promotion of mango cultivation in these districts can lead to the economic empowerment of tribal farmers, provided that needed infrastructural facilities, organizational support and timely techni-

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cal guidance are made available to them.

In general, mango is consumed as dessert fruit. Its demand is increasing day by day because of its high nutritive value. Looking to the importance of mango fruit, it is essential that farmers of the state should be motivated to adopt recommended practices of mango production on a large scale. To find out the reason, restricting adoption of improved mango production technologies and problems being faced by mango growers the present study entitled "Constraints and obstacles perceived by mango growers in the adoption of scientific mango production technology" was undertaken.

RESEARCH METHODOLOGY

The present study was conducted in Banswara & Dungarpur districts of state Rajasthan in India. These districts were selected purposely on the basis of maximum area under mango cultivation in the southern Rajasthan. The districts in the state has been divided in the various panchayat samities hence, for the selection of panchayat samities, a complete list of all the panchayat samities of both the identified districts, where the mango fruit is being grown extensively was prepared. From the list so prepared, Bagidora and Ghari panchayat samities of Banswara district and Dungarpur and Sangwara panchayat samities of Dungarpur district were selected on the basis of maximum area under mango cultivation. For selection of villages, four villages having maximum area under mango cultivation were selected from each identified panchayat samiti. Thus, in all sixteen villages were selected. To select the respondents, category-wise comprehensive list of tribal and non-tribal mango growers were prepared with the help of village patwari and agriculture supervisor of respective villages. From the list so prepared, five tribal and

five non-tribal mango growers were selected randomly from each identified village. Thus, in all 160 farmers (80 tribal and 80 non-tribal farmers) were included in the sample of study. The nature of the entire study demanded more number of farmers whereas, availability of farmer having mango orchard was limited therefore 160 farmers were selected. Thereafter, data were collected from the selected respondents by employing personal interview technique. The interviews were conducted at farmer's homes in the month of December 2009 and January 2010. About 50-60 minutes were spent to interview each respondent. To conduct interview a structured schedule was used.

To measure the constraints hindering the adoption of improved mango cultivation practices by the farmers, a suitable schedule was developed. The schedule consisted of 40 statements pertaining to constraints related to adoption of scientific mango production technology. These constraints were further categorized into technical, economic, storage & marketing and processing & value addition constraints. To measure the degree of severity of constraints, the responses were recorded on a three point continuum viz., most important, important and least important, which were assigned 3, 2 and 1 score respectively. The recorded responses were counted and converted into mean percent score for each constraint and were ranked accordingly. In order to find out the significant difference in the constraints level between tribal and non-tribal farmers, "Z" test was used and then conclusion were drawn accordingly.

RESULTS AND DISCUSSION

In the present study, the term constraints mean the barriers or obstacles, which were perceived by the respondents in the adoption of scientific mango

Table 1: Distribution of respondents according to level of constraints faced by farmers in mango cultivation
n = 160

S. No.	Level of constraints	Tribal farmers		Non-tribal farmers		Total	
		f	%	f	%	f	%
1.	Low(Below 75.50)	2	2.50	19	23.75	21	13.13
2.	Medium(75.50 to 86.90)	56	70.00	50	62.50	106	66.25
3.	High(Above 86.90)	22	27.50	11	13.75	33	20.62
Total		80	100.00	80	100.00	160	100.00

f = Frequency, % = Per cent

production technology. It is needless to mention that pace of adoption can be augmented by overcoming the perceived constraints. So it was felt necessary to overcome the perceived constraints which prevented the respondents from adopting scientific mango production technology. In the present context, the constraints perceived by the respondents in scientific mango cultivation were identified and the results are presented in subsequent tables:

Distribution of respondents according to level of constraints faced by mango growers:

To get an overview of the level of constraints, the respondents were ramified into three strata i.e. low, medium and high level of constraints. These categories were formed on the basis of calculated mean and standard deviation of the scores given to the constraint items by the respondents.

