

## **PROBLEMS RELATED TO MARKETING OF MANGOES IN SRINIVASPUR TALUK AND ITS ADVERSE IMPACT ON SALES AND REVENUE**

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### **ABSTRACT**

*This research paper focuses on the key problems associated with adverse impact on sales and revenue from the cultivation and marketing of mango fruit in Srinivaspur Taluk-Kolar district. The research has been conducted based on three key elements such as problems related to mango cultivation, distribution and problems related to marketing of mango growers. There are 326 villages under Srinivaspur taluk (Kolar District-Karnataka State), among them 82 villages were selected and 100 farmers were selected as respondents for the study based on the convenience of the research. Questionnaire and focus group discussion was the technique followed to gather required information. Regression analysis was used to find out whether any significant relationship between problems related to cultivation, distribution, marketing of mangoes and its adverse effect on sales and revenue. The results shows that non-availability of reliable varieties and plant material, lack of finance and credit, no insurance for mango trees, aged orchards, lack of transportation facility, lack of consultation before price fixation, demanding sample mango at free of cost, irregular market demand, excessive wastage during low marketing demand, bargaining method of sales and demand mangoes beyond actual weight are the key problems were identified which are adversely effecting sales and revenues from the cultivation and marketing of mangoes in Srinivaspur.*

**KEYWORDS:** : *Mango, Problems, Cultivation, Distribution, Marketing, Sales and Revenue.*

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### **INTRODUCTION**

The mango fruit is inherent to the south Asia from where it was distributed across the world. Generally, Mango is produced in most frost free tropical and sub-tropical climates, more than 85 countries in the world cultivate mango (Kayier Guien Chay 2019). Mango, a tropical fruit of great economic importance, is generally harvested green and then commercialized after a period of storage (Mathieu Lechaudel and Jacques Joas.2007). Most of the varieties in mango fruit are tasty and highly nutritious. The mango fruit processing sector is rapidly being transformed into a high volume profit making industry. Supplying of mangos as a raw material for many food processing industries yield attractive revenue for the formers (Purushottam Bung, 2012).

Mango pulp is not generally consumed directly rather used as fillings for pastries, Juices, Fluids, Drinks, Jams, Fruit Cheese, Ice Cream as a delicious dessert. It can also be used in Sweets, Bakery items, and fruit meals for children, to add mango flavors for food industry, and also to make Yoghurt (Saeed Akhtar et al, 2010).Mango fruits are also utilized to make some other products like Chutney, Pickle, Mango powder, Beverage, etc. Ripe ones are used in making pulp, packed juice, syrup, squash etc (Mukonde Siafunda, 2019).

In India, mango is mainly produced in Andhra Pradesh, Maharashtra, Karnataka, Orissa, Tamil Nadu, West Bengal, Bihar, Gujarat, Madhya Pradesh, Haryana, Punjab, Rajasthan, Uttarakhand, and Uttar Pradesh, etc (Arvind Singh Yadav, 2016). Among these states Karnataka state also major producer of mangos especially from Srinivaspur taluk Kolar district. The following table shows the production of mangoes in Karnataka.

Production of mangoes in Karnataka from 2015 to 2017

Districts	2015-16		2016-17	
	Area in '000 Ha	Production in '000 MT	Area in '000 Ha	Production in '000 MT
Kolar	49.64	421.19	50.43	426.79
Ramanagara	22.72	228.01	23.09	230.90
Tumkur	15.67	167.91	15.67	167.91
Dharwad	12.50	107.43	12.54	107.22
Chikballapur	16.00	128.97	13.73	102.94
Mandya	6.50	74.43	6.50	74.43
Bangalore Rural	6.98	66.12	6.80	64.36
Belgaum	5.08	62.95	4.95	61.56

Source: Horticultural Statistics at A Glance 2018

From the above table it is understood that, Srinivaspur taluk is considered as a predominant location for producing mango compared to other locations in Karnataka (Viresh Kumargoud, 2017). Many people from this area are engaged in producing and marketing of mangos as they consider this as cash crop. Most of the growers were found to dispose the standing crop to the preharvest contractors because, farmers are not ready to accept challenges of national and international market (K.Venkat Reddy, 2015). Many of the farmers are selling their mangoes to agents at lower cost. Agents and middlemen are getting more profits and farmers are getting very less price for the mango crop they produce (Bhave Atul Vijay, 2017).

## MARKETING OF MANGO FRUIT

It is common in Srinivaspur, that most of the mango producers sell their products at nearby local market. Most of the time mango producers sell their produce to consumers and sometimes to retailers because of the market fluctuation and lack of marketing infrastructures. The dealers and the farmers will have contract to deal with the final output of mango before its cultivation on the basis of forward price (H.S. Srikanth 2015). Mangoes which are ready to sell in the month of April are considered to be the more productive. Later in the second phase mangoes may regrow several times during the following months or may cease to grow anymore to attain blooming maturity and thus this becomes essential to determine pattern of growth (K. Usha Rani, 2018). In this situation the price of the fruit will get reduce and as a consequence of this farmer are forced

to sell their produce at the local market. Keeping these problems related cultivation, distribution and marketing in mind the following literature review has been carried out.

## **LITERATURE REVIEW**

Mango growers finding adverse effect on sales and revenue of mangoes due to lack of suitable marketing avenues and channels decreases the margin for the mango growers. Mango growers sold their produce at farm gate and the reasons expressed by them were convenient to sell in the village, better price for produce, less risky compared to other type of sales, lack of labour, absence of marketing costs like harvesting, loading, unloading and commission charges, lack of proper transportation facilities, immediate cash requirements and lack of market information. (H.S. Srikanth 2015). Under current system there are number of intermediaries who add little value to the product, but increase price dramatically by commissions or trading margins. This all coupled with lack of integration of market leaves farmers and consumer vulnerable alike (Devang K. Nandola 2017).

In the study done by (Mesay Adugna Kassa, 2017) they found that, the yield is low as compared to other mango growing areas in Ethiopia. Most farmers are using poor harvest and post-harvest handling practices due to lack of awareness and lack post-harvest handling technologies. In addition, they are having limited access to central market. A study conducted by identified that anthracnose and stem- end rot are important post-harvest diseases in mango production. Generally, these problems in post-harvest handling and management practices can relate to lack of knowledge, skills and facilities in production and agronomic practices, harvesting, post-harvest handling and limited capacity in R&D and extension services to promote improved and marketable mango varieties introduction, prevalence of mango fruit diseases and pests.

In the research conducted by (Mukonde Siafunda, 2019) it is understood that, Mango trees are widely grown in the Zambia, however, there is a lot of wastage where they rot on the ground or buried because of lack of storage technology, lack or few fruit processing cottage industry and no value addition to the fruit. This is as a result of inadequate fruit processing technology knowledge amongst small scale farmers.

(Masbaul Islam 2017), says that, scarcity of better varieties, seedling, grafts, climate change and lack of modern technology were also three major problems faced by mango farmers in case of mango production. Inadequate transport facility, higher cost of transportation, preservation problem, lack of feeder roads, lack of shed in the market, post-harvest loss and strike, political unrest problems were identified for the farmers in mango marketing. Marketing problems for traders were unstable price, selling on credit, lack of capital, lack of market place, high transport cost, Lack of market information, lack of processing center, lack of processing plant etc.

Even though India occupies the prime position in the production of mango fruits in the world, still mango cultivars of India are facing grave challenges such as very small land holding, mango transportation and marketing problem, maximum orchards are 35-40 years old, providing low yield, lack of proper training on fertilizer application, irrigation, pest and diseases management, non-availability of good quality saplings, drying of branches, insect attack (mango hopper, mealy bug, fruit fly etc.), disease infestations (anthracnose, powdery mildew, mango malformation), middle man menace, lack of harvesting and post harvesting technology etc, (Barsha Sarkar, et al., 2018). The main reason for the decline in mango production is due to the lack of proper cultural management practices and general neglect. But this low yield may be

addressed to improve the productivity through the proper scientific agricultural management practices (Md.Jahangir Alam, et al., 2017).

Lack of infrastructure in rural areas and inadequate finance are also some of the other important problems encountered by the mango growers. The least considered problem was the irregular settlement of dues by the middlemen. The middlemen role was also responsible for the non-remunerative prices received by the mango growers. In Mango marketing too many middlemen do the mango grading unscientifically with mere eye judgment the growers are very often thrown to the receiving end. Insufficient marketing mechanism for mango marketing is the last problem of mango marketing (A. Sulthan Mohideen 2016). But what is lacking is the link between demand and supply in the marketing side and good post-harvest practices in the production side. In today's market structure, in order to realize more prices, there is a need to shift from mere "marketing" to "supply chain management". In the supply chain, growers, contractors, traders, processors, exporters and supermarket owners are the important stakeholders, involved in successful trading of mangoes (Sarada Gopalakrishnan, 2013).

Mango production continues to be affected by poor marketing linkages, lack of crop insurance cover and climate change impacts often compelling the growers for distress sales at throwaway prices (S. K. Chaudhari and A. Singh 2019). In the research article by (Yigzaw Dessalegn, 2014), it is understood that, most mango farms in Ethiopia are owned by aged farmers. This could be since the youth group lack adequate capital and land to grow fruit crops like mango which naturally has long unproductive or juvenile period. It could also be since the youth group are educated and preferred to be engaged in off-farm activities. Moreover, this could be since aged farmers prefer less labor intensive agricultural activities such as fruit crops production.

Orchards on terraces with soils of poor WHC clearly suffered from water stress during flushes and fruit bearing. The lack of water at periods when it is most needed make soils less fit for orchard establishment (C.A.J.M. de Bie 2000). The probable reason might be for marketing of mangoes due to easy accessible of pre harvest contractor, easy to farmers to sell with less risk, lack of regulated markets, lack of knowledge about market information, lack of storage facility in the area and low keeping quality of the fruit the farmers simply lease out their orchards (Manjunath et, al.,2017).

Mango cultivators are facing multiple problems with regard to get successful mango yield. The challenges such as small cultivation land hold, non-availability of hybrid seeds, post harvesting loss due to storage problems, exploitation of middlemen, lack of support from government and local bodies, unorganized and con cooperative efforts, low profit etc. he suggested that there is a need for turnaround strategies in this industry. the industry should address problems and constraints faced in the field of mango cultivation by developing integrated research model (Purushottam Bung (2015).