The data incorporated in Table 1 reveal that 66.25 per cent respondents faced medium level of constraints in adoption of scientific mango production technology. Whereas, 20.62 per cent mango growers were observed to be in the high constraint group and only 13.13 per cent respondents perceived

low level of constraints group.

A close look at the data presented in Table 1 further shows that 70 per cent tribal and 62.50 per cent non-tribal farmers fell under the category of medium level of constraints. Likewise, 27.50 per cent tribal and 13.75 per cent non-tribal farmers could be placed under the category of high level of constraints. However, only 2.50 per cent tribal and 23.75 per cent non-tribal farmers were noticed under the category of low level of constraints in the study area. From the above matrix, it can be concluded that tribal farmers possessed more constraints than non-tribal farmers in adoption of scientific mango production technology. The present findings are supported by the findings of Chandra (1993), Gomase and Patil (1998), Sharma (1997) and Meena (2005).

Aspect-wise constraints perceived by the mango growers:

All the constraints expressed by the mango growers were categorized into technical, economical, storage & marketing and processing & value addition constraints. The results are presented under different headings as given below:

Table 2: Technical constraints perceived by the mango growers **n = 160**

S. No.	Constraints	Tribal farmers		Non-tribal farmers		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Long juvenile period i.e. unproductive period	90.41	3	85.00	2	87.70	3
2.	Non-availability of reliable varieties & plant material	87.91	4	81.25	4	84.58	4
3.	Lack of knowledge about scientific cultivation practices	80.41	5	71.66	6	76.03	5
4.	High mortality of plants during initial years	75.83	6	73.33	5	74.58	6
5.	High susceptibility of disease and insect pests	50.41	11	49.16	8	49.78	11
6.	Irregular bearing	68.33	7	62.08	7	65.20	7
7.	Difficulty in supervising scattered plantation	65.83	8	48.75	9	57.29	8
8.	Lack of skill in performing technical operations	92.08	2	83.33	3	87.71	2
9.	Inadequate training for acquiring skill about scientific mango production technology	95.00	1	91.00	1	93.00	1
10.	Erratic rainfall and water logging	45.41	12	42.08	12	43.74	12
11.	High wind velocity during harvesting season	59.58	9	47.91	10	53.74	9
12.	High temperature during May-June	39.58	13	37.50	13	38.54	13
13.	Low keeping quality of mango varieties	54.58	10	46.66	11	50.62	10

MPS = Mean Per cent Score** = Significant at 1 per cent level—% $r_s = 0.956^{**}$ ‘%

(1) Technical constraints

A perusal of data presented in Table 2 reveal that “inadequate training for acquiring skill about scientific mango production technology” was the most important constraint perceived by the tribal and non-tribal mango growers with mean per cent score 95 and 91 respectively and was ranked first by both the categories of respondents. The realization of this problem might be due to the fact that majority of the farmers were unaware about the training institutions and facilities available at the district head quarter for organizing various trainings for mango growers. The next important constraint perceived by the tribal farmers was “lack of skill in performing technical operations” with 92.08 MPS. This constraint was assigned third rank by the non-tribal respondents with 83.33 per cent. This was followed by the constraints of “long juvenile period i.e. unproductive period”, “non-availability of reliable varieties & plant material”, “lack of knowledge about scientific cultivation practices”, “high mortality of plants during initial years” and “irregular bearing of plants”. The extent of these constraints perceived by the tribal farmers was 90.41, 87.91, 80.41, 75.83 and 68.33 per cent, whereas, in case of non-tribal farmers it was 85.00, 81.25, 71.66, 73.33 and 62.08 per cent, respectively.

Table 2 further shows that “difficulty in supervising scattered plantation”, “high wind velocity during harvesting season”, “low keeping quality of mango varieties”, “high susceptibility of diseases and insect-pests” and “erratic rainfall and water logging” were also important constraints perceived by tribal farmers with 65.83, 59.58, 54.58, 50.41 and 45.41 per cent respectively.

While, in case of non-tribal farmers the extent of these constraints was 48.75, 47.91, 46.66, 49.16 and 42.08 per cent respectively. Further analysis of table clearly reveals that “high temperature during May-June” was expressed as the least important constraint by the tribal and non-tribal farmers with 39.58 and 37.50 MPS respectively and ranked last by both the categories of farmers in the study area.

The rank order correlation co-efficient was calculated between the ranks accorded by the tribal and non-tribal mango growers about technical constraints in adoption of scientific mango production technology. The calculated value of rank order correlation co-efficient (r_s) was found to be 0.95 which is statistically significant at 1 per cent level of significance. Thus, it was inferred that there was significant correlation between tribal and non-tribal mango growers with regard to assigned ranks about technical con-

Table 3: Economic constraints perceived by the mango growers **n = 160**

S. No. Constraints	Tribal farmers		Non-tribal farmers		Total	
	MPS	Rank	MPS	Rank	MPS	Rank
1. Perishable nature of commodity results in economic losses	80.83	4	78.33	3	79.58	4
2. High cost of transportation of fruit and plant material	46.66	10	46.25	9	46.45	10
3. High cost of establishment of mango orchards	87.91	2	85.65	2	86.78	2
4. High price of reliable plant materials	84.58	3	75.83	4	80.20	3
5. Costly hired labour	36.66	11	34.16	11	35.41	11
6. Lack of finance and credit	91.66	1	88.35	1	90.00	1
7. Lack of farmers' friendly economic policies	71.66	6	70.83	5	71.24	6
8. Inadequate subsidy on mango cultivation	64.16	7	62.08	7	63.12	7
9. Seasonal and uncertain returns	51.25	9	42.50	10	46.87	9
10. Threat from wild and stray animals	58.33	8	55.41	8	56.87	8
11. Chance of theft	75.41	5	68.75	6	72.08	5

MPS = Mean Per cent Score** = Significant at 1 per cent level

—% $r_s = 0.97^{**}$ %

straints in adoption of scientific mango production technology.

The present findings are supported by the findings of Mohammad (2000) who concluded that high intensity constraints of orchard development with their relative position in the hierarchy as expressed by the orchard owners were lack of technical knowledge, long juvenile period, perishable nature of commodity, high cost of establishment of orchards, problematic soil, erratic rainfall, sub-division and fragmentation of land and lack of need based training programmes. The similar findings also reported by Poonia (2002), Jhaharia (2005), Meena (2005) and Brar (2008).

2. Economic constraints

The data incorporated in Table 3 reveal that "lack of finance and credit" was expressed as the most important constraint by the tribal and non-tribal respondents with 91.66 and 88.35 per cent respectively and ranked first. This was followed by the constraints of "high cost of establishment of mango orchards" and "high price of reliable plant materials" for mango cultivation. The MPS of these constraints was 87.91 and 84.58 respectively among tribal farmers, whereas were in non-tribal farmers it was 85.65 and 75.83 per cent respectively.

Table 3 further shows that "perishable nature of commodity results in economic losses" was also expressed as important constraint by tribal and non-tribal farmers with 80.83 and 78.33 MPS and ranked fourth by both the categories of respondents respectively. The realization of this problem may be due to the fact that there was not a cold storage unit available in the study area. The next important problem realized by the tribal and non-tribal respondents was "chance of theft" with 75.41 and 68.75 per cent respectively. The problem related to chance of theft might be because of reason that mango fruits are more delicious than other fruits.

Further analysis of table clearly reveals that most of the tribal and non-tribal respondents faced the constraint entitled "lack of farmers' friendly economic policy" with 71.66 and 70.83 MPS respectively. The constraints about "inadequate subsidy on mango cultivation", "threat from wild and stray animals" and "seasonal and uncertain returns" was

64.16, 58.33 and 51.25 per cent perceived by the tribal farmers, while 62.08, 55.41 and 42.50 per cent by the non-tribal farmers respectively. The constraint perceived at the end of the list was "costly hired labour" by both the categories of mango growers in economic constraints.

From the above results it can be concluded that tribal farmers faced more constraints than non-tribal farmers in most of the economic aspects. The extent of economic constraints perceived by the tribal farmers was from 36.66 to 91.66 per cent, while it was from 34.11 to 88.35 per cent in non-tribal farmers.