The success of mango output is adversely influenced by the factors such as volatility in the natural conditions, fluctuations in the market price, non-availability of labors, lack of market information etc (SA Dhenge., et al 2018). As per the examination made by (Sharad Yadav, 2018) marketing elements of mango in the study area. The marketing aspects includes market intermediaries, channels of mango distribution, cost of marketing and its revenue. Theresearch revealed that the share of middlemen in consumer's rupee is higher compared to other cost marketing of mangoes. Arvind Singh Yadav,(2016), This research article highlights the

geographic variations and soil quality leading to profitable mango yield. He also finds that the geographical area is supporting to cultivate mangos in a larger quantity.

The research article published by (A.Sulthan Mohideen,2017), the key objective of this article is to analyze income from Mango cultivation with the help of applying Cost-Volume-Profit analysis in Theni District. Simple tabular analysis and marginal costing techniques concepts were used to work out cost of cultivation of mango. At over all basis per hectare cost of cultivation (variable cost) and cost of establishment (fixed cost) were Rs.24746 and Rs.39611 respectively. The study revealed that the profit was Rs.11318. The selling price of mango was worked out to Rs.155.03 per qtl. The profit from sale of mango mainly goes to growers, which use it for their socio –economic development activities.

In the research conducted by (Madhuri Saripalle, 2019), The mango value chain is analysed in-depth to understand the market choices of farmers and the role of market intermediaries and is based on data collected from a primary survey of 131 farmers. The results show that in addition to age and education, distance to markets and farming practices are significant factors influencing the profitability of mango cultivators.

In the research study by (Akurugu, G. K, 2016), From the study it is revealed that, the causes of postharvest losses in the Northern region among mango farmers and sellers were found to include poor harvesting practices, storage and packaging methods. The results also showed that anthracnose disease affected the matured fruits on the field especially Keitt, which led majority of the farmers to remove the plants from their fields. The study also revealed that, there is no proper storage facility for the market women and the farmers to store their produce after harvesting. This has created serious economic loses to all the actors in the supply chain of the fruits. This calls for proper storage facility in future for both growers and sellers in the region.

## **PROBLEM STATEMENT**

Srinivaspur taluk is considered as one of the largest mango producers in India, being the highest contributing area in mangoes production there is a need for understanding what are the problems faced by the mango growers and what kind of solutions they need to sustain so has to make Srinivaspur as one of the major contributor of GDP of the country. After intensive literature review, there were no research articles related to the problems related to marketing of mangoes and prospective solutions. Through the preliminary interview method with the mango growers in Srinivaspur, it is understood that, the farmers are not able to export to other countries, not enjoying adequate revenue from the mango cultivation, their socio economic status is not improving since several years, the mango growers are not satisfied with the cultivation of mangoes, the farmers are not able to compete with world class mango growing regions in India, they are not able to achieve self-reliance in mango cultivation. Therefore, there is a need for immediate attainment of problems related to harvesting, distribution and marketing of mangoes in Srinivaspur, so that the farmers in this region may get handsome revenue through sale of mango produces.

## **RESEARCH OBJECTIVES**

1. To study the problems related to cultivation of mangoes and its impact on sales and revenue.
2. To study problems related to distribution of mangoes and its impact on sales and revenue

3. To study problems related to marketing of mango growers and its impact on sales and revenue.
4. To find out the key problems which is adversely effecting on sales and revenue from the mango cultivation in Srinivaspur.

### HYPOTHESIS

H1: There is a significant relationship between problem related to cultivation of mangoes and adverse effect on sales and revenue from mango cultivation.

H2: There is a significant relationship between problem related to distribution of mangoes and its adverse effect on sales and revenue from mango cultivation.

H3: There is a significant relationship between problems related to marketing of mango growers and its adverse effect on sales and revenue from mango cultivation.

### METHODOLOGY

Descriptive research methodology was followed to study the present research because the facts and figures collected based on the descriptive information and information provided by the mango growers in Srinivaspur taluk. The research work is aimed to find out key problems that the mango growers are facing with respect to farming, distribution and marketing of mangoes which are leading to adverse impact on sales and revenue. Primary research involves collecting first-hand information directly from the mango cultivators through structured questionnaire and interview schedules. Once the data is collected, the processed information has been obtained by using MS-Excel and SPSS software packages.

### DATA COLLECTION

Data collection was based on a survey of individual mango producers, sellers and stakeholders in the mango sector by using a structured questionnaire. The research therefore had a quantitative and qualitative approach on empirical basis and literature review. A detailed interview schedules were used to capture factual and in depth data of post-harvest; handling and marketing mango fruits. Questionnaires were administered to mango farmers and sellers who were selected based on their scale of production within Srinivaspur taluk to evaluate post-harvest problems of mango growers.

### SAMPLING

There are 82 villages were selected from Srinivaspur by using convenience sampling technique and a sample of 100 respondents (Farmers) were selected from all villages based on the size of their agricultural land.

### RESULTS & DISCUSSION

**H1: There is a significant relationship between problem related to cultivation of mangoes and effect on sales and revenue in Srinivaspur.**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.762 <sup>a</sup>	.581	.534	.80223

<b>Model Summary</b>						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.762 <sup>a</sup>	.581	.534	.80223		
a. Predictors: (Constant), Pest and Disease, Non-availability of reliable varieties and plant material , Costly Hired labour, Lack of finance and credit , Weather problems and fluctuation , High cost of establishment of mango orchards, Lack of knowledge about scientific cultivation practices, Long juvenile period i.e. unproductive period , No insurance for mango trees , Aged orchards.						
<b>ANOVA<sup>b</sup></b>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	79.473	10	7.947	12.349	.000 <sup>a</sup>
	Residual	57.277	89	.644		
	Total	136.750	99			
b. Dependent Variable: Adverse effect on sales and revenue from mango cultivation						
<b>Coefficients<sup>a</sup></b>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.191	.631		.303	.763
	<i>Non-availability of reliable varieties and plant material</i>	<b>.239</b>	<b>.119</b>	<b>.248</b>	<b>2.016</b>	<b>.047*</b>
	Lack of knowledge about scientific cultivation practices	.052	.066	.057	.791	.431
	Long juvenile period i.e. unproductive period	-.121	.106	-.132	-1.142	.256
	High cost of establishment of mango orchards	.014	.065	.016	.216	.829
	<i>Lack of finance and credit</i>	<b>.254</b>	<b>.108</b>	<b>.268</b>	<b>2.345</b>	<b>.021*</b>
	Costly Hired labour	-.046	.065	-.050	-.707	.481
	Weather problems and fluctuation	.022	.068	.023	.321	.749
	<i>No insurance for mango trees</i>	<b>-.251</b>	<b>.115</b>	<b>-.269</b>	<b>-2.186</b>	<b>.031*</b>
	<i>Aged Orchards</i>	<b>.461</b>	<b>.211</b>	<b>.491</b>	<b>2.186</b>	<b>.031*</b>
Pest and Disease	.271	.211	.287	1.287	.201	
a. Dependent Variable: Adverse effect on sales and revenue from mango cultivation						

Note: \*p < 0.05 = 95 % Confidence level,

\*\*p < 0.01= 99% Confidence level;

\*\*\*p < 0.001= 99.9% Confidence level.

The regression analysis shows that, the value of “R” indicates the high degree of correlation coefficient (.762) between the problems related to cultivation of mangoes and adverse effect on sales and revenue from mango cultivation.  $R^2$  measure the variation explained by the regression model is (.581) being high which indicates that the model fits the data well. The significant of F change is less than 0.05 which indicate that problems related to cultivation of mangoes have significant relationship with adverse effect on sales and revenue from mango cultivation. All the ten variables of problems related to cultivation of mangoes were used to predict adverse effect on sales and revenue from mango cultivation.

In this case problems related to cultivation of mangoes such as *non-availability of reliable varieties and plant material* ( $t = 2.016$ ,  $p = .047^*$ ), *lack of finance and credit* ( $t = 2.345$ ,  $p = .021^*$ ), *no insurance for mango trees* ( $t = -2.186$ ,  $p = .031^*$ ) and *aged orchards* ( $t = 2.186$ ,  $p = .031^*$ ) have significant relationship with adverse effect on sales and revenue from mango cultivation.

Regression model for adverse effect on sales and revenue from mango cultivation due to problems related to cultivation of mangoes is  $Y = b_0 + b_1 \times 1 + b_2 \times 2 \dots + b_k \times k + n$

Adverse effect on sales and revenue from mango cultivation due to problems related to cultivation of mangoes =  $.191 + (.239 \times \text{Non-availability of reliable varieties and plant material}) + (.052 \times \text{Lack of knowledge about scientific cultivation practices}) + (-.121 \times \text{Long juvenile period i.e. unproductive period}) + (.014 \times \text{High cost of establishment of mango orchards}) + (.254 \times \text{Lack of finance and credit}) + (-.046 \times \text{Costly Hired labour}) + (.022 \times \text{Weather problems and fluctuation}) + (-.251 \times \text{No insurance for mango trees}) + (.461 \times \text{Aged Orchards}) + (.271 \times \text{Pest and Disease})$ .

Since the non-availability of reliable varieties and plant material, Lack of finance and credit, no insurance for mango trees and aged orchards significant values are < than p value of 0.05, therefore hypothesis statement of significant relationship between problem related to cultivation of mangoes and adverse effect on sales and revenue from mango cultivation is accepted.

### **Non-Availability of Reliable Varieties and Plant Material**

Nursery planting material is not available according to the demand in the market so as to fetch good market price. Even if it is available also some of the plant varieties not suitable to climatic and soil conditions. The plant materials are not obtained from authorized and reliable nurseries. Low quality, stunted, diseased planting material are causing immense losses to the plantation. Non qualitative planting material do not produce a good and healthy orchard even after taking proper care and management. Most of the farmers buying plants at the time of planting an orchard avail lesser height of mango plants, stunted growth or premature plants which may adversely effect on sales in future. Such plants fail to establish and unable to produce quality yield. Taller plants indicate older plants; such plants may also face difficulty in establishment. Taller plants are also difficult for handling, transportation and plantation.