The calculated value of rank order correlation co-efficient (r_s) was found to be 0.97, which is statistically significant at 1 per cent level of significance. The data support the proposition that there was an association between the ranks assigned by tribal and non-tribal mango growers with respect to economic constraints in adoption of scientific mango production technology. It means that both the categories of respondents expressed economic constraints on more or less same priority.

The present findings are supported with the findings of Dhanasekaran (1990) who reported that lack of marketing facilities and long gestation period (100%) were perceived as major constraints by the respondents for growing tree crops. Meena (2005) observed that long juvenile period, high cost of establishment of orchard, lack of credit facilities and lack of preservation industry were major constraints causing serious concern to the Anola growers.

3. Storage and marketing constraints:

An observation of Table 4 indicates that "lack of storage facility in the area" was expressed as a constraint with highest intensity by the tribal and non-tribal respondents with 92.50 and 87.91 per cent respectively. The realization of this problem might be because of non-availability of commercial cold storage in the study area.

The next important constraint faced by the tribal and non-tribal respondents was "high fluctuation in the market price during harvest season" with MPS 88.33 and 82.50 respectively. This was followed by the "constraints related to poor co-operative marketing network", "high charges on availing private storage houses", "high price difference among

Table 4: Storage and marketing constraints perceived by the mango growers **n = 160**

S. No.	Constraints	Tribal farmers		Non-tribal farmers		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Lack of storage facility in the area	92.50	1	87.91	1	90.20	1
2.	Inadequate marketing system	59.58	9	45.00	10	52.29	10
3.	Poor cooperative marketing network	85.00	3	80.84	4	82.91	4
4.	Distant market for mango fruit	69.58	7	65.00	7	67.29	7
5.	High fluctuation in the market price during harvest season	88.33	2	82.50	3	85.41	2
6.	Mal practices of the middlemen	54.58	10	53.33	9	53.95	9
7.	Distress sale of mango	77.50	6	78.33	5	77.91	5
8.	High mandi taxes	62.91	8	60.00	8	61.45	8
9.	High charges on availing private storage house	83.33	4	84.58	2	83.95	3
10.	High price difference among mango varieties	81.66	5	73.33	6	77.49	6
11.	Inadequate and unreliable marketing channels	47.50	11	42.08	11	44.79	11

MPS = Mean Per cent Score** = Significant at 1 per cent level—% $r_s = 0.95^{**}$ %

mango varieties”, “distress sale of mango” and “distant market for selling mango fruits”. The extent of these constraints perceived by the tribal farmers was 85.00, 83.33, 81.66, 77.50 and 69.58 per cent respectively whereas the level of these constraints among the non-tribal farmers was 80.83, 84.58, 73.33, 78.33 and 65.00 per cent respectively.

Table 4 further shows that “inadequate marketing system” and “malpractices of the middlemen” were also perceived important constraints by the farmers of both the categories in adoption of scientific mango production technology. It was further observed that constraint perceived at lowest by the tribal and non-tribal farmers was “inadequate and unreliable marketing channels” with the extent of 47.50 and 42.08 per cent respectively.

From the above results it can be concluded that tribal farmers possessed more constraints than non-tribal farmers about most of the storage & marketing problems. The extent of storage and marketing constraints perceived by the tribal respondents was from 47.50 to 92.50 per cent, whereas, it was from 42.08 to 87.91 per cent in non-tribal farmers.

The calculated value of rank order correlation co-efficient (r_s) was found to be 0.95, which is statis-

tically significant at 1 per cent level of significance, which leads to the conclusion that there is correlation in realization of storage & marketing constraints between tribal and non-tribal respondents. It means that both the categories of respondents realized storage and marketing constraints on more or less same order.

The present findings are in line with findings of Yadav (2006) who revealed that high fluctuation in market price, high cost of insecticides and pesticides, costly plant material and lack of storage facility were the important constraints perceived by the mandarin growers. Similar findings have also been supported by Meena (2005) and Brar (2008).