### **Lack of Finance and Credit**

For mango cultivation a farmer needs finance. They arrange finance in different sources. The sources have been classified into four categories viz., own fund, money lender, borrowings from nationalized banks, borrowing from commission agent. The researcher has made an attempt to



find out the sources of financial needs of a farmer and the method of fulfilling their needs is given in the following table in Srinivaspur taluk.

SL.No	Sources	No. of Respondents	Percentage
1	Own fund	43	43%
2	Money lender	20	20%
3	Borrowings from nationalized banks	12	12%
4	Borrowing from Commission agent	25	25%
	<b>Total</b>	<b>100</b>	<b>100%</b>

Source: Primary Data

Many of the farmers facing the financial problem to cultivate, distribute and marketing of mangoes in Srinivaspur as the table shows that 43% of farmer's dependent on own fund which is not sufficient for meeting the mango production cost.

### **No Insurance for Mango Trees**

Like an insurance coverage for life and general insurance, there is no concept of insurance for mango trees. There will be a chances of getting diseases for the trees, less yield due to aged trees etc. This leading to affect adversely on sales of mango crops.

### **Aged Orchards**

In general, 40-45 years old mango trees exhibit decline in fruit yield because of dense and overcrowded canopy. The trees do not get proper sunlight resulting in decreased production of shoots. New emerging shoots are weak and are unsuitable for flowering and fruiting. the population of insects and pests built up and the incidence of diseases increases in such orchards. Intermingling, diseased and dead branches are not removed. Thereafter undesirable branches of unproductive trees are not marked for the reproductive trees.

**H2: There is a significant relationship between problem related to distribution of mangoes and adverse effect on sales and revenue from mango cultivation.**

<b>Model Summary</b>						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.904 <sup>a</sup>	.817	.801	.52416		
a. Predictors: (Constant), Demanding sample mango at free of cost, High commission charged by middlemen, Lack of consultation before price fixation, Lack of transportation facility, Lack of storage facility in the area, High dominance of market intermediaries, Inadequate and unreliable marketing channels, High cost of transportation of mango fruit.						
<b>ANOVA<sup>b</sup></b>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	111.748	8	13.969	50.842	.000 <sup>a</sup>
	Residual	25.002	91	.275		
	Total	136.750	99			
b. Dependent Variable: Adverse effect on sales and revenue from mango cultivation						
<b>Coefficients<sup>a</sup></b>						

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.614	.219		2.802	.006
	High cost of transportation of mango fruit	.056	.102	.060	.550	.584
	Lack of storage facility in the area	.119	.106	.121	1.118	.266
	High commission charged by middlemen	-.108	.087	-.092	-1.231	.221
	Inadequate and unreliable marketing channels	-.070	.091	-.077	-.767	.445
	<b><i>Lack of transportation facility</i></b>	<b>-.155</b>	<b>.076</b>	<b>-.143</b>	<b>-2.053</b>	<b>.043*</b>
	High dominance of market intermediaries	.180	.100	.172	1.805	.074
	<b><i>Lack of consultation before price fixation</i></b>	<b>.367</b>	<b>.075</b>	<b>.357</b>	<b>4.865</b>	<b>.000***</b>
	<b><i>Demanding sample mango at free of cost</i></b>	<b>.559</b>	<b>.066</b>	<b>.575</b>	<b>8.530</b>	<b>.000***</b>

a. Dependent Variable: Adverse effect on sales and revenue from mango cultivation

Note: \*p < 0.05 = 95 % Confidence level.

\*\*p < 0.01 = 99% Confidence level.

\*\*\*p < 0.001 = 99.9% Confidence level.

The regression analysis shows that, the value of “R” indicates the high degree of correlation coefficient (.904) between the relationship between problem related to distribution of mangoes and its adverse effect on sales and revenue from mango cultivation. R<sup>2</sup> measure the variation explained by the regression model is (.817) being high which indicates that the model fits the data well. The significant of F change is less than 0.05 which indicate that problem related to distribution of mangoes and its adverse effect on sales and revenue from mango cultivation. All the ten variables of problem related to distribution of mangoes were used to predict adverse effect on sales and revenue from mango cultivation.

In this case problem related to distribution of mangoes such as ***Lack of transportation facility*** (t = -2.053, p = .043\*), ***Lack of consultation before price fixation*** (t = 4.865, p = .000\*\*\*), ***Demanding sample mango at free of cost*** (t = 8.530, p = .000\*\*\*) have significant relationship with adverse effect on sales and revenue from mango cultivation.

Regression model for adverse effect on sales and revenue from mango cultivation due to **problem related to distribution of mangoes** is  $Y = b_0 + b_1 \times 1 + b_2 \times 2 \dots + b_k \times k + n$

Adverse effect on sales and revenue from mango cultivation due to problem related to distribution of mangoes = .614 + (.056 × High cost of transportation of mango fruit) + (.119 × Lack of storage facility in the area) + (-.108 × High commission charged by middlemen) + (-.070 × Inadequate and unreliable marketing channels) + (-.155 × ***Lack of transportation facility***)

+ (.180× High dominance of market intermediaries) + (.367×*Lack of consultation before price fixation*)+ (.559× *Demanding sample mango at free of cost*).

Since the Lack of transportation facility, Lack of consultation before price fixation, demanding sample mango at free of cost significant values are < than p value of 0.05, therefore hypothesis statement of significant relationship between problem related to distribution of mangoes and its adverse effect on sales and revenue from mango cultivation is accepted.

### **Lack of Transportation Facility**

Most of the mango growers complained that they did not face problems regarding this issue. But situation was different for small land owners and about 40 percent they complained that they faced regarding problem. For these reasons, it was a major problem for mango marketing due to high transportation cost. According to 80% mango farmers revealed that transportation cost was a major problem. Most of them hire from others to transport their mango produces to mandi market. Due to perishable nature of mango they had to count a huge loss in this case. About 60% of mango growers faced it as an acute problem. Because they had to sell fresh mango and supply products to distant market, even in different district.

More than 90% of the fresh fruits from Srinivasapur taluk goes to the distant markets such as Mumbai, Delhi, Kolkata, Raipur. Long distance transportation in the region is carried out by trucks and trains, and no refrigeration is used for transporting mangoes. During the transit time of 3-4 days to reach these markets, the fruits touching the sides of the boxes and those on the bottom layer suffer damage (10-15%) during transport. The use of crates can considerably reduce these losses; however, the major problem is bringing back the crates from distant markets which will incur additional costs in transport.

Marketing cost is increasing due to increase in transportation cost. In cities also road condition is not proper and another problem is of traffic jam which effects on mango quality, on time delivery and smooth transportation. Shortage of labors especially in mango peak season for loading and unloading is the other problem these intermediaries have to face. Day by day the rates of packing material are increasing which increases mango marketing cost. Cold storage facility and ripening chambers are not available even with wholesalers and at APMCs to retain the mangoes for longer period.

### **Lack of Consultation Before Price Fixation**

The assessment indicated that 90.5% of the farmers have reported as they don't negotiate on price to sell their produce; indicating this large number of producers are price takers. But 92.3 % of the farmers stated the term of payment is conducted through cash in hand system. The selling strategy of the farmers was open to any buyer. Thus, all producers sell their produce to anybody as far as they offer better price. Most of the respondents indicated that fruit price was set by demand and supply interaction. This means that buyers and sellers negotiate in the process and finally agree to exchange the products with the agreed up on price. In Srinivasapur taluk, most of the mango sellers fix price for local market after taking into consideration of price fixed by leading competitor in the local market. The fluctuations in mango prices are of an irregular pattern as shown below;

1. At the beginning of the season- less supply- high prices.
2. At the middle of the season-increased supply- prices declining gradually.

3. At the close of the season- less supply- high prices.

Mango production is seasonal and price is related with its supply. All mango farmers supply their produce only once in a year. The supply of mango occurs mainly from the month of January to July. Commission agents and wholesalers know that mango farmers do not have storage facility to retain mangoes hence they put pressure on mango farmers to sell at low price. Srinivaspur taluk mango farmers do not maintain adequate and required record of mango transactions and same is the case of pre-harvest contractors. There is no official record or publication about Srinivaspur taluk mango marketing which can show the prices and marketing cost of mangoes and the pattern for mango price quotations is also not uniform. In wholesale and retail trade the unit of sale varies from place to place. It causes great confusion for comparing prices in different markets.

### Demanding Sample Mango at Free of Cost

Most of the middlemen exploit mango formers to supply free samples of mangos before purchasing of bulk mangoes in tones. The sample quantity of mangoes could be 10 KG's or 20 KG's. For this transactions the middlemen do not pay any consideration for the mango suppliers which leads to reducing of sales and revenue of the mango growers.

**H3: There is a significant relationship between problem related to marketing practices of mango growers and effect on sales and revenue in Srinivaspur.**

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.701 <sup>a</sup>	.491	.440	.87958		
a. Predictors: (Constant), Demand mangoes beyond actual weight, Frequent Price fluctuations, Poor cooperative marketing network, Inadequate marketing system, Inadequate knowledge about marketing information, Excessive wastage during low marketing demand, Irregular marketing demand, Credit sales, Bargaining method of sales.						
ANOVA <sup>b</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	67.121	9	7.458	9.640	.000 <sup>a</sup>
	Residual	69.629	90	.774		
	Total	136.750	99			
b. Dependent Variable: Adverse effect on sales and revenue from mango cultivation						
Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.101	.468		-.217	.829
	Inadequate marketing system	.035	.087	.034	.404	.687
	Poor cooperative marketing network	.091	.080	.101	1.136	.259

Inadequate knowledge about marketing information	.137	.083	.154	1.646	.103
<b><i>Irregular market demand</i></b>	<b>.180</b>	<b>.090</b>	<b>.184</b>	<b>1.999</b>	<b>.049*</b>
Frequent Price fluctuations	.117	.095	.117	1.229	.222
<b><i>Excessive wastage during low marketing demand</i></b>	<b>.237</b>	<b>.088</b>	<b>.256</b>	<b>2.678</b>	<b>.009**</b>
Credit sales	-.142	.088	-.152	-1.618	.109
<b><i>Bargaining method of sales</i></b>	<b>.235</b>	<b>.094</b>	<b>.264</b>	<b>2.507</b>	<b>.014**</b>
<b><i>Demand mangoes beyond actual weight</i></b>	<b>.189</b>	<b>.087</b>	<b>.194</b>	<b>2.185</b>	<b>.031*</b>

a. Dependent Variable: Adverse effect on sales and revenue from mango cultivation

Note: \*p < 0.05 = 95 % Confidence level.