4. Processing and value addition constraints

The data presented in Table 5 shows that “lack of preservation facilities for mango” was the top most constraint perceived by the tribal and non-tribal respondents and was ranked first by both the categories of respondents. The realization of this problem might be due to the fact that majority of the mango growers are enthusiastic for preservation of mango to get higher benefits from its cultivation.

The next important constraint perceived by the tribal farmers was “lack of initiatives from govern-

Table 5: Processing and value addition constraints perceived by the mango growers **n = 160**

S. No.	Constraints	Tribal farmers		Non-tribal farmers		Total	
		MPS	Rank	MPS	Rank	MPS	Rank
1.	Lack of preservation facilities for mango	92.91	1	83.75	1	88.33	1
2.	Lack of knowledge about mango by-products	54.58	4	42.50	5	48.54	5
3.	Absence of value addition units in the area	65.41	3	65.01	2	65.21	3
4.	Inadequate skill in grading and packaging of mango	49.16	5	49.58	4	49.37	4
5.	Lack of initiative from government organizations for processing & value addition	79.16	2	61.25	3	70.20	2

MPS = Mean per cent score** = Significant at 1 per cent level —% $r_s = 0.80^{**}$ ‘%

ment organizations for processing and value addition” with 79.16 MPS, whereas this problem was assigned third rank by the non-tribal respondents with 61.25 per cent. This was followed by the constraint of “absence of value addition units in the area” which was also expressed as one of the important processing & value addition constraints by tribal and non-tribal farmers with 65.41 and 65.01 MPS respectively.

Further analysis of table clearly indicates that “inadequate skill about grading and packaging of mango” were considered as average problem by tribal and non-tribal respondents with 49.16 and 49.58 per cent respectively. It was noted that “lack of knowledge about mango by-products” was expressed as least important constraint by the respondents. This may be due to the reason that most of the farmers possessed knowledge about mango by-products like pickles, mango juice, chutneys in the study area.

From the above discussion it could be inferred that the extent of processing and value addition constraints perceived by tribal respondents was from 49.16 to 92.91 per cent, while it was from 42.50 to 83.75 per cent in non-tribal farmers. Further, it was noted that tribal farmers perceived more constraints than non-tribal farmers in almost all the constraints.

The rank order correlation was calculated between ranks accorded by the tribal and non-tribal mango growers about processing & value addition constraints in the adoption of scientific mango production technology. The calculated value of rank order correlation was found to be 0.80 which is statistically significant. Thus, it was inferred that there was significant correlation between tribal and non-

tribal respondents with regard to assigned ranks about processing & value addition constraints of scientific mango production technology.

The present findings are in accordance with the findings of Bhople *et al.* (1996) who found that non-availability of processing units (76.67%) and transportation charges of fruits from orchards to near market (54.09%) were major constraints faced by orange growers. Mohammad (1997) who revealed that lack of storage facility, lack of preservation industry, perishable nature of fruits and lack of technical know-how were the major constraints faced by mandarin growers. Poonia (2002) found that lack of technical know-how, perishable nature of commodity, lack of storage and preservation industry in the area were the major constraints causing serious concern to the kinnow orchard owner of Sri Ganganagar district.

Comparison of constraints between tribal and non-tribal mango cultivators:

To find out the difference in constraints perceived by the tribal and non-tribal respondents in adoption of scientific mango production technology, ‘Z’ test was applied.

Table 6 shows that calculated ‘Z’ value was found to be greater than the tabulated value at 1 percent level of significance in technical, economic, storage & marketing and processing & value addition constraints. Therefore, the research hypothesis (RH_1) was accepted and null hypothesis (NH_{01}) was rejected. It means that there was significant difference between tribal and non-tribal respondents with respect to constraints perceived about technical,

Table 6: Comparison of constraints between tribal and non-tribal respondents about mango cultivation n = 160

S.No.Constraints	Tribal farmers		Non-tribal farmers		'Z' Value
	Mean	S. D.	Mean	S. D.	
1. Technical constraints	27.31	2.30	26.63	1.84	8.12**
2. Economic constraints	22.63	2.10	21.23	1.64	4.82**
3. Storage & marketing constraints	23.92	2.35	23.07	2.06	2.59**
4. Processing & value addition constraints	10.26	1.04	9.27	1.08	6.03**
Total	84.12	7.79	80.2	6.62	21.47**

** = Significant at 1 per cent level

economic, storage & marketing and processing & value addition for successful cultivation of mango.