\*\*p < 0.01= 99% Confidence level.

\*\*\*p < 0.001= 99.9% Confidence level.

The regression analysis shows that, the value of “R” indicates the high degree of correlation coefficient (.701) between the problems related to marketing of mango growers and its adverse effect on sales and revenue from mango cultivation.

R<sup>2</sup> measure the variation explained by the regression model is (.491) being high which indicates that the model fits the data well. The significant of F change is less than 0.05 which indicate that problems related to marketing of mango growers and its adverse effect on sales and revenue from mango cultivation. All the ten variables of problems related to marketing of mango growers were used to predict adverse effect on sales and revenue from mango cultivation.

In this case problems related to marketing of mango growers such as ***Irregular market demand*** (t = 1.999, p = .049\*), ***Excessive wastage during low marketing demand*** (t = 2.678, p = .009\*\*), ***Bargaining method of sales*** (t = 2.507, p = .014\*\*) and ***Demand mangoes beyond actual weight*** (t = 2.185, p = .031\*) have significant relationship with adverse effect on sales and revenue from mango cultivation.

Regression model for adverse effect on sales and revenue from mango cultivation due to problem related to distribution of mangoes is  $Y = b_0 + b_1 \times 1 + b_2 \times 2 \dots + b_k \times k + n$

Adverse effect on sales and revenue from mango cultivation due to problems related to marketing of mango growers =  $-.101 + (.035 \times \text{Inadequate marketing system}) + (.091 \times \text{Poor cooperative marketing network}) + (.137 \times \text{Inadequate knowledge about marketing information}) + (.180 \times \text{Irregular market demand}) + (.117 \times \text{Frequent Price fluctuations}) + (.237 \times \text{Excessive wastage during low marketing demand}) + (-.142 \times \text{Credit sales}) + (.235 \times \text{Bargaining method of sales}) + (.189 \times \text{Demand mangoes beyond actual weight})$ .

Since the Irregular market demand, Excessive wastage during low marketing demand, bargaining method of sales and Demand mangoes beyond actual weight significant values are < than p value of 0.05, therefore hypothesis statement of significant relationship between problems related to marketing of mango growers and its adverse effect on sales and revenue from mango cultivation is accepted.

### **Irregular Market Demand**

Overall, demand is well covered by supply. However, the seasonality of production, combined with trading habits, can affect demand. Demand may be turned by an early or late start to an export campaign. Excessive prices, which prevent distributors from making their expected margins, can affect the demand level. Conversely, a product influx, leading to a considerable fall in prices, may temporarily refresh demand. The marketing periods can also have an influence. Customers prefer domestically or regionally grown fruits, which are generally abundant and cheap. Festive periods often lead to a consumption peak, such as the end-of-year holidays. Under-representation of a variety at a given period can explain a dip in demand or a switch to another variety. Demand can vary with size fruits too small or too large and quality (attractive or spotted fruits).

According to trade sources, during the months of March to May, supply exceeds demand in market which leads to decline in prices. Because of the excess supply, traders and farmers search for new markets for mangoes. Similarly, natural calamities like wind with high velocity' lead to drop in supply of mangoes during June to September and hence upward trend in price of Mango is witnessed.

### **Excessive Wastage During Low Marketing Demand**

The wholesale market was the most critical stage with the highest postharvest losses followed by the transport and harvest stages with losses. Damaged fruits were scored based on incidences of microbial decay, mechanical injuries and softening. Incidence of mechanical injury was scored as the number of fruits with broken peel and or pulp whereas the incidence of microbial decay was scored as the number of fruits with decay symptoms. The causal agents of the fruit microbial decay were identified using a compendium of mango diseases and disorders. Decay due to fruit fly infestation was scored based on presence of larvae in the fruit pulp. Fruit softening was measured by punching the pulp with a penetrometer (David Bishop Instruments) and fruits with penetration pressure of less than 1.0 kg/cm<sup>2</sup> were considered to be soft.

### **Bargaining Method of Sales**

The price of the mango fruit influenced by bargaining skills of the farmer and middleman, and the quality of the fruit. Better information can improve farmers' bargaining position, reduce search costs, and give them the choice to travel to farther markets if prices there are higher. Most of the smallholder farmers lack collective action in markets; individual marketing of small quantities of produce weakens the smallholder farmers' bargaining power and exposes them to price exploitation by traders. Collective action of groups also reduces transaction cost incurred by farmers in searching for markets and increases their bargaining power in setting prices. If a household belongs to a farmer group, then it is likely the household will shift from selling to brokers and probably target formal channels such as exporters.

Brokers often refused to sign contracts and were secretive, the price a farmer would receive from a broker would depend on several factors including; negotiation skills, bargaining power, among others. Farmers with few mango trees, poor quality and low quantity have low bargaining power and would accept the price offered by the buyer in fear that he/she may not get a better price before mangoes start ripening and rotting in the farms. Being in a group reduces transaction cost of both the buyer and the farmers hence raising farm gate prices, group also improves the bargaining power of sellers and thus they are able to obtain a better price. The direct market had

a sizeable proportion of farmers who could decide price which could be attributed to the fact that these farmers transported their produce to the market where they had a broad choice of buyers. More than half of the farmers were not members of any mango marketing groups. This shows a very disadvantaged situation of the farmers considering the importance of collective action in marketing by increasing farmers bargaining power, reducing transaction costs and improving information flows.

### **Demand Mangoes Beyond Actual Weight**

In Srinivaspur taluk mango grading is not done on standardized basis. There is lack of grading facilities in Srinivaspur market. It is only informal grading based on size, freshness and appearance of mangoes. According to size mangoes are classified and packed in the boxes with/without cleaning. On the box of big size mangoes number one, middle size mangoes number two and low size mangoes number three are written for identification purpose. Size confirmation is just based on observation and not on actual weight of mangoes. Grading is based on size of mango but all the mango farmers/pre-harvest contractors do not follow actual weight basis.

### **SUGGESTIONS**

1. All the nodal bodies, Government Departments, concerned Institutions should work on a common agenda of building required infrastructure.
2. There is an urgent need to train the farmers on scientific postharvest management techniques such as good agricultural practices such as harvesting at maturity, grading, pre-cooling, packaging and storage practices etc.
3. Financial assistance for small, marginal farmers must be available from various private, public sector institutions without much delay and at nominal charges of interest.
4. Community type pre-cooling and cold storage facilities need to be created at district and block level in the respective State.
5. Set up processing units at rural areas to avoid post-harvest losses.
6. Price forecasting information systems should be available at village levels so that farmers can directly contact the concerned in the market regarding the price.
7. Local mandis or regulated markets should be updated and upgraded with modern information systems as well as residential facilities.
8. Number of intermediaries and their commission should be reduced in the marketing channel.
9. Reduce transport cost by pooling method through the mango grower's association
10. Starting insurance scheme on mango trees. The Insurance herein is by way of indemnity against pecuniary loss suffered by the Insured in respect of the damages for the tree must be introduced.
11. Supply of good quality mango saplings.
12. Qualitative and healthy planting material is the key to successful and profitable mango orchard management.

13. Age of the plant is an important criterion in quality of nursery plants. Plants with appropriate age tend to acclimatize better in the field conditions and sustain transplantation shock. Proper age of plants also symbolizes sufficient time for union of graft and hardening process.
14. The Mango nursery plants from 6 to 12 months should be preferred. Young mango plant of less than 6 months may face mortality in the field conditions.
15. Planting material in the nursery should be produced under favorable climatic conditions.
16. These unproductive trees can be converted into productive ones by pruning with the technique developed at the agricultural research institute.
17. There is need for interventions aimed at assisting farmers to come up with new kinds of institutional arrangements such as collective action and contract farming to reduce cost and improve the bargaining power of farmers.

### **CONCLUSIONS**

As agriculture plays a vital role in Indian economy, it is our duty to analyse the agricultural production and marketing system properly and try to resolve its problems. From the above discussion it can be seen that the mango growers of Srinivasapur taluk are facing certain problems related to marketing. From the study it is understood that the mango growers are not getting proper support for mango cultivation and extension management regarding production and marketing of the mango output. For solving these problems firstly, there is a need to identify the major problems. Government should take initiative to solve these problems otherwise it badly affects our economics in the places like Srinivasapur. Given the large potential for mango fruit production in the Karnataka, their contribution to the total output has been extremely low compared to other states. The most cited reasons include Non-availability of reliable varieties and plant material, lack of finance and credit, no insurance for mango trees, aged orchards, lack of transportation facility, lack of consultation before price fixation, demanding sample mango at free of cost, irregular market demand, excessive wastage during low marketing demand, bargaining method of sales and demand mangoes beyond actual weight. As a result, marketing of mango fruit needs due attention in any on-going or future development plan.

### **LIMITATIONS OF THE STUDY**

1. The study is confined to mango producing sector only.
2. This research is conducted only in Srinivasapur, other mango producing districts in Karnataka are not covered in the study.
3. The sample were selected on the basis of size of the land possessed by the farmers and confined to only 100 mango growers.
4. The analysis part is consisting only regression but other statistical tools can also be used such as factor analysis, correlation, tabular analysis etc.
5. The study is limited to discuss only problems related to cultivation, distribution and marketing of mangoes only.

### **DIRECTION FOR THE FUTURE RESEARCH**

Since the present study deals with only problems related to cultivation of mangoes, distribution and marketing of mangoes and its adverse effect on sales and revenue in Srinivasapur. Further

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research can be conducted for instance, factors influencing marketing of mangoes in the perspective of exports. The research contribution can be strengthened by selecting the samples across the major mango producing states in India and comparative analysis can be done.

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