The overall calculated 'Z' value was also greater than its tabulated value. This indicates that there is a significant difference in overall constraints perceived by tribal and non-tribal respondents in adoption of scientific mango production technology. Further analysis of table shows that tribal farmers have higher mean value as compared to non-tribal respondents. This reveals that tribal respondents possessed more constraints than non-tribal farmers in cultivation of mango plants.

The findings are similar to the findings of Neelam (2006) who reported that there was significant difference in the level of constraints perceived by the peripheral and distant farmers in adoption of garlic production technology. She further reported that peripheral farmers had less constraint than distant farmers in adoption of garlic cultivation technology. Similar findings also reported by Meena (2006) who found that there was a significant difference in constraints perceived by the tribal and non-tribal respondents in adoption of *Jatropha* cultivation technology. He further observed that tribal respondents possessed more constraints than non-tribal farmers in cultivation of *Jatropha* plants.

CONCLUSION

From the above findings it can be concluded that more than two-third of the mango growers perceived either medium or higher level of the constraints regarding scientific mango production, which indicates severity of the problems being faced by mango growers. The results of Z test indicate that

there was a significant difference in overall constraints perceived by tribal and non-tribal mango growers in the adoption of scientific mango production technology. This reveals that tribal respondents possessed more constraints (technical, economic, storage, marketing, processing and value addition) than non-tribal respondents about scientific mango production. It may be due to poor and deprived economic status, poor knowledge and skill of tribal farmers about scientific mango production technology.

It was reported that inadequate training for acquiring skills about scientific mango production, lack of skill in performing technical operations, long juvenile period, non-availability of reliable varieties and plant material, lack of finance & credit, high cost of establishment of mango orchards, high price of reliable plant materials, perishable nature of commodity results in economic losses, lack of storage facility, high fluctuation in the market price during harvest season, high charges on availing storage houses owned privately, poor cooperative marketing system, lack of preservation facilities for mango, lack of initiatives from govt. organizations for processing & value addition and absence of value addition units were important constraints expressed by the tribal and non-tribal respondents in mango production.

To resolve these obstacles it is recommended that skill oriented trainings on various aspects of scientific mango production should be provided to the mango growers by subject matter specialists or scientists. High mortality of plants during initial years of planting in the field was one of the major constraints expressed by the mango growers therefore, orchard owners should be educated fully in

handling and care of tiny saplings, digging of pits, planting techniques, timely irrigation and use of manures and fertilizers, which will help in less mortality of plants during initial years of establishment of mango orchard. It is recommended that during juvenile period of plants subsidy in the form of inputs may be given to the mango orchard owners so that the farmers can be motivated to take up this venture. Besides this, some model nurseries should be established by Horticulture department in this area to meet out the demand of planting material.

To solve the storage problem farmers and various organizations of the area should develop the storage units in the cluster of villages and facilities like zero energy chambers, dipping fruits in paraffin wax etc. should be developed by utilizing local resources so that produce of horticultural crops after harvesting can be stored timely. This will provide more prices to the mango growers because they will be able to sell the produce at the right time and also storage loss could be minimized.

It was also observed that extent of awareness and utilization of marketing channels was low among the mango growers. Therefore, it is recommended that proper training should be conducted for the mango growers by marketing officers on various aspects and procedure of marketing in the regulated markets, cooperative societies and mandies of the city. It is further suggested that mango growers should organize the own market and rural mandi at gram panchayat level or block level to sell their produce at reasonable rates; government should establish good marketing network in the villages, so farmers can get remunerative price of their produce at the time of harvesting. It will develop the confidence in mango growers about marketing as well as cultivation of mango. It is also recommended that there should be cooperative system of marketing which will safeguard the interests of its members in disposal of their produce.

